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ABSTRACT BOOK
Microwave Assisted Synthesis of N-Substituted Benzylidene-2-(1H-benzo[diazol-1-yl]) Acetohydrazide Derivatives as Antibacterial Agents

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Abstract

Benzotriazole is an important class of heterocyclic compounds which possesses good antibacterial activity, oral bioavailability and low toxicity which urged us to synthesize a wide range of novel chemotherapeutics with benzotriazole as main nucleus. The reaction of o-phenylenediamine with glacial acetic acid resulted in the formation of benzotriazole, which was further reacted with ethyl chloroacetate and potassium carbonate solution in acetone to form methyl-2-(1H-benzo[d]1,2,3triazole-1-yl)acetate. Ethyl-2-(1H-benzo[d]1,2,3triazole-1-yl)acetate when reacted with hydrazine hydrate in the presence of ethanol, gave (benzotriazol-1-yl)acetic acid hydrazide. Finally, the resulted hydrazide produced was condensed with aromatic aldehydes in the presence of ethanol and glacial acetic acid under microwave conditions to give Schiff’s bases (six compounds 5a-5f). The TLC was used as a method for purity determination and characterization of synthesized compounds was done using IR, 1HNMR and mass. The in vitro antibacterial activity of synthesized compounds was evaluated using Gram positive and Gram-negative strains (E. coli, S. aureus and B. substilis, P. aeruginosa) by cup and plate method. All the synthesized compounds showed activity against the above-mentioned microbes. Compounds 5b, 5d, 5e were found to possess maximum antibacterial activity as compared to the standard vancomycin.

Keywords: Benzotriazole; Schiff’s bases; Antibacterial agents.
12 Principles: Backbone of Green Chemistry

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Abstract

Green chemistry is a process of planning a chemical reaction in such a way to maximize the product yield while reducing the formation of byproducts which are harmful to the environment. This approach involves the minimum use of chemicals, solvents, auxiliaries and specific catalyst that affects the product concentration and formation of toxic substances. The raw materials used in chemical reactions are renewable and undergo chemical reaction at ambient temperature and pressure. Analytical techniques are used to monitor in process reaction so that formation of dangerous chemical derivatives could be avoided. So, twelve principles of green chemistry help us in designing synthetic pathway which does not affect the environment.

Keywords: Green Chemistry; Principle’s of green chemistry; Catalyst.
Synthesis and Biological Evaluation of Thiosemicarbazone Analogues of Ornidazole as Antifungal Agents

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Abstract

A series of ornidazole thiosemicarbazone analogues have been designed and synthesized on the basis of literature reviews of 2-Methyl-5-nitroimidazoles and thiosemicarbazones, all the target compounds were evaluated in vitro for their antifungal activity against \textit{Aspergillus niger} and \textit{Aspergillus fumigates}. All the compounds showed good antifungal activity against \textit{A. fumigatus} and \textit{A. niger} except compound 46. Unsubstituted amine analogue 40 has shown highest percentage inhibition (96.6\%, 500 μg/ml) against \textit{A. fumigatus} while aromatic amine with or without electronegative atom analogues 43 and 49 has shown highest activity against \textit{Aspergillus niger} which is two times than standard drug ornidazole (100\%, 1000 μg/ml).

Keywords: Thiosemicarbazone; Ornidazole; Antifungal; \textit{Aspergillus niger}
Chemometrics: Quality Evaluation of Botanical Drugs

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Abstract

Chemometrics is an important statistical tool to retrieve convenient chemical information from the original data. Principal component analysis (PCA) as well as chemometric resolution methods (CRM) are commonly employed methods to get meaningful information. Various advanced analytical techniques are introduced to assess the purity and quality of botanical drugs and significantly large amount of measurement data has been developed. Chemometrics tools are extensively used for extracting advantageous information and data processing in herbal drugs characterization. This review emphasis mainly on the vital analytical techniques and applicability of chemometrics tools in quality assessment of botanical drugs for the identity, efficacy and uniformity. Recent developments in the field of chemometrics software and their integration with sophisticated analytical techniques have also been touched.

Keywords: Chemometrics, Principal component analysis, Botanical drugs, Data processing.
Design of Carbonic Anhydrase Inhibitor and Non-steroidal Anti-inflammatory Drugs Hybrids (NSAIDs-CAI) as the Human CA-I Inhibitors

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Abstract

In this paper the dual hybrids of therapeutically used carbonic anhydrase inhibitor fragments of the sulfonamide type and non-steroidal anti-inflammatory drugs (COX inhibitors) as new series of dual hybrid compounds were discussed. As based on previous studies the preliminary reports of rheumatoid arthritis affected person constitute several carbonic anhydrases and also found that the serum affected patients contains abnormal expressions of the human CA I, III, IV, IX and XII isoforms in the synovium. The CAs catalyzed the reactions of reversible hydration of carbon dioxide and forming bicarbonate ion.

\[ \text{CO}_2 + \text{H}_2\text{O} \rightleftharpoons \text{H}^+ + \text{HCO}_3^- \]

If this reaction remains uncatalyzed a local extracellular acidosis takes place. The important symptoms in RA affected patients have inversely correlation with tissue and intracellular pH value and intensity of inflammation processes. Thus, NSAIDs are used for ache symptoms associated with inflammatory disease and carbonic anhydrase inhibitors useful in preventing extracellular acidosis by maintaining the tissue and intracellular pH for reducing symptoms. In this paper we are targeting only one isoform for the management of rheumatoid arthritis (RA) based on human CA-I. So, the hybrid molecules composed of carbonic anhydrase inhibitors and non-steroidal anti-inflammatory drugs can be a better option for the treatment of RA.

Keywords: COX; Carbonic anhydrase inhibitor; Non-steroidal anti-inflammatory drugs; Rheumatoid arthritis
Recent Advancements in Structure Activity Relationship Study of Sodium-Dependent Glucose Co-transporter (SGLT) Inhibitors in Management of Diabetes

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Abstract

Sodium-dependent glucose cotransporters (SGLT) is a protein coupled carrier transport system responsible for the transportation of glucose and Na\(^+\) across the lipid membrane. It is a family of glucose transporter found in the intestinal mucosa (SGLT-1) and the proximal tubule of the nephron (SGLT-2). They contribute to renal glucose reabsorption. Successful approaches have been conducted by pharmaceutical researchers for the formulation of oral hypoglycemic agents. SGLT-2 inhibitors and their derivatives were developed and approved by FDA for the treatment of type II diabetes mellitus and seen to be the best anti-hyperglycemic agents due to their high potency in inhibiting glucose reabsorption in the kidney. In view of above facts present report will be based on the study of advancement in mechanism of action, advantages and SAR of reported most active SGLT-1 and SGLT-2 inhibitors as antidiabetic agent. Present review will be helpful for the researchers, who are working in area of synthesis of SGLT inhibitors as antidiabetic agent.

Keywords: SGLT; Anti-hyperglycemic; Diabetes mellitus, SAR, Glucose
A Review on Cinnamic Acid and Their Modified Analogues as Antimicrobial Agent

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Abstract

Over the years, microbial infections have tended to grow resistance to the existing antibiotics due to gene modification, efflux pump, excessive use etc. Hence, to overcome resistance problem more development of antimicrobial agents effective against resistant strains, especially of natural sources required, as they tend to have less side effects. Further, natural phenolic compounds like bioflavonoids and cinnamic acid have drawn attention due to their potent antimicrobial activity, by selectively inhibiting bacterial ATP synthase enzyme, cell wall biosynthesis and alteration of membrane structure and integrity. Cinnamic acid derivatives comprises of a series of trans-phenyl-3-propenoic acids that differ in their ring substitution. They are widely distributed in plants and are found in bulk amounts in beverages like tea, fruits, vegetables and cereals. Cinnamic acids metabolites like phenyl-propanoids, coumarins, lignans, flavonoids and tannins have been found to exhibit multiple antimicrobial properties. The term “cinnamic” derives from the spice cinnamon (Cinnamomum zeylanicum) which has been in usage for a long period of time along with its analogues, including esters and amides, as flavourings, perfumes, synthetic dyes and pharmaceutical purposes like stimulant, antiseptic, anti-carcinogenic, hepatoprotective, insecticide and antimicrobial agents. Hence, there is increase interest in the medicinal and pharmaceutical research world, to synthesis more novel derivatives of cinnamates including hybrids with biologically active compounds having antimicrobial properties. In view of above facts, in present paper we have compiled the data of most active antimicrobial cinnamic acid analogues and their SAR data evaluated by different research groups.

Keywords: Cinnamic acid; Antimicrobial; Antibiotics
**HPLC as a Tool for Impurity Profiling of Pharmaceuticals**

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**Abstract**

Impurities are any substances which exist with original drug as intermediate or foreign or undesired bodies. These affect the efficacy of pharmaceuticals products. Impurity profiling is a process which gives full description and detailed information about identified and unidentified impurities. Impurities are classified as organic, inorganic and residual solvents. Impurities in pharmaceutical products are originated from many sources like synthetic intermediate, formulated related impurities, stereochemistry related impurities, and also arises during storage. The importance of impurity profiling is to develop the understating about the unidentified and potentially toxic impurities in order to enhance the safety of drugs. Therefore, impurity should be identified and determined by selective method. There are several methods which used for impurity profiling includes HPLC, NMR, Mass spectrometry, LC-MS, LC-MS-MS. HPLC is most widely used technique for impurity profiling which gives complete identification, characterization and determination of impurities present in pharmaceutical products. Herein we reviewed some case studies on impurity profiling using HPLC like Ezetimibe, Loratadine, Niverapine etc.

**Keywords:** Impurity; Pharmaceuticals; Toxic; HPLC; Impurity profiling
Recent Advancements in the Treatment of Rheumatoid Arthritis - An Autoimmune Disease

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Abstract

Rheumatoid arthritis (RA) is an autoimmune disease that results into joint inflammation due to synovial proliferation and destruction of the articular cartilage in the joints. According to WHO report (2017), 1.3 million people suffer with RA worldwide. Immunosuppressants, 5-amino salicylic acids, TNF – alpha inhibitors, Interleukin -1 antagonists, corticosteroids are the treatment approaches to reduce the severity of the disease. Therapies for rheumatoid arthritis (RA) continue to expand rapidly. These traditional treatment approaches only produce symptomatic relief and are not able to cure the disease. The purpose of this abstract is to discuss novel treatment options, including biosimilars, as well as novel agents inhibiting IL-6 and Janus kinase that are available, as well as to highlight promising agents in development. Sarilumab is the newest biologic for the treatment of RA, approved by the U.S. Food and Drug Administration (FDA) in 2017. It is a human monoclonal antibody having higher affinity for the alpha subunit of the interleukin-6 (IL-6) receptor. Other drugs that are currently being studied include the IL-6 cytokine blocker sarikumab, the small targeted molecule filgotinib, and many new biosimilars. Novel non-biologic DMARDs such as PI3Ks inhibitors Phosphoinositide 3-kinases, MMPs inhibitors, matrix metalloproteinases, Glycosidase inhibitors and cathepsin inhibitors are the other novel treatment approaches used in the RA. With the discovery of new pathways and therapeutic targets, potential, novel and targeted therapeutic agents are developed that shows their better efficacy in the treatment of RA.

Keywords: Rheumatoid arthritis; Autoimmune disease; Interleukin-6; Glycosidase inhibitors
Herbal Approaches in Treatment of Oxidative Stress

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Abstract

Oxidative stress is a phenomenon which arises due to imbalance between generation and utilization of reactive oxygen species (ROS) and includes species such as peroxide, singlet oxygen, superoxide and hydroxyl radical etc. It may result in damage due to peroxidation of bio membranes and also to DNA, which further lead to tissue damage. Oxidative stress is one of the major causes for etiology of many of diseases including diabetes, cancer, metabolic disorders, cardiovascular diseases, rheumatoid arthritis, ulcerative colitis and atherosclerosis. Antioxidants are the compounds which neutralize the effect of free radicals through different pathways and also provide body defense mechanism from various diseases. Various synthetic antioxidants are available but are associated with side effects. Various antioxidants from natural sources are available and are widely distributed in food and medicinal plants. A number of natural products such as catechins, flavonoids, terpenes, alkaloids, polyphenols, anthocyanins, quinines and anthoxanthins have anti-inflammatory and antioxidant effects, hence considered as gold mine in treatment of oxidative stress. Various conventional and non-conventional techniques have been adopted for extraction of antioxidant component based on energy consumption and cost effectiveness. Plant-derived products are much promising for treatment of oxidative stress but still further investigation should be performed to prove their effectiveness. Although a number of natural products and herbal medicines are recommended as antioxidant but further research is required to investigate their safety, efficacy, usefulness and potential drug interaction.

Keywords: Oxidative stress; Antioxidant; Natural products; Diseases; Reactive oxygen species
Healthy Life Style to Avoid the Hypertension

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Abstract

According to American Heart Association (AHA) hypertension was defined as a blood pressure higher than 130 over 80 mm Hg. Recently, it was found that chronic kidney disease (CKD) was a common cause of high blood pressure because the kidneys did not filter out fluid. This fluid excess leads to hypertension. The various factors contribute to the hypertension are smoking, alcohol, tobacco, obese, lack of physical activity, too much salt in diet, low potassium in diet, stress, older age, genetics, certain diseases and medications. Some complications, which can lead to further deterioration of overall health of an individual, are heart failure and heart attacks, an aneurysm, kidney failure, stroke, amputation. WHO data shows that raised blood pressure was estimated to cause 7.5 million deaths, about 12.8% of the total of all deaths. More than half of the people suffering from high blood pressure live in Asia, including 226 million people in china and 199 million in India. It is necessary that people must know about the risk factors and complications of hypertension so that they can take early precautions and can avoid a hypertension diagnosis by making some healthy lifestyle choices. It’s better to adopt such a healthy lifestyle so that there is no need to do hypertension diagnosis. The purpose of this study is to find out that what changes can be done in lifestyle to avoid hypertension and also to give people awareness about it, so that they can take precautions. As “prevention is better than cure”.

Keywords: Hypertension; Chronic kidney disease; Yogasanas; home remedies
Searching Anti-malarial Plants

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Abstract

Malaria that is caused by Plasmodium parasite is one of the largest health problems in many parts of the world and considered as world's most important parasitic disease. About 1.2 million people each year in Africa are killed by malaria, in Cameroon and Sub-Saharan Africa, 20% of children died before attaining the five year's age due to malaria. Malaria is transmitted by infected mosquitoes’ bites. These parasites grow and reproduce in the liver of the human body affect the red blood cells. Malaria symptoms are manifested in an infected person within 10-15 days after a bite by mosquito. In most areas of the world, the parasites developed resistance to medicines curing malaria can be partly ascribed to resistance developed by parasites to most of the well-known anti-malarial drugs. Malaria is diagnosed from blood samples of infected persons. Quinine belongs to alkaloids family of compounds possessing anti-malarial activity and is the one of the oldest and most important anti-malarial drugs still in use to cure malaria. Even the currently used anti-malarial drugs in the conventional medicine are derived from medicinal herbs like Cinchona tree and Artemisia annua, declining efficiency of artemisinin derivatives initiate the research to find the new classes of anti-malarial agents from new resources. There is a long list of plants and their parts that can be used as promising cure for malaria. Z. chalybeum, Toddalia (T. asiatica), C. anisata, Leea indica, Achra sapota, Cassia auriculata, Curcuma longa, Momordica charantia, M. Jalapa, Enantia clorantha, Xylopia parviflora, Mangifera indica, Picralia nitida, Microglossa pyrifolia, Bidens pilosa, Aspilia africana and many more are there for the treatment of malaria. These plants open the doors to get rid of malaria worldwide.

Keywords: Malaria; Quinine; Artemisinin; Plasmodium
Agricultural Waste: Adsorbent for Removal of Heavy Metals from Waste Water

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Abstract

The water sources from natural origin contain toxic non-biodegradable materials such as heavy metal ions like chromium (Cr) [VI], Zinc, Arsenic, Nickel, Mercury, Lead etc. from waste of various metallic, textile, glass, paints and pigments industries which results many disorders in living organisms such as metal poisoning, dermatitis, lungs cancer, GIT disorders, bones cancer, nose bleeding, mental disorders in children and various CNS disorders. In plants they cause reduction of growth, chlorosis of leaves and yield reduction etc. Although there are many available methods for waste water treatment such as ion exchange, chemical precipitation, reverse osmosis and adsorption but they all are costly. There is a great need of development of ecofriendly methods which are inexpensive. The quantity of agricultural wastes is increasing around the globe. Although many agriculture wastes have adsorbent capacity for removal heavy metal ions from waste water which are less expensive and ecofriendly. Agricultural waste contains cellulose, lignin, lipids, proteins and hydrocarbons which has high adsorption capacity, recyclable and biodegradable. Agricultural waste such as tea industry waste (adsorb Cd, Ni and Cu), pretreated rice husk (adsorb Cd), grape stalk waste (adsorb Cu and Ni), dehydrated wheat stalk (adsorb Cu), potato peels (adsorb Cu), maize cob and shell (adsorb Zn, Cd and Pb), ground nut husk (adsorb Cr), wheat bran (adsorb Cu and Cd), rice husk (Cd and Pb) and tobacco stem (adsorb Cr). They form metal complex with heavy metal ion due to presence of their functional groups. To increase heavy metal ion removable capacity the agricultural wastes are chemically modified.

Keywords: Agriculture waste; Waste water; Heavy metals; Biodegradable
Recent Progress in Natural Product Inhibitors of Mdm2-p53 Interaction

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Abstract

The functional inactivation of natural tumor suppressor, p53 responds to cellular stresses such as DNA damage and oncogenic activation which can lead to the cancer development. Mdm2 (Murine Double Minute 2) plays an important role in the development and progression of cancer via both p53 dependent and independent mechanism. Mmd2 binds with p53 to inactivate it through its proteolytic degradation. Hence, disruption of Mdm2-p53 interaction is most attractive and potential strategy to activate p53 for the treatment of cancer. Natural products are rich source of compounds for the drug molecule. In last decades for the identification of anticancer agents, natural products have been highly followed and more than 100 drug molecules are natural products or natural product derived compounds. Although in recent years, after many efforts few synthetic Mdm2 inhibitors are brought into light among which some are under clinical trials. Scientists have shown interest towards the discovery of the natural product Mdm2 inhibitors due to their greater chemical stability, less toxicity and lower cost than synthetic antagonist. Some of natural Mdm2 inhibitors have been discovered which have shown to decrease the Mdm2 expression and activity in-vitro and in-vivo such as pyrrolidinyl-spirooxindole, genistein, oroxylin A, apigenin, ginsenosides, nandrolone, platycodin D, chlorofusion etc. Here, we reviewed various recently identified natural products which inhibit the Mdm2 mediated degradation of p53 to induce their anticancer effect along with their mechanism of action.

Keywords: Natural products; Mdm2-p53 interaction; Cancer; Apoptosis.
GLP-1 Agonist a Tool for Treatment of Diabetes mellitus

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Abstract

Intake of high level of sugar can cause diabetes which is a metabolic disorder. It is characterized by hyperglycemia (an increased glucose level), hyperlipidemia, glycosuria, ketonaemia and negative nitrogen balance. The diabetic affected patients suffer from frequent urination, increased thirst and increase hunger. If the diabetic affected patients do not take the treatment, there may be two complications include: acute complication, and serious long-term complication. Acute complication includes hyperglycemic state, ketoacidosis, hyperosmolar and death. Whereas, long term complication includes chronic kidney disease, stroke, cardiovascular disease and harm to the eyes. Diabetes is classified as: type 1 and type 2 diabetes mellitus. GLP-1 is an important incretin which will induce insulin from the pancreatic (beta cell). It will inhibit the release of glucagon. The GLP-1 receptors will get activated where the appetite will get suppress and emptying of gastric. Incretins are such as GLP and GIP on the beta cell membrane act on G-protein coupled receptor. Various common side effects observed in case of GLP-1 receptor agonists are mild nausea, vomiting which lessen with time.

Keywords: Hypoglycemia; Diabetes; GLP-1 agonist; Insulin; Incretin
Cancer Immunotherapy: An Update

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Abstract

Cancer immunotherapy is a type of cancer treatment which effectively harnesses the natural ability of immune system to fight against cancer cells. This approach takes into consideration the fact that cancer cells express various types of antigens on their surface. Such tumor antigens can be detected by the immune system. However, cancer cells normally develop resistance to the defensive mechanisms presented by the immune system. Thus, cancer immunotherapy has some challenges in its path but due to its impressive clinical effectiveness, it is considered as the potential and effective mode of treatment for cancer. Cells responsible for incurring natural immunity to the body are engineered in such a way that they become able to efficiently recognize and bind to tumor antigens. Such type of immunotherapy is referred to as the active immunotherapy. Another type is the passive immunotherapy, which involves the process of modifying the existing natural immune responses against cancer cells. A hybrid type of immunotherapy has also been developed which involves the combinative use of both active and passive immunotherapy. Cancer immunotherapy has so far proven to be an effective treatment for cancer as this therapy primarily aims at attacking cancer cells and not the healthy body cells lying in close vicinity to them.

Keywords: Cancer, Immunotherapy, Tumor antigens, Active immunotherapy, Passive immunotherapy
Analytical Method Validation: A Tool for Quality Control

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Abstract

Validation is establishing documented evidences which provide a high degree of assurance that a specific process/method will consistently produce a product meeting its preset specifications and quality attributes. Method validation is used to ensure that the analytical procedure which is used for specific test has suitability for intended purpose. Thus, the obtained results from method validation are being used to confirm the quality, reliability and consistency of analytical procedure. Validation of analytical methods are focused to the four most common types of identification tests: Quantitative tests for impurities content, Limit tests for the control of impurities, Quantitative tests of the active moiety in samples of drug. Analytical method validation comes under Q2 (R1) Guideline. Certain parameters are needed to be tested as per the regulatory body includes linearity, accuracy, precision, limit of detection, limit of quantitation, range, specificity, robustness. Herein we reviewed all the parameters and comparison between Q2 and Q2 (R1) guideline for analytical method validation.

Keywords: Validation; Reliability; Consistency; Linearity; Robustness; Impurity.
A Short Review on DDP-4 Inhibitors as Potential Antidiabetic Agents

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Abstract

Diabetes is considered as a metabolic syndrome caused by disturbances in carbohydrates metabolism occurs due to lack in secretion of insulin. It is of two types: type 1 diabetes mellitus (insulin dependent) and type 2 (non–insulin dependent) result from insulin deficiency. There are different classes of drugs which are used in the treatment of diabetes like Sulfonylurea, glucose like peptide inhibitor, dipeptidyl peptidase -4 inhibitor, biguanides, thiazolidinedions etc. DPP-4 inhibitors are active when given orally and inhibit the enzyme DPP-4 which degrade the GLP-1. These reduce glucagon and blood glucose level but increase the incretin level which inhibit glucagon release and increased insulin secretion. Sitagliptine, Vildagliptine, Saxagliptine, Alogliptine, Dutogliptine are the inhibitors of this class. They have some side effects like diarrhea, vomiting and hepatotoxicity. DPP-4 inhibitor are promising new medicine for treatment of diabetes mellitus type 2 with improved metabolic control without causing severe hypoglycemia.

Keywords: Diabetes; Hypoglycemia; DDP-4 inhibitor; Antidiabetic; Insulin
A Review on Characterisation of Dendrimers

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Abstract

The dendrimer is the combination of the two Greek words Dendron and meros. Dendron means tree and meros mean part. The dendrimers are highly branched three-dimensional structure. Two strategies have been proposed for the preparation of dendrimers first one is divergent method and the second one is examine the techniques, which is used for evaluation of dendrimers, investigate the shape of the dendrimer, reaction rate, morphology, structural defects, conjugation, synthesis, chemical composition, physical state, polydispersity, molecular weight, homogeneity and purity of dendrimer. It includes infrared (IR) spectroscopy, Raman spectroscopy, NMR, mass spectrometry, fluorescence technique, x-ray photoelectron technique, atomic force microscopy, ultraviolet-visible spectroscopy, laser light scattering, small angle neutron scattering, scanning electron microscopy, electrophoresis, electrochemistry, size exclusion chromatography, electron paramagnetic resonance, dielectric spectroscopy, intrinsic viscosity, differential scanning calorimetry.

Keywords: Dendrimer; NMR; IR spectroscopy; Mass spectroscopy; Scattering technique; Chromatography.
Novel Inhibitors of Gyrase B for Effective Managements of Tuberculosis

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Abstract

Tuberculosis is one of the major infectious diseases responsible for millions of deaths across the world. There are many drugs available for the treatment of tuberculosis but these drugs cause resistance. So, new drugs are required to overcome this resistance. Fluoroquinolones are used for the treatment of tuberculosis. These drugs inhibit the enzyme DNA gyrase (α subunit) and cause bacterial cell death. But bacteria also cause resistance to fluoroquinolones. In this review we studied about the drugs which specifically act on DNA gyrase (β subunit) as these drugs (aminobenzimidazole) exhibit bactericidal activity against drug susceptible and drug resistant mycobacteria. Additionally these drugs have no cross-resistance with fluoroquinolones.

Keywords: DNA gyrase; Cross-resistance; Fluoroquinolones
A Comprehensive Review on Biological Importance of Scopoletin: A Bioactive Coumarin

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Abstract

Scopoletin is also known as gelsemic acid, chrysatropic acid and murrhyetin. It is (7-hydroxy-6-methoxy-2H-chrome-2-one), a coumarin derivative. Coumarins are a wide class of natural and synthetic compounds that showed versatile pharmacological effects. Scopoletin can be found from different sources such as Scopolia Carniolica, Scopolia Japanica, Passion flower, Ipomoea reniformis, Tetrapleura tetraptera etc. Several studies have investigated the possible use of simple coumarins such as 7-hydroxycoumarin, 6-nitro-7-hydroxycoumarin, scopoletin and esculetin in the treatment of cancer cells. Coumarins exhibited antitumor activities at different stages of cancer formation through various mechanisms, for example blocking cell cycle, inducing cell apoptosis, modulating estrogen receptor (ER), or inhibiting the DNA-associated enzymes, such as topoisomerase. It also prevents oxidation as it has antioxidant, anti-inflammatory, anti-arthritic, anti-angiogenesis agent because it inhibit COX-2, nitric oxide synthesis, endothelial cell migration, pro-inflammatory cytokine production. It also possesses anti-hypertensive action; by inhibiting the positive chronotropic and inotropic effects of isoprenaline, noradrenaline and calcium to approximately the same extent, and its inhibitory actions on the atrial muscles were not altered by prior atropine administration, anticholinesterase is shown by some scopoletin derivatives such as 6-methoxy-7-[(pyridin-4-yl)methoxy]-2H-1-benzopyran-2-one. Despite numerous effects of coumarins in the search for bioactive compounds, they still remain as one of the most versatile class of compounds for drug design and discovery.

Keywords: Scopoletin; Coumarin; Cancer; Cytokine
Molecular Docking Studies of Phytochemicals of Basil Against Epigenetic Targets in Breast Cancer

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Abstract

Breast cancer is one of the most prominent types of cancer found in women, reported to have second highest number of deaths after lung cancer. One of the causes can be improper regulation of epigenetic modifications. These modifications act as markers in many cases, such as neoplasia, breast cancer, prostate cancer, X chromosome inactivation. Underlying mechanisms involves DNA methylation, acetylation and deacetylation of histone proteins, modification of non-histone proteins. SIRT1 and SIRT2 regulate many types of disease models, including breast cancer. Basil has anticancer property; however the role of its phytochemicals against the epigenetic targets is still not very clear. We have screened phytochemicals of basil and have performed molecular docking studies against epigenetic targets- SIRT1 and SIRT2. These results will help us in finding the best candidate for binding against epigenetic targets. In this study, we want to elucidate the underlying mechanisms involved in the binding of phytochemicals of the basil into the active site of epigenetic targets.

Keywords: Breast Cancer; Epigenetics; Basil; Phytochemicals; Molecular docking
Abstract

Type 3 diabetes mellitus (T3DM) is a neuroendocrine disorder that progresses from Type 2 diabetes mellitus (T2DM) to Alzheimer’s disease (AD). Patients of Alzheimer’s disease (AD) have shown reduced expression of insulin and neuronal insulin receptors in brain. Alzheimer disease (AD) is termed as “Brain diabetes” or “Type 3 diabetes mellitus (T3DM)”’. AD is responsible for around 60–80% cases of dementia. Symptoms progresses to cognitive decline, impairing normal functioning and finally leading to death. The exact pathological mechanism for AD is unknown, but existing theories focuses on deposition of β-amyloid plaques or neurofibrillary tangles. Insulin also plays an important role in the pathology of AD by altering various cellular and molecular mechanisms involved in the formation of neurofibrillary tangles and deposition of amyloid plaques. T2DM and AD patients have similar amyloid beta deposits both in pancreas as in the brain. As T2DM patients have almost double the chances of developing AD, T3DM is also increasing the already existing burden of AD in the society, so there is need to explore mechanism involved in impaired insulin signaling that holds the capability to shift T2DM to T3DM by altering various metabolic pathways.

Keywords: Type 3 diabetes mellitus, type 2 diabetes mellitus, neurofibrilatory tangles, β-amyloid plaques.
Investigation of Antioxidant and Antidiabetic Potential of *Trichosanthes Diocia* by *In-Vitro* and *In-Vivo* Methods

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Abstract

α-Amylase and α-Glucosidase are the two enzymes that regulates the post prandial glucose level in the body and thus considered as novel target for the development of new therapeutic agents for the treatment of diabetes. *T. diocia* has shown antioxidant and hypoglycemic potential in the previous studies, but its effect on the activity of α-Amylase and α-Glucosidase is not known till now. Extracts of roots and stems of *T. diocia* were fractionated by different solvents and then screened for their α-Amylase, α-Glucosidase and NO inhibitory potential. The best fraction was decided on the basis of the IC 50 values and then screened for its antidiabetic potential in the STZ treated rats. The ethylacetate fraction of root of *T. diocia* showed the highest α-Amylase, α-Glucosidase and NO inhibitory potential and reduced the blood glucose levels of the STZ treated diabetic rats significantly after 14 days of continuous administration. It is concluded that the ethylacetate extract of *T. diocia* root showed significant hypoglycemic activity in STZ treated rats and it may be due to their α-Amylase, α-Glucosidase and NO inhibitory action.

Keywords: α-Amylase, diabetes, α-Glucosidase, Nitric oxide, nitrite, streptozotocin.
Clinical Evaluation of Efficacy and Safety of *Amrita Guggulu* and *Pinda Taila* in the Management of Hyperuricemia in Gout (*Vatarakta*) Patients

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**Abstract**

*Vatarakta* vis-à-vis gout is a common condition in both primary care and specialist practice. Gout is a systemic disease characterized by manifestations of chronic underlying hyperuricemia, resulting in the deposition of monosodium urate crystals in various tissues. To explore the therapeutic efficacy and safety of *Amrita Guggulu* and *Pinda Taila* in the management of hyperuricemia in gout (*Vatarakta*) patients. A total of 100 cases (25–65 years) of primary gouty arthritis fulfilling the diagnostic criteria as recommended by the American College of Rheumatology were selected for the present study from outpatient department of the CARI for Respiratory Disorders Patiala and RAR Institute for Urinary Disorders, Jammu, India, irrespective of their sex, religion, and socioeconomic status. Only those patients who presented themselves with at least 6 of 12 criteria of American College of Rheumatology (1977) were selected for the clinical trial. *Amrita Guggulu* was given 1000 mg twice daily orally and *Pinda Taila* was applied locally 10 mL twice daily for 84 days. The trial therapy was assessed based on the improvement in clinical features, Visual Analog Scale (VAS) score, Patient’s Global Assessment Scale score, Physician’s Global Assessment Scale Score, SF-36 Health Survey Score for quality of life (QOL), and biochemical parameters. Each patient was subjected to routine blood test, serum uric acid, liver function tests, and renal function tests before treatment, after 28 days of treatment, and after 84 days of treatment. The trial combination showed statistically significant improvement in the clinical manifestations, QOL as well as reduction in marker of hyperuricemia, i.e., serum uric acid; the mean serum uric acid at the baseline was 7.76mg/dL, which was reduced to 6.50mg/dL after the trial period of 84 days. There was also decrease in the level of VAS score, Patient’s Global Assessment Scale score, and Physician’s Global Assessment Scale score. There were no impairment in liver function test and renal function test, indicating the good safety profile of trial therapy. Hence, *Amrita Guggulu* and *Pinda Taila* drug combination is an effective and safe remedy for gouty arthritis (*Vatarakta*) patients.

**Keywords:** Amrita Guggulu, Pinda Taila, Vatarakta, Gout, Gouty arthritis
Antimicrobial Activity of *Lactobacillus Rhamnosus* and *Lactobacillus Reuteri* Against *E. coli* Species from Urine Sample

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Abstract

Urinary tract infection is the second most common nosocomial, community acquired and Recurrent type of infection in females. It is caused more than 85% by *E. coli*. More than 50% females have infected at least one time in their life. About 30 to 40% recur within six months after the initial period episode that is called Recurrent Urinary Tract Infection. In the present study *E. coli* strain isolated from urine samples were investigated. The antimicrobial activity of *Lactobacillus rhamnosus* and *Lactobacillus reuteri* were checked against *E. coli* strain. The well diffusion technique has been used for the investigation of antimicrobial activity. The present investigation concluded that *Lactobacillus rhamnosus* and *Lactobacillus reuteri* showed antimicrobial activity against *E. coli*. The 7 to 8 mm zone of inhibition is measured.

Keywords: *Lactobacillus*, Antimicrobial activity, Urinary Tract Infection, Zone of inhibition, *Escherichia coli*
A Retrospective Study of Current Treatment for Diabetes Mellitus with Exploration of Natural Product as a Combination therapy

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Abstract

Diabetes mellitus (DM) is a commonly occurring endocrinological disorder characterized by hyperglycemia that occurs due to lack of insulin (autoimmune or idiopathic) or inadequate release of insulin (insulin resistivity) by pancreatic beta cells. Incidence of DM has increased four times in last 34 years. However, majority of diabetic cases are diagnosed with type 2 diabetes mellitus (T2DM) than that of type 1 diabetes mellitus (T1DM). There are several oral hypoglycemic agents available in market for the treatment of T2DM. Initially to control blood glucose levels, monotherapy is commenced but in long term therapy, it is associated with high risk of secondary failure rate. Therefore, to effectively manage the condition, combination therapy is used but its long term administration is associated with increased risk of adverse effects and most commonly, hypoglycemia that further causes death. In order to reduce the risk of hypoglycemia, secondary failure rate and adverse effect profile, combination of certain natural products with oral hypoglycemic agents can be taken into account. The present work mainly emphases on currently investigated combinations of natural products with oral hypoglycemic agents to prevent complications of oral anti-diabetic drugs. Certain phytochemicals, antioxidants, vitamins etc. that have potential to be used in combination with oral hypoglycemic agents are also discussed in this study.

Keywords: Diabetes mellitus; Monotherapy; Combination therapy; Natural products
Clinical Reasoning of Transverse Myelitis and its Treatment

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Abstract

Transverse myelitis (TM) is a neurological inflammatory disorder that affects the spinal cord which results in motor, sensory and autonomic dysfunction. The average annual incidence rate is 0.6 per 100,000 populations in India. It is a rare disorder with no or less awareness in our society. Transverse myelitis may be monophasic in which attack occurs only once and it may be relapsing. Various causes of transverse myelitis include neuromyelitis optica (NMO) an autoimmune disorder, multiple sclerosis (MS), viral and bacterial infections. The damage due to demyelination causes scars in the nervous system which alters the inter-neuronal communication in the spinal cord. Symptoms include weakness, pain and tingling sensation in limbs, bladder and bowel dysfunction. Symptoms develop within hours or days and then worsen in coming days or weeks which results in paraplegic or tetraplegic conditions having partial or no movement at all. There is no treatment for transverse myelitis which may result in complete cure at once. Although corticosteroids, immunosuppressants and monoclonal antibodies in case of immune mediated transverse myelitis and plasmapheresis are used for its management.

Keywords: Demyelination; transverse myelitis; Automic dysfunction; Tetraplegic; Neuromyelitis optica
Genetics of Parkinson’s Disease: How Close and How Far We Are?

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Abstract

Parkinson’s disease (PD) is one of the neuronal disorder in which there is continuous degeneration of the neurons occur. It is an age related disorder, so the most effected peoples are those who are 60 or above 60 years of age. The main neurons involved in PD are the dopaminergic neurons, specifically present in the substantia nigra pars compacta. It is known that, at the time of diagnosis of PD or appearance of its symptoms, 80% of the dopaminergic neurons got deteriorated. The major symptoms of PD are tremors, rigidity, akinesia and postural instability. There are various etiological factors which are responsible for the development of the PD and among them, genetic factor considered to be one of main factor involved in this condition. The major genes which are involve in PD are SNCA, PARK1, PARK 2 and DJ-1. Whenever, any mutation occurs in these genes, it alters the protein expression which ultimately leads to the dysfunction of the neuronal cell organelles. There is aggregation of the alfa synuclein protein occurs due to the mutation of these genes. In the present review, we reviewed the available information regarding the genetic of the PD and try to conclude about its present status.

Keywords: Parkinson’s disease, Genetics, Dopamine, Neurodegeneration, Alfa synuclein, Substantia nigra.
A Review on Pathophysiology of Rheumatoid Arthritis in Conjunction with Modernistic Approaches of Treatment

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Abstract

Rheumatoid arthritis (RA) is a constant fundamental immune system disorder that principally influences the lining of the synovial joints and is related with dynamic inability, sudden passing, and socioeconomic burdens. Inflammation, pain and stiffness of the joints which leads to the deformity and disability of the joint are the main symptoms of rheumatoid arthritis. There are a few foundations for rheumatoid joint pain these causes are unclear however some incorporate hereditary factor, family history, age, hormones, smoking and so on. Here we analyse the etiology and pathology at particular stages: activating, development, targeting, and fulminant stage. Analysis incorporates X-rays and imaging, using diagnostic criteria, laboratory test and barring other medical conditions. There is no solution for this disease, treatment can enhance side effects and moderate the advancement of the illness, change in way of life, normal exercise and consumption of disease modifying anti-rheumatic drugs (DMARDs). Modernistic pharmacological therapies includes conventional synthetic, biological, and small molecule DMARDs. This review talks about on-going advances of our comprehension of RA pathogenesis, illness adjusting drugs, and gives viewpoints on progressive therapeutics for RA.

Keywords: Rheumatoid arthritis, Disease modifying anti-rheumatic drugs, Hyperplastic synovium.
Glucocorticoids in Rheumatoid Arthritis: A Risk and Benefit

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Abstract

Rheumatoid Arthritis (RA) is a chronic condition ultimately produces disability and deformity by affecting joints as well as connective, muscle, tendons, and fibrous tissue. It tends to strike between the ages of 20 and 40. Its prevalence varies in the range of 0.3-1% in the developing countries. Steroids were identified as the first drug treatment. The therapeutic efficacy of glucocorticoids ranges from decrease in pain to disease-modifying effects in early rheumatoid arthritis, and to strong immunosuppressive actions in vasculitides. The principle mechanism for its inhibition in inflammation involve down-regulation of the production of tumor necrosis factors [TNFs], interleukin-1[IL-1], etc. and inhibition of leukocyte migration. At higher doses it produces severe adverse effect but low dose can be given for longer duration of time to treat RA. It should be recommended with proper care as it used to give immediate adverse effects (increases in weight, pressure in the anterior chamber of the eyes, blood pressure and mood), late side effects (osteoporosis) and unpredictable effects (osteonecrosis and cataract formation). It is an advancement of pharmaceutical science that in morning stiffness patients of RA switched from immediate release to delayed release Prednisone. Hence this review will give knowledge of ratio of risk and benefits of glucocorticoids to be best utilize for the treatment of RA.

Keywords: glucocorticoids, rheumatoid arthritis, therapeutic advancement
Prevalence of Lower Respiratory Tract Infection Among Patients in a Tertiary Care Hospital in North India

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Abstract

Lower respiratory tract infections (LRTI) are the fifth leading cause of death and combined leading infections cause of death, being responsible for 2.74 million deaths worldwide. Pneumonia is the most common cause of infection from bacteria *Streptococcus pneumoniae* that accounts for the most of infections. LRTIs are more serious than upper respiratory tract infections (URTIs). LRTIs are mostly transmitted by airborne droplet. This study reports the result of lower respiratory tract infections among different individuals according to their mode of infection in accordance with different age groups in surrounding areas of IVY Hospital (Mohali) in North India. Sputum and pleural fluid were taken as sample. MacConkey agar was used to isolate and identify the bacterial growth. The identification was done with Vitek2 instrument by using different cards. Further, Real time PCR was used to identification *Mycobacterium tuberculosis*. The infections that were mostly found in current study were caused by *Streptococcus pneumonia, Staphylococcus aureus, Pseudomonas aeruginosa, Klebsiella pneumonia, Acinetobacter baumanii, Salmonella enterica*, etc. Among the patients, males were more affected than females. Moreover, the patients from age group 61-75 were mostly affected with LRTI. Among males, most patients were in the age group 61-75. Females had comparable population among patients of 45-60 and 61-75 age groups.

Keywords: Lower respiratory tract infections, pneumonia, tuberculosis, prevalence
Injury to the nerves can causes alteration in normal neurobiological sequences lead to disease of somatosensory nervous system called as neuropathic pain (NP). It affects peripheral as well as central nervous system. It a chronic painful condition caused due to various diseases (HIV, Diabetes), lesions, infection, trauma, and metabolic insults. NP affects 7-10% of world population. Pharmacotherapy for NP remains a major clinical challenge due to its complex pathophysiology. Analgesics, antidepressants, anticonvulsants, non-steroidal anti-inflammatory drugs, tri-cyclic antidepressant, sodium channel blocker and opioid agonist administrated individually to patients of NP are providing only partial relief. These drugs have limited efficacy, adverse effects. Hence instead of monotherapy, pathophysiology of NP suggests that treatment with multiple drugs (polypharmacy) show fast, sufficient effect in treatment of NP. Recent updates indicate that combination of Morphine and gabapentin, Pregabalin and duloxetine, Gabapentin and nortriptyline, Amitriptyline and ketamine (topical), Doxepin and capsaicin (topical), Glyceryl trinitrate (topical) and valproate are also a good choice for the treatment of NP. Several clinical trials also established that combination pharmacotherapy showed greater efficacy than monotherapy treatments in NP even dual targeted substance also exhibits better responses like tapentadol. Physicians, Scientists working in the area of NP they are not only looking for its treatment but also resolve the issues of co-morbidities associated with it. Hence the present review focuses on rationalized approach of combination therapy for the treatment of various aspects of NP.

Keywords: Nerve injury, Neuropathic pain, Polypharmacy
In Vitro Antioxidant Activity of Potato Peels Extract

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Abstract

The present study was intended to evaluate in vitro antioxidant activity of Solanum tuberosum peel extracts (Ethyl alcohol). The ethanol extract was investigated for its antioxidant action using 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging, Ascorbic acid is scavenging and reducing power assay. The results of the free radical scavenging potentials of standard and extracts tested by DPPH method. Antioxidant reacts with DPPH, which is a nitrogen-centered radical with a characteristic absorption at 517 nm and convert it to 1, 1-diphenyl-2-picryl hydrazine, due to its hydrogen donating ability at a very rapid rate. Extracts showed gradual increasing percentage inhibition with increasing concentration at 517 nm in spectrophotometer as antioxidant by DPPH assay. Ascorbic acid showed gradual increase in percentage inhibition with increasing concentration at 517 nm in spectrophotometer as standard antioxidant by DPPH assay. The findings of the study suggested that the extract from Solanum tuberosum peel has strong analgesic, anti-inflammatory activity and antioxidant effects.

Keywords: DPPH assay, ascorbic acid, free radical scavenging, anti-inflammatory activity
Neuropathy: A Major Complication in HIV and its Treatment Strategy

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Abstract

Peripheral neuropathy is one of the major complications in HIV patients. In HIV patients the number of suffering from neuropathy is more worldwide. HIV virus can affect sensory, motor nerves, thoracic nerve, cranial nerve as well as autonomic nerve. HIV majorly effect multiple sensory and motor nerve in the distal part of the limbs, this type of neuropathy is called polyneuropathy. In this mostly people experience unusual sensation, numbness and pain in their hands and feet and even touching can cause pain sensation. HIV sometimes can affect one nerve at a time which leads to pain this type of neuropathy is called mononeuropathy, in this type of symptoms depends on the nerve which is affected. DSP (distal symmetric polyneuropathy) was recognized as a common neurological manifestation of AIDS, it is characterized by distal degeneration of long axons. Distal regions of the fibers degenerate first, with centripetal progression. The density of small and large myelinated fibers, and in particular, of unmyelinated fibers is reduced. Antiretroviral treatments have been demonstrated to improve thermal thresholds in those who show virological responses.

Keywords: Peripheral neuropathy, myelinated, unmyelinated, virological, Polyneuropathy.
The Evolution of Disease and Human Survival

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Abstract

Disease has been around since the existence of biological life forms, which bids a question what is disease. Is it as basically defined, a disorder of structure or function, especially by producing symptomatic effects of specificity in human, animals or plants not as a direct result to physical injury, which is to differ? Disease is caused by various different microbes, from viruses; which rank as the deadliest disease causing agents out of which fungi and bacteria are the most common. It seems that the purpose of disease is to destroy other life forms (animals/plants), partly true but like all animals and plants the need for reproduction and survival comes first. Ever since before man walked this earth his waged a war with the microbial world and thus different animals and plants have developed different mechanism to defend themselves from microbial disease, either by gaining immunity to complete resistance and eradication of disease-causing microbes in one of the greatest evolution of science and medicine. Though man is the only animal that has taken a direct approach to defend him from diseases, but despite all our technological advancements today it seems that diseases are only getting more deadly and humans have contributed to this. Moreover in 1967, Mabeyrie Germany, German scientists testing polio vaccines on monkeys die from a disease that would be later on called Marburg hemorrhagic, recently Zedov i.e. Ebola (whose vaccine is recently developed) has average fatality rate of 83% and same data is available for rabies, chicken-flu as well as bird-flu (H5N1). According to literature survey in 1954, 500,000 pounds of antibiotics were produced in the United States which is now increased to 40,000,000 pounds annually. However, the rate of emerging disease and their impact can now affect large segments of the world population at an increasing rate, and we need to be increasingly aware of the implications for human population around the globe.

Keywords: human, evolution, disease, population.
Pathophysiology Involved in Antepartum and Postpartum Depression: A Brief Review on Recent Updates

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Abstract

Type 3 diabetes mellitus (T3DM) is a neuroendocrine disorder that progresses from Type 2 diabetes mellitus (T2DM) to Alzheimer’s disease (AD). Patients of Alzheimer’s disease (AD) have shown reduced expression of insulin and neuronal insulin receptors in brain. Alzheimer disease (AD) is termed as “Brain diabetes” or “Type 3 diabetes mellitus (T3DM)”. AD is responsible for around 60–80% cases of dementia. Symptoms progresses to cognitive decline, impairing normal functioning and finally leading to death. The exact pathological mechanism for AD is unknown, but existing theories focuses on deposition of β-amyloid plaques or neurofibrillary tangles. Insulin also plays an important role in the pathology of AD by altering various cellular and molecular mechanisms involved in the formation of neurofibrillary tangles and deposition of amyloid plaques. T2DM and AD patients have similar amyloid beta deposits both in pancreas as in the brain. As T2DM patients have almost double the chances of developing AD, T3DM is also increasing the already existing burden of AD in the society, so there is need to explore mechanism involved in impaired insulin signaling that holds the capability to shift T2DM to T3DM by altering various metabolic pathways.

Keywords: Type 3 diabetes mellitus, type 2 diabetes mellitus, neurofibrilatory tangles, β-amyloid plaques.
Protective Effect of *Prunus Amygdalus* Nut Extract on Chronic Unpredictable Stress Induced Memory Deficits in Rats

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**Abstract**

Present study was designed to evaluate the effect of *Prunus amygdalus* on Chronic Unpredictable Stress (CUS) induced memory deficits in rats. Initially, *Prunus amygdalus* nuts were successively extracted with different solvents and were then evaluated for in-vitro antioxidant activity. CUS was induced in the rats for 10 days using different stress paradigm each day. On day 11 and 12 Acquisition trials for memory evaluation were performed using Morris Water Maze. On day 13 on day 23, short term and long term memory retrievals were evaluated respectively. Treatment groups were given methanolic extract (25 mg/Kg and 50 Mg/Kg *p.o* respectively) 1 hour before stress protocol. Rats were sacrificed, brains were evaluated for biochemical estimation and histopathological study. CUS resulted in significant increase in the Transfer Latency time in both acquisition trails and retrieval trials indicating memory impairment which was reduced to a significant extent in extract treated groups. There was significant increase in the brain tissue TBARS and significant decrease in the GSH and catalase levels which was reversed by extract treatment. Histopathologically changes were prevented to a major extent in extract treated groups. We conclude that methanolic extract treatment protected the rat brains against CUS induced neuroinflammatory changes mediated through stress induced free radical generation. The beneficial effect could be attributed to the antioxidants present in *Prunus amygdalus* methanolic extract.

**Keywords**: *Prunus amygdalus*, Chronic Unpredictable Stress, Memory Deficits, Antioxidants
Gymnema Sylvestre for Diabetes Mellitus

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Abstract

Gymnema sylvestre (Asclepiadaceae) is regarded as a medicinal plant having potent antidiabetic properties also for controlling obesity in the form of gymnema tea. The phytoconstituents responsible for sweet suppression activity includes triterpene saponins termed as gymnemic acids and polypeptide gurmarins. Its flowers, leaves, and fruits contains alkaloids, flavones, saponins, anthraquinones, phytin, resins, formic acid, tartaric acid and other related glycosides. It is a perennial woody vine that grows in tropical area of India, Africa and Australia. The common name includes Gymnema Australia cowplant, periplora of woods and hindi name for gurmar is “Destroyer of sugar”. It is used for lowering blood serum level, cholesterol, triglycerides and blood glucose level, hypolipidemic, weight loss, stomach ailments, constipation, water retention and liver diseases, tachycardia or arrhythmias. Also, used as aperitive, purgative, in eye troubles, anti-inflammatory, smooth muscle relaxant, cataract and as anticancer-cytotoxic agent. The appropriate dose of this drug depends on several factors such as the user’s age, health and several other conditions. The drug is available in tablet, powder and extracts form. One of the major challenges of this commercially less explored drug is isolation of its secondary metabolites.

Keywords: gymnemic acids, gurmarins, sweet suppression activity
Strategies to Reduce the Impact of Ischemic Heart Diseases Due to Ischemia Reperfusion Injury

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Abstract

Ischemia reperfusion injury is a critical condition where the tissue damaged occurs due to restoration of blood supply to the tissue after a period of ischemia. Ischemia is an impairment of blood flow to the tissue and result into tissue injury and organ dysfunction. However, reperfusion of previous ischemic tissue has the potential to induce subsequent injury due to oxidative stress. This oxidative stress favours the accumulation of oxidants, thus leading to cellular damage in the cardio myocytes. Oxidative stress is associated with reactive oxygen species or reactive nitrogen species in the cellular and subcellular levels leadings to proteins, lipids and DNA damage. An ischemic heart disease including myocardial infarction is the result of ischemia and reperfusion injury. Intensive research efforts have been focused on the amelioration of various pathophysiological components of ischemia reperfusion injury to limit the extent of myocardial injury and necrosis. Reperfusion therapies, with primary percutaneous coronary intervention and fibrinolytic therapy, punctually return blood flow to ischemic myocardium and limit infarct size in myocardial infarction. This review summarises the various strategies employed to reduce the myocardial infarction due to ischemia reperfusion injury.

Keywords: Ischemic heart disease; Ischemia reperfusion injury; Oxidative stress; Reperfusion therapies.
Role of Probiotics in Treatment of Type 2 Diabetes Mellitus: An Overview

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Abstract

Diabetes mellitus is a metabolic syndrome characterized by increased blood glucose levels resulting from lack of insulin secretion or ineffective use of insulin due to insulin resistance (IR). The key in development of type 2 diabetes mellitus (T2DM) is IR, whereas, the increased blood glucose level is just a symptom of the disease. Contemporary research is focused towards development of strategies to treat IR. Attention has been driven towards understanding the role of gut microbiota as an underlying mechanistic driver in IR. The gut microbiota is a collective term for the microbial community in the gut and is involved in many functions such as host nutrient metabolism, maintenance of gram positive and gram negative bacterial ratio, drug metabolism, maintenance of gut wall integrity, immunomodulation, and protection against pathogens. Perturbations in the composition of microbial communities, may increase the gram-negative bacterial count, and lipopolysaccharides (LPSs), impair gut permeability and hence result in disrupted interactions between microbes and its host contributing in the development of T2DM. Unraveling these mechanisms hence provides unique insights into the therapeutic opportunities for T2DM. Many probiotics such as *Lactobacillus casei*, *Bifidobacterium bifidum*, and *Lactobacillus plantarum* have been used in human and animal studies and have shown promising results in maintenance of bacterial balance and gut wall integrity, and decrease in circulating LPSs, thus contributing in the treatment of T2DM. Therefore, the modifiable effects of probiotics on human gut microbiota in treating T2DM make them a promising therapeutic approach.

Keywords: Diabetes, Insulin resistance, Probiotics, Gut microbiota
Strategies Employed in the Management of Renal Failure

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Abstract

Renal failure is an illness which affects one in three persons and associated with muscle wasting, cardiovascular diseases and premature deaths. The conditions when kidney does not work properly or no longer work are known as renal failure. The renal failure can be caused by high blood pressure, diabetes or by the drugs. Renal failure is classified into categories: acute renal injury (ARI) and chronic renal injury (CRI). Acute renal injury is the life threatening illness that generally seen in hospitalized patients or critically ill patients. Ischemia, myoglobinemia and toxins are the major precipitating factors of acute renal injury. The initial management of ARI is the avoidance of nephrotoxic substances such as NSAIDs and other toxic drugs, by decreasing the protein intake and by decreasing the sodium intake and after fluids replacement therapy should be started. However, if the sufficient response is not obtained then consider the loop diuretics, mannitol, dopamine (at lower doses) and adenosine agonists. If still the response is poor or the patient life is at risk, then the last option is dialysis such as haemodialysis, peritoneal dialysis or renal replacement therapy. Chronic renal failure is the gradual loss of kidney function and its symptoms includes leg swelling, loss of appetite, confusion and vomiting. The management of CRF includes medicines that manage the BP, blood sugar and lower the cholesterol level and the last option is renal replacement therapy or dialysis. This review summarises the strategies employed to reduce the inflammation and progression of renal failure.

Keywords: Acute renal injury; Chronic renal injury; Renal failure.
Dermtopharmacokinetics of Drug Release from the Skin: An Update

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Abstract

From primeval time, topical medicine was applied on skin. In recent time, topical formulations for pharmaceutical delivery are becoming increasingly popular. Research scientist has emphasized more on dermatopharmacokinetics along with formulation component, as the impact of the formulation ingredient will affect the release kinetics of drugs. Stratum corneum which act as barrier for dermtopharmacokinetics of the drug has barrier need to be considered before formulating any drug formulation for topical skin. It is always possible that drug molecules applied on the skin surface may transport thorough the skin and reaches systemic circulation. Thus the real time measurement of molecules in the skin layer has become obligatory. The rate limiting factor for release kinetics of drug to the skin is not only the stratum corneum, the role of excipient, hair follicles, protein presence in the skin too. By assessing the bioavailability of drug molecules at the site of action delivers better understanding into the efficiency of a dosage form. The Fick’s second law of diffusion can also be used to describe drug release kinetics into this compound biological membrane. It is constantly promising that drug molecules smeared on the skin surface will be transport thorough the skin and reaches into systemic circulation. Considerate the fundamentals of dermatokinetics, drug depot formation and skin metabolism and also the clearance of drug particles from the skin layers resulting application of topical formulations. However, conventional topical drug delivery systems struggle from problems such as poor retention and low bioavailability. The effective formulation of topical delivery formulation involves the vigilant influence of defensive barriers and variety of a soluble drug carrier.

Keywords: dermatopharmacokinetics; hair follicles; drug depot formation; poor retention; defensive barriers.
Modulatory Effect of Probiotics on Different Doses of Voglibose in Type 2 Diabetic Rat Model

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Abstract

Over the couple of decades’ bound demographic changes are as curtained worldwide, that have diode to a rise within the prevalence of chronic non-communication diseases in particular T2DM (type 2 diabetes mellitus) and a major cause for rising morbility and mortality worldwide. The problems of compliance and adverse effects throughout long-run use have tempered the employment of existing medications. Probiotics are carboxylic acid microorganisms that are used extensively explored for many metabolic diseases. Voglibose is valiolamine by-product and is that the potent competitive substance of α-glucosidase catalyst gift in brush border of intestine. Voglibose delays the digestion and absorption of carbohydrates, thereby inhibiting post sustenance hyperglycaemia and hyperinsulinemia. The present study was focus to estimate the combined medical care of voglibose at the side of probiotics and illustrate the modulatory effects of probiotics on totally different doses of voglibose. Male Sprague–Dawley rats (160–180g) were taken and divided in to 6 groups i.e. traditional management, diabetic management, diabetic treated with probiotics, diabetic treated with voglibose, diabetic treated with combined medical care of probiotics and lower dose of voglibose, diabetic treated with combined medical care of probiotics and better dose of voglibose. sort two polygenic disease was elicited within the rats by high fat diet and low dose of streptozotocin (35mg/kg) and weight, aldohexose estimation, lipoid profile and cholesteserol estimations were performed. Probiotics and voglibose has shown vital impact in treating sort two diabetic rats as compared to the kind two diabetic rats treated with single medical care of voglibose.

Keywords: Probiotic, Voglibose, Diabetic Mellitus, In-vitro study
**Abstract**

Stem cells are the unique class of multipotent cells which have the ability to differentiate into specialized cells and organs. They help the cells for self-repair of various tissues and organs in the human body. Multivariate application of stem cells including organ generation have been reported by researchers around the globe. However, none of the reports are having a realistic approach for organ development due to unspecified mechanism for controlling the behavior of stem cells for organ regeneration. Control of stem cell behavior for attachment, proliferation and differentiation is still a major challenge in tissue engineering for **in vitro** organ development. Recent advancement in the technology has made the use of graphene, a carbon-based material offering excellent bioavailability, surface properties and versatile chemistry which can easily be functionalized for biological uses. These can be easily attached with the biomolecules by both covalent and non-covalent interactions for stem cell growth and differentiation. Graphenes have potential to be used for signaling and controlling the behavior of stem cells. It promotes the differentiation of stem cells for organ development in the same manner as of natural or topical growth factor does. In the present paper, the applications of graphene and related carbon-based nanomaterials for stem cell growth and differentiation in the organ development are discussed.

**Keywords:** Stem cells, graphene, functionalization, organ generation
Coumarins: A Biochemical and Pharmacological Perspective

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Abstract

The coumarins are heterocyclic compounds belonging to the class of benzopyrone. Tonka bean seed is a rich source of such compounds. Coumarins and their derivatives exert a vast array of bioactive properties such as anticoagulant, antibacterial, anti-inflammatory, antioxidant, antitumor, antiviral, and enzyme inhibition. Higher doses of coumarin are found to be hepatotoxic however they exhibit beneficial effects by reducing the risk of cancer and other brain and cardiovascular ailments. Most of these effects can be attributed to their free radical scavenging effects. The antioxidant property of coumarins can be investigated by several assays, viz., DPPH, nitric oxide assays, etc. The coumarins such as umbelliferone, esculetin and quercetin show antioxidant properties by protecting the human single cell DNA from oxidative attack. The dicumarol shows anti-coagulant properties by inhibiting the action of vitamin K, whereas angelmarin has been reported to be cytotoxic against the pancreatic cancer. Largely, coumarins also reduce edema and inflammation by inhibiting the prostaglandins biosynthesis. Hydroxyl aromatic substituted derivatives such as 5-hydroxycoumarin or vicinal dihydroxy coumarins have also been found to be potent anti-inflammatory agents. Some coumarins are approved by FDA as drugs, and warfarin is one such example. Also known as coumadin, it is used to prevent the venous thrombosis and pulmonary embolism. Warfarin blocks the Vitamin K reductase enzyme ultimately disrupting the clotting mechanism. In conclusion, coumarin class has a lot of potential to be used as medicines for various diseases. Much work is needed to bring them at the stage of clinical trials and further approval. There is a lot of hope for this unexplored area of translational research.

Keywords: Coumarin, anti-inflammatory, antioxidant, free radical, DPPH, Warfarin.
Management of Asthma by Liquorice: A Brief Review on Recent Update

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Abstract

According to WHO 235 million people suffer from asthma worldwide. Asthma is most common chronic disease among children. Bronchial asthma is common chronic inflammatory disease of air way. The clinical manifestation of bronchial asthma includes shortness of breath, cough, chest tightness and wheezing and often happens in morning and at night. Several international asthma management guideline recommend the use of systemic corticosteroid in the treatment of asthma. Prolonged uses of corticosteroids have limitation because of their side effect and presence of corticosteroid resistance in some patient. Liquorice (glycyrrhiza glabra) is a traditional herb use as treatment of asthma. Glycyrrhizin (triterpenoid saponin glycoside, also called Glycyrrhizic acid) and its aglycon (glycyrrhetic acid) of active Constituent of liquorice root have use to treatment of asthma which may be steroid like activity. Glycyrrhizin is structurally similar to corticoids. Glyrrhizin bind to mineralocorticoid and glucocorticoids receptor. Liquorice possesses several pharmacological activity-reduce Anti-inflammatory activity, inhibit antigen and antibody reaction, inhibit leucocyte migration, inhibit macrophages, IL-6. Liquorice also inhibits the expression level of Pro-inflammatory cytokinies level. Overall, liquorice posses’ good antiasthmatic acivity.

Keywords: Glycyrrhizin, liquorice, glycoside, antiasthamatic
A Combined Approach for the Characterization of Coronary Artery Disease Using Electrocardiogram Signals and Cardiac Impedance

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Abstract

Coronary Artery Disease (CAD) is the core reason of various Cardio Vascular Disorders (CVD) such as High blood pressure, Cardiac arrest, Heart Attack (HA) and Stroke. In the presence of coronary artery disease blood and oxygen will not reach the heart muscle due to narrowed arteries path. Early detection and treatment of Coronary Artery Disease condition is essential to prevent from arrhythmogenic diseases. There are many noninvasive methods are there to analyse Cardio Vascular Disorders. However, an individual method may be imprecise on determining the patient's Cardio Vascular Disorders. The precision for cardiovascular disease diagnosis can be improved by combining Electrocardiogram (ECG) and cardiac impedance together. This paper presents a novel features detection of impedance cardiography parameter and Electrocardiogram R wave and the T wave based on empirical mode decomposition (EMD). The proposed methodology has achieved the mean cardiac index significantly lower in group 1 by 2.19 L/min/m² compare to group 2 due to the presence of coronary artery disease. Finally, the extracted features are used to calculate Cardiac Output to realize the characterization of the Coronary Artery Disease (CAD).

Keywords: Coronary Artery Disease, Cardio Vascular Disorders (CVD), cardiac impedance, ECG, Cardiac Output, Empirical mode decomposition (EMD)
Novel Usage of CAR T Cell Therapy in Treatment of Hematological Malignancies and Solid Tumors: Shift in Paradigm of Biomarkers

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Abstract

Hematological malignancies and solid tumors are the common form of cancers increasing by annual rate of 7.9% every year. In past few decades, with new advent of CAR T (chimeric antigen receptor) cell therapy, T cells are engineered in such a way that it becomes more specific, selective as well as efficient targets to treat different types of cancers. Biological markers are naturally occurring molecules, genes or characteristics by which particular disease can be identified. However, biological markers (CD19) produced in past are found to have no capability to kill solid tumors and associated with some toxicities in treating hematological malignancies. Hence, recently, group of biomarkers associated with surface of malignant cells have been emerged which serve as targets for directing the cytotoxic T cells towards CD5, IL3Rα, CD33, CD70, CD38, BCMA. These are some of surface targets having unprecedented clinical outcomes in the treatment of hematologic malignancies and solid tumor. Furthermore, these biomarkers are known to have capacity to kill tumors with no toxicities. This review demarked the newly emerged biomarkers which are useful for treatment of hematological malignancies and solid tumors.

Keywords: CAR T, CD19, Biomarkers, solid tumors
Emergence of Antibiotic Resistance and its Management

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Abstract

Antibiotic resistance is spreading at global level due to evolutionary response of bacteria. Over use of antibiotics is connected with a high rate of toxic effects, produced tolerance, complications, weakening of immune system and elevation in rate of hospital stays. Antibiotic resistance is majorly seen in those peoples where infection is caused by virus and is some hypersensitive situations. Some of the factor responsible for this crisis; overuse, inappropriate prescribing etc. Centre for disease control and prevention (CDC) has announced this crisis as an urgent matter. Antibiotic resistant management proved a connection between antimicrobial intake and dissemination of resistant bacteria stains. In today’s scenario the resistance of bacteria is unique and differs from past since the microbes evolves themselves against antibiotics. Bacterial strains are now been resistant to multiple antibiotics and have possess a unique character that is responsible for its pathological activity. The CDC and other organizations now a days promoting Antibiotic stewardship programs to reduce antibiotic resistance. Studies like molecular genomics provide us the basis for research and synthesis of new antibiotics. Various new drugs have recently come in market that are very potent to a wide range resistant bacterium. Still more research is going on alongside with various programs to overcome this situation.

Keywords: Antibiotic resistance, CDC, pathology, microbes; stewardship programs
Biomedical Potential of CD8$^+$ in Disease Management: An Overview

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Abstract

The cytotoxic T cells have CD8$^+$ glycoprotein, cosignalling receptor and adhesion protein. Their function in adhesion activation and signalling cascade is instigated by binding of antigen. The cell surface glycoprotein (CD8$^+$ antigen) facilitates the efficient cell-cell interactions in immune system. It also acts as coreceptor using the T-cell receptor on T lymphocyte to identify the antigens exposed from an antigen offering cell in context of molecules of class I MHC. This coreceptor acts as a homodimer (two alpha chains) either a heterodimer (one alpha chain and one beta chain). Both chains show significant homology to the immunoglobulin adaptable light chains. CD8$^+$ plays an important role in eradication and control of intercellular pathogens. Although the consequences for cancer immunotherapy, conventional methods involving in vitro expanded CD8$^+$ T cells shows optimal results, mainly due to the functionality harm from cellular fatigue. This paper reviews about the biomedical application of CD8$^+$ and their recent application in cancer treatment.

Keywords: CD8$^+$; T cells; Cytotoxicity; Immunotherapy
Contribution of Probiotics: A Healthy Approach from Newborn to Adult

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Abstract

The global market of probiotics reached to 45.64 billion U.S. dollars in 2017 and till 2022 it will reach to about 64.02 billion dollars. Probiotic bacterial mechanisms of action involve production of short chain fatty acid, exclusion of pathogens, resistance towards colonization, bile salt metabolism and immunologic effects. These mechanisms contribute its application in the treatment of Cancer, Depression, Allergic disorders, Gastrointestinal disorders etc. Curd, fermented foods, chicory, pea, cheese and are the good source of probiotics. On the other hand, preclinical studies also gave an evidence of downregulation of HPA axis, promotion of GABA to synthesize and boosts serotonin levels. Recently clinical study established the use of probiotics form new born stage to till the end of life i.e. death as it provides beneficial effect on modulation of the functional properties of the microbiota, epithelial cells, dendritic cells and diverse immune cell types (lymphocytes TH1, TH17) and the regulation of cytokines production. Hence the present review will give an overview for its multiple potential throughout a life.

Keywords: Probiotics, Lactobacillus, Gut-brain axis
Advancements in the Diagnosis of Diabetes Mellitus

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Abstract

Diabetes mellitus, a chronic metabolic disorder which has been associated with humans since ancient times, characterized by elevated blood glucose level in the body resulting in various complexities. Due to which it has become important to determine the severity of glucose level so that appropriate treatment can be provided to inmates in order to control the disease. Body Glucose concentration helps to determine if a person has Diabetes, usually done by diagnosing the body’s glucose concentration with the help of Blood Glucose measuring devices. The conventional blood glucometers principally utilize blood as the analyte for glucose measurement. But the blood sampling is an invasive approach which has created inconvenience from neonates to the elderly people who may require multiple pricking of the skin, thereby driving the attention of the researchers towards the more reliable and convenient method which could be the best alternative for the already existing invasive devices. Glucose is present in other body fluids as well apart from blood that can be used as an active analyte, leading to the development of non-invasive methods. Non-invasive methods could be a promising and user friendly method for the Diabetic patients who require multiple glucose testing if proper standardization can be developed. Non-invasive testing procedures can utilise several available body fluids such as saliva, urine, sweat, which can be procured easily and have been proved to contain numerous biomarkers, providing painless and simplified glucose measurement. Through this discussion we would like to enlighten the problem generated by conventional blood based method to the subjects as well the advancements in the body glucose monitoring devices, which would help to overcome the ill-effects of the invasive methods.

Keywords: Diabetes mellitus, Glucometer, Biomarkers, Non-invasive testing, Blood.
Protective Effect of Andrographolide in 3-Nitropropionic Acid Induced Huntington Disease and Associated Neurodegenerative Changes in Rats

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Abstract

Oxidative stress and activation of pro-apoptotic mediators have been associated with the pathogenesis of Huntington’s Disease. Andrographolide is a well-known antioxidant and inhibitor of pro-apoptotic mediator, nuclear factor kappa B (NF-kB). The present study was hence designed to evaluate the effect of andrographolide in Huntington’s disease. Five groups (n=6) of Sprague Dawley rats were used. Normal group animals were kept untreated. The control groups were administered 3-Nitro propionic acid (3-NP) for seven days. The three treatment groups received 3-Nitro propionic acid followed by andrographolide intraperitonially for seven days. On 8th day, behavioural and coordination parameters were evaluated using multiple tests. Oxidative stress and anti-oxidant enzyme levels in brain tissue were also evaluated. Andrographolide administration resulted in significant decrease in the muscle incoordination in the behavioral tests and also decreased prooxidative biochemical changes. Brain tissues of the andrographolide treated animals showed protection against neuronal damage and neurodegeneration. The results indicate that the use of andrographolide may afford protection against Huntington’s disease associated muscle incoordination and subsequent neurodegeneration. Present study provides a lead for further investigation of role of NF-kB inhibitors in Huntington’s disease and possible development of low cost natural medication.

Keywords: Andrographolide, Huntington Disease, Oxidative Stress, Nuclear Factor Kappa B, Antioxidants
Morphological and Nutraceutical Characterization of Guava (*Psidium guajava* L.)

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**Abstract**

Guava (*Psidium guajava*) belongs to family Myrtaceae. Genus Psidium contains nearly 150 species out of which only few produce edible fruits. Guava is the second most important fruit crop after mandarin. It is cultivated on 8210 hectares of area and a total of 180.78 thousand tonnes of production. Guava fruits can be eaten as raw or they can be processed into products like jam, jellies, juices etc. Guava is considered to be nutritious fruit as it is rich source of antioxidants like Vitamin C, polyphenols and carotenoids. The main phytochemicals present in Guava are triterpenes, flavonoid, tannins, lectins, carotenoids, saponins, urosolic acid and other compounds. The fruits of guava have high levels of ascorbic acid (260 mg/100g of fruit). It is also a good source of pectin and fibre. Due to its easy availability and high nutrition value, it is known as ‘Apple of the Tropics’. The leaves have sedative effect and are chewed to get relief from mouth sores and bleeding gums. Other than the high health benefits of guava, less work is done at national level for knowing the nutraceutical potential of guava. The coloured flesched varieties of guava shows difference in antioxidant activity as compared to white flesched guava. So the nutraceutical potential of guava varieties with different flesh colour needs to be e valuated to get a variety with better antioxidant potential.

**Keywords:** Flavonoids, urosolic acid, nutraceuticals
Advanced Technologies for the Treatment of Chronic Wound Infection: An Emerging Trend

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Abstract

Chronic wound infection is a significant medical problem for the complicated, critically ill patient that subjects the patients to severe discomfort and distress. Infection of wound with pathogenic microorganisms results in delay of physiological events involved in healing of wound injury. The major problem associated with the conventional antibiotics used to treat wound infection is that they are costly and resistance cases with them are also raising nowadays. Hence, a large focus of attention is need to give on development of the new technologies, advanced therapeutic dressings that can be used for the treatment of chronic wound injuries. Advanced technologies such as hyperbaric oxygen therapy, advanced wound dressings, laser therapy, nanoparticles, photodynamic therapy are used for chronic wound infections. In this, major focus is give on the currently available wound management product with more emphasis on the advanced technologies that can be used for chronic wound therapy.

Keywords: Hyperbaric Oxygen Therapy, Laser Therapy, Photodynamic Therapy
Hemodynamic Effects of Serelaxin in Acute Heart Failure

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Abstract

Acute heart failure is inability of heart to produce sufficient amount of blood output from both the ventricles. It is life threatening disease. Serelaxin is latest discovery in acute heart failure by Novartis. Serelaxin, a drug which is marketed in Russia to treat acute heart failure patients. Serelaxin is a recombinant form of human hormone, relaxin-2. Relaxin is a hormone which releases during pregnancy. Relaxin controls the changes occur during birth and control blood output. It is present in both male and female. Serelaxin activates this hormone and causes vasodilation and increases the expression of vascular endothelium growth factor. Serelaxin block angiotensin II and increases the phosphorylation of myofilaments which induces stroke volume without energy consumption by cardiac myocytes. Novartis had done preclinical and clinical trails of serelaxin on 2017. Phase I gives positive results of safety of drug and in phase II it shows reduction in pulmonary arterial pressure. In Phase III serelaxin shows improvement in short term dyspensia but the end point of seleraxin was not satisfied that time. Many clinical trials had been done and still different parameter had been studied on effects of serelaxin.

Keywords: Myofilaments, Dyspensia, Relaxin-2, vasodilation.
Piperine: A Review on its Pharmacological Actions

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Abstract

Piperine, a characteristics compound present in fruits of Piper nigrum and Piper longum. Piperine is tasteless, but chavicineis the active ingredient in black pepper that provides its characteristic taste. It also stimulates pancreas digestive enzymes, protection from oxidative damage, lipid peroxidation lowering and improvement of the bioavailability of therapeutic drugs. It is produced in the laboratory for chemical and medical purposes. It exhibits potential anti-microbial, anti-oxidant, anti-inflammatory, anti-canceractivities and manymore It improves the bioavailability of other nutritive substances including beta, carotene, cucumin, selenium, pyroxidine, glucose and amino acids so it can also used as bioavailability enhancer. It is also reported that it may relieve stomach ulcerations by treating the production of serotonin. Piperinehaswide range of pharmacological actions and it has a great therapeutic potential.

Keywords: Piperine, Black pepper, Anti-oxidant, Anti-inflammatory
Relationship Between Waist Hip Ratio and Visceral Fat Measurement in Adolescent Population

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Abstract

Visceral fat is a type of body fat that is stored within the abdominal cavity and it is referred as active fat. As it plays a distinctive and potentially dangerous role in increasing risks of a number of health problems like type 2 diabetes and heart disease. The abdominal obesity is defined as a waist hip ratio (WHR) above 0.90 for males and above 0.80 for females or a body mass index above 30.0. WHR measures the ratio of a waist and hip circumference. The aim of this study is to find out the relationship between visceral fat and WHR in a healthy adolescent population in LPU campus.

Key words: Visceral fat, WHR, BMI, Body fat analysis
Vanillin: A Comprehensive Review of Pharmacological Activities

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Abstract

Vanillin is the chief constituent of the vanilla bean extract obtained from the seed pods of *Vanillius planifolia* belonging to the family Orchidaceae. Nowadays, synthetic vanillin is being preferred as a flavouring agent in foods, beverages and pharmaceuticals. Chemically, it is a phenolic aldehyde with the molecular formula C₈H₈O₃. Over years it has been used as a flavor in sweet foods like chocolates & ice creams, in cosmetics like perfumes, and in pharmaceuticals to mask the unpleasant odor and tastes in medicines. Also, vanillin-HCl is extensively used a visualizing agent in Thin Layer Chromatography. Quite recently, vanillin has been studied by researchers all over the world for its pharmacological effects. The compound has exhibited remarkable effects in treatment and management of several pathological conditions. This review focuses on the different reported pharmacological activities of vanillin.

Keywords: antioxidant; Alzheimer's disease; flavouring agent; neuroprotection; pharmacological effects; vanillin
Silver Nanoparticles: A Novel Drug Delivery System

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Abstract

This presentation highlights the role of silver nanoparticles in the novel drug delivery system as they can themselves act as drugs or drug vehicles. The novel approach for synthesizing silver nanoparticles can be achieved in the forms of ligand coated AgNPs, polymer based nanocomposite, cellulose-silver nanoparticle, β-cyclodextrin containing polymer, bisphosphonate Ald coatings, AgNPs with biomolecules (proteins, nucleic acids, long-chain hydrocarbons), Light-responsive drug delivery, silver nanoparticles bioscaffolds for their targeted delivery. The surface ligand coating of silver nanoparticle incorporated drug as drug delivery vehicle enlightens its sustained release with reduced side effects used as antimicrobial drug targeting. PEG-SH functionalized, folate-modified and conjugates of the nanoparticles were evaluated for their cytotoxicity. The phospholipid protected silver nanoparticles were delivered into 3T3 fibroblast cells and platelet cells with minimal toxic effects. The recent vibrant development of nanotechnology based drug delivery is creating the smart and novel approach. Silver nanoparticles offer higher extinction coefficients and blue-shifted plasmon resonant peaks over other metallic nanomaterials making them available for drug delivery applications. The surface modification of silver nanoparticles with various modified biomolecules has been shown to improve silver biocompatibility and intracellular uptake.

Keywords: Novel Drugs, Silver nanoparticles.
Plant Mediated Synthesis of Silver Nanoparticles: A Green Expertise

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Abstract

Recently, silver nanoparticles have attracted the major focus of researchers due to the extensive properties shown by them. They have numerous applications in different fields like biomedical, catalysis, electronics, bio-sensing, food, textiles and cosmetics. Mostly traditional methods (physical and chemical) are used for the synthesis of silver nanoparticles. But they suffer from a number of drawbacks like use of high temperature, pressure, energy and toxic chemicals making them hazardous to environment. These inherent drawbacks have demanded the need for safer alternative methods. Plant mediated synthesis/ green synthesis has gained much attention in recent years due to a lot of advantages offered by them like freedom from toxic chemicals, cost effectiveness, simple procedure, rapid rate of synthesis and environment friendliness. Phytoconstituents like terpenes, phenols, flavonoids and tannins act as effective reducing and capping agents in the synthesis of silver nanoparticles. Plant may itself contribute to the medicinal properties (like antimicrobial) of silver nanoparticles thereby enhancing the overall effect and reducing the effective dose. So, plant mediated synthesis holds tremendous potential as an eco friendly alternative to the traditional physical/chemical methods for the development of nano based potential therapeutic agents.

Keywords: Silver nanoparticles; green synthesis.
Nanosponges: An Innovative Drug Delivery System

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Abstract

Efficacious targeted drug delivery systems have been a dream for a long time but the chemistry hold complex form had made conditions complicated but the expansion of new colloidal carrier called Nanosponges likely circumvent these problems. They consist of nanoporous particles that can suspend or entrap a wide variety of substances, and then be engulfed into a dosage form. They release their active components on a time mode and also in response to other stimuli (rubbing, temperature, pH etc.). They can be crafted for targeting drugs to specific site, prevent drug and protein degradation and prolong the drug release in a controlled manner. They can circulate around the body and release the drug in a controlled and predictable manner at the specific target site. Another feature of nanosponges which makes them a carrier for poorly water soluble drugs is their good aqueous solubility. Both lipophilic as well as hydrophilic drugs can be loaded into nanosponges. By differing the proportion of crosslinker to polymer, the nanosponge particles can be made smaller to larger. Various applications of nanosponges like enhancing bioavailability of drug molecule and delivery of drugs into oral, topical, parental as well as nasal route make them a good candidate for targeted delivery of drugs.

**Keywords:** Nanosponges; Targeted Drug Delivery Systems; Bioavailability.
Tailormade Drug Delivery System: A Novel Trio Concept of 3DP + Hydrogel + SLA

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Abstract

Hydrogels possess three-dimensional polymeric network structure and capable of absorbing large amount of water or biological fluids. This quality makes them as exceptional candidate for the simulation of extra cellular matrixes. For this the three dimensional printing (3DP) has evolved as the technique for the formation of the digital models. The 3DP is capable for processing the medicines and the medical devices. One of the technique known as stereolithographic (SLA) printing has shown promising results in formulating the hydrogel based system for fabrication. The SLA acts by cross linking the resins to form the polymer matrices. Due to water entrapped in the gels it is possible to fabricate the pre-wetted, drug hydrogels and devices. The 3DP helps in formation of tailor made drug delivery system as per needs of patients. Many of Bioinks has been tried up for the hydrogel formation such as collagen, gelatin, hyaluronan, silk, alginate, and nanocellulose etc.

Keywords: Hydrogels; polymeric network; 3DP; Stereolithographic.
Abstract

Microencapsulation is a technique by which solids, liquids and gases are coated to form microcapsules in the sizes ranges from micrometer to millimeter. Microencapsulation is the most important method used for protecting the highly sensitive, volatile liquids and herbal drugs. Herbal medicines are the oldest and most popularly used in the treatment of illness and improving the health. In India and some other Asian countries, about 70-80 %of the population depends on the traditional herbal medicines. Herbal medicines are very safe and effective. Many herbal medicines such as volatile oils, vitamins, proteins, lipids, and enzymes are highly sensitive to the nature. Microencapsulation plays an important role in protecting the herbal medicines. The advancement of microencapsulation technology(controlled release system) continues to develop and is the most popular in the pharmaceutical industries specially in the extraction of natural products which are unremarkably sensitive to light, heat and microorganisms, so get easily oxidized and degraded. The natural products used in controlled drug delivery system are biologically harmonious, cost efficacious and having some nutritional values. Microcapsules produced after microencapsulation release their contents at controlled release. Microencapsulation process having various applications in pharmaceutical industry, food industry and cosmetic industry.

Keywords: Microencapsulation; herbal medicines; controlled release; natural products.
Nano -Technology in Herbal Medicines: A Review

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Abstract

Herbal drugs have been recently getting more attention because of their potential to treat almost all diseases. Nanosized herbal medicines can potentially enhance the biological activity and overcome the problems associated with pure herbal drugs. Phytotherapeutics need a Scientific approach to deliver the components in a sustained manner to increase patient compliance and avoid repeated administration. This can be achieved by designing novel drug delivery systems (NDDS) for herbal constituents. Using ‘herbal therapy’ in the form of nanocarriers will definitely increase its potential for the treatment of many chronic diseases and health benefits. Natural remedies are also prosperous resources of advantageous compounds holding antioxidants and constituents that can be made use in purposeful foods. NDDS not only reduce the repeated administration to overcome non-compliance, but also help to increase the therapeutic value by reducing toxicity and increasing the bioavailability.

Keywords: Herbal Therapy; NDDS- Novel Drug delivery System; Phytotherapeutics.
Formulation Development and Evaluation of Thermosensitive In Situ Gel of Gemcitabine Hydrochloride Loaded Nanoparticles for Pancreatic Cancer

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Abstract

The objective of the current research work was to prepare polymeric nanoparticles of gemcitabine hydrochloride and then incorporate the drug-loaded nanoparticles into an in situ gelling system to provide dual sustained release effect, whereby the duration of action, targeting action, dose as well as dose duration could be improved. Gemcitabine hydrochloride is a first line therapy drug for the treatment of pancreatic cancer, which competes with new generations in the market, with its potential activity. The major physicochemical constraints and pharmacokinetics of gemcitabine hydrochloride such as poor permeability, less half-life, high dose has initiated many researchers to develop diverse modified release dosage forms. Firstly, development of nanoparticles using chitosan and sodium TPP by ionic gelation method followed by dispersion of the suspended nanoparticles into thermo sensitive in situ gelling system of pluronic F-127 with carbopol 934. The characterization & evaluation of the nanoparticles and its sol-gel system performed through particle size, zeta potential, TEM, XRD, DSC and other rheological properties like viscosity, gelation temperature & time. The % cumulative drug from optimized PNP’s (CTN7) & in-situ gelling system (GIS5) was found to be 72% and 47% respectively after 24 hours.

Keywords: Herbal Therapy; NDDS- Novel Drug delivery System; Phytotherapeutics.
Eradication of Biofilm Forming Microbes from the Surfaces of Medical Devices by Native and Formulated Metallic Nanoparticles

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Abstract

Metallic nanoparticles (MNPs) have been the center of attention for the development of antimicrobial and anti-biofilm coatings, since the antibiotic resistance among bacteria have been a major concern in public health. MNPs potentiate the antimicrobial effects of the bulk metal owing to their tremendous physicochemical properties such as high surface area to volume ratio, high cell permeability and high biomolecules (proteins, DNA or enzymes) binding ability. MNPs are known to show antimicrobial effect by more than one pathways hence, they are less prone to resistance. They act by the generation of reactive oxygen species, damaging the cell membranes by strong binding, damaging the organelles such as nucleus, mitochondria etc. and by binding to the biomolecules. Various MNPs such as silver, zinc oxide, magnesium fluoride, titanium dioxide, gold and copper have shown a prominent antimicrobial effect, due to which they are believed to be eminent antimicrobial candidates to coat the medical devices. MNPs can be easily coated or used to prepare anti biofilm surface formulations owing to their unique physicochemical properties and high surface functionality. Currently, many antimicrobial surface formulations have been developed using MNPs alone or in combination with other antimicrobial agents, such that their effect on biofilm eradication can be studied.

Keywords: Metallic nanoparticles; Biofilm; Medical devices; Antimicrobial; Formulation.
Novel Drug Delivery Approaches for Bioactive Constituents of *Allium sativum*, Garlic

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**Abstract**

*Allium sativum*, Garlic is the most commonly used spice and a scientifically proven medicinal food from ancient period of time belonging to family Liliaceae of the plant kingdom. The six varieties of *Allium sativum* are grown and cultivated at the divergent part of the world. All these divergent varieties possess more or less same amount of chemical constituents. Major biologically active organosulphur compounds are allicin, allin, diallyl disulfide and traces of volatile oil and lipids. Several pharmacological activities are reported in the treatment of various ailments such as cancer, hypertension, congestive heart failure, atherosclerosis, diabetes, jaundice, tuberculosis, rheumatism, common cold, platelet aggregation, arrhythmia, and neurological disorders. However, thermo-stability and solubility is the major issues associated with these constituents. It becomes unstable above 39 degree Celsius and has poor aqueous solubility. To overcome these issues, various drug delivery approaches have been applied such as nanotechnology (nanoparticles), self emulsifying systems, microspheres and bio-adhesives for formulation development. Overall, this review focuses on the translational work on this bioactive molecule from nutraceutical to pharmaceutical.

**Keywords:** Phytoconstituent; Solubility; Bioavailability; Drug delivery.
Oral Film: Present Status and Future Prospectives

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**Abstract**

Fast dissolving dosage form is designed to allow administration of an oral solid dosage form in the absence of water or fluid intake. Such formulation readily dissolves or disintegrates in the saliva generally within less than 60 seconds. Fast dissolving systems are useful for pediatric, geriatric, and bedridden patients and for patients who are suffered with Dysphasia. Fast dissolving oral films have been introduced in the market recently as they provide convenience and ease of use over other dosage forms such as orally disintegrating tablets. Most fast-dissolving delivery system films must include substances to mask the taste of the active ingredient. This masked active ingredient is then swallowed by the patient's saliva along with the soluble and insoluble excipients. The sublingual and buccal delivery of a drug via oral film has the potential to improve the onset of action, lower the dosing, and enhance the efficacy and safety profile of the medicament. Oral films dissolve rapidly along with drug in mouth and majority of the drug is absorbed through buccal/oral mucosa in to systemic circulation avoiding first pass metabolism. Methods for the preparation of oral films are Casting and Drying (solvent casting, semi-solid casting), Extrusion (hot melt extrusion solid dispersion extrusion), and Rolling method. The films were prepared by hydroxy propyl methyl cellulose E15 (film base synthetic polymer) and Poly Ethylene Glycol 400 (plasticizer), Sodium Lauryl Sulfate and Micro Crystalline Cellulose (surfactant) in different concentration.

**Keywords:** Fast dissolving dosage form; Oral films; Drug delivery.
Abstract

Microsponge delivery system (MDS) has been introduced to facilitate the controlled and targeted release of active drug. The Microsponge Delivery System is a patented polymeric system consisting of porous microspheres. They are tiny sponge-like spherical particles that consist of a myriad of interconnecting voids, releasing bioactive agent at a target site within predetermined time. Microsponges having myriad of interconnected size ranging voids of particle from 5-150 μm. Microsponges are prepared by several methods utilizing quasi emulsion system diffusion or by liquid–liquid suspension polymerization system. These microsponges have the capacity to entrap a wide range of active ingredients. Release of drug into the skin is initiated by a variety of triggers, including rubbing and higher than ambient skin temperature. This technology has the best feature that it is self-sterilizing. Microsponge drug delivery can provide increased efficacy for topically active agents with enhanced safety, extended product stability and improved aesthetic properties in an efficient and novel manner. They are mostly used for topical use and have recently been used for oral administration. Microsponges are prepared by several methods utilizing quasi emulsion system diffusion or by liquid–liquid suspension polymerization system.

Keywords: Microsponge Delivery System; Drug delivery.
Grafting: A Unique Technique for Modifying Natural Polymers

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Abstract

The pharmaceutical and cosmetic industries commonly use the most abundantly available plant ingredients i.e. the gums and mucilage, which are present in the fruit, seed, seed coat, and bark of the tree. As these gums and mucilage are of natural origin, these are very prone to microbial contamination and also on storage viscosity of these may vary. So, to overcome these problems, modifications techniques like grafting and curing are used. Gums and mucilage are used in the pharmaceutical industry as gelling agents, thickening agent, stability enhancer, etc. Modification of the natural gums provide better stability, rigidity, compatibility, so these can be incorporated in the sustained release drug delivery systems. Various techniques are incorporated in the modification of the gums like chemical, enzymatic and radiation grafting, that can be done by using various synthetic compounds like acrylamides, methyl methacrylate, monochloroacetic acid, etc. As per literature, there are about 30 natural gums which has been modified till date these includes xanthan, tamarind, artemisia seed, okra and locust bean gums. Also, various mucilage has been investigated for grafting includes mucilage from hibiscus, fenugreek, aloe etc. Different formulations have been developed using these grafted gums like nanoparticles acrylic acid grafted cashew gum, hydrogel of ranitidine HCl with polyacrylamide grafted karaya gum etc.

Keywords: Grafting; Acrylamide; Methyl methacrylate; monochloroacetic acid; Xanthan; Nanoparticles.
Transungual Drug Delivery System

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Abstract

Nail is an integral part of human body and diseases associated with it can cause certain topical deformity or abnormality. Treatment of nail disorder should be topical therapy to get maximum efficacy in addition to minimum adverse effect due to nonspecific tissue distribution. Transungual drug delivery system is absolute solution for the treatment of nail disorders, which comprises of transporting a particular chemotherapeutic agent or a concurrent delivery of chemotherapeutic agent across the nail bed to get maximum efficacy. Specifically diseases like onychomyosis and psoriasis were associated with human nails disorder. Delivery and desired permeability of chemotherapeutic agent across the nail plate and further nail bed were limited by some factors such as polarity of the drugs, pH of the drugs, molecular size and surface charge. Techniques to exaggerate the permeability of drug across the nail plate have been divided into three categories depending on the methods used namely physical, chemical and mechanical methods. Physical methods comprising of iontophoresis, etching, laser and microneedles. Moreover, chemical method includes the use of thiols, organic solvents and keratolytic agents as well as mechanical methods including nail abrasion and nail avulsion. Various formulations of TDDS along with the evaluation criteria depending on parameters like smoothness, spread ability and drying time. That have been marketed or patented or which are in clinical trials depending on formulations used like cream, nail solution, gel, thermogel, topical solution, nail film, and nail lacquers have been covered. In the review article we cover major topics like the factors affecting permeation; technique to enhance the drug transfer; along with the anatomy of human nail.

Keywords: Transungual; Onychomycosis; Permeation enhancers; Vehicles
Role of Biofilm in the Antibiotic Resistance

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Abstract

Biofilms are effective assortments of the planktons (free living forms) to sessile (attached) morphological structures between related or unrelated species of micro-organisms. This living spread sheet shows wide tolerance against environmental conditions due to alteration in their morphological and physiochemical behaviours. Biofilms having a mechanism of superficial polysaccharides covering along with Quorum sensing (signalling) and gene coding for widespread cellular signalling and flourish of microbial communities. The binding of biofilms for processes like virulence, proliferation, viability etc. can be related with the substrate attachments either on animate or inanimate surfaces which includes medical tools and analysers, body fluid samples (blood), water sewage pipelines systems (domestic or industrial), oceans or stagnant water, living tissues, dental plaque formations etc. Factors like presence of nutrition, surface texture, cellular signalling and shear forces influence the development of biofilms. As observed from the historic emergence of biofilms, the more resistance patterns towards multidrug and biocides can be remarked, making it difficult for the identification and eradications with currently available techniques. Therefore, it is very essential to study and control the development of novel patterns of biofilms for its dispersion and protection against new drug resistance with new era technologies.

Keywords: Biofilm; microorganism; planktons; resistance; quorum sensing
Nocturnal Asthma: A Chronomodulated Approach for the Treatment using Salbutamol Sulphate Entrapped Beads

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Abstract

In the present study Salbutamol sulphate entrapped in calcium alginate beads is used as a model drug. The calcium alginate beads were further coated with pH dependent polymer Eudragit S-100. The prepared beads were evaluated for drug content, drug entrapment efficiency, particle size and in vitro drug release study. The compatibility of polymer with drug was investigated by using FTIR spectroscopy and Differential Scanning calorimeter (DSC). It is investigated that high encapsulation efficiency were found in the beads having less cross linking time. Calcium alginate beads coated with Eudragit S-100 were spherical and had a smooth surface. The drug release study of the coated and uncoated alginate beads were performed by simulating gastrointestinal pH variance, which shows a burst release of the calcium alginate beads in the initial hours, whereas the calcium alginate beads coated with Eudragit S-100 produced a controlled release system by protecting the drug release in initial hours. The drug release was dependent on sodium alginate concentration, CaCl₂ Concentration and Eudragit S-100 concentration.

Keywords: Chronomodulated; Calcium Alginate; pH dependent; Drug delivery
Neuropathy is defined as the pain caused by a lesion, a disease affects the somatosensory system. The somatosensory system belongs to the perception of touch, pain, pressure, temperature, position, movement and vibration. When the neuropathic pain results from lesions to the peripheral nervous system caused by mechanical trauma, metabolic diseases, neurotoxic chemicals, infections or tumour invasion, then the pain is termed peripheral neuropathic pain. When the pain results from spinal cord injury, stroke or multiple sclerosis, it is termed as central neuropathic pain. Multiple mechanisms are responsible for neuropathic pain like altered gene expression/ regulation and changes in ion channel that lead to ectopic activity. In addition, synaptic facilitation and loss of inhibition at multiple levels of the neuraxis produce central amplification. Earlier, in 1970 the mechanism associated with it was not clear, but they keep on discovering the challenges on SSRI. The proved mechanism of the fluoxetine as SSRIs used in many diseases like the mood disorder, depressive disorder, panic disorder, premenstrual dysphoric disorder, bulimia nervosa and one of the best choice to treat NP. Here we will focus on the importance of fluoxetine (Prozac) in neuroscience and in NP.

**Keywords:** Somatosensory system; Neuropathic pain; SSRIs; Fluoxetine; Antidepressants
**Generation of Daidzein Cocrystals: An Opportunity to Improve Its Biopharmaceutical Parameters**

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**Abstract**

The present study involves the contribution of cocrystallization towards the modification of the biopharmaceutical parameters of poorly water soluble plant-originated isoflavone, daidzein. The cocrystals were prepared with GRAS status coformers i.e., isonicotinamide, theobromine and cytosine using mechanochemical grinding and characterized by various analytical techniques (DSC, FT-IR, PXRD and solid state NMR). Crystal structures were obtained from PXRD data using BIOVIA Materials Studio software and compared in terms of supramolecular motifs. An additional qualitative and quantitative insight into interactions between both components of the cocrystal illustrated the presence of OH…N and OH…O=C heterosynthons and also revealed a stabilizing role of hydrogen bonding. The cocrystals were further evaluated for their solubility, intrinsic dissolution and in vivo profile. Solubility and dissolution studies of pure daidzein and its cocrystals, namely daidzein-isonicotinamide (DIS), daidzein-cytosine (DCYT) and daidzein-theobromine (DTB) exhibited an almost 2-fold improvement. Evaluation of Cmax of cocrystals reveals that the DIS cocrystal shows the highest Cmax of 1848.7 ng/ml followed by DCYT cocrystal (1614.9 ng/ml) and DTB cocrystal (1326.0 ng/ml) in comparison to DAID which has a Cmax 870.5 ng/ml. Each of these cocrystals showed significant enhancement in in vivo and in vitro activities in comparison to daidzein. Thus, this report suggests cocrystallization as a viable approach to resolve the solubility and bioavailability issues that circumvent the use of a therapeutically potential isoflavone, daidzein.

**Keywords:** Daidzein; Cocrystals; DSC; FTIR; Solid State NMR.
Application of Nanotechnology in Phytomedicine

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Abstract

The green synthesis of nanoparticles can be effectively carried out utilizing plants and various microbes as bacteria, fungus, viruses etc. The bio-reduction of a metal salt via plant extract is the most commonly followed approach as plants are cheap and easy to procure and process. Moreover, the resulting yield is also much higher. Earlier various common medicinal plants as Aloe vera, Azadirachta indica, Emblica officinalis, Ocimum sanctum etc. have been utilized for such synthesis. Many precious metals as Gold, Silver, Platinum, Titanium and some cost effective ones as Iron, Copper, Zinc etc. have been previously employed where in the resulting nanoparticles have successfully displayed some amazing inherent properties as antimicrobial, antioxidant, anti-neoplastic etc. Many more rare and indigenous plants can be thought off to parent certain new metal nanoparticles that would probably be carrying the therapeutic properties which would certainly aid in preventing and treating certain existing complex medical pathologies.

Keywords: Green synthesis; Bio-reduction; Antimicrobial; Antioxidant; Anti-neoplastic.
Nanocarrier Mediated Treatment Approaches of Diabetes Mellitus

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Abstract

Diabetes mellitus is a multifaceted, chronic, metabolic disorder and it has become a severe health problem across the world. It occurs when body cannot produce sufficient amount of Insulin and cannot use Insulin efficiently which results in hyperglycemia. Worldwide around 451 million people are suffering from diabetes and this number will increase to approx. 693 million by 2045. Type 2 diabetes is the common diabetes and it accounts for more than 90% of the cases. Type 2 diabetes is characterized by β-cell dysfunction, hepatic glucose output and insulin resistance. Type 2 diabetes also results in chronic hyperglycemia that produces several complications like nephropathy, heart diseases, retinopathy, atherosclerosis. As compared to conventional therapies, for enhancing the delivery of oral hypoglycemic agents nanocarriers are developed like dendrimers, liposomes, niosomes, micelles, which has now-a-days become the most favourable technology and has control in the increase of blood glucose level. Nanocarriers are developed to improve the efficacy and safety. Nanocarrier improves the management of diabetes by minimizing the acute and chronic problems. For enhancing drug bioavailability some strategies can be adopted like the use of mucoadhesive polymers, enzyme inhibitors, absorption enhancers etc. This may lead to increase patient compliance also helps to manage the disease.

Keywords: Diabetes Mellitus, type 2 diabetes, nanocarriers , dendrimer, liposome, noisome.
Nanocrystal Based Oral Formulation: Nanosuspension

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Abstract

As a formulation strategy for improving the bioavailability of poorly water-soluble drugs, drug nanocrystals can be employed. Several studies have shown that drug nanocrystals exhibit higher dissolution rate compared to conventional drug formulations. However, when orally administered, various conditions in gastrointestinal tract, such as changes in pH may result in problematic absorption. In that case, the preparation of drug nanosuspension will carried out. Preparation of nanosuspension is simple and applicable to all drugs which are water insoluble. A nanosuspension not only solves the problems of poor solubility and bioavailability, but also alters the pharmacokinetics of drug and thus improves drug safety and efficacy.

Keywords: Bioavailability; Nanosuspension; Antimicrobial; Bioavailability.
Fast Dissolving Tablet – A Promising Carrier for Drug Delivery

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Abstract

In the present scientific scenario the drug delivery technology has become highly competitive with ever increasing demand. Fast dissolving tablet (FDT) is one such type of an innovative and unique drug delivery system which is swiftly gaining much attention in the research field of rapid dissolving technology. The development of fast dissolving tablet (FDT) improved patient compliance and convenience. The fast dissolving tablet (FDT) which dissolve or disintegrate rapidly in mouth saliva without intake of water. This novel drug delivery such as fast dissolving tablets (FDT) has overcome many disadvantages like dysphagia or non accessibility of water while travelling. Method of preparation of fast dissolving tablets are freeze-drying or lyophilization, sublimation, direct compression, moulding method, melt granulation. They have several advantages like they are beneficial in cases such as motion sickness, allergic attack or coughing, where an ultra rapid onset of action required of through dosage form and an increased bioavailability, particularly in cases of insoluble and hydrophobic drugs, due to rapid disintegration and dissolution of these tablets and make the dose effective to use. Fast dissolving tablets are designed to disintegrate speedily, absorb faster so, in vitro drug release time improve and this property of drugs enhanced bioavailability. The fast dissolving solid dosage form turns in to a soft paste or liquid form for easy swallowing, and thus it is free of risk of choking without obstruction.

Keywords: Fast dissolving tablet; Bioavailability.
Strategic Approaches of Drug Carriers Targeting to Hepatic System

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Abstract

In vertebrates many functions like detoxification, synthesis of protein, and production of many chemicals which aid the digestion are carried by liver making it a vital organ in the body. Liver metabolism is the major route for elimination for a wide variety of drugs & it can be affected by a variety of parameters. Medication conveyance to liver is a standout amongst the most difficult research regions in pharmaceutical sciences. The some physiological hindrance, for example, opsonization, mechanical capture by pneumonic vascular bed, take-up by RES speaks to an inconceivable obstruction for an extensive number of proteins and medications, including anti-infection agents, antineoplastic specialists and antiviral operators to target liver issue. Hence, different procedures have been proposed to enhance the conveyance of various medications to liver and hepatocytes which incorporates latex gathering of nanoparticle therapeutics and dynamic focusing by surface alterations of nanoparticles with particular ligands, for example, starches, peptides, proteins and antibodies. The present survey illuminates about various pathologies of liver and focusing on procedures utilized in connection to liver life systems and infection aetiologies. Absence of site-particular conveyance of these meds to the hepatocytes/nonparenchymal cells and adverse effects associated with their off-target interactions limit their continuous use. This calls for the development and fabrication of targeted delivery systems which can deliver the drug pay load at the desired site of action for defined period of time. Targeting is done to the different types of receptors present on the different types of cells present on the liver like Kupffer cells, stellate cells etc. The primary aim of drug targeting is to avoid drug distribution to non-targeting cells. Recent studies showed that several intrahepatic cells can be targeted using several drug carriers. The knowledge regarding drug targeting gained with good preclinical evaluation can be a great progress in the near future.

Keywords: Nanoparticle; Targeting; RES; Kupffer cells.

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**Abstract**

Diabetic peripheral neuropathy is a type of nerve damaging disorder which occurs when one suffers from diabetes mellitus. Microvascular injuries observed in minute blood vessels i.e. vasa nervorum are responsible for generating diabetic peripheral neuropathy. In Ayurveda, Madhumeha vyadhi can be compared with diabetes mellitus. Madhumeha, is categorized as one of the four varieties of Vataja Prameha. In the incurable stage (Itsasahya), Madhumeha gives rise to a number of complications (upadrava) such as burning sensation (Daha), numbness (suptata), tingling sensation (harsha), wasting (shosha), and weakness (dourbalya) which are similar to the symptoms of diabetic peripheral neuropathy. The regimens utilized in modern medicine for mitigating diabetic peripheral neuropathy are effective, but are highly expensive and incorporates a list of side effects. In contrast, Ayurveda provides some Herbal remedies that can act as an alternative therapy in such conditions. One of the most superior plant utilized in Ayurvedic medicine for the treatment of Diabetic neuropathy is Guduchi (*Tinospora cordifolia*). Due to its effective anti-diabetic, analgesic, antioxidant and immunomodulator activities validated in animal models, it is highly recommended for Diabetic peripheral neuropathy. The present review describes about the pharmacological activities and efficacy of Guduchi (*Tinospora cordifolia*) in the management of Diabetic peripheral neuropathy.

**Keywords:** Diabetic peripheral neuropathy; Madhumeha, Upadrava; Guduchi (*Tinospora cordifolia*).
Development of Analytical Method and its Validation of Bilayer Tablet Containing Fexofenadine HCl (Immediate Release Layer) and Monteleukast Sodium (Sustained Release Layer)

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Abstract

The aim of the present study was to develop and validate analytical method for the simultaneous estimation of Fexofenadine HCl and Monteleukast sodium in bilayer tablets by UV spectrophotometric method. The absorption maxima of Fexofenadine HCl and Monteleukast Sodium were found to be 259 nm and 285 nm respectively using phosphate buffer pH 6.8. The method obeys Beer’s law in the concentration range of 24-84 µg/ml and 2-14 µg/ml for Fexofenadine HCl and Monteleukast Sodium respectively. Different analytical parameters like Limit of detection [LOD], Limit of quantitaion [LOQ], accuracy and precision were determined as per ICH guidelines Q2 (R1). The accuracy of the method was found to be 99.71% and 99.13% for Fexofenadine HCl and Monteleukast Sodium respectively. There is no interference shown by the excipients of the formulation in the method and the method can be used for routine quality control.

Keywords: UV spectroscopy; Limit of detection; Limit of Quantitaion.
Neuroprotective Potential of Rutin: Pathway and Mechanism of Action

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Abstract

Neurodegeneration (NrD) is a chronic and unpredictable diseased state which is identified as progressive loss of neurons, apoptosis, mitochondrial abnormalities, oxidative stress, and inflammation. It leads to difficulty in breathing, speaking, walking with impairment of memory and cognitive functions. Hence, NrD is responsible to causes prion, Alzheimer’s and parkinsonism like diseases. Rutin is bioflavonoids acts as a vital nutritional supplement, contains quercetin and a disaccharide rutinose with a multiple biological activity. Rutin, a glycoside of the flavonoid quercetin. It can be obtained from buckwheat, apricots, cherries, grapefruit, plums, and oranges. Several in-vivo activities gave an evidence for its neuroprotective, anti-carcinogenic, cytoprotective, anti-platelet, antithrombic, vasoprotective, and cardioprotective potentials. Recently it was reported to protect memory impairment in cerebral ischemic state in rats, interfere with Aβ aggregation and neurotoxicity, prevent oxidative stress induced by Aβ and reduce Aβ42 levels in mutant human. It activates the ERK-CREB pathway, increases expression and secretion of BDNF from the synapse through increases of CREB stimulation which accounts to enhance the memory power. Hence, this present review will focus on neuroprotective potentials and mechanism of rutin towards NrD.

Keywords: Neuroinflammation; Amyloid-β aggregation; Reduction of reduce Aβ42 levels; Antioxidant action; Rutin.
Ommaya Reservoir an Brain Targeted Drug Delivery System: Review Update

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Abstract
Brain is the crucial part of our body but the disorders like brain tumor, Parkinson’s disease, Huntington’s disease, and Alzheimer’s disease are at high rate. The treatments for brain disorders are quite difficult due to the presences of barriers like blood brain barrier. Several strategies are tried to target the brain either by increasing the lipophillicity of drug molecule or reducing the molecular weight of drug or prodrug approach. In Parkinson’s disease levodopa is used which is a prodrug for dopamine. But still there is lack of targeted drug delivery (chemotherapy) for the treatment of brain-tumors. As blood brain barrier along with blood brain-tumor barrier act as an obstacles for the targeting of drug in tumor.so the prospective is shifting towards the targeted delivery of drug along with bypassing the barriers. This can be achieved by the use of ommaya resevoir.Ommaya reservoir is a device through which fluids can be put into or removed from, around the brain. It is the new type of implant that would be at high rate for brain disorders in the coming years. Only once the surgery is required directly the drug is delivered in cerebrospinal fluid and targeted action can be achieved even the aspiration is possible in cystic craniopharyngioma. After the tumor is cured ommaya reservoir can be removed.

Keywords: Ommaya reservoir (OR); Chemotherapy; Cystic; Craniopharyngioma; Tapping.
Abstract

The oral route of drug delivery is mostly preferred drug delivery route due to the associated advantages. At the same time, this route is not always suitable for the drugs of biopharmaceutical class II drugs. Self-nanoemulsifying drug delivery system (SNEDDS) is a novel approach aimed to increase the absorption and bioavailability of poorly soluble drugs by increasing their dissolution rate, additionally preserving the chemical stability and solubility of the drug. The system exist as a liquid phase, which after administration and dilution with the aqueous media, such as gastric fluid, results in the formation of the o/w nano or micro emulsion. A typical SNEDDS formulation has globule size of about 100nm, and shows excellent absorption, permeation and dissolution profiles. SNEDDS are composed of an isotropic mixture, incorporating oil, surfactants, co-surfactants along with other excipients such as anti-oxidants, stabilizers, preservatives, viscoelastic agents, etc. The SNEDDS can be easily prepared by homogenisation, micro fluidization, sonication, phase inversion, etc. The prepared SNEDDS are evaluated on the basis of various parameters including the droplet and globule size, viscosity, emulsion time, centrifugation study, dispersion test, freeze thaw studies, thermodynamic stability, transparency, pH, drug content, cloud point temperature, poly-dispersibility index, zeta potential, microscopy, surface charge analysis, etc. The formulated SNEDDS are also sometimes tested for in-vivo studies using dog or rat model. The various tests include diffusion and dissolution study, toxicity studies, etc. SNEDDS are being currently researched for various class II drugs and the system has a promising future ahead.

Keywords: SNEDDS; Emulsion; Homogenisation; Absorption rate; Fluidization.
Awareness on Active Immunization: Survey Based Project

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Abstract

Immunization is one of the effective intrusions to treat various diseases. In china they were first to discover and use a primitive form of vaccination called variolation. Two major approaches to active immunization are use of live- attenuated vaccines and inactivated or detoxified agents. India is a leading producer and exporter of vaccines all over world, still lack behind because increasing population and growth rate. Due to lack of awareness and inadequate health services, supervision and monitoring in health services. Different types of vaccines available such as oral polio vaccine (DPT) vaccines, BCG vaccine, (MMR) vaccine, Hepatitis B vaccine. This present work represents survey on active immunization out of 50 families 60% are aware about immunization while 30% are not aware and 10% are not sure. It has been a major contributor in the decline of under-5 mortality rate from ~233 to ~63(per 100) in last five decades in India. According to survey some of them they don’t know about the vaccination for that disease. Due to low literacy rate among the people the disease is not cure although the vaccination is available. According to survey report it was found that most of the parents are aware of oral polio vaccine, whereas they are not aware of some of the vaccines like Hib vaccines, Measles, Hepatitis B etc. From the survey it is concluded that still awareness is required for the proper immunization for the children to complete eradication of disease caused due to lack of vaccination.

Keywords: Variolation; DPT; MMR; Vaccination; Live attenuated vaccines.
A Review on Pharmaceutical Waste Management

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Abstract

Continuous entry of uncontrollable pharmaceutical waste into eco system has gained more attention by policy makers to initiate the effective corrective action to improve the present environment situation. This paper review the methods used for waste management, including the common sources, governing legislation and handling and disposal methods. There is a lack of clarity about the definition of ‘infectious medical waste’ in legislation of different countries, results in inefficient sorting of medical waste. It increases the disposal cost and undesirable environmental impact. The review concludes that pharmacists are the forefront for educating the patients about safe drug disposal. Proper patient counseling on safe medication disposal can make a significant difference to public health and environment.

Keywords: Infectious waste; Medical waste; Waste management; Biomedical waste.
Epidemiology of Nipah Virus Infection: A Review

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Abstract

Paramyxovirus commonly known as Nipah virus (NIV) is an emerging zoonosis which can cause morbidity and mortality in human and can further affect economy and public health impact. NIV caused infection was first identified in 1998 in Malaysia and later cases were reported in Singapore, Bangladesh, and India. The emergence of NIV in pig and later in to human population may be attributed due to changes in ecological conditions. Symptoms for infection may vary from none to fever, cough, headache followed by disorientation and mental confusion which may further progress into a coma. The complications can further cause inflammation of the brain and ultimately death. NIV particles like other paramyxoviruses are pleomorphic, may vary from spherical to filamentous shape, and range in size from 40 to 1,900 nm. NIV is a type of RNA virus in the genus Henipavirus and can be transmitted from infected animals to humans. Diagnosis of NIV infection is done by using reverse transcriptase polymerase chain reaction (RT-PCR) from throat swabs, cerebrospinal fluid, urine, and blood. Currently there is no effective treatment for NIV infection. As per the study given by World Health Organization in 2018, the prevalence of NIV infection is almost between 45-70% in South East Asia Region and occurrence is increasing in other parts also. Although currently no drug or vaccination is effective in curing infection caused by NIV, however a Hendra G protein using vaccine has been found to produce cross- protective antibodies against Henipavirus and Nipah virus and has also been approved preclinically in monkeys to protect infection against Hendra virus. However, its potential for being safely used in humans has not been explored yet.

Keywords: NIV, Paramyxovirus, Infection, Henipavirus, Nipah Virus.
Recent Advancements of Omeprazole Containing Targeted Drug Delivery for Acid Reflux Management

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Abstract
Acid reflux is a problem which may lead to several other diseases like peptic ulcer, Zollinger-Ellision syndrome and GERD. Thus, if this issue could be addressed within time, the risk of occurrence of other such diseases could be prevented. Omeprazole, our drug of choice acts as a proton pump inhibitor which blocks the gastric H, K ATPase enzyme leading to the inhibition in gastric acid secretion. Hence, from the last 25 years it has proven to be an effective and safe medicine for managing gastric reflux. But, since it falls in BCS class II classification, it has low solubility which leads to lower therapeutic effect, hence larger amount of doses has to be used for the desired action. Targeted drug delivery system can be the solution to this problem and nowadays so much work is being done on the targeted drug delivery of Omeprazole to enhance its therapeutic effect at lower dose. This study is focusing on such formulations to identify any further possible way to get an effective drug delivery system of omeprazole.

Keywords: Omeprazole; Acid reflux; Proton pump inhibitors; Gastric secretions; GERD.
Utilizing the Nanocarrier As Nanomedicine in the Tissue Engineering

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Abstract
Utilizing the nanotechnology in medicine or pharmaceutical formulation is nanomedicine. Tissue engineering (TE) is one of the emerging technology using cells and biomaterial for the treatment or substitute of biological tissues. Delivering bioactive agents to the tissue to be repaired through scaffold biomaterial faces certain challenges. Utilizing the nanocarrier, which can overcome the problem of delivery the bioactive agents to the impaired tissue. Aquasomes, niosomes, gold nanoparticles (AuNPs), silver nanoparticles (AgNPs), nanoemulsion, dendrimers and liposomes are important tissue engineering scaffold materials and drug delivery systems, which deliver drugs to impaired or injured tissues. AuNPs, AgNPs and dendrimers to augment stem cell differentiation in tissue engineering. Nanocarrier AuNPs extensively used in skin, cardiac and bone tissue engineering due to the wide extend of chemical and physical properties. The blend of dendrimers with polymers will be make hybrid scaffold and helping in the regenerative medicine. The combination of nanomedicine with nanocarrier in TE will provide faster ripening of the tissue or cells in body. Nanocarrier provide new avenues in delivering bioactive agent or therapeutic agent strategies in tissue engineering.

Keywords: Nanocarrier; Tissue engineering; Gold nanoparticles; Silver nanoparticles; Liposomes; Nanotechnology.
Recent Advance in Surfactant Vesicles Niosome for Delivery of Therapeutics and Its Application

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Abstract

Surfactants are surface-active agent, which reduce or lower the interface tension between two phase system. Such concept were utilized in the drug delivery, surfactant vesicles (SV) niosomes. Niosomes are second generation of liposome which slightly different in composition of liposomes. Surfactant play important role in the noisome formation and utilization of different surfactant can possess different properties depending upon the surfactant such as bola surfactant, gemini surfactant. Bola surfactant niosomes have been used as topical for the treatment to skin cancer. Gemini based surfactant niosomes they are main comprised of amino acid-based surfactants and they have shown good penetration enhancer of drug into the skin. Gemini based niosomes able to delivery of anti-diabetics, chemotherapeutics, analgesic and antibiotics to treat different diseases. Surfactant vesicles are more prominent in delivering the drugs in controlled manner to skin through topical and transdermal route.

Keywords: Surfactant; Surface active agents; Bola surfactant; Niosomes; Vesicles; Transdermal syetm.
A Journey of Silver nanoparticles from Lycurgus Cup to drug delivery system

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Abstract
The Lycurgus Cup is one of the finest nanotechnology based cup, where colloidal microscope particles of gold and silver were impregnated on the glass and gives dichroic effects. Silver nanoparticles gives greenish color on light scattering. Silver nanoparticles (Ag-NP) concept was used to decorate the different materials using nanotechnology. Concept of Silver nanoparticles was not limited to only decoration but its inherent properties were extensively studied and explore the different application of the silver nanoparticles in field of science. Some of the properties such as antimicrobial, drug delivery, catalyst are newly studied and reconnoitered. Ag-NP can delivery many therapeutics agents to target site of the disease. Green synthesis method are preferred from synthetic method of Silver nanoparticles. Silver nanoparticles is new era of drug delivery for delivering various therapeutics agents, it can have synergetic effects along with active pharmaceutical ingredients.

Keywords: Silver nanoparticles; Lycurgus Cup; Nanotechnology; Drug delivery; Antimicrobial; Colloidal particles.
Silkcocoon Proteins-Based Biomaterials in Drug Delivery

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Abstract

Silkworm could be an organically critical and interesting creepy crawly insect, which build a structure called cocoon. Silks is natural biomateri als with exceedingly optimized various levelled structures and extraordinary physico-mechanical properties. The regenerated silk filaments, which contain sericin, may be a characteristic polymer conveyed by silkworm, Bombyx mori, which includes and keeps together two fibroin filaments in silk string utilized within the casing. It has numerus restorative properties, for example, for wound healing, endowing cell multiplication, protection against ultraviolet radiation, anti-wrinkle and antiaging effects. Silk fibroin based hydrogel, silk liposomes, silk fibroin nanoparticles, silk fibroin sponges, silk beads, silk scaffolds are various drug delivery of different therapeutic agent. Using silk protein along with other polymers blend can have different properties from sustain release to different kinetics release.

Keywords: Silkworm; Biomaterials; Silk fibroin; Silk sericin; Drug delivery; Cocoon.
Future of Nanotechnology in Herbal World

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Abstract

Ayurveda is the ancient Indian medical science based on herbs and its preparations. Herbal medications have been used by a large number of people in the world since ancient times and have better therapeutic value as they have fewer inimical issues as compare to synthetic medications. Most of the Phytochemicals that have therapeutic effects such as flavonoids, glycoside, resins, etc. are poor aqueous soluble, poor absorption/permeation, low systemic availability, instability, and extensive first-pass metabolism. They have large molecular size and are unable to cross the lipid membrane of the cells and shows low bioavailability and efficacy. To conquer these problems, nano-sized delivery technologies are used for sustained and enhanced delivery of plant-derived bioactive compounds. Novel drug delivery systems have gained popularity since last two decades because of its advantages over conventional dosage forms. Nanotechnology is one of the fastest growing technique, the most potential and the far-reaching high and new technology in the present period, and it greatly promotes the development of herbal medicine and bioavailability enhancement of herbal medicine, protection from toxicity, enhancement of pharmacological activity, enhancement of stability, sustained delivery, protection from physical and chemical degradation, etc. Nano formulations such as polymeric nanoparticles, liposomes, solid lipid nanoparticles, and microemulsions present implicitly to deliver herbal medicines effectively. Nanoparticles can be used to target the herbal medicines to individual organs which improve the targeted drug delivery, effectiveness, and safety of the medicine. Thus, the nano-sized drug delivery systems of herbal drugs have a potential future for enhancing the activity and overcoming problems associated with plant medicines.

Keywords: Phytochemicals; Nano formulations; Herbal medications; Nanoparticles.
Recent Advancements in Topical Drug Delivery System: A Review

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Abstract

Drug delivery system is a method or technology for delivery of the drug into the body at the target site. Drug enters into the human body and reaches at desired area where it is needed. These systems take an amount, effectiveness of the drug. When any drug is taken, the dosage must be carefully calculated so that dose can show its effect in the proper way and body can use the drug. In topical drug delivery system, the drug is applied on the surface of the body. The drug applied in the formulation (creams, gels, ointments, lotions, foams) which can be absorbed. There are other methods involves inhalation aerosols, eye drops, sprays to the mucous membrane of the nose. This is very easy for the patient to use. In all cases the purpose of the drug delivery system to give the right dose to the right place. The topical route is directly used for the skin to treat or cure the skin disorders. These systems offer numerous benefits to treat local infection related to skin such as a fungal infection. It is preferable route to deliver the therapeutic agent in the safe and effective manner. Some routes are not suitable for self-medication but it provides suitability for self-medication. Moreover, it is not difficult to apply and avoid the first pass effect. Hence, it aids to improve the patient compliance.

Keywords: Topical route; Self-medication; First pass effect; Drug delivery system.
Current Status of Emulgel in Pharmaceutical and Cosmetic Science

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Abstract

Topical drug delivery system has gained popularity as an effective method to deliver the hydrophobic drug inside the body through skin to show its effect, among other delivery system due to its umpteen benefits like affordability and convenience. Emulgel is one of the promising therapeutic agent delivery system that offers numerous applications to treat psoriasis, acne, fungal infection and other topical disorders. It is a combination of gel and emulsion (either water-in-oil emulsion or oil-in-water emulsion). Many of the advantages of gels have great limitations in the supply of hydrophobic drugs. So, to overcome this limitation, an emulsion approach is used so that even the hydrophobic therapeutic intensity can enjoy the unique properties of the gels. It also facilitates drug’s penetration into the skin. It is one of the interesting drug delivery system as it has ability to control dual release like gel and emulsion. It aids to increase the stability of the formulation as polymers act as emulsifier. It shows properties such as easy to spread, environmentally friendly, no greasy, non-polluting, fluid-changing, easy to remove, long shelf life, transparent and emollient. Emulgel utilization has extended in various cosmetic formulations. The evaluation parameter used for emulgel is viscosity, physical properties, pH, spreadability, and stability study. This study will involve the key parameters related to preparation, characterization, evaluation and marketed formulations of emulgel. Moreover, their applications in drug delivery will also be elaborated.

Keywords: Emulsion; Gel; Hydrophobic; Emulgel; Topical delivery; Stability.
**Supercritical Fluid Technology: A Review on Concept and Pharmaceutical Applications**

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**Abstract**

Over a period of last 20 years, supercritical fluid technology has become a significant tool in the product of different particulate system along with extraction and from drying cleaning to metal cleaning, nutraceuticals to pharmaceuticals, polymers to powders and food to fragrances. Supercritical fluid holds both the properties of liquid as well as gas, above their critical point. Carbon dioxide (CO2) and propane and are the most popular supercritical fluids and other fluids like ethanol, acetone, methane, ammonia, benzene are also used. Carbon dioxide (odourless, colourless, non-toxic, cost effective, and safe) is most widely used supercritical fluid for extraction methods. Various techniques are utilized for supercritical fluid such as-rapid expansion of supercritical solutions (RESS), precipitation with compressed fluid antisolvent, gas antisolvent recrystallization, solution enhanced dispersion by supercritical fluid, supercritical antisolvent process (SAS) and impregnation or infusion of polymers with bioactive materials. Presently it offers certain pharmaceutical applications such as reducing the particle size, increasing the surface area, improvement of solubility of poorly soluble drugs and thus improving the bioavailability, particle coating of solid dosage form, separation and analysis of drug enantiomers, particle and crystal engineering and preparation of liposome. Besides, the technology is useful mainly when final product is required in dry state. Instead of using organic solvents, supercritical fluids are used for the enhancement of solubility of drug and recrystallization operation. The present paper reviews pharmaceutical applications of supercritical fluids and the concept involved behind this technology.

**Keywords:** Supercritical Fluid; Size reduction; Solubility; Bioavailability.
Importance of Ocular Inserts in Ophthalmic Drug Delivery System

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Abstract

Ophthalmic drug delivery systems (ODDS) are conventional dosage form which include use of different dosage forms such as solution, suspension & gel against various eye infections. But above mentioned ophthalmic drug delivery system having some limitations such as poor bioavailability, multiple time administration with different doses volume as well as removal of drug by lacrimal fluid. To overcome this related issues, ocular inserts are beneficial because of many properties like increasing ocular residence, releasing drug at low and constant rate, accurate dosing and improved shelf life. Different methods are reported to prepare ocular inserts for example solvent casting, powder compression and melt cast. Both first and second methods have issues related to trace amount of residual solvent. In present review, our main focus is to discuss the utility of melt-cast method by taking different polymer such as poly ethylene oxide N-10, hydroxy propyl methyl cellulose etc. This method used as an effective noninvasive ocular drug delivery platform to fabricate ophthalmic inserts and highly beneficial in the intervention and treatment of a wide variety of ocular complications.

Keywords: Ophthalmic drug delivery system; Polymers; Melt-cast method.
Importance of Vaccine Delivery System

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Abstract

Vaccines have been an essential aspect of therapeutics to induce immune responses in patients, targeting a number of infectious diseases. Delivery of vaccines (live or attenuated form) via oral, intranasal, intradermal and transcutaneous routes will minimize the use of sterile equipment as well as reduces the needle-borne diseases. New vaccine (needle-free) delivery systems are vital need of healthcare system due to poor patient compliance, safety issues and weak immunogenicity of sub-unit vaccines. Various carrier systems such as liposomes, microspheres, nanoparticles, dendrimers, and micellar systems are useful for developing new vaccine delivery systems having sustained release and precise targeting capabilities. Some needle-free delivery strategies like Jet injectors, microneedles, melt in mouth strips are interest of our study and their importance will be discussed.

Keywords: Vaccine; Delivery system; Immunogenicity; Carrier system; Needle free delivery
Niosome: A Novel Drug Delivery System

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Abstract

Niosome are non-ionic surfactant vesicles obtained by hydrating mixture of cholesterol and nonionic surfactants. It can be used as carriers of amphiphilic and lipophilic drug. In niosomes drug delivery system, the medication is encapsulated in a vesicle. Niosomes are biodegradable, biocompatible non-immunogenic and exhibit flexibility in their structural characterization. The main object of this review the application of niosome technology is used to treat a number of diseases, niosome have good oppurnity in research and beneficial for researcher and pharma industries. Niosome appears to be a well preferred drug delivery system over liposome as niosome being stable and economic. Also niosomes have great drug delivery potential for targeted delivery of anti-cancer, anti-infective agents. Drug delivery potential of niosome can enhances by using novel drug delivery concepts like proniosomes, discomes and aspasome. Niosomes also serve better aid in diagnostic imaging and as a vaccine adjuvant. Thus these areas need further exploration and research so as to bring out or to make for commercially available niosomal preparation.

Keywords: Cholestrol; Nonionic surfactant; Pronisomes; Discomes; Aspasome
An Updated Review on Industrial Applicability of Emulsion

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Abstract

Emulsions are thermodynamically unstable biphasic liquid dosage form in which one phase dispersed as globules. These have exceptional properties of encapsulating active pharmaceutical ingredients to serve as a carrier for various bioactive molecules to avoid degradation and increase bioavailability. There is enormous area as well as products wherever emulsion system has already demonstrated its applicability i.e. foods, cosmetics, pharmaceuticals, agricultural, pulp and paper, water treatment and minerals beneficiation. Numerous industrial products are based on emulsion system. Emulsions are useful because they allow ways to deliver active materials in water which is economical and innocuous. Emulsions are commonly used in many major chemical industries. Moreover, in the pharmaceutical industry, they are used to make medicines more palatable, to improve effectiveness by controlling dosage of active ingredients, and to provide improved aesthetics for topical drugs such as ointments. In cosmetics, emulsions are the delivery vehicle for many hair and skin conditioning agents. Anionic and non-ionic emulsions are used to deliver various oils and waxes which provide moisturization, smoothness and softness to hair and skin. Emulsions formed with cationic emulsifiers are themselves effective conditioning agents since their positive charge is attracted to the negative sites on the hair, thus allowing them to resist rinse off. In the agricultural industry, emulsions are used as delivery vehicles for insecticides, fungicides and pesticides. These water insoluble biocides must be applied to crops at very low levels, usually by spraying through mechanical equipment. Emulsion technology allows these chemicals to be effectively diluted and provides improved sprayability. Nonionic emulsions are often used in this regard due to their low foaming properties and lack of interaction with biological agents they are carrying. The present review provides an overview of application of emulsions in various industries.

Keywords: Emulsion; Cationic emulsifiers; Pharmaceutical Industries; Cosmetics Industries; Agriculture Industries.
An Updated Review of Ligand Anchored Targeted Liposome

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Abstract
Liposomes act as a backbone of pharma industries because of the numerous advantages and their effectiveness in targeting drug. Also, its structural appearance is similar to lipid bilayer and cell membrane, so it can easily penetrates and smoothly deliver drug to such that a free drug would not easily penetrate. Liposomes are also helpful in incorporation of hydrophobic drug which plays a key role to improve their bioavailability and leads to increased stability along with decreased drug toxicity. This serves as the main reason behind various researches about liposomal advancements as it can be largely attributed to the fact that liposomes can mimic biological cells. This also means that liposomes are highly biocompatible; making them an ideal candidate for a drug delivery system. Development in scientific research in recent years has led to the rapid expansion of the global liposome drug delivery market. With the efforts of researchers related to targeted drug delivery system that has fuelled the liposome drug delivery system in the market. Also by seeing all the advantages of liposome like improvement and control over pharmacokinetics and pharmacodynamics, decreased toxicity, and enhanced activity of drugs against intracellular pathogens are key divers for pharmaceutical companies to invest in the global liposomes drug delivery market. Currently, there are a number of liposomal products such as ambisome, myocet, doxil, depoCyt, etc., approved by the FDA for commercial usage. Inspite of many advantages of liposomes, still it has many limitations like low efficacy, less circulation time and not site specific. So, for this ligand based targeting method is used in which ligand plays a key role for site specificity and also helps in improving efficacy, and circulation time. Some recent advances in the field of ligand-targeted liposomes for the treatment of various diseases are summarized including: selection criteria for the receptors to be targeted, choice of targeting ligands and choice of encapsulated therapeutics. In this current review, various ligand anchored liposomal drug delivery for targeted targeting various therapeutic agents for the treatment of various diseases are summarized.

Keywords: Liposomes; Ligand; Target drug delivery.
Cubosomes: An Innovative Drug Delivery System with Remarkable Potential

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Abstract

Cubosomes are the self assembled colloidal dispersion of liquid crystalline particles of any suitable surfactant in water resulting in a discrete nano-structured system. It is active drug delivery system that enables the delivery of hydrophilic, lipophilic and amphiphilic drugs along with sustained or controlled release. Their size ranges from 10-500 nm in diameter. These are made up of certain amphiphilic lipids in definite proportions, known as biocompatible carriers in drug delivery. They are thermodynamically balanced and stable because they are encircled in a “honeycomb” like structure through continuous areas of water and lipid. The surfactant becomes stable, gets accumulated into bilayers and gets enfolded into a three dimension geometry creating a strongly compact structure. Cubosomes offer ease of administration by different routes such as oral, percutaneous and parenteral and since they have unique property of bioadhesion, they can be conveniently applied in topical and mucosal depositions too. This paper reviews the methods of preparation of cubosomes along with their potential applications in improvement of bioavailability.

Keywords: Cubosomes; Delivery system; Surfactant; Biocompatible; Bioavailability.
Gold Nanoparticles: Optical Properties and Implementation in Cancer Diagnosis and Photothermal Therapy

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Abstract

Cancer is a hyperproliferative disorder. It is the second leading cause of mortality and morbidity worldwide. Commonly, diagnosis of cancer includes physical examination, laboratory tests, biopsy, imaging tests, nuclear medicine scans, endoscopy, genetic tests. Recently the intensity for the design and study of nanomaterials is tremendously in progress and regulates towards biological and biomedical applications, and most remarkable among them is Nobel Metal Nanoparticles. Currently, for cancer diagnosis and photothermal therapy, gold nanoparticles are being used widely, this method act by increase in optical property of gold nanoparticles. The present review deal with the method for detection of cancer which includes surface plasmon resonance light-scattering, surface enhanced emission and surface enhanced scattering. Also, the photothermal therapy of cancer will be discussed by using gold nanoparticles.

Keywords: Cancer; Metal nanoparticles; Surfactant; Gold nanoparticles.
Nanotechnology in Cancer Therapy and Diagnosis

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Abstract

Cancer is one of the most leading cause of death worldwide with estimated number 7.6 million annually that is 13% of the total deaths and it is expected to rise to 13.1 in 2030. Due to the fact that many cancer treatments are ineffective or having a numerous side effects as well as difficulties in early cancer detection a new field of Nanotechnology appeared rapidly in the recent years which is still under research and development. It is not limited to medicine and life sciences but also affects almost all fields. Nanotechnology gives new means of early and prompt diagnosing of cancer, better treatment opportunities as well as enhanced methods of drug delivery by directly and selectively delivering the drug into the cancerous cells without damaging the normal healthy tissues. Nanotechnology delivers drug to tumors by using nanoparticles, liposomes, polymeric micelles and others. Passive method through enhanced penetration rate(EPR) that will lead to increased residence time of nanoparticles as well as increasing its concentration in the blood stream while the active method provides selective molecular recognition specially proteins present on the surface of malignant cells, or by detecting biochemical properties of tumor cells like metalloproteinase secretion. Nanoparticles can be used to identify the tumor cells by adding optic, magnetic or fluorescent properties and can be treated by heat ablation, chemotherapy or gene therapy. Although Nano technological human trials are not undertaken yet but based on the pre-clinical studies there are great considerable opportunities in the near future with the use of safer, more consistent and highly specific multifunctional nanoparticles.

Keywords: Nanotechnology; Cancer therapy; Cancer diagnosis; Nanoparticles.
A Systematic Comparison of Marketing Approval Process of Therapeutics in Regulated and Semi Regulated Countries

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Abstract

Marketing authorization is one of the most important part in the life span of a pharmaceutical product. The newly developed drug product is required to be approved by the concerned regulatory agency where the product is to be marketed. Pharmaceutical market for drugs products is categorised as regulated, semi regulated and non-regulated market. Countries under the category of regulated and semi regulated have their own regulatory body which governs their own set of guidelines that supervises the marketing authorization of pharmaceutical products. The regulatory body of the country is responsible to enforce the rules and regulations and issue the guidelines to regulate the marketing of drugs. United States Food and Drug Administration (USFDA) governs the marketing authorization in USA, European Medical Agency (EMA) in Europe, Health Canada in Canada, Therapeutic Goods and Administration (TGA) in Australia, Central Drug Standard Control Organization (CDSCO) in India, Ministry of Health Labour and Welfare (MHLW) for Japan, China Food and Drug Administration (CFDA) in China, Medicinal Control Council (MCC) for South Africa and Saudi Food and Drug Authority (SFDA) in Saudi Arabia. Drug reviewers of regulatory agencies form individual countries caters the responsibility for the evaluation of research data supporting the safety and effectiveness of a new product for better service of public health. In the present paper a detailed comparison of drug approval process in regulated and semi regulated countries has been conducted and summarised.

Keywords: Drug safety; Regulatory bodies; Marketing authorization application.
Role of Aloe Vera in Cosmetic Industry: A Review

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Abstract

The genus Aloe belonging to family Alliaceae is a succulent herb of 80 - 100 cm in height which matures in 4 - 6 years and survives for nearly 50 years under favourable conditions. Aloe vera (L.) Burm. f. syn. Aloe barbadensisMiller, is most biologically active among 400 species. A. vera contains substantial amounts of antioxidants including α-tocopherol (vitamin E), carotenoids, ascorbic acid (vitamin C), flavonoids, and tannins. It was proposed that the A. vera gel containing products improved skin hydration possibly by means of a humectant mechanism. In the cosmetic and toiletry industry, it has been used as base material for the production of creams, lotions, soaps, shampoos, facial cleansers and other products. The aim of this study is to find out the role of A. vera in cosmetic industry.

Keywords: A. vera; Anti-aging; Antioxidant; Laxative; Immunomodulatory activities.
Characterization and Comparison of Drug Release from Modified and Unmodified Chitosan Microspheres

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Abstract

Chitosan is a renewable, linear polysaccharide with reactive –NH2 (at C2) and –OH (at C3 and C6) group. It is preferred as a polymer due to its properties such as biodegradability, biocompatibility, non-toxicity and ease of chemical modification. Its solubility is limited and it also has higher swelling index in aqueous environment, which creates hindrance in its use as a polymer. Various efforts have been made to overcome these limitations. Most efficient and versatile tool for modifying chitosan chemically is graft copolymerization which includes substitution of a variety of functional group at C2, C3 or C6 positions. Grafting does not change the basic structure of chitosan but results in a variety of derived products with improved properties. In the present study, graft copolymerization of 2-hydroxyethyl methacrylate onto chitosan was carried out using ceric ammonium nitrate as free radical initiator. Evidence of grafting was confirmed by various analytical techniques such as fourier transform infrared spectroscopy, scanning electron microscopy, X-ray diffraction, differential scanning calorimetry and nuclear magnetic resonance. Microspheres of modified and unmodified chitosan were then prepared by emulsion cross-linking method using glutaraldehyde as cross-linking agent. Optimized microspheres were evaluated for their percentage yield, particle size, % drug entrapment efficiency and surface morphology. In-vitro drug release from chitosan microspheres and modified chitosan microspheres was studied in 0.1N HCl for two hours and in pH 6.8 phosphate buffer for next seven hours. An increase in % cumulative drug release might be due to enhancement in solubility of chitosan after modification with monomer. An increase in water uptake capacity of modified chitosan might be another reason for increased % CDR.

Keywords: Graft copolymerization; Microspheres; Emulsion cross-linking; Chitosan.
Nanotechnology Based Therapeutics for Brain Tumours

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Abstract

Around the world, the tumors showed up as a most driving reason for diseased and death of the sufferers. Among different cancer composes, a brain tumour is most perilous with a low survival rate. Consistently approx. 238,000 new instances of the brain and other focal sensory system tumours are analysed and diagnosed every year. The nanotechnological approaches have a tremendous potential for diagnosis and treatment of a brain tumour with targeting capacities of molecules to the tumour locales and the proficiency of intersecting through the blood-brain barrier after reaching systemic circulation. The different nanocarriers have been composed as novel delivery tools for new therapies including sustained medication discharge, gene therapies, and radio imaging for diagnostic purposes. At present time, different kinds of nanocarriers like carbon nanotubes, dendrimers, liposomes, gold carrier and viral carrier are exhibited as the points of reference for the treatment and diagnosis of a brain tumour and other cancers.

Keywords: Nanocarriers; Brain tumour; Carbon nanotubes; Targeted delivery; Blood-Brain Barrier.
3D Printing Technique in Medicine - A Passing Vogue or the Future?

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Abstract

With the recent approval of the first 3D printed tablet, “Spritam” by FDA in 2015, the three-dimensional printing (3DP) is gaining attention in pharmaceutical dosage form design and development. It is an effective and revolutionary strategy in the pharmaceutical sector, changing the face of medicine and its development; manufacture and use; and conventional pharmaceutical unit operation. Being a form of additive manufacturing, it includes the ability to incorporate and form complex geometries to achieve variable drug release kinetic over conventional solid dosage. The prepared dosage form would not only be multifaceted, also having precised spatial control and geometric flexibility along with accurate amount of drug deposition which will allow the formulation to show multi-kinetic release of drug. It is an emerging imaging technique, created by computer-aided design (CAD) to obtain unparalleled flexibility and extraordinary manufacturing capabilities of pharmaceutical drug products. There are several 3D technologies out of which, two techniques got special attention- 3D Inkjet powder printing and Fused Deposition Modeling (FDM). With incorporation of these technologies in dosage forms, would prove to promising, novel, multifunctional dosage form. It will not only ease pharmacotherapy of patients but lowers the cost of dosage, also, beyond just being a novel method, it provides key advancement over traditional manufacturing of drug and greatly influence patients compliance with complex dosing regimen.

Keywords: Computer-aided design; three-dimensional printing; additive manufacturing; inkjet powder bed printing; fused deposition modeling; multi-mechanism release
Skin-Aging: Factors and Herbs Used

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Abstract

Aging comprises “changes from maturity to senescence”. Two types of skin aging exist – age dependent/chronological and premature aging/photo-aging. As skin aging is a complex biological process influenced by combination of endogenous or intrinsic (genetics, cellular metabolism, hormone and metabolic processes) and exogenous or extrinsic (chronic light exposure, pollution, ionizing radiation, chemicals, toxins) factors. Physical (surface changes and color) and biochemical (blood flow, formation of aging cells, dehydration of skin) changes occur due to aging. Major active ingredients involved in anti-aging cosmetics are for scavenging free radicals, cell repairing, moisturizing, UV absorption. Many plants have been used in cosmetic industries as for preparing anti-aging and anti-wrinkle formulations. Natural photo-protective agents like Allantoin; an extract of comfrey plant used for its healing, soothing and anti-irritating properties.

Keywords: Aging, Factors; Free radical scavenging; Natural Plants; Photo-aging
Investigation of Antioxidant and Antidiabetic Potential of *Azadirachta indica* by *In-Vitro* Methods

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**Abstract**

α-Amylase and α-Glucosidase are the two enzymes that regulates the post prandial glucose level in the body and thus considered as novel target for the development of new therapeutic agents for the treatment of diabetes. Azadirachta indica has shown hypoglycemic potential in the previous studies, but its effect on the activity of α-Amylase and α-Glucosidase is still unknown. Extracts of leaves of Azadirachta indica were fractionated by different solvents and then screened for their α-Amylase, α-Glucosidase and NO inhibitory potential. IC 50 values were used for the selection of best fraction. The mode of inhibition was determined by the calculation of the Vmax and Km values by plotting Michaelis Menten and Lineweaver Burk plot. Ethylacetate fraction of leaves of Azadirachta indica showed the highest α-Amylase, α-Glucosidase and NO inhibitory potential. Also, result suggested that ethyl acetate fraction of Azadirachta indica inhibit the enzyme α-amylase and α-Glucosidase in uncompetitive manner and mixed manner respectively.

**Keywords:** α-Amylase; α-Glucosidase; Diabetes; Azadirachta indica.
**Nagakesharadi Yoga - Female Infertility**

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**Abstract**

Growing incidence of Infertility in current era and increasing adverse effect of available medicines, lack of cost effective remedy to treat infertility made us to search the alternative effective remedy for the same. The formulation Nagakehsaradi Yoga (Shunti, Marich, Pippali, Nagakeshara) is explained in Bhaishajya Ratnavali for female infertility. The probable actions of this yoga it found to be very effective in anovulation. Agnimandya at the level of jatharagni and dhatwagni, vitiation of Vata pradhana tridosha, Srotorodha at rasavaha and artavavaha srotas, apachita rasa dhatu utpatti leading to dushita aratava utpatti, Avarana of Vata by sama dosha. Avarodha at sthayi beeja by kapha and dhatuksaya causing Posanaabhava are the probable events in the pathogenesis of anovulation. The formulation is having dipana pachana, vatanulomana, srotoshadhana properties which correct the pathology by doing amapachana, srotoshodhana and by removing Sanga at arata & rasavahasrotas. It also bring tridosha to normalcy by the virtue of its rasapanchaka’s hence corrects HPO axis, regulates the metabolism and establishes ovulation. The imbalance between antioxidant defense and free radical activity is more evident in the infertility condition, thus pepper extract shows significant effect in increasing fertility. Antiseratoninergic activity of shunti helps for the activation of hypothalamus to secrete the gnrh. Shunti was found to increase the LH and FSH levels.

**Keywords:** Female Infertility; Anovulation, Nagakesharadi Yoga
Antiaging and Antiwrinkle Potential of *Glycyrrhiza glabra*

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Abstract

Since traditional plants and their extracts are long used for their various therapeutic effects and for the protection of skin against several environmental damages due to their skin protective properties. The present study was designed to evaluate the anti-aging and anti-wrinkle potential of *Glycyrrhiza glabra* through *in vitro* models. Methanolic extract of *Glycyrrhiza glabra* was prepared by maceration and further fractionated to get ethyl acetate, n-butanol and aqueous fractions. The obtained extracts were then subjected to antioxidant, Hyaluronidase, MMP-1/collagenase and elastase inhibition activities to assess the anti aging and anti wrinkle potential of *Glycyrrhiza glabra*. The data obtained showed that the methanolic extracts of *Glycyrrhiza glabra* exhibited a maximum total antioxidant activity of 88.76 at 100μg/ml as compared to ascorbic acid (standard) which was found to be 90.12%. This was further confirmed by calculating the IC$_{50}$ values and was found that the methanolic extract (34.08) showed the maximum antioxidant activity. *Glycyrrhiza glabra* was also evaluated for various enzymatic activities and it was found that methanolic extract exhibited the maximum enzymatic activity for hyaluronidase, elastase and MMP-1/collagenase at 100μg/ml. The IC$_{50}$ values of the methanolic extract for hyaluronidase, elastase and MMP-1/collagenase were found to be 13.57, 18.90, 14.40μg/ml. Whereas the % inhibition exhibited by the standard (catechin) was found to be 95.72%. The IC$_{50}$ value of standard catechin was found to be 21.52μg/ml. The present study demonstrated that *Glycyrrhiza glabra* can be beneficial as a potent antiaging agent as illustrated by the *in-vitro* analysis. Among the various test samples, methanolic extract of *Glycyrrhiza glabra* showed the maximum activity as a potent antioxidant and also exhibited the maximum enzymatic inhibitory activities.

**Keywords:** Skin ageing; *Glycyrrhiza glabra*; Enzymatic; Hyaluronidase; Elastase; Collagenase; Antioxidant.
GILOY: A Saviour herb to Combat life threatening diseases

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Abstract

The scientific name of “Giloy” is Tinospora cordifolia (Family-Menispermaceae). It is also known by the name “Amrita” in ayurvedic medicine system, which means a nectar belonging one’s life. It’s considered to be the queen of the herbs which can defy and cure many dreadful disorders, which ultimately leads to long, disease free and healthy life. The scientific researchers and studies have depicted its effectiveness in treatment of many ailments like gout, lymphoma, rheumatoid arthritis, peptic ulcer, gonorrhea, syphilis etc. Out of which it has shown profound effect to save lives by elevating the blood platelet count, when the people were severely suffering from the frightful fevers like dengue and chikungunya in recent couple of years back. Even the experts have attested it as the superfood, one should have every single day. The beauty of this herbal traditional medicine is the ease to grow and consumption in various forms. It can be taken with castor oil to relieve gout, with ginger to appease rheumatoid arthritis and with sugar to treat skin and liver diseases. It is a wonder herb with plentiful health benefits, which are been reviewed to be accorded in the presented review.

Keywords: Tinospora cordifolia; Amrita; Superfood; Blood platelets; Dengue
Herbal drugs in the treatment of cancer

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Abstract

Cancer is second leading cause of death worldwide. There are more than hundred types of cancer which are characterized by abnormal growth of cell caused by mutation in oncogene. A number of unknown side effects are reported during chemotherapy. The search for cancer drugs from natural sources started in late 1960s, lead to discoveries of vincristine, vinblastine, camptothecin and taxol. Nowadays the natural therapies are introducing by using various plants and its products. the whole world is trying to find anticancer agents which help to cure oncogenic effects on human body. There are many known plants which can help in treatment of cancer like Cannabis sativa, Betula alba, Colchicum autumnale, Taxus baccata and many more. The extract of these plants contain secondary metabolites which perform therapeutic action in human body. Many cancers can be prevented by not smoking, maintaining a healthy weight, less consumption of alcohol, eat plenty of green vegetables, fruits and vaccination against some of the infectious diseases.

Keywords: Cancer; Secondary metabolites; Anticancer agents
Medicinal Uses of Onion Extract (Allium Cepa)

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Abstract

Onion is a versatile food which is used as traditional Indian spice. It is an essential part of food habit and has immense health benefits therefore consumed for its putative nutritional and health benefits for centuries. Onion (Allium cepa L.) belongs to family Liliaceae (lilies) and easily digestible aromatic vegetable used globally. Onions contains phenolics and flavonoids that have potential anti-inflammatory, anticholesterol, anticancer, and antioxidant properties. Moreover, onion is also prescribed to relieve headaches, coughs, snakebite, to facilitate bowel movements, erections and hair loss. A study found that on consumption of large amounts of Allium vegetables reduces the risk for gastric and prostate cancer. A. cepa (dry bulbs) was found to possess antimicrobial activity against Gram-positive and Gram-negative bacteria and fungi in vitro tests. The red and white varieties of A. cepa showed significant antioxidant activities. A Quercetin-3’-O-beta-D-glucoside isolated from A. cepa has antioxidant activity. Moreover, onion flesh and onion peel were also found to enhance antioxidant status in aged rats. Such an outcome has been attributed to the antioxidant, xanthine oxidase inhibitory, and superoxide radical scavenging activities of onion peel. Some epidemiological studies relate onion’s antioxidant activity to the presence of organosulfur-compounds and flavonoids.

Keywords: Allium Cepa; Anti-Inflammatory; Anticholesterol; Anticancer; Antioxidant
Vinegar as functional food
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Abstract

Vinegar is term said to be around 5% acetic acid assimilated within water, differential proportion of acids from fruit source, colouring agents, salts as well as supplementary fermenting agents. Vinegar is made with conversion of ethyl alcohol into acetic acid with incorporation of bacterial genus “Acetobacteria”. Numerous method but mostly Orleans, Generator and Submerged fermentation respectively implemented. Several types of vinegars have been prepared traditionally, with varied number of benefits. Although, conventionally vinegar has been implemented as a class-I food preservative, it is also being explored as a functional food. It has spectacular impacts on human health to resolve countless health disorders viz. antioxidative damage, microbial infections, tumorous conditions, obesity, hypertension, cholesterol down order and numerous others.

Keywords: acetic acid, preservative, fermentation processes, acetobacteria, functional effects, bioactive influence, vinegar
Probiotics: A Tool for the Management of Gastrointestinal Homeostasis

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Abstract

Probiotics are living bacteria and yeast that planned to provide ease to human health. Probiotics intake is usually through dietary supplements, food (such as yogurt). They re-establish the equilibrium of bacteria in gut when it gets damaged by long usage of antibiotics. Probiotics can also be used for the management of different gastrointestinal disorders where it helps the normal gut microbiota. Hence, they are called friendly bacteria as they can survive in harsh conditions of stomach. A research in Japan revealed that probiotics based on spore forming bacteria can survive even in strong acidic environment of stomach. Lactobacillus and Bifidobacteria are the two main classes of probiotics used nowadays. Widely used strains are of Lactobacillus genus which prevents numerous health problems like diarrhea, irritable bowel syndrome, inflammatory bowel disease, lactose intolerance, necrotizing enterocolitis. Probiotics act in various ways as they stimulate the immune response. Recent researches also reveal that probiotics can also be used for the management of diabetes where they work via the modulation in the glucose metabolism in the gut. Surveys have also revealed that among adults, probiotics are major source of dietary supplements. Probiotics rarely cause side effects although researchers are concerned about usage of probiotics for patients with low immunity, critical conditions or elderly and children.

Keywords: Probiotics; Microbiome; Symbiosis; Gut microbiota; Immune system
A survey on usage of anti-diabetic traditional medicines was conducted in rural and urban areas of district Jalandhar. Ten places viz. Adampur, Alavalpur, Jalandhar Cantt, Nurmahal, Chogitti, Maqsudan, Arjunwal, Maayi Heera Gate, Garden Colony and Mand were visited and renowned Vaidhs/hakims (traditional doctors) of these areas were interviewed regarding the herbs used by them for the preparation of anti-diabetic medicines (nuskhas). Survey revealed that in total 47 different herbs were used for the preparation of these nuskhas. Neem was the most widely used herb followed by Karela and Jamun with their presence in 80% and 70% of the nuskhas, respectively. Traditional instruments like Silvatta (a large flat stone with another small round stone to facilitate grinding) and Kundda (pestle mortar) were used for grinding herbs and the sale of these nuskhas was confined to the specific regions. Vaids also told that nuskhas were only a preventive measure and not a permanent cure for diabetes. Analytical comparison of the nuskhas revealed that they were rich in bioactive compounds. Total phenols ranged in between 2.08±0.015 to 18.36±0.005 mg/g, total flavonoids 34.66±0.577 to 476±1.52 µg/g, ascorbic acid 23.33±23.28-66.66±28.86 mg/100g, anthocyanins 1.171±0-14.35±0.105 mg/100g, and tannins 3.12±0.051-67.49±0.040 mg/g. The collected samples also exhibited free-radical scavenging activity in the range of 35.78±0.070 to 88.36±0.17 %.

Keywords: Anti-diabetic; Documentation; Physiochemical analysis; Traditional medicine.
Amazing Medicinal and Therapeutic Potential of Sitaphal: An Assessment

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Abstract

Normally the natural remedies have been utilized from ancient era for the treatment and prosperity of people. A portion of the regular therapeutic plants are common to the point that we utilized them in every day existence without knowing their restorative significance. Sitaphal is one among of them usually known as custard apple, sugar apple; sweetsop is the fruit of Annona squamosa L. (Annonaceae). The leaves of the plant have been utilized as bug spray, anthelmintic and in healing of bleeding wounds. The health and medicinal benefits of the custard apple fruit are numerous even though the leaves or seeds have also been shown to possess significant bioactivity. Annona species have been widely grown throughout Central and South America. It is also grown in West Indies, Taiwan, USA other than India. It is reported to contain various chemical compounds such as alkaloid, isomeric hydroxyl ketones from leaf, acetogenin, samaquasine, annonacin and annonastatin from seeds, acetogenin, and squamone from bark of it which show antibacterial, antidiabetic, antitumor, anti-malarial, anthelmintic, hepatoprotective, antioxidant, respiratory stimulant and have diuretics properties.

Keywords: Annona; Custard apple; Phytoconstituents
Abstract

Growth promoters are feed additives added in broilers diet to enhance their potential output. Ginger is one of the potential rhizomes with huge range of medicinal properties like carminative, diuretic, tonic and disinfectant compound contains glucosinolate, sterols and triterpenes anti-inflammatory and antibiotic growth promoters. Ginger is rich in beneficial bioactive compounds such as gingerols, shogaols, diarylheptanoids, phenylbutenoids, flavanoids, diterpenoids and sesquiterpenoids. In this review attempts to discuss effect of ginger in broiler diet on feed intake, feed conversion ratio, gain in weight, weight performance, sensory evaluation, dressing percentage, economics of broiler production, blood profile, fatty acid profile and proximate composition of meat.

Keywords: Ginger; Broilers; Potential; Growth; Feed
Efficacy of Nutritional and Medicinal Properties of Amaranthus on Human Health

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Abstract

Amaranthus (Amaranthus spp., 2n=64) is the most common among the leafy vegetables, it is grown throughout in India because of its low production cost and high yield. The family Amaranthaceae consists of 65 genera and 850 species. In India, grain amaranthus is grown along the whole length of the Himalayas from Kashmir to Bhutan on the southern Indian hills and also in plains of India. The amaranthus is really unique in many respects, easy to cultivate for food and non-food purposes for at least 5,000 years. It plays an important role against the hunger and malnutrition that occur due to low rain fall conditions. Amaranthus is highly nutritional crop and drought tolerance and having capacity to maintain the diet of rural people. Amaranthus is broad leaf non-grass plants that produces significant amount of edible cereal like grain. All parts of the plant are used as medicine to control many diseases. It is heat resistant, drought tolerant, resistance for insect pest and high nutritional value of both grain and leaves. They are rich in proteins and micronutrients such as zinc, iron, calcium, vitamin A, vitamin C. The health beneficial aspects of amaranthus are decreasing plasma cholesterol levels, restorative the immune system, reducing blood glucose levels and improve the condition of hypertension and anemia. They are having, antioxidant properties due to the presence of phenolic acids. The present article given an overview of amarnthus medicinal properties and in agricultural point of view it is easy to cultivate no extra intercultural operations are require and give good amount of yield 3660-4000kg per acre. It is consist of various nutritional compound so its beneficial for human health.

Keywords: human health; nutritional; antioxidants; restorative; resistance.
A Clinical Comparative Study on Efficacy of Vayama vs Yoga in Sthoola Madhumeha

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Abstract

Implementation of yoga or vyayama is a best preventive aspect in Sthoola Madhumeha. The muscular activity increases the sensitivity of the insulin and increases glucose uptake. So it helps in the reduction of the blood glucose level to normalcy without complications of hypoglycaemia. Yoga or vyayama enhances the physical, mental, well-being of an individual by providing relaxation. The study was formulated in to two groups consisting of 10 patients in each group were selected from the OPD and from the camp conducted for diabetes mellitus in OPD’s of Ayurvedic hospitals Karnataka. To evaluate the efficacy of Vyayama and Yoga therapy in Sthoola Madhumeha. It was a comparative study with pre test and post test design. Subjects were divided into two groups of 10 each. The subjects were made to perform Vyayama or yoga respectively. The common general rules remained same for both the groups. The period of study was 30 days. After the Vyayama therapy the mean F.B.S. score was decreased from 163 to 147.2, and B.M.I reduced from 29.85 to 29.44 kg/m$^2$. After the Yoga therapy the mean F.B.S. score was decreased from 155.7 to 136.6 and B.M.I reduced from 27.88 to 27.55 kg/m$^2$. Vyayama has given more statistically significant results when compared to yoga in sthula Madhumeha.

Keywords: Yoga; Sthoola Madhumeha; BMI; Glucose level.
RECENT ADVANCEMENT IN DPP-IV INHIBITORS FOR TREATMENT OF TYPE 2 DIABETES MELLITUS

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Abstract

Diabetes is a heterogeneous metabolic disorder manifested by hyperglycaemia and malfunctioning of carbohydrate, protein as well as fat metabolism. Hyperglycaemia occurs from defects in both insulin secretion and insulin action. It is a major cause of morbidity and mortality worldwide. At present, nearly half a billion people live with diabetes. 80% of the diabetic people are from low and middle income countries. The global burden of diabetes now affecting more than 425 million people, and it may rise to 693 million in 2045.

Several classes of anti-hyperglycaemic agents are used as mono or combination therapy to treat diabetes mellitus. These include meglitinides, biguanides, sulphonyl ureas, α-glucosidase inhibitors, thiazolidinediones, incretin mimetics, SGLT2 inhibitors and dipeptidyl peptidase-4 (DPP-IV) inhibitors. Owing to the side effects of currently available antidiabetic drugs, still for a better management of TYPE 2 diabetes mellitus (T2DM) a search for the newer agents is required. In this paper we described about dipeptidyl peptidase-IV inhibitors as an emerging tool to treat T2DM.

Keywords: Diabetes, Hyperglycemia, Antidiabetic agents, DPP-IV inhibitors.
Preliminary Antimicrobial Screening of Black Seed (Nigella Sativa)

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Abstract

In this study, the antibacterial effects of methanolic and chloroformic extracts of black seed (*Nigella sativa* family: Rannunculaceae) have been investigated. The organisms were collected from a clinical case at the University of Maiduguri Teaching Hospital, Nigeria. Similarly, the plant was collected from Maiduguri Monday Market, Nigeria. The aim of this study was to assess the in vitro antibacterial activity of black seeds extracts having different concentrations against some selected micro-organisms. The inhibitory effects of extracts were assessed using disc diffusion method at four different concentrations viz: 20mg/ml, 50mg/ml, 100mg/ml, and 200mg/ml. Results showed that the methanolic and chloroformic extracts have inhibitory effects against all the bacteria (*Escherichia coli, Klebsiella pneumonia, Staphylococcus aureus, Streptococcus pyogenes*) tested, except *Shigella dysentriae* which was resistant at all concentrations. The diameter of zone of inhibition in methanolic extracts was higher (13mm) than chloroformic extract (12mm) at the same concentrations. At concentration of 100mg/ml, the highest antibacterial activity of 13mm was recorded in *Strep. pyogenes* and *k. pneumonia*. Chloroformic extract of black seed had a remarkable sensitivity against *K. pneumonia* and *P. aeruginosa* with inhibition zones of 12mm and 13mm at 100mg/ml respectively. Antimicrobial activity was also observed in methanolic extract of black seed in *E. coli, S. dysentriae, Staph. aureus and P. aeruginosa* with an inhibition zone of 10 mm, 11mm, 12 mm and 13 mm respectively. The result obtained is in conformity with that of Erdman and Pyrek in 2006 and 2007 respectively. However, the results also revealed a significant scope to develop a broad spectrum antimicrobial formulation and can be used as good food preservative.

**Keywords:** *Nigella sativa; Antibacterial activity; Methanolic extract*
Concept of Pippali (Piper Longum) Verses Heart Diseases

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Abstract

Heart diseases occur due to insufficient and improper oxygen and nutrient supply to the heart muscles by coronary arteries. There are various heart diseases in which heart muscles do not work properly so leads to haridya (heart) shaithilya (exhaustion) further leads to improper working of heart muscles. In case of dilated cardiomyopathy, heart chambers become dilated as a result of muscle weakness. Due to this, proper pumping of blood is not possible. When coronary arteries do not work due to deposition of cholesterol then left ventricle is affected. If there is blood coagulation in coronary arteries, myocardial infarction occurs which is caused by damage to the heart muscles. In some cases heart muscles become too stiff or too weak to fill and pump properly. Due to valve weakness heart becomes weak. All these factors and causative agents leads to improper working of heart muscles so leads to heart exhaustion. Pippali (Piper longum) both small and long contains Piperine which inhibit elevation of total serum cholesterol and total cholesterol to HDL-cholesterol ratio.

Keywords: Cholesterol; Haridya shaithilya; Nutients; Oxygen; Pippali
Pharmacognostic and Preliminary Phytochemical Screening of Fruits of Ficus Infectoria Roxb.

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Abstract

Ficus infectoria commonly known as Pilkhan belonging to family Moraceae, is a medium sized tree which is distributed in tropical and subtropical regions in the world. The aim of this research was to study the preliminary phytochemical screening and pharmacognostic parameters of fruits of Ficus infectoria. Macroscopic study showed that the fruits possess greyish brown to yellowish brown colour with astringent taste. Transverse section of fruit showed that the presence of epidermis, endocarp, mesocarp and starch grains. Powder microscopy showed that the presence of sclereid, Trichomes, fibers, parquetry layer and lignified parenchyma. Physicochemical parameters i.e Ash values, extractive values, TLC fingerprinting, fluorescence and histochemical analysis of Ficus infectoria were also determined. TLC fingerprinting showed the presence of various phytoconstituents in the fruit extract. Qualitative phytochemical screening revealed the presence of alkaloids, glycosides, flavonoids, steroids, terpinoids, saponins and carbohydrates in methanolic fruit extract.

Keywords: Ficus infectoria; Sclereid; Parquetry layer; TLC fingerprinting
Inception of Artificial Intelligence in Traditional Health Care System – Ayurveda

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Abstract

Artificial intelligence (AI) also termed as machine intelligence is a branch of Computer Science based on the theory of symbolic programming. It is now profoundly utilized in business, engineering, healthcare and Ayurveda due to its problem solving hallmark. One of the most crucial application of AI in today’s era is the evolution of the expert system. Ayurvedic system of treatment has a very strong relationship to the concept of Prakriti which basically means the natural form of the physique and constitution of the human body. Its diagnosis offers a unique insights into understanding and assessing one’s health. Hence, AI has made it possible to diagnose and discover a custom-made product for each individual. Due to scarce utilization of efficient data by the Ayurvedic physicians, computer assisted diagnosis will aid in minimizing the intra and inter observer variability. The application of AI facilitates elucidation of results with high accuracy and speed hence, succour clinical practice and research. Yet, there are few new major concepts that can be adopted using AI in the healthcare systems of Ayurveda such as Consultant Information System, Drug Information System, Patient’s Information System, Communication Technology and Drug development system which will restructure the rising demands of a cyber-society. The current article briefly describes the application of AI in Ayurveda and explore its further implementations in the healthcare system of Ayurveda.

Keywords: Artificial intelligence (AI); Ayurveda; Diagnosis; Prakriti
A Novel Technique to Authenticate Spices Using Computational Approaches

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Abstract

India is a land where huge population depends upon its ancient system of medicines involving herbs and spices for the treatment of ailments. During the last financial year, India has exported a total of 9,47,790 tonnes of spices and spice products valued Rs. 17664.61 crore. Though, there are many stakeholders and huge amount of money involved in the spice business, tools for assessing the quality spices using advanced or computational methods are yet not available. So, it is proposed to adopt computational techniques involving various classifiers, neural networks for image processing and development of algorithms for the quality assessment of spices. Spices also possess vital pharmacological activities therefore, the tools for identifying and assessing the quality of of spices should be economical providing relief to vast per cent of population. The purpose of our proposed methodology is to disseminate of knowledge of proper identification, characterization, quality standardization and determination of extent and nature of adulteration in selected Indian spices to layman, which is still limited to experts. In our proposed methodology, the unique morphological and microscopical features of selected spices, its varieties and their possible adulterants for proper identification will be identified utilizing pattern recognition techniques for identification of spices and its varieties.

Keywords: Adulteration; Characterization; Computational approaches; Identification; Spices.
Extraction, Isolation and Characterization of Bioactive Compounds Obtained From Herbal Sources for Treating Hypertension

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Abstract

Hypertension is one of the major cause & concern behind the cardiovascular problems depicted by the persistent higher blood pressure as compared to normal vital readings. In order to combat the unwanted medical hustle, a wide range of allopathic drugs have been implemented but, these are associated with several side effects like diuresis, dizziness, & abnormal heart rate. Therefore, the herbal medicines are searched upon to overcome the shortcomings of the available medications. The researches have proven that certain plants are enriched with bioactive compounds with clinical importance to concur hypertension. These includes; Arjuna, Barberry, Garlic, Ginger, Ginseng, Punarnava & Rouwolfia. The process of obtaining the bioactive compounds involves certain steps like extraction, isolation & purification. Soxhelation is the commonly employed extraction technique, in which parts of plants like root, shoot, seeds, vegetative part & branches are extracted through combination of solvent systems depending upon the polarity. The extracted crude is then analyzed through biological assay for the clinical activity & identification of the most effective bioactive molecule. Followed by the purification process using chromatographic techniques like TLC, HPLC etc. The isolated bioactive molecule is then screened for the biological assay like in-vivo screening and toxicity assay. Finally, the chemical characterization of the molecule is elucidated via LC-MS, GC-MS, FTIR, & NMR. The presented review is entitled to represent the complete process of obtaining bioactive compound from herbal sources for treatment of hypertension.

Keywords: Hypertension; Herbal medicines; Extraction; Isolation; Characterization
Role of Natural Herbs In Cancer

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Abstract

Cancer is a group of more than 100 different diseases. It can develop almost anywhere in the body. Cancer begins when genetic changes interfere with this orderly process. Cells start to grow uncontrollably. These cells may form a mass called a tumor. Cancer can be cured using Chemotherapy, Radiation therapy, Immunotherapy, Hormone therapy. The most widely herbal drugs used as anticancer are like podophyllotoxin and several other compounds (known as lignans) from the common mayapple (Podophyllum peltatum) ultimately led to the development of drugs used to treat testicular and small cell lung cancer. Other plants that have shown anticarcinogenic properties include Anacardium occidentale in hepatoma, Asparagus racemos in human epidermoid carcinoma, Boswellia serrata in human epidermal carcinoma of the nasopharynx, Erthyrina suberosa in sarcoma, Euphorbia hirta in Freund virus leukemia, Gynandropis pentaphylla in hepatoma, Nigella sativa in Lewis lung carcinoma, Peaderia foetida in human epidermoid carcinoma of the nasopharynx, Picrorrhiza kurroa in hepatic cancers, and Withania somnifera in various tumors.

Keywords: Chlorella; Antifungal; Antibacterial; Algae; Opportunistic organism
Phyto Pharmacological Applications of a Multi-potential Medicinal Drug: Illicium verum Hook. f.

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Abstract

The use of plants as food and medicine can be well evidenced in the rich classical literature such as Charaka Samhita and Sushruta Samhita. With the passage of time, some herbal origin drugs have become an integral part of the kitchen community such as fennel, asafoetida and star anise. Owing to the presence of rich volatile oils along with beneficial effects, Star anise has its own contribution towards food and health industry. The fruits of Illicium verum Hook. f. are commercially used to extract star anise oil which is potent antimicrobial agent. This species is a tree, member of Illiliaceae family and has been in use since long times in Chinese system of medicine for alleviating cold and relieving pains. In the present work, an attempt has been made to present the summary of Phyto-pharmacological aspect of star anise along with its therapeutic benefits. More work may be carried out to observe the synergism of the drug with other natural agents as antimicrobial agent and as a medicine.

Keywords: Charaka Samhita; Volatile oils; Antimicrobial.
**Therapeutic potential of Tinospora cardifolia: A review from preclinical to clinical studies**

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**Abstract**

Tinospora cardifolia (family: Menispermaceae) is a medicinal plant with multi health benefits. This plant is reported to possess anti-diabetic, anti-periodic, anti-spasmodic, anti-inflammatory, anti-arthritic, anti-oxidant, anti-allergic, anti-stress, anti-leprotic, anti-malarial, hepato-protective, immunomodulatory and anti-neoplastic effects. Each part of this plant and its various species are effective in the treatment of various disorders. Alpha-D-glucan of this plant causes activation of immune system through activation of macrophage that occur by TLR6 signaling, NF kappa B translocation and cytokine production. Its extract is antagonizing the effect of Histamine, 5-HT, bradykinin, PGE1 in smooth muscle of rat. Scientific reports established that, LD50 value was higher than 1 g/kg in case of oral administration in experimental animal apart from that no abnormalities were detected in liver and renal function of rats received 100 mg/kg for 12 weeks. 3 g/kg of its administration did not show any adverse effects or animal death in Wistar albino rats undergone acute toxicity studies. T. cordifolia reported safe in a phase I study. Clinically it was reported that its aqueous extract decreases the toxic effects of alcohol and help to modulate testosterone and cholesterol biosynthesis. Hence present review focus on preclinical and clinical importance of Tinospora cardifolia and its bioactive compounds.

**Keywords:** Anti-diabetic, Alpha-D-glucan, Tinospora cardifolia.
Migraine Treatment by Natural Drugs

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Abstract

Migraine is a common, multifactorial, disabling, recurrent, hereditary neurovascular headache disorder. Migraine features often include unilateral location; moderate, moderate-to-severe, or severe intensity of the pain; and a throbbing or pulsating nature to the pain. There may be associated nausea, photophobia, or phonophobia. Unilateral throbbing type moderate to severe intensity headache is a common manifestation of the migraine though it may present with varied presentation. Traditional remedies for headache are widely practiced throughout the world. In addition, the use of traditional methods to treat any symptom of headache could delay the diagnosis and management of serious conditions such as meningitis and other intracranial pathologies. The natural products discussed here include Zingiber officinale (ginger) for migraine treatment and Cannabis sativa (cannabis), intranasal Capsicum annuum (cayenne), and Lavandula stoechas (Spanish lavender) volatile oil for treatment and prevention.

Keywords: Migraine; Photophobia; Volatile oil.
An insight into Functional Foods

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Abstract

Functional food is an innovative concept introduced globally, is a nutriment which gives one or more additional function by adding new ingredients to it or more of existing ingredients. Now a day’s nutrition science has moved on from the classical concepts of avoiding nutrient deficiencies and basic nutritional adequacy to the concept of "positive" or "optimal" nutrition. Meaning of functional food is “A food containing health-giving additives.” Functional food has particular action on our body and has specific nutrients like- vitamins, minerals, prebiotics, probiotics, synobiotics etc. It was first introduced in Japan the mid-1980s and refers to processed foods containing ingredients that assist specific body functions but in India our ancient science gave almost alike concept term as “Ahar kalpana” such as-virhi, laja, shookadhanya(cereal grains) etc. in the era of Vedas. European commission modernized same concept in 1990s by using the term functional food. In 1991 “Food for Specified Health Use” (FOSHU) established for any regulatory issues regarding this by Japanese ministry of health and welfare but till now India don’t have any specific law regarding any issues of functional food. In this digitized society there have so many health issues that killing human mentally and physically but we can overcome it by taking functional Food in specific dose daily and can reduce the risk of chronic diseases like- Diabetes, cancer, BPH, Cardiovascular disorder etc. and can lead better way of life.

Keywords- Functional food; Disease Management; Regulatory issues.
Tuberculosis is an infectious disease which is caused by bacteria. The disease is mostly transmitted from person to person, usually by inhaling bacteria-carrying air droplets. Tuberculosis most commonly affects the lungs, but it can also affect any other organ. It also results in nearly 10 million cumulative orphans due to parental deaths. Moreover, it causes 6%-15% of all maternal mortality, which increases to 15%-34% if only indirect causes are considered. Tuberculosis screening is done using a simple clinical algorithm that relies on the absence of current cough, fever, weight loss, and night sweats. The challenge of discovering new, urgently needed anti-TB drugs from natural sources requires a truly interdisciplinary research. The use of allopathic medicine in complex disease like tuberculosis is associated with the problem of cross resistance and herbal drugs have proven to be most effective in this context. The exploration of therapies for the successful attenuation of the morbid condition associated with tuberculosis is the need of the day. Anti-tuberculosis agents: Allium cepa, Aloe vera, Prunus armeniaca, Ocimum sanctum.

Key words: Tuberculosis; Cross resistance; Night sweats.
Indian Herbal Treasure: Novel Approach Against Diseases

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Abstract

In today’s world natural herbs and their formulations are getting popularity for the treatment of various diseases and its combination with the conventional drug therapies gives safe and effective way of treatment. India, being a rich source of medicinal plants India, there are many remedies to cure the diseases and most of remedies consists of treatment with natural medicinal plants and their derivatives. Herbs like Basil, Parsley, Dill, Aloe Vera, mint, curcumin, vinca, ginger are some of the medicinal herbs that are used to treat the deadly diseases like Diabetes mellitus, Cardiovascular disorders, arthritis, gallbladder and urinary tract infections and cancer. Some medicinal plants like Ginger, Garlic, Goldenseal and Clove has antibiotic activity against a number of bacteria and infections associated with them. In recent times the Poly herbal formulations are used to treat the diseases due to the cumulative therapeutic effect of the herbs. To show the therapeutic effect within the desired range the combination of multiple herbs in the appropriate ratio is required to get the desired therapeutic effect, popularly known as Polyherbalism. The therapeutic response of poly herbal formulations occurs at low doses and at wide range. The major reasons for using herbal medicines for disease treatment are cost effective, natural, minimal or very low side effects, cure disease invariably, and mainly concentrate on the root cause of the disease. On the other hand allopathic treatment involves with the use of synthetic chemicals and their derivatives. The synthetic formulations has single drug molecule concentrations without any counter balancing content as in case of herbal formulations a counter balancing content is present. The most common disadvantage of allopathic medicine system is that the organisms becoming resistant to these medicines and there are no alternative remedies left for resistant organisms.

Keywords: Herbal drugs; Polyherbal Formulation; Combinational Therapy.
Wheat Grass as Alternative Treatment for Cancer

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Abstract

Wheat Grass (Agropyron) refers to the young grass of the common wheat plant that is TRITICUM AESTIVUM is freshly juiced or dried into powder for cancer patients or can be consumed by human. India has discovered wheat grass as a best source to cure cancer. Wheat grass containing chlorophyll, amino acid, minerals, vitamins, and enzymes. Wheat grass is categorized as humble weed and power house of nutrients and vitamins for the human body. Wheat grass juice is rich in energy by fulfilling nutritional deficiencies and by removing wastes that clog your cells, blood, tissues and organs. Wheat grass juice has chlorophyll that neutralizes infections, heals wounds, overcomes inflammations and gets rid of parasitic infections the three most important effects of wheat grass on the human body are: blood purification, liver detoxification and colon cleansing. This is because wheat grass juice is the richest source of vitamins A, B, C, E and K, calcium, potassium, iron, magnesium, sodium, sulphur and 17 forms of amino acids. Wheat grass can be grown indoors or outdoors. Leaves are harvested when they develop a ‘split’ as other leaf emerges. These can be cut off with scissors and allow a second crop of shoots to form. Their juice is used in other treatments like aids, chronic fatigue syndrome strengthen immune system, reduced serum iron level etc. So, according to my opinion the wheat grass is highly nutritional and helps to fight with cancer.

Keywords: Cancer; Minerals; Nutrients; Wheat grass.
Drug Discovery and Drug Design in Ayurved: A Review

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Abstract

Ayurved is a system of medicine used by mankind for thousands of years. Although safety and efficacy of ayurvedic drugs can be justified by numerous ayurvedic practitioners but when tested through contemporary tools, these proofs become trench between achievements. In Ayurved, it is clearly mentioned that Dincharya, Ritucharya, Pathay-aphya should be strictly followed along with drugs to achieve complete health. In present era, more emphasis has given to only drug and not to other important factors. At the end, conventional methods are inadequate to prove safety and efficacy of ayurvedic drugs. Hence drug discovery needs modified processes of standardization and quality controls for future development of herbal drugs. Reverse pharmacological approach has been reported by researchers in field i.e., clinical, pharmacognosy then pharmacology. Further developments in this traditional system of medicine will give better understanding of appropriate newer drug discovery process and play a crucial role to facilitate desirable, safe and more effective herbal products.

Keywords: Drug discovery, Pharmacology, Standardization, Quality control
Citrus Flavonoids: A versatile Phytoconstituents

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Abstract

There has been increasing interest in the research on flavonoids because of their versatile property reported in various studies. Flavonoids are important natural compounds with diverse biological activities such as anti-inflammation, antioxidation, antimicrobial, antiallergic and immunomodulation. Flavonoids have also been known to possess biochemical effects, which inhibit a number of enzymes such as aldose reductase, xanthine oxidase, phosphodiesterase, Ca+2-ATPase, lipoxygenase, cyclooxygenase, etc. Flavonoids from citrus genus have been of particular interest because of their broad spectrum of biological activities, including anti-inflammatory, anticarcinogenic and antiatherogenic properties. Citrus flavonoids constitute an important series of flavonoids including rutin, hesperidin, naringin, quercetin, and a standardized mixture of rutinosides known as hydroxyethylrutosides (HER). They are used for the treatment of capillary fragility and venous insufficiency. Several researchers said in one voice that citrus flavonoids are beneficial for the treatment of liver ailments. This review aims to explore the biologic activities of citrus flavonoids.

Keywords: Flavonoids; Citrus; HER.
Medicinal Value of Broccoli (Brassica Oleracea Var. Italica L.) and Its Effect on Human Health

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Abstract

Broccoli is an important vegetable crop which has large flower heads with a tree like structure. Broccoli is eaten as raw (salad) as well as cook. Broccoli is rich in vitamin C, vitamin E, Minerals, fiber and several carotenoids. Broccoli has many other health nutrients like one cup of chopped broccoli supplies us with 9 percent of our RDA of dietary fiber. Broccoli might benefit the heart, may improve respiration function, may fight and prevent cancer- including throat, lung, prostate, breast, skin cancer, support strong bones. Broccoli and related vegetables such as cabbage and brussels sprouts naturally contain a chemical known as glucobrassicin. Broccoli sprouts are more active against cancer as compared to broccoli alone due to their antioxidant activity. When these vegetables are crushed by chewing, a chemical reaction transforms glucobrassicin into indole-3-carbinol (I3C). Broccoli have ability of sulforaphane to prevent lung cancer caused by tobacco carcinogens. Sulforaphane blocks the enzymes that cause joint destruction by stopping a key molecule known to cause inflammation. Broccoli sprouts are young Broccoli plants, they contain compound that have anticancer activities. Other side broccoli sprouts can help eliminate environmental toxins and protect against some viruses and bacterial infections. Broccoli rich in glucoraphanin which can be processed by the human body into a kind of compound capable of preventing cancer and is essential for creating sulforaphane, releasing Phase-2 enzymes which neutralize highly reactive forms of cancer causing chemicals before they can damage DNA and promote cancer. The study found that glucoraphanin helped 'retune' metabolic processes in the cells. Broccoli sprouts had 20 to 50 times the glucoraphanin to sulforaphane capacity as regular broccoli. Broccoli sprout extract contains sulforaphane that holds good for reducing the impact of particulate pollution on allergic disease and asthma. Broccoli plays a major and beneficial role in treating cancer of several forms that occurs in different parts of the body.

Keywords: Vitamin c; Vitamin a; Sulforaphane; Glucoraphanin; Several carotenoids.
Medicinal uses of Lavender Oil (Lavandula Latifolia) and Its Effect on Human Health

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Abstract

Lavender plant is perennial flowering aromatic herb that belongs to Lavandula genus essentially grown in northern Africa and the Mediterranean mountains for its flowers and extraction of oils. In India, it is cultivated in low rainfall regions and on slopes of Himachal Pradesh and Uttar Pradesh. However, it is successfully grown in Kashmir Valley region. Lavender oil contains up to 40% linalyl acetate and 30% linalol. Linalol is a terpene alcohol that is non-toxic to humans, yet naturally antimicrobial. Linalyl acetate, its acetic ester, has a pleasant, sweet, fruity, aroma which along with its antimicrobial properties makes lavender unique. Other constituents of the oil are cineol, pinene, limonene, geraniol, borneol and some tannin. In addition to cosmetic values, lavender has been found successfully a relief from anxiety, insomnia, depression, menstrual pain, headache, healing of wounds, muscle relaxation and pain after surgery. Recent studies by the researchers suggest that the lavender oil is effective in treatment of hair fall, acne and eczema for good skin health and administration of lavender as a tea can help digestive problems such as vomiting, nausea, intestinal gas, upset stomach, and abdominal swelling.

Keywords: Lavender; Linalol; Linalyl acetate; Acne; Eczema.
Recent Advances in Hydrogels for Cancer Treatment

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Abstract

Hydrogels are mostly water insoluble, hydrophilic unique biocompatibility, cross linked 3D networks of polymer chains having the ability to absorb water but does not dissolve in water. Due to its temporary structure (scaffolds), it can provide structural integrity to tissue constructs, control drug and protein delivery to tissues and cultures, also serve as adhesives between tissues. The mechanical strength and physical integrity is offered by this crosslinks, the solubility depends on the forces crosslinks with which it is bound. Hydrogels are used for Therapeutics and in biomedical applications because of its biocompatibility and similar properties to human tissues. Cancer is one of the fatal diseases in the world and results in a large number of deaths per year. Many types of cancers currently remain incurable due to its complex nature. It reduces the quality of the life and life expectancy. Abnormal cell proliferation and metastasis are the two main characteristics of cancer development which leads to cancer recurrence and proved to be most important reason for mortality. Hydrogels based drug delivery systems have improves chemotherapy results. They are capable of localised and targeted therapy. This abstract aims to give focus on the recent treatments of cancer with the help of hydrogels. So it concludes that hydrogels is not just 3D viscoelastic network but it can also used for biomedical purposes.

Keywords: Hydrogels; Crosslinks; Cancer; Drug delivery system; Diomedical.
Herbal Prevailing of Gonadotropin Hormone Imbalance in Oligomenorrhea

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Abstract

First line medical therapy of oligomenorrhea includes the use of hormonal contraceptives for the treatment of menstrual irregularity. This approach comes with side effects such as intermenstrual bleeding, excessive bleeding on menstruation, blotting, headache and migraine during the course of regimen. The treatment is not highly effective as it is not an exact cure of the disease but gives a symptomatic relief and the symptoms may appear again after one or two years. Due to less patient education in India, the sufferers may not get the full knowledge about the importance of compliance with regimen and the case is with countryside women. Countryside women do not comply with the regimen which leads to more side-effects. Herbal treatment strengthens the woman reproductive system and also eradicate the inflammation which is caused by cyst formation in the ovaries. Herbal treatment also normalizes the hormonal imbalance. Gonadotropin hormones like Luteinizing hormone and Follicle stimulating hormone are made in pituitary gland and these play an important role in maintaining the normal menstrual cycle. Thus by using a herbal approach for balancing of these hormones may be an effective concept. Ayurveda recommends various therapies and Yoga asana for the disease. In the present work, we are reviewing on the various medicinal plants which act on the gonadotropin hormones and the Ayurvedic prospective of oligomenorrhea treatment.

Keywords: Gonadotropin; Herbal; Oligomenorrhea; Ayurveda; Yoga asana.
Therapeutic Potential of Traditional Medicine Shilajit in Treatment of Various Ailments

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Abstract

Medicines obtained from plants, sand material and rocky material were used from primeval time for different ailments. Shilajit is a well known traditional medicine obtained mainly from the Himalayan region. It is formed by the decomposition of certain plants by microbes. Its use in traditional medicine to treat various diseases and recent investigations for medicinal properties shows promise for the treatment of chronic diseases like diabetes and Alzheimer’s disease. Shilajit has also been reported to escalate testosterone levels in healthy volunteers. Shilajit is active against certain viruses such as herpes virus, RSV virus. It contains fulvic acid and humic acid as the main active agents. Fulvic acid has different therapeutic activities such as antioxidant, anti-inflammatory and antiaggregation. This makes it potentially useful for the treatment of Alzheimer’s disease. In this article, we are considering the immense potential of traditional medicines and reverse pharmacology of such materials which require a thorough research. Reverse investigation of traditional medicines will give new horizons in the treatment of diseases.

Keywords: Shilajit; Traditional medicine; Fulvic acid; Reverse Pharmacology; Alzheimer’s disease; Antiviral; Testosterone.
Consolidated Contemporary Technologies with Ayurveda: A Review

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Abstract

Day by day, we have seen an increase in the acceptability of Ayurveda. In ancient times, people believed in healing and maintaining the quality and longevity of life through daily living practices. But nowadays the scenario has changed, various technologies and improved techniques are being used to expand the wisdom of Ayurveda. There are various analytical tools for standardization of drugs, in instruments, we can mention Tridosha Graph Ayurveda Scan, improved medicine preparation techniques, information and communication technologies like Ayurvedic knowledge digitization and dissemination, Ayurinformatics, Decision-support systems and expert systems. In the field of modern engineering, there is a technique like personal health monitoring and in computer science techniques; there are artificial intelligence, mobile apps and much more. All these technologies are actually the assets to enhance the adequacy of Ayurveda.

Keywords: Ayurveda; information and communication technologies; Digitization and dissemination; Ayurinformatics; Decision-support systems and expert systems; Artificial intelligence
Effective Disease Management Practices of Peach (*Prunus persica* (L.) Batsch)

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**Abstract**

*Prunus persica* (L.) Batsch / Peach originated from China is the most important fruit with temperate nature which is also grown in sub-tropic regions, but the quality is inferior. Uttar Pradesh, Jammu & Kashmir, Himachal Pradesh, Punjab, Nilgiris, North eastern states viz., Arunachal Pradesh, Meghalaya, Manipur are the areas under cultivation of peach in India. But some serious and considerable diseases are the factors behind low production of peach fruits. These have been detected in Punjab state. The following research study is done to identify and introduce those problems faced by Peach growers in the area which is pointed out above with a proper solution. The diseases which are identified in this research study are affecting different individual parts of the plant such leaves, fruits, branches, roots and so on. This scientific work aims to promote disease management system of fruiting trees, using following biological, mechanical as well as chemical treatment methods with low impact on the environment and human health. These can contribute to increase crop quality as well as the quantity. Leaf curl, brown rot, powdery mildew, silver leaf, bacterial spots and bacterial gummosis are the common ones among the identified diseases. Peach yellow, little peach, red suture, peach yellow bud mosaic, peach wart, maur dwarf, asteroid spot, golden net, line pattern, mottle, willow twig, ring spot and tem pitting are the diseases that are being caused by viruses in this area. The treatment is done with commonly used chemicals for disease control such as Bordeaux mixture, lime sulfur, mancozeb, carbendazim and thiophanate-methyl. With a rise in living standard, the consumer demand for higher quality and safer fruit is increasing, and more and more efforts have been done to search for effective biocontrol agents and active ingredients in herbal extracts.

**Keywords:** Biocontrol agents; Bordeaux mixture; Chemical control; Diseases; Gummosis; Peach.
Barmi: The Urate Crystal Healer

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Abstract

Barmi, biologically known as Persicaria sagittata, family Polygonaceae, is one of the best traditional medicines used to treat urate kidney stones. The plant grows alongside damp roadside ditches. It plays an important role as an antioxidant, antispasmodic and urocoside interferer. The purpose of the author is to gather and summarize all antiurate crystal properties of plant, by using it as whole. Traditional methods suggest that oral administration of fresh plant after grinding and collecting the plant's juice and diluting one part in three parts of water during fastening state, twice a day, cures urate kidney stones faster. The adverse or side effects are very minimal or equal to zero. Hence, the plant is proved to be a safe drug product in curing kidney stones as compared to the drugs that cause adverse side effects.

Keywords: Persicaria sagittata; Coumarin; flavonoids; Urate crystals.
Aromatic Oils: An Alternative Approach for the Antibiotic Resistance In Human Body

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Abstract

Plants are the major source of food and medicines in the whole world. Many plants contain bioactive constituents that play an important role in the prevention of some serious diseases such as cardiovascular, neurodegenerative disorders and cancer. Aromatic oils (volatile oils or essential oils) are considered as safe by the Food and Drug Administration (FDA) and some of them have shown antibacterial activities. The primary components of aromatic oils are terpenes and terpenoids and they also contain acids, alcohols, aliphatic lactones, and hydrocarbons. Many research studies have been carried out on volatile oil composition and antimicrobial and antifungal effects of different plants. Today an increasing number of multidrug-resistant bacteria and the antibiotic resistance of synthetic antibiotics are demanding a need for alternative treatments against infections. The present review reports the antibacterial, antifungal, and antiviral potentials of aromatic oils extracted from medicinal and aromatic plants and results have shown that there is opportunity to use these alternatives for present day antibiotic resistance in the human body. Study found that Gram-positive bacteria are more susceptible to aromatic oils than Gram-negative bacteria. The review concluded that some aromatic oils and their constituents are effective against human pathogenic microorganisms but the combination of two or more aromatic oils have shown significant role as good antimicrobial agents. So aromatic oils can fulfill the present and future need of an alternative to synthetic antibiotics.

Keywords: Aromatic oils; Volatile oils; Microorganisms; Antimicrobial; Antibiotic resistance.
Formulation and Biochemical Analysis of Herbal Soap Prepared Using Leaf Extracts of Mentha and Eucalyptus

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Abstract

Microorganisms, primarily bacteria, are responsible for various infections in humans. We are living in a world full of bacteria and it is impacting us more than we had thought. These bacteria come in contact with our body either directly from the environment or by touch. This can lead to several dermatological infections and ingestion can lead to various types of infectious diseases such as typhoid, dysentery, etc. Due to the pathogenic effects that bacteria have on humans, there is a need of antibiotic formulations and skin being the most exposed part of the body has to be protected. In recent decades, the research on plants has intensified due to the fact that these plants contain some pharmacologically active compounds. These active compounds can become new antibiotics after the evaluation of pure constituents and extracts of plants. In the present study, ethanolic and hexane extract (55% of solvent) of Mentha arvensis and Eucalyptus obliqua leaves were prepared and analyzed for their antioxidant properties. These extracts demonstrated high antioxidant activity and were used for formulating herbal soap that targets skin infecting bacteria and other microorganisms. Promising results were obtained after in vitro antimicrobial analysis and antioxidant activity analysis of prepared plant extracts. Further evaluation and fractionation of extracts would help to formulate a potent herbal soap composition that directly acts on skin problems as acne, rashes and inflammation.

Keywords: Mentha arvensis; Eucalyptus oblique; Herbal soap; Microorganisms; Biochemical analysis.
A Review of Classical and Modern Applications of an Indian Medicinal Drug: *Murraya koenigii*

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**Abstract**

Modern day human has extended his approach to the different flavours in the normal dietary preparations and is inclining towards the herbals when it comes to the treatment. India is the land of herbs with *Murraya koenigii* as one of the drug being used since classical times. It belongs to Rutaceae family and the leaves possess compounds such as carbazole alkaloids, koenigin and glycosides. Traditionally it has been in use as a stimulant and in the management of diabetes mellitus. It is commonly used in the preparation of food items especially in south India. Studies have found it to be an antioxidant, nephroprotective, neuroprotective, antiageing, hepatoprotective, anticancer and a potent antibacterial agent. In this work, an attempt has been made to highlight the literature available for the phytopharmacological aspect of *Murraya koengeii* along with its medicinal benefits. Some more analysis may be carried out to observe the synergism of this drug with other natural agents as antimicrobial agent and as a medicine.

**Keywords:** *Murraya koenigii*; Rutaceae; antiageing; hepatoprotective; Neuroprotective.
Isolation, Characterization & Evaluation of Citrullus Species as inhibitor of Hyaluronidase, Lipoxygenase and Xanthine Oxidase Enzyme \textit{In Vitro} - An Overview

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Abstract

Citrullus species have been widely used in the preparations of folk medicine for centuries. Citrullus species have the traditional use as remedy for various diseases like cancer, endothelioma, leukaemia, tumours of the liver, spleen etc. A decoction of the whole plant is made with juices used to help indurations of the liver. Roots may also be used as a purgative and for jaundice, urinary diseases, rheumatism and for snake poison. The leaves are diuretic and used in the treatment of jaundice and asthma. This plant is available in wild in the sandy lands of North West Punjab, Rajasthan, and southern coastal areas of India. Citrullus colocynthis & Citrullus lanata are commonly known as the colocynth, bitter apple, bitter cucumber and kaurtumba. It is a desert plant native to the Mediterranean basin and Asia. It resembles a common watermelon vine, bears, small, hard fruit with a bitter pulp. Lipoxygenase inhibitors may lead to the design of biologically and pharmacologically targeted inhibiting therapeutic strategies. Evaluation of Citrullus species extracts as a lipoxygenase inhibitor may be useful in cancer treatment. Evaluation of the fruit extract as an inhibitor of hyaluronidase activity can be useful in the treatment of allergic reactions, snake bite poisoning, dengue and edema.

Keywords: Citrullus Species; Folk medicine; Lipoxygenase inhibitor; Hyaluronidase Inhibitor; Cancer treatment.
**Green Tea - An Antioxidant Mystic Herb**

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**Abstract**

Green tea is widely used as a hot or cold beverage all over the world. It is usually obtained from the unfermented leaves of Camellia sinensis. It contains lipids, proteins, flavonoids, vitamins and carbohydrates. Flavonoid contains polyphenols which helps to potentiate health benefits. The polyphenols found in green tea are catechins, epicatechin (EC), epigallocatechin (EGC), epicatechin gallate (ECG) and epigallocatechin gallate (EGCG). Bitterness of green tea depends on the amount of polyphenols. More the amount of polyphenols, more bitter is the taste. Green tea is preferred over black tea. Usually, the green tea in north – eastern parts of India are rich in amount of polyphenols. The processing of green tea involves steps like crop growing, collecting, inhibition of enzymes, drying, rolling and effective, again rolling and aeration, drying, purifying, firing, merging, picking and packaging. Antioxidants potential of green tea is the major centering area of health effects. Polyphenols compose green tea more beneficial in protecting the body from oxidative damage due to free radicals. Catechins inhibit growth of bacteria and also have a natural activity in prevention of cancer. Green tea is a good metabolizing agent, thereby lowers cholesterol level. Green tea in short is a very basic and normal solution for maintaining good health of an individual.

**Keywords:** Green tea; Catechins; Polyphenols; Cancer; Cholesterol; Antioxidant.
Biomedical Potential of Graphene Oxide based Nanoformulations: An Overview

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Abstract

Graphene oxide is graphene based two dimensional material and structure based on single sheet of carbon atoms arranged in hexagonal lattice or honeycomb framework. Graphene oxide is better than graphene in terms of dispersion in polar solvents due to oxygen containing functional groups attached with carbon sheets, results as researchers to get indulged in this molecule. Graphene oxide has been attracted researchers in different fields like chemistry, physics and materials science. Graphene oxide has endless potential applications in building materials, environmental protection, electronics, medicine, pharmaceutical industries etc. In medicinal industry, graphene oxide used as antibacterial, antimicrobial and antifungal agent. Its potential activity with other nanoparticles as antifungal agent has come in light and became the main focus of going on works on graphene oxide. The antifungal property of GO-Ag composites was investigated. Furthermore, nanoparticles show great potential in the fields of biomedical, because of their antifungal properties. The GO-Ag composites act as alternative antifungal material. Moreover antifungal activity of Reduced Graphene Oxide (rGO) nanosheets is also researched.

Keywords: Graphene; Graphene Oxide; Nanoparticle; Antifungal.
Herbal Plants Used in the Neuropathic Pain

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Abstract

Neuropathy is weakness and pain that refers to general diseases of the nerves. There are several types of neuropathy according to the location of nerves that is peripheral neuropathy, proximal neuropathy, cranial neuropathy, autonomic neuropathy and focal neuropathy. Nerves damage may be caused by different diseases, infections, injuries and vitamin deficiency states. Nowadays scientists are showing more focus towards herbal medicinal plants formulations due to their less side effects and more healing capacity. A lot of herbal medicinal plants are available which can be used for the treatment of neuropathic pain. For example Ginkgo biloba, Acorus calamus, Artemisia dracunculus, Citrullus colocynthis, Butea monosperma, Crocus staivus, Curcuma longa, Elaeagnus angustifolia, Mitragyna speciosa, Nigella sativa, Momordica charantia, Ocimum sanctum etc. The most effective medicinal drug used in peripheral neuropathy is Ginkgo biloba leaves. It shows antioxidant activity which improves blood flow to the brain. The herbal medicinal plants are highly protective and advisable. The natural herbal plants have multiple modes of action that can help in symptoms of neuropathy.

Keyword: Medicinal plants; Neuropathic pain; Neurology.
Pharmacognostic Investigations and Pharmacological Evaluation of *Swertia chirata*: A Review

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**Abstract**

Swertia chirata is a medicinal herb which is commonly known as “East Indian Balmony” belonging to the family Gentianaceae. It is an endangered medicinal plant found in temperate highly regions of Asian countries. In Traditional medicinal system, this drug is mentioned as “kirrat”. This herb holds an ethano-botanical importance due to its pharmacological activities. Active phyto constituent present in chirata are ophelic acid and two bitter glycosides chiratin and amarogentin. The main bioactive constituent is “xhantanon”. Secondary metabolites such as flavonoids, iridoid glycosides and triterpenoids hold a wide range of pharmacological activities. The stem is used as food supplement, root as tonic for liver and extract for hypoglycaemia and skin related disorders. S. chirata also possess anti-malarial properties. It has been declared as critically endangered plant by IUCN and by the government of India. The human interference and climate change is a big problem for this plant. Although, global warming, poor seed germination and lack of viable seed production can be a variant factor for the endangerment of this plant. The plant bio-technology offer so much methods for the preservation of seeds by way of germplasm. In vitro micro-propagation and somatic embryogenesis as well as improvement in strategies of seed germination is a way to conserve this magical herb.

**Keyword:** Swertia chirata; Kirrat; Xhantanon.
Traditional Herbal Drugs as Therapeutics

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Abstract

With the advancement in the field of medicines, herbal drugs are now being found to be utilized in up to 50% of the western population for treating various ailments. Traditional herbs and their derivatives are being studied and used as corresponding system of medicines for dealing with a variety of diseases globally. Many herbs are even the part of the medicinal system since centuries, just not for curing certain disorders but also as nutraceuticals. These possesses greater therapeutic and holistic nutrition, which helps to improve the quality of life. In order to attain healthy and disease-free life, use of such herbs can be included in the lifestyle, which has been reported to improve the overall quality of life by delaying various physical, immunity and stress related problems. Although a significant number of herbal drugs are been recognized and used to cure different diseases, but, few of the majorly used herbs are been mentioned. For instance trials have shown the benefits of ginger in combating nausea and vomiting, liquorice extracts in treating peptic ulceration, Chinese herbal medicine in overcoming irritable bowel syndrome, opium derivatives in diarrhoea along with senna, isphagula and sterculia in treating constipation. In South Africa, African potato and sutherlandia are even been used to treat HIV/AIDS. Despite holding great potential to cure all such health problems & possessing properties to serve as boon for the health care system still, there are many challenges related to the practical implementations of the herbal medicinal system for complete treatment. The present review is therefore a compilation of the studies related with use of various herbal drugs to cure diversified diseases & criteria to include the herbal system in daily life to improve its quality.

Keywords: Herbal medicines; Diseases; Therapeutics; Nutraceuticals; Challenges
Comprehensive Review of Giloy - The Magical Herb

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Abstract

Giloy with the scientific name Tinospora cordifolia is considered to be one of the most miraculous as well as formidable herb which is used as an ingredient in various Ayurvedic, Unani and Siddha system of medicines to treat most of the health problems. Its classification is that it belongs to the kingdom Plantae and family Menispermaceae also commonly known as Guduchi, Amrita, Gurachand Tinospora. In ayurvedic system, giloy shows phenomenal effects in reproductive system, blood and fat and is also used for treating the health problems like Jaundice, Dengue, Gout, Stones and Tuberculosis also showing properties like anticancer activity, immune system boosting activity, anti-allergic activity, anti-diabetic activity, anti-inflammatory activity, antioxidant activity, antiulcer activity, wound healing activity. Its ayurvedic properties tell about its astringent or bitter taste having hot potency and sweet metabolic property. The leaves, stem, bark and roots of the herb are used as a source of medications. Giloy’s required properties are in its parts which are used as medications by extraction. Its stems are dried under cool conditions for 7–10 days and then pulverized using an electric grinder. The dried part of it is extracted with methanol and acetone as solvent systems at 40°C for 16 hours in soxhlet apparatus. The residue is again dried under decreased pressure by using a rotary vacuum evaporator. After this palatine is isolated from the extract with the help of chromatography and recrystallization. Giloy juice is one of the most convenient and effective medications which is prepared easily. Use of Ayurveda in pharmacy has increased as more than 500 preparations and more than a hundred single plant medications are included. Being the boon for most of the health problems giloy can be a scourge of causing low blood sugar level, causing constipation, stomach irritation and promoting auto immune disease symptoms of diseases like lupus, multiple sclerosis and rheumatoid arthritis increases. These side effects are independent of the form of medications i.e. whether the herb is incorporated in the form of juice or supplement capsules.

Keywords: Ayurveda; Unani and Siddha system; Tinospora cordifolia; Menispermaceae; Metabolism.
Phytochemical and Therapeutic Potential of Different Species of Physalis in Uttarakhand: A Review

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Abstract

Physalis is the genus of the Solanaceae family. Different types of Physalis species are distributed in India. About 80-90 varieties of Physalis are occurred in North and South America; only 4 to 5 varieties of Physalis are cultivated in India. Different species of Physalis found in Uttarakhand are Physalis angulata, P. minima, P. peruviana and P. hetrophylla. This article emphasizes the therapeutic importance of these species. They are reported to have specific pharmacological activities and phytochemical constituents. Traditionally, these species exhibits various pharmacological activities like anti-malarial, anti-inflammatory, diuretic, anti-parasitic, anti-microbial activity. Withanolide compounds were reported in Physalis. Withanolides are potent phytochemical of Solanaceae family. In Ayurvedic system of medicine the fruits and the leaves of Physalis species have great importance for the treatment of various elements.

Keywords: Physalis; Anti-malarial; Anti-inflammatory; Withanolide.
A Brief Review on Pharmacological Effects of Capsaicin

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Abstract

The rapid development in the field of medical sciences emphasize towards the exploration of complementary and alternative medicine for treatment of different diseases. These medicines not only considered to be safe, compared to conventional allopathic medicines, but also contributes as a major source for most of the allopathic medicines. One of these compounds is capsaicin (8-methyl-N-vanillyl-6-nonenamide) which can be extracted from chili pepper, a plant belonging to capsicum genus. Capsaicin and many related substances called capsaicinoids are produced by chili pepper as secondary metabolites, and these show protective mechanism against invaders such as fungus or mammals. It is colorless crystalline to waxy solid and has a highly pungent flavor with a hydrophobic characters. Moreover, capsaicin compound is used as an ailment for different types of diseases as well as disorders. Previous studies revealed that capsaicin has neurological effects especially in the treatment of neuropathic pain like osteoarthritis, rheumatoid arthritis, diabetic neuropathy and post-herpetic neuralgia. Beside this, capsaicin was found to protect the liver from damage produced by reducing the activation of hepatic stellate cells. Though, capsaicin has a spicy and pungent taste and also cause burning sensation, it was found that its anti-inflammatory effect is useful in treatment of gastritis at low concentration. It also has an effect on iron absorption and cause alteration in the lipid profile. It has the effect on reducing the adipose tissue by enhancing energy and lipid metabolism. This review highlights the main pharmacological actions of capsaicin.

Keywords: Capsaicin; Chili pepper; Capsicum; Anti-inflammatory; Pharmacological effects.
Antioxidant Activity of Ethyl Acetate Extract of Tubers of *Habenaria pectinata*

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**Abstract**

The main objective of this study was the determination of anti-oxidant potential of *H. pectinata* with respect to its total phenolic content, antioxidant capacity, reducing activity, with respect to their total phenolic content, antioxidant capacity, reducing activity, and oxidative stability. The tubers of this plant were extracted with the conventional method, reflux with ethyl acetate. The phenolic content was determined by the Folin-Ciocalteu method, while the phenolic substances were identified. The antioxidant capacity of the plant extracts was measured by their ability to scavenge free radicals such as (a) DPPH (2,2-diphenyl-1-picrylhydrazyl) and, (b) ABTS (2,2′-azinobis-(3-ethylbenzothiaziline-6-sulfonate). The Folin-Ciocalteu method proved the existence of antioxidants in the aromatic plant extracts using graded concentrations (10-50 mg/ml) of the extract. From the results of the DPPH and ABTS methods, the free radical scavenging capacity was confirmed. The tubers of this plant exhibited noticeable protection levels against lipid oxidation, as determined by the Rancimat test.

**Key words:** Antioxidant; DPPH; Phenolic substances; Free radicals.
**Review on Yarsagumba (Cordyceps sinensis) - An Exotic Medicinal Mushroom**

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**Abstract**

In Nepal, there are many indigenous medicinal plants. Among them Ophiocordyceps sinensis (Berk.) or cordyceps sinensis is one of most rare and costly plant known as Yarsagumba (winter worm summer grass). It is a well-known entomogenous fungus distributed in high mountains at an altitude of 3600-5000m. It is a parasitic organism that grows on a rare caterpillar [Thitarodes (Hepialus)] until the caterpillar dies and the mushroom sprouts from the caterpillar’s head. In traditional Chinese medicine, it is one of the most trusted main ingredients for several preparations of remedy from wide range of human health conditions. There are wide ranges of biological activities from O. sinensis have been reported that include anti-inflammatory, antioxidant, antitumor, anti-metastatic, immunomodulatory, antimicrobial, insecticidal, hypolipidaemic, hypoglycemic, anti-ageing, neuroprotective, renoprotective effects, etc. Although several components can be responsible for activity of compound. Despite of its scientific progress, further development is required particularly in cultivation, formulation of dosage forms and analysis leading to the best utilization of this most costly medicinal mushroom.

**Keywords:** Ophiocordyceps sinensis; Medicinal mushroom; Yarsagumba; Caterpillar; Cultivation.
Prediction of Alpha-Glucosidase Inhibition Activity for Management of Type-2 Diabetes using Prediction of Activity Spectra of Substances Software

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Abstract

Alpha-glucosidase inhibition was found to be an effective strategy in management of type-2 diabetes mellitus, a heterogeneous disorder characterized by defects in either insulin secretion or its action. The main objective of this study is to predict the active moieties from a pool of pharmacologically important phytoconstituents for alpha-glucosidase inhibition property using prediction of activity spectra of substances (PASS) software. PASS is valuable software which is used in this study for the prediction of alpha-glucosidase inhibition activity of different selected constituents. Canonical simplified molecular-input line-entry system is used for the prediction of the activity which is obtained from PubChem website. The predicted activity compared with marketed standard drug, acarbose. It was found that amongst the screened compounds, rutin, isoquercitrin, and hyperoside are having highest probable activity value of 0.858, 0.842, and 0.842 respectively. These phytoconstituents showed less predicted activity against alpha-glucosidase inhibition, as compared to acarbose with probable activity of 0.958. Rutin, isoquercitrin, and hyperoside showed good probable activity against alpha-glucosidase inhibition and these phytoconstituents can be further investigated for the same activity using in vitro and in vivo studies and these may become future drugs as alpha-glucosidase inhibitors.

Keywords: Type-2 diabetes; Alpha-glucosidase; Hyperglycemia; Acarbose; Insulin
Is Cannabis sativa A New Wonder Drug?

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Abstract

Preparations of Cannabis sativa have been used for medicinal purposes for at least 4000 years. However, it was exploited in whole world as hallucinogenic drug that cause addiction to people which lead to it ban. But recent studies showed very promising results. 60 different pharmacologically active components were found in extract of C. sativa; the most prominent being D9-tetrahydrocannabinol (D9-THC) and cannabidiol. These constituents have a wide range of pharmacological activities ranging from hallucinogenic, hypnotic, sedative, analgesic, anti-inflammatory and also showed anticancer activity. Various in-vitro and in-vivo studies have been reported for these biological activities. This review will discuss the recent findings based on the pharmacology constituents of Cannabis sativa along with its working.

Keywords: Cannabis sativa; Pharmacological activities; Biological activities
Study of the Effect of Natural Plants and Their Mode of Action in the Treatment of HIV/AIDS-Related Infections

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Abstract

Acquired Immuno Deficiency Syndrome (AIDS) is considered to be caused by Human Immunodeficiency Virus (HIV) which exists in different forms. In addition, the SIV virus which has been known to affect the macaques is thought to have similar mode of action. Reported cases are increasing worldwide and clinical treatments such as protein inhibitors have shown minor improvements. The ethnobotanical surveys done in Namibia for cure of HIV/AIDS-related infections and has shown improvements in number of patients from Katima Mulilo, Caprivi region, Namibia treated by natural products. The results of the species showed that out of 71 plants from 28 families, mostly the Combretaceae(14%), Anacardiaceae (8%), Mimosaceae (8%), and Ebanaceae (7%) were used to treat conditions as herpes zoster, diarrhea, coughing, malaria, meningitis and tuberculosis. The most plant parts used were leaves (33%), roots(28%), barks(32%) and the least used parts were fruits and seeds(4%). Further research is required to isolate the phytoconstituents and understand their mode of action. The use of natural methods along with the clinical treatments has led to a big leap in advanced treatment of infection related to HIV/AIDS. The use of plant parts and their active chemical compounds could also enhance the working of protein inhibitors and effects of microbicidals.

Keywords: HIV; Phytoconstituents; Clinical treatments
A Review on Recent Advancement in Defensive Therapy of Migraine

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Abstract

Migraine is a conjoint neurological syndrome categorized by periodic attack of severe headache enduring 4 to 72 hours and associated through vomiting, nausea etc. It is a standout amongst the most widely recognized cerebral pain objections in clinical preliminaries which influences roughly 14.7% of grown-up in the U.S. what's more, happens more typical in ladies as contrast with men. Challenge is not only to pick the time when to start the preventative therapy but also the rationale selection of the therapeutic agent as well. At present time there were a lot of acute and preventive treatments include specific and non-specific drugs existent in the market for this disease. These include herbs, antibodies, non-steroidal anti-inflammatory drugs (NSAIDs), minerals, vitamins and other drugs. Recent developments in the understanding of the neurobiology of migraine have initiated to account for some portions of the symptomatology, which has heading for to the improvement of well-worn target-based therapies that may revolutionise how migraine is treated in the upcoming time. This review article will discover modern advancement in understanding pathophysiology of acute and chronic migraine and pharmacotherapeutic enhancement for migraine inhibition therapies includes the usage of calcitonin gene related peptide (CGRP) receptor antagonist, glutamate receptor antagonist, nitric oxide synthase inhibitor, 5-HT1F receptor and furthermore non-obtrusive neuromodulation by means of Transcranial magnetic stimulation and transcutaneous neurostimulation.

Keywords: Migraine; Non-steroidal anti-inflammatory drugs; Glutamate receptor antagonist; Calcitonin gene related peptide receptor antagonist
Regulatory Aspects in Herbal Drugs

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Abstract

Herbal drugs are obtained from medicinal plants used by majority of peoples because of their fewer side effects, but in herbal drugs some side effects are present which creates toxicity and drug interactions. These effects are controlled by the regulatory authorities. Total 3000 species are used in Indian system of medicines but about 90% of the medicinal herbs are collected from the wild sources. Herbal preparation is consisting of complex mixture of one or more plants which contains active ingredient of plant material. Regulatory authorities regulate the various drugs and the problems on the basis of herbal drugs such as: interactions and toxic effects of drugs. Regulatory affairs in herbal drugs control the safety and efficacy of herbal drugs and make the product worldwide and protect the public health. WHO (World Health Organization) has done various efforts for improvement of herbal drugs.

Keywords: Herbal drugs; Regulatory authorities; Safety; Efficacy; Interaction
Influence of Rice husk Biochar under Wheat Cultivation

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Abstract

Wheat is one of the most important growing cereal crop all over the world. It is Rabi seasonal crop and grown in a wide range of climatic zones. The biochar is the residue left after thermal decomposition of any organic matter. Pyrolysis occurs when organic material is burn under anaerobic condition. It is charcoal which is used as reclamation of soil’s physical condition. Due to the presence of more C: N ratio, rice husk not easily degradable to the soil. Biochar application is one of the best solutions for improvement of wheat production. Biochar is mainly used to increase soil fertility, increase water holding capacity because it have more surface area. It helps to deflect soil properties and increase the microbial activity to absorb organic and inorganic compound. The major benefits of this amendment is, it have high nutrient availability due to the presence of higher amount of potassium, phosphorous and zinc which is known as essential element for plant growth and development. The experiment was carried out in Lovely Professional University, Phagwara at experimental field to check out the growth and development of wheat in biochar applied soil. On the basis of field trial, biochar may significantly improve the different morphological parameters like no. of tillers, no. of panicle, panicle length, stem grith were measured at 45 DAS, 60 DAS, 75 DAS, & 90 DAS. Hence this is the very simple way to give nutrient to the soil and subsidiary agricultural development.

Keywords: Biochar; Crop; Fertility; Nutrient; Pyrolysis; Rice husk; Soil; Wheat
Role of Bioactive Plants in Epilepsy

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Abstract

Antiepileptic drugs are widely used as long-term adjunctive therapy or as monotherapy in epilepsy. Visual disturbance are common side-effects of many antiepileptic drugs. Non-specific Retino and Neurotoxic visual abnormalities, that are often reported prolonged include diplopia, Antiepileptic drugs are widely used as long term adjunctive therapy or as monotherapy in epilepsy. The clinically used antiepileptic drug has many side effects like Visual blurred vision and nystagmus. Use herbs have a vital role in prevention and treatment of convulsion. The phytochemical exploration of these herbs has contributed to some extent in this race or the discovery of new antiepileptic drugs. Though herbal medicine is widely used in antiepileptic treatment, there is a lack of robust evidence for efficacy and toxicity of most herbs. The most widely used herbal plants with antiepileptic activity are Withania somnifera (Amhar), Ocimum sanctum, Brahmi grihta (Bacopa), Catharanthus roseus, Caesalpinia crista, Citrus sinensis, Datura stramonium, Ricinus communis, Terminalia glaucescens, Tetrapleura tetraptera, Senna singuena, Jatropha gossypiifolia, Mentha cardiifolia.

Keywords: Bioactive plants; Antiepileptic drugs; Epilepsy
Role of Vitamin D in Progression of Breast Cancer

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Abstract

Vitamin D widely known as “Sunshine Vitamin” mostly comes from endogenous production under the skin on exposure to sunlight and from dietary sources such as plants and fish. It is essentially required for calcium absorption and bone growth. Its deficiency is associated with rickets in a child and osteomalacia in an adult. Now Breast cancer in women has been found due to the deficiency of vitamin D in their body. The serum level of 25 (OH) D, which is the major storage form of vitamin D and major indicative of vitamin D status in human body, is significantly associated with the occurrence of breast cancer risk. The higher level of 25(OH) D is inversely associated to low risk of breast cancer and vice versa. This review aim to show the association between level of 25(OH) D and the incidence of breast cancer risk among the vitamin D deficiency women.

Keywords: Vitamin D; 25(OH) D; Breast cancer
Chemopreventive and Antineoplastic Potential of Saffron

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Abstract

Oncology is the branch of medicine that addresses the prevention or treatment of tumor or cancer which is one of the fatal diseases worldwide. So far there has been a profusion of drugs which scientists have come up with and these drugs have shown a marked effect in treating cancer. Yet these chemotherapeutic agents have toxic side effects and shows actions for a limited period of time due to the buildup of resistance, which ultimately results in recurrence of cancer. Nutraceuticals like food, plants, and spices are being explored to discover more effective anti-cancer compounds with fewer side effects. Crocus sativus, also known as saffron (English) or Kesar (Hindi) is used as a spice in India and has various pharmacological activities. Chemopreventive constituents have been identified from saffron which has shown pharmacological activity in cultured human malignant cell lines as well as experimental animals. These natural chemopreventive agents have potential to be a safer and effective alternative than the synthetic drugs. This review will contribute to brief insight of anticancer properties of active constituents of saffron.

Keywords: Saffron; Anticancer; Chemoprevention; Tumor; Natural Products
A Survey on Obesity Stigma and Its Assessment with Update

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Abstract

Obesity word comes from Latin language "Obesitas" indicates stout, fat or plump nature. The fatness in person more than their usually body requirement or having BMI more than 30 is known as obese person. An obese person is in severe condition that it can lead to further more diseases like hypertension, diabetes, myocardial infarction, peripheral vascular disease, stroke, heart attack, etc. The number of obese person is increasing day by day in the world. Obesity is generally caused by eating too much and moving too little. In the event that you consume high amounts of energy, especially fat and sugars, but don't burn off the energy through work out and physical action, much of the excess energy will be stored by the body as fat. It has been detailed that in the event that we adjust the good nourishment and diminishing terrible nourishment such as fast food or junk food and adjusting good life style like waking up and running, gym workout makes a difference to decrease in the obesity. Other strategies are moreover accessible for treating obesity like Acupuncture, Hot spa, Medication but the lifestyle and diet are find to be key role player in treating obesity. A survey questionnaire was planned and reaction was reported online in google form. An obesity study is conducted with 212 people’s responses gotten through web against 17 questions/query asked. The questions are related to their life style, diet and medication which is particularly related with their diet propensities. The detailed response data recorded on a basis of structured questionnaire and response against each question was presented in percentages. The survey revealed that life style, diet and medication which is particularly related with their diet propensities plays major role in the management of obesity.

Keywords: Obesity; Survey; Life style; Diet and medication
Antimicrobial Medicinal Value of the Melaleuca Alternifolia (Tea Tree oil) as Contemporary and Alternative Medicines in Dermatology

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Abstract

Hippocrates and physicians essentially used herbs, plant oils for an assortment of ailment. Tea Tree Oil, also known by the name Melaleuca Oil, is extracted by steam distillation from a plant native to Australia called Melaleuca Alternifolia. Melaleuca Oil is an essential oil with enormous prospective to treat skin infections and dermatological ailments due to its antimicrobial, antiviral, antibacterial properties against the wide range of microbes, bacteria and virus. Tea tree oil exhibits antifungal, anti-inflammatory, antioxidant, anticancer, anti-psoriasis, anti-acne, anti-pruritic, acaricidal activity and many more activities that are therapeutic have been reported. A terpinen-4-ol compound present in the melaleuca oil in high amount is responsible to reduce the inflammation and act as potent anti-inflammatory activity. The different therapeutic activity of Tea Tree Oil is under research and different scientific pool data will reveal many therapeutic activities of the oil. Using of the tea tree oil along with conventional dosage form or novel formulation will open new horizons in the dermal skin treatment.

Keywords: Tea Tree Oil; Melaleuca Oil; Antifungal; Terpinen-4-ol; Skin infection; Dermatological; Antimicrobial
Annona muricata (Custard Apple): A Potential Agent for the Treatment of Cancer

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Abstract

Cancer is a disease which has spread universally and is affecting a major part of population. Various plant parts produce secondary metabolites and many of them have been investigated for anticancer properties. Many have even entered into clinical trials. As per WHO reports, there are 1 in 6 deaths due to cancer globally. About 75 to 80% of the world population use herbal medicines, mainly in developing countries, for primary health care because of their better acceptability by human body and lesser side effects. Annona muricata, also known as “Graviola” or “Custard Apple” has been consumed traditionally to maintain good health. Different parts of A. muricata are used in alternative systems of medicines for the treatment of various diseases like cancer, inflammation, diabetes and abscesses. The plant has been screened for its beneficial activities like anticonvulsant, antiparasitic, antiarthritic, antimalarial, anti-diabetic, hepatoprotective and anticancer activities. Graviola extracts have shown significant anticancer effects in a number of cancer cell lines both in-vitro and in-vivo. Chemical characterization studies have indicated that annonaceous acetogenins are the main ingredients of Graviola. Annonaceous acetogenins have now been characterized as a family of natural products with antitumor activities. These are the important phytoconstituents which are capable of blocking ATP production in the mitochondria. Existing conventional cancer therapies are known to be highly toxic with severe side effects that also affect the quality of life of the patients. New drugs need to be developed/ investigated that include bioactive natural molecules such as Graviola that do not have toxic side effects and are selective in killing cancer cells but do not harm the normal healthy host cells. Thus, an alternative approach to anticancer therapies should involve the determination of novel drug targets that must be highly effective and specific against cancer development and growth, non-toxic to the host cells and affordable for the patients.

Keywords: Annona muricata; Acetogenins; Cancer; Graviola; Anticancer
Impact of Slow Release Inorganic Fertilizer Under Wheat Cultivation
(*Triticum aestivum*)

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Abstract

Wheat (*Triticum aestivum* L) is the second most essential staple food. It is one of the
extensively cultivated cereals in the temperate region with both human consumption and
feeding utilization. Ecological diversity among Indian subcontinent favors wheat cultivation
throughout the country. Chemical fertilizers are main input elements for plant growth and
development. Urea is the majorly utilized fertilizer by the farmers. Excessive input of urea
creates some problems of residual effect concerning environmental degradation. So in terms
of new approach use of Neem coated urea (NCU) leads to the slow release of nitrogen in the
field enhance inhibit nitrogen losses due to leaching. The application of N through NCU
and normal urea increased the wheat grain yield significantly with increasing levels of N at
different state. Neem coated urea, NPK, and vermicompost were used for this experimental
with 7 treatments and 3 replications. Data was collected at 45, 60 and 90 days after sowing
the crop. There is a significant variance follows in various agronomical traits like no of
tillers, plant height, no of panicles, length of panicles. In this study, the results shows
significant increase in yield and yield attributes with the application of NCU in comparison
with normal urea.

Keywords: Cereal; Fertilizers; Neem coated urea; Parameter; Wheat
Recent Advancements in the Treatment of Parkinson’s Disease: A Brief Review

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Abstract

Parkinson's disease (PD) is a debilitating and progressive neurodegenerative disorder. Alpha-synuclein plays significant pathogenic role in PD. PD is also associated with non-motor symptoms like sleep disorders, autonomic symptoms, and neuropsychiatric symptoms. Advanced condition of PD is mainly comprised of symptoms like freezing, falling and neuropsychological dysfunction. The present therapy is mainly relied on the dopamine supplementation by using different drugs e.g. levodopa and/or dopamine receptor agonists. Many advancements happened in the treatments strategies for this condition. It includes immunotherapy against alpha-synuclein as one example. Currently few invasive techniques like subcutaneous or intraduodenal delivery of anti-PD drugs, or surgical techniques by stimulating the subthalamic nucleus gaining popularity. When L-Dopa/carbidopa infusion is continuously administered in the jejunum provides continuous dopaminergic drug delivery and stimulation and reduce motor complications. Continuous dopaminergic stimulation reduces severity and occurrence of the L-Dopa associated motor fluctuation and dyskinesia. Another compound, baicalein found to attenuate behavioural impairments and depletion of dopaminergic neurons in PD rats. In this review, all the advancements in the drug therapy of PD has been reviewed.

Keywords: Mitochondrial dysfunction; Alpha-synuclein; Parkinson's disease; Dopamine
Vitamin D: A Therapeutic Agent

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**Abstract**

Vitamin D is a tremendously essential vitamin that has an influential effect on several functioning of our body. Vitamin D is a hormone which is fat-soluble synthesized in response to sunlight and crucial for the maintenance of bone and muscle health of the body. Nowadays, sunlight exposure is limited due to lifestyle and other choices that make it difficult to obtain enough vitamin D from diet only. It is important for strong bones because it helps to absorption calcium from the intestine. Vitamin D functions through two of the mechanism that is endocrine as well as an autocrine mechanism in our body. Vitamin D is of two major types of vitamin D2 (ergocalciferol) and vitamin D3 (cholecalciferol). The concentration of vitamin D is needed to be maintained for the functioning of the metabolic, immune, reproductive, muscular, skeletal, respiratory and cutaneous systems of people of every age group. A rough estimation indicates that near about 1 billion people from all age groups are suffering from the deficiency of vitamin D which can be the cause of various diseases like heart diseases, bone disorders, malignancies, rheumatoid arthritis, diabetes and many more. Calcitriol is a hormonally-dynamic, synthetic, vitamin D analogue recommended for the treatment of hypocalcaemia, osteoporosis, and prevention of corticosteroid-induced osteoporosis. This review represents role of vitamin D, its deficiency and diseases related to vitamin D and calcium absorption with the help of vitamin D.

**Keywords:** Vitamin D; Vitamin D deficiency; Calcium absorption; Hypocalcaemia
Biochemical Markers of Adrenal Insufficiency

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Abstract

Adrenal is one of the most important endocrine glands of human body. The adrenal insufficiency can lead to life-threatening disorder. The main cause of this disorder is due to failure of the main adrenal gland to produce hormone or due to secondary disease of adrenal glands, a kind of deterioration in the pituitary hypothalamus axis. It is a rare disease having less prevalence and fewer than 1 million cases in India. The prevalence of this among the general population is 4-6 people in a lakh. The main clinical sign and symptom for adrenal insufficiency starts very slowly and it includes weight loss, anorexia, muscular weakness, abdominal pain, tiredness, salt craving. These symptoms are first discussed by Thomas Addison in 1855 and called as cardinal clinical symptoms. In the case of primary adrenal failure, the skin has hyperpigmentation. The important biomarkers for the adrenal insufficiency include increase in the potassium ion, called, hyperkalemia (> 5 mmol/l), decrease in the sodium ion, called, hyponatremia (< 135 mmol/l), decrease in blood pH (called acidosis) (pH<7.35), increase in calcium ion (hypercalcaemia) (>2.5mmol/l) and also rise in adreno Corticotropic hormone (ACTH). There are a number of highly sensitive confirmatory tests are available such as basal serum cortisol, basal plasma corticotropin, urinary free cortisol, standard- dose corticotropin test, insulin tolerance test. In this article, we are basically focusing on new emerging techniques used in the diagnosis of adrenal sufficiency.

Keywords- Adrenal insufficiency, Serum, Cortisol, Corticotropin, Insulin tolerance.
Current status of Phytomedicines in the Management of Dengue fever

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Abstract

Dengue fever is an infectious viral disease. It is transmitted by Aedes mosquito. It is the leading arboviral disease in humans. In the recent epidemiology of the disease, drastic changes are noted in the morbidity, mortality and geographical expansion. The viral circulation virulence and vectorial resistance have enhanced. The various clinical pattern, diagnostic method, and pathogenesis are reviewed. It is presently threatening half of the world’s population and remains a puzzling disease in many aspects such as virus vector, host-viral relationship. In this respect, dengue fever appears as a model of the viral disease. According to the World Health Organization (WHO), 50-100 million people are suffering from dengue annually. In the current era, most researchers are showing their keen interest towards nature, so that the herbal medicines could use locally, validate and analyse to evaluate its mechanism, safety, and efficacy. The current herbal approach is trying to provide the accurate and deep understanding of the pathophysiology of the disease. More efficient tools for disease control and an efficient plant extracted medicine in near future are needed to be discovered. Plants based medicines are getting more popular over the conventional therapies due to its several benefits in terms of safety and fewer side effects. Phytomedicines such as neem, papaya, pippli, bitter melon etc. shows an inhibitory action against Aedes mosquito. These formulations help to enhance the count of platelets and rapid recovery. The main objective of this article is to review the causes, pathophysiology, and use of herbal preparations to control as well as to cure an emerging disease like dengue.

Keywords: Herbal medicines; Dengue; Pathophysiology; Conventional therapies
Hepatoprotective Effects of *Epigallocatechin gallate* via Mitochondrial Permeability Transition Pore in Paracetamol Induced Hepatotoxcicity

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**Abstract**

Paracetamol (PCM) is a widely used as antipyretic throughout the world. Overdose of PCM is linked to many cases of hepatic failure and death in many countries. PCM is also used as an experimental model of hepatotoxicity screening. The protective efficacy of Epigallocatechin Gallate (EGCG) in PCM induced liver injury has been evaluated in present study. Rats were treated with 40 mg/kg body weight of PCM alone or with EGCG (40 mg/kg), Atractyloside (ATR) 5 mg/kg a potent Mitochondrial Permeability Transition Pore (MPTP) opener is given and combination of EGCG & ATR pretreated PCM also given in one group. *Serum glutamic oxaloacetic transaminase* (SGOT), *Serum glutamic pyruvic transaminase* (SGPT), bilirubin, TBARS and superoxide dismutase (SOD) in liver tissues had been predicted 6 hrs after PCM and EGCG treatment. EGCG was shown to be efficient in reducing aspartate transaminase (AST) and alanine transaminase (ALT) released from liver hepatocytes. EGCG also inhibited production of TBARS whereas supplementation with EGCG maintained near normal SOD level in liver of PCM treated rat. ATR treated also cause increase in liver injury as compared to the combination of EGCG+ATR pretreated PCM. Histopathological examination of liver samples revealed reduced necrotic areas (47%) in EGCG treated PCM group compared to PCM alone treated group. EGCG treatment also prevents hepatocytes DNA fragmentation compared to PCM treated group. The survival test conducted confirmed that rat receiving PCM + EGCG are more resistant to the deleterious effect of PCM overdose than PCM alone. ATR indicates a change in liver cellular as examine to EGCG+ATR pretreated PCM. This examine showed the hepatoprotective activities of EGCG may be due to closing of MPTP in PCM prompted liver damage version in rat.

**Keywords:** EGCG; Green Tea; Hepatoprotective; Liver
Abstract

Herbal drugs are quite popular these days and have been for several years, as an alternative to manmade prescription. In contrast to conventional medications, unconventional treatments like herbs have little or no actual scientific basis so that doctors can guide their patients regarding proper usage or potential toxicity. Although herbal products are advised as “natural” they are not necessarily natural to human body. Unlike normally prescribed drugs the herbal drugs need not to be tested so strictly to prove that they work well and safe. Also they may not be pure. They might contain other ingredients example plant pollen and sometimes they contain other drugs which are not listed e.g. steroids or estrogens. Some of such side effects include headache, high BP caused by ephedra, nausea, diarrhea, allergy caused by garlic. Herbal drugs also have large batch to batch variability which also contributes as a source of side effects. In addition, the potency of herbal drugs may increase the possibility of adverse effects. It is concluded that adverse effects of herbal medicines are an important neglected subject in pharmacology, which deserve further systemic investigation.

Keywords: Herbal drugs; Adverse effect; Nausea; Pharmacology
Review on Phytoconstituents and Their Biological Activity

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Abstract

Phytoconstituents occur naturally in plants with various chemical compounds containing specific biological activity. Phytoconstituents are used by plants for their protection known as secondary metabolites. These are bioactive compounds having plant medication properties. These phytochemicals are essential nutrients of plant. Plant derived chemical compound have chemo-retentive properties and they are used to treat illness from the ancient time till today. The phytoconstituents contain polyphenols have antioxidant, radical scavenging and antimicrobial activity, alkaloids have antifungal, cytotoxic and anti-inflammatory activity, glycosides have aconitine-type sesquiterpene glycoside inhibitory activity and anti-tumor activity, saponins have immunomodulator and hemolytic activity, terpenes have enzyme inhibitory antimicrobial activity, tannins have anti-ulcer and anti-radiation activity, anthraquinones act as anti-proliferative agent and have anti-biofilm activity, steroids have estrogenic activity and essential oil contain halanogenic activity. Different types of phytochemicals contain specific pharmacological activities which is use for medicinal purpose of various diseases.

Keywords: Phytoconstituent; Immunomodulator; Anti-biofilm; Halanogenic
Pharmacological Actions of *Sinomenium acutum*: A Brief Review

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**Abstract**

Sinomenine is an alkaloid, found in the roots of the climbing plant *Sinomenine acutum*, which is a popular Chinese medicinal plant. The SA contains alkaloids, sterols, phospholipids, and some other components. Now a present day studies it is confirmed that, SA have therapeutic benefit in rheumatic disease. SA has various pharmacological actions like analgesic, anti-arrhythmic, anti-inflammatory. It is a morphine derivative which related to opioids such as levorphenol. It is reported to have activity against oligomeric Aβ. It supports its neuroprotective potential, specifically to hippocampal cells. Sinomenine (SN), it’s a bioactive alkaloid which has anti-inflammatory effect against neurological disorder. The current review mainly focuses on the immune system, cardiovascular system, and nervous system actions of this plant.

**Keywords:** *Sinomenium acutum*, rheumatic disease, sinomenine
Significance of Anupana (Vehicle) in Treatment

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Abstract

Nowadays, medicine is considered to be whole treatment for a disease. However, medicine is just one component of treatment; a lot of people neglect the other very significance components like drug administration, diet, exercise, etc. Drug administration is called as Bheshajaavacharanavidhi in ayurveda constitutes a concept of anupana which has been given a very crucial role in treatment. Anupana is considered as integral part of chikitsa(treatment) in ayurveda. Anupana (vehicle) is a substance which is used to administrate the drug with it or it may be used after the administration of the drug (depending upon the prescription of physician). In this review, we have been discussed about role and benefits of anupana in treatment of diseases.

Keywords: Anupana; Drug administration; Bhashajaavacharanavidhi
Chemopreventive Potential of Triphala (A Composite Indian drug)

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Abstract

In present scenario, the combination of fruit powder of three different plants namely *Terminalia chebula*, *Terminalia belerica* and *Emblica officinalis*, commonly known as Triphala, is considered as a trustworthy ayurvedic combination with medicinal values. The formula is comprised of equal parts of three myrobalans taken without seed. Amalaki or amla is well known for its cooling effect that manages pitta, thus, supporting the natural functioning of the liver and the Immune system. Bibhitaki is particularly good for kapha, supporting the respiratory system as well as kapha accumulation in all systems. Triphalais used in liquid extract and can be incorporated in tea and powder. It contains several compounds that have been proposed to be responsible for its claimed health benefits, including carbohydrates, vitamin, minerals, sodium, dietary fibres, gallic acid, chebulagic acid, and chebulinic acid. Benefits of Triphala is that it boosts immunity and reduces inflammation, lowers cholesterol, prevents cancer, prevents viral and bacterial infections and has antiallergic properties, improves removal of stored fats from the body, treats dandruff. The side effects and allergies of triphala are there, even though triphalachurna is a safe choice, there are a few risks involved. Breastfeeding mothers should avoid taking triphala as the herb present in it, can be passed on to the child via breast milk and can be harmful, therefore, it must not be consumed more than a pinch by babies as it can lead to diarrhea and other stomach troubles. A diabetic person should consult the physician before consuming triphala. Bloating problems only arise if this is taken in excessive. So, if one is already suffering from gastric troubles, take mild dosages. The cultivation of triphala consists of three fruits, i.e. Haritaki, Amalaki, Bibhitaki. Haritaki are indigenous to Southern Asia. Haritaki trees are grown from seeds. This plant is grown in clay and sandy soil during spring season. The growth of this plant requires full sunlight and high amount of water. Such trees are not grown in cold temperatures but the mature plants can tolerate the low temperatures. The fruits are only collected when they develop green color. Amalaki has its origin in India. For amalaki cultivation, annual rainfall of 630-800 mm is ideal; the baby young plant should be protected from the hot winds during summer and the frosts during winter for 3 years. Light and medium heavy soils, except purely sandy soil is ideal to grow amalaki. Bibhitaki has its origin in southern Asia, within lower the hills and plains.

Keywords: Triphala; Ayurveda; Amalaki; Haritaki; Bibhitaki; Immune; Respiratory; Diabetes
Nanobots: A Futuristic Drug Delivery Technique to Combat Diseases

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Abstract

Nanorobots or Nanobots are the revolutionary controllable nanotools ranging from few millimeters to few micrometers in size. Their scope in the medical and healthcare industry is immensely extensive. Targeted drug delivery and eradicating diseases like diabetes, neoplasm, hepatitis, kidney stones removal etc. are the main goals of these nanobots. It offers a plethora of advantages over the conventional medical drug delivery techniques like the action of the drug on targeted location, enhanced bioavailability, control over the dosage and frequency of release of the drug. These specialized machines have the potential to avoid risks and side-effects that arise due to conventional techniques like chemotherapy in which healthy tissue also get harmed along with cancerous cells. These nanorobots are getting huge momentum from around the world and will expectedly gain acceptance within a few decades owing to its merits over conventional methods for treating diseases.

Keywords: Drug delivery technique; Nanorobots; Neoplasm; Hepatitis; Chemotherapy
Role of Solanum Tuberosum Vitelotte as a Lead for Colon Cancer: A Review

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Abstract

A variety of the food products in form of brightly coloured fruits and vegetables are found to contain various antioxidants and other components which are known to improve the health condition. Last few years have seen a tremendous increase in the research and development of the models including the topic of anthocyanins. Anthocyanins are antioxidants that are present majorly in purple coloured vegetables and fruits, e.g. Pigmented potato (Solanum tuberosum L.) variety constitute an important source of anthocyanins. Solanum tuberosum L. var. Vitelotte, a potato variety is undergoing research, as the pigments responsible for its attractive color belong to the class of anthocyanins. The potato variety has been conformed to show anti-microbial, anti-proliferative, and anti-oxidant effects. The problem of obtaining pure pigment is still a drawback, which hinders the study of bioavailability, biotransformation, bioactivity, and modes of action of the pigment. Apart from other effects, anthocyanins have been reported to pose an anti-cancer effect, thus they can be of great use in the future. Pure anthocyanins and anthocyanin-rich extracts from different fruits and vegetables have shown anti-proliferative activity when tested against multiple cancer cell types in vitro. The mode of action is thought to be inhibitory control on the regulatory proteins and the blocking of the cell cycling process.

Key words: Purple potatoes, Anthocyanin-rich extracts, Antimicrobial activity, Cell proliferation.
Citrus medica: An Overview

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Abstract

The bijora nimbu Citrus medica belongs to citrus family. It is having a large aromatic citrus fruit along with thick rind. Bijora nimbu swarasa (shelf expressed juice) is used as bhavana dravya in various Ayurvedic formulations. The use and method of preparation of dried extract (nimbu satwa) of fruit is well described in classical literatures of Ayurveda. It is also used as major source of antioxidants and important ingredients of various classical and proprietary ayurvedic formulations like shankh vati and Eno, both the formulation is commonly used in the relief of Acidity, Gastric pain. The objective of present paper is to review the literature of Citrus medica Linn., a commonly used herb in Indian system of medicine the present paper will be highlights the review based on botanical description of plant, physical, chemical and pharmacological properties like analgesic, hypoglycaemic, anticancer, antidiabetic, hypolipidemic, insulin secretagogue, anthelmintic, antimicrobial antiulcer and estrogenic. Searching strategy based on google scholar search, PMC google patents and literatures based on Indian system of medicine.

Keywords: Citrus medica; Lemon; Shankh vati.
Prediction of Prospective Anti-Parkinson Phytochemicals using PASS Software to Justify 3R’s Ethics of In-vivo Evaluation

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Abstract

Parkinson's disease (PD) is a chronic progressive devastating disease of dopaminergic neurons characterized mainly by muscular rigidity, tremors, and dyskinesia. In present scenario, it is affecting more than 1% population above 50 years of age and hence is an important concern in society. Advancement in research field in recent decades has led to upsurge the use of animals for evaluation of new drugs. In contemplation of upward trend in use of animals, PASS (prediction of activity spectra of substances), a web tool, provides an informative prediction data for different pharmacological activity of compounds without using the animals which justifies the 3R’s ethics (Reduction, Replacement, and refinement) to be followed for before In vivo evaluation. For prediction of pharmacological activities of anti-parkinson compounds, canonical smiles of phytochemicals were obtained from Pubmed and used in the software for prediction of relevant pharmacological activity so that phytochemicals, showing best results can be further explored for In-vivo evaluation against PD. This article describes the utility of PASS to justify the 3R’s concept which is to be followed for the further in vivo exploration of compounds.

Key words: Parkinson's disease; PASS; Reduction; Replacement; Refinement
Stem Cells and Stem Cells Therapy for Cancer Treatment

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Abstract

Stem cells are the special types of cells of the body that have the ability to differentiate into any type of cells. They have a unique property to self-renewal and it can also replicate itself for a long period of time. They are derived from different types of cells like embryonic stem cells, adult stem cells, placental stem cells, fetal stem cells and umbilical cord stem cells etc. Nowadays stem cells have propensity to cure over 50000 diseases such as Brain stroke, Alzheimer’s disease, Parkinson’s disease (Neurological diseases), Multiple myeloma, Leukemia, Lymphoma and Thalassemia. Scientists from different countries they are using stem cells in vitro to invent new drugs as well as new therapy for the treatment of cancer. Today more than 1200 clinical studies are being conducted for the treatment of cancer due to their screen potential anti-tumor drugs. Aim of this abstract is to give concentration on the recent developments of the stem cells in cancer treatments. Now we can consider stem cells as a foundation of the cancer treatment.

Keywords: Stem cells; Neurological diseases; Cancer; Multiple; Myeloma
Ophthalmology and Lifestyle Disorders

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Abstract

Life style disorder defined as disease linked with the way people live their life. This is commonly caused by alcohol, drug and smoking abuse as well as lack of physical activity and unhealthy dietary habits. These life style exposures are significantly associated with risk of several different diseases which may lead to different ophthalmological conditions. Prevalent rate of these diseases in today’s scenario are diabetic retinopathy 22.4%, cataract 22.9% and retinal diseases 11.5%. A WHO report opines that in many middle income and industrialized countries eye condition have emerged as potential threats to the status of sight and their populations. These being diabetic retinopathy, glaucoma, age related macular degeneration, cataract, retinal vein occlusion disease and dry eye. Out all these life style diseases the most contributing factors affecting visual health are metabolic syndrome, obesity, diabetes, hypertension, dyslipidemia etc. WHO and Indian Govt. both are setting forth many programs to counter attack this emerging health trend. To combat these situations Ayurveda can also offer many management skills which are put forth in this article.

Keywords: Lifestyle disorder; Glaucoma; Metabolic syndrome; Dyslipidemia
Ayurvedic Management of Hemifacial myospasm: a case study

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Abstract

Hemifacial myospasm, a medical condition characterised by a brief or persistent involuntary spasms or contractions of muscles innervated by facial nerve. This neuromuscular disorder is approached by modern science through repeated use of botulinum injections or surgical interventions like Microvascular decompression surgery, etc. Objective- To assess the efficacy of Abhayanga emphasizing Marma points & facial nerve supply routes in face, Nasya Karma, Gandusha & Samshamana Ausadhi in the management of hemifacial myospasm. Methods- The present case is a female aged 55yrs suffering from hemifacial myospasm since last 2yrs, to whom Abhyanga, Nasya Karma, Gandusha & Samshamana Ausadhi was administered. Observation & Results- At the time of admission of the patient she suffered from left sided twitching of facial muscles 50times/min and pain in the cheek & mandibular region. After completion of the treatment regimen (2 months) highly significant result was observed. The patient was completely cured of the symptoms, i.e., absence of twitching of facial muscles of left side of face & pain. During the course of follow up (for 1mth) the patient reported that there is occasional twitching of facial muscles in case of severe stress or strain for 2-3min. Conclusion- Treatment with the aforesaid regimen has successfully treated this case of hemifacial myospasm within 2months.

Keywords: Hemifacial myospasm; Nasya Karma; Abhyanga; Marma points
AYURVEDA AS AN ADJUVANT THERAPY IN CANCER MANAGEMENT

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ABSTRACT

A review of articles published in different reputed journals of cancer care suggests that patients under combined modality therapy (coordination of medical oncologist, radiation oncologist & surgeon) of cancer treatment experience Adverse Events (AEs), which included constitutional symptoms, gastrointestinal complications & pain; approximately half of these AEs were nonlaboratory symptoms. The most common reason for withdrawal from studies was disease progression, followed by adverse effects. Thus, it can be inferred that high rates of AEs lead to earlier dropouts in cancer trials. Complications during cancer treatment modalities includes- complications due to disease, complications of treatment, psychosocial problems, & long-term follow-up/late complications. Most awful symptoms during the treatment regimen being nausea/vomiting, febrile neutropenia, myelosuppression, pain, systemic infections, effusions, & decrease in nutrient intake leading to considerable weight loss/cachexia & alteration of intermediary metabolism. Ayurvedic combinations with formulations including single drugs like Gvarras, Sadabaharras, Panchatulasiras, Giloyras & combination drugs like Rasayan Churna, Noni plus tablet & Yastimadhu Ghrta, etc have proven to be effective medicines when given in between consecutive chemo/radiation therapies. Ad hoc modifications of standard protocol with intermittent ayurvedic herbal supplements have proved to subside the three type of emesis (acute, delayed & anticipatory), alongwith alleviating complications like pain, diarrhoea, fever, etc. It normalizes nutrient intake, thus avoids cachexia. Supportive herbal therapies increases the quality of life, have positive impacts on psychological factors & sometimes check the progress of the disease. Ayurvedic interventions alongwith combined therapies reduces cost of treatment with substantial decrease in relapse of disease, improved outcomes & decreased AEs at relatively low expenses of the patient.

KEY WORDS: Palliative therapy, Supportive therapy, Panchatulasiras, Rasayan Churna
An Ayurvedic Preventive Protocol and Curative Approach to Hypertension

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Abstract

Hypertension is a medical condition resulted due to persistent elevated pressure in the arteries. Its enormity can be assessed by the conglomeration of grave diseases it can result into affecting heart, brain, kidney & peripheral arteries. Considering the high prevalence & disastrous consequences of hypertension there is a need to look for alternative medicines. Ayurvedic science is chiefly based on treating diseases by addressing three aspects at a time: Ahara, Vihara & Ausadha. This holistic approach is gaining momentum now-a-days to treat diseases influenced by both environmental & genetic factors like hypertension. Recent studies have revealed about successful administration of Ayurvedic therapies & medicines in cases of hypertension. This study is a brief compilation on different aspects of hypertension & the interventions which can subdue them. Broadly hypertension patients can be approached according to Haemovascular dysfunction & Stress induced cases while treating. A patient of Haemovascular dysfunction can be managed by performing Virechana Karma, Basti, Sarivadyasava, etc. Atherosclerotic changes can be addressed by use of Chedana drugs like Bibhitaki, Hridyarnava Ras, etc. Cases with increased viscosity can be treated by giving Raktaprasadaka Ausadhi & Tikta Rasa Ausadhi like Guduchi. Diuretics like Gokshura, etc also have immense effect. While treating Stress induced conditions drugs like Sarpagandha, Medhya Rasayana, etc can be prescribed.

KEYWORDS: Hypertension, Medhya Rasayana, Diuretics, Stress
PREVENTION AND CURE OF STHOULYA

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Abstract

Lifestyle disorders are associated with the way a person or group of people live their life. Sthoulya (Obesity) is one of them, characterized by an excess of body fat due to eight factors as told by Acharya Charak in sutra sthan. Acharya Charak mentioned about Sthoulya is “Satatam Vyadhitaav” and described it under Asthanindit purusha. People with Sthoulya invariably affected with several diseases like- Cardiovascular diseases, Type 2 diabetes, Obstructive sleep apnea etc. Sthoulya is a general growing medical condition in world wide. Our ancient Maharshis have given special emphasis on maintenance of health as they followed the principle of prevention is better than cure. In order to maintain an equilibrium of physical and mental well being they have prescribed Dincharya, Ritucharya, Pathya ahar-vihar and Sodhan Chikitsa. If any individual due to time constraints etc can not follow the aforesaid module and becomes a victim of life style disorders like obesity than the prescribed protocols of Vaman, Virechan, Lekhan basti, Nitya shodhan, Arogyavardhani vati, Agnimantha, Kutki, Vyoshadi vati, Medohar guggulu, Gomutra, Guggulu, Ruksha anna etc should be used. This study aims at compiling facts related to prevention and management of obese persons and inturn decrease the associated diseases like Diabetes mellitus etc.

KEYWORDS: Sthoulya, Obesity, Lifestyle
Ayurvedic & Yogic Management of Scalp Psoriasis – A Case Study

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Abstract

Introduction- Scalp Psoriasis, a non-contagious inflammatory condition of scalp characterized by silvery scaly patches & flaky skin associated with itching, burning sensation, hair loss & bleeding caused by scratching. It is a site variant of Plaque type of Psoriasis. As per Ayurveda, it is co-related with Ekakustha. Objective- To assess the efficacy of Virechana Karma, Samshamana Ausadhi & Kunjal Kriya in the management of Scalp Psoriasis. Methods- The present case is a female aged 31yrs suffering from scalp psoriasis since last 5yrs, to whom classical method of Virechana Karma was administered followed by Samshamana Ausadhi intake along with practice of Kunjal Kriya & was also advised to take Carrot juice daily. Observation & Results- After completion of the treatment regimen (31days) highly significant result (100% improvement) was observed. The patient was totally cured of the symptoms, i.e., silver scaly eruptions & itching was relieved fully with improvement in hair fall. During the course of follow up (for 6mths) no remission of the disease was reported. Conclusion- Treatment with the aforesaid regimen has successfully treated this case of persistent scalp psoriasis within 31days.

KEYWORDS- Scalp Psoriasis, Virechana Karma, Kunjal Kriya, Carrot juice
Evaluation of the Protective Effect of Apple Peel Extract in Chromium Induced Oxidative Stress

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Abstract

There has been an increasing appreciation and understanding of the link between dietary fruit and vegetable intake and their peel with improved health in humans. Peels of various fruits and vegetable are generally considered as waste product and are normally thrown away but these are reported as a great source of antioxidants. In the present study the protective effect of methanolic extract of different varieties of apple peel in chromium induced oxidative stress was evaluated. Administration of potassium dichromate for 3 weeks orally in positive control group resulted increase in free radical level and caused oxidative stress. Different varieties of apple peel such as Buckingham, Golden Delicious and Red Delicious were collected from different areas (Kumaon, Kashmir and Himachal Region). Ethanolic extract were prepared by soxhlet method and the concentrated extract at different dose level used for evaluation of the oxidative stress parameters in blood serum such as GSH, LPO and SOD. The treatment groups (T1, T2 and T3) after oral Administration of methanolic extract of apple peel in two dose levels (a) 250mg/kg of body weight and (b) 500mg/kg of body weight were studied for 21 days for all the biochemical parameters and then compared with the positive control group. Among all the treatment groups, group T3 (b) (Red Delicious) at 500 mg/kg of body weight was shown high potential antioxidant activity as compared to positive control group.

Keywords: Apple peel; Antioxidants; Potassium dichromate; Oxidative stress; Soxhlet method
Recent Trends on *Catharanthus roseus* (Sadabahar) Extract in the Management of Diabetes

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**Abstract**

In the current era, lifestyle diseases are spreading at a higher pace so much so that, as per the recent studies it has been stated that till the year 2020, one member of each family will be suffering from one of such lifestyle diseases, that is Diabetes. We all are aware of the fact that in today’s stressful environment and food stalls full of processed food, it is very difficult to keep away with such diseases. Diabetes is a hyperglycemic disease in which the release of insulin hormone that is required for glucose metabolism starts decreasing leading to the higher blood-sugar level. Since Diabetes is a hormonal disorder, permanent treatment is very rare and allopathic medicines taken for a longer period of time may lead to certain side effects. People are now getting more concerned about the probable adverse drug reactions and are willing to pay more in the desire of getting rid of such risks. Thus, an organic approach towards the management of such disease may resolve this issue. *Catharanthus roseus* (Sadabahar) is having antihyperglycemic properties in it and it is being used in some ayurvedic preparations in the form of churna or juices as well. The prescribed dose along with proper diet and exercise has been found to be effective in maintaining the blood sugar level as well as cholesterol and thus eventually helps in weight loss and cardiovascular disease preventions. Since India is leading the world in the number of cases registered for Diabetes, this study carries a significance in finding a new drug delivery for diabetes management and may help in resolving this matter of higher concern.

**Keywords:** Diabetes; *Catharanthus roseus*; Churna; Antihyperglycemic drug; Lifestyle disease
Prevention in Lifestyle Disorders with Ayurved and Yog

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Abstract

Today, in the era of globalisation everyone is facing lifestyle disorders. It is a matter of concern for every individual to stay fit and fine by using the assets for life like yoga as it the best solution to get rid of these lifestyle disorders. By following these assets for healthy and fit life *i.e.* YOGA and AYURVEDA, we can live a healthy and prosperous life. As it is an immediate relive to stress, tension and anxiety. And it even increases the physical strength and endurance of body to do work with full enthusiasm. But now a days, people are fully embedded in there day to day life prob. Which leads to physical and mental problems. Which further leads to life threatening disorders like diabetes, hypertension, obesity, cancer, & so on. But people should not to be worried when YOGA is here. As various researchers had done researches on YOG they got to know the credibility of YOG in evading these disorders. As mentioned in Indian traditional shastra Rigveda “YOG IS A GROUP OF PHYSICAL MENTAL AND SPIRITUAL PRACTICES”. According to Atharvaeda “RITUCHARYA, DINCHARYA. SADVRUITA, AHAR VIHAR, POSTIVE THOUGHT POSTIVE REACTION GIVES HEALTHY LIFE”. Ayurveda and YOGA should be considered as a primary healthcare therapy. Ayurveda & YOG activities gives everyone happiness, positive attitude which is an important part to grow human, society and nation for prosperous health life. Asana, pranayama, a spiritual posture with deep breath control leads meditation, concentration and key to life success. Latest statistics shows YOGA improves life style and solve disorders like cardio vascular, breathing, digestive, sleep, anxiety, hypertension and mental intellectual system. when we are with natural Jeevan shelly and YOGIC system we feel like birds flying in the sky with freedom and no stress no fear only positive attitude.

**Keywords:** Yoga; Ayurveda; Hypertension; Obesity; Cancer
Prevention and Rehabilitation in Life Style Disorders—An Ayurvedic Approach

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Abstract

Lifestyle means linked with the way people live their life. Lifestyle diseases are those which occur because of our living habits and environment under which we live. Thus they can be classified under the headings of communicable and the non-communicable diseases. Communicable includes illness transmitted by direct and indirect contact. Direct contact is via bodily contact and indirect contact is that which are shared via air and water contact. Non-communicable diseases (NCD’s) are the one which are caused by fast changing lifestyle in developed and developing countries. As per WHO NCD’S are estimated to cause 61% of mortality rates in india and 70% globally. Majority of NCD’S include heart diseases, stroke, cancer, diabetes and many more. WHO estimates that by 2030, mortality rate will increase to 52 million because of NCD’S. hence, prevention of the healthy people and rehabilitation of the affected individuals should be the chief area of focus in lifestyle disorders. Causative agents include genetic, physiological, environmental, and behavioural factors. Driving risk factors include physical inactivity, unhealthy diets, tobacco and alcohol abuse, low resources, dyslipidemia and rapid unplanned urbanization. Ayurveda magnetizes the population with its allurements of bio-purification procedures (panchkarma), dietary regimens, daily schedule regimens and rejuvenation therapies and recommended asanas for holistic health. Thus ayurveda gives population a key to holistic approach i.e, physically, psychologically and spiritual as well for maintaining healthy body and mind. Rehabilitation means a set of measures that enable individuals who experience or are likely to experience disability, to maintain their optimum functioning in their interaction with environment and ayurveda provides this rehabilitation very effectively via rejuvenation therapies, panchkarma procedures, asanas and pranayama.

Keywords: lifestyle; Spirituali; Environment; Holistic; Ayurveda
Prevention and Rehabilitation in Lifestyle Disorders

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Abstract

Life in 21st the century isn’t really a cake walk. With our lives racing at unstoppable paces, it is wise enough to just slow down and deal with the severities that this lifestyle is offering. Lifestyle disorders are the main cause of mortality and morbidity not only in developed countries but also in developing countries too. The diseases like irregular sleep wake cycle, insomnia, stress, hypertension, obesity, constipation, type 2 diabetes are just a few to name. Ayurveda, the ancient science of medicine renders few of the best and time tested solutions to these disorders for it believes that the solution to all these disorders lies with in the ‘aahar’ and ‘vihar’ commonly known as the the ‘diet’ and ‘lifestyle’. Talking about prevention, it is not something that we don’t know rather it is something that we don’t bother to care about. Few points of knowledge might be: waking up before the sunrise, indulging in at least 30 min of physical exercise, healthy eating habits and so on. Prevention is also necessary because we ayurvedacharyas strongly believe in the wordings of our texts, one of which is quoted as: “Swasthasya swastha rakhshanam”. Coming down to the rehabilitation, the WHO defines it as the” measures that help individuals with disability or a disabling health condition, achieve and maintain optimum interaction with their environment”. Therefore we can say that the rehabilitation must include: Mano rog chikitsa commonly called the psychological treatment, yoga and pranayam, rejuvenating therapies etc.

Keywords: Aahar; Ayurveda; Lifestyle; Mortality; Rehabilitation
**Herbal Medicines Targeting Viral Infections**

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**Abstract**

Viruses are very minute germs, having their genetic material surrounded by protein coating. Different viral pathogens including coxsackie virus (CV), corona virus (CoV), dengue virus (DENV), entero virus 71 (EV71), hepatitis B virus (HBV), hepatitis C virus (HCV), human immuno deficiency (HIV), herpes simplex virus, influenza virus, measles virus, and respiratory syncytial virus (RSV) are responsible for complex syndromes. Absence of effective treatments for numerous viral infections, and the rapid emergence of new drug-resistant viruses have pushed for developing effective agents based on natural products to treat viral diseases. Various medicinal plant extracts, such as flavonoids, polyphenols, phenolics, terpenes, have been reported as active anti-herpetic agents. Anthraquinones from extracts of *Aloe barbadensis*, *Rheum officinale*, *Rhamnus frangula*, and *Cassia angustifolia* showed significant promising activity against HSV-1. Baicalin (a flavonoid), calanolides (coumarins) were also reported against HIV replication.

**Keywords:** Flavonoid; Herpes simplex virus; Human immuno deficiency; Herbal Drugs
Preparation and Quality Control Evaluation of Chyawanprash Avaleha

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Abstract

Chyawanprash is traditional Ayurvedic formulation being used as immunomodulator, memory enhancer, anti-asthmatic, antioxidant and used as rasayana since ancient times. Traditional methodologies for preparation of chyawanprash are prescribed in the classical literatures and Ayurvedic formulary of India. Composition of chyawanprash sold under proprietary name eg. Himani sona chandi, Kesari kalp varies from manufacturer to manufacturer and shows one to another specific activity but the basic action of chyawanprash remains same. The aim of this paper is to formulate and evaluate the chyawanprash avleha as per AFI. Raw drug standardization and prepared formulation was evaluated for its physiochemical parameters eg. moisture content, ash value and extractive values. Parameters of stability studies were also performed for final formulation as per the standard protocol given in Ayurvedic Pharmacopoeia of India. The results of physiochemical evaluation and stability studies were found to be within limits of official compendium.

Keywords: Chyawanprash; quality control; preparation; extract
Personalised Leukaemia Treatment and Faster Adoption of New Drugs: Four Breakthroughs Leading Towards More Effective Cancer Treatment

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Abstract

Our understanding of the genetics of cancer is constantly increasing. At the same time, we are accumulating more information of the genetic variations which increase cancer susceptibility, allowing the development of more effective cancer treatments. These four breakthrough studies about the “fifth letter in the human genome, adoption of new cancer drugs, personalised cancer treatment and blood cancers were achieved by the University of Helsinki’s cancer researchers during the past year. To comprehend the biology of cancer, we must have an extensive understanding of the human genome and the genetic variations that increase susceptibility to cancer as well as the genetic mutations found in cancer tumours. The Centre of Excellence in tumour Genetics Research, which launched at the Faculty of Medicine at the beginning of 2018, focuses on the mutations that occur in cancerous tissue. “Once we understand the detailed significance of the structure of the genome, we will also be able to better decipher the genetic changes we see in cancerous tumours,”

Keywords: Leukemia, therapeutics, personalized treatment
Management of Thyroid Disorders Through *Panchakarma*

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**Abstract**

**Introduction:**

The activities of the neuro-endocrine system are severely altered in this stress filled contemporary era and by sedentary lifestyle causing newer health challenges like thyroid disorders. Thyroid disorders are grossly divided into hypothyroidism, hyperthyroidism, thyroid nodules, neoplastic processes and goitre. The treatment also thus varies based on the disorder. Thus the underlying pathology is to be known before planning treatment, whether it can be managed by hormone supplement or surgery, thus can be divided into drug and surgical management. Considering this, *shodana chikitsa* can be adopted in the two main thyroid dysfunctions i.e., hypothyroidism and hyperthyroidism. In *Ayurveda*, there is no exact mention of thyroid disorders but it can be correlated with the descriptions of *pandu, sotha, asragdhara, sthoulya, atisara, prameha, bhasmaka roga and shosha* making it a *vyadhi sankara*. Considering them, the line of treatment remains same based on the analysis of symptomatology of the thyroid disorders. There is a need to find out a safe and effective remedy which will not only relieve symptoms but also increase the well being. So panchakarma treatment modalities can be adopted like *vamana* in hypothyroidism as it helps in treating the *kaphaja vikara* and in hyperthyroidism *virechana* as it subsides *pitta*. Other treatment modalities like *basti, nasya* and its mode of action on particular disease aids in a better treatment plan. Thus this paper is being written, to understand *panchakarma* treatment benefits in managing thyroid disorders.

**Keywords:** *Panchakarma, Hypothyroidism, Hyperthyroidism, Vamana, Virechana, Basti*
Abstract

Human body harbors various microorganisms as commensals. Most of them are beneficial and contribute to wellbeing of an individual. However, due to certain intrinsic and extrinsic factors, these organisms become pathogenic. These organisms affect mainly immunocompromised individual and termed as opportunist pathogens. Indiscriminate uses of pesticides, chemicals, metal toxins, consumption of adulterated foods, contaminated ground waters are some of the key factors in reducing immunity of an individual. Current therapies and existing drugs are ineffectve and pose challenges due to resistance. In this report we have used green food *Chlorella* and tested its efficacy in controlling common human bacterial and fungal pathogens. We found that cell wall lysed crude extract of *Chlorella* is effective in inhibiting the growth in antimicrobial susceptibility assay. We surmise that *Chlorella* powder can be used as health booster and could be an effective therapy in controlling opportunist infections.

**Keywords:** *Chlorella;* Antifungal; Antibacterial; Algae; Opportunist organism
Effect of Different Treatment Methods on Micronutrient Availability of Colocasia Leaves

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Abstract

The nutritional potential of Colocasia leaves is not widely explored. The leaves are rich source of micronutrients and bioactive compounds. However, the presence of high level of oxalates limits the bioavailability of these nutrients. In this study the effect of various household-level treatments viz. blanching (1-3 minutes), cooking (60-120 minutes), microwave heating (2-6 minutes) and soaking (8-12 hours) followed by sun drying was examined on the nutritional composition of Colocasia leaves. The analytical investigations revealed that calcium (796.76 ± 20.70 mg 100 g⁻¹), potassium (622.93 ± 33.93 mg 100 g⁻¹) and magnesium (236.64 ± 21.68 mg 100 g⁻¹) were highest in leaves soaked for 10 hours; zinc was maximum in leaves soaked for 8 hours (15.58 ± 3.49 mg 100 g⁻¹) while iron was maximum (8.24 ± 0.54 mg 100 g⁻¹) in leaves which underwent microwave heating for 6 minutes. Highest radical scavenging activity for bound phenolic compounds was exhibited by the samples soaked for 10 hours (84.08 ± 2.66 %) and that for free phenolic compounds was exhibited by samples soaked for 8 hours (53.09 ± 32.88%). The leaves soaked for 10 hours also exhibited the maximum reduction in oxalic acid (69.5%). Hence soaking the leaves for 10 hours was found to be the most efficient treatment-time combination for maximum micronutrient availability.

Keywords: Colocasia; bioactive, bioavailability; phenolic; micronutrients; blanching
Optimization of a Process for Microgreen and Aloe vera Based Functional Beverage

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Abstract

Microgreen based functional juice blends containing fenugreek (Trigonella foenum-graecum), kinnow mandarin (Citrus reticulate) and aloe vera (Aloe brobadensis) in different ratios were blended with sorbitol and stevia. The different ratios of juice blends were analysed for total soluble solids, sedimentation, viscosity and titrable acidity. They were also screened for total phenolic content, total carotenoid content and antioxidant properties such as DPPH, reducing power and metal chelating activity. The formulation with highest TPC, TCC and antioxidant property was selected to optimize a microgreen based functional juice. The optimized microgreen blend formulation had 20 ml 100⁻¹ ml microgreen juice, 40 ml 100⁻¹ ml kinnow juice, 8.5 ml 100⁻¹ ml sorbitol, 1.78 g 100⁻¹ ml stevia and 29.72 ml 100⁻¹ ml aloe vera juice. It had high protein, minerals (sodium and potassium) and vitamin (vitamin C) content as well as good source beta-carotene, phenols and antioxidants. Antioxidant helps in reducing the diabetic complications by reducing the oxidative stress and because of their protective action against reactive oxygen species.

Key words: Microgreens, Functional Juice, Juice Blends, Antioxidant
Plantain: Reinventing Banana as Functional Food

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Abstract

Plantains are termed as ‘culinary bananas’ as they are only consumed after cooking or other forms of processing. Providing good nutritional values and versatility in diet it is considered as an important commercial crop and efficient dietary staple in Africa. However, irrespective of geographical locations and economic status of diverse ethnic groups plantains are consumed extensively due to its easy availability and preparation. They are prepared and consumed in numerous forms between the green and yellow stages of maturity and ripeness. The nutritional composition of plantains imparts several health benefits and therapeutic purposes making it preferable for consumption purposes. They are processed for the further development of a variety of products. The present review aims to enlist various traditional dishes and the value added products prepared from plantains after processing. It also highlights other diverse uses of plantain where all the parts of the crop are functional and demonstrates its potential in future scope.

Keywords: Culinary bananas, health benefits, processing, value added products, traditional dishes.
Analysis of Antioxidant Interaction of Stevia Glycosides or Whole Leaf with Black Tea

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Abstract

In the past few decades doubling of incidence of obesity and diabetes led to surge in development and commercialization of tea-based beverages supplemented with non-nutritive sweeteners such as aspartame, sorbitol, sucrolose and stevia. Among these a particular interest is being generated for Stevia whole leaf, as it not only act as sweetener but also contain phytochemicals that have antioxidant and anticancer property. Stevia leaf has sweet-tasting components called steviol glycosides. The aim of the present study was to determine and compare the antioxidant interaction between black tea and stevia glycosides or whole leaf. The antioxidant potential of aqueous infusions of black tea (BT), stevia pellets (stevia glycosides), and stevia leaves alone and in combination were evaluated employing different chemical assays (DPPH and ABTS) and ex vivo test (chick liver lipid peroxidation assay). Stevia leaves displayed higher radical quenching ability as compared to black tea whereas no antioxidant activity was observed of stevia pellets. Isobolographic and combination index analysis revealed the interaction between black tea and stevia leaf ranged from nearly additive to moderate synergism in antioxidant assays. The fortification of black tea with stevia leaves markedly augmented the radical quenching and anti-lipid peroxidation ability of black tea.

Keywords: Black Tea; Stevia; Antioxidant; Combination Index; Synergism; Isobolograms.
Pharmacological Importance of Most Common Indian Weeds

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Abstract

Generally, the weeds are considered as troublesome and a menace in the fields as well in the gardens because they compete with the crop plants for nutrition and light. There is one major misbelief that these weeds are of no use. Several herbal floras, which were once considered as noxious weeds by the field botanists, are now regarded as pharmacologically important. Several weeds possess diverse group of phytochemicals which include flavonoids, phenols, alkaloids, steroids, terpenes, saponins etc. exhibiting significant pharmacological activities such as anti-microbial, anti-fungal, anti-oxidant, anti-pyretic, analgesic, anti-inflammatory, anti-malarial, anti-helminthic, diuretic, anti-diabetic, hepatoprotective, neuroprotective, anti-cancerous etc. The bioactive principles extracted from them are a promising alternative to the synthetic drugs as they are safe and cost effective. The main aim of the present study is to provide explicit information on the pharmacological importance of common Indian weeds and to create awareness among the scientific community regarding their protection, conservation and sustainable use.

Keywords: Weeds, Pharmacological activity, Phytochemicals, Flavonoids, Conservation
Okra (*Abelmoschus esculentus*) Breeding: Improvement in Nutritional and Pharmaceutical Potential

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Abstract

Okra is one the commercially exploited crops, which are grown worldwide for vegetable purposes. It is a member of Malvaceae family and known to be originated in Ethiopian region of the world. Okra is a multipurpose crop enriched with various nutrients, minerals, fibers and antioxidants. Along with nutritional properties; it also has therapeutic, medicinal, industrial and aesthetic potential. One of the significant pharmaceutical utilization of okra is used as blood volume expander and also has anti-cholesterolemic and anti-cancereous property. Few reports also specified use of different parts of okra plant in traditional medicinal practices. In terms of industrial use, it is extensively utilized in food processing applications as whipping agents, gums, adhesives etc. Recent researches showed the presence of beneficial chemical composition of okra can be due to accumulation of secondary metabolites produced under stress condition. The proportion of presence of beneficial phytochemical can be similar or ranges differently among different species of okra. It is reported to represent eleven species, widely distributed throughout the diverse climate zones in world. Diversity among the cultivars is always been considered important associated with the okra improvement program. In that context, present study hypothesized potential of conventional and modern okra breeding to enhance the nutritional and therapeutically quality of cultivated cultivar by means of recent approaches.

Keywords: Pharmaceutical, Therapeutics, Aesthetic, Phytochemical
Salicylic Acid Mediated Mitigation of Cadmium toxicity in Rice (Oryza sativa L.)

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Abstract

Cadmium (Cd) accumulation in the soil has built up environmental befoulment, which paved its way in the food chains of humans, through plants. Rice (Oryza sativa L.) toxicity of Cadmium (Cd) have higher risk in those areas where there is higher consumption of Rice (Oryza sativa L.). The transfer mechanism of Cadmium is through Soil>Crop>Food, and the accumulation of Cadmium (Cd) is found to be higher in the grains, which eventually effects the risk of Human Health and milking animals which consume the Rice straw after harvesting. In this study, pot experiments of Pusa Basmati -1121 is grown to analyze the effect of Cadmium toxicity at different (30ppm, 60ppm) concentrations and Cadmium (Cd) was applied to the Rice plant at its critical stages (tillering and flowering). The amelioration of Cadmium (Cd) was done by application of Salicylic Acid. The Cadmium (Cd) toxicity results and plant responses, bioaccumulation, plant physiological characteristics (membrane stability index, osmotic potential, chlorophyll content and index by using (SPAD meter), UV at different wavelengths, Lipid peroxidation (MDA) and Hydrogen peroxide and nutritional quality were assessed before and after application of Cadmium stress in Pusa Basmati 1121. Through this study there has been a significant decrease in the height of plant, delayed in flower initiation(Cadmium treated) with contrast to Control and Salicylic acid treated Rice plant observed at 30DAT and 60DAT (Days After Transplanting).

Keywords: Agriculture, Biology, Crop, Cadmium, Deficiency,
Appraisal of Antioxidant Potential of Binary Combination of Black Tea with Different Species of Ocimum

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Abstract

Antioxidants are believed to reduce the risk of chronic diseases like cardiovascular diseases, cancer and diabetes. They are generally found in fruits, vegetables, herbs and teas. Black tea is one of the commonly consumed beverages in the world. Both in vitro and in vivo studies demonstrated antioxidant potential of black tea but the data from clinical studies showed mild to moderate effects on the cancer and cardiovascular diseases. In India, tulsi leaves are generally added in the black tea for the flavour and medicinal properties, but scientific literature discussing about the interaction of black tea with different Ocimum spp. is limited. The present study was conducted to evaluate the antioxidant potential of binary combination of black tea along with three different Ocimum (tulsi) spp. (i.e. O.gratissimum, O. sanctum and O. canum sinesis) employing various tests {2,2-diphenyl-1-picrylhydrazyl (DPPH), 2,2’-azino-bis(ethylbenzthiazoline-6-sulfonic acid) (ABTS), nitric oxide (NO) and Lipid peroxidation (LPO)}. Among the individual infusions, black tea (BT) demonstrated highest antioxidant potential followed by OG (O. gratissimum), OS (O. sanctum) and OCS (O. canum sinesis). Supplementation of O. gratissimum (leaves) to black tea enhanced radical quenching ability substantially in DPPH, NO and LPO assays while in case of ABTS a minor increase was observed. The binary combination of black tea and O. gratissimum displayed maximum antioxidant potential as compared to the other studied pairs.

Keywords: Black tea, Antioxidant, O. gratissimum, O. sanctum and O. canum sinesis.
A Review of Phyto-Pharmacological Potentials of *Ficus geniculata* (Putkal) to Health Industry

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**Abstract**

*Ficus geniculata* (Putkal) is one of underutilized fig species, belongs to the Moraceae family, which blooms during March-April and fruits during May-August. It is found in different places of India (Andaman & Nicobar, Arunachal Pradesh, Assam, Jharkhand, Bihar, West Bengal, Meghalaya, Orissa, Sikkim and Tamil Nadu) and in world (Asia, Bangladesh, China, Laos, Myanmar, Nepal, and Thailand). In daily life, young leaves and buds are cooked and consumed by the tribal. The tender shoots are dried and used in different pulses which act as functional food along with pickle preparation to be consumed throughout the year. Traditionally, this plant has been in application to treat conditions such as leucorrhoea, urinary tract infection and gastrointestinal infection. Different parts (shoot, bark and leaf) of the plant possess numerous phytochemical compounds. Recently, this medicinal plant has been explored by the researchers for its affective utilization and medicinal properties such as antimicrobial and antioxidant potential. But the plant is still in its infancy stage and needs to be explored for its effective applications in the health industry. Therefore, the present work has been focused to review the studies which have already been conducted till date along with an attempt to find the research gaps for further exploration towards health industry.

**Keywords:** Black tea, Antioxidant, *O. gratissimum*, *O. sanctum* and *O. canum sinesis*. 
**Evaluation of Rice Bean (*Vigna umbellata*) for the Development of Instant Malt Beverage**

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**Abstract**

Rice bean (*Vigna umbellata*) is a multipurpose underutilized pulse crop belonging to genus Vigna. It is considered as a store house of nutrients which is attributed to its high protein content, essential amino acids, vitamins and mineral content. Rice bean was utilized for the development of malt beverage due to its high nutritional profile. It was exposed to different treatments such as germination and blanching. The germinated seeds were selected, dried and then grounded to fine powder. Three variables viz: malted rice bean powder, sugar and skimmed milk powder (SMP) were used for the formulation of beverage. Response surface methodology (RSM) was used to optimize the formulation of the instant malt beverage. Out of the suggested formulations, the formulation containing 55.08 g malt, 30 g sugar and 35 g SMP were selected as the optimum formulation. The selected formulation had a desirability of 0.887.

**Keywords:** Rice bean, germination, response surface methodology, instant malt beverage
Health Benefits of a Potent Medicinal Plant *Ficus Racemosa*: A Mine of Phytochemicals

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Abstract

*Ficus racemosa* Linn. (Moraceae) is a popular medicinal plant found throughout world, commonly known as "Gular" in India and has been used in traditional system of medicine such as Ayurveda. The plant has been a source as medicine for curing various conditions including diabetes, liver disorders, diarrhea, inflammatory conditions, hemorrhoids, respiratory, and urinary diseases. The different parts of the plants have numerous chemical and phytochemical compounds such as alkaloids, tannins, saponins, β-sitosterol and Lupeol thereby possessing a wide range of therapeutic properties. Despite of the different pharmacological potentials, it remains underutilized because of its limited availability *i.e.* found at limited places and for limited time. However, until date, no scientific reports witnessed it effective utilization in the food and feed industry. Therefore, an attempt has been made to explore the potentials of *Ficus racemosa* with respect to its composition, health benefits, value addition along with future prospective.

Keywords: *Ficus racemosa*, phytochemicals, therapeutic properties, value addition
Ancient Grains and Their Health Benefits and Utilisation

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Abstract

There are more than 30,000 grains being discovered and known for the cultivation but we consume and cultivate only a limited number. Only 30 types of grains are most commonly used by the world are used as feed. The most commonly cultivated and consumed cereals include rice, wheat, maize, sorghum and millets. There are various ancient grains which are having good nutrimental value but are underutilised those include amaranth, barley, bulgur, farro, freekeh, kamut, quinoa, spelt, Job’s tears and buck wheat. These grains are also known as supper foods and are used as functional food and in formulation of nutraceuticals. These grains are rich source of antioxidants, minerals carbohydrates and proteins. Most of the ancient grains are gluten free and can be used in production of gluten free products which help curing the celiac diseases. The buck wheat flour is used in pasta products preparations. 30% more protein is present in the amaranth when compared to other cereals. All the ancient grains are good source of dietary fibers, antioxidants and proteins with good digestability.

Keywords: Grains, Quinoa, nutraceuticals, buck wheat, gluten.
Reusability of Lignocellulosic Waste Obtained After a Primary Treatment of Textile Effluent

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Abstract

The treatment of textile wastewater is a global practice performed due to the presence of numerous contaminants which comprise primary, secondary and tertiary treatments involving more uncompromising controls presumable in future. Such textile wastewater when undergoes primary treatment operations with a lignocellulosic agro-waste tends to generate a considerable amount of sludge that needs to be remediated in an ecologically and economically prosperous way. The lignocellulosic waste is initially detoxicated to a certain permissible level followed by the biodegradation of the lignocellusic biomass by the usage of definite lignolytic enzymes. This review assesses the myriad methods of detoxification and biodegradation procedures resulting in the effective reusability of lignocellulosic waste such as biomass feedstock for bioenergy production, production of enzymes via SSF and its subsequent utilization in plant growth, fish growth and finally its potential for production of natural antioxidants. The study would also enable to highlight the recent trends that influence the reincarnation of lignocellulosic waste as a sustainable waste material.

Keywords: Lignocellulosic waste, Wustainability, Agrowaste, Antioxidant
Co-Processed Excipients: A Journey From Its Origin In Past To Present
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Abstract

Excipients are the neutral substances added to the formulation in addition to active pharmaceutical ingredient (API) for converting it into a suitable dosage form. The stability and performance of a formulation depends mainly upon the excipients added to it. Many a times the failures of dosage form have been reported due to inability of excipient to perform its function well. This is the main reason why formulation scientists always seek for an alternative or novel excipient which may overcome the formulation related problems. This need of excipients can be satisfied by combining the pre-existing excipients to have novel modified mixtures (called as co-processed excipients) which might act as a broad spectrum performer. The use of these co-processed excipients in the formulation may improve the functionality of dosage form as well. The co-processed excipients are evaluated by using different methods like bulk density, porosity, compatibility, loss on drying, dynamic scanning calorimetry, x-ray diffraction & scanning electron microscopy. The present paper attempts to review the research done so far on such novel combinations of excipients and their potential effects on the formulation and its performance.

Keywords: Co-processed excipients, functionality, broad spectrum, formulation, performance.
NASAL DELIVERY OF DRUGS: AN APPROACH TOWARDS BRAIN TARGETING

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Abstract

Delivery of drugs to brain is complex process owing to presence of blood brain barrier (BBB), which limits the entry of variety of molecules in the brain; consequently it becomes difficult to treat certain neurological diseases by conventional drug administration. To overcome this barrier, various approaches have been utilized such as BBB disruptors, intracerebral injection, carrier mediated transport etc. The probable exchange of toxic metabolites between plasma and brain that may lead to serious damage, limits the use of BBB disruptors. On the other hand, intracerebral injection is an invasive technique and is inconvenient as well. So the nasal route for brain delivery of drugs can be an alternative since nasal passage and brain is directly connected with each other through olfactory nerve endings which promote the transport of drugs directly in the brain bypassing BBB. Although certain factors such as muco-cilliary clearance, location of drug deposition, amount of nasal secretions etc. affect the delivery of drugs through this route, still the nasal route offers a promising and effective way of taking drug to brain directly. The delivery route demands more exhaustive research to be carried out to establish the potential of nasal route. This paper attempts to review the research that has been done so far, addresses the problems encountered in delivery of drugs from nose to brain and strategies to overcome them.

Keywords: Brain targeting, Neurological disease, Blood brain barrier, Nasal drug delivery, Olfactory nerves.
Various techniques have been utilized for enhancing the solubility of the BCS class II (low solubility high permeability) or BCS class IV (low solubility and low permeability) drugs. Some of these techniques involve salt formation, solid dispersion, micronization, nanonization and co-crystals. Amongst them, co-crystal is very promising technique that offers several advantages. In this technique, very less or negligible amount of solvent is used in formulation of the co-crystals. Co-crystallization technique is highly preferable over other techniques since it results in improvement of solubility of drugs without any alteration in therapeutic activity. In co-crystals preparation, the selection of suitable co-former for active pharmaceutical ingredient (API) is a challenging task for the researcher. Different methods like pKa rule, Fabian method, Hansen solubility parameter and Synthon matching etc. are used for the screening of the co-former. This review attempts to enlighten the methods of preparation of co-crystals along with the mechanism involved and potential applications of co-crystals in altering physiochemical characteristics of drugs for improved bioavailability.

**Keywords:** Co-crystal, Solubility, Co-former, Bioavailability.
AN UPDATE ON ROLE OF ANGIOGENESIS INHIBITORS IN CANCER/TUMOR TREATMENT

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Abstract

Tumor angiogenesis is characterized by formation of new blood vessels from previous ones that are involved in propagation as well as advancement of cancer cells. The progressions of new blood vessels not only supply the nutrients to cancer cells but also are involved in penetration of cancer cells. Tumor angiogenesis is mainly involved in various diseases such as lung cancer, colon cancer and breast cancer. Hence, antiangiogeneic inhibitors are used to treat this harmful disease by two mechanisms either by arresting the receptor tyrosine kinase ungracefully or by balancing the angiogenic factors like vascular endothelial growth factor (VEGF) or its receptors. There are three major types of antiangiogenic agents which target the angiogenic receptors namely monoclonal antibodies, small molecule tyrosine kinase inhibitors and VEGF decay receptors. Some other examples of antiangiogenic inhibitors are Bevacizumab, Thalidomide and Axtinib. However, these inhibitors have various side effects like hepatotoxicity, lung cancer and phocomelia. Due to such side effects these are used in a combinatorial therapy with chemotherapeutics agents. The current paper focuses on different angiogenic inhibitors along with their mechanism involved.

Keywords: Angiogenesis; VEGF; Cancer; Angiogenesis inhibitor; combinatorial therapy
CONTROLLED RELEASE OCULAR DRUG DELIVERY BASED ON NANOSTRUCTURED LIPID CARRIER: AN OVERVIEW

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Abstract

The unique physiological conditions of eye render the ocular route of drug administration delicate. The physiology and biochemical composition of eye prevents penetration and permeation of any foreign particles including administered drugs, thus making it difficult for formulation scientists to deliver the drug by conventional means. Since majority of ocular drugs are instilled into eyes as aqueous eye drop solutions, their fast drainage and dilution of drug with lacrimal fluid demands for repeated small doses of the drug to be administered frequently so as to achieve therapeutic levels, which ultimately leads to poor patient compliance. To overcome these problems, nanostructured lipid carriers (NLCs) can be used as drug delivery carriers. It has been observed by the researchers that characteristic properties of nanotechnology derived drug carriers like NLCs may produce promising results. The studies have shown the effectiveness of NLCs in increasing the drug penetration into ocular tissues along with improved ocular bioavailability and better tolerance. The present paper focuses on research which has been carried out so far on delivery of drug to eye through NLCs as drug carriers.

Keywords: Nanostructured lipid carrier, ocular drugs, retention time, controlled drug release, conventional drugs.
Abstract

Breast cancer is the most common type of malevolent tumour in females, constituting about 30% of all cancers in females worldwide. Incidence rate of disease has increased by 20% since 2008 globally. In the past few years, mortality rate of disease has been reduced significantly due to adoption of various treatments like surgery, radiation, chemotherapy etc, and emergence of breast cancer screening. At present, chemotherapy is the most efficient treatment for disease. However, their side effects cause a long term provocation on patient’s health. Thus, there is a need to develop a new treatment strategy that can only target the malignant cells without causing any harm to the adjacent body cells. Nanomedicines are auspicious alternative for treatment of breast cancer. Nanomedicines refer to materials having biomedical applications and have size range below 100nm. A variety of nanocarriers are available like polymeric nanoparticles, dendrimers, nanotubes, liposomes, etc. Some of the nanocarriers like liposomes (Doxil) and nanoparticles (Abraxane) are successfully used for breast cancer treatment. These nanomedicines hold immense potential to refine treatment strategies against breast cancer. They can enhance the pharmacodynamics and pharmacokinetics profiles of conventional treatments and may optimize the efficacy of existing drugs. Site specific delivery of anticancer drugs using nanocarriers results in increased therapeutic efficiency of conventional drugs. Nanomedicines based approaches are also used to understand the interaction of cancerous cells with their surrounding cells. Current review provides insight knowledge about the targeted drug delivery for breast cancer using nanomedicines approach to conquer the limitations of conventional therapy.

Keywords: Nanomedicines; breast cancer; targeted delivery; conventional method; limitations.
Current status and therapies used for the treatment of diabetic retinopathy

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Abstract

Diabetic retinopathy (DR) is one of the major complications of diabetes. It damages the tiny blood vessels of the retina of the eye. It occurs when these tiny blood vessels causes leakage of blood and other fluids. This will lead to swelling of the retinal tissue and blurred vision. The longer the duration of diabetes, the more likely the patient will have DR. If not treated properly, DR can lead to blindness. The symptoms of DR include-blurred vision, difficulty in seeing well at night, and blindness. Different treatments available for DR are laser surgery, vitrectomy, intravitreal injections, anti-inflammatory, and antiangiogenesis agents are being used. A laser surgery used to cure the edema, hemorrhage and vitrectomy to remove blood from the eye. However, these available treatments are less effective and have some side effects such as cataract and increased IOP (intraocular pressure). Further, systemic agents (particularly hypoglycemic, hypolipidemic and antihypertensive agents) and herbal drugs provide promising treatment in the progression of DR.

Key words: Diabetes, diabetic retinopathy, herbal drugs, laser surgery
Graphene microelectrodes: An advance tool for neural stimulating system and treatment of brain trauma

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Abstract

Graphene is an extract of graphite produced by redox reaction. When graphite is oxidized or reduced by chemical methods, it produces sheets of graphene which can be used in the preparation of microelectrodes for the communication purpose in electronic devices. Graphene possesses very high thermal and electrical conductivity which makes it a suitable material for use in electronic devices. Apart from the electronic application, graphene can also be used in the construction of microelectrodes for medical applications. In the treatment of brain abnormalities or trauma, the microelectrodes made up of other materials are being used but suffer from one to another limitations. The microelectrodes made up of graphene with some biological modifications can be used to overcome the limitations of existing microelectrodes and to establish better functional communication between the neurons in the brain. Graphene plays a diversified role in neural stimulating system compared to other traditional electrodes which cause biocompatibility, cytotoxicity and can interfere with other systems of human body. This review provides details about the synthesis of graphene, construction of microelectrode of graphenes and its application to establish connection between neural cells for brain disorders.

Keywords: Graphene, microelectrode, electrical conductor, neural cells
Formulation and evaluation of herbal toothpaste for the prevention and cure of dental caries and halitosis

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Abstract

The aim of this paper is to develop herbal toothpaste for the prevention and cure of dental caries and halitosis with the aid of herbal constituents. Eight batches of toothpaste were prepared by using extracts of haritaki, pippali, lavang, dalchini individually with excipients and preservatives permitted for Ayurvedic drugs such calcium carbonate, sodium benzoate, glycerin and menthol. Gum tragacanth and starch paste were used as gelling agents for the formation of toothpaste, sodium saccharine was used as sweetening agent. Cinnamom and clove oil were extracted by Clevenger apparatus. However, decoction of pippali and haritaki was made as per classical method reported in texts. Different batches (B1-B8) of toothpaste having individual extracts of haritaki (B1), pippali (B2), clove oil (B3) and cinnamom oil (B4) with starch and other four batches (B5-B8) with gum tragacanth as a base were prepared. Prepared batches of toothpaste were evaluated for pH, foaming ability, spreadability, abrasiveness and antibacterial action. Stability studies of formulation was also carried out as per ICH guidelines. The pH of toothpaste was found to be in the range of 7.2 to 7.6, foaming ability was in the range of 1.2 to 1.4, spreadability in the range of 2.8 to 3.0, abrasiveness was absent on touching and rubbing the paste on palm and all of the batches were stable with no fungus growth and phase separation. The antibacterial action of the paste was found to be decreasing order for haritaki, pippali, cinnamon oil clove oil. Starch was identified as good gelling agent in comparison to gum tragacanth due to the consistency and visible pale color of tragacanth in the paste. The prepared batches of toothpaste were also compared with marketed toothpaste such as Colgate, Close-up, Pepsodent and Dant Kanti of Patanjali Ayurved on the basis of important parameters like pH, foaming ability and spreadability etc.

Keywords: Dental caries, halitosis, herbal ingredients, toothpaste.
Microbial degradation of plastic: Green solution to environmental plastic pollution

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Abstract

Lack of degradation methods and uncontrolled growth of plastic waste in water, soil and environment has become the biggest threat to the mankind now a days. The traditional methods used for plastic disposition includes on site incineration, landfills and chemical degradation. These methods are not suitable for long term uses as they also contribute to water, air and soil pollution. To overcome the stated problem of plastic disposition, a green method of biodegradation of plastic has been presented in the current paper. Biodegradation of plastic by the bacterial strains present in soil such as Staphylococcus, Pseudomonas, E.coli and Consortium can be achieved within 10 – 20 days at a very low cost and eco-friendly scale. In the proposed method, adherence of microorganism on the surface of plastic followed by their colonization leads to enzymatic biodegradation of plastic. The process involves two major steps. In first step, growth of microorganism in the agar medium and inoculation of grown microbes on to the surface of plastic. In the seconds phase, the grown microorganism will produce enzymes followed by their binding to polymer substrate and catalyses a hydrolytic cleavage of plastic. The overall process can be confirmed by formation of clear holozones around the colonies to the end of plastic. Although the process seems very simple, eco-friendly and effective. However, it suffers from minor process limitation such as surface pH condition, boiling point, melting point, modulus of elasticity and crystal structures of polymer which can be eliminated by systematic process steps monitoring. Microbial biodegradation has a potential to be used on commercial scale for the green degradation of plastic.

Keywords: Environmental plastic pollution, microbial biodegradation, eco-friendly.
Three dimensional (3D) printing is an innovative technology being utilized for the construction of mechanical objects in the field of automobile, aeronautical, architecture and designing. The application of 3D-printing are multivariate. Apart from all the applications, medical application of 3D-printing in the generation of personalized medication and organs for transplantation are one of the thrust area. For the generation of organs by 3D-printing, a layer by layer construction of a particular organ structure is done to form a scaffold further followed by the process of cell seeding in which required cells are added directly onto the scaffold structure. The printing process includes cell mixing - the cells need to be mixed with ink before printing. The ink used for 3D-printing can be prepared by the stem cells of the recipient collected by bone marrow puncture. The organ prepared by 3D-printing technology will have low rate graft rejection and high safety margin due to the similarity of MHC complex of the recipient and the organs cells. As a sum of the whole 3D-printing with personalization based upon the requirement in medical field can be revolutionary. In the present paper, process, instrumentation and applications of 3D-printing in organ development has been discussed.

**Keywords:** 3D-printing, bio ink, graft rejection, organ development
Preparation and evaluation of oral colon targeted delivery system of sulfasalazine and curcumin

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Abstract

The aim of this paper is to develop a suitable colon targeted delivery system for the administration of sulfasalazine and curcumin to the colonic site for the treatment of colonic ulcers as both of selected candidates are reported to have synergistic actions. A microbially triggered oral colon targeted delivery system of sulfasalazine and curcumin in the form of tablet is designed. Guar gum, xanthan gum and pectin were used as matrix as well as carrier in the tablet formulation. The prepared powder blends were evaluated for precompression parameters such as angle of repose, bulk density etc. The evaluated blends were compressed by direct compression. Prepared tablets were evaluated by using quality control tests such as weight variation, hardness, friability, assay and in-vitro drug release studies in 200mL of 1.2pH HCl buffer solution for initial 2h and later in 1000mL by using phosphate buffer pH6.8 till the completion of study. The release was found to be 47% which was more than the release expected for drug targeting to colon. The tablets were coated to retain the drug release to a maximum of 15% within 5h using Eudragit S100 up to a weight gain of 2, 4, 6 and 8\%w/w and the coating was further supplemented with guar gum up to a weight gain of 12\%w/w. The average weight of the tablets was found to be 350±10mg, average hardness was 4.8Kg/nm^2, friability was 0.63\% and the drug loading was found to be 95±10\%. Prepared tablets were evaluated for in-vitro drug release in 200mL of 1.2pH HCl buffer solution for initial 2h and later the medium was made up to 1000mL by using phosphate buffer pH6.8 and study was further continued for 12h. The drug release was found to be 16.2% at 5\textsuperscript{th} h and later the release was increased up to 94.3\% at the end of 12\textsuperscript{th} h. Based upon the performed studies it was found that 8\% w/w coating of Eudragit S100 and 12\%w/w of guar gum was sufficient to successfully target sulphasalazine and curcumin to the colon.

Key words: colon targeted drug delivery system, sulphasalazine, curcumin.
Therapeutic potential of Scorpion venom in the treatment of cancer

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Abstract

Scorpion venom is a complex mixtures of bioactive compounds such as proteins, enzymes and other components which shows severe toxicity in the case of scorpion bites. Apart from the poisonous properties it has also been reported to be used as a medicinal compound. In the traditional medicine system of Asia and African continent the scorpion venom has been reported to be used for the treatment of bacterial and fungal infections. However, its use as an active compound for the treatment of cancer is matter of research. Recent studies conducted on scorpion venom has shown the inhibition of the growth of 38 various types of cancer cell lines with minimum or no toxic effects on normal cell line of body at the varying doses strength. As none of the toxic effects were observed on normal cell lines, the scorpion venom can be used as a potential anticancer agent for the treatment of cancer with no toxic effects associated to therapy. As the current scenario, Vidatox a marketed product of Labiofam is produced from the venom of blue scorpion and is used as a potent antineoplastic agent. In the present study a systematic review of the anticancer potential of scorpion venom and its associated uses is compiled and reported.

Keywords: Scorpion venom, Vidatox, Antineoplastic.
Development of analytical method for simultaneous estimation of curcumin and sulfasalazine by using UV-Visible spectrophotometer

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Abstract

Curcumin is bright yellow coloured principal curcuminoid of turmeric (Curcuma longa), a member of the ginger family (Zingiberaceae). It possess anti-inflammatory and antiseptic properties. Sulfasalazine is a prodrug of the anti-inflammatory agent 5-aminosalicylic acid which is covalently linked to sulfapyridine by azo bond. Both of these selected drugs are well reported for their anti-inflammatory action during the gastric and intestinal ulcers. These drugs can be estimated in the dosage forms by using UV-Visible spectrophotometer individually. However, there is no single reported method for simultaneous estimation of these drugs in a combined dosage form. Hence, in the present study a simple and sensitive UV method has been developed for their co-estimation. In the developed method, the response of UV-visible spectrophotometer was found to be linear in the range of 2-10μg/mL for both the drugs with correlation coefficient $r^2$ of 1 and 0.998 for sulfasalazine and curcumin respectively. The percentage recovery of both drugs was found to be more than 95% indicating that the method was accurate and the percentage coefficient of variance less than 2% indicates that method was precise.

Keyword: Curcumin, sulfasalazine, anti-inflammatory, simultaneous estimation
Pharmacognostic evaluation of *Calendula officinalis* leaves commercially cultivated in local areas of Jaipur, India

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**Abstract**

*Calendula officinalis* L., belonging to *Compositae (Asteraceae)* family, commonly known as garden marigold. Calendula is indigenous to central, eastern and southern Europe. Many research work has shown that *Calendula Officinalis* is can use for external treatment of superficial cuts, burn, wounds, minor inflammations of the skin and oral mucosa. In the present study, quality standards of plant leaves were developed by performing the pharmacognostic evaluation studies including morphological, microscopical, physicochemical, phytochemical, thin layer chromatography and other possible evaluation methods. Macroscopical studies were followed evaluation of drugs by color, odor, taste, size, shape and special features like touch, texture. Macroscopical studies for fresh leaves of *Calendula officinalis* have been performed. *Calendula officinalis* leaf shown wavy epidermis cells with anomocytic or ranunculaceous type stomata. Physical evaluation, fluorescence analysis, chemical analysis, screening tests, phytochemical investigations also thin layer chromatography were also performed successfully. This evaluation study highlighted essential characters which contribute to the standardization, identification, and authentication of *Calendula Officinalis* commercially cultivated in local area of Jaipur.

**Keywords:** *Calendula officinalis*, anomocytic, superficial cuts, standardization
A review on shelf life of fermented products practised in Ayurveda, is presented on the basis of classical references, official compendium and online line data base. The analysis is based on the data available in google patents, google scholar, PMC, classical literatures of Ayurveda, various guidelines issued by AYUSH and shelf life regulations mentioned in drug and cosmetic act 1940. Fermentation includes various categories of Ayurvedic medicines broadly classified in to madya and sukta sandhan. Asava and arista which are currently described as biomedicines of Ayurveda well known for shelf generated alcohol along with reducing and non-reducing sugars. Classical texts like Shrangdhar, Vanga Sen and Yogaratnakar mentioned the asava and arista may be more potent as gets older. Initially government of India also consider the shelf life mentioned in the classical texts through gazette notification number 161-B vide G.S.R. 764 and provides no expiry date for such kind of formulation. But recently, Government of India Department of AYUSH has amend the shelf life of asava and arista in 2016 through Gazette notification number G.S.R. No. 789 (E) and proposed the new shelf life of the asava and arista category which seems to be unscientific. So, current paper highlights the differences in shelf life of asava arista since Vedic era to recent guideline of AYUSH.

Keywords: Asava and Arishta , Shelf life, Fermentation
**Tomato (Solanum lycopersicum) Potential of Secondary Metabolite Under Stress Condition: Pharmaceutical and Industrial Importance**

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**Abstract**

Tomato is one of the protective fruit contains flavonoids, carotenoids, saponins, and fatty acid derivatives including these vitamin C; vitamin E, vitamin A vitamin B₆, vitamin K₆, manganese, zinc and chromium, biotin, molybdenum and copper, potassium, phosphorus dietary fiber are also present. These nutritive contents vary with individual plant species, organs and developmental stages. Now a days, environmental stresses like high and low temperature, drought, alkalinity, salinity, ultra violet stress and pathogen infection are potentially harmful to the plants. These environmental conditions also responsible for the enhancement of secondary metabolites. Proline was one of the secondary metabolites which under salt stress condition. Proline (Pro) accumulation and its relationship with the changes occurring at the level of polyamine (PA) metabolism and tyramine were investigated in leaf discs of tomato. The rate of accumulation of Pro, PA and tyramine was higher in the salt-sensitive than in the salt-tolerant cultivar. In tomato, under nutrient stress the 3-fold increase in anthocyanidins level and the simultaneous doubling of quercetin-3-O-glucoside. Flavonoid biosynthetic pathway of tomato regulates gene expression of enzymes nitrogen stress under nitrogen stress condition. It exposed to combined salinity and heat stress performs better than plants subjected to these stresses separately. In meanwhile these metabolites extending to many different body systems, including the cardiovascular system, musculoskeletal system, renal system, hepatic system and integumentary system. These biotic and abiotic increased level of natural products for medicinal purpose.

**Key words**: Secondary metabolites, environmental stress, Medicinal value
Irrigation Practices in Vegetable Crops

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Abstract

The availability of water in the soil is one of the most important requirements for successful vegetable production. Adequate moisture is necessary for good crop establishment, good growth, good yields and good quality. The water should be applied no quicker than it can penetrate the particular soil. This would reduce disease incidence. Note that raised beds or ridges dry out faster than flat land, and are used only for certain crops, e.g. potato and sweet potato, or where waterlogging is a problem. Crops differ in their water requirements, and have certain stages of growth when an adequate water supply is critical. Adequate water is essential for good germination of all crops. For flowering crops, such as beans, tomatoes and cucurbits another critical period is at flowering, and then also during the development of fruit and/or seed. For heading crops, such as lettuce and cabbage, the most critical period for water is at heading stage. An adequate supply of water is essential for root crops once the roots start enlarging. The suitability and the quality of water available for irrigation should be tested.

Key word: Irrigation practices, vegetable crops, depth of the soil and yield.
Challenges and Opportunity in Subsurface Drip Irrigation – A Review

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Abstract

Water is precise gift to living creatures and should be utilize judicially and economically. To fulfill the demand of water for agriculture in the water scarcity areas, water is to applied at the root zone, avoid evaporation and deep percolation and to increase the water use efficiency. This can be possible by micro irrigation technique. Drip irrigation is the most efficient irrigation method for all types of crop. Subsurface drip Irrigations fulfill 80-85% of the maximum crop requirements compared to fully-irrigated sprinkler system. The art of placement of drip lateral as per the row and depth beneath the soil surface improves the productivity. The maintenance of the subsurface lateral from the rodents, crop root and other biological agents is the big problem in subsurface drip irrigation. The present study reviewed the effect of depth of placement of drip lateral on yield of crop and management from rodents attack. It was observed that depth of lateral up to 30 cm from the ground surface gives the better result for all kind of crop, it maintains proper moisture at root zone and attack of rodents is also less in this depth. It was also suggested that using of anti-rodents material for lateral and rodents repellent application gives less maintenance cost and attention.

Key words: SDI, drip lateral depth, rodents management, yield.
Spinach (*Spinacia oleracea*) is an important green leafy vegetable. The leaf of this annual plant is used as major ingredient in Indian cuisine mainly due to nutritional and therapeutic values. Spinach bundled up with vitamins such as vitamin A, vitamin B, vitamin C and vitamin E and minerals like magnesium, manganese, iron, calcium and folic acid. Spinach is great source of chlorophyll, which speed up digestion. Leaves are the richest source of carotenoids, beta-carotene and lutein and also over viewed to observe the nutritional effect on human health by consuming it in to various form as raw or cooked because of its antioxidant compound, dietary fiber, minerals, vitamins and iron compound which prevents ones health. Herbal and natural products of traditional medicine have been used for centuries in every culture throughout the world. “Let food be your medicine and let medicine be your food” was advised by the father of medicine. Spinach is also used to prevent the bone loss associated with osteoporosis and for its anti-inflammatory properties in easing the pain of arthritis. It is a good source of the bioflavonoid quercetin with many other flavonoids which exhibits anti-oxidant, ant proliferative, anti-inflammatory, antihistaminic, CNS depressant, protection against gamma radiation, hepatoprotective properties in addition to its many other benefits. Spinach is good for the heart and circulatory system and has energy-boosting properties. Spinach is truly one of nature's most perfect food and it also contains many anticancer agents. It also contains omega 3 fatty acids and anti-inflammatory agent.

**Keywords:** Spinach, health, medicinal
Effect of Organic and Inorganic Fertilizers on the Morphology of *Triticum aestivum* L.

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**Abstract**

A field experiment conducted during *Rabi* season 2017-18 at farm of lovely professional university phagwara, Punjab to study the effect of organic and inorganic fertilizers on yield and quality of wheat (*Triticum aestivum* L.). The experiment was laid out according to randomized block design with three replication. Treatments include T0-control, T1-100% RDF, T2-100% vermicompost, T3-100% FYM, T4-100% Sludge, T5-25% RDF + 25% vermicompost + 25% FYM + 25% Sewage sludge with wheat variety HD 2967 was grown. Plant height (cm) significantly increased by (21%, 25.30% and 10.8%) with respect to T0 respectively 30, 60 and 90 DAS leaf length in T1 significantly increased by (20.9%, 30.05%, 30.91%) with respect to T0 respectively 30, 60 and 90 DAS. Leaf number/plant significantly increased in T5 by (20.5%) with respect to T0. In T2 leaf number increased by (22.31%) (37.8%) respectively 30, 60 and 90 DAS. Tiller number plant^-1_ significantly increased in T1 by (48%) with respect to T0. In T2 tillers number increased by (73.11%) and in T2 increased by (75.45%) respectively 30, 60 and 90 DAS spike length increased in T1(40.95%) and T5. Ear number plant^-1_ significantly increased in T1. Test weight of grain are increased in in T1 and T5. Biological yield of wheat are significantly increased in T1 and T5. Grain yield t^-1_ ha significantly increased in T1 and T5(5.49 t^-1_ ha, 5.10 t^-1_ ha) respectively straw significantly increased in T3(10.40 t^-1_ ha). Harvest index (%) significantly increased in T1 (17.18%) with respect to T0 and in T5 percentage increased by (10.92%). Protein content(gm/100gm of grain) percentage higher in T1 and T5 (11.33 and 10.33 gm) respectively.

**Keywords:** Agriculture, Biotic, Crop, DAS, Energy, FYM, Grain, Vermicompost
Effect of nitrogen on the fodder yield and quality of two sorghum cultivars (Sorghum bicolor L.)

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Abstract

Response of two sorghum cultivars Raseela and Jumbo-Gold to different nitrogen levels of 100%, 75% and 50% was studied under field condition. The experiment was conducted by using Randomized Block Design having eight treatment and four replicates of each. Raseela was applied to T1, T2, T3 and T4 treatments [Control, 100%N, 75% (N+ 25%FYM), 50%(N+50%FYM)] and Jumbo-Gold was applied to T6, T7, T5 and T8 [Control, 100%N, 75% (N+ 25%FYM), 50%(N+50%FYM)]. The on field observations were stem height, stem girth; number of leaves and Leaf Area Index (LAI) were recorded periodically after 30, 50 and 70 DAS. Proximate composition was recorded after sowing. The result revealed that the yield and quality of Jumbo gold was better than Raseela. There was significant difference noticed in growth attributes and proximate compositions. The total nitrogen content in soil was more after harvesting than that of before sowing.

Key words: Nitrogen, Variety, Fodder, Sorghum
Changing aspects of potassium in Indian Soil

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Abstract

India is the third largest user of nitrogenous, phosphatic and potassic fertilizers in the world. The potassium are required for initiation of 60 distinct enzymes engaged with plant development, imperative for osmoregulation, cation-anion balance, protein combination, water balance, reducing lodging, bestowing infection obstruction and enhancing quality and timeframe of realistic usability of yield create. Numerous physical, concoction and mineralogical factors administer the arrival of K from micas by cation trade response and disintegration forms. For the most part in Indian rural conditions, the vast majority of the ranchers utilizes just nitrogen and phosphorus and don't utilize the potassic manure because of ignorance that the issue of K lack happens in soils and it is accounted for that 72% of soils require prompt K treatment for good yield creation. Soil test results for potassium (K) fertility status among India’s agricultural soils are categorized accordingly: 21% low, 51% medium and 28% high. Thus, 72% of India’s agricultural area, representing 266 districts, needs immediate K fertilization. Indian soils are rich in potassium because of potassium-bearing minerals in and reduction in potassium as India imports its entire potash fertilizer requirement. The potassium exist in different forms in soil, these forms are not homogenously distributed in soil. The soil having different minerology shows wide variation in different forms, which effect on development of deficiencies symptoms in plants.

Keywords: Potassium, Soil, Fertility status
A review on health benefits of wheat grass juice

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Abstract

The plant of wheat grass (Triticum aestivum) is belongs to the family Gramineae. Wheat grass juice is one of the best source of chlorophyll with various health issues along with other vital nutrients. It is utilized either fresh or in dried powder form. It is widely utilized for remedy like ulcerative colitis, cancers, diabetes, obesity, skin problems, high blood pressure etc. In spite of these it’s major impact on blood purification, liver detoxification and colon cleansing since it is reservoir of vitamins A, B, C, E and K, calcium, potassium, iron, magnesium, sodium, sulphur and 17 forms of amino acids. Thus it has many pharmaceutical therapeutic properties. Prevention is better than cure so, it is better to include the wheatgrass in regular diet in any form like juice, powder, etc to prevent various chronic diseases. This review article is an attempt to present the findings of scientific studies and create awareness among us which is easily available with regard to nutritive value and health benefits of wheat grass juice for human.

Keywords: Wheat grass, Chlorophyll, Medicinal plant.
Food security and human health

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Abstract

From time of Green Revolution, main focus is given to quantity of produce not quality. In India, food availability is not reliable. Population is growing at an alarming rate and it’s a great challenge to produce quality products to meet demands of growing population. Land which is main source for agriculture is also shrinking day by day. According to reports about 60% population of India depends upon agriculture for their needs. Production of rice in India per annum is 100 million ton. But due to financial problems, many families cannot afford to buy food. India needs to concentrate on availability of food products to whole population so that children, old people as well as pregnant women can get nutritional and balanced food. India shares a quarter of global hunger burden. Stunting, chronic diseases, weakness, women often giving birth to low weight infants and menstruation irregularities in women are some of the problems of malnutrition. Time to time government of India promoted many food security programs but there is always a gap between inclusion and exclusion. Government should provide nutritional food to students in schools like mid day meal and ration to pregnant women like fruits, milk, ghee etc. on priority basis and this rule must be followed strictly. Ministry of Health and Welfare should focus on biofortification of essential nutrients in food grains like wheat and rice to enhance their nutritive value as biofortification of wheat with Zn is very successful to increase nutritive value in wheat.

Key words: green revolution, malnutrition, biofortification, chronic diseases etc.
HEALTH AND NUTRITIONAL IMPORTANCE OF BABY CORN: A REVIEW

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Abstract

Baby corn cultivation promises to have an important role in the future of crop production due to its fresh and quality product. The change in food habit from non-vegetarian to vegetarian aggravated the consumption of vegetables especially baby corn. Its delicate, tender, sweet flavour and crisp nature contribute to its increasing popularity making it an indispensable ingredient in many fancy dishes today. With the increasing concern for health, people have turned towards quality food in place of bulky items. Baby corn is such vegetable crop which is low in calorie, very rich source of minerals, vitamins and fibres. Its consumption helps in lowering the cholesterol level, blood sugar level, stimulate digestion, weight loss and a vital source of anti-oxidents. The nutritional value is at par or even superior to most of the commonly grown vegetables of the country and having a prime place as a safe and quality vegetable.

Keywords: Baby corn, health and nutrition
Incidence of Brown Plant Hopper in rice field with the use of different doses of fertilizers

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Abstract

The rice brown plant hopper, *Nilaparvata lugens* is rice pest, which one is very harmful when the nitrogen fertilizer is applied at high rate. To evaluate the effect of brown plant hopper by using different fertilizers on transplanted basmati rice a field experiment was conducted at the experimental farm of School of Agriculture, in Lovely Professional University, Punjab during kharif season 2015-2016. The different fertilizer doses were used and the experiment comprised with 15 treatments. The result showed that the nitrogen fertilizer did not harm to rice crop but the attack of brown plant hopper was increased due to more succulent tissues of rice plant. The nitrogen increased the photosynthesis effect and ratio in the plant due to more production of chlorophyll. In case of another fertilizers P and K (P₂O₅ and K₂O) are not promoting but also nor affecting to insect/pests attack. Zinc sulphate has being proved that their effect is much positive towards crop because the zinc sulphate making less susceptibility of plants to pest attack at all level of doses. The rice crop was showed highest brown plant hopper attack at 50kh ha⁻¹ of nitrogen and also showed maximum plant height, more number of tillers, panicles/plant, 1000 grain weight from the experiment maximum grain and straw yield (7093 kg/ha, 8753kg/ha in T9 where NP- 50, 40kg ha⁻¹). The grain yield and straw yield recorded maximum in treated plots as compared to the control.

Key words: BPH, Fertilizer, Doses, Treatments, Pests, Straw yield and Grain yield.
Organic farming:-Impact on Human health and Environment

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Abstract

Organic farming mainly centers on cultivating and rearing crops without any use of chemically based fertilizer and pesticides. The distressing effect of conventional farming on human health and environment has lead to increase in area under organic cultivation in previous decade and has changed the food preference and perception of consumer towards safer healthier source of nutrition produced by environmental friendly methods as organic crops have less residual effect of nitrates, pesticides and cadmium and higher content of bioactive compounds and antioxidant which helps or contributes in maintaining an favorable health status and decrease the risk rate of developing chronic long standing diseases. Organic farming along with benefiting human health also helps in sustainably managing agriculture as it is more environment friendly keeps biodiversity and decrease the negative impact of agriculture on environment. This review study highlights the impact of organic farming in improving the health status of human and environment as well as its support in sustainably managing agriculture

Keywords: Organic farming, Sustainability, Organic food, Human and Environment health
Review on Advancement of pulse irrigation (drip) in sandy soil

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Abstract

Pulse irrigation refers to the practice of irrigating for a short period, then waiting for another short period, and repeating this on-off cycle until the entire irrigation water is applied. Under pulse irrigation system amount of irrigation water and operation time play a key role in reducing excess flooding, decreasing percolation of water beneath the root zone and reducing water evaporation after irrigation. Based on the literature revived application of irrigation water through pulse irrigation (drip) increased the yield of crips head lettuce, green gram and potato crop on sandy soil by 5.78 %, 19.89 % and 40 %, respectively. The soil moisture in the root-zone was improved and reaches near field capacity after adoption of 10 pulses per day in case of bell paper study. The reviews pointed that pulse irrigation (drip) system can be useful in terms of water saving, maintaining soil moisture in the root zone near field capacity, increasing soil moisture horizontally in the root zone than vertically, increasing yield. The lateritic soil is having high infiltration rate resulting in increased vertical movement of soil moisture. Pulse irrigation (drip) can be used effectively for increasing the horizontal spread in the high infiltrating soil.

Keywords: Pulse drip irrigation, Infiltration, Soil moisture, water use efficiency, yield
Effect of different regimes of nitrogen on varietal performance of Fodder Maize

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Abstract

A field experiment was conducted at experimental farm of School of Agriculture at Lovely Professional University, Phagwara (Punjab) to study the effect of nitrogen on different varieties of fodder maize (*Zea mays*). The experiment was comprised with two varieties of maize (J-1006 and African tall) and three levels of nitrogen 50%, 75% and 100% N in randomized complete block design (RCBD) with four replicates. The two varieties of fodder maize were used, J-1006 and African tall. To compensate the dose of nitrogen 25% and 50% recommended dose of FYM in T3 and T4 was applied. The parameters was recorded during study were- plant height, number of leaves and stem girth periodically at 30, 50 & 70 DAS, whereas proximate compositions were obtained after harvesting of the crop. The fresh dry weight of plants were also obtained for two seasons. The result revealed that by increasing dose of nitrogen there was increase in all growth attributes but the variety developed by PAU i.e. J-1006 showed more yield and growth as compared to African tall. It was healthier than African tall but the variations was due to difference in nitrogen doses.

**Key words:** Nitrogen, Variety, Fodder, Maize
**Medicinal importance of weeds for human health**

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**Abstract**

Weeds which are considered as unwanted plants also have great medicinal value. Some weeds consist of large amount of alkaloids, steroids, flavonoids, glycosides, polyphenolics etc. which can cure many human health disorders. As long as humans started cultivating crop plants they focus mainly on crop plants and destroy unwanted plants. People are not aware about pharmaceutical properties of weed plants. The market for ayurvedic medicines is increasing day by day and is a flourishing business. Forests are main source of biodiversity and are best approach to search for medicinal weed plants. Weeds are used to cure many human health disorders like breast cancer can be cured by Dandelion roots. Purslane which is a rich source of potassium is used to cure wound heals for boils and burns. Liver cirrhosis and gall bladder diseases can be cured by roots of Dandelion and its young roots are also anti-inflammatory. Jaundice is a very serious and dangerous disease and it can be treated by *Phyllanthus nirurai*. The use of medicinally important weed plants is not too much in India due to lack of resources, market value and low prices. They are also not popular among common people due to lack of awareness. Government in collaboration with Health and Welfare Ministry must focus on promotion and conservation of medicinally important weed plants.

**Key points:** Weeds, Human health, ayurvedic, collaboration etc.
Impact of Rice Husk Biochar Under Wheat Cultivation

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Abstract

Wheat is one of the most important growing cereal crop all over the world. It is Rabi seasonal crop and grown in a wide range of climatic zones. The biochar is the residue left after thermal decomposition of any organic matter. Pyrolysis occurs when organic material are burn under anaerobic condition. It is charcoal which is used as reclamation of soil’s physical condition. Due to the presence of more C: N ratio, rice husk not easily degradable to the soil. Biochar application is one of the best solutions for improvement of wheat production. Biochar is mainly used to increase soil fertility, increase water holding capacity because it have more surface area. It helps to deflect soil properties and increase the microbial activity to absorb organic and inorganic compound. The major benefits of this amendment is, it have high nutrient availability due to the presence of higher amount of potassium, phosphorous and zinc which is known as essential element for plant growth and development. The experiment was carried out in Lovely Professional University, Phagwara at experimental field to check out the growth and development of wheat in biochar applied soil. On the basis of field trial, biochar may significantly improve the different morphological parameters like no. of tillers, no. of panicle, panicle length, stem grith were measured at 45 DAS, 60 DAS, 75 DAS & 90 DAS. Hence this is the very simple way to give nutrient to the soil and subsidiary agricultural development.

Keywords: Biochar, crop, fertility, nutrient, pyrolysis, rice husk, soil, wheat.
Effect on sugars in Rice plant (*Oryza sativa* L.) on exposure to Aluminum toxicity

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**Abstract**

Rice (*Oryza sativa* L.) is a major cereal crop which is consumed worldwide especially in Asian countries. Effect of Aluminum in the soil is found in traced amounts, especially the acidic soil, that’s the reason for liming the soil before Rice plantation. The amount of aluminum in the food can lead to adverse effect in the gastrointestinal tract of humans. Aluminum has direct effect on root growth of Rice by limiting its size, but on the other hand it increases the crop height. Here the study will be on the senescence stage of the leaves of Pusa basmati1121 between sugars and starch in relation to each other where the reducing and non-reducing sugar incurred with decrease in the amount of starch.

**Keywords:** Aluminum, Crop, Effect, Rice, Sugar
A review on beneficial importance of agricultural weeds

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Abstract

Weed control is one of the most important crop protection activities undertaken in both intensive and low-input farming systems. However, weeds contribute to the resource base of the rural community providing a source of secondary foods, medicines and insecticides. Those weeds with high food potential or which have pesticidal or medicinal properties might be deliberately encouraged within the crop or field margins. Many weeds are having a great importance of medicinal importance, so weeds can be use as medicinal properties. Weeds like Amaranthus spp, Chenopodium spp, Commelina spp, Cynodon dactylon, Solunum nigrumm are hugely use as medicinal properties as well as use as vegetable. In Indian rural areas these weeds are use specifically for some medicinal purpose and also use as vegetable among different tribes. Amaranthus spp use as as a relish and leafy vegetables. Chenopodium spp, applied to face to treat convulsions and also use to repel snake. Commelina spp leaves and young shoots used either fresh or boiled as a vegetable and also use in cold, eye problems. Cynodon dactylon is use as a remedy for indigestion and heartburn, also use as pasture grass. The Juice from the fruit of Solunum nigrumm has antibacterial and antifungal properties and is used to treat skin infections. So weeds can be grown and use for different purpose in our daily life.

Key words: Benefit, Medicinal Properties, Weed.
Heavy metals and metalloids accumulation in soil and plant its impact on food security in India

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Abstract

Agriculture being the main supply of employment and earnings for a massive share of the Indian population, improvement of agriculture and the rural economy is an important supply of accomplishing meals safety at the countrywide and family levels. The whole number of undernourished human beings used to be 172.4 million in 1990–92 which rose to 208.7 million in 2015–17 i.e. nearly 38% enlarge in undernourished people. India witnessed a quantum extend in food grain manufacturing from 51 million tonnes in the course of 1950-51 to about 190 million tonnes in 1994-95 and 320 million tonnes in 2017. Despite this development, hunger and malnutrition have become a perpetual problem, mainly in rural families and more so, with the female and children. Food security is a condition, the place ample nutritious meals is on hand for the household members. Heavy metals and metalloids toxicity is one of the principal motive for declining food safety in India. Heavy metals such as Cadmium(Cd), Copper(Cu), Lead(Pb), Chromium(Cr), Mercury(Hg), Zinc(Zn), Nickel(Ni) and metalloid like Arsenic(As) are fundamental environmental pollutants, particularly in areas with high anthropogenic pressure. Heavy steel accumulation in soils and plants is of subject in agricultural manufacturing due to the damaging outcomes on meals protection and marketability, crop increase due to phytotoxicity and environmental health of soil organisms. Plants growing in metal-polluted web sites show off altered metabolism, growth reduction, lower biomass production and steel accumulation. Various physiological and biochemical strategies in flowers are affected via metals. Reports are also on hand on the occurrence of excessive concentration of these metals in crop flora and on consumption of the produce from this vegetation have an effect on the fitness of animals and human beings.
Improving rice grain quality by foliar application of plant growth regulators under various mode of Zn application

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Abstract

Zinc (Zn) deficiency is found as an important aspect for the production of rice in many parts of world as well as of India. To evaluate the effect of different plant growth regulators on translocation and Zn content in the grains, two rice varieties namely PB1509 and PB1121, were examined under different Zn application methods i.e. control (no Zn), soil application (5 mg Zn/kg of soil) and foliar application (0.5% ZnSO$_4$ at 30, 60 and 90 DAT). Plant growth regulators i.e. gibberellic acid (GA$_3$) (20 ppm) and cytokinin (20 ppm), were used to enhance translocation of the Zn from vegetative parts to the grains of the rice. Among all the treatments tested in study, a combined foliar application of 0.5% ZnSO$_4$ solution along with 20 ppm cytokinin was found most effective in increasing grain yield, 100 seed weight and protein content while enhanced Zn content of grains was recorded at a combination of 0.5% ZnSO$_4$ and 20 ppm GA$_3$. Results clearly indicated that application of plant growth regulators can be helpful to improve Zn and grain protein content, so need further testing.

Keywords: Zinc, plant growth regulators, translocation, Zn accumulation in grains
Seed priming in vegetable crops: A review

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Abstract

Vegetables constitute a major part in Indian agriculture in terms of providing food and nutritional security. In recent past, Indian agriculture has witnessed a tremendous progress in vegetable production, due to the advent of high yielding varieties and new technologies. Vegetables are important sources of minerals, vitamins and other nutrients of medicinal and therapeutic value. Due to the lower germination and seedling emergence yield of the crops decreasing day by day. Insufficient seedling emergence and inappropriate stand establishment are the main constraints in the production of vegetable crops. Farmers do not have sufficient resources to meet the requirement of seedbed preparation for sowing and they are at more risk as compared to progressive farmers. On the other hand good establishment increases competitiveness against weeds, increases tolerance to drought period, increase yield and avoids the time consuming need for re-sowing that is costly too. It is well accepted fact that priming improves germination, reduces seedling emergence time and improves stand establishment. A method to improve the rate and uniformity of germination is the priming or physiological advancement of the seed lot. Seed priming is an effective technology to enhance rapid and uniform emergence and to achieve high vigour, leading to better stand establishment and yield. It is a simple and low cost hydration technique in which seeds are partially hydrated to a point where pre-germination metabolic activities start without actual germination, and then re-dried until close to the original dry weight. Seed priming is employed for better crop stand and higher yields in a range of vegetable crops.

Key word: Seed priming, crop establishment, germination, vegetable crops and yield.
The screening of mustard varieties resistance against mustard aphid

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Abstract

The field experiment was carried out at student instructional farm of C.S. Azad University of Agriculture and Technology, Kanpur during rabi season 2013-14 and 2014-15 to know the screening of mustard varieties resistance against mustard aphid. The screening of eight varieties of Indian mustard against aphid but not a single variety was resistant to the aphid. The results indicated that sucking insect pest; Lipaphis erysimi (Kalt) appeared from seedling till harvest of the crop. The incidence of aphid start on eight varieties eight week after sowing the peak period of aphid population third week of February, and maximum population found on the variety Varuna 285.7 aphid/10 cm apical shoot and minimum population on the variety Rohini 110.5 aphids/10 cm apical shoot on the third week of February. Overall maximum mean population of mustard aphid found on variety Varuna and minimum found on variety Rohini during 2013-14. The next year maximum population found on the second week of February on variety Varuna 281.3 aphids/10 cm apical shoot, and minimum found on variety Rohini 86.3 aphid/10 cm apical shoot on that week. Overall maximum mean population found on variety Varuna and minimum on variety Rohini during 2014-15. On the basis aphid infestation index (AII) at full flowering stage and at full pod formation stage found varieties Varuna and Vaibhav susceptible to the aphid incidence and Vardan, Uravasi, Maya, Ashirvad and Pitambari were found moderately resistant to aphid and variety Rohini found resistant to the aphid incidence which may be used as a check experimental material for screening of varieties resistant to aphid during both year.

Key words: Resistant, Mustard aphid, Susceptible and varieties.
Ameliorative effect of putrescine and mycorrhiza on water logged stress in maize

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Abstract

Waterlogged is a condition due to conversion of the rhizosphere from aerobic to anaerobic environment i.e. depletion of oxygen in the soil profile. The topic which is under research is effect of waterlogged stress on various morphological, biochemical and yield attributes in maize and effect of polyamines (putrescine) and mycorrhiza in ameliorating waterlogged induced stress in maize. For this, we select 7 treatment and one control of different water level and each have four replication. The CRD (Complete Randomized Design) was used for this experiment. The reading would be collected after 30day, 60 days, 90 days and 120 days and hence compared the biochemical properties for the seed before the sowing of seed and after harvesting seed products and determined the food and nutritional level of the maize in term of carbohydrate, total sugar soluble sugar (Anthrone method) and total soluble protein (Brandford method). Finally, it is concluded that, the combination of putrescine and mycorrhiza was the best way to mitigate the water logged stress in maize.
Weed management in field crops: A review

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Abstract

The concept of weed management is one of the most important aspect where crop production is concerned. Weeds alone able to reduce the yield varies in in different crops viz., in soybean (50–76%), groundnut (45–71%), in direct-seeded rice (15–66%) and maize (18–65%). So, to suppress the weed population farmers are following chemicals for easy and quick suppression of weeds. But, due to application of herbicides farmers faced lots of problems related to soil health as well as some toxic effects also observed on human health and livestock. So, to protect the environment, one should be familiar with different weed management practices. It also helps to reduce the cost of production as well as for the production of healthy food.

Key words: Weed, soil health, herbicides, IWM and healthy food.
Polyamine: a mysterious modulator involved in plant responses to stress

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Abstract

Polyamines (PAs) are omnipresent biogenic amines that have been ensnared in differing cellular capacities in broadly disseminated life forms. In plants, mutant and transgenic plants with changed movement pointed to their inclusion with diverse abiotic and biotic stresses. Besides, microarray, transcriptomic and proteomic approaches have illustrated key capacities of distinctive PAs in signaling systems in plants subjected to abiotic and biotic stresses, in any case the precise atomic instrument remains puzzling. Here, we contend that PAs ought to not be taken as it were as a defensive particle but or maybe like a double-faced atom that likely serves as a major zone for advance investigate endeavors. This audit summarizes later progresses in plant polyamine inquire about extending from transgenic and mutant characterization to potential components of activity amid natural stresses and infections.

Keywords: Agriculture, Biotic, Cadmium, Density, Energy, Forage
NUTRITIONAL AND BIOCHEMICAL PROPERTIES OF STEVIA

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Abstract

Stevia is a bio sweetener that belongs to Asteraceae family and is native to Paraguay. Common names of stevia are honey leaf plant, sweet chrysanthemum, sweetleaf stevia, sugarleaf, etc. The sweet taste of stevia is due to diterpene glycosides stevioside, rebaudiosides A-F, steviolbioside and dulcoside, which is present in the leaves of stevia. It is propagated by stem cuttings and best time for propagation is February-March. Stevia yields about 15,000kg/ha of green herb which on drying gives about 4000-kg/ha. The most important components of stevia is steviol glycosides and it has high potency sweetening which estimated about 250 times sweeter than table sugar and 300 times sweeter than sucrose but do not have any calorific value. Stevia contains nontoxic and possess antioxidant, antimicrobial, antifungal and anticarcinogenic activity which are suggested by many periclinal and clinical studies. Stevia has numerous medicinal values in the treatment of patients with diabetes, diabetes-related obesity, hypertension or cardiac disease, antioxidant, antimicrobial and antifungal activity. The aim of this review is to tell about the biochemical composition, nutrition value and application of stevia leaves and how it is beneficial to human health.

Keywords:- Glycoside, Stevia, Sweetener, Stevioside, Nutrition.
Salinity is one of the major environmental factors limiting the productivity of crop plants because most of the crop plants are sensitive to salinity caused by high concentrations of salts in the soil, and the area of land affected by it is increasing day by day. For all important crops, average yields are only a fraction – somewhere between 20% and 50% of record yields; these losses are mostly due to drought and high soil salinity, environmental conditions. In India nearly 9.38 million ha area is occupied by salt-affected soils out of which 5.5 million ha are saline soils (including coastal) and 3.88 million ha alkali soils and these occur from Jammu & Kashmir (Ladakh region) in north to Kanyakumari in south and Andaman & Nicobar Islands in the east to Gujarat in the west. Development and refinement of appropriate technologies for reclamation and management of such lands seems promising option to achieve future food and nutritional security as well as adoption and mitigation strategy to cope with predicted future climate change scenario. Impact of climate change on agriculture: recent case studies, harnessing salt-affected soils potential and future research and development needs. Various physiological and biochemical strategies in plants were affected. A wide range of adaptations and mitigation strategies are required to cope with such impacts. Efficient resource management and crop/livestock improvement for evolving better breeds can help to overcome salinity stress. Such as tolerance to saline conditions, genetic diversity, synthesis of compatible solutes, production of plant growth promoting hormones, bio-control potential, and their interaction with crop plants.

Keywords: Agriculture, Biotic, Crop, Ratio, Salinity, Tension
**Mushroom: a potential source of nutrition and nutraceuticals**

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**Abstract**

Mushrooms are placed under vegetables in the food world though, they are not technically plants. They are a fleshy, spore-bearing fruiting body of the kingdom fungi, grown on dead organic matter by extracting their nutrients. They are packed with good amount of nutrition such as dietary fibre, protein, thiamine, riboflavin, vitamin B6, niacin, folate, iron, magnesium, selenium, potassium, phosphorus and copper. Mushrooms are also rich source of antioxidants as more colourful fruits and vegetables. Its consumption on daily basis shows great immune-boosting benefits, helps to prevent respiratory infections, nourish good bacteria in gut and improves digestion. A wide range of activities including anti-tumor, cardiovascular and antimicrobial are reported in mushrooms. Edible mushrooms are considered to be ideal food for obese persons and for diabetics to prevent hyperglycaemia. The present review aimed to discuss on nutritional as well as medicinal importance of mushroom as nutraceuticals from Indian context.

**Keywords:** Mushroom, nutraceuticals and nutrition
Effect of intercropping wheat with chickpea and mustard on yield attributes

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Abstract

Wheat is one of the most versatile crops among the cereal family, stood third in position after rice with respect to area and productivity globally. The world’s population increasing rapidly and their production seem shrinking day by day. The goal of agriculture to enhances crop production by using different agronomical tools. Intercropping is an advanced agronomic technique that allows two or more crops to yield from the same area of land. It aids in proper utilization of soil moisture from the soil layer to maintain fertility status for better girth and development performance of the crop. It may provide the better utilization of resources, reduced weed competition and minimize the risk of food shortages by enhancing yield stability. Mustard and chickpea plays a significant role in improving soil fertility by fixing the atmospheric nitrogen. Therefore, intercropping has been recognized as potentially beneficial system of crop production and evidences suggest that it can provide sustainability yield advantage compared to sole programming.

Key words: Crop, intercropping, productivity, rice, wheat, weeds
Estimation of genetic variability, correlation and path analysis for yield components traits in bread wheat (Triticum aestivum L.)

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Abstract

Phenotypic and genotypic coefficients of variation (pev, GCV), heritability, genetic advance (GA) and correlation and path coefficients for 13 characters were estimated in 47 genotypes of bread wheat (Triticum aestivum). The PCV was greater than GCV for all the characters which reflects the existing range of variability within the genotypes was not only due to varying influence of environment. High heritability along with high genetic advance was observed for characters such as grain yield plant⁻¹, ear weight plant⁻¹ and no. of ears plant⁻¹ which indicates that improvement in these traits can be done by direct selection. In correlation analysis the highest positive and significant correlation was recorded in harvest index, biological yield plant⁻¹, ears plant⁻¹, productive tillers plant⁻¹ and ear weight plant⁻¹ on the dependent character i.e. grain yield per plant. In the path analysis the highest positive direct effect was observed in biological yield plant⁻¹, harvest index, ear length, 1000-grain weight, days to 50% heading and no. of spikelet’s ear⁻¹. Traits such as no. of productive tillers plant⁻¹ and plant height had negative direct effect on yield. Traits such as biological yield plant⁻¹, no. of ears plant⁻¹ and no. of productive tillers plant⁻¹ showed positive indirect effect on yield. Therefore these traits may be effective in selection during breeding programme for improving grain yield and quality.

Keywords: Bread wheat, path, correlation coefficient, genetic variability, genetic advance, heritability
Anticancer Property of Cruciferous vegetables

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Abstract

Cruciferous vegetables are vegetables of family Brassicaceae which include cabbage, cauliflower, broccoli, garden cress, brussels sprouts and other green leafy vegetables. These are rich source of glucosinolates and their hydrolysis products also indoles and isothiocyanates. High intake of cruciferous vegetables has been associated with lower risk of lungs and colorectal cancer. Glucosinate hydrolysis product improves the metabolism of sex hormones in ways that could slow the development of hormone sensitive cancers. National Cancer Institute recommended 5-9 serving of fruits and vegetables consumption daily, but separately not for cruciferous vegetables. Isothiocyanates and indoles are the product of hydrolysis of glucosinolates, such as sulforaphane and indole 3-carbinol, have been inculpated in a variety of anticarcinogenic property, but also deleterious effects have been reported in some experiments, including tumour promotion over prolonged periods of exposure. Epidemiological studies indicate that human exposure to indoles and isothiocyanates through cruciferous vegetable consumption may decrease the risk of cancer but the protective effects may be controlled by the genetic variation in the metabolism and elimination of isothiocyanates from the body.

Keywords: sulphoraphane, glucosinolate, cancer, indole-3-carbinol
ORGANIC CULTIVATION TO ENHANCE YIELD AND QUALITY OF STRAWBERRY

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Abstract

Environmental issues are capturing more and more of the world's attention, researchers are aiming at improving environmental quality through the adoption of techniques and measures that have a reduced impact on the environment. Conventional agriculture practices utilize high-yield crop cultivars, chemical fertilizers and pesticides, irrigation and mechanization. Pollution is becoming a serious problem in agricultural regions. For example, various mineral fertilizers and agrochemicals lead to pollution and serious health problems in humans, hence alternative production techniques which employ biological or organic compounds for disease and pest control are needed. Organic farming is an agricultural practice that raise plants specially vegetables and fruits without the use of synthetic pesticides, herbicides, fertilizers, or plant growth regulators. Organic cultivation of strawberry though has reduced the yield/hectare but returns per hectare is high as well as the quality of the fruit is found to be superior than the one grown in conventional methods. Pollination of insect pollinated crops has been found to be correlated to pollinator abundance and diversity. Since organic farming has the potential to mitigate negative effects of agricultural intensification on biodiversity, it may also benefit crop pollination. It has been found that pollination success and the proportion of fully pollinated berries were higher on organic compared to conventional farms which suggest that conversion to organic farming may rapidly increase pollination success and hence benefit the ecosystem service of crop pollination regarding both yield, quantity and quality of strawberry.

Keywords: Organic, Strawberry, Yield, Quality, Pollination
Genetic diversity in Green gram *Vigna radiate* based on morphological and biochemical traits

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Abstract

Green gram [*Vignaradiata*(L) Wilczek] is an annual, erect or semi-erect plant. The crop is in high demand for its high protein content. In India, problems with pulses are the low productivity of existing cultivars, an lack of suitable breeding practices to develop a resistance cultivar against biotic and abiotic components. Therefore, aim of study is to evaluate the diverse germplasm of Green gram under local conditions of Punjab, India. Studies was done by using 22 cultivars of Green gram collected from different agro-climatic zones of India. Result will be recorded on the basis of morphological and biochemical traits. The present study indicated that the distribution of different genotypes into different clusters was at random and sufficient $D^2$ values among different cluster suggests that the genetic constitution of the promising lines in one cluster is in close proximity with the promising lines in other cluster of the pair may lead to desirable segregants having broad genetic base through hybridization between genotypes of two distant clusters. Different statistical analysis were done and data were recorded to identify the best suitable cultivar to be grown in Punjab condition and further seed profiling was done to identify the best cultivar.

Key words: Germplasm, Diversity, Morphological, Biochemical, Seed protein
Role of Horticultural Crops in Human Health

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ABSTRACT

In this changing global scenario, nutrition and healthcare are great matter of concern for the social and economic development of any country. Horticultural crops play a vital role in maintaining human health. Horticulture therapy is now a practice to have good health without medication because they are rich source of nutraceutical compounds. Vegetables, fruits and flowers play essential role in prevention of several chronic diseases such as cancer, heart disease, macular degeneration, osteoporosis, diabetes, etc. These health benefits are attributed due the presence of phytochemicals in horticultural crops. Fruits and vegetables are called as functional foods because apart from nutrients, which are required to fulfill body’s physiological needs, they also contain antioxidants, which prevent our body from various degenerative processes by free radical scavenging activity. Common antioxidants found in fruits, vegetables and flowers are ascorbic acid, carotenoids, anthocyanins, phenolics and flavonoids. In order to have protective effect, it is essential to consume 400- 600 g of fruits and vegetables every day.

Key words: Horticultural crops, nutraceuticals, phytochemicals, functional food and antioxidants
Micro-organisms: Role in sustainable agriculture

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Abstract

World’s 2nd largest producer of several dry fruits, agricultural-based textile raw materials, roots & tuber crops, pulses, farmed fish, eggs, sugarcane and vegetables is currently India. India is world’s 5th largest producer of 80% agricultural produced items including many cash crops such as coffee and cotton. Green revolution showed a huge increase in crop yield over years. But to increase the yield the use of chemicals in form of pesticides, insecticides is in practice and they have crossed the limits resulting in harming the environment and effecting the mankind. They have increased the quantity that is the yield but the quality is not up to mark. So, there is a need to opt for better options rather than using chemicals for pest and insect control. Use of naturally occurring micro-organisms has proved beneficial for agricultural practices. For sustainable agriculture production, there is requirement of practices like crop rotation, green manure, organic manures, biofertilizers, composts and biological pest management. Nearly one trillion species of micro-organisms are present on earth, but only one thousandth of one percent of those is identified, it means 99.99% is still unknown which can be proved beneficial in agricultural practices that is in increasing crop production, plant health protection and soil health maintenance and environmental issues. Microbes can be isolated from environment only to treat environment issues. Micro-organisms such as \textit{Bacillus subtilis}, \textit{Bacillus aryabhattai}, \textit{Pseudomonas fluorescence}, rhizobium, \textit{Azotobacter}, \textit{Tricoderma virdi}, \textit{Tricoderma harzanium} are used in bio-fertilizers to enrich the soil for better crop yield and for regional crops, particular microorganism isolated from that region is more beneficial due to the stability of strains of the microorganisms. Similarly biopesticides, biostimulants are used in improving agricultural practices. Use of different technologies such as nanomaterials, biosensors is used for improving agricultural practices.

Keywords: Agriculture; Biofertilizers; Biopesticides; Biostimulants; Micro-organisms
PROSPECTS OF SOILLESS CULTURE IN HORTICULTURE

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Abstract

Soil less culture in horticulture crops is gaining popularity owing to the utilization of resources both in time and space. Many developed countries have adopted this technology owing to its greater output and higher economic returns. Soil less cultivation has manifold advantages when compared to conventional cultivation of crops. Cultivation of various horticulture crops is done with the help of nutrients dissolved in water instead of soil application. Popularly known as hydroponic cultivation, this system has been adopted especially in countries where there is resource constraint and demand for horticultural produce is more. This soilless culture has been successfully demonstrated for the production of vegetables and flowers. As far as fruit crops are concerned, the application of hydroponics is limited to a few fruit crops owing to the perennial nature of the fruit crops. In India, soil less culture was first started in 1946-1947 in Gujarat city wherein soil less cultivation was applied to floriculture. States like Himachal Pradesh, Goa, Karnataka and Punjab have adopted this system. Now days, many improvised techniques have been developed for soil less culture of plants. Hydroponics has two main fold advantages over conventional system of crop culture. Firstly, increased production over the conventional yields and secondly, soil less culture can be taken up at places where soil is not suitable for cultivation. It holds a lot of promise as very less input cost is incurred and it results in increased economic value, higher crop yield, maximum utilization of space, less growing time and water saving through recycling the nutrient water. Organic growing media such as sawdust, cocopeat, peatmoss, woodchips, barks etc. can be incorporated. In view of the shrinking land holdings in India, this technology holds promise in upcoming years and could give a new dimension to the Indian horticulture industry.

Key words: Hydroponics, soil less culture, horticulture, economics
Production of Electricity from Hydrogen Fuel

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Abstract

Hydrogen gas is a zero-emission fuel when burned with oxygen. This super specialty makes it very preferable fuel option for variety of operation. Hydrogen fuel can provide motive power for liquid-propellant rockets, cars, bikes, and airplanes. Because pure hydrogen does not occur naturally on Earth in large quantities, it takes a substantial amount of energy in its industrial production. There are different ways to produce it, such as electrolysis and steam-methane reforming process. Obtaining hydrogen from other process is also being studied to find a viable way to produce it domestically at a low cost. We have found out one such method through this project. It involves a chemical reaction between scrap Aluminum and Sodium Hydroxide. This process is environment friendly as it solves two major problems which are removal of scrap Aluminum waste and production of hydrogen gas at low cost.

The overall process involves the reaction Aluminum with Sodium Hydroxide in the presence of water which gives Sodium Aluminate and Hydrogen gas. We carried out this reaction in a plastic barrel and connected it with a gas primary purification unit containing water to remove any solid particle present in the out flux of produces of hydrogen gas. The partially pure Hydrogen is now transferred to the secondary purification unit containing bed of Activated Carbon and filter paper. Here, any impurity present in a gas is removed and pure stream gas is generated to be used as fuel to engine. To demonstrate the working of hydrogen gas powered engine, we have used a two stroke 120CC engine in which a few modifications were made to its carburetor and connected its fuel inlet port to the outlet of secondary treatment unit for the supply for pure Hydrogen gas to it. Further, a 12watt DC motor was connected with engine which rotates with engine power and produces electricity. In order to have a constant supply of electricity (without any fluctuation) a DC to AC converter is connected in the power supply line.

Keywords- Hydrogen fuel, Electricity, Eco-friendly, Aluminium waste
ENHANCING SHELF-LIFE AND QUALITY OF BER CV. UMRAN THROUGH EDIBLE COATINGS

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Abstract

Coating materials can enhance the shelf life of horticultural products post harvest as has been evidenced by numerous research works carried out on different fruit crops. In this context, an experiment was conducted at the Post Graduate Laboratory, Department of Horticulture, School of Agriculture, Lovely Professional University, Phagwara, India during the year 2018 to evaluate the effect of different edible coating materials on the post harvest quality and shelf life of ber cv. Umran. A total of eight coating treatments were used under the experiment. Out of all the treatments applied, the treatment comprising coating of ber fruits with food grade petroleum jelly resulted in minimum loss in weight and size. The spoilage percentage in ber fruits at different storage intervals was minimum in case of fruits coated with food grade petroleum jelly. There was degradation in the chemical attributes of the ber fruit during storage but positive results were obtained for TSS, acidity, total sugars (reducing and non-reducing) and vitamin C content wherein fruits coated with petroleum jelly exhibited superior chemical attributes as compared to fruits coated with other coating materials. The biochemical characters of the ber fruit coated with food grade petroleum jelly exhibited incremental variations as compared to other coating treatments. Maximum antioxidants were recorded with the treatment comprising coating the ber fruits with food grade petroleum jelly. The carotenoid content of ber fruits showed an increasing trend and maximum carotenoid content was recorded with the treatment comprising coating of ber fruits with petroleum jelly.

Keywords: Ber, umran, shelf-life, biochemical, coatings
Vegetable crops as nutraceuticals

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Abstract

Vegetables are an essential part of balanced diet since they are good source of phytonutrients and nutraceutical compounds. Vegetables being rich source of carbohydrates, proteins, vitamins and minerals are known as protective foods. Each vegetable contain a unique combination of nutraceuticals, for instance sulphoraphane and indole compound present in cole crops (broccoli, cabbage) are known to reduce lung, breast and prostate cancers. Cheratin compound present in bittergourd and diphenyl amine present in onion is effective against diabetes. The presence of plant flavonol from the flavonoid group of polyphenols known as quercertin present in onion and garlic provide protection against cancer and heart disease, while sulphur compound help in reducing blood cholesterol level. A good amount of antioxidant activity found in green leafy vegetables like broccoli, spinach, kale and lettuce etc. counteracts radical damage. The major active nutraceutical ingredients in vegetables i.e. flavonoids, act as potent antioxidants and metal chelators. They also have long been recognized to possess anti-inflammatory, anti-allergic, antithrombotic, anti-viral, and anti-carcinogenic activities. Anthocyanin rich vegetables such as purple cauliflower, broccoli and black/purple carrots are gaining popularity due to their enhanced antioxidant activity. Hence, a great diversity of vegetables should be eaten to ensure that individual's diet includes a combination nutraceuticals and to get all the health benefits.

Keywords: Antioxidants, flavonoids, nutraceuticals and Vegetables
Vegetable production for nutritional security

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Abstract

Vegetables are an excellent source of vitamins, minerals, carbohydrates, dietary fibres, flavonoids and antioxidants, because of which they are rightly known as protective as well as productive food. Vegetable consumption can help alleviate malnutrition. Many vegetables, indigenous vegetables in particular, have high levels of micronutrients and could significantly contribute to nutritional security if eaten as part of the daily diet. Consumption of lower amount of the vegetable in many developing countries are common and often in conjunction with poverty and availability. The availability, affordability and consumption of nutrient from vegetables can be increased by growing more varieties of vegetables under more areas. It may be substantially reversed, yet nutritional security appears to be less valued than food security by key decision makers and vegetable crops thus receive inadequate research investment. Many researchers continues on defining appropriate nutrient-dense vegetables for such activities, but these efforts may be compromised by failure to adopt good agricultural practices, resulting in contamination and unhealthy produce for producers and consumers. The World Vegetable Center conserves a highly diverse collection of indigenous vegetable and multiplying them. Some of the indigenous vegetables are eggplant, drumstick, bitter gourd, water spinach, amaranth, chinese kale, edible rape, roselle, malabar spinach, winged bean and many gourd species. To fulfill the demand of vegetables, good production practices and research strategies should be implemented to address the nutritional security of country.

Keywords: Nutrition, indigenous, production and vegetable
EFFECT OF HEAVY PRUNING ON YIELD AND QUALITY OF KINNOW FRUIT

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Abstract

Pruning is an important aspect of fruit crop cultivation. Most of the fruit species respond well to pruning activities as it promotes plentiful fruit bud formation thereby increasing the crop load and maximizing the yield. Pruning in citrus is not well documented but some research studies have shown citrus responds to pruning. A study was conducted in Kinnow orchard at village Gidranwali, Tehsil Abohar, Distt. Fazilka to evaluate the effect of pruning on the yield and quality of Kinnow fruit. Mature, healthy and vigorous bearing trees of Kinnow mandarin were pruned as per the treatments T₁ = Pruning of healthy fruit bearing branch on west side, T₂ = pruning the healthy fruit bearing branch on east side, T₃ = pruning the healthy fruit bearing branch on south side and T₄ = pruning the healthy fruit bearing branch on north side. Unpruned healthy plants were treated as control (T₀). The perusal of the data generated revealed that treatment T₃ (pruning of healthy fruit bearing branch on south side) produced larger number of fruits with attractive colour and better quality as compared to other pruning treatments. Fruit weight and juice percentage were also observed to be superior under the same treatment (T₃). The study revealed that instead of conventional pruning strategies followed in Kinnow orchards, one can take up lopping of heavy bearing branch on the southern side of the orchard to open the canopy for better light penetration and solarisation of the plant which comprehensively resulted in the increased yield with better quality of fruits. Treatments T₁ and T₂ were also at par with T₃.

Keywords: Kinnow, pruning, lopping, yield, fruit quality
Life history and sustainable management of Helicoverpa armigera

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Abstract

*Helicoverpa armigera (Hübner) (Lepidoptera: Noctuidae) is a highly polyphagous agricultural pest. Host species for H. armigera come from a broad spectrum of families and include important agricultural crops such as cotton, maize, chickpea, pigeonpea, sorghum, sunflower, soyabean and groundnuts. Due to highly damaging capability this pest have international important. Fecundity potential since each female can deposit 1,000 to 1,500 eggs, always laid singly on stems, flowers, fruits and leaves at night time, usually on the adaxial leaf face and hairy surfaces. Its larval period is completed within five to six instars. The incubation period varied from 4 to 6 days. These resembled the first instar larvae except that the head was darkted and thorax was greenish. During the 3rd stage the head was yellowish with brown dots black tubercles each bearing a seta became prominent. The 4th larva appeared brownish green with pale brown head. The dorso lateral and lateral strips were dark brownish and chalky green respectively. The thorasic legs were black and abdominal legs were of yellowish colour. In the fifth instar head colour was yellow with brown patches; the body was green yellow in colour. The prothoracic shield was yellowish with greenish black patches. The three dorsal longitudinal lines were brownish and the lateral lines were faint yellowish in colour. Freshly formed pupa was light green, sometime yellowish green in colour but later on it turns into dark brown prior to emergence of month. Adult - The adult was brownish in colour, fore wings were pole brown with a series of dots on margins and black kidneys shape mark on the underside of each forewings. His total cycle from egg to adult was completed in 35 to 75 days depending on the climate. The average maximum, minimum temperatures and relative humidity were 28.3°C, 7.2°C and 56-70 % respectively. Integrated management of pod borer done by utilizing techniques : use of resistant varieties according to crop wise availability, implementing a number of good agronomic practices, such as early sowing with optimum planting density and fertilizer levels, including inter/trap crops (coriander, mustard, linseed, sunflower, sorghum, and marigold) and set up bird perches at specific distance for bird predation , monitoring and management pod borer through pheromone traps, Integrating all of these approaches with biological control has shown some encouraging results for sustainable pod borer management and has resulted in high chickpea yields. It concludes that an integrated approach is most effective for long-term sustainable management of pod borer.

Keywords: Pod borer, fecundity, instars and management
**Recent Trends in High Density Planting for Subtropical Fruit Crops- A Review**

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**Abstract**

Accommodation of the maximum possible number of the plants per unit area to get the highest income from optimum tree canopy without affecting the soil fertility is called High density planting (HDP). It may be achieved by different approaches like use of dwarf cultivars, dwarfing rootstocks/interstocks, use of growth retardants, training/pruning, and planting systems. Tree density is one of the most important factors that influence the production of fruit in an orchard particularly in its early years. Under subtropical fruit crops HDP technology has been successfully applied in banana, pineapple and papaya and recently in mango, guava and citrus and many more fruit crops are now under HDP. Presently, the continued decline in the availability of cultivable land, rising energy and cost of land with increasing demand for fruits, have given impetus to adopt HDP system in fruit crops. The main reason for this shift in approach is urgency to achieve early bearing, continuous higher yields. It also emphasizes the need of low labour work to meet the continually increasing costs of production. In HDP, light distribution and average fruit colour may become less optimal. Orchard planted at much closer spacing may face the situation that may lead to higher incidences of pests and diseases in the middle parts of the multi-rows. Now that the market is making ever-higher demands with respect to fruit quality, the planting system tree density per ha must be selected with lot of care to provide the maximum yield of easily marketable fruits. This underline the need for more careful planning by the fruit grower on planting density and planting system with respect to site of cultivation and plant vigour.

**Keywords**: Dwarf cultivars, dwarfing rootstocks, growth retardants, pruning, canopy management, planting systems.
Response of Vermicompost on quality and yield parameters of Tomato (Solanum lycopersicum L.)

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Abstract

The raising awareness on health makes consumers more concerned for the quality and safety of food. Vermicomposting is an eco-friendly and cost-effective process to treat organic waste by using the various species of worms, usually red wiggler, white worms and some other species of earthworms for decomposing the organic waste. Vermicompost is nutrients rich organic amendment which is formed from the interaction of earthworms and microorganism by the breakdown of organic waste. The earthworms convert the organic waste into small sizes particles by breaking in gut and acquire nutrients from the microbes that patronize upon them. The degradation of organic matter will be increased by this process and modifies the physiochemical properties of organic waste which leads to the formation of humus in terms of unstable organic waste completely oxidized. Various physiochemical and biological properties of soil will be enhanced by the vermicompost amendment and it also aggregates the stability of soil, plant growth, increases microbial activity and enzyme production. The use of vermicompost promotes the germination growth, flowering and yield of greenhouse and field horticultural crops. Vermicompost has an effective role in improving the quality, growth and yield of tomato or different vegetable and field crops.

Keywords: Vermicompost, Tomato fruit quality, Earthworms, organic waste.
Impact of different weed biochar on fertility of soil

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Abstract

Weeds are the unwanted plants that grow where they are not desired. Many of weeds create harmful effects in the environment and also a threat to human and animal health. They also show allelopathic effect as well as nutrient imbalance in soil. Elimination of weeds is difficult task so in order to eliminate them we converted these weeds into biochar by burning them in the biochar unit at the temperature of 300 °C and incorporated the in the soil. Different weeds show different effects in the soil and also there nutritional properties vary. By converting weeds into biochar we can increase the fertility of the soil to some extent and at the same time weed management techniques may also be improved. Using biochar in soil is better than organic matter and it also increases plant growth and reduces the effects of heavy metals and organic pollutants. Decomposition of biochar is a slow process, so it can retain biochar properties for many years. The most commonly used weeds for preparation of biochar are milky weed (Calotropis gigantean), Devil horse whip(Achyranthes aspera),Coffee senna (Cassia occidentalis).

Keywords: Biochar, weed management, Soil fertility
PHYTOCHEMICAL ANALYSIS AND ANTIMICROBIAL ACTIVITY OF SEEDS OF CARICA PAPAYA AND TAMARINDUS INDICA

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Abstract

Papaya and Tamarind seed extracts are very much beneficial for skin care. The nutrients inside papaya seeds can help our body and skin to rejuvenate better. Tamarind seed boosts skin elasticity, provides hydration and smoothness. This contains hyaluronic acid that helps in skin moisturization and smoothes fine lines and wrinkles. To evaluate the scientific basis for the use of these plants, the phytochemical analysis and antimicrobial activities of different solvent extracts of seeds were evaluated against some common gram negative and gram positive bacteria. The antibacterial activity of seed extracts of *Carica papaya* and *Tamarindus indica* were evaluated by disc diffusion method. All the extracts were active against gram-positive bacteria and gram-negative bacteria. The extract of *Carica papaya* was found to be the most active against the *E.coli* and *Pseudomonas aeruginosa*. Phytochemical analysis showed that the extracts contain carbohydrates, flavonoids, saponins, alkaloids, proteins, steroids, and glycoside.

Keywords: Carica papaya, Tamarindus indica, solvent extraction, phytochemical analysis, antibacterial activity, disc diffusion method.
Endophytes: A Potential Source of Bioactive Compounds and Its Application in Sustainable Development

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Abstract

Endophytes are symbiotic group of microorganisms that colonize in plants. These microorganisms are found to produce a lot of bioactive compounds (alkaloids, phenolic acids, saponins, tannins and terpenoids) with different bioactivities such as anticancer, antimicrobial, antiviral and many more. Bioactive compounds obtained from endophytic microorganisms shows potential application in pharmaceutical, food and agriculture industry. This review aims to comprehend the role of endophytes and the bioactive compounds obtained from endophytes in sustainable development.

Keywords: Bioactive compound; Anticancer; Antimicrobial; Endophytes
MYCORRHIZA ASSOCIATED DROUGHT AVOIDANCE IN CEREAL CROP

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Abstract

Cereals are majorly grown crop all over the world and its rhizosphere is induced with several microorganisms and especially beneficial root symbiotic fungi i.e. Arbuscular Mycorrhiza (AM). This symbiosis helps plant in nutrient uptake and also to protect host plants against the effect of drought stress through the mechanism of drought avoidance. The biochemical mechanism which promotes drought tolerance in AM inoculated plants which include accumulation of osmoprotectants like proline, sugar and trehalose. Higher osmotic adjustment capacity is a characteristics feature of drought tolerance as it allows the cell to maintain turgor and turgor dependent processes like stomatal opening, cellular expansion, growth, photosynthesis as well as keeping the water potential gradient favourable for water entry into plant roots. In AM inoculated plants under drought conditions there is rapid enhancement in concentration of different enzymatic and non-enzymatic antioxidants. These antioxidants reduce the risk of free radicle attack on plant cell membrane. This reduce electrolyte leakage and MDA (malondialdehyde) content of drought stress plant tissue. This improvement in membrane stability has been attributed to increase phosphorus uptake by AM inoculation and changes brought about in membrane phospholipids levels and also in permeability properties. During the period of inhibited growth proline serve as Nitrogen an energy source besides reducing the cell water potential. The improved growth, yield and nutrient uptake in cereals crops with potential of mycorrhizal inoculation to reduce effect of drought stress on cereals when grown under field conditions. This review provides an overview on different biochemical mechanisms involved in drought stress tolerance and role of mycorrhiza combating abiotic stress.
Importance of bio-fertilizers for improving the soil health

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Abstract

Bio-fertilizers are the organic substances which contain live micro-organisms that help in increasing productivity of the crops. These when applied to seeds, plant surface or soil, colonize the rhizosphere or interior of the plant that helps to promote growth of the plant by increasing the availability of primary nutrients to the host plant. These also produce hormones, like Indole Acetic Acid (IAA) and gibberellin as well as vitamins like biotin, folic acid and vitamin B and provide protection against drought and some soil-borne diseases. Bio-fertilizers such as *Rhizobium*, *Azotobacter*, *Azospirillum* and blue green algae etc. are used in different crops. Nitrogen is a major nutrient required for all crops and *Rhizobium*, a symbiotic nitrogen fixing bacteria is used in leguminous crops which symbiotically associates with plant roots and fixes atmospheric nitrogen in the soil and makes it available for the plants. Likewise, the involved microorganisms can readily and safely convert complex organic materials into simpler compounds, so that they are easily taken up by the plants. *Azotobacter* can be used with crops like wheat, maize, mustard, potato and other vegetables. The application of bio-fertilizers can substitute NPK fertilizer by 25% to 50% in soil and may also reduce the plant diseases. Along with adding natural nutrients to soil, bio-fertilizers also increase soil organic matter, improve soil structure and water holding capacity and reduce soil erosion from wind and water, in contrast to chemical fertilizers which are manufactured from synthetic materials and affect the soil health, plant health and ultimately the human health as some fertilizers have high acid content.

Keywords: Bio-fertilizers, micro-organisms, *Rhizobium*, soil health, organic matter, nutrients
SEED PRODUCTION AND SEED QUALITY ENHANCEMENT THROUGH THE USE OF PLANT GROWTH REGULATORS: A REVIEW

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Abstract

Plant growth regulators considered as a missile in agriculture for enhancing yield and quality of crops when you applying in minute quantity have ability to change in the morphology of plants and affect growth either by enhancing or by stimulating the natural growth regulatory systems from seed germination to senescence. These can improve the metabolic efficiency of plants including photosynthetic capacity and effective partitioning of assimilates, resulting into increase in yield. Many seed technologies have proved effective in increasing seed viability and vigour when applied as seed treatment or as foliar spray at different growth stages. Bolder seeds without any infection are mostly considered as quality seed in some crops because they have the ability to withstand any condition. So this can be achieved with the use of plant growth regulators. The effect of plant growth regulators on seed production and seed quality is reviewed herewith, which may help the researchers in planning their research very precisely and in right direction to get more fruitful results in seed production program.

Keywords: PGR, field crops, viability and vigour.
POSTHARVEST TREATMENTS FOR SHELF LIFE IMPROVEMENT IN PEAR (Pyrus communis L.)

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Abstract

Application of coatings is a suitable method to maintain the quality and reduce post-harvest losses in horticultural commodities. Pear being a climacteric fruit and having more juice content has a short shelf life and coating is considered as one of the most popular technique to improve its shelf life and reduce post-harvest loss. A total of eight coating treatments viz. chitosan (2%), calcium chloride (2%), aloevera (50%), bee wax (12%), pectin (3%), guar gum (6%), petroleum jelly and untreated control. were used under the experiment. Out of all the treatments applied, the treatment comprising coating of pear fruits with chitosan (2%) resulted in minimum loss in weight and size. There was degradation in the chemical attributes of the pear fruit during storage but positive results were obtained for TSS, acidity, total sugars (reducing and non-reducing) and vitamin C content wherein fruits coated with chitosan exhibited better chemical attributes as compared to fruits coated with other coating materials. The biochemical characters of the pear fruit coated with chitosan exhibited incremental variations as compared to other coating treatments. Maximum antioxidants were recorded with the treatment comprising coating the pear fruits with chitosan (2%) coating. All the coatings were helpful to improve shelf life of pear fruit compared to control but chitosan @ 2% gave better results than other coating materials.

Key words: Pear, patharnakh, shelf-life, biochemical, coating treatments
Portable fruit and vegetable quality sensor

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Abstract

Modern agriculture has been using chemical fertilizers which get accumulated in plant products when used in excess. These chemical fertilizers have nitrates and nitrites. When such plant products are consumed by humans causes many disorders such as methamoglobinemia in infants. The acceptable daily intake (ADI) of nitrate and nitrite set by European Commission’s Scientific Committee for Food (ECSCF), is 3.7 mg/kg body weight and 0.06 mg/kg body weight, respectively.

Thus we have come up with a cheap and portable device which will help consumers to analyse the nitrate content and nutritional value of fruits and vegetable they are consuming. The main guideline of our work is the conductivity residing inside the fruits and vegetables. The presence of nitrate ions in organic matter measurably increases conductivity. The measurement differs according to the ion concentration and the cell structure of the fruits and vegetables under test.

At present we are on our way of establishing a relationship between resistance and the nitrate concentration in fruits and vegetables. We are opting several quantitative and qualitative methods to derive the relationship between resistance and the nitrate concentration. Hence our work would present a resistance based device that would display the nitrate content of the fruit or vegetable under test, the standard nitrate concentration prescribed by WHO for that fruit or vegetable and the nutritional value of the fruit or vegetable. The device would be cheap and portable so that the consumers can carry it to market and easily analyse the fruits and vegetables they are buying.

Keywords- Nitrate, Fruits quality, WHO, Nutrition
Abstract

Integrated nutrient management involves integration of nutrient from all possible sources like inorganic, organic and biofertilizers so as to improve the soil health without compromising with the yield. In this context, an experiment was conducted at the experimental farms of the Domain of Agronomy, Lovely Professional University, Punjab to evaluate the effect of different integrated nutrient management treatments on rabi sown wheat crop. The treatments comprised of a total of 8 different combinations which were replicated thrice. Results revealed that maximum plant growth, number of green leaves, number of tillers per metre row length, number of ear heads per square meter and number of seeds per ear were maximum when 50 per cent RDF was applied alongwith vermicompost @ 5 tonnes per hectare. However, grain yield, seed weight and harvest index was worked out to be maximum for the treatment comprising of RDF @75 per cent alongwith vercompost @ 2.5 tonnes per hectare. The FTIR spectroscopy also revealed that the organic molecules content of the wheat seeds was superior to other treatments comprising of inorganic amendments only. The soil nutrient status evaluated pre and post harvest also revealed that the experimental plots receiving integrated nutrient management treatments had appreciable amount of available organic carbon, nitrogen, phosphorus and potassium content.

Keywords: wheat, FTIR, spectroscopy, INM, vermicompost, yield
Effect of Different Growth Hormone on Fruit Yield and Growth Parameter of Strawberry (*Fragaria ananassa*) Fruit

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Abstract

An experiment was conducted to study the effect of different growth hormones (GA3, NAA and BA) on fruit set, yield and quality under pot culture of strawberry in shade net condition. The strawberry runners were collected from plant nursery near Jalandhar and used as propagating material. The experiment implemented with 7 treatments and 4 replications. From the results of the experiment, it was inferred among all seven treatments, that strawberry plants responded much better to application of T\textsubscript{2} (GA3-50 ppm) for their number of flowers per plant, number of fruit set per plant, yield per plant and TSS, followed by T\textsubscript{3} (BA- 25 ppm) for fruit length, fruit girth and fruit shape index. Fruit weight is an important character in strawberry which was observed superior in treatment T\textsubscript{2} (GA3-50 ppm), followed by T\textsubscript{4} (NAA-50ppm) and the minimum fruit weight of 4.17gm was recorded in T\textsubscript{7} (control). Maximum number of flower per plant (7.5) was observed by the application of GA3-50 ppm (T\textsubscript{2}) and NAA- 25 ppm (T\textsubscript{3}). Based on these results, it is concluded that GA3, BA and NAA all are playing important role in the expression of different characters.

Keywords: Hormones; Fruit weight; Treatment; Strawberry; Flowering
Review on Management of *Colletotrichum capsici* Through Antagonistic Microbes and Botanicals

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Abstract

Chilli is the one among the large scale essence crops grown in India which accounts about 30% of total spice production. Chilli has been put to use in varied forms such as fresh green chilli compensate vitamin C and red chilli fruiting body contains more amount of vitamin A. It is also used as dry and powdered ingredients form. Anthracnose disease is major economic problems to chilli production in world-wide, peculiarly in tropical and subtropical regions. In recent past, the *Colletotrichum* was catalogued as the 8th major group of plant-pathogenic fungi on the globe, based on anticipated economic and scientific understanding. Almost chilli harvested all over the world is sensitive to more than one *Colletotrichum* species. About 50% of yield loss occurs due to chilli anthracnose. The disease triggers major damaging symptoms to both mature fruits inside the farm as well as during their storage area under favourable conditions which results drastic reduction in market value. Complete inhibition of mycelium and spore germination of *Colletotrichum* observed by the application of Onion bulbs and leaf extract of *Pongamia, Azadirachta* and *Tagetes*. Bioagents like *Trichoderma* sp. and *Pseudomonas* effectively manage the growth and development of *C. capsici* through seed and foliar treatment. These are the alternate practices which can effectively reduce the excessive use of pesticides because pesticidal residues on dry fruits which are used in cooking purpose without washing have given negative impact on human health. This paper over all reviews about the management of anthracnose of chilli through contrasting microbes and botanicals.

**Keywords:** Anthracnose; Mycelium; Pesticidal residue
Shoot Tip Culture of Date Palm: A Review

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Abstract

Shoot tip culture can be used for rapid and mass multiplication of virus and disease free date palm. The maximum number of clone plantlets can be produced from elite genotypes in a relatively shorter time and it has proved effectiveness for the large scale production of many varieties of this palm. The high levels of auxin (2,4-D) at the concentration of 95 to 105 mg/L has been reported effective in shoot tip culture. However, regeneration through shoot tip culture in date palm is little bit difficult to achieve rate of regeneration in recalcitrant varieties and is mostly prevent by some physiological disorders. In this present review, we recorded the results of a variouse research work performed on the date palm tissue culture specially shoot tip culture. It also describes variouse biotic and abiotic factors that affect the each stage of shoot tip culture and the important problems noted during the micro propagation process.

Keywords: Phoenix dactylifera L.; Shoot tip culture
Let Stubble Not to Be a Trouble

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Abstract

India being agriculture dominant country produces over 500 mt crop residue annually. About 35 mt crop waste is burnt in Punjab and Haryana State alone. Large quantities of unused crop residues are burnt in the field after the harvest. Open burning of stubbles produces harmful smoke that causes air pollution. Large quantities of toxic pollutants are released in atmosphere. About 1460 kg CO$_2$ is released from one tonne stubble. Smog is formed which increases the level of pollutants. Institute of Medical Science and Research, Bhatinda reveals that, the 84% people in Punjab were having adverse health problem due to dangerous air pollution by stubble burning. These pollutants contribute air pollution about 20 times higher in north India, including Delhi region. This happen during the winter season in the month of November and December which coincide with the kharif harvesting season. Air quality of Delhi has already started worsening and PM10 & PM2.5 level are gradually shooting up. Some think burning is quick, easy and cheap method to get rid of them but burning the grounds destroys natural nutrients in soil. Government has announced subsidy (50%) for straw management devices i.e. happy seeder, baler zero till, chopper club-shedder. Happy seeder is a machine that cuts rice straw, sows wheat seed into soil and deposit the sown area as mulch. It is developed by PAU, Ludhiana in 2001. Punjab pollution control board (PPCB) identified 250 cases of burning straw also collected as stubbles fines of Rs. 32500/- in Punjab. Semi dwarf varieties of wheat have less straw. The urea treatment with stubbles is used as fodder for animal, which is used in biothermal energy production, composting, mushroom cultivation, biochar making, baler making and mulching etc. Therefore, appropriate management of crop residues assumes a great significant.

Keywords: CO$_2$, ;Happy seeder; Health; Verities; Subsidy
Eco-Friendly Agriculture: A Review

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Abstract

Since Green revolution, application of artificial chemicals such as synthetic pesticides and inorganic fertilizers increased the yield, but in the long run the excess usage of these chemicals has been showing a serious negative impact on the environment and humans as well. Impacts like the loss of biodiversity of land, reduced fertility, air pollution, water contamination and carcinogenic effects on mankind etc. As outlined by Mehta, just a single individual in 100 residents of the USA does not possess DDT in their body. With the great change in agricultural activities, organic farming came into existence in the twentieth century. This idea exploited eco-friendly methods just by cutting down on the usage of artificial chemicals and simply utilizing organic matter to cultivate plants. By which the environment rewards as a result of natural habitat sources are much less threatened, assures more healthy food for the people and also the soil is set in an enhanced state on account of the manure utilized. Eco-friendly agriculture in its advanced version, backed up with natural resources, made stronger with the advanced technology and reinforced with the mechanization is able to take on complications in the environmental preservation; resource optimizing, comparable productivity and soil strength build-up. Despite the fact that eco-friendly agriculture can be the best alternate to ensure the environment and human health, there are several challenges which can overcome with the suitable strategies and steps to build self reliance.

Keywords: Eco-friendly agriculture; Environmental preservation; Human health
A REVIEW ON IRON FERTILIZATION OF PEACH

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Abstract

The main aim of this review is to provide an overview of the iron fertilization studies of peach. The application of iron is an important management strategy for iron chlorosis correction, which may help to maximize the crop yield and fruit quality of peach. Soil and foliar fertilization with iron is used as a means of supplying supplemental doses on nutrient. Effects of iron fertilization have included chlorosis remediation, yield increases and enhanced crop quality. However, plant response is dependent on varieties, fertilization method, concentration and frequency of application. Foliar fertilization is often used to meet the demand of nutrient for chlorosis remediation in peach. Advance techniques viz. nano fertilization and bioremediation could be eco-friendly strategy to control the chlorosis in peach. It is projected that these advanced techniques should be recommended in integrated nutrient management, because it is more eco-friendly and increase productivity and quality of crops. In the present paper, a brief review of the research on iron fertilization and potential advance techniques for iron chlorosis control measure, are discussed.

Keywords: Foliar fertilization; Peach; Iron chlorosis; Yield;
Abstract

Green gram \textit{Vigna radiate} (L) Wilczek is an annual, erect or semi-erect plant. The crop is in high demand for its high protein content. In India, problems with pulses are the low productivity of existing cultivars, an lack of suitable breeding practices to develop a resistance cultivar against biotic and abiotic components. Therefore, aim of study is to evaluate the diverse germplasm of Green gram under local conditions of Punjab, India. Studies was done by using 22 cultivars of Green gram collected from different agro-climatic zones of India. Result will be recorded on the basis of morphological and biochemical traits. The present study indicated that the distribution of different genotypes into different clusters was at random and sufficient $D^2$ values among different cluster suggests that the genetic constitution of the promising lines in one cluster is in close proximity with the promising lines in other cluster of the pair may lead to desirable segregants having broad genetic base through hybridization between genotypes of two distant clusters. Different statistical analysis were done and data were recorded to identify the best suitable cultivar to be grown in Punjab condition and further seed profiling was done to identify the best cultivar.

Key words: Germplasm, Diversity, Morphological, Biochemical, Seed protein
Wheat Bran as an Efficient Lignocellulosic Agro-Waste for the Removal of Dye from the Textile Industry Waste Water

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Abstract

Textile industry waste water is one of the major source of water pollution and is recognised as one of the root cause of environment pollution due to its low biodegradability and toxic properties. Dye molecules even in trace amounts can produce high coloration, these molecules are highly resistantto the various conventional physical and chemical treatment methods. Adsorption is a highly efficient method for removal of synthetic dye from the wastewater because of its low cost, high efficiency, technological simplicity, specifically for biomass sorbent derived from agricultural waste. In this review, wheat bran, an agro-industrial waste has been highlighted as an efficient cost effective biosorbent for the remediation of textile dyes from textile industry effluent. A comparison of batch and column adsorption study on the basis of various parameters along with their kinetic study is explored to provide evidence of usage of such a lignocellulosic waste as an efficient adsorbent. The dye removal percentage by them from the effluent may serve as an evidence of the usage of bran as an efficient and economic adsorbent.

Keywords: Biosorbent, wheat bran, adsorption
Effect of Audible Sound Waves on the Growth of Plants: A Review

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Abstract

This review reveals the effect of audible sound waves on the growth of the plants. Just like humans plants also reacted to the attitude they have been exposed to. They are also sensitive to temperature, light and noise like humans. It has been studied that under optimal conditions sound waves at different frequencies under sound pressure levels, exposure periods and distances from the source of sound and type of sound influence the growth of the plant. Till now researchers have experimented different aspects of sound on a variety of plants; crops, vegetables, ornamental plants etc. After the treatment of the plants growth tests of the plant and the different parts of the plant have been carried out. After the sound treatment, it was observed that the overall growth of the plants had improved in one or the other way. However very little is known about the mechanism of the effect of sound waves on plants and it needs further study so that new and eco-friendly techniques using the sound waves could combat the challenge of the enhancement of the production of food against the use of harmful chemical fertilizers.

Keywords: audible sound waves; growth; plants
Evaluation of Strawberry (*Fragaria x ananassa* Duch.) germplasm under polyhouse and shade net

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Abstract

Strawberry (*Fragaria x ananassa* Duch.) belongs to family rosaceae and is cultivated for its fruit all over the world. Strawberries are also excellent source of vitamin C and manganese and also contain a fair amount of fibers, iodine, copper, phosphorus, biotin, potassium, magnesium and vitamin B6. The seeds of strawberry are good source of omega-3 fatty acid alpha-linolenic acid. Many varieties of strawberry have been introduced from different countries in India and have been grown in different part of the country including tropical, subtropical and temperate region however, no conclusive variety has been claimed to be better for any region. Further, the varieties available in the nurseries are also have no credibility and conformity. Considering the significance of strawberry in terms of yield and market value 11 germplasms (seven known varieties-Sweet Charlie, Hadar, Yasmin, Shani, Chandler, Camarosa and Winter Dawn and four unknown local germplasms- LGP01, LGP02, LGP03 and LGP04) have been collected and evaluated under shade net and polyhouse for its performance. The performance of Local Germplasm (LGP) was comparable to Sweet Charlie and Winter Dawn under polyhouse and shade net condition.

Keywords: Germplasm; Polyhouse; Strawberry; Shade net
Exploration of the applications of ligninolytic enzymes produced by Basidiomycetes species as a bioremediating agent

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Abstract

The biodegradation of lignocellulosic biomass has been generally examined in wood spoiling basidiomycetes microorganisms. White-rot fungi are the best bio-degraders of lignocellulosic biomass (e.g. Phanerochaete chrysosporium) and can debase lignin speedier than different microorganisms Lignin-degrading fungi and microorganisms can deliver fundamentally four noteworthy extracellular heme peroxidases, including lignin peroxidase (LiP), manganese-subordinate peroxidase (MnP), versatile peroxidase (VP), and laccase (Lac). These proteins can specifically degrade lignin, cellulose, and hemicellulose of the plant cell wall to break down it. These lignolytic enzymes produced by white-rot fungi are applicable in various industries at a commercial scale including the chemical, fuel, food, agricultural, paper, textile, cosmetic industrial sectors and more. The ligninolytic enzyme system of white-rot fungi is also directly involved in the degradation of various xenobiotic compounds, they also have capacities to remove xenobiotic substances and produce polymeric product which makes them a useful tool for various bioremediation purposes. More notable is the fact that they provide excellent results in dye degradation purposes. Of course, this exceptional intrigue has brought about voluminous writing. In this present investigation the applications of ligninolytic enzymes of basidiomycetes within different industrial and biotechnological area has been taken into consideration. The configuration of this content is sorted out around lignin degradation by the enzymes and their latest advancements are featured.

Keywords: Basidiomycetes, bioremediation, xenobiotic
Effect of Different Micronutrient on Growth, Yield and Quality of Tomato

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Abstract

Tomatoes are enormously grown in India as well as in the world but production and quality can still be improved if worked out. A field experiment was conducted during 2018 (feb-march) School of Agriculture, Lovely Professional University during rabi season to study about the effect of different micronutrient at different concentration on growth, yield and quality of tomato cv. Golden Shiv. The experiment way laid out using RBD design with eleven treatment and three replications along with the control. Foliar spray of boron, iron and zinc at different concentration and combination of these three treatments together were compared with control. Spraying were taken up thrice i.e. 30, 60, 75 days after transplanting. Application of micronutrients had marked influence on growth parameters that was plant height, number of cluster per plant and yield per plot by combined spray of three micronutrients (B+ Fe + Zn). Combined foliar spray of boron, iron and zinc were found to reduce the number of days required for 50% flowering and expressed the higher percentage of ascorbic acid and total soluble solid.

Keywords: Tomato, micronutrients, growth, yield and quality
Recent Patent Technologies of *Mimosa pudica*: A Review

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**Abstract**

*Mimosa pudica* commonly known as “chuimui” or “lajwanti” or “touch me not plant” belongs to family Mimosaceae. It is creeping annual or perennial herb. *M. pudica* is responsible for nastic movements. It usually responds to stimuli such as temperature, humidity, light and irradiance in a non-directional way. These nastic movements are due to the changes in turgor or changes in growth. The major phytoconstituents present in plant are alkaloids, flavonoids, tannins and phenolic compounds. The preliminary phytochemical screening of leaf extract of *M. pudica* exhibited the presence of terpenoids, flavonoids, glycosides, alkaloids, quinines, phenols, tannins, saponins and coumarins. Several therapeutic properties of plant are listed in the Ayurveda for example, heal wounds, coagulate blood and in weakness. Almost all part of the plant is considered to possess some pharmacological activities such as in inflammation, fatigue, leucoderma, fatigue and blood disease. *M. pudica* are used as in reducing the blood glucose level, used in the infection of urinary tract, use as the ulcer protective or reducing and many more activities. The patented activity of this plant are increasing the skin collagen level and other it is used in the treatment of rheumatoid arthritis. The phenolic extract of roots is used with cosmetics to increase the skin collagen level. This study shows the patented pharmacological studies and different phytochemicals present in the plant.

**Keywords:** alkaloids, flavonoids, tannins, phenolic, leaf extract
Performance of Strawberry (*Fragaria x ananassa* Duch.) germplasm under hydroponic condition

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Abstract

Strawberry (*Fragaria x ananassa* Duch.) has very specific nutrient requirement and variation in nutrient doses results in distortion in fruit shape or malformation in fruits. Availability of nutrients to the plants grown in soil media largely depends on rhizosphere climate so use of soilless media is the only option to provide required nutrients in appropriate proportion. This will ensure quality production of strawberry fruits. Hydroponic system includes nutrient solution may be supplemented with inert growing media like perlite or rockwool etc. Strawberry is well suited for hydroponic cultivation where plants are grown under perforated PVC pipes holding suitable nutrient solution with slightly acidic pH (6.0±2). The roots remain suspended in nutrient film or stream which ensures effective absorption of nutrients and better vegetative growth. Further, the yield and quality of fruits produced is also better and attractive. Hydroponically grown strawberry plants also remain free from soil borne diseases.

**Keywords:** Hydroponics; Nutrient film; Soilless media; Strawberry.
Zinc Dynamics and Management in Rice Production System of India

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Abstract

Rice is one of the most important cereals and has broadest adaptation of all the cereal crops in India. High zinc (Zn) deficiency in human population is a major concern and in past several studies has been conducted for increasing Zn concentration in grain. Zinc is highly essential for seedling vigor, abiotic and biotic stress management, photosynthesis, protein and sugar synthesis. This review highlights the Zn dynamics in different soils of India and its management practices. Several fertilizer applications are known for minimizing the Zn deficiency however this information is scattered in different research articles. This review is aiming to provide very confined information on different management practices of Zn in rice production system of India.

Keywords: Zinc dynamics, nutrient management, rice.
Studies on potential of budding of various Citrus species on Jambhiri rootstock

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Abstract

*Citrus x jambhiri* Lush. (Jambhiri of Rough lemon) is most common rootstock used for budding or grafting of various Citrus species. The species is believed to be originated from Himalayan foothills and has been distributed to African continent by Portuguese explorers. It is supposed to be mandarin and citron hybrid bearing low quality fruits so is not suitable for fruit production. However, it exhibits vigorous growth habit with extensive root system and grow well in sandy dry soil with ability to tolerate drought and alkaline condition. It is easy to grow with rootstock with fast growing behaviours. Its compatibility with various citrus cultivars has been proved. Considering the significance of rough lemon as rootstock and its ability to perform better for various cultivars of citrus species, its compatibility is being evaluated with twelve scion cultivars. The observation under study includessuccess of budding, growth of scion shoot and rootstock, number of days required for 50% sprouting, number of days required for first sprouting, branchlets count per plants, nodes count per plant, plant growth, chlorophyll content in leaves, relative water content (RWC) of leaves, leaf area, perimeter of the leaves, length of longest primary root, length of longest secondary root, girth of scion and rootstock, leaf count on scion, count of secondary root, length of internodes of scion. The Mandarin cultivars had best performance on the Rough lemon rootstock in comparison to others.

Keywords: Budding; Rough lemon; Grapefruit; Lemons; Mandarins; Oranges
Evaluation of impact of GA$_3$ and Kinetin on Strawberry (cv. Camarosa and Winter Dawn) cultivation under polytunnel

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Abstract

The cultivated strawberry (*Fragaria × ananassa* Duch.) have wider diversity enabling the cultivation under temperate, subtropical and tropical condition. Short day strawberry varieties respond well towards exogenous application of GA$_3$ and Kinetin. The performance evaluation was initiated with two short-day heavy bearer strawberry varieties viz. Camarosa and Winter Dawn; two growth promoters viz. GA$_3$ and Kinetin in three different concentrations viz. 50ppm, 75ppm and 100ppm. The objective of work was to compare response of varieties and different concentrations of growth regulators applied under polyhouse condition. Most of the results pertaining to growth parameters like plant height, plant growth, plant spread, number of leaves, leaf area, number of runners and crowns; flowering and fruiting parameters like number of flowers, number of fruits, fruit set percent, number of harvesting and fruit yield; and quality parameters like fruit weight, fruit size specific gravity, TSS, Acidity and Ascorbic acid content was reported to be significantly influenced by application of GA$_3$ and Kinetin and their interactions with varieties. Application of GA$_3$ at concentration of 75 to 100ppm will be most suitable plant growth regulator which can be used for better growth, flowering, fruiting and yield of strawberry without impairing the quality parameters. Further, both of the cultivars, Camarosa and Winter Dawn have been reported to perform significantly under polytunnel after application of various concentration of GA$_3$ and Kinetin.

Keywords: Camarosa; GA$_3$; Kinetin; Plant growth; Quality; Yield
Role of *Trichoderma viride* and GA3 in Growth and Development of Summer Squash

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The farmers all over the world face day to day problems, of which sustainability in the crop production is a serious issue. The use of chemicals in the form of fertilizers and pesticides has done more harm than the otherwise, be it the increase in cost of production or the various environmental and health issues. Keeping in mind the aforementioned issues an experiment was conducted to determine the effect of *Trichoderma viride* & Gibberellic acid (GA3) on the growth of Summer squash. Randomised Block design was followed wherein; the experimental area was divided into 5 treatments having different combinations of *T. viride* (5%) and GA3 (25ppm, 50ppm, 100ppm) at different concentrations and replicated thrice. Summer squash is a non-climber bushy member of *Cucurbitaceae* while conducting the above experiment two characters were taken into consideration viz., plant height and number of leaves. For plant height Treatment (T2) having *T. viride* + GA3 (25 ppm) was proven best. However, Treatment (T3) having *T. viride* + GA3 (50 ppm) emerged best out of all treatments for number of leaves.

**Keywords:** Summer squash, *Trichoderma viride*, Gibberellic acid, concentration, growth
Pharmacological Properties of Seed of Chiku (*Achras zapota*)

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**Abstract**

Seeds of Chiku (*Achras Zapota* Linn.) are known to be aperient and diuretic. It is also used as mild laxative and antipyretic. The infusion of the crushed seeds, prepared with sweetened water and the filtrate, is claimed to promote diuresis. On the other hand, the bark is used to check and regulate blood flow and give tone to the muscles. Aside from that, it is reputed to be tonic and febrifuge. The fruit soaked in melted butter overnight is prescribed to prevent fever and bile and liver abscess. In Cambodia, the bark is a component of concoction to cure diarrhoea and fever. In Java, the flowers of the plant is used as a certain ingredient pounded together to make a powder rubbed over the body of a woman after childbirth. In West Indies, the seeds are known to be aperient and diuretic and the bark reputed to be tonic and febrifuge. The bark contains much saponin, sapotin, and tannin than the other parts of the tree yielding 11.8 percent equally. The leaves contain a bitter principle alkaloid, saponin and fixed oil, with 0.076 and 1.45 percent respectively. The seeds yield the sapotin; saponin, achrassapoinin; an alkaloid; fixed oil 16-23 percent; a bitter sapotinine 0.80 percent. The gum chicle, the principal substance derived from the milky juice of the bark, contains resin 75 percent, gum (arabin) 10 percent, calcium oxalate, sugar, etc. The fruit- flesh yields saccharose 7 percent, dextrose 3.7 percent, and levulose 3.4 percent. It contains 0.013 percent sapotin. The unripe fruit is full of tannins and is therefore astringent. The ripe fruit gives an energy yield of 60 kcal per 100 g. They contain about 15% total sugars and the vitamin C content is 10 -20 mg per 100 g.

**Key words:** Chiko, Diuretic, Saponin, Sugar
Use of Okra in Ayurveda for Diabetes

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Abstract

India is a 2nd largest country in population out of which 62 million people are affected with diabetes including 7.1% adults in the population (International Diabetes Foundation,2016). If its estimated in world, 415 million people are living with diabetes, which is estimated to be 1 in 11 of the world’s adult population. In wake up of this problem Okra (Abelmoschus esculentus), also known as “lady’s finger,” is green vegetable plant which is a good and cheapest treatment of diabetes. Eight pods of okra contain 3 grams of fibre having the quality to reduce blood sugar in case of type 1, type 2, and gestational diabetes. The superior insoluble fibre of okra helps to stabilise blood sugar. If okra is used as “okra fibre juice” it gives good result. Okra fibre juice can be prepared by putting the okra pods in water and soaking overnight, extracting the juice next morning. Okra fibre juice reduces the effect of dyslipidemia and hyperglycemia and increases β-cells functioning and starts the formation of insulin. Purpose of research to identify suitable and desirable cultivar of okra having more fibre using conventional breeding practices. However, long time using recent development of conservation practices, our research to screen due to exotic germplasm have greater potential to work against diabetes.

Keyword: Okra Fibre Juice, Conventional Breeding, Modern Breeding, Diabetes
Biological Control Against Insect Pest of Potato

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Abstract

Potato (Solanum tuberosum) is one of the most important and popular crop cultivated under very diverse agro-climatic conditions in India and rank 4th after wheat, maize and rice. It is consumed as staple food in many countries across the globe due to its nutritional richness, easy digestibility and it also provides more nutrition than cereals. The low productivity of potato in India due to insect pest causing complex and variable problems in potato. Tubers are heavily damaged in the field as well as in storage, and this leads to direct losses to farmers. Major part of yield losses occur in potato production due to attacked by potato tuber moth, aphids, whitefly, white grubs, cutworms, potato leaf hopper. Potato pests are generally managed conventionally by the application of pesticides which have adverse effects on the agricultural ecosystems and further, have many health hazards on human due to their toxicity and residue related activities. Therefore, management through safe, organic and ecofriendly approach with the least and need based use of insecticides is essential. Biological control includes insect predators, parasitoids, pathogens and plant extracts etc. to control these insect pests. There are many predators, parasitoids and plant extract such as neem having ability to control insect pests. These bio control methods of managing insect pest attack having no harmful impact on humans, mammals, non-target organisms and environment health. Effective use of biological control will reduce the use of chemical pesticide.

Keywords: potato, insect pest, ecofriendly, biological control, health hazards
Application of bio-fertilizer for root vegetable production

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Abstract

Bio-fertilizers are preparations which contain living cell of efficient microorganisms strain. They hasten certain microbial processes in the rhizosphere which enhance the degree of availability of nutrients elements from non-usable to usable form by the crop plants. They are eco friendly and help in phosphate solubilisation, fixing of atmospheric nitrogen, producing vitamin, hormone, amino acid for plant growth and development. In the present day, strong confirmation exists that root vegetables contains many vital nutrients viz; vitamin A, vitamin C, dietary fibres, magnesium and potassium which help to fight diabetes, obesity, heart diseases and cancer. Chemical fertilizer has been used in large quantity for increasing the production of these important crops, which altimetry leads to the accumulation of chemical residue in the soil, ecosystem as well as in crop tissue. The rising public concern about personal health, food safety and environmental protection have generated enormous interest in use of bio-fertilizer as a substitute to chemical fertilizer. There is a massive demand for organically produced root vegetables among rich people living in Europe, USA and Middle East. The use of bio fertilizer as a alternatives to chemical fertilizers is essentially needed for root vegetable production not only due to the likelihood of future price increases but also by the need to preserve long-term soil productivity and ecological sustainability and the need to produce safer produce.

Keyword: Bio-fertilizer; Organic farming; Health; Soil productivity; Safer produce
Effect of integrated nutrient management on baby corn

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Abstract

Maize (Zea mays) was initially cultivated in Tehuacan valley of southern Mexico 10,000 years ago by the natives of the America. It is regarded as the “Queen of cereals” acquiring position of the third most important cereal in the world after wheat and rice. Baby corn is the young, dehusked and finger-length maize ear harvested immediately after 1-2 cm silk emergence but before the fertilization. The cumulative effect of using inorganic and organic fertilizers with biofertilizers enhances the growth and development of plant by virtue of their collegial effect. Besides of providing primary nutrients to the crop plant, these fertilizers also add various micro nutrients to the soil, increasing the metabolic and physiological processes in the plant. The biofertilizers like Azotobacter fixes the atmospheric nitrogen to soil. It helps in the production of antifungal metabolites in soil and develops the ability to tolerate biotic and abiotic stresses in the plant. The Phosphate Solubilizing Bacteria makes the unavailable P to available form in the soil excreting various organic acids. Vasicular Arbuscular Mycorrhiza increases the uptake of other nutrients like phosphorus and redemption of disturbed places of activity. In the nutshell, integrated nutrient management can bring an overall development of crop plant and provide better nutrient status to soil.

Keywords: Baby corn; Azotobacter; Phosphorus Solubilizing Bacteria; Vasicular Arbuscular Mycorrhiza
Recent developments in agronomic practices for nutritional enhancement of wheat

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Abstract

In developing countries like India, a large population is affected by malnutrition of micronutrient which is directly associated with the poor availability of nutrients in their regular diet. Wheat is one of the major components in regular diet of Indian population. Therefore, enhancing nutrient in this crop can contribute to minimize the nutritional imbalance. This review highlights recent advances in agronomic practices to modify and enhance nutrient levels. Available mineral concentration in edible part of crop can be altered by different applications like fertilization, breeding and also by biotechnological approaches. Although, the technology advancement in coming future for improving the nutrient availability in crops is possible however cost minimization, farmer and consumer acceptance will be a major concern. Therefore, this review will be highlighting all possible methods and challenges related to nutritional enhancement in wheat crop.

Keywords: Malnutrition; Micronutrient; Imbalance; Fertilization
A Review On modern Methodologies for Crop Improvement

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Abstract

We live in more advance, technically sound and intelligent world thus to grow a healthy food there is a need to be more intelligent approaches wise, tools using wise and techniques going through. Modern farmers have incredible resources to protect their crops from the threats that seem to be most efficient. Methods such as seed biopriming, precision application tools, predictive analytics and targeted pesticide solutions suit to innovative technologies. To track any disease, early and exact identification is necessary, ‘machine learning’ in agriculture provides more precise disease diagnosis which terminates the wastage of resources and energy from misdiagnoses. The software can be used for diagnosis and to develop the management strategy by uploading images taken by smartphones, UAVs and land based rovers. Instead of synthesizing new chemicals, agro-based companies are trying out a new strategy using plant extracts, soil microbes, animal byproducts and their combinations which are a bit more advanced than using compost in the soil. To divert animal intrusions into the crop a wireless sensor network is being used to protect the crop. Passive infrared sensor, Sound generating devices, Radio frequency module and light flashers are fitted near nodes in the crop field. Node activation sequence is based on time, proximity and location. The nodes alarms the hindering gadgets on acquiring the info of animal approach and thus helps in diverting animal away from the field.

Key words: Intelligent farming; Precision application tools; Machine learning; Sensor network application; Integrated plant disease management.
Estimation of nitrogen use efficiency and its effect on crop growth and yield of Maize (Zea mays L.) on crop rotation with different leguminous crops

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Abstract

In order to observe the estimation of nitrogen use efficiency and its effect on crop growth and yield of maize on crop rotation with different leguminous crop. A field experiment is conducted in lovely professional university with four treatments and three replications. T0 is for the control, T1 is for Pea and T3 for the lentil. In this context the quality and quantity of protein stored in maize kernels with the use of uptake of nitrogen fixed by different leguminous crops. In this measure the nitrogen use efficiency of maize with the use of available nitrogen in soil which was fixed biologically by different leguminous crops sown in previous season. The expected result is that the pea will fix less nitrogen as compared to gram and lentil will fix very less nitrogen.

Keywords: Nitrogen fixation, Pea, Gram, Crop Rotation.
**Review on induced resistance into plants through Bio-char:A new approach**

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**Abstract**

Bio-char, a carbonaceous organic byproduct of pyrolysis which have shown a great significance in inducing the resistance within the tomato plants by stimulating the activity of PR- proteins and phenolic compounds against the pathogen *Fusarium oxysporum* spp. *lycopersici* (a soil borne plant pathogen). Bio-char is added in the soil as an amendment with different concentrations viz., 1-5 percent to induce resistance into plants. Bio-char not only induces the resistance within the plants but also increases the yield of the plants and reclaim the nutrient ability of the soils. Bio-char application in the soil proved as an effective measure in order to induce resistance when compare with various other chemicals (inorganic) responsible for the induction of the disease resistance within the plant system.

**Keywords:** Bio-char; Carbonaceous; PR- proteins
Biofortified crops: A solution to cope hidden hunger

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Abstract

India has been fighting with challenges posed by hunger which is one of the major cause of deaths in the world. Caloric hunger has been already tackled with the revolutionary ‘Green revolution’ which significantly enhanced the production of maize, wheat, rice etc. But another form of hunger which is also referred to as ‘hidden hunger’ is caused by the deficiency of micronutrients such as vitamin A, vitamin B12, Zinc, Iron etc. in the diet and this gives rise to other diseases. According to WHO, 30% of the world population is anemic, in many cases due to iron deficiency. Children are the worst victims and hence, there is an urgent need to adopt a better life-cycle approach in terms of nutrition intake. An important key fact that can’t be denied is that India is the home of the largest undernourished population in the world and also 1 in every 4th child in India is malnourished. The most effective approach to overcome micronutrient malnutrition is consumption of biofortified crops that can be produced by Biofortification, a process of increasing bioavailability and concentration of nutrients in crops through conventional plant breeding and genetic engineering. Some of the important biofortified varieties are iron and zinc rich wheat variety WB 02, iron-rich pearl millet variety AHB 1200, protein-rich rice variety CR Dhan 310 etc.

Keywords: Biofortification, biofortified crops, hidden hunger, caloric hunger, malnutrition, plant breeding.
Chemical Alternatives to Conventional Fungicides for the Management of Post Harvest Diseases

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Abstract

Considerable amounts of fruits and vegetables are lost due to spoilage after harvest. This loss range nearly about 10-50%. Presently, inorganic chemicals are the primary means used to control post harvest diseases of fruits and vegetables. Public concern over food quality, however, express interest to find the substitute to pesticides to regulate post harvest diseases of fruits and vegetables. This need is stressed even more when fruits are exported to countries where postharvest applications of conventional fungicides are prohibited. Substitute chemicals with potential of managing diseases include antimicrobials derived from plants, animal and soil, other organic and inorganic compounds and many widely used food additives. These chemicals derived naturally have antimicrobial, allelopathic, antioxidant and bioregulatory properties whereas synthetically produced other chemical alternatives have been observed to have fungicidal and fungistatic activity along with being utilized in the food industry for increasing the shelf life of post harvest produce and thus have been regarded as GRAS (Generally regarded as safe) chemicals.

There are various mechanisms employed by pathogenic fungi affecting the economically important food produce from spoilage. These include pH change, enzyme activity along with induction of defence response in the host. Potency of these chemicals varies depending upon nature of the pathogen, crop variety, time of chemical application and storage conditions. If we use them in a planned way in the integrated disease management program, they have the capability to reduce the hazards of conventional fungicides and it increases the quality and yield of post harvest food produce. Lack of effectiveness, consistency, persistence and other quality parameters such as acidity, flavour and aroma are the major concerns that have limited their commercialization and therefore demand more research in this field, so that we would have new alternative chemicals that matches the effectiveness of conventional fungicides for the management of post harvest diseases.

Keywords: Fungistatic, Allelopathic, Antioxidant, Bioregulatory, GRAS.
Effect of Ultraviolet Radiation on Microbes

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Abstract

The photo-biological reactions of all prokaryotic organisms depend upon the different microbes and changes occurring in the individual living cell within their organ systems, which in turn is determined by individual intracellular photochemical reactions. The sunlight consists of ultra violet radiations and their wavelength ranges from 10 nm to 400 nm. Ultraviolet radiations damage the DNA of microbes. UV radiation causes the formation of pyrimidine dimers on DNA which destroys the structure of DNA. The growth of Klebsiella pneumonia and Candida albicans declines, when it is exposed to UV radiations. In response to UV radiation, cells start repairing the DNA. Sometimes the damage is so severe that cell death occurs. The experiment which we are going to perform will prove how pyrimidine dimers form on DNA and growth of Klebsiella pneumonia and Candida albicans occurs at 200 nm.

Keywords: DNA; Ultra violet radiations; Prokaryotic organisms

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Impact of various growing media on fruiting, yield and quality of Strawberry cv. Winter dawn in pot culture

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Abstract

The garden strawberry is an extensively grown hybrid species of the genus *Fragaria*, communally known as the strawberries. It is cultivated worldwide for its berry. The berry is widely appreciated for its characteristic aroma, bright red color, juicy texture, and sweetness which makes it highly remunerative. Even though, the production is good, but the productivity is less when compared to global scenario which may be because of lack of nutrients in the growing media. In order to determine that “Impact of various growing media on fruiting, yield and quality of Strawberry cv. Winter dawn in pot culture” a study was conducted in the protected cultivation unit of LPU. The quality parameters of soil and water were estimated (pH, EC, carbonate, Bi-carbonate) with standard procedures. The potting soil collected from the poly house was mixed with the different media that was subjected to study viz. Sawdust, Sand + Soil, Coco peat, Perlite and FYM. Among the different treatment, media containing coco peat performed significantly better with maximum average of 5 fruits per plant, average TSS of 9.01° Brix and yield of 190.2 grams per 6 plants. This was followed by FYM and Sand + Soil. The least fruiting, yield and TSS was observed in the treatment involving sawdust.

Keywords: Strawberry; Media; Sawdust; FYM
Integration of Practices to Manage Rice Blast Disease

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Abstract

Rice crop has been attacked by many fungal diseases. From all of that the Rice blast is one of the most menacing disease caused by the fungal pathogen *Pyricularia grisea* with teliomorphic stage *Magnaporthe grisea* which causes a loss of 30 percent to worldwide production. Since various chemicals, biological, conventional and genetic engineering methods have been used to control these diseases but, the widespread of the disease has not been controlled upto a great extent. Since the various chemicals used for controlling this disease has not performed 100% when used at various concentration tricyclazole75 WP (500ppm), propiconazole 25 EC (500ppm), hexaconazole 5 EC (500 ppm). Some of the integrated disease management methods physical methods like crop rotation, row to row and plant to plant spacing, application of bio-agents such as *Pseudomonas fluorescence* and *Trichoderma harzianum* will be helpful to reduce the spread of the disease, and some of the fertilizer management like application of silica can reduce the disease development but not permanently, it should be applied when the disease condition is severe.

Keywords: Rice; *Pyricularia grisea*; *Magnaporthe grisea* Chemicals; Bio-agents; Physical methods
Need of sustainability in agriculture

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Abstract

India is the country where agriculture contributes major in GDP. After the green revolution the phase of agriculture has been changed. People switched to intensive agriculture from the conventional one and used heavy doses of fertilizers, agro-chemicals, mono-cropping, genetically uniformed varieties which led to ecological threat. Everyone was so happy with the increased production but they never paid attention on natural resources until they faced the consequences of over exploitation. Human are being selfish by harnessing the maximum profit from existing resources, leaving the heap of inorganic salt for the future generations on which they can’t even grow a single plant. Excess use of agro-chemicals are making the insects and pathogens more resistant and killing the beneficial organisms and polluting the water bodies, ground water too.

There is need to cultivate the crop which is eco-friendly and yet give same productivity as the intensive agriculture. Sustainable farming defines farming systems that are capable of preserving their productivity and expediency to society indefinitely. This form of agriculture preserves our soil and water resources, protects environment, augments agro-diversity, ensures biodiversity, meets the mandate for food and safeguards livelihoods. In this system crop rotation, crop diversification, animal husbandry and other allied farming are combined together to have sustained productivity along with good income. Eco-friendly agriculture is not tough to practice but it needs awareness and dedication. There is need of extension work in our country which brings the technology from lab to farm.

Keywords: Sustainable farming; Eco-friendly agriculture
Remediation Measures to the Management of *Pleurotus djamor*

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**Abstract**

Mushrooms are very beneficial for the health of humans because they contain various nutrients like carbohydrates, proteins, fats, fibers, vitamins and lipids in various amounts differ from species to species. The production of mushrooms can be done on various types of agro-wastes. The experiment tested on the different objectives of *Pleurotus djamor*, including testing of the nutrients composition of mushroom and various types of diseases induced in the mushroom cultivation. There is a need of research that focuses onto problems of mushroom mainly diseases occur in-vitro conditions and their management using not only chemicals (conventional method) but various remediation measures. This need to be checked that what kind of the remediation measure performs well in the disease control and at what concentrations they need to be applied within the mushrooms and at what period of time.

**Key words:** Pleurotus djamor; Diseases; Remedial measures
Industrial hemp: Need of exploitation

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Abstract

Industrial hemp is a unique plant in its way. Actually industrial hemp is a crop as well as weed at the same time. It is rapid growing and high yielding herbaceous annual plant. Delta-9 tetrahydrocannabinol (THC) is the psychoactive drug component of marijuana but also found in industrial hemp. THC contain in industrial hemp is less than 0.3. If industrial hemp is considered as a crop, then it has used in many ways, its stalk is used for varies purpose like clothing and textiles, paper product, construction materials and other industrial products and even made biodegradable plastics. Quality fats and proteins food items are made from hempseed another important things that hempseed have high medicinal value in the form of lowering of cholesterol and decreasing of blood pressure. Hempseed oil has been used in Paints, Varnishes and Lubricants. Another main important is biofuel can made from hemp. Industrial hemp being multiuse item, need more research oriented focus and exploitation to towards societal use.

Keywords: Industrial hemp; THC; Biofuel
Role of Systemic Acquired Resistance (SAR) in plant defence: A milestone

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Abstract

This all about induced immune response mechanism in plants against certain inoculants. In vertebrates, there is an adaptive immunity but, plants instead have a mechanism called SAR. Systemic acquired resistance is broad spectrum, without any specificity to the initial infection where, an avirulent pathogen may initiate local programmed cell death resulting in induction of SAR through mobile signal generations. Defence hormone; salicylic acid accumulates and as a result pathogenesis related (PR) proteins possesses antimicrobial properties secreted that allows a protection to plants for a period of weeks to months from secondary infection. Though passing of SAR to the progenies is not certain but there is a possibility to be passed through epigenetic regulation. For future aspect, this approach needs to be promoted to next level and as an alternative of chemicals or in integration proposes management of diseases towards eco-friendly agriculture.

Keywords: Systemic acquired resistance; Pathogenesis related (PR) proteins; Salicylic acid
Role of mycorrhiza as a biocontrol agent against soil-borne pathogen

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Abstract

The use of biocontrol techniques has become an area of great interest because the present society strives to minimize the use of synthetic pesticides and enhance sustainability in controlling disease causing pathogens. Arbuscular Mycorrhizal fungi (AMF) are ubiquitous in nature and is considered a better alternative of terrestrial ecosystem as it play a decisive role in plat development by enhancing the supply of water and nutrients to the host plants, disease suppression and makes plant less susceptible to environmental stress such as drought and salinity. Arbuscular mycorrhiza influence a symbiotic relationship with plants in suppressing soil borne pathogen such as Aphanomyces, Fusarium, Phytophthora, Pythium, etc. AMF utilize the carbohydrates provided by the host plants for their growth and to synthesis and excrete molecule known as glomalin. The release of glomalin to the soil results in better soil structure and higher organic matter content. However the quantity of mycorrhiza in soil decreases drastically with time because they are often disturbed by human activity and that there are not enough of them to give a significant benefits sometimes. Advance research is needed to develop the present farming system so that farmers optimize the use of natural resource such as Arbuscular mycorrhiza as a biocontrol agent for sustainable agriculture.

Keywords: Biocontrol; Mycorrhiza; Symbiotic relationship; Sustainability.
QSAR Studies and Designing of Some New Curcumin Analogs as Anticancer Agents

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Abstract

2D QSAR and 3D QSAR studies of curcumin derivatives as anticancer agents were performed on a series of 40 compounds. The structures were sketched by using Chemsketch 12.5 versions then subjected to energy minimization and the lowest energy structures were used to calculate the physiochemical properties by using V-life MDS 3.5 version for molecular modeling study. The best model so generated from QSAR studies showed regression values having n=23, r²=0.5502, q²=0.4372, pred_r²=0.2361, r²_se= 0.2864, q²_se= 0.3204, pred_r²se= 0.5723(Standard errors) and descriptor so generated were T_2_2_7 and T_N_O_6. Thus, descriptors T_2_2_7 and T_N_O_6 were the important descriptors and important for anticancer activity. Molecular field analysis was used to construct the best 3D QSAR model using k-nearest neighbor (kNN) method which showed good correlative and predictive capabilities in terms of n=21, q²= 0.7397, pred_r²=0.3749, q²_se= 0.2731, pred_r²se= 0.2972(Standard errors), kNN=3 and degree of freedom=18. The q² value 0.7397 shows good correlation between electrostatic, steric and hydrophobic properties and biological activities. After descriptor calculation two electrostatic descriptors (E_2189 0.3806 0.5895 and E_1198 -0.1032 0.0026) were found. This study can help in rational drug design and synthesis of new curcumin analogs as anticancer agents with predetermined affinity.

Keywords: QSAR; Anticancer; Drug design; k-Nearest neighbor; Curcumin; Prostate cancer
Anxiolytic Like Effect of Lithium in Elevated Plus Maze and Light and Dark Box Test

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Abstract

Anxiety is a frequent negative emotional state characterized by feelings of worry, apprehension, and various somatic, cognitive, and behavioral manifestations. In rodents the anxiety related behavior is commonly measured by using elevated plus maze (EPM) and light and dark box (LDB) test. In the present study lithium was investigated for its anxiolytic like activity in mice. Lithium (50, 100 and 200 mg/kg, i.p.) was administered to the mice and the anxiety related behavior was determined by using EPM and LDB test. Results of the study suggested that the administration of lithium (100 mg/kg, i.p.) exerts anxiolytic like activity in EPM and LDB test. Further the results from the biochemical estimations suggested that the administration of the lithium reduced the levels of glutamate and nitrite in the brain of mice. Glutamate and nitrite lowering effect of lithium was found to be responsible for the anxiolytic like effect of lithium in mice as suggested by the results of the present study.

Keywords: Anxiety, diazepam, glutamate, lithium, maze, mice, nitrite.
Designing of Modified 6 Minute Walk Test on Endurance Performance for Stroke Patients with Breathing Pattern Disorder: Testing of Construct Validity

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Abstract

The measure of accurate cardio-respiratory fitness is highly challenging in stroke patients. Neurological conditions are mostly predominant with respiratory distress and poor cardiovascular endurance. To test the cardiovascular endurance a number of clinical tests have been conducted. However there is a need to propose a more comprehensive multidimensional outcome measure in a single test. Therefore this study aims to design and find the reliability and validity of the modified six minute walk test among participants with stroke and associated poor respiratory efficiency. Study suggested that the modified 6MWT was a reliable tool with our values (R value > 0.05) two participants reached HR peak >85%. Besides, one participant with balance disorder unable to complete modified 6MWT. Hence, modified 6MWT could be used as a reliable tool for testing cardiorespiratory endurance among stroke patients.

Keywords: Modified 6MWT, HR peak, Body Composition
Vandhyatva (Infertility): Causes & Role of Counselling and Formulation for Infertility (Garbhhasathapaka Yog) in its Management

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Abstract

Infertility (Vandhyatva) is disease of reproductive system defined by the failure to achieve a clinical pregnancy after one year or more of regular unprotected sexual intercourse. Ideally, Infertility is a cardinal feature of so many other diseases. In Ayurvedic texts Harita Samhita is the only book in which Acharaya Harita has defined Vandhyatava as a separate disease. He has defined it as a failure to achieve a child rather than a pregnancy; Maharishi Sushruta has included vandhyatava in 20 yonivyapadas. Acharaya Charaka mentioned it in beejansha dhushti, According to Harita, Ritukala (proliferative phase), Kshetra (normal reproductive tract), Ambu (nutritional fluid) and Bija (sperm & Ovum) are essential factors of conception and also described the other causes of infertility. Chikitsa (treatment) includes Nidhana parivarjana, bala vardhak, panchkarma, garbsthapaka yog (shtavari, guduchi, priyangu etc.) rog anusar chikitsa. Counselling of infertile couple is most important part of treatment because we come across so many cases where all the reports are normal but still don’t conceive. Counselling includes proper Ahara vihara (diet & lifestyle), awareness about fertile period, postures, guidance how to know about early pregnancy and instructions thereafter to reach up to the live birth.

Keywords: Infertility; Vandhyatva; Yonivyapadas; Garbsthapaka yog.
Quality, Safety and Efficacy of Traditional Formulations

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Abstract

Ayurveda, systematically evolved science of the universe focuses upon prevention, preserving health and curing of diseases in a comprehensive way. The approaches of this system are unique and patient centric. This heritage is survived through the ages and Ministry of AYUSH took a number of initiatives to showcase the potentialities at global levels. But, Quality, safety and Efficacy concerns in the past couple of decades initiated debates in scientific conventional community which attempted to maligning the glory of Ayurveda. Classical Ayurveda texts are filled with comprehensive information pertaining to Drug Collection, Storage and Preservation Methods, Standards of Raw Materials, SOPs for Different Dosage Forms, Quality Control Aspects for finished products, Shelf Life, Posology, Routes of Administration, Safety, ADRs that can occur on inappropriate use of treatment procedures and their management, concurrent diet advices etc. to avoid possible ill effects inferring that the seers were well studied about the current day trends of GCPs, GSPs, GMPs, GDPs, GACPs etc. regulations and took maximum care in the management of different pathologies. Also there are good number of studies on Herbal, Herbo-mineral and Metallic formulations that have proven their safety & efficacy. It can be said that rational use of Ayurveda formulations is well established before the period of Charaka Samhita, more than 5000 BC. This was the period when most of the countries in the world were just awakening. All the safety and efficacy concerns raised are possibly some part of conspiracy but need to be addressed systematically. Also, there is need of systematically planned trials to generate evidences inferring effectiveness & safety of Ayurveda interventions in different pathologies that became a hindrance in its global acceptance.

Key words :- Quality, Herbal formulations, Safety
Therapeutic Gardening - A Drug Free & Non-Invasive way to Heal

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Abstract

A Therapeutic garden is a plant-dominated environment purposefully & specifically designed to facilitate interaction with the healing elements of nature to meet the Physical, Psychological, Social and Spiritual needs of the people. Interactions can be passive or active depending on the garden design and users’ needs. e.g. Healing gardens, Cancer & Alzheimer’s gardens, Rehabilitation gardens and Restorative gardens. The first recorded use of Therapeutic garden for therapy occurred in ancient Egypt, when walking in palace gardens was prescribed for mentally disturbed Royalty. Comprehensive information pertaining to drug collection methods in specific Nakshatra, relation between various plants, directions & constellations are also found in ancient texts. Alan Dilani, founder of the International Academy of Design and Health, described its salutogenesis as a setup that promotes health and well-being rather than curing disease which is being widely embraced as a preventive design. In 1984, Roger Ulrich demonstrated that gazing at a garden can speedup healing from surgery, infections and other ailments and can reduce duration, dose of medications and post-surgical complications in comparison to the wall-view group. Today, radical changes in the environment, demographics, technology, and morbidity and mortality are forcing everyone to shift their focus from the old ‘Pathogenic’ paradigm to ‘Preventative care’. Presently, healthcare costs are climbing and Therapeutic gardening has various benefits which include reduction in Stress, Anxiety and Social isolation along with increase in Self esteem, Immune response, Concentration, Memory & Quality of life. Hence it can be an integral part of healthcare system.

Keywords: Nakshatra; Preventive care; Psychological disorders; Speedup healing; Therapeutic gardens
Synergistic Interactions between Green Tea and Some Medicinal Plants Commonly Used as Herbal Teas to Enhance the Antioxidant Activity

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Abstract

Green tea (Camellia sinensis) is gaining popularity worldwide due to its various health benefits but meta-analysis reports suggested that green tea consumption is associated with mild to moderate effects on major global killers. In quest to enhance the health promoting potential of green tea, one of the strategies is to combine it with traditionally used medicinal plants. The aim of this investigation was to evaluate and compare the possible synergistic antioxidant interaction of aqueous binary combination of green tea (Camellia sinensis) leaves with Vana Tulsi (Ocimum gratissimum) leaves, China rose (Hibiscus rosa-sinensis) flowers, East Indian lemon grass (Cymbopogon flexuosus) leaves and West Indian lemon grass (Cymbopogon citratus) leaves, respectively. The antioxidant potential of the mentioned infusions was determined employing chemical models and ex-vivo assays. The interaction between green tea and medicinal plants were determined by combination index (CI) value and isobolographic analysis. In all the engaged antioxidant models, green tea and O. gratissimum combination showed the highest antioxidant potential and strongest synergistic interaction as compared to other binary combinations. This investigation provides the scientific basis for exploring green tea combinations that can potentially increase the efficacy of green tea as a functional beverage.

Keywords: Green Tea; Antioxidant; Combination Index; Synergistic; Isobologram
Effect of Certain Medicinal Plant Extract on Insect Pest Management of Watermelon Cultivation

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Abstract

Today the human species is being challenged through a series of hurdles! Be it population explosion, pollution or the ever alarming global warming. The extensive use of chemical pesticides in the lieu of managing various pests attacking our food crops has been working towards the escalation of global warming since the last decade. Apart from global warming the injudicious use of chemicals has been lethally affecting the health of humans & other living organisms. Moreover, the total expenditure has increased, which is affecting the pockets of the farmers. Thus, the farmers have now- a-days moved towards indigenous methods to manage the insect pest attack on their field crops, where they use certain medicinal plant extracts. Keeping this in mind, an experiment has been conducted to see the effect of certain medicinal plant extracts on Insect pest management of watermelon cultivation at Lovely Professional University Field Campus, Kapurthala, and Punjab, India. In this study, the botanical extract has been prepared using garlic, ginger and chilli mixture in the ratio 2:1:1 respectively. The plant samples containing primarily leaves were dried, ground into fine powder and using distilled water different concentration viz., 2%, 5%, 8% & 10% level were made. Results show that the red pumpkin beetles were completely eradicated upon spraying 10 % concentration solution. Although, the results of botanical treatments are not as quick as compared to chemical spray, but once sustainability is kept in mind, then farmers can opt for this.

Keywords: Biological control, Insect pest, Plant extract, Sustainable
Effect of Trichoderma Species and Fungicides on Nutritional Quality and Yield Attributes of Tomato

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Abstract

Trichoderma species have been utilized as natural control operators against soil borne pathogens. During this research, Trichoderma species have shown the drastic changes in the yield attributing parameters of tomato and control of pathogen causing fusarium wilt of tomato under field condition. The devastating pathogen found causing wilt disease of tomato was isolated in vivo and identified based on diagnosis and microscopic observations and mapping with literatures as Fusarium oxysporum f. sp. lycopersici, (FOL). A bio-protected layer of Trichoderma harzianum was formed on tomato seedlings before they were transplanted that have shown a stimulatory effect on qualitative parameters of plant i.e., plants height, dry weight of roots, chlorophyll content, total soluble salt, lycopene content, acidity and disease incidence. Trichoderma harzianum showed great potential to be a bio-weapon against FOL and was exploited to save ecological hazards to plant, soil, water, stake holders and society through sustainable disease management of fusarium wilt of tomato.

Keywords: Wilt disease; Quality traits; Bio-weapon
Screening for Putative Probiotics to Minimize Use of Antibiotics in the Aquaculture

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Abstract

In aquaculture, the chemotherapeutic agents like antibiotics are used more frequently to cure microbial infection. However, the frequent use of these chemotherapeutic drugs lead to their accumulation in the aquatic habitat resulting in the harmful consequences viz. emergence of antibiotic-resistant bacteria, accumulation of antibiotic residues in flesh, killing of the beneficial gastrointestinal tract (GIT) microbes and alterations in the aquatic microbiota. The increased antibiotic resistance among the pathogens requires new alternative strategies to control such diseases in aquaculture. Probiotics, renowned as valuable microbes, are recommended for an efficient and environmental friendly approach to reduce the use of antibiotics. The present study aims at isolation of some probiotic bacteria from the intestinal tract of different fish species from Doaba region of Punjab, India and their in vitro and in vivo evaluation as potent probiotics. During this study, the isolated bacterial strains were evaluated as per FAO/WHO guidelines. The in vivo evaluation was done to assess the efficacy of putative probiotic strains on survival and growth performance of Common carp (Cyprinus carpio) challenged with Pseudomonas aeruginosa (MTCC 4673). A total of 169 different bacterial strains were isolated from the GIT of 42 different fish species. After in vitro evaluation, out of 169 bacterial strains only 5 bacteria (S3, S7, BDK2', BDK7 & BDK9) were found to comply with the criteria for probiotics. The percentage survival of fish subjected to in vivo evaluation was found to be 76.1 % (S3), 100 % (S7), 95.2 % (BDK7), 89.4 % (BDK9), 95.2 % (BD K2'), 54.5 % (Pathogen) and 79.5 % (Control). The observations of in vivo evaluation concluded that bacterial strains S7, BDK2', BDK7 and BDK9 serve as effective probiotics to enhance the growth, survival and immune responses in fishes as compared to control and the pathogen. These probiotic strains can be used as a novel and safe treatment to fight the current issues in the aquaculture.

Key words: Putative probiotics, Aquaculture, Cyprinus carpio, fishes
Determination of seasonal aeromicroflora induced allergy in Bilaspur District (CG)

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Abstract

Allergy is a systematic reaction by the immune system to something that does not bother most of the population. A substance, protein or non-protein, capable of inducing allergy or specific hypersensitivity is called an allergen. Once the allergen comes in contact with body cells, it sets off a series of immune responses ranging from localized inflammation to a fatal systemic anaphylaxis. Respiratory allergies occur when the immune system react to airborne substance such as dust, mould or pets’ dander etc. causing coughing, sneezing, congestion, sinus pressure and difficulty in breathing. The present study aims to identify biotic allergens and their role in the occurrence of respiratory disease in Bilaspur district (C.G). Sampling collection was done for four weeks starting from January to March 2017. In these months, weather change took place from winter to spring season which led change in frequency of biological allergens. We observed an increase in biotic allergens like fungal spores and bacteria, which are responsible for the increase in respiratory diseases in the study period. Simultaneously, collection and analysis of the patients suffering from respiratory diseases on a weekly basis was done from CISM Hospital, Bilaspur (CG). On the basis of patient data and biological allergens arising in the samples collected in a weekly basis, a correlation between both the data was drawn. These microbial species (fungus and bacteria) were identified by macroscopic and microscopic observation.

Keywords: Allergy, Allergen, Allergic Proteins.
SynuClean-D: A New Molecule Can Stop or Even Reverse Neural Damage in Parkinson’s Disease

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Abstract

Parkinson's a neurodegenerative disease results into degeneration of neurons in substantia nigra. The symptoms associated with the disease include tremor, impaired balance and slowness of movement. Parkinson's disease is the second most widely diagnosed neurodegenerative condition that affects one percent of the population aged 60 and over. One of the main mechanisms involved in pathophysiology of Parkinson’s disease is the formation of aggregates known as "Lewy bodies" which disrupt the normal activity of nerve cells. Alpha-synuclein is a protein responsible for formation of aggregates in the disease. Therefore preventing aggregation of the protein alpha-synuclein may be one of the approach that can be utilized for treatment of Parkinson’s disease. Caenorhabditis elegans worm expresses alpha-synuclein in the muscle or in certain nerve cells namely dopaminergic neurons is a good model for Parkinson's disease. Researchers found that after administering SynuClean-D to the worms in food, the compound prevented alpha-synuclein molecules from sticking together, protected the animals against neural degeneration, and boosted their mobility. Therefore, SynuClean-D, may provide a new therapeutic option for the treatment of Parkinson's in the future as it has the ability to prevent degeneration of dopaminergic neurons.

Keywords: Parkinson’s disease, Lewis bodies, alpha-synuclein, SynuClean-D
Heart failure (HF) is a condition in which the heart is not able to pump enough blood to meet the normal requirements of the body. The ejection fraction (EF) <40% is termed as HF with reduced systolic function (HFrEF). ACE inhibitors have been well established for the treatment of heart failure with reduced ejection fraction for more than 25 years. Sacubitril/valsartan which consists of the neprilysin (NEP) inhibitor sacubitril and the angiotensin receptor blocker valsartan has been approved superior to the ACE inhibitor enalapril in reducing the risk of death and number of heart failure hospitalization. In addition, sacubitril/valsartan was more effective as compared to ACE inhibitors at improving symptoms and preventing clinical deterioration in surviving patients. Therefore FDA has approved sacubitril/valsartan for the treatment of patients with chronic heart failure with reduced ejection fraction (HFrEF) with NYHA class II, III, or IV. Sacubitril/valsartan is to be used in place of an ACEI or angiotensin II receptor blocker (ARB) and in conjunction with other standard, heart-failure treatments (beta blocker, aldosterone antagonist). Adverse effects associated with the medication include hyperkalemia, renal failure, hypotension, cough, and angioedema.

**Keywords:** Heart failure, ACE inhibitor, sacubitril/valsartan, neprilysin
Alteration of Growth and Size of Dalton Lymphoma Cell by Cinnamaldehyde and Eugenol In Vitro

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Abstract

Plant-derived drugs are currently drugs of choice for treatment of many medical anomalies including neoplastic disorders. They have many advantages over conventional drugs especially low toxicity and minimal occurrence of resistance. However, many a potential phytodrugs are not experimentally evaluated for their activity. Present investigation was taken up to evaluate the antineoplastic activity of Cinnamaldehyde [CIN] and Eugenol [EUG], isolated from Cinnamon and Clove, respectively. A murine lymphoma of spontaneous origin, known as Daltons Lymphoma, was used as model for in vitro experiments. The survival of the neoplastic cells was found to decrease, with treatment with CIN and EUG along with increase in the population of cells undergoing death, in a dose-dependent manner. Further, to evaluate the effect of CIN and EUG on growth properties, Specific growth rate and doubling time were enumerated. A decrease in specific growth rate with increase in doubling time of Lymphoma cells were observed for both the drugs in a dose-dependent manner. Additionally, the size of the lymphoma cells were also found to decrease significantly in treated groups along with significant modulation in nucleus to cell size ratio. The findings of current study indicate the antineoplastic ability of CIN and EUG against Lymphoma cells through modulating cell growth and division. Although, further investigation is required for deciphering underlying molecular mechanism and in vivo efficacy, current investigation suggest the potential of CIN and EUG for clinical application.

Keywords: Phytodrugs; Cinnamaldehyde; Eugenol; Lymphoma