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BRIDGING INNOVATIONS IN PHARMACEUTICAL MEDICAL AND BIO SCIENCES

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Keynote / Invited Speaker

"THE IMPACT OF POLYMORPHISM OF TLR9 PROMOTER IN SUSCEPTIBILITY AGAINST PULMONARY TUBERCULOSIS IN TRIBES OF MP"

Deepak Bharti

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Abstract

Tuberculosis (TB) remains one of the major cause of human death worldwide. According to world health organization (WHO) estimation, about 3.5 million new TB cases occurs every year 0.5 million culminates to death. India has the highest burden of TB that accounts one fifth of world's new TB cases, each year. The prevalence of tuberculosis is not only high in caste populations, but some tribes also show a high prevalence of TB infection. Tuberculosis is a multifactorial disease, so there is a need of a complete genetic check-up. Toll-like receptors such as TLR2, TLR4, TLR8, and TLR9 are known to play a pivotal role in PTB via modulating sensor expression and/or effector responses. Single-nucleotide polymorphism (SNP) rs187084 (T-1486C) of the TLR9 promoter is associated with various bacterial and viral diseases. To investigate the role of T-1486C in PTB, we stimulated PBMCs with the H37Rv whole cell lysate. In the present study we found that the presence of "C" allele increases the transcriptional output of the TLR9, which generally induced high levels of Interferon gamma-induced protein 10 (IP-10), IP-10 is a biomarker for PTB. However, the expression of protective cytokines such as IFNγ and TNFα was observed significantly less with "C" allele in comparison to "T" allele. We further selected three different tribe populations showing differential susceptibility to PTB and performed genotypic analyses for the TLR9 promoter. We found a significantly lower minor allele frequency (MAF) of T-1486C in the Baiga tribe, wherein fewer PTB cases were reported, than that in the Gond and Korku tribes. Collectively, these data suggest that the minor "C" allele at rs187084 locus may be associated with susceptibility to PTB, which may explain the relatively lower PTB rates observed in Baiga tribe members.

Keywords: *Tuberculosis,* single-nucleotide polymorphism, *TB infection*

BLOOD PRESSURE PROFILES AMONG EAST BONGAS AND WEST BONGAS PEOPLE IN EFFORT AND SUPPORT FROM UNIVERSITAS PADJADJARAN AND THE REGENT OF MAJALENGKA REGENCY AND CHIEVES OF THE VILLAGES

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Abstract

The main objective of the study was to support the people in East Bongas and West Bongas villages to prevent and cure the hypertension disease, avoid its harmful effects, and provide proper information on the condition of blood pressure from the public to the government. This was a cross-sectional design while the subjects were taken by a simple random sampling. 323 families, blood pressure, were measured of males and females aged between 18 to 65 y. The blood pressure profile was classified based on JNC 7. The normal blood pressure, pre-hypertension, hypertension stage 1, and hypertension stage 2 were 34.3%, 49.5%, 12.1%, and 4.1%, respectively. Prevalence based on sex showed that those who had information about hypertension in males were 46.8%, females were 47.9%, and the total of both were 47.4%. Prevalence of patients with hypertension in males were 16.8%, females were 15.7%, and the total of both were 16.2%. Prevalence of patients with hypertension based on the age group 30-39, 40-49, 50-59, and 60-69 y were 6.8%, 15.6%, 33.9%, and 37.3%, respectively. The youngest male and female patients of pre-hypertension were 18 and 22 y, respectively. Base on this information, t*he* people in two villages should be given the appropriate knowledge and awareness regarding hypertension, which can reduce the quality of life.

Keywords: Hypertension, east bongas, west bongas, majalengka regency

SHIFTING PARADIGM IN NATURAL PRODUCTS RESEARCH FOR DRUG DEVELOPMENT

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Abstract

The development of natural products requires the confluence of modern techniques and integrated approaches related to their research in various fields of science through International coordination and cooperation. Drugs from medicinal plants are widely respected for their unique chemical and biological features, and are gaining global acceptance because they offer natural ways to treat diseases and promote healthcare. Natural products are the best sources of chemical diversity for finding new drugs and leads. Combining the unique features of identifying biomarkers that are highly conserved across species this can offer a promising approach to biomarker-driven drug discovery and development. Globalization of traditional medicine (TM) is necessary for health care with assessment of its safety, efficacy, therapeutic and clinical evidences. Evidence based validation of the ethno pharmacological claims on traditional medicine is the need of the hour for its globalization and promotion.

The development of traditional medicines with the perspectives of safety, efficacy and quality will help not only to preserve the traditional heritage but also to rationalize the use of herbal medicine in the human and animal health care. Nature is considered as a compendium for templates of new chemical entities (NCEs). The medicinal plants mentioned in the ancient texts of different systems of medicines may be explored with the modern scientific approaches for better leads in the health care. The plant species mentioned in the ancient texts of different Indian systems of medicines may be explored with the modern scientific approaches for better leads in the health care. This development was supported by the diverse biodiversity in flora and fauna due to variations in geographical landscaping.

The introduction of biotechnology in medicinal plant research has dramatically facilitated the research opportunities in the field of plant biotechnology and its potential applications by the industry today. The identification of molecular mechanisms and targets is a critical step in the validation of a biological effect and in this aspect “omic” techniques have become key tools in the development of systems biology. Also the natural dyes, alternative food ingredients and preservation materials, such as, natural antioxidants, bioflavours, biopreservatives, natural colourings, fragrances, and microbial polysaccharides, are examples of the growing use of natural products in the industry. This seminar is particularly concerned about understanding of the medicinal plant research in traditional system of medicine. The practice of Indian traditional medicines is put into practice in different cultural settings in daily health care, nutrition, veterinary, hunting, pest control etc. More than 80% of the total population in the developing world are dependent on the natural products because of its time tested safety and efficacy.

Development of operational methodology, consisting of a wide array of standard operating procedures through international coordination will help to promote the natural products so as to promote them from Farm to Pharma. This address will highlight on different perspectives for exploring phyto-pharmaceuticals for health care through traditional systems of medicine with major highlights on their scientific validation and therapeutic benefits for better human life.

Keywords: Health care, traditional systems of medicine, scientific validation, natural products

GINKGO BILOBA EXTRACT EFFECT ON OXIDATIVE STRESS MARKER MALONILDIALDEHYDE, REDOX ENZYME GLUTHATION PEROXIDASE, VISUAL FIELD DAMAGE, AND RETINAL NERVE FIBER LAYER THICKNESS IN PRIMARY OPEN ANGLE GLAUCOMA

MASITHA DEWI SARI

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Abstract

The main objective of the present work was to investigate *Ginkgo biloba* extract effect on oxidative stress marker malonildialdehyde, redox enzyme gluthation peroxidase, visual field damage and retinal nerve fibre layer thickness in primary open angle glaucoma. An experimental study, prospective, double-blind was conducted at the Adam Malik Hospital from August 2012 to August 2013 after approved by the ethics committee for health research University of Sumatera Utara School of Medicine. Diagnose of open-angle glaucoma was based on the presence of an open iridocorneal angle, the characteristic appearance of glaucomatous optic neuropathy such as enlargement of optic cup-disc ratio, focal thinning of neuroretinal rim, and corresponding visual field defect and elevated intraocular pressure. Subject underwent assessment visual field defect with Octopus 301, retinal nerve fibre layer thickness with Cirrus HD-OCT and venous blood was taken to measure plasma levels of oxidative stress marker malonildialdehyde (MDA), and redox enzyme gluthation peroxidase (GPx), then subject were defided into 2 group. The first group of 20 patients POAG was given 40 mg GBE 2 time's daily and 20 patient POAG as a control given placebo (identical capsule filed with 40 mg fructose) for 6 mo. We evaluated MDA and GPx, the visual field for the change of progression rate using Mean Deviation (MD) and Pattern Standart Deviation (PSD), retinal nerve fiber layer thickness (RNFL) both of groups before and after treatment. After GBE treatment, a significant improvement in oxidative stress marker and redox enzyme indices at the 6 mo was recorded: MDA level ($p = 0{,}001^{*}$) and GPx level ($p = 0{,}001^{*}$), visual field MD ($p = 0{,}011^{*}$), PSD ($p = 0{,}002^{*}$) and retinal nerve fiber layer superior ($p = 0{,}001^{*}$), inferior ($p = 0{,}035^{*}$). No significant change was found in intraocular pressure, retinal nerve fiber layer nasal, temporal, mean and optic nerve head after GBE extract or placebo. GBE extract administration as a neuroprotective and antioxidant slowed of the visual field and retinal nerve fiber layer damage and restored the MDA and GPx level.

Keywords: Malonildialdehyde (MDA), gluthation peroxidase (Gpx), visual field, retinal nerve fiber layer, *ginkgo biloba*, primary open angle glaucoma

BIOLOGICAL PROPERTIES OF FREEZE-DRYING DENTAL PULP STEM CELLS

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Abstract

The main objective of the present work was to evaluate the effects of subsequent freeze-drying on viability and differentiation dental pulp stem cell (DPSCS) and periodontal ligament stem cells (PDLSc). DPSCs was isolated from dental pulp and PDLSc and loaded with trehalose. A solution containing trehalose-loaded DPSCs was placed into vials, which were transferred to a tray freeze-dryer and removed during each step of the freeze-drying process. Control groups for these experiments were DPSCs stored in liquid nitrogen. MTT assay was used to evaluate the cell viability and expression of collagen type I and osteocalcin were determined by using real-time PCR. Compared to the values for the control group there are reducing of cell viability in DPSCs, but surprisingly PDLs recovered up to 80 percent in comparing the cell count before freeze drying process. In addition both freeze dried DPSCs and PDLs have shown differentiation ability as the expression of collagen type osteocalcin mRNA and I were detected. Freeze dried DPSCs and PDLs would potentially meet the ability to ship and store without the need for low temperature.

Keywords: Dental pulp stem cells, periodontal ligament stem cells, freeze drying

ADVANCED GAS CHROMATOGRAPHCOUPLED WITH MASS SPECTROMETER FOR RAPID DETERMINATION OF ACTIVE COMPOUNDS AND RELATED SUBSTANCES IN PHARMACEUTICAL DRUGS

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Abstract

Non-communicable diseases are increasing every year in the world. It is estimated to increase up to 70% of all deaths by 2020. The effective treatment of different non-communicable diseases like hypertension, diabetics, depression, cardiovascular, rheumatism, epilepsy that often requires the use of multiple drug agents from different classes of chemical combinations in pharmaceutical preparations. The literature survey revealed that a number of methods had been reported for the determination of individual drug or in combination with other drug substances and high-performance liquid chromatography has been reported as a major technique used for these assays. Due to related substances, degradation products and solvent residues, the efficiency of the drug has been decreased or toxic in some cases. There is no method that enables the simultaneous determination of the current drug formulations of the substances and their related substances. This paper describes a rapid and sensitive gas chromatograph coupled with a mass spectrometer (GC-MS) for the qualitative and quantitative analysis of *active compounds, residues, degradation products and related substances* in raw materials, pharmaceutical formulations and metabolites in plasma samples. Solid phage extraction (SPE) technique and liquid-liquid extraction (LLE) procedure were carried out and high recovery values were achieved. For example, gas chromatograph (GC) coupled with a mass spectrometer (MS) detector for the quantitative determination of stereoisomeric drugs like sertraline hydrochloride in pharmaceutical dosage forms. This method is applicable for the quantification of related substances and assays of active substances in most of the drugs. Hence, this hybrid technology of the gas chromatograph and mass spectrometer will be the highly reliable and fast analytical method for future.

Keywords: Chromatography, spectroscopy, non-communicable diseases

AN INSIGHT TO SITE SPECIFIC DRUG DELIVERY TO COLON

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Abstract

The drug delivery to the colon has been the focus of the increasing interest of scientists not just for the treatment of local diseases associated with the colon but also for its potential for the delivery of the proteins or therapeutic peptides. The specific drug delivery to colon can reduce the incidence of systemic side effects as drug releases close to target site i. e. colon and very less amount will reach to the systemic circulation. This approach increases the therapeutic efficacy of the drug, reduces the side effects of drug and maximizes drug utilization. For the successful colonic delivery, a drug needs to be protected from absorption and/or the environment of the upper gastrointestinal tract and then be abruptly released into the proximal colon, which is considered the optimum site for colon targeted delivery of drugs. Colon targeting is naturally of value for the topical treatment of diseases of the colon such as Crohn disease, ulcerative colitis, colorectal cancer and amoebiasis. Peptides, proteins, oligonucleotides and vaccine pose potential candidature for colon targeted drug delivery. Various signaling pathways for the treatment of colonic diseases are also pointed of attention for the researchers especially engage in the treatment of inflammable bowl diseases. Scientists have used various strategies to target the release of drug to colon viz. prodrug approach, a coating of pH sensitive polymers, using colon specific biodegradable polymers, timed released systems, osmotic systems and colloidal/nanocarriers. Various approaches for the achieving colonic specific drug delivery shall be discussed.

Keywords: Drug delivery, proteins, therapeutic peptides

*ACANTHAMOEBA*SPP.–A SEARCH FOR NOVEL NATURAL PRODUCTS

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Abstract

Acanthamoeba species, pathogenic free-living amoebae (FLA), are the causative agent of granulomatous amoebic encephalitis (GAE) and amoebic keratitis (AK). The dormant and resilient cyst stage of *Acanthamoeba* is highly resistant to most of the antibiotics and physical agents, hence, complicates *Acanthamoeba* therapy. The purpose of this study is to screen novel Malaysian medicinal plants against the cyst as well as trophozoites stage of *Acanthamoeba*. Water, chloroform, ethanol and methanol fractions of various plants were assayed *in vitro* for its amoebicidal activities. Different concentrations ranging from 0.5 to 1.5 mg/ml in 1% DMSO were investigated for anti-amoebic activity and chlorhexidine was used as reference drug. The results showed that only the ethanol fraction of *Pericampylus glaucus* stem showed 100% growth inhibition of trophozoites after 72 h and possessed significant activity in comparison with the reference drug while other fractions of *Pericampylus glaucus leaves, Diospyros wallichii, Polyalthia longifolia* and chloroform as well as hexane fractions of *Pericampylus glaucus* stem were found to be insignificant. Results obtained warrants further investigation on the amoebicidal activities of *Pericampylus glaucus* stem as it could be potentially used as an alternative therapeutic option against *Acanthamoeba* spp.

Keywords: *Acanthamoeba, pericampylus glaucus,* amoebic encephalitis, amoebic keratitis

GENOMIC AND METABOLOMIC PROFILING FOR DETERMINING BIOACTIVE COMPOUNDS OF *STREPTOMYCES KEBANGSAANENSIS*

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Abstract

Streptomyces has enormous potential to produce various bioactive compounds with broad spectrum activity. Most secondary metabolites produced can only be predicted through bioinformatics analysis as putative secondary metabolites gene clusters but rarely produced naturally in the laboratory. Genomics and metabolomics approach helps to bridge the gap between the genome encoding secondary metabolites and the contradictory number of the compound produced. *Streptomyces kebangsaanensis* an endophyte isolated from plant *Portulaca olerace,* was found to produce biologically active metabolite belonging to the phenazine class of antimicrobial. The genomic data of *S. kebangsaanensis* was characterize using whole genomic sequencing and metabolite profiling was carried out to identify the present of antibiotics and important secondary metabolites compound produced *S. kebangsaanensis*. The whole genome sequencing reveals that the genome of *S. kebangsaanensis* is composed of one linear chromosome with a size of 8, 328 719 base pairs with high GC content which is 71.35%. The chromosome contains 12 rRNA operons, 81 tRNA and 7 558 protein coding genes. Nonetheless, 443 genes are uncharacterized because of no homology to known proteins. Further genome analysis reveals that 24 gene clusters were found encoded for genes that involved in the biosynthesis of polyketide, nonribosomal peptide, terpene, bacteriocin and sideraphore. Metabolomics analysis (positive mode: 226 metabolites, negative mode: 27 metabolites) successfully identified bioactive compounds including anticancer agents, antiparasite, antibacterial, antifungal and herbicidal agents. As a conclusion, genomic and metabolomics analysis have provided better understanding toward *S. kebangsaanensis* for its potential in producing various antibiotic and secondary metabolites. Moreover, the genome analysis has allowed us to identify an operon that responsible for phenazine antibiotics biosynthesis, which could facilitate the future genetic engineering research in designing new synthetic phenazine antibiotics.

Keywords: Phenazine antibiotics, *streptomyces,* antimicrobial

ETHNOPHARMACOLOGICAL RESEARCH AND DRUG DISCOVERY–A STRATEGIC APPROACH FOR SUSTAINABLE DEVELOPMENT OF THE INDIGENOUS HEALTHCARE PRACTICES OF NORTH-EAST INDIA

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Abstract

Traditional knowledge is the age old practices of a community associated with its survival. There are thousands of human communities on the earth and each and every community has their own skill and age-old practices in several walks of life like food, medicine, dance, sports, agriculture, costumes, etc. Ethno-medicobotany is one of the tools that help to deal with the direct relationship of plants and man to prevent and cure ailments. The indigenous medicinal plants grown in the North–East India are useful folk medicines used by the people of this region. Therefore, we have devised a cross-cultural ethno pharmacological survey on traditional healthcare practices of North-East India. During our survey in Manipur and Sikkim states of North-East India, we have documented for 89 traditional practitioners in all nine districts of Manipur and 11 traditional practitioners in two districts of Sikkim. The record of traditional knowledge on 1223 different formulations used for 67 different human and animal ailments in Manipur and 27 formulations used for 20 human ailments in Sikkim were enacted from these surveys. After having generated a large database, our initial focus was for pharmacological evaluation of selected formulations for their effectiveness against human ailments as claimed by the local healers and identified promising therapeutic agents. In the course of this survey, several manuscripts, photographs of stone inscriptions, copper plates and ancient therapeutic protocol *"Sida Hidak Taret"* has also been collected. This strategic research approach will help for the sustainable development of the indigenous healthcare practices of North-East India.

Keywords: Ethnomedicobotany, indigenous healthcare practices, therapeutic protocol

NANOTECHNOLOGYIN PHARMACOTHERAPY: A SMALL BUT A BIG DEAL IN 21st CENTURY

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Abstract

The nanotechnology is a double-edged weapon, nanoparticles are attractive but also potentially toxic. New trends will throw light on the formation of molecular systems that may be similar to living systems. The current research projects such as Quantum dot imaging probes, nanotubes, magnatosomes, polymer nanocomposites, etc., have gained importance in pharmaceuticals. The nanotechnology is useful in cell repair, cancer treatment, anti-aging process, nanobots, systems, stem cells, diabetes, surgery, medical monitoring and disease preventives. The nanotechnology for nanomedicines are utilized to develop a cure for incurable diseases and also provides more effective treatment with lesser side effects by means of targeted drug delivery systems. Many products are in the pipeline to enter the market after FDA approvals. Many products are in the pipeline to enter the market after FDA approvals.

Keywords: Nano technology, nanoparticles, nano medicines

HPLC/lC-MS GUIDED PHYTOCHEMICAL/*IN VITRO* SCREENING OF INULA HELENIUM L. (*ASTERACEAE*) AND ALTHAEA OFFICINALIS L. (*MALVACEAE*), AND PREDICTION OF POSSIBLE CYTOCHROME P450 INTERACTIONS

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Abstract

The dried roots of *Inula helenium* L. (Asteraceae) and *Althaea officinalis* L. (Malvaceae) are used as traditional medicines for various medical conditions including tuberculosis, in Africa. The aim of this study is to determine the major phytoconstituents present in the roots of *I. helenium* and *A. officinalis* and assess their potential in altering the activity of cytochrome P450 enzymes, through *in vitro* assays using Human liver microsomes (HLM). Aqueous, methanolic, and ethanolic extracts of *I. helenium* and *A. officinalis* were analysed using biochemical tests, HPLC-VWD and LC-ESCI-MS using quercetin (flavonoids), caffeine (alkaloids), 1-benzopyran-2-one (coumarins), lanatoside C (glycosides), and gallic acid (phenols) as analytical reference standards. *In vitro* inhibition assays were done using HLM with Rifampicin as the substrate for the target enzyme CYP3A4. The biochemical tests confirmed the presence of alkaloids, saponins, phenols, glycosides, terpenoids, flavonoids and coumarins in almost all plants, especially the methanolic extracts. The HPLC retention times were consistent with the presence of quercetin, coumarin, lanatoside C, caffeine and gallic acid standards (retention times 0.71 min, 1.23 min, 1.93 min, 1.25 min and 0.79 min respectively; plant extracts with mean retention times±0.67 min,±1.09 min,±0.61 min,±0.39 min and±0.79 min). LC-ESCI-MS analysis further confirmed this through the MRM scans. Glycosides were observed in almost all plants. In *I. helenium*, the prolific compound observed was alantolactone (*helenin*) or isoalantolactone which belonged to the class of sesquiterpene lactones. In *A. officinalis*, the known lactone, n-hexacos-2-enyl-1,5-olide (althea hexacosanol lactone) was observed at 387.39 *m/z* along with quercetin-equivalent flavonoids which could be potential inhibitors of CYP3A4 and 2B6. Positive/negative mode full scans also showed the presence of major compounds such as sesquiterpene lactones, flavones, saponins and amides. HPLC-guided HLM screening assays indicated the inhibitory potential of the aqueous and methanolic extracts of *I. helenium* on CYP3A4 (IC_{50} = 110 µg/ml and 115 µg/ml, respectively) compared to the methanolic extract of *A. officinalis* (IC_{50} = 3.94 µg/ml). The result suggests that co-administration of the various extracts of *I. helenium* and *A. officinalis* with anti-TB drugs that are substrates of CYP3A4, 2B6, 2C9 and 2C19 enzymes could, in turn, lead to undesirable pharmacokinetic herb-drug interactions in humans.

Keywords: HPLC/lC-ESCI-MS fingerprinting, elecampane, marshmallow, cytochrome P450, phytoconstituents, human liver microsomes

MATRIX METALLOPROTEINASES (MMPS): NOVEL TARGETS IN SKIN CANCER

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Abstract

The continuous exposure of skin to ultraviolet radiations generates reactive oxygen species leading to photo aging in which degradation of dermal collagen and degeneration of elastic fibres occurs. Various studies have shown that macrophages are crucially involved in skin cancer and express significantly higher levels of M1 (CD40, CD127) and M2 (arginase I) markers as well as higher levels of MMP-9, a pivotal enzyme in tumor matrix remodeling and tumor invasion, than macrophages from the basal cell carcinomas. These macrophages represent different receptors like folic acid receptor, a glycosylated receptor which was exploited by us in our studies to observe the extent of our experiments. Further we designed such delivery systems (nanoparticles, transferosomes etc) encapsulating natural flavanoidal drugs against skin cancer and made an attempt to discuss the current view on the feasibility of MMPs as targets for therapeutic intervention in cancer and also tried to summarize the role of small molecular weight natural MMPIs and a clinical update of those natural MMPIs that are under clinical trial stage.

Keywords: Photo aging, Macrophages, Matrix Metalloproteinase, Tumor Remodeling, ROS

ROLE OF BIONANO INTERFACE IN NANOMEDICINE

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Abstract

The productivity of research on cancer nanomedicine for past several decade has been poor which is exemplified by very few clinical products. Clinical studies on nanomedicine have shown poor translation due to their limited selectivity and efficacy. The study on bionano interface has resulted in a paradigm shift for the safe usage and targetability of nanomedicine. My talk will focus on new insight in nanotechnology based on the understanding of the bionano interface.

Keywords: Cancer, nanomedicines, clinical products

FTNIR: A VERSATILE TOOL FOR PHARMACEUTICAL ANALYSIS

Deepti Jain

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Abstract

Near-infrared (NIR) spectroscopy and imaging are fast and nondestructive analytical techniques that provide chemical and physical information of virtually any matrix. In combination with multivariate data analysis these two methods open many interesting perspectives for both qualitative and quantitative analysis. It covers the wavelength range adjacent to the mid infrared and extends up to the visible region, i. e from 780–2526 nm. The most prominent absorption bands occurring in the NIR region are related to overtones and combinations of fundamental vibrations of–CH,–NH,–OH (and–SH) functional groups. The key issues which determine the occurrence and spectral properties, i.e. frequency and intensity of NIR absorption bands are anharmonicity and Fermi resonance. Main advantage of the technique is that its low absorption coefficient, however, permits high penetration depth and, thus, an adjustment of sample thickness. This aspect is actually an analytical advantage, since it allows direct analysis of strongly absorbing and even highly scattering samples, such as turbid liquids or solids in either transmittance or reflectance mode without further pretreatments. But on the other hand NIR absorption bands are typically broad, overlapping and 10–100 times weaker than their corresponding fundamental mid-IR absorption bands. These characteristics severely restrict sensitivity in the classical spectroscopic sense and call for chemometric data processing to relate spectral information to sample properties. This technique is a valuable tool for raw material identification and qualification, direct analysis of intact solid dosage forms, and process monitoring and process control.

Keywords: Analytical techniques, near-infrared (NIR) spectroscopy, solid dosage forms

Oral Presentation

EVALUATION OF *IN VIVO* HEPATOPROTECTIVE ACTIVITY OF SOME NOVEL OXADIAZOLE DERIVATIVES FOLLOWED BY MOLECULAR DOCKING AGAINST NF-KB GENE

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Abstract

The main objective of the present work was the synthesis of N-(4-{[5-(substituted phenyl)-1,3,4-oxadiazol-2-yl]methoxy}phenyl)acetamide and to evaluate the hepatocytes regenerator potentiality by molecular docking with 2V2T-NF-KB and as well as *In vivo* methods. The nuclear factor kappa-light-chain-enhancer of activated B cells (NF-κB) pathway is critical in inflammation, proliferation and carcinogenesis. There exist three main players in this pathway. The inhibitor of NF-κB (IκB), IκB kinase (IκK)-NF-κB essential modulator (NEMO) complex and NF-κB. The IkK-NEMO complex activates NF-κB via phosphorylation of Iκβ and, eventually, leads to its proteasomal degradation. This leads to nuclear translocation of NF-κB and activation of target genes, such as cyclooxygenases and interleukins. The identification of anti-inflammatory compounds might be an effective strategy to target inflammatory disorders and cancer. TLC method was used to check the purity of the synthesized compounds. TLC plates are Pre-coated Silica gel (HF254-200 mesh) aluminium plates, ethyl acetate: n-hexane was used as eluent and visualized under UV chamber. The melting point of synthesized compounds was determined by open capillary tube and the synthesized compounds were characterized by IR, NMR, and Mass spectroscopy. The *in vivo* Hepatoprotective activity was carried out by using albino rats where CCl_4 was used as a hepatotoxin. Most of the scoring functions in molecular docking are physics-based molecular mechanics force fields that estimate the energy of the binding pose; a low (negative) energy indicates a stable system and thus a likely binding interaction. Molecular docking is performed to find out the binding affinity or molecular interaction energy (kcal/mol) of docked compounds. The lowest (negative value) energy of docked molecule indicates high binding affinity with the target protein/compound. *In silico*. molecular docking studies displayed the binding energies: -5.17,-5.52,-5.40,-4.60,-4.60,-4.87,-3.42,-3.85 k. cal/mol, of the synthesized compounds (AB1-AB8) which indicated that the compound had high binding affinity towards the 2V2T-NF-KB protein and inhibited the NF-KB protein function in comparison with std. drug silymarin(-3.54 k. cal/mol). The *in vivo* experimental data displayed that the elevated levels of SGOT, SGPT, ALP and Sr. bilirubin were mainly due to CCl_4 intoxication, reduced significantly (*$P<0.05$) in rats, after treatment with synthesized compounds. Treatment with a synthesized compounds (AB1-AB8) at a dose of 250 mg/kg b.w. decreased the SGOT: 10.76%, 8.74%, 9.08%, 7.16%, 9.58%, 6.61%, 11.65%, 7.80%, SGPT: 23.30%, 23.35%, 22.87%, 23.78%, 23.20%, 22.87%, 23.01%, 23.92%, ALP: 10.18%, 9.92%, 10.30%, 10.20%, 9.33%, 10.56%, 8.80%, 9.56% and Serum bilirubin levels by 36.98%, 42.46%, 46.57%, 36.98%, 38.35%, 42.46%, 36.98%, 38.35%, (significantly) respectively, while at higher dose of 500 mg/kg b. wt. was more effective, causing a reduction of SGOT: 25.33%, 24.69%, 24.83%, 23.85%, 24.69%, 23.75%, 26.22%, 24.19% SGPT: 42.26%, 41.69%, 41.97%, 42.39%, 41.54%, 41.49%, 41.40%, 42.40%, SALP: 22.66%, 22.58%, 22.58%, 22.35%, 22.35%, 22.56%, 22.30%, 22.33%, and Sr. bilirubin: 54.79%, 55.10%, 57.46%, 57.68%, 53.51%, 55.83%, 55.04%, 53.85%. Silymarin was used as standard drug showed a significant reduction of the level of SGOT: 54.79%, SGPT: 47.61%, SALP: 60.39% and Sr. bilirubin: 78.08% respectively receiving CCl_4 alone.

Keywords: NF-Kb, nuclear translocation, IR, NMR, hepatotoxin, molecular docking

PHARMACOTHERAPY OF PHYTOMEDICINE ON OXIDATIVE STRESS-INDUCED BY STREPTOZOTOCIN IN ANIMALS

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Abstract

The main objective of the present work was to study the effect of seed extract of *Momordicadioica* on hepatic oxidative enzymes, glycemic control and lipid profile in streptozotocin (STZ) induced diabetic rats. This investigation was done to evaluate the anti-hyperglycaemic nature of plant products and also to combat the diabetic complications. Type II diabetes was induced in Wistar rats by a single intraperitoneal injection of streptozotocin (STZ) at the dose of 30 mg/kg body weight. The test extracts were administered at the dose of 100 mg/kg and 200 mg/kg body weight orally. Experiment for *in vivo* antioxidant effect was carried out after a continuous treatment with methanolic extract for a period of 15 d. Serum glucose, insulin levels and lipid profile were also determined. Metformin Hcl was used as a standard oral hypoglycemic agent. After the treatment with the methanolic extract of *M. dioica* (MEMD) at the dose of 200 mg/kg body weight, there was a significant elevation ($^{a}p<0.001$) of superoxide dismutase (SOD) and catalase (CAT) with the values of 35.5±0.76 and 12±0.54 U/mg of protein. MEMD also showed a significant reduction ($^{b}p<0.01$) in serum glucose levels at 2 h, 4 h, 6 h and 8 h respectively as compared to diabetic rats. Lipid profile was reinstated to nearly normal in MEMD treated diabetic rats. The present findings demonstrate the improved glycemic control and lipid profile in diabetic rats along with improvised biological anti-oxidant status. This has a beneficial effect in preventing the diabetic complications by scavenging the free radicals in diabetic rats.

Keywords: Antioxidant enzymes, lipid peroxidase, wistar rats, streptozotocin

SUBLINGUAL DELIVERY OF PROPRANOLOL HYDROCHLORIDE ACROSS ORAL MUCOSA UNDER THE INFLUENCE OF pH

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Abstract

Lipophilicity of the drug, solubility of the drug in salivary secretion, pH of saliva and pKa of the drug are the prime parameters that influence the speed and extent at which the drug enters into the systemic circulation when administered sublingually. The absorption of drugs is favored if the drug remains unionized at the oral pH. To achieve enhanced permeability of propranolol hydrochloride, a weakly basic drug with poor oral bioavailability using the sublingual route, promoting the rapid release and immediate action of Propranolol hydrochloride. Thus a study was designed using by lipid matrix technique and pHmax technique. In lipid matrix systems fusion technique was used and in pH max technique buffering technique was utilized. *Ex vivo* studies were performed to understand flux of the drug in both the techniques. *In vitro* disintegration times for the buffered tablets were less when compared to the lipid matrix formulations. *In vitro* drug release of lipid matrix, trial formulations showed that formulation with compritol 888ATO as solid lipid carrier (F1) has good release 31% in 15 min and 92% in 60 min. The formulations with carbopol showed a less percentage of drug release. The drug release profile showed the rapid release of 62% in 15 min and 97% in 60 min and hence F5 was the best of lipid matrix tablets. Marketed formulation (Inderal) showed drug release of 38% in 15 min and 82% in 60 min. Buffered tablets without carbopol (F7) showed 49% of drug release in 15 min and 84% at the end of 1hour. The pure drug showed drug release of 34% in 15 min and 65% at the end of 1hour. In *Ex vivo* sublingual mucosa permeation studies pure drug permeated 28%,Inderal 22%, in a lipid matrix (F1 and F5 permeated 20% and 26%),in pHmax method(F6 and F7 permeated 39% and 38%) at the end of the 1hour. Sublingual delivery of propranolol HCl with both lipid matrix and pHmax techniques offer enhanced permeation and rapid drug release. The buffered tablets without carbopol (F7) showed an immediate release of drug within 5 min and also improved permeation through the sublingual mucosa compared to the pure drug and lipid matrix tablets.

Keywords: Propranolol Hcl, formulation, lipophilicity, bioavailability

ENHANCEMENT OF TRANSCORNEAL PERMEATION AND SUSTAINED RELEASE OF TIMOLOL MALEATE FROM DEVELOPED AND OPTIMIZED *IN SITU* GEL WITH BETTER SAFETY PROFILE

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Abstract

Glaucoma is a chronic disease that causes irreversible blindness. Timolol maleate is used as the first-line drug in the treatment of glaucoma. Poor ocular bioavailability and therapeutic response shown by the conventional ophthalmic system can be overcome by use of *in situ* gelling system which undergoes reversible sol to gel transition in a cul-de-sac by physical stimulation. Present work describes formulation and evaluation of pH sensitive *in situ* gel system of timolol maleate. Carbopol 974P was used as pH sensitive polymer with HPMC K15M as a viscosity modifier. 3^2 factorial design was used to study the effect of independent variables viz. concentrations of Carbopol 974P and HPMC K15M on dependent variables like *in vitro* drug diffusion and viscosity. Optimized batch showed 88.48% drug diffusion up to 8h. Optimized formulation was evaluated for various parameters such as drug release study, isotonicity, texture analysis, preservative efficacy studies, sterility testing as per IP 2010, accelerated stability studies. *Ex vivo* trans corneal permeability study was carried out on goat eye cornea which showed that EDTA (0.5%) increased drug penetration by 1.90 fold and showed no corneal damage after histological study. In conclusion, prepared formulation is stable and non-irritant.

Keywords: Glaucoma, *in situ* gel, transcorneal permeation, polymeric system, optimization and validation

IN VITRO EVALUATION OF SUN PROTECTION FACTOR OF NANOPARTICLE INCORPORATED SUNSCREEN LOTION

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Abstract

The present research work involves the formulation of a sunscreen lotion using *Acorus calamus* extract and biogenically synthesized zinc oxide nanoparticles (ZnONPs). The prepared sunscreen lotion was evaluated for sun protection factor (SPF) values by a facile UV-spectrophotometric method. The SPF value of the *Acorus calamus* sunscreen lotion increased with the addition of ZnONPs. The SPF value of the combination product revealed a synergistic action between ZnONPs and the phyto-constituents present in the *A. calamus* extract. The prepared sunscreen lotion was compared for SPF with that of the commercially available formulations. The sunscreen lotion containing zinc oxide nanoparticles was found to have higher SPF compared to that of conventional one indicating the effect of reduction in particle size, from micro to nano, on the sun protection factor. The proposed UV-spectrophotometric method is simple, rapid, employs low-cost reagents and can be used in the *in vitro* determination of SPF values in many cosmetic formulations.

Keywords: Sunscreen lotion, *acoruscalamus*, spf, zinc oxide nanoparticles

STUDIES ON *N1*-ALKYLATED PYRIMIDINE DERIVATIVES AS POTENTIAL ANTIBACTERIAL AGENTS

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Abstract

In bacterial translation, messenger RNA is translated into proteins and the bacterial ribosome is a key target for naturally occurring antibiotics. Considering the importance of bacterial translation inhibitors a new series of pyrimidine derivatives has been derived. Designing of pyrimidine derivatives has been done on the basis of Lipinski's Rule of Five using the DS 2.5 software. The molecules have been interacted with bacterial protein using DS 2.5 in order to create computational statistics and consider their appropriateness. This protein-ligand interaction has predicted the structure of probable antibacterial agents. The present efforts have been focussed at the development of antibacterial agents with enhanced therapeutic spectra and favourable pharmacological properties. Further, all compounds were examined for their antibacterial activities against Gram-positive and Gram-negative bacterial strains using the microdilution broth susceptibility test method. Antibacterial results indicated that these molecules possessed significant activity against all the tested species with MIC values ranging between 0.12 and 1.62 μM. The structures of all these newly synthesized derivatives were confirmed by spectral data techniques. We have discovered a series of novel antibacterial agents, which could prove as effective lead molecules to fight out the menace of bacterial disease.

Keywords: Pyrimidine derivatives, antibacterial, MIC

DESIGN, SYNTHESIS AND BIOLOGICAL EVALUATION OF BENZIMIDAZOLE DERIVATIVES AS ANTIBACTERIAL AND ANTIVIRAL AGENTS

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Abstract

Antibiotic/Drug resistance is recognized as a serious and permanent public health concern and is usually considered to be a consequence of the wide use and misuse of antibiotics/drugs. Considering the importance of benzimidazole moiety a new series of benzimidazole derivatives has been derived from substituted benzimidazole nucleus. An effective way to predict the binding structure of a substrate in its receptor is docking simulation. Docking results were discussed on the parameters, such as hydrogen bond because they help to stabilize and strengthen a bound receptor-ligand complex and non-bonded pi-pi and pi-cation interactions. Molecular docking studies have been performed on Discovery studio 2.5 software. Further, all compounds were examined for their antibacterial activities against Gram-positive and Gram-negative bacterial strains using the microdilution broth susceptibility test method. Antibacterial results indicated that all these molecules possessed significant activity against all the tested species with MIC values ranging between 0.375-6.2µg/ml. In antiviral results only one molecule showed significant inhibition of HIV-1 growth under *in vitro* conditions with EC_{50} value in the range 1.37µg/ml, however, its TI value is 2.73 only, which is much lower. The structures of all these newly synthesized derivatives were confirmed by their elemental analyses and spectral data techniques. From biological and *in silico* data it confirms that these molecules perform as bacterial translation inhibitors while interacting with bacterial protein and NNRTIs while interacting with the viral HIV-RT protein.

Keywords: Benzimidazole derivatives, docking study, antibacterial study, antiviral study

VALIDATION AND STABILITY INDICATING REVERSE PHASE-ULTRA FAST LIQUID CHROMATOGRAPHIC (RP-UFLC) METHOD FOR THE DETERMINATION OF NAPROXEN SODIUM IN PHARMACEUTICAL DOSAGE FORM

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Abstract

A simple, economical, precise and selective quantitative method was developed and validated for the determination of naproxen sodium in pharmaceutical dosage form. In the current study, the analysis was performed on inertsil shield GRP-C_{18},(250 mm x 4.6 mm; 5 µm) column using methanol and 10 ml TBAHS(80:20 v/v)as mobile phase at a flow rate of 1.2 ml/min. The system consisted of a pump (Shimadzu, prominence, UFLC) with 20 µl sample injector, along with a PDA detector at a wavelength of 231 nm for Naproxen Sodium. Data was compiled using Shimadzu LC solution software. The drug concentrations were found to be linear in the range of 0.01-60 µg/ml and the correlation coefficient value of 0.9991 indicates that developed method was linear. The intra-day and inter-day precision results in terms of % RSD values were found to be 0.71 and 0.77respectively, since% RSD is less than 2%, it indicates that the proposed method has good reproducibility. The accuracy of the method was assessed by recovery studies at three different levels i.e. 80%, 100%, 120% and it was found that the percentage recovery values of pure drug from the pre-analyzed solutions of formulations were in between 100.11%-100.52%, which indicates that the method was accurate and also reveals that the commonly used excipients and additives present in the pharmaceutical formulations were not interfering in the proposed method. The result of the analysis for pharmaceutical formulation by the developed method was consistent with the label claim, highly reproducible and reliable. The proposed method is simple, selective, reproducible, sensitive and accurate with good precision. The method was successfully validated in accordance to USP pharmacopoeia and ICH guideline for accuracy, precision, range and linearity. This proposed method for estimation of naproxen sodium can be successfully applied either in bulk or pharmaceutical formulations.

Keywords: Naproxen sodium, RP-UFLC, ICH guidelines

GC-MS ANALYSIS OF INVASIVE AQUATIC WEED, *PISTIA STRATIOTES* L. AND *EICHHORNIA CRASSIPES* (MART.) SOLMS

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Abstract

The main objective of the present work was to investigate the bioactive components of an invasive aquatic weed, *Pistia stratiotes* L. and *Eichhornia crassipes* (Mart.) Solms vegetative parts by using gas chromatography-mass spectrometer (GC-MS). The chemical compositions of the ethanol extract of whole plant *Pistia stratiotes* L. and *Eichhornia crassipes* (Mart.) Solms was investigated using Agilent Technologies GC-MS (GC-7890A, MS 5975C). The results of GC-MS analysis of the ethanolic extract revealed the existence of 28 phytochemical compounds in *Pistia stratiotes* L. n-hexadecanoic acid,-11-hexadecenoic acid, ethyl ester, hexadecanoic acid, ethyl ester, octadecanoic acid, ethyl ester, 2-cyclopenten-1-one, 5-hydroxy-2,3-dimethyl, L-glutamine, 2-pentadecanone, 6,10,14-trimethyl, linolelaidic acid, methyl ester, 9,12,15-octadecatrienoic acid, methyl ester, (Z,Z,Z), nonadecane, 12,15-octadecadiynoic acid, methyl ester, hexadecanoic acid, 2-hydroxy-1-(hydroxymethyl)ethyl ester, diisooctyl phthalate, docosanoic acid, ethyl ester, stigmasterol, bis(2-ethylhexyl) phthalate, 1-monolinoleoylglycerol trimethylsilyl ether, ethyl iso-allocholate are the major compound. The ethanolic extract of *Eichhornia crassipes* (Mart.) Solms contains 43 phytochemical compounds of high and low molecular weight n-hexadecanoic acid, e-11-hexadecenoic acid, ethyl ester, palmitic acid, phytol, 9,12,15-octadecatrienal, 9,12-octadecadienoic acid, ethyl ester, linolenic acid, ethyl ester, stearic acid, ethyl ester, hexadecanoic acid, 2-hydroxy-1-(hydroxymethyl)ethyl ester, α-glyceryl linolenate, 1-monolinoleoylglycerol trimethylsilyl ether, linoleic acid, 2,3-bis-(o-tms)-propyl ester, stigmasterol, linolelaidic acid, methyl ester, 9,12,15-octadecatrienoic acid, ethyl ester, (z,z,z), ethyl iso-allocholate, cholesta-22,24-dien-5-ol, 4,4-dimethyl are the major compounds. These results indicate *Pistia stratiotes* L. and *Eichhornia crassipes* (Mart.) Solms possess potent antioxidant, anti-inflammatory, anticancer, antitumour, antiarthritic, cancer preventive, antibacterial effects so can be recommended as a plant of phytopharmaceutical importance. The ethanol extract of *Pistia stratiotes* L. and *Eichhornia crassipes* (Mart.) Solms proves as a potential source of bioactive compounds of pharmacological importance.

Keywords: GC-MS, antioxidant, anti-Inflammatory, antiarthritic activity

PARAFAC ALGORITHM WITH APPLICATION TO CALIBRATION OF HPLC-DAD FOR SIMULTANEOUS DETERMINATION OF OVERLAPPED POLYPHENOL and FLAVONOID COMPOUND IN DIABETOGEN FORMULATION

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Abstract

The polyherbal formulation is very complex nature due to potentially containing multiple pharmacologically active entities. The complexity of the analytical result of polyherbal medicament in high-performance liquid chromatography–photodiode array (HPLC-PDA) is an obstacle. The combination of the instrumental technique with chemometrics multivariate technique along suitable experimental designing may resolve the complexity of multicomponent medicament. To lead the search method based on chromatographic separation followed by photodiode array detector system. To affix probability number of discriminating components that can be further subjected to validation protocol. A set of eighteen samples containing a constant amount of compound diabetogenic extract, all of them spiked with respective individual semi-purified extract was analyzed three different concentration level. The preprocessed HPLC-PDA data were subjected to parallel factor analysis (PARAFAC) algorithm, a chemometric method that is a generalization of principal component analysis (PCA) to multi-way data arrays as an internal individual extract as a function of time and wavelength. PARAFAC analysis was used to facilitate sample comparison and allowed straightforward interpretation of constituents responsible for the differences in composition between three labels of preparation. In tallying, loadings from the PARAFAC analysis provided pure elution profiles and pure UV spectra even for coeluting peaks, thus enabling the identification of chromatographically unresolved components in context target class of phytochemical. PARAFAC analysis of the easily accessible HPLC-PDA data provides the means for unsupervised and unbiased assessment of the composition of herbal preparations, of interest for assessment of their pharmacological activity and clinical efficacy.

Keywords: Polyherbal formulation, HPLC-PDA, chemometrics, PARAFAC, polyphenol

MOLECULAR MODELLING, SYNTHESIS AND ANTIBACTERIAL STUDIES ON SULFONAMIDE ANALOGUES AS PEPTIDE DEFORMYLASE INHIBITORS

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Abstract

Bacterial infections, in recent years, have become a serious threat as bacteria have been found to be capable of developing resistance to the most of the antibiotics being used clinically. Peptide deformylase (PDF) is an essential metalloenzyme that removes the formyl group from methionine at the N-terminus of nascent polypeptide chains followed by protein maturation. This protein is expressed in all pathogenic bacteria. Considering the importance of the sulphonamide and amide linkage, some novel molecules with such structural features have been designed and synthesized as probable antibacterial agents. Designing is done keeping the Lipinski's Rule of Five in focus and SAR studies using DS 2.5 software. Further, all compounds were examined for their antibacterial activities against Gram-positive and Gram-negative bacterial strains using the microdilution broth susceptibility test method and subjected to polynomial regression. The present efforts have been focussed at the development of antibacterial agents with enhanced therapeutic spectra and favourable pharmacological properties. The compounds showed very promising *in silico* results with considerable inhibition pattern against all bacterial strains and in some cases showed better activity than the reference used under experimental conditions. Antibacterial results indicated that these molecules possessed significant activity against all the tested species with MIC values ranging between 0.12 and 1.62 μM. We have discovered a series of sulphonamide derivatives as antibacterial agents, which could prove as effective lead molecules to fight out the menace of bacterial disease.

Keywords: Sulphonamide derivatives, antibacterial study, MIC

EFFECT OF BACOSIDE A ON LIPID PEROXIDATION IN D-GALACTOSE INDUCED AGING MICE

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Abstract

Bacoside A is a major bioactive constituent of *Bacopa monnieri* L having antioxidant property. The objective of this study was to evaluate the effect of bacoside A, on lipid peroxidation in brain, heart and liver during induced aging. Male Swiss albino mice, *Mus musculus,* was used for the present investigation. Four experimental groups were used as group In-ormal adultg ;roup II-D-galactose induced, group III-D-galactose induced plus bacoside A treatedand group IV-natural aging. The effect of bacoside A was studied against lipid peroxidation during induced aging. The level of lipid peroxidation in the form of MDA formation was determined and measured in brain, heart and liver. The statistical data obtained was analyzed using one-way ANOVA, control vs other groups and results were expressed as mean±SE. In bacoside, A treated group the lipid peroxidation level in heart, brain and liver was significantly decreased ($p<0.001$) compared to control group. A significant increase ($p<0.0001$) in the level of lipid peroxidation was observed in D-galactose induced mice. In natural aging group highly significant increase ($p<0.0001$) in initial lipid peroxidation, ascorbate-dependent lipid peroxidation and spontaneous lipid peroxidation was observed. The observations revealed that lipid peroxidation was reversed in bacoside A treated group which may be due to antioxidant property of bacoside A. Thus bacoside A is able to ameliorate the stress induced changes in lipid peroxidation during aging. The findings also provide a theoretical basis for the development of novel therapeutic formulations, such as antioxidant supplementation to boost antioxidant defences in the body.

Keywords: Oxidative stress, aging, lipid peroxidation, d-galactose, bacoside a, antioxidant

ESTIMATION OF PHOTOSYNTHETIC PIGMENTS FROM ANTIALLERGENIC PLANTS AND THEIR POSSIBLE CORRELATION WITH THERAPEUTIC ACTIVITY

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Abstract

The aim of the present investigation was to estimate photosynthetic pigments from antiallergenic plants for understanding their correlation with therapeutic activity of medicinal plants. Spectrophotometric estimation of chlorophyll and carotenoid content has been carried out by Hiscox and Israelistam method (1979). Total chlorophyll and carotenoid content were calculated by Arnon's method (1949) and Kirk and Allen Method (1965) respectively. *Cynadon dactylon* and *Cymbopogon citratus* have been selected for present investigation. This research revealed variation in photosynthetic pigments of plants. The highest concentration of chl. a, chl. b and total chlorophyll content have been observed in the *Cynadon dactylon* leaves (260.1 mg/100 gfw) than *Cymbopogon citratus* leaves (201 mg/100 gfw). The ratio of chl. (a) and chl. (b) has been recorded highest in *Cynadon dactylon* (4.67) followed by *Cymbopogon citratus* (2.96). The carotenoid content has been observed comparatively higher in *Cynadon dactylon* leaves (182.5 mg/100 gfw) than *Cymbopogon citratus* leaves (125.2 mg/100 gfw). Estimation of photosynthetic pigments of antiallergenic plants revealed variation in chlorophyll and carotenoid contents. The result of present study provided a better photosynthetic pigment concentration which is useful to understand the therapeutic activity of these plants. *Cynadon dactylon* was characterized with the highest total chlorophyll, carotenoid content and Chl. (a) and (b) ratio than *Cymbopogon citratus*. This research is important to overcome the health problems such as atherosclerosis, some forms of cancer, osteoporosis, cataracts, neurodegenerative diseases, vitamin A deficiency and oxidative stress. Chlorophylls and carotenoids show protective effects against these health problems. The present investigation may be correlated with the therapeutic activity and photosynthetic pigments of these antiallergenic plants.

Keywords: Photosynthetic pigments, antiallergenic plants, chlorophylls, carotenoids, spectrophotometric, *cynadon dactylon, Cymbopogon citrates*

SYNTHESIS AND MORPHOLOGICAL STUDY OF VALACYCLOVIR IMPRINTEDPOLYMER FOR DRUG ANTICOUNTERFEITING STUDY

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Abstract

Molecular imprinting technology is a new and revolutionary way of producing recognition sites for the specific analyte in synthetic polymers. It contains specifically designed cavities for the target molecule. This imprinting technology can be used to generate polymeric materials with recognition sites providing high selectivity and affinity for template molecules. The purpose of this work was the development of MIPs for valacyclovir highly selective with respect to other antiviral agents and to develop a best synthetic tool for counterfeit drug detection. The number and nature of functional groups present in a valacyclovir molecule seemed to be suitable to design specific recognition cavities with the non-covalent approach. Surface characteristics were investigated by scanning electron microscope (SEM) measurements. The polymer was prepared under different synthesis conditions using valacyclovir as a template. A mixture of a functional monomer methacrylic acid (MAA), ethylene glycol di-methacrylate (EDMA) and 2, 2-azobisisobutyronitrile (AIBN) was dissolved in the porogen acetonitrile in a 25 ml glass tube along with the template molecule. This mixture was purged with nitrogen for 8–9 min. The glass tube was then placed in a thermostat-controlled water bath at 68 °C for 11 h. Once the polymers were produced, the glass tube was broken to obtain the polymer block. This was crushed and ground in a mechanical mortar to obtain particles of different size for analysis. Finally, the template was removed from the imprinted polymers to create the binding sites. This was done in two ways: soxhlet extraction with a mixture methanol: acetic acid (50:50 v/v) with acetonitrile. Non-imprinted polymers (NIPs) were prepared in the same way but without adding the template molecule. The SEM clearly shows that pores were embedded in the network of the MIPs and that there were substantial differences in morphology between the MIPs and non-imprinted polymers (NIPs). The NIPs had a smoother structure with small cavities and surface area than those of the MIPs, which indicates that the increase of surface area of MIPs was because of imprinting. This research presents MIP as an interesting biomaterial for analyte identification and separation of drugs from complex biological matrices and may serve as useful references for identification of other antiviral drugs. The surface morphological differences may suitably applied for distinguishing a counterfeit drug from a genuine drug.

Keywords: Molecular imprinted polymer, scanning electron microscope, morphology, counterfeit drugs

IDENTIFICATION AND ISOLATION OF SWERTIAMERIN: AN ACTIVE BITTER PRINCIPLE FROM *EXACUMLAWII* LINN

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Abstract

Exacum lawii C. B. Clarke in Hook (gentianaceae) is a bitter herb, endemic to western coast region and southern part India. Traditionally used in kidney disorders and eye problems. Swertiamerin is bitter secoiridoid glycoside and widely distributed among plants belonging to the family gentianaceae. Swertiamerin is reported to have a potent therapeutic agent. The main objective of the present work was quantitative standardisation, isolation and characterisation of swertiamerin from bitter herb *Exacum lawii*. Swertiamerin was identified and quantified in methanolic extract of *Exacum lawii* using CAMAG HPTLC at 254 nm using solvent system ethyl acetate: methanol: water (7.7: 1.5:0.5). To isolate swertiamerin, powdered drug (50 g) was defatted with petroleum ether (60–80 °C) and extraction was done by cold maceration with methanol (4 x 250 ml). The extract was concentrated in a rotary evaporator to 50 ml. The methanolic extract obtained was treated with cold diethyl ether and the precipitate was acquired. The further precipitate was subjected to column chromatography (Merck, Germany) and eluted with petroleum containing ethyl acetate (0–18%), then ethyl acetate followed by ethyl acetate with increasing ratio of methanol (0–12%). Different elutes were collected and monitored by thin-layer chromatography (TLC) for swertiamarin using the solvent system of ethyl acetate: methanol: water (7.7: 1.5: 0.5). Ethyl acetate: methanol fractions identified with swertiamarin were pooled and evaporated to dryness (yield 1.26 gm). The characterisation of swertiamarin was done by Ultraviolet absorption spectroscopy, Melting point, FTIR, ^{13}C-NMR and H^{1}-NMR. The study revealed that ethanolic extract contains 5.46 µg/gm. The UV spectra of both standard and isolated swertiamerin were found to be overlapped. The melting point was 113-114°C. ^{13}C-NMR confirms the position and linkage of secoiridoid moiety.

Keywords: *Exacum lawii*, swertiamerin, HPTLC, column chromatography, ^{13}C-NMR, H^{1}-NMR

EXPLORING SUN PROTECTION FACTOR FROM TROPICAL MEDICINAL PLANTS

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Abstract

The present study focuses on the evaluation of the sun protection factor (SPF) of three medicinally important tropical plants namely *Elephantopus scaber* L., *Buchanania lazan* Spreng and *Holoptelia intregrifolia* Roxb. Planch (Asteraceae, Anacardiaceae and Ulmaceae) respectively. Aqueous extract of leaves was tested for absorptive nature of UV radiation by spectrophotometric analysis (200 nm–400 nm) to obtain characteristic absorption pattern. These extracts were further quantified for phenols and flavonol, the key components of SPF. Subsequently, thin layer chromatography (TLC) of extracts was also analyzed to partition the phenolic fractions which mostly contribute to SPF activity. FT-IR analysis revealed the presence of characteristics phenolics (aliphatic group with characteristic wave number 3366.85, 3329.14 and 3332.99 cm^{-1}respectively) which are known to play a critical role against sunray induced damage. Most importantly, all the extracts showed the significant content of SPF 13.5, 14.83 and 10.5. Additionally, Vitamin C content of the extracts was found to be 42.105, 31.579 and 39.474 mgl^{-1}. The extracts showed a significant combination of SPF and Vitamin C. SPF reduces UV-induced skin damage and vitamin C inhibits sunburn and skin cancer. Thus, the plants offer an unexplored source of potent sunscreen with effectiveness against photo-aging and as skin rejuvenant. Cream based formulation of these extracts definitely holds lucrative cosmeceutical market for topical application.

Keyword: *Elephantopus scaber*, *buchanania lazan*, *holoptelia intregrifolia*, SPF, vitamin C, Cosmeceuticals

FREE-WILSON AND DOCKING APPROACH FOR THE DESIGNING OF CHALCONES AS EPIDERMAL GROWTH FACTOR RECEPTOR TYROSINE KINASE INHIBITOR IN PREVENTION OF LUNG CANCER

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Abstract

Epidermal growth factor receptor (EGFR) are stimulated by epidermal growth factor which causes cell proliferation, cell differentiation, etc. which leads to cancer including lung cancer.

The present study aims Free-Wilson and docking approach for the designing of chalcones as epidermal growth factor receptor tyrosine kinase inhibitor in the prevention of lung cancer. Total 18 compounds were selected for the study. Results obtained from QSAR was statistically significant with $q^2$of 0.764, r^2 value of 0.857, std. of 0.1,F value 28.075 and s_{press} value of 0.130. Equation generated from the study reviled that NO_2 and OCH_3 at the para position enhances the activity might be due to penetrating and donating effect respectively. Docking was performed through molegro virtual docker 6.0 on epidermal growth factor receptor tyrosine kinase and it was observed that the most active compounds binds to the active amino acid Met 769 within the active site of protein. The given study could be helpful in designing the novel compounds for the treatment of lung cancer as EGFR tyrosine kinase inhibitor.

Keywords: Epidermal growth factor receptor, chalcones, free-wilson, docking, lung cancer

SYNTHESIS AND CHARACTERIZATION OF SOME NOVEL SERIES OF INDOLO-IMIDAZOLONES AS BIOLOGICAL AGENTS

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Abstract

Imidazole is an entity which is being synthesized in many of its derivatives form from past few years. This entity is a major source of interest for many of medicinal chemist to explore its various pharmacological potentials. Imidazole derivatives have a wide range of pharmacological activities. The literature survey revealed that it has analgesic, anti-inflammatory, cardiovascular, anti-neoplastic, antifungal, enzyme inhibition, anthelmintic, anti-filarial, antiviral and antiulcer activities. Indole is an essential structural fragment of a large number of natural and synthetic compounds possessing a wide variety of pharmacological activities. Indole derivatives have occupied a unique position in the design and synthesis of novel biologically active compounds since they are often used as antiallergic, antiproliferative, anti parasitic, anti-inflammatory, antiasthmatic, antituberculosis, antibacterial, antihypertensive, antitumor and most notably antimalarial. Keeping in view of these wide activities of both the pharmacophores novel indolo-imidazole derivatives are synthesized in accordance to the procedure given in the literature and resultant compounds were transformed into respective Schiff's bases. Newly synthesized title compounds were characterized by analytical spectral data and they were screened for the study of antimicrobial activity, antioxidant and anti-tumour activity.

Keywords: Imidazole, indole, synthesis

STUDY OF THE REFERENCE STANDARD MASS IMPACT ON THE HOMOGENEITY ASSESSMENT OF PHARMACEUTICAL SUBSTANCES

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Abstract

The main objective of the present work was to study an impact of a mass of a reference standard (RS) on the homogeneity assessment of pharmaceutical substances intended to be used as candidate materials. Pharmacopoeial methods for assay and purity tests (liquid chromatography, loss on drying, absorption spectrophotometry, semi-micro determination of water, etc.). According to the State Pharmacopeia of Ukraine (SPU) recommendation, between-unit homogeneity of pharmaceutical substances (candidate materials for SPU RS) containing a significant amount of impurities was studied for the intended use of drug manufacturers. As a homogeneity assessment criterion, we used the requirement: a 95% confidential interval calculated for the RS content must not exceed 0.5%. Homogeneity of some substances for RS masses specified in analytical procedures did not comply with the SPU criterion; the required homogeneity was achieved by increasing RS masses, drying RS before using, or certification of RS in solution form. In some pharmacopeial monographs, only reference solution concentrations are specified; information about the minimum RS mass is absent. SPU specifies a minimum mass of RS and a homogeneity assessment criterion in the SPU certificate for RS if it is found that a mass of RS taken for a drug test can affect the analysis result. The use of small RS masses can result in unacceptable RS homogeneity assessment. Drug analysis procedures should be developed based on scientifically proven criteria for RS homogeneity. The necessary homogeneity can be achieved by using proper RS masses or other means.

Keywords: Reference standards, homogeneity, pharmaceutical substances, significant impurity content, minimum masses

ANTI-UROLITHIATIC PROPERTY OF AQUEOUS EXTRACT OF *OCIMUM-SANCTUM*

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Abstract

During mineralization, an organic substance becomes impregnated by inorganic substances. It is basically of two types: physiological and pathological mineralisation. Urolithiasis is an example of pathological mineralisation which deals with the formation of renal calculi in the kidney. In the supersaturated condition of urine, crystals are formed which serve as nidus. These crystals grow in size to form renal calculi. Stones can be removed by surgery or by shock wave lithotripsy (SWL). Chances of recurrence of kidney stones are high in these painful, invasive processes. An alternative and effective approach is required to overcome this problem. Medicinal plant extracts and their isolates can play a vital role in managing this disease. These plants are easily available and their extract has fewer or no side effects. Not much work has been done on evaluating the effect of *Ocimum* leaf extract on urolithiasis. In the present study, the effect of aqueous extract of *Ocimum sanctum* was studied on nucleation, growth and demineralization homogenous assay system of mineralization. Fresh plant leaves were collected from the local area and authenticated by expert and plant specimen was submitted to Delhi University Herbarium. After washing leaves were extracted by boiling in distilled water at 100 °C till the volume reduced to one-third. Extract thus obtained was filtered, dried and kept at 4 °C for further use. Nucleation mineralization system consisted of $CaCl_2$, KH_2PO_4 along with distilled water and plant extract. To study the growth mineralization system, the precipitate formed by the nucleation mineralization system was resuspended in the same assay system along with the different concentration of plant extract. For demineralization system, the preformed mineral phase was resuspended in the assay system with plant extract but without further addition of calcium and phosphate. Calcium and phosphate ion for each assay system were estimated to evaluate the activity of *Ocimum* extract. In nucleation assay system phosphate ions were inhibited by 86.13% while calcium ions were inhibited by 88.75%. Inhibition of phosphate and calcium ions was also observed in growth assay system (95.67% and 81.39% respectively). In demineralization system, 99.85% and 85.35% inhibition was exhibited in the case of phosphate and calcium. In all the assay system calcium and phosphate ions were inhibited by the Ocimum leaf extract. Highest inhibitory activity by the plant extract is exhibited against all the assay system, including nucleation, growth and demineralization assay. We can conclude from the present study that Ocimum extract could be a potent phytotherapeutic agent against urolithiasis.

Keywords: Urolithiasis, phytotherapeutic agent, *ocimum sanctum*

GLUTEN FREE CASEIN FREE DIET AS COMPLEMENTARY AND ALTERNATIVE MEDICINE (CAM) TREATMENT FOR CHILDREN' S WITH AUTISM SPECTRUM DISORDERS (ASD)

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Abstract

Autism is a developmental disorder that is marked by profound deficits in social, language, and cognitive abilities. GFCF diet is a complementary and alternative treatment for children' s with autism which does not digest gluten and casein proteins completely and that the incompletely metabolized proteins leak into the digestive tract and travel through the bloodstream to the brain These peptides able to enter the blood stream and act upon the central nervous system. The gluten free casein free (GFCF) diet is a common alternative intervention used for ASD management. This study analyzes the effect of gluten free and casein free diet in children with autism in Gwalior city. This gluten free and casein free (GFCF) diet was administered to a group of 20 children's with ASD and 20 ASD children's with on control diet. Observation and test are done before and after 6 mo. Nutritional assessment is done before and after the study. A gluten free and casein free diet module was circulated to all the parent/guardians. Parents were then asked to exclude gluten and casein based food products from the children s' diets for six months. There was a significant difference between the two groups. Different improvements were seen in children which on a diet than controls ones. This study suggests that GFCF diet had an impact on the behavior of children with ASD positively, and highlights the importance of diet, including nutritional health benefits.

Keywords: Autism, Diet, Protein, Gluten, Casein, Nutritional

FORMULATION, OPTIMIZATION AND *IN VITRO* CHARACTERIZATION OF LOSARTAN LOADED SOLID LIPID NANOPARTICLES

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Abstract

Losartan loaded solid lipid nanoparticles were produced by hot homogenization followed by ultrasonication at a temperature above the melting point of lipid. SLN were characterized for entrapment efficiency, drug content, zeta potential, *in vitro* drug release, particle size analysis, scanning electron microscopy, Fourier transform infrared studies and stability. The SLNs formed were in nano size with maximum entrapment efficiency with an initial burst and prolonged release over 24h. Solid lipid nanoparticles were prepared by hot homogenization followed by ultrasonication. Stearic acid, glycerol monostearate were used as solid lipid core, tween 80, tween 40, tween 20 were used as surfactants mixture. Process ad formulation variables were studied and optimized. Hot homogenization of melted lipids ad aqueous phase followed by ultrasonication at a temperature above the melting point of lipid was used to prepare SLN dispersion. The prepared formulations have been evaluated for entrapment efficiency, drug content, zeta potential, *in vitro* drug release, particle size analysis, scanning electron microscopy, fourier transform infrared studies and stability. The mean particle size, PDI, zeta potential and entrapment efficiency of optimized losaran SLN formulation was found to be 37.54 nm, 0.173, 19.70mv, 88.63% respectively. *In vitro* release studies indicated that after an initial burst release, SLN could provide prolonged release of losartan. In this study, a poorly water soluble drug VLN was successfully incorporated into SLNs by modified high shear homogenization and followed by ultrasonication. SLN formulations F1 ad F10 composed of Tween-80 as a surfactant ad lower concentration of lipid matrix showed the best results in view of the entrap efficiency as well as in *in vitro* drug release.

Keywords: Solid lipid nanoparticles, losartan, particle size analysis, entrapment efficiency, *in vitro* release study

EFFECT OF NATURAL ANTIOXIDANT IN THE PREVENTION OF ENZYMATIC BROWNING REACTION IN ETHNOMEDICINE OF *SOLANUM ANGUIVI* L

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Abstract

Solanum anguivi L. is one of the ethnomedicines consumed as a vegetable grown in the Indian subcontinent. The enzymatic browning that occurs in the cut surface of eatable tissue affects the ferrous iron and makes it into undesirable one. Therefore, it is important to control their effect, as well as to establish their characteristics associated to the fruits. The present study was designed to control the enzymatic browning reaction in *Solanum anguivi* L. extracts using the natural antioxidant agent of *Emblica officinalis* at different ratios. It was analyzed for the determination of phenol, tannin, antioxidant and antimicrobial activity; ferrous iron content was confirmed by different methods. The result of the study indicates that combined extract of *Solanum anguivi* L. and *Emblica officinalis* were rich in iron, vitamin C, total phenol and tannin content and also exhibited a strong antioxidant activity significantly when compared to other studied combinations. The presence of bioactive compounds like alkaloids, phenol, tannin, flavonoid, saponin, steroids, glycosides and reducing sugar was noted in all studied combinations. The effect of *in vitro* antibacterial activity of combined extracts *Solanum anguivi* L. and *Emblica officinalis* revealed the highest resistant against clinical pathogens. There was no significant activity observed in *Solanum anguivi* L. extract. Thus the combination of *Solanum anguivi* L. with *Emblica officinalis* fruit extract proved that significant phytochemical profile may be an alternative to synthetic iron therapy for the treatment of anemia.

Keywords: Antioxidant, *solanum anguivi* L., enzymatic browning prevention, resistance

DEVELOPMENT AND EVALUATION OF MATRIX LOADED GELATIN NANOPARTICLES FOR THE DELIVERY OF BORTEZOMIB

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Abstract

The aim of this research work was to develop and evaluate matrix loaded gelatin nanoparticles of bortezomib for the treatment of multiple myeloma. In this work, biodegradable gelatin nanoparticles were prepared by one-step desolvation technique using ethanol–water mixture as the non-solvent. Nanoparticles were prepared in the ratios of drug: gelatin (500µg: 10,20,30,40 mg). The prepared nanoparticles were characterized for size, size distribution, FT-IR. Drug release studies were performed in dialysis tubing of 2 ml capacity and with an MWCO of 3.5KDa for a period of 96 h and drug release was estimated at several time points using a gradient RP-HPLC method. The formulation containing 20 mg polymer has yielded a good morphology and satisfactory size range of 200-300 nm. Drug loading studies indicated 75.9% of drug loading efficiency. FT-IR studies show characteristic peaks at 1380-1310 cm^{-1} which indicate the B-O stretching and 3300-3200 cm^{-1} reflect the B-O-H stretching of boronic acid belonging to the bortezomib and were diminished in the drug loaded gelatin nanoparticles. The drug release was found to be sustained for the entire period of study with a maximum release of 62% at the last time point. The developed nanoparticles exhibited good size and surface characteristics. The release profile was sustained for 96 h suggesting that biodegradable matrix loaded gelatin nanoparticles for the delivery of bortezomib was successfully developed.

Keywords: Bortezomib, gelatin nanoparticles, matrix nanoparticles

INDUCTION OF APOPTOSIS BY FATTY ACID RICH FRACTIONS OF THREE MEDICINAL PLANT EXTRACTS IN HUMAN CERVICAL CANCER CELLS

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Abstract

The main objective of this study was to induce cell death on a panel of cervical cancer cell lines and elucidation of cell death pathway by three medicinal plants extracts (*Solanum nigrum*, *Phyllanthusamarus, Heliotropiumindicum*). Methanolic extracts were fractionated with hexane, chloroform and water. MTT assay was done on a panel of cervical cancer cell lines (HeLa, SiHa and C33A) to determine IC_{50} doses. With the most potent fractions, other experiments were conducted. Biomolecules present in the potent fractions were TMS-derivatized and run in GCMS and fragmentation patterns were compared with NIST library. Cytoplasmic blebbing and nuclear condensation were observed in treated sets. The presence of DNA laddering suggested apoptotic cell death which was further supported by AnnexinV-FITC/PI double staining. Cells were arrested at G1/S phase in several treated samples. The extent of DNA damage was observed by COMET assay. Higher expression of p53, p21 and Bax and decreased expression of Bcl2 were observed. Phenol 2,4-Bis (1,1–dimethyl ethyl), palmitic acid(TMS) ester, stearic acid(TMS) ester, butanedioic acid (TMS), chrysene, cinnamic acid, linoleic acid (TMS) ester, oleic acid (TMS) ester, benzoic acid, benzoic acid 4-Me3(TMS), benzoic acid (TMS) ester, and benzene acetic acid (TMS) ester were detected in the potent fractions. The chloroform fractions were most effective to induce apoptotic cell death. Profuse DNA damage by treatment with the chloroform fractions might be the reason for apoptotic induction through up-regulation of p53 and stabilization of it by downregulating HPV E6. The cytotoxic chloroform fractions were rich in fatty acids.

Keywords: Apoptosis, DNA damage, HeLa, SiHa, C33A, *Solanum nigrum*, *Phyllanthus amarus, Heliotropium indicum*, Fatty acid

INDUCTION OF AUTOPHAGIC CELL DEATH IN HPV 16 POSITIVE SIHA CELLS BY *CHAETOMORPHABRACHYGONA,* A MARINE GREEN ALGAE

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Abstract

The main objective of the study was to evaluate the cytotoxic and anti-proliferative efficiency of filamentous marine algae (*Chaetomorpha brachygona)* on cervical cancer cell line SiHa (HPV 16+ve). Due to presence of various chemical constituents (alkaloids, polyketides, polysaccharides, diterpenoids, sterols, quinones, lipids, cyclic peptides, phlorotannins and glycerol) algae from marine origin, can act as a potential candidate for anticancer drug development. A collection of algae was followed by identification of the genus by studying filament morphology. Then the algae were extracted in different solvent systems (petroleum ether, chloroform and methanol-water), MTT assay on SiHa and T293 cell line to determine selective cytotoxicity and IC50 doses were undertaken. DNA laddering assay, cell cycle analysis by FACS, flow cytometric analysis assay with Rh123 and Acridine Orange; fluorescence microscopy with Hoechst and Acridine Orange, wound healing assay, Western blot analysis, preliminary phytochemical study and GCMS were also undertaken to determine the cell death pathway. Chloroform fraction of *Chaetomorpha brachygona* showed cell growth inhibition at very low dose (IC_{50} dose: 23.6 µg/ml) but zero percent cell death was observed on normal human embryonic kidney cells (T293), the absence of DNA ladder in DNA fragmentation assay and the presence of auto-phagosomal structures were observed under fluorescence microscopy and FACS. Increased expression of autophagic proteins (LC3BII, Beclin 1, p62, Atg12-Atg5 conjugate) was also observed. Chloroform fraction of *Chaetomorpha brachygona* was found to be the most potent one. Autophagic cell death pathway was induced to the cervical cancer cell line SiHa. The cell death pathway was Beclin1 dependent.

Keywords: MTT assay, IC_{50} dose, FACS, western blot analysis, GCMS

PHARMACOLOGICAL EVALUATION OF AQUEOUS LEAF EXTRACTS OF *SENNA ALATA* USING ANIMAL MODELS

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Abstract

Analgesic, antipyretic and anti-inflammatory activities of aqueous leaf extracts of *Senna alata* have been carried out to establish the species as a potent natural phytomedicine. For analgesic activity, acetic acid induced writhing; Eddy's Hot plate and Tail flick tests were conducted in wistar albino mice. Antipyretic activities of aqueous leaf extracts of *S. alata* was studied by using 2,4 DNP induced pyrexia in adult rats of either sex. Anti-inflammatory activities were performed by adopting the method carrageenan-induced paw edema in rats. The results on analgesic activities of aqueous leaf extracts showed a significant effect at a dose of 200 mg/kg similar to the standard drugs diclofenac sodium and tramadol (10 mg/Kg). In the antipyretic activity, administration of 200 mg/kg aqueous leaf extracts exhibited a reduction in body temperature of the rats after 1hr similar to standard drug paracetamol. The leaf extract (200 mg/kg) had shown a significant anti-inflammatory activity that is equal to that of Diclofenac sodium (15 mg/kg). From the pharmacological studies, it is evident that the administration of aqueous leaf extracts of *S. alata* (200 mg/kg) showed a considerable decrease in analgesic, antipyretic and anti-inflammatory activities in all the test animals and can be used by replacing the commercially available synthetic drugs.

Keywords: Analgesic activity, antipyretic activity, anti-inflammatory activity, aqueous leaf extracts, *senna alata*

STUDY OF INTERACTIONS BETWEEN ZIKA VIRAL PROTEINS AND HUMAN AXL RECEPTOR TO DECODE THE POSSIBLE CAUSE OF MICROCEPHALY

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Abstract

The outbreak of Zika fever is the talk of the world in the last few years. Cases of microcephaly in Brazil, which is most affected by Zika suggest that the pathogen has pronounced effects on the developing foetus. The scientific community is currently exploring the reason for microcephaly in Zika affected foetus. Previous research highlights the role of AXL receptors on neural progenitor cells in catalyzing Zika infection. The aim of this work is to derive a reason for the affinity of Zika proteins towards the AXL receptor at the residue level. The apparent affinity of Zika proteins to AXL receptor is studied by analysing protein-protein interactions between them through computational approaches. The interactions at a structural level were studied using the Global Range Molecular Matching (GRAMM) methodology, an empirical docking approach. The binding affinity can be measured by the amount of surface area buried in the interface. Protein-protein docking showed there were crucial interactions between the proteins of Zikavirus and the AXL receptor at specific sites suggesting the possible potential affinity between them. The changes in the polar surface area of the interacting residues serve as an evidence of favourable binding between the residues of the complex. The critical residues involving in the Zika viral proteins and AXL receptors were identified. This could possibly help us in identifying the drug leads that can inhibit the binding of Zika with the AXL receptor, eventually to protect the babies from microcephaly.

Keywords: Zika, microcephaly, AXL receptors, neural progenitor cells, protein-protein interactions, docking

VALIDATED METHOD FOR THE PHARMACOKINETIC STUDIES OF PHENOTHIAZINE DRUG PROMETHAZINE USING DROP–TO-DROP SOLVENT MICROEXTRACTION COUPLED WITH GC-MS

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Abstract

The aim of the study was to develop an innovative and rapid method based on solvent minimization coupled with GC-MS for the pharmacokinetic studies of drug Promethazine HCl. The method involves the use of solvent minimized drop-to-drop solvent extraction method for the extraction of the drug from the small quantities of biological samples. The extracted drug was further separated and analyzed using GC-MS fitted with SPB-5 column in the selective ion monitoring (SIM) mode. Deuterated promethazine HCl was used as an internal standard throughout the quantitation process. The calibration curve obtained for the drug was in the range of 150-1250 ng ml^{-1} with a coefficient of correlation (R^2) ≥ 0.99. The limit of detection (LOD) obtained for promethazine was obtained to be 18 ng ml^{-1} with recoveries from the spiked blood samples greater than 90%. We believe that the method is novel and virtually solvent-free and serves as a green alternative to the traditional Liquid-liquid extraction method. Finally, the method can be easily applied for the determination of trace levels of the drugs of abuse in forensic and clinical applications.

Keywords: GC-MS, solvent minimization, promethazine drug, green-chemistry

EFFECT OF THERMOXIDATION PROCESS ON FLAXSEED OIL USING GCMS AND FTIR

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Abstract

A thermoxidation process has been applied to flaxseed oil to develop the volatile compounds responsible for oxidative deterioration. The aim of this study was to analyze the effects of potato during frying at different temperature and the characteristics changes of oil were determined. The present investigation includes the estimation of density, saponification value, acid value, free fatty acids, iodine value, *p*-anisidine value, peroxide value, unsaponifiable matter (UM) was carried out by standard IUPAC methods and total phenol, flavonoids using high-performance liquid chromatography (HPLC) of flaxseed oil for the analysis. Chromatographic analysis of flaxseed oil was performed using GC-MS to find the volatile compounds at different temperatures and changes in a functional group of oil after frying was also detected using fourier transform infrared (FTIR). Fuel properties of flaxseed oil were changed after heating treatment. Moreover, a heating process caused loss of total phenolic acids, total flavonoids and antioxidant activity. These techniques provide complementary information about the process where GC-MS provides relevant compound present in the volatile phase of flaxseed oil during oxidation processes such as aldehyde and ketone. When the flax seed oil exposes to heat or oxygen, increases the formation of free radicals and denature the omega 3 fatty acid. The total amount of all identified volatile compounds increased as the temperature increased.

Keywords: Thermoxidation, volatile compounds, GCMS, omega-3 fatty acids, HPLC

A PROSPECTIVE OBSERVATIONAL STUDY OF PATTERN AND SEVERITY OF ADVERSE DRUG REACTIONS DUE TO DOTS THERAPY IN PATIENTS OF TUBERCULOSIS IN A TERTIARY CARE HOSPITAL

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Abstract

The present study aims to assess the pattern and severity of adverse drug reactions (ADR) caused due to directly observed short treatment course (DOTS). It is a prospective observational study. n=151 patients suffering from pulmonary/extra pulmonary tuberculosis were included in the study. The pattern of ADR was observed and severity was assessed using Modified Hartwig and Siegel Scale. n=36 patients developed ADR showing the incidence of 23.84%. The mean age group is 30.3975 y±16.467 y. Females were n=91 and males n=60 in number. n=15 patients showed more than 1 ADR with total ADR to be n=52. ADR in the gastrointestinal system was 42.3% (n=22). Cutaneous ADR was 19.2 %, the musculoskeletal system was 11.5 %, ototoxicity was 9.6 %, nervous system was 7.6 %, liver and the biliary system were 5.7 % and other systems was 3.8 %. 40.3 % of ADR were caused due to isoniazid, 25 % because of rifampin, 17.3 % due to pyrazinamide, 7.6 % due to ethambutol and 9.6% due to streptomycin. 57.6 % cases were of mild grading in severity, 42.3 % were moderate and there was no case of severe grading. The ADR developed may result in poor compliance of the patient causing drug resistance and increased economic burden.

Keywords: ADR, DOTS, tuberculosis

DAPSONE INDUCED DRESS: A RARE CASE SERIES

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Abstract

Evaluation and analysis of dapsone-induced drug rash with eosinophilia and systemic symptoms (dress) due to dapsone given for multibacillary leprosy cases in tertiary care hospital in South India.

As a part of pharmacovigilance programme, adverse drug monitoring and causality assessment were done using Naranjo's scale. Four patients diagnosed of multibacillary leprosy were started on tablet dapsone 100 mg, clofazimine 50 mg daily and rifampicin 450 mg single dose once a month. All developed DRESS, with a variable time period ranging from one month to three months after starting therapy. Patients presented with fever, swelling of the face, erythematous papules, patches of hyperpigmentation and scaling over the body, enlarged lymph nodes, elevated liver enzymes, eosinophilia and elevated white blood cell count. The test was negative for malaria, hepatitis B and C and antinuclear antibodies. In all patients Dapsone was discontinued, symptomatic treatment was given with oral steroids, antibiotics, fusidic acid cream and derma care shampoo. Our cases fulfil the RegiScar and Scar-J criteria for the diagnosis of DRESS, in addition to the cutaneous manifestations persisting even after the withdrawal of offending agent. All four cases were ascribed to have a probable causal relationship with dapsone. The lesions subsided after starting treatment with steroids and skin cream. Prompt discontinuation of the offending drug and systemic steroids are the mainstay of treatment in DRESS along with supportive treatment.

Keywords: Dress, naranjo scale, steroids, leprosy, dapsone

EVALUATION OF ANTIOXIDANT AND ANTI-INFLAMMATORY ACTIVITIES OF *AEGICERAS CORNICULATUM* (L.) BLANCO. LEAF EXTRACTS-AN *IN VITRO* STUDY

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Abstract

The main objective of the study was to evaluate preliminary phytochemical analysis, antioxidant and anti-inflammatory activities of *Aegiceras corniculatum* (L.) Blanco. The leaf material was subjected to sequential extraction using Soxhlet apparatus in the increasing order of the solvent polarity. Preliminary phytochemical analysis was performed using standard procedures. The total phenolic and flavonoid content was estimated using Folin-Ciocaltue and $AlCl_3$ method respectively. *In vitro* antioxidant activity was performed by using ferric ion reducing power assay, Phosphomolybdenum assay, DPPH assay and H_2O_2 scavenging assay and anti-inflammatory activity were done using *in vitro* protein denaturation assay. Preliminary phytochemical analysis revealed the presence of a broad spectrum of secondary metabolites. The aqueous extract showed high phenolic content methanol extract showed high flavonoid content compared to other extracts. The chloroform, ethyl acetate, methanol and aqueous extracts showed better antioxidant activity in different assays. Methanol extract showed potent anti-inflammatory activity compared to all other extracts. The leaf extracts of *A. corniculatum* has potent antioxidant and anti-inflammatory activities.

Keywords*: Aegiceras corniculatum*, mangrove plants, antioxidant activity, anti-inflammatory activity, free radicals, DPPH, preliminary phytochemical analysis

ONE-POT SYNTHESIS OF NOVEL PYRIMIDINE DERIVATIVES INCORPORATED WITH BENZOTHIAZOLE AS POTENT *IN VITRO* ANTIMICROBIAL AGENTS

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Abstract

In this present research paper, we have reported the synthesis of novel pyrimidine derivatives incorporated with benzothiazole moiety (4a-m). The title compounds were synthesized by the reaction of substituted 2-aminobenzothiazole, barbituric/thiobarbituric acid, substituted benzaldehyde and 2-3 drops of HCl in ethanol with constant stirring at reflux temperature for about 8h. The newly synthesized compounds were characterized by IR, NMR and by mass spectroscopic methods. Further, the synthesized compounds were evaluated for their antimicrobial efficiency against various microbial strains at different concentrations. Among target compounds, compounds 4k (150-50 µg/ml) and 4j (400-150 µg/ml) were found to be more active against all the tested pathogens compared with the other synthesized compounds. Additionally, the selected compounds were screened for *in silico* molecular docking studies. It concludes that all the compounds showed appreciable antimicrobial activity and the activity is comparable with the standards and it can be used as effective antibiotic drug designing in future.

Keywords: Condensation, pyrimidines, antibacterial, antifungal, molecular docking study

EVALUATION OF PHYTOCHEMICAL AND PHARMACOLOGICAL ACTIVITIES OF UNDEREXPLORED WILD FRUITS OF DARJEELING HIMALAYA

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Abstract

Darjeeling Himalaya, one of the major biodiversity hotspot favours the luxuriant growth of diversified vegetation. People residing in this area consumers several types of edible plants most of which are till now underexplored but have potential ethnomedicinal values. Thus in this study, initially 34 plants of 16 families were selected for screening their phytochemical constituents and free radical scavenging properties. Potential antioxidant activities were obtained from *Calamus erectus, Cyphomandra betacea, Capsicum annum, Solanum incanum, Solanum anguivi, Nastruitum officinale* and *Evodia fraxinifolia.* The ethnomedicinal market survey indicated that some of these edible plants are also potentially useful for diabetes treatment and thus antidiabetic activities of these plants were also analyzed *in vitro.* Results showed that *Calamus erectus* and *Discorea alata* have higher antidiabetic activity. It is considered that different maturation stages of fruits affect their biological properties. Considering this fact, fruits of *Cyphomandra betacea* (Cav.) and *Solanum anguivi* Lam. were evaluated from immature to mature stages. Antidiabetic and antioxidant property along with phytochemical attributes enhanced successively from immature to mature transition. For further validation of antidiabetic activity, *in vivo* hypoglycemic potential was determined in streptozotocin induced diabetic rat model and compared with glibenclamide. Oral administration of *Calamus erectus* fruit extract in streptozotocin-treated rats exhibited a dose dependent significant hypoglycemic activity, which was comparable with reference standard glibenclamide. Significant reduction in the progression of total serum cholesterol, triglycerides and LDL-c in association with enhanced HDL/lDL ratio can be assumed to be due to the activation of LDL receptors by *C. erectus*. As *C. erectus* showed an impressive antidiabetic activity, an attempt was made to purify and identify bioactive compounds responsible for the mentioned activity. High resolution LC-MS analysis of best bioactive fraction indicated the presence of compounds like pentadecanoic acid, hexadecanoic acid, 9,12-octadecanoic acid, hexadecanoic acid, octadecane 3-ethyl-5-(2 ethyl butyl), (z)6,(z)9-pentadecadien-1-ol, cyclopropane octanoic acid, 2-hexyl, phthalic acid, di(2-propylpentyl) ester, 9,12-octadecadienoic acid (z,z)-, 2-hydroxy-1-(hydroxymethyl) ethyl ester, stigmasterol and Ç-sitosterol. These compounds are reported to have different biological activities. Earlier reports available states that stigmasterol has anti-diabetic activity, hence it can be assumed that diabetes preventing activity of *C. erectus* might be due to the presence of stigmasterol and other phytochemicals detected. This work supports antidiabetic properties of wild vegetables of Darjeeling Himalaya.

Keywords: Under-explored vegetables, antidiabetic, antioxidant, phytochemicals

COMPARATIVE ANALYSIS OF *IN VITRO* ANTIOXIDANT POTENTIAL OF CRUDE EXTRACTS OF *BRYOPHYLLUM PINNATUM* L. LEAVES IN DIFFERENT SOLVENTS AND THE *IN VITRO* HYPOGLYCEMIC POTENTIAL OF ITS HYDROALCOHOLIC EXTRACT

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Abstract

The therapeutic potential of leaf extract of *Bryophyllum pinnatum* was screened for *in vitro* antioxidant potential and alpha-amylase inhibitory action. Antioxidant activity of the extract was evaluated for hydroxyl radical scavenging activity by Fenton reaction, free-radical scavenging by hydrogen peroxide scavenging and superoxide scavenging potential. The *in vitro* alpha-amylase inhibition action of the plant was evaluated for hypoglycemic properties using starch as substrate. The phytochemical screening of the crude methanolic, aqueous and hexane extracts revealed the presence of flavonoids, alkaloids, tannins, glycosides, saponins, phenols, steroids and carbohydrates. The results indicated that methanol extract showed significant antioxidant potency at a concentration of 250-500µg as compared to other solvent extracts and also possess alpha-amylase inhibitory property. Hence it can be suggested that the leaf extract of *Bryophyllum pinnatum* has potential as an antioxidant and probably in biological systems as a nutraceutical for hypoglycemia.

Keywords: *Bryophyllum pinnatum,* antioxidant potential, alpha-amylase inhibitory action

STUDY OF CONSTITUENT PHYTOCHEMICALS AND PHARMACOLOGICAL ACTIVITIES OF SIX LIVERWORTS FROM DARJEELING, EASTERN HIMALAYA

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Abstract

Bryophytes are reported of having different biological activities like antimicrobial, antifungal, antiviral, cytotoxic, superoxide anion radical release, α-glucosidase and antioxidant activities triggered by bioactive components they possess. They have been reported to be medicinally used in Native American, Indian and Chinese traditional medicine. Many new compounds that are not present in another group of plants have been reported from bryophytes, but still very few efforts were made to explore this plant group worldwide. Very few reports are available detailing the phytoconstituent and different biological activities of liverworts available in Darjeeling. This work is an effort to study phytochemical profile and their role as antioxidative, anti-diabetic agent from six liverworts namely *Ptychanthus striatus, Scopania ligulata, Scopania ferruginea, Frullania duthiana, Bezzania oshimensis* and *Pellia epiphylla* from Darjeeling, Himalaya. Preliminary phytochemical analysis showed significant and varied levels of phenols, flavonoids and Orth dihydric phenol in studied liverworts. The study suggests that phenolic compounds present in the plant are accountable for their antioxidative and other biological activities. All studied liverworts showed potential to scavenge free radicals; best activity was shown in *Bezzania oshimensis, Ptychanthus striatus* and *Pellia epiphylla.* Tight control of post ingestion glucose level is an important therapeutic strategy for the management of diabetes. The inhibition of carbohydrate hydrolyzing enzyme, α-amylase and α-glucosidase is an important strategy to tackle diabetes. All studied liverworts showed an impressive α-amylase and α-glucosidase inhibitory activity. In DM patients during persistent hyperglycemia, low-density lipoprotein oxidation by the overproduction of RS contributes to oxidative protein damage and, therefore, to the pathogenesis of diabetic's complication like arteriosclerosis. All the studied liverwort also showed potential lipid peroxidation inhibitory activity. Qualitative analysis showed the presence of steroid, tannin, triterpenoids, amino acids, resin, cardiac glycoside, flavonoids, reducing sugar and anthraquinones in all studied hepatics. TLC analysis further confirmed the presence of phenolic compounds like coumarin, alkaloid, acanthaglycoside, arbutin, phenol and flavonoids. This work confirms the *in vitro* anti-diabetic and free-radical scavenging potential as well as the existence of versatile groups of bioactive phytochemicals in studied liverworts and thus paves the pathway for further work in this field.

Keywords: Liverworts, antioxidant, antidiabetic, phenols, phytoconstituents

AN ANTIDIABETIC ETHNOMEDICINE, *F. FLORIBUNDA* BARK: ITS PHARMACOGNOSTIC STUDY AND THE INFLUENCE OF VARIATION IN EXTRACTION PROCESS ON ITS ANTIOXIDANT AND ANTI-DIABETIC ACTIVITY

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Abstract

Medicinal plants are the source of natural compounds due to their nutritional and pharmacological characteristics. *Fraxinus floribunda* is a popular ethnomedicine for lowering blood sugar level in diabetic patients used in some villages of west Sikkim. Thus, the objective of the present study is to standardise the bark of *Fraxinus floribunda* and to investigate the *in vitro* antioxidant and antidiabetic activity. Thin layer chromatography (TLC) was also performed to analyze the variation in bioactive chemical constituents. The pharmacognostic study was done with various parameters such as microscopic studies of the sample in powder form, total ash values, alcohol and water soluble extractive values, pH values and fluorescence analysis. Antioxidants activity was done on the samples extracted in four different methods namely boiling, soxhletion, pressure boiling in an autoclave and cold percolation. Antidiabetic activity was performed by the inhibition of α-amylase and α-glucosidase enzymes. The results of TLC showed the presence of arthra glycosides, arbutin, flavonoids, etc. in the sample. A basic standard for this ethnomedicine was established for future reference. The pressure boiling extract showed highest total phenol content with better scavenging activity of DPPH, $ABTS^{+}$, nitric oxide along with highest anti-lipid peroxidation activity and ferric reducing power. The same extract also showed lowest IC_{50} and highest antidiabetic activity. The overall study suggested that the bark of *F. floribunda* is a novel source of natural antioxidants and antidiabetic potentiality supporting its use in traditional medicine. This study could further be justified by the *in vivo* pharmacological activities in animal models.

Keywords: *Fraxinus floribunda*, pressure boiling, antioxidant, antidiabetic

DETERMINING THE POTENTIAL OF BLACK TEA PHYTOCHEMICALS ON DIABETES AND ITS ASSOCIATED DISORDERS THROUGH NETWORK ROBUSTNESS ANALYSIS

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Abstract

Black tea is a highly consumable drink in India among different age groups. Black tea contains a relevant number of phytochemicals which play an important role in preventing diseases, among which theaflavin, theagallanin, vitamin B_{12} etc. are important. Network analysis is a useful tool to analyse the importance of a phytochemical over a disease through targets. A Phytochemical-Target-Disease Network had been constructed to analyse the importance of targets over a specified disease class through network perturbation. The network vulnerability to intentional topological attack facilitates target prioritization for overcoming a disease. The network vulnerability was accessed by means of intentional centrality attack by removing the nodes having higher degree, betweenness and their product which leads to reveal a number of targets playing a vital role in the network. The intentional centrality attack had been performed on the network by removing 1, 2, 5, 10, 15, 20 and 25 percent of the total number of targets from the network and corresponding isolated nodes, characteristic path, network diameter, clustering coefficient and largest sub-graph were compared to find the important nodes. These targets had been cross verified through the data-mining of articles which results a couple of targets relevant viz. AKR1B1, TNF, VEGFA, GSK3B and PIK3CG. The metabolic pathway mapping through KEGG was also analysed to show the effect of these targets on Diabetes and its associated diseases. The network shows that the phytochemicals kaempferol, quercetin and myricetin have potential regulation on these targets. So these phytochemicals can be used to control diabetes and its associated diseases which lead to a conclusion that black tea can be used to control over those diseases. However, further experimental validation will strengthen the pertinence of this *in silico* framework.

Keywords: Black Tea, Network Analysis, Robustness, Kaempferol, Quercetin, Myricetin

FORMULATION AND CHARACTERIZATION OF *CURCUMIN* LOADED TRANSDERMAL PATCHES FOR WOUND HEALING POTENTIAL

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Abstract

The purpose of this study was to investigate the feasibility of *curcumin* patches formulation (CPF) as a transdermal therapeutic system for the administration of *curcumin*. To improve the penetration of *curcumin* in the patch, a combination of (PVP) polyvinyl pyrrolidone and EC (Ethyl Cellulose) most strongly enhanced the permeation of curcumin. Curcumin that permeated through the skin could effectively pass into the systemic circulation. All formulation showed good physicochemical properties like thickness, weight variation, drug content, folding endurance, moisture content. The drug release through the transdermal patches of *curcumin* follows first order kinetics with the diffusion-controlled mechanism. The results showed wound healing and repair, accelerated by applying CPF-1 formulation of the wound area by an organized epidermis. Study on animal models showed an enhanced rate of wound contraction and a drastic reduction in healing time than control, which might be due to enhanced epithelisation. The animals treated with vicco-turmeric cream and CPF-1 formulation showed significant (* $p<0.01$) results when compared with control groups. The treated wound after nine days itself exhibit marked dryness of wound margins with tissue regeneration. Group treated with CPF-1 formulation showed better wound closure compared to control group. Histopathological studies of *curcumin* patches showed well-organised collagen fibres, increased in fibroblast cells and new blood vessels formation as compared to control group. Curcumin-loaded transdermal patches (CPF-1) has properties that render it capable of promoting wound healing potential and novel drug formulation like transdermal patch can be a better option for enhancement of drug penetration and skin treatment.

Keywords: Curcumin, transdermal patches, wound healing potential

BIOENGINEERING OF NANOPARTICLES TO ENHANCE THEIR POTENTIAL ANTIMICROBIAL ACTIVITY OF MULTIDRUG-RESISTANT BACTERIA

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Abstract

Several multiple-drug-resistant mutants of different bacteria belongs to both groups (Gram+ve and-ve bacteria) like *Staphylococcus aureus*, *Enterobacter* sp., *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Acinetobacter baumanii*, species were frequently reported in various health related infections. These bacteria are also responsible for cross contamination especially in the case of cancer as well as HIV. Because of multi-drug resistant nature of these isolates, there is an alarm call to develop an ideal bactericide urgently, however, in this direction, we are far behind to identify novel bacterial targets which can be used to develop high potential antimicrobial agents. Over the last two decades, several reports have been published on applications of nanoparticles in drug delivery. For the synthesis of nanoparticles, a number of methods were reported earlier. Many of these protocols require hazardous chemicals, and the process of purification is also very difficult. Therefore, there is urgent need to develop eco-friendly methods for synthesis of nanoparticles without using any hazardous chemicals. The present study was done in four steps. First, the plant extract was prepared from the plants cultivated under different condition. Silver nanoparticles were then synthesized by reacting silver nitrate with the different plant extract. The produced silver nanoparticles were characterized and finally, nanoparticles were evaluated for antimicrobial activity. In the present study, we used different parameters and conditions for the synthesis of high efficient nanoparticles. Further, we will explore the possible antibacterial (Gram+ve and–ve bacteria) activities of these bioprospecting green synthesised nanoparticles against different drug-resistant bacterial strains.

Keywords: Green nanoparticle, *catharanthus roseus*, multi-drug resistant bacteria

PHYSICO-CHEMICAL ASPECTS AND FOLDING-UNFOLDING EVENTS OF DIHYDROFOLATE REDUCTASE FROM *ZEBRAFISH*

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Abstract

The dihydrofolate reductase (DHFR) plays a significant role in folate metabolism. It helps to produce dTMP from dUMP and glycine from serine. A number of inhibitors of DHFR have been developed as a part of anti-cancer drug therapy for suppressing the formation of dTMP that is essentially required for the synthesis of DNA e. g methotrexate is one such inhibitor of DHFR. DHFR has also lured the researchers as a model to study the enzyme structure-function relationships owing to its small size and easy purification. This can help in understanding the mechanism of various diseases with protein aggregation such as neurodegenerative diseases and various types of cancers. A deeper understanding of the folding and unfolding of the enzyme and the intermediates formed can help in designing of efficient inhibitors for it. In this presentation, equilibrium is unfolding and refolding events of Zebrafish dihydrofolate reductase enzyme using biochemical and biophysical approach have been demonstrated. As the cloning and over-expression of Zebrafish DHFR have already been achieved, there is a need for its biophysical characterization. Equilibrium unfolding process of zDHFR was monitored through enzymatic assay, intrinsic tryptophan fluorescence spectroscopy and Far UV-CD spectroscopy. It has been demonstrated that intermediate species were observed during the equilibrium unfolding transition of DHFR having higher exposed surface hydrophobicity, unchanged enzymatic activity and minimum changes in the secondary structural elements. These intermediates could be used as efficient targets for anti-cancer drug design owing to the enhanced surface hydrophobicity, and unchanged enzymatic activity. Though spontaneous refolding of Zebra fish DHFR provides a very small fraction of the functional protein, however, optimization of refolding conditions using oxido-shuffling reagents like reduced/oxidized glutathione, etc. facilitates the refolding process and enhances the yield of refolded protein.

Keywords: Dihydrofolate reductase, zebrafish, anti-cancer drug therapy

MOLECULAR MODELLING STUDIES ON HYDROXAMIC ACID BASED HISTONE DEACETYLASE INHIBITORS AS ANTICANCER AGENT

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Abstract

The increased histone deacetylase (HDAC) activity plays a critical role in the pathogenesis of cancer. The inhibitors of HDAC activity induces histone hyper acetylation, leading to the transcriptional activation of suppressed genes, concerned with cell cycle arrest, differentiation or apoptosis in tumor cells. Thus, HDAC inhibitor has emerged as a novel target for treatment of cancer. The 3D-QSAR and pharmacophore modelling studies were completed on a series of hydroxamic acid-based HDAC inhibitors to find out the critical pharmacophoric characteristics and correlate 3D-chemical structure with anticancer activity. The pharmacophore hypotheses were developed using e-pharmacophore script and phase module. Pharmacophore hypothesis signifies the 3D arrangement of molecular features required for biological activity. A series of hydroxamates with well-assigned HDAC inhibitory activity was employed for 3D-QSAR model development. The energetic based pharmacophore modelling, pharmacophore, atom based 3D QSAR models were used for establishing structure-activity correlation. The results of present investigations established a correlation between chemical group/substituent's at different molecular sites of interest with the biological activity and could be employed for the development of novel HDAC inhibitors for their anticancer activity.

Keywords: Histone deacetylase, pharmacophore modeling studies, 3D-QSAR model

EVALUATION OF ANTI-ARTHRITIC ACTIVITY FOR *MOMORDICA CHARANTIA* BY USING *IN VITRO* AND *IN VIVO* MODELS

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Abstract

The present study was aimed to evaluate anti-arthritic activity for *Momordica charantia* by using *in vitro* and *in vivo* models. Human red blood cell (HRBC) and inhibition of protein denaturation were used for *in vitro* study. For *in vivo study*, Freund's complete adjuvant (FCA) induced arthritis model was used in Sprague-Dawley rats. Arthritis assessment was carried out on the basis of parameters including arthritis score, joint diameter and paw volume. The standard drug was diclofenac sodium. The results of both *in vitro* models showed concentration-dependent inhibition of protein (egg albumin) denaturation as well as stabilization towards HRBC membrane. The findings of *in vivo* study showed that EEMR in a dose of 400 mg/kg produced a more significant reduction in arthritis score, joint diameter and paw volume as compare to 200 mg/kg. On the basis of both *in-vitro* and *in vivo* study, It can be concluded that EEMR showed anti-arthritic activity. It may be due to the presence of phytocompounds such as flavonoids, alkaloids, tannins, etc.

Keywords: *Momordica charantia,* anti-arthritic activity, human red blood cell, karela

(E)-N-(2-(1H-BENZO [D] IMIDAZOL-2-YL) PHENYL)-2-(SUBSTITUTED-STYRYL) ANILINE EXHIBITED ANTI-PROLIFERATIVE ACTIVITY BY INHIBITION OF EPIDERMAL GROWTH FACTOR RECEPTOR (EGFR) KINASE: REJUVENATING THE IMPORTANCE OF SMALL MOLECULAR WEIGHT LIGANDS IN CHEMOTHERAPY

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Abstract

Cancer is the leading cause of mortality across the globe. There is a need for exploring new classes of substances against cancer cells. Small molecular weight ligands (SMWL) have gained popularity in the modulation of cancer targets recently. *(E)*-N-(2-(1H-benzo[d]imidazol-2-yl)phenyl)-2-(substituted-styryl) aniline derivatives comprising of a benzimidazole function; along with a chalcone (or styryl) moiety linked by a benzamide were rationally designed, synthesized, and characterized. The rationale behind the present research involved that in individuality; benzimidazoles (tubulin inhibitor); chalcone (JAK/STAT inhibitor); benzamide (HDAC inhibitors), and styrene (DNA intercalating property). The derivatives were synthesized in three step reactions, utilizing phenylenediamine as the starting material. The benzamide and chalcone (or styryl) groups were introduced successively in benzimidazole scaffold. The compounds were screened against non-small cell lung cancer (H460) and human colorectal cancer (HCT116) cell line using Propidium Iodide assay. *In silico* docking, study was performed against protein tyrosine kinase to determine the probable mechanism of action of the compounds. The docking analysis of enzyme tyrosine protein kinase reveals that A4 and A5 demonstrated the strongest affinity as compared to other compounds. The compounds A3 and A4 were found to be the potent candidate with IC_{50} values of 20.81 μM and 2.98 μM against HCT116 cell line and 14.67 μM and 5.15 μM against H460 cell line, respectively. The study revealed the potential of *(E)*-N-(2-(1H-benzo[d]imidazol-2-yl) phenyl)-2-(substituted-styryl) aniline as successful anti-proliferative agent. The docking revealed a true correlation between the cytotoxic activity and the binding affinity. The research fruitfully rejuvenates the potentials of SMWL in chemotherapeutics.

Keywords: Anticancer, Antiproliferative, Benzimidazole, Cell lines, Docking, Kinase

SYNTHESIS AND CHARACTERIZATION OF WATER SOLUBLE CARBOXYMETHYL CHITOSAN BY CHEMICAL MODIFICATION METHOD AND ITS APPLICATION FOR DRUG DELIVERY

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Abstract

Synthesis and characterization of water-soluble carboxymethyl chitosan by chemical modification method and its application for drug delivery application was aimed for the present study. Chitosan displays interesting properties such as biocompatibility, biodegradability and its degradation products are non-toxic, non-immunogenic and non-carcinogenic. Recently, there has been a growing interest in the chemical modification of chitosan in order to improve its solubility and widen its applications. Chitosan was converted into its carboxymethyl derivative i.e. carboxymethyl chitosan (CMCs) using alkali solution and mono chloroacetic acid. The prepared CMCs were characterized by FTIR, XRD, TGA/DTA, SEM, ^{1}HNMR. FTIR spectra produced the characteristic band of–NH_2 at 3445 cm^{-1} and carbonyl (C=O) at 1607 cm^{-1}, according to thermogravimetric analysis (TGA/DTA), the thermal stability of chitosan decreased with increase of DS, X-ray diffraction patterns also indicated the semi-crystalline nature of CMCs. In ^{1}HNMR the signals at 4.6 ppm and 4.8 ppm were represents the protons of CH_2COO-at N-position on carbon 2 and O-position on carbon 6, of the N,O-carboxymethyl chitosan respectively. Carboxymethylation of chitosan increases its solubility in water and other relevant solvents which make it a promising candidate for delivery of numerous drugs.

Keywords: Carboxymethyl chitosan, grafting, FTIR, XRD, NMR spectroscopy

QSAR STUDY OF CYCLOPENTANOPHENANTHRENE

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Abstract

QSAR study of cyclopentanopheneanthrene was carried out to study its anticancer properties. CADD approach, using ACD chemsketch5.0/chemdraw–to draw the structure of cyclopentanopheneanthrene compounds. Suitable rings were chosen and hetero atoms were incorporated into the structure. MLR (Multiple linear regressions) analysis was performed. The best model selection the statistical parameters like F value, R^2value and mean square deviation, etc were considered. The above MLR calculations were also further verified by ANN. The QSAR study has provided an insight towards the potent antitumor activity of this parent structure of cyclopentanopheneanthrene. The study of cyclopentanopheneanthrene and its analogues aided for developing a significant QSAR model with good efficacy as a possibly anti-tumor drug. The best model selection the statistical parameters like F value, R^2value and mean square deviation, ANN, etc. Compounds 44, 45 and 48 inhibit the activity of human topo II [when used as a ligand to human topo II (RCSB PDB–3QX3)]. Among all 3 methods of analysis, the application of artificial neural networks shows the maximum Pearsons coefficient 0.940, Pearsons coefficient square 0.88, minimum mean square deviation 10.033. This study has given an insight towards the structural aspects of cyclopentanopheneanthrene and its analogues for developing a significant QSAR model. The ability of this moiety to be present in various parts of the cell, makes it a desirable entity to work towards the generation of new similar compounds (drug library), that may have good efficacy as an anti-cancer drug.

Keywords: Cyclopentanopheneanthrene, QSAR, anti-cancer drug

PREPARATION AND CHARACTERIZATION OF CHONDROITIN SULPHATE DECORATED CELLULOSE ACETATE PHTHALATE (CAP) NANOPARTICULATE FOR EFFECTIVE TREATMENT OF CANCER: DRUG RELEASE BEHAVIOR, *IN VITRO* AND *EX-VIVO* ASSESSMENT

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Abstract

The aim of this research was to prepare chondroitin sulphate modified cellulose acetate phthalate (CSAC) core-shell nanoparticles (NPs) of 5-fluorouracil (5-FU). The chondroitin sulphate anchored nanoparticles were proposed for the delivery of anticancer drug for tumor targeting and which provide drug stability, solubility, localization and controlled release, increasing the efficacy and duration of drug activity thereby increasing the patient compliances through decreased dose frequency and convenient route of administration and also improve targeting for a specific site to reduce unwanted side effects. CSAC copolymer was synthesized and confirmed by Fourier transform infrared (FTIR) and nuclear magnetic resonance (NMR) spectroscopy. CSAC NPs with 5-FU were prepared using CSAC copolymer and compared with 5-FU loaded cellulose acetate phthalate (CAP) NPs. NPs were characterized by atomic force microscopy (AFM), entrapment efficiency, *in vitro* release, differential scanning calorimetry (DSC) and X-ray diffraction (XRD). CSAC NPs were found slower release (95.5% in 34 h) than (78.97% in 8 h) CAP NPs. In cytotoxicity studies, showed the great cytotoxic potential of 5-FU loaded CSAC NPs in A549 cancer cell line. CSAC NPs showing least hemolytic than CAP NPs and 5-FU. In conclusion, HAC NPs is effective to deliver carrier of 5-FU for lung cancer.

Keywords: Chondroitin Sulphate, Cellulose Acetate Phthalate, Nanoparticles, Cellular Cytotoxicity, 5-Fluorouracil

EFFECTS OF HLB VALUES OF EXCIPIENTS USED IN OIL IN WATER (O/W) MICROEMULSION SYSTEM

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Abstract

The present study was based on the evaluation of hydrophilic-lipophilic balance (HLB) system on the formulation of different types of microemulsions including O/W, W/O and bicontinuous microemulsions. The formulation of microemulsion system was done through water titration method, which involved various oils (Eucalyptus, Geranium, Clove, Iso Propyl myristate, etc.), water, surfactant (Labrasol, Tween 20, Tween 80, Span, etc.) and a cosurfactant (Ethanol, Methanol, Propanol, etc.)Thereafter, the existence zones of microemulsion were determined by constructing pseudo-ternary phase diagrams (XLSTAT-Pro) where surfactant and co-surfactant (S_{mix}) were taken in different ratios (1:0, 1:1,2:1, 3:1,4:1, 5:1 and 6:1) along with different combinations of oil and S_{mix} (1:9, 2:8, 3:7, 4:6, 5:5 6:4, 7:3, 8:2, 9:1 and 1:2). The obtained results suggested that HLB system provides distinctive feature in deciding the role of S_{mix}+oil to be utilized in any structure, that is, when HLB is 10, it forms bicontinuous structure, when HLB>10, it forms o/w microemulsions, whereas, HLB<10, forms w/o microemulsions. Thus it offers a strategic approach to determining on the choice and selection of suitable emulsifiers. Also, the results suggested the various aspects like role of surfactants, which have amphiphilic properties and thus, it combines with the oil and the aqueous phase by forming an interface between them with its polar head (hydrophilic) towards the aqueous phase and tail ending (lipophilic) towards the oil phase, role of co-surfactants composed of small polar head group with an alkyl chain of appropriate length which blend into the interfacial films, thereby helping the surfactant to form a sturdy interface between the oil and the aqueous phase and so on. Finally, thermostable microemulsion system was attained highlighting the evidence that if the S_{mix} ratio content of surfactants is increased with the comparatively lesser content of oil, it contributes to the stable formulation for the same. Hence, it was concluded from the study that the HLB value affects the ratio of S_{mix} and excipients (oil and S_{mix} ratio) used in the microemulsion system.

Keywords: Surfactant, co-surfactant, interfacial tension, aqueous phase, amphiphilic

MODELING OF 5-OR 6-METHYL-2-SUBSTITUTED BENZOXAZOLES/BENZIMIDAZOLES-A POTENT INHIBITOR OF FUNGAL INFECTION

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Abstract

Benzoxazoles and its derivatives comprise an important class of therapeutic compounds which have gained much importance because of its wide applications in the medicinal sector. A quantitative structure–activity relationships (QSAR) study using multiple linear regression (MLR) methodology was performed for a series of 5-or 6-methyl-2-substituted benzoxazoles/benzimidazoles, a potent inhibitor of fungal infection. QSAR models have been developed to predict the activities in terms of log 1/C using dragon descriptors. A bi-parametric model containing MW and IP1 is the best model for modeling antifungal activities of the present set of compounds. The model predictability was tested by several parameters, including internal, external and Y-randomization test.

Keywords: QSAR, MLR, Y-randomization, antifungal

DEVELOPMENT OF NOVEL INDOLE BEARING AZETIDINONE BASED MAO-A INHIBITORS: SYNTHESIS, ANTIDEPRESSANT ACTIVITY AND DOCKING STUDIES

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Abstract

The main objective of the study was to generate new molecular template by linking two pharmacophores (indole and azetidinone), which are likely to exhibit antidepressant-like action in animal models. The derivatives were synthesized by conventional reactions. The structures were characterized by IR, ^{1}H NMR and Mass spectrometric methods. The derivatives were evaluated for antidepressant activity by using forced swim test. Molecular docking studies of the synthesized derivatives with MAO-A enzyme were carried on Vlife MDS Molecular Modelling software, version 4.3.1. by using k-nearest neighbour genetic algorithm method. The final derivatives were obtained in satisfactory yield using experimental protocol. The structures of the all final derivatives were established on the basis of spectral analysis. The antidepressant evaluation exhibited final derivatives 26 and 36 as promising molecules with percentage decrease in immobility duration 66.82 and 65.61 respectively. Molecular docking studies are also in agreement with pharmacological evaluation with potent compounds exhibiting dock score-2.84. It can be stated that these compounds can be further studied for their structure-activity relationship studies and developed into potential lead molecules.

Keywords: Indole, MAO-A, molecular docking, antidepressant

SYNTHESIS AND CHARACTERIZATION OF SOME METAL COMPLEXES WITH α–(1, 3–DIOXO–INDANE–2–YL) ETHYLIDENE THIOSEMICARBAZONE AS LIGAND DERIVED FROM 2-ACETLYLINDAN-1,3-DIONE

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Abstract

The present research is based on the synthesis and characterization of metal complexes with Schiff's bases (anils) α–(1, 3–dioxo–indan–2–yl)–ethylidene–thiosemicarbazone (IETS) derived from 2-substituted acetyl 1, 3-dione by condensing it with primary aryl amine (aniline) in absolute alcohol. 2-acetyl indan-1, 3-dione was prepared by claisen-condensation. The Co (II), Ni(II), Cu (II), Zn (II), Cd (II), Fe (III), V (III) and Cr (III) complexes of the Schiff's bases have been prepared in the reactions and investigated their structures by physicochemical methods. The formulation and structure of the ligands have been screened by their chemical analysis, IR, PMR and mass spectral studies. The PMR spectrum of the metal complexes in quite similar to the PMR spectrum of the anil (IETS) with a slight change in the position of PMR signals. The metal complexes are thermally stable at a higher temperature (> 300 °). These characteristics suggest polymeric nature of the metal complexes. The observed molar conductance values of the complexes with IETS have been found in the range 170 to 250 mhos $cm^2g\ mol^{-1}$. The mass-spectra of this IETS showed the molecular ion peak as a base peak at m/z 261. The structure of ligand has been confirmed by their mass–spectral studies.

Keywords: Metal complexes, schiff's bases, 2-acetlylindan-1,3-dione

INSIGHT TO NEW CHALLENGES ASSOCIATED WITH MYCOBACTERIUM SPP

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Abstract

Mycobacterium spp is still a major concern because the diseases, TB and Leprosy caused by this genus are responsible for the death of three million people each year. This review explores the structure of the cell wall envelope as well as the virulence factor responsible for the unique pathogenesis of the bacteria. Study on Porins protein elucidate the role of this protein in the membrane permeability of the bacteria and can be targeted to understand the pathogenesis of TB. Further, this review illustrates the host-pathogen interaction in details along with innate and acquired immunity. Presently HIV infection caused the emergence of the active form of TB very dangerously. Drug resistance in this bacterium is also a prime concern in eradication of TB. Advanced and cheap diagnostic test can help in the detection of the bacteria, particularly in those developing countries like Asian and African countries which are the epidemiological prevalent areas of TB. Effective treatment and vaccination can help in the eradication of this disease.

Keywords: *Mycobacterium sp*, TB, Leprosy

MODELING OF 5-OR 6-METHYL-2-SUBSTITUTED BENZOXAZOLES/BENZIMIDAZOLES-A POTENT INHIBITOR OF FUNGAL INFECTION

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Abstract

Benzoxazoles and its derivatives comprise an important class of therapeutic compounds which have gained much importance because of its wide applications in the medicinal sector. A quantitative structure–activity relationships (QSAR) study using multiple linear regression (MLR) methodology was performed for a series of 5-or 6-methyl-2-substituted benzoxazoles/benzimidazoles, a potent inhibitor of fungal infection. QSAR models have been developed to predict the activities in terms of log 1/C using dragon descriptors. A bi-parametric model containing MW and IP1 is the best model for modelling antifungal activities of the present set of compounds. The model predictability was tested by several parameters, including internal, external and Y-randomization test.

Keywords: QSAR, MLR, Y-randomization, antifungal

FORMULATION AND CHARACTERIZATION OF HONEY HYDROGEL WOUND HEALING SPONGE FOR CHRONIC ULCERS

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Abstract

There is an ever-present need for non-allergenic antibacterial and antifungal-wound dressing with a superior healing property for chronic ulcers. Among the entire modern wound healing dressings, hydrogel has a good capacity to donate moisture or absorb exudate and thereby providing a moist environment to facilitate wound healing process and at the same time protect the wound too. In the present study, povidone iodine loaded acrylamide based biocompatible, biodegradable hydrogel dressings incorporating alginate, chitosan and gelatin showed good fluid absorbance capacity. The addition of honey showed improved tensile strength and moisture absorbance capacity of the hydrogel sponge. Apart from tensile strength, all the formulations were evaluated and compared for thickness, % elongation, folding endurance, swelling ratio, % of drug loading, thrombus formation, hemolysis assay and dispersion characteristics. The hydrogel containing chitosan and alginate showed better results in terms of tensile strength 4323 gm/mm2, drug loading (27.17 %), thrombus formation (0.002 gm), drug release (97.99 %) and other parameters compared to gelatin-based hydrogel. Wound healing study using well-established wistar rat model showed complete healing of wound i.e. 98.28 % within 12 d. Povidone-Iodine and honey loaded acrylamide hydrogel with chitosan and alginate presented a very promising wound healing dressing. This honey hydrogel dressing can be a good alternative for infected chronic wounds and diabetic foot ulcers.

Keywords: Chronic ulcers, wound dressing, hydrogel, honey, iodine-povidone

PHYTOTHERAPEUTIC APPROACH IN PREVENTION AND TREATMENT OF ALZHEIMER'S SYNDROME AND DEMENTIA

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Abstract

Memory is the ability of an individual to record the information and recall it whenever needed. Dementia is a mental disorder characterized by loss of intellectual ability (judgment or abstract thinking) which invariably involves impairment of memory. The most common cause of dementia is Alzheimer disease (AD), which is a progressive neurodegenerative disorder associated with loss of neurones in distinct brain areas and cord. Stressful conditions are often associated with loss of memory and cognitive functions which may lead to threats of schizophrenia and AD. Traditionally herbal drugs have been used to enhance cognitive functions and to alleviate other functions associated with the AD. Various treatments can be used as preventive measures for people whose families have a history of the disease that indicates the unique role of herbal medicine in the treatment of Alzheimer's disease. Herbal remedies for Alzheimer's disease have become more and more popular in the recent years and not without reason that there is a possibility to slow down the brain's degeneration caused by Alzheimer's with natural treatments and it has drawn the attention of the scientific community. Many natural herbal treatments have been researched and the benefits derived from using herbal treatments for Alzheimer's and dementia have been very promising. *Semecarpus anacardium* can be greatly aided by the isolation of active principal for the leaf and determination of structure-function relationship. Also, the potent curative effect of *Semecarpus Anacardium* against human ailments needs to be verified by control clinical studies.

Keywords: Alzheimer disease, *Semecarpus Anacardium*, dementia

APPLICATION OF 3D-QSAR IN DRUG DESIGN-A REVIEW

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Abstract

Earlier the process of drug research was confined to the empirical testing of a large number of compounds for a specific activity. The lead compound thus obtained was further altered based on one's synthetic abilities. The medicinal chemist was like a compulsive gambler who hoped that his next compound will be more active. This 'Edisonian' approach was too expensive and success rate was too low. Many attempts were made to make the process more rational. A landmark in this direction was the idea of QSAR proposed by Hansch and his coworkers. He converted the qualitative relationship like "chloro derivative is more active than bromo" to a quantitative structure-activity relationship (QSAR). The paradigm of Hansch approach influenced every discipline of drug research. From that time, the medicinal chemistry is never the same again. Later, many more methods were introduced enlarging the scope of QSAR. It will also discuss briefly other methods of QSAR and their applications.

Keywords: QSAR Model, parameters, Log, CoMFA, 3D-QSAR, drug design

DEVELOPMENT AND VALIDATION OF UV SPECTROPHOTOMETRIC METHOD FOR ESTIMATION OF GLYCYRRHETINIC ACID IN HYDRO-ALCOHOLIC EXTRACT OF GLYCYRRHIZA GLABRA L.

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Abstract

A simple, rapid, accurate, precise and economic spectrophotometric method for estimation of glycyrrhetinic acid in the hydro-alcoholic extract of *Glycyrrhiza glabra* L. has been developed. Glycyrrhetinic acid show absorbance maximum at 253 nm when phosphate buffer (pH 6.5): ethanol used as a solvent in 70:30. Glycyrrhetinic acid obeys the absorbance low in con.5-30 µg/ml. A method was validated as per ICH guidelines and can be adopted for daily analysis of glycyrrhetinic acid in the hydro-alcoholic extract of *Glycyrrhiza glabra* L. The method is simple rapid accurate, precise and useful for validation of liquorice products.

Keywords; Glycyrrhetinic acid, *Glycyrrhiza glabra* L, validation

POTENTIAL PHYTO-PHARMACOLOGICAL ACTION OF SELAGINELLA BRYOPTERIS IN HUMAN LIFE

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Abstract

Sanjeevani grows on the hills of tropical areas, particularly the Arawali mountain terrains from east to west in India and is known to be a *Poikilohydric lithophyte* occurring along the mountains and in fact, this herb is sold for this peculiar feature in several markets in India. In Hindu mythology, Sanjeevani (*Selaginella bryopeteris*) is a magical herb which has the power to cure any malady. Selaginella has been used traditionally to treat wounds and bleeding such as menstruation, uterine disorders and other internal injuries. Selaginella contains a variety of secondary metabolites such as alkaloids, phenol and terpenoids, etc due which it can act as antioxidants, anti-inflammatory, anti-cancer, anti-allergic, antimicrobial, antifungal, antibacterial, antiviral etc. It is also used as a tonic to improve fitness and to expand life span. So it is important to explore more and more about this wonder herb so that it can be a "Jeanie" (master wizard for all desires) medicine for one and all in this world.

Keywords: *Selaginella bryopeteris,* sanjeevani, magical herb

RECENT ADVANCES OF NANOPARTICLES FOR ANTICANCER DRUG DELIVERY: A REVIEW

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Abstract

Biodegradable nanometer-sized particles have novel structural and physical properties that are attracting great interests from pharmaceuticals for the targeted delivery of anticancer drugs and imaging contrast agents. These smart nanoparticles are designed to ferry chemotherapeutic agents or therapeutic genes into malignant cells while sparing healthy cells. In this review, we describe currently clinically used chemotherapeutics in nanoparticle formulation and discuss the current status of nanoparticles developed as targeting delivery systems for anticancer drugs, with emphasis on formulations of micelles, liposome, polymeric nanoparticles, gold nanoparticle dendrimers, and bio-nanocapsules. Nanotechnology provides a variety of nanoscale tools for medicine. Among them, nanoparticles are revolutionizing the field of drug delivery. These drug nanocarriers have the potential to enhance the therapeutic efficacy of a drug, since they can be engineered to modulate the release and the stability and to prolong the circulation time of a drug, protecting it from elimination by phagocytic cells or premature degradation. Moreover, nanoscale carriers can be tailored to accumulate in tumour cells and tissues, due to enhanced permeability and a retention effect or by active targeting using ligands designed to recognize tumour-associated antigens. Could these nanomedicine tools mark an end to the necessity for locoregional drug delivery?

Keywords: Nanotechnology, nanoparticles, cancer, drug delivery

EVALUATION THERAPEUTIC BENEFITS OF TRIMETAZIDINE IN COMBINATION WITH MELOXICAM ON CFA INDUCED RHEUMATOID ARTHRITIS IN RATS

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Abstract

The main objective of the study was to evaluate therapeutic benefits of trimetazidine in combination with meloxicam on CFA-induced rheumatoid arthritis in rats. Male Lewis rats (200-300 g) were divided into seven groups. Animal (6per group) were treated with meloxicam (1.5 mg/kg), TMZ (25 mg/kg) and the combination of both before and after induction of CFA-induced arthritis (0.1 mg/animal) is lewis rats. At the end of 28th day from CFA administration arthritic index. Erythrocyte sedimentation rate, histology and radiographic parameters were observed. Antioxidant parameters like and reduced MDA levels were also observed. Body weight paw volume was the observed week after CFA administration. Arthritic control group significantly ($p<0.05$) impaired hind paw volume and edema, body weight, arthritis scale, erythrocyte sedimentation rate, histopathological parameters and radiography and oxidative damage as compared as compare to prophylactic treatment and therapeutic. Prophylactic treatment with meloxicam (1.5 mg/kg; orally) combination with trimetazidine (25 mg/kg; orally) significantly ($p<0.05$) reduced hind paw volume and edema, arthritis score, erythrocyte sedimentation rate and improved body weight. An antioxidant like effect as evidenced by improved superoxide dismutase and reduced lipid peroxidation. Potential anti-arthritic effect of administered combination drug was supported by histopathological examination that reduced the severity of cellular damage of liver tissue and radiography shown that prevention against bony destruction by showing less soft tissue swelling and narrowing of joint spaces. Further, co-administration of meloxicam (5 mg/kg) with trimetazidine (25 mg/kg) significantly ($p<0.05$) potentiated the anti-arthritic effects as compared to their effects alone. Rheumatoid arthritis induced by CFA administration was significantly ameliorated by a combination of TMZ and meloxicam. The therapeutic benefits observed could be attributed to the restriction of free radical generation improved energy utilization by TMZ and potential anti-inflammatory.

Keywords: Anti-arthritis, meloxicam, trimetazidine, antioxidant, anti-Inflammatory

ANTICANCER EFFECT OF ARTESUNATE ON BREAST CARCINOMA: AN *IN VIVO* STUDY

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Abstract

The objective of this study was to investigate the anti-tumor effects and analyze the concentration of artesunate (ART) on breast cancer cell line MCF-7 using tumor transplanted mice. The human breast tumor cell line MCF-7 was transplanted into nude mice, and the animals were treated with various doses of ART alone or in combination with curcumin (CUR) or normal saline. The tumor inhibitory effects were observed and compared, and the ultra-structural, morphology of transplanted tumor cells was observed by microscopy. The apoptosis rates and cell cycle arrest were detected by flow cytometry. The expressions of apoptosis proteins caspase-3 were detected by immunohistochemistry and by western blot. The tumor inhibition rates in the low dose ART group, high ART group, CUR group and combined drug therapy group were (24.40±10.12) %, (41.26±7.04) %, (56.02±5.64) %, and (66.28±5.1) % respectively. The cell cycle was arrested in phase G0/G1 after treatment with ART. There was significant increased expression of caspase-3. ART inhibits the growth of MCF-7 breast tumor cell xenografts in nude mice. The anti-tumor action of ART for human breast carcinoma in nude mice might be corrected with the alteration of apoptosis-related protein expression, which may further induce apoptosis and inhibit cell proliferation.

Keywords: Artesunate (ART), Nude mice, Anticancer effect, apoptosis

SYNTHESIS AND CHARACTERIZATION OF WATER SOLUBLE CARBOXYMETHYL CHITOSAN BY CHEMICAL MODIFICATION METHOD AND ITS APPLICATION FOR DRUG DELIVERY

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Abstract

Synthesis and characterization of water soluble carboxymethyl chitosan by chemical modification method and its application for drug delivery application was aimed for the study. Chitosan displays interesting properties such as biocompatibility, biodegradability and its degradation products are non-toxic, non-immunogenic and non-carcinogenic. Recently, there has been a growing interest in the chemical modification of chitosan in order to improve its solubility and widen its applications. Chitosan was converted into its Carboxymethyl derivative i.e. carboxymethyl chitosan (CMCs) using alkali solution and monochloroacetic acid. The prepared CMCs were characterized by FTIR, XRD, TGA/DTA, SEM, ^{1}HNMR. FTIR spectra produced the characteristic band of–NH_2 at 3445 cm^{-1} and Carbonyl (C=O) at 1607 cm^{-1}, According to thermogravimetric analysis (TGA/DTA), thermal stability of chitosan decreased with increase of DS, X-ray diffraction patterns also indicated the semi-crystalline nature of CMCs. In ^{1}HNMR the signals at 4.6 ppm and 4.8 ppm were represents the protons of CH_2COO-at N-position on carbon 2 and O-Position on carbon 6, of the N,O-carboxymethyl chitosan respectively. Carboxymethylation of chitosan increases its solubility in water and other relevant solvents which make it a promising candidate for delivery of numerous drugs.

Keywords: Carboxymethyl chitosan, grafting, FTIR, XRD, NMR spectroscopy

QSAR STUDIES OF PYRIDINE DERIVATIVES AS ANG II RECEPTOR

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Abstract

The aim of this study is employing QSAR method to explore the structure–activity relationship of a series of pyridine derivatives as angiotensin II receptor antagonists. The series was subjected to molecular modelling using CS Chem-Office 8.0. Structures of all the compounds were sketched using builder module of the programme. The best quantitative structure activity relationship model was selected having a correlation coefficient (r^2) of 0.8653, cross-validated correlation coefficient (q^2) of 0.7825 and, r^2 _pred of 0.7977. The predictive ability of the selected model was also confirmed by leave one-out cross validation. The information derived from the present study may be useful in the design of angiotensin II receptor.

Keywords: QSAR method, pyridine derivatives, angiotensin II receptor

Poster Presentation

SKILL DEVELOPMENT OF BASIC EMERGENCY CARE FOR PRIMARY PROTECTION AND CARE OF COMMUNITY

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Abstract

Prevention is a core value of any health system. Nonetheless, many health problems will continue to occur despite preventive services. A significant burden of diseases in developing countries is caused by time-sensitive illnesses and injuries, such as severe infections, hypoxia caused by respiratory infections, dehydration caused by diarrhoea, intentional and unintentional injuries, postpartum bleeding, and acute myocardial infarction. The provision of timely treatment during life-threatening emergencies is not a priority for many health systems in developing countries. An argument is made for the role of emergency medical care in improving the health of populations and meeting expectations for access to emergency care. We consider emergency medical care in the community, during transportation and at first contact and regional referral facilities. Obstacles to developing effective emergency medical care include a lack of structural models, inappropriate training, concerns about cost and sustainability in the face of a high demand for services. A basic but effective level of emergency medical care responds to perceived and actual community needs and improves the health of populations. The objective of this focused work is to identify research evidence on the value of primary care both nationally and internationally, focusing on the importance of effective primary care services in delivering quality healthcare, improving health outcomes, and reducing disparities. The objective was to improve the knowledge and skill of health care workers and laypersons in basic emergency care and to identify the impact of the course. The target groups will medical and nonmedical personnel. Our vision is to expand the knowledge and skill across the country on cardio-pulmonary resuscitation (CPR), choking, etc., via lectures, audio-visual aids, and mannequin training, so that they can disseminate the knowledge of pre-hospital care to each and every person across India leading to improvement in the outcome.

Keywords: Prevention, skill development, health care system

MIXED HYDROTROPY: A NOVEL MIRACULOUS TECHNIQUE EMPLOYED TO DEVELOP AQUEOUS INJECTION FORMULATION OF POORLY WATER SOLUBLE DRUGS

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Abstract

The main objective of current research work was to explore the application of mixed hydrotropy technique in the development of injection formulation of antihypertensive drug valsartan. The rationale to choose valsartan as the drug of choice was that it has very poor aqueous solubility (0.021 mg/ml) and also very low bioavailability of 23%. Preformulation studies were performed for drug including UV spectroscopic characterization, IR analysis, partition coefficient determination, pH dependent solubility studies, etc. Various hydrotropes employed in solubility studies include sodium acetate, sodium ascorbate, sodium benzoate, sodium citrate piperazine, etc. hydrotropic solubility studies were performed using various blends of hydrotropic solutions keeping the total concentration of each blend 30% w/v as constant. The aqueous solubility of drug in case of selected blends ranged from 9.096±0.021 mg/ml to 556.055±0.14 mg/ml (as compared to the solubility in distilled water 0.0212±0.002 mg/ml). The enhancement in the solubility of drug in a mixed solvent containing 20% piperazine anhydrous, 5% sodium citrate and 5% ammonium acetate was increased by 26 thousand times and marked its importance in the pharmaceutical field. This proved a synergistic effect in solubility enhancement of valsartan. Each solubilized product was characterized by ultraviolet and infrared techniques and also studied for physical and chemical stability. The reason for tremendous solubility enhancement may be due to higher pH of hydrotropic blend that could dissolve valsartan being weakly acidic in nature. Thus mixed hydrotropic concept definitely proved a boon for pharmaceutical industries for the development of dosage forms of poorly water-soluble drugs.

Keywords: Mixed hydrotropy, valsartan, solubility enhancement, piperazine

UTILITY OF *HOMOSAR* METHODOLOGY FOR MAPPING ACTIVITY ELEMENTS OF PROTEGRIN ANTIMICROBIAL PEPTIDES

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Abstract

Antimicrobial peptides (AMPs) are naturally occurring small peptides which are an innate part of the host's defence mechanism against both gram-negative and gram-positive bacteria and various viruses, fungi, and parasites. Optimization of the activity and specificity of the AMPs using large peptide libraries is a very tedious and expensive route. In this venture, QSAR can be used to shed light or reveal the structural basis that is necessary to be incorporated during the design of new AMPs. However, within the realm of QSAR, 3D-QSAR of peptides is an overwhelming task due to the sheer number of conformational degrees of freedom for peptides. To achieve this, we propose the use of a validated 2D-QSAR technique that is specifically designed for peptide QSAR, coined as *HomoSAR. HomoSAR* which is a union of the principles of *Homo*logy modeling and the Q*SAR* formalism to predict and design new peptide sequences. The first step in the *HomoSAR* methodology is multiple sequence alignment which is followed by scoring every position in the peptide sequence against a reference peptide (the most active) in the alignment, through calculation of *similarity indices*. The *similarity indices* obtained for each position (amino acid residue) in the peptide form the "descriptors" values "X" (independent variables) which are then correlated to the biological activity "Y" (dependent variable) of the peptides by G/PLS technique. This is a comprehensive study on a data set of protegrin antimicrobial peptides isolated from porcine leukocytes and with a broad spectrum of activity against both gram-positive and gram-negative bacteria, as well as the fungus *C. albicans*. *HomoSAR* methodology revealed all the necessary information required for binding of protegrin and protegrin analogues to the membrane and elicit the antimicrobial activity. It has been able to recognise amino acids and their allied physicochemical properties that are preferred or detrimental at specific positions in the peptide sequences for biological activity. The developed *HomoSAR* models were validated both internally as well as externally and found to have robust r^2, q^2 and r^2 (pred) values. It can, therefore, be concluded that the *HomoSAR* methodology would be a useful tool in the medicinal chemist's armamentarium of peptide design.

Keywords: Antimicrobial peptides (AMPs), *HomoSAR,* QSAR, protegrin

MANAGEMENT OF HEPATOTOXICITY BY *FICUS RELIGIOSA LINN*

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Abstract

Ficus religiosa is a sacred holy tree also known as "peepal tree" (sacred fig), belonging to family Moraceae. It has got mythological, religious and medicinal importance in Indian culture. The leaves of *F. religiosa* showed the presence of flavonoids, terpenoids, tannins, cardiac glycoside and vitamin k. We evaluate the hepatoprotective activity of *Ficus religiosa* with different extract. Albino rats (150–200 g) were divided into five groups. Groups A and B were normal and experimental controls; paracetamol 2000 mg/kg BW/p. o. for 3days, Groups C received standard drug silymarin 100 mg/kg BW/p. o. for 7days, Groups D and E received the different extract of *F. religiosa* (methanolic and water extract) 200 mg/kg BW/p. o. for 7days. Hepatotoxicity was induced in Groups B, C, D and E with paracetamol 2000 mg/kg BW for 3 d. The hepatoprotective effect was evaluated by performing an assessment of serum enzyme, oxidative stress and liver histopathology. The assay results were presented as a mean and standard error of the mean (SEM) for each group. The study group was compared with the control group by one-way ANOVA, a *P*-value of<0.01 was considered significant. In groups, C, D and E liver serum enzymes ratio were significantly ($P<0.01$) closer to normal than in group B. Reduction in Centrilobular necrosis and regenerative areas of the liver were observed on histopathological examination in groups C, D and E whereas group B showed only hepatic necrosis. The preliminary phytochemical analysis of the methanolic extract of *F. religiosa* has shown better prophylactic hepatoprotective activity as compared to that of our standard drug.

Keywords: Hepatoprotective activity, hepatotoxicity, oxidative stress, serum enzyme

WOUND HEALING, ANTIMICROBIAL AND INHIBITOR ACTIVITY OF A PHYLA NODIFLORA USED SOLID FORMULATION IN RATS

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Abstract

Phyla nodiflora (Verbenaceae) is wide used in tropical and semi-tropic regions for treatment of wound and alternative diseases. Though reports area unit out there within the literature on a number of the claimed activities, nothing has so far been reported concerning the wound healing activity of *Phyla nodiflora*. This study was designed to judge the wound healing potential of 80% whole plant extract of *Phyla nodiflora* through the excision wound model and evaluates the useful changes in biochemical, antioxidant and also assess the antimicrobial activity. Following extraction of *Phyla nodiflora* was formulated as an ointment (5% and 10% w/w) with simple ointment base B. P. The ointment was evaluated for wound healing activity. Parameters including antioxidant, measurement of the wound area, wound contraction, wound index, measurement of tensile strength and histopathological examination. The content was determined using the excision wound model, in the parallel Antimicrobial activity of the *Phyla nodiflora* was evaluated, the antimicrobial activity of the extract was more effective against bacterial strains compared to fungal strains. Remarkable wound healing activity was observed with the 10% (w/w) ointment of *Phyla nodiflora* and the statistical analysis was performed by one-way analysis of variance followed by t-test. Wound treated with 5% and 10% (w/w) alcoholic extract ointment exhibited significant excision wound, antimicrobial and antioxidant parameter. The healing activity of excision wound as evidenced by increased wound contraction, shorter epithelization time, higher tissue breaking strength and increased hydroxyproline content. The phytochemical investigation of this plant having great properties for curing the wound healing, antimicrobial and antioxidant activity. The study provided sufficient evidences that *Phyla nodiflora* might be indeed potential sources to treat many diseases.

Keywords: *Phyla nodiflora,* Excision Wound, Antimicrobial, Antioxidant, Wound Index

HEPATOPROTECTIVE AND ANTIOXIDANT EFFECT OF ORAL APPLICATION OF ETHANOLIC WHOLE PLANT EXTRACT OF*LUCAS ASPARA* IN HgCl2 INDUCED HEPATOTOXICITY IN MICE

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Abstract

The present study was carried out to evaluate the hepatoprotective activity of ethanolic whole plant extract of *Lucas aspara* in $HgCl_2$ induced hepatotoxicity in mice. 36 males healthful mice of weight 20-30 gm every had been assigned into six groups: (1) control organization that acquired everyday normal saline i. p, II served as mercury chloride $HgCl_2$, group III served L. aspera (low does)+mercury chloride $HgCl_2$ (i. p), group IV served as *L. aspera* (mid does)+mercury chloride $HgCl_2$ (i. p) and L. aspera (high does)+mercury chloride $HgCl_2$ (i. p), organization VI dealt with as mercury chloride $HgCl_2$+liv liv 52 (polyherbal Ayurvedic formulation) and after end of the experiment liver tissue turned into used to decide lipid peroxidation, quantification of reactive oxygen species, and decreased glutathione and oxidised content material and the liver have been processed for histology. The considerably serum enzymatic levels of serum transaminases, alkaline phosphatase and total bilirubin, were considerably renovated towards standardization by the extract. Whole plant extract of *Lucas aspara* considerably accumulated the degree of antioxidant enzymes: superoxide dismutase, catalase and glutathione. The phytochemical analysis discovered the presence of alkaloid, as well as flavonoids and phenolic compounds, which are legendary for their hepatoprotective activities. *Lucas aspara* possesses significant protective effect against hepatotoxicity induced by Hgcl2 which may be attributed to the individual or combined action of Phytoconstituents present in it.

Keywords: *Lucas aspara,* $HgCl_2$, superoxide dismutase, flavonoids, hepatoprotective

DOCUMENTATION OF THE HERBAL POTENTIAL OF PISONIA GRANDIS (R. BR)

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Abstract

Pisonia grandis R. Br. is a plant of the four O'clock family *Nyctaginaceae* and commonly called as lettuce tree. It is native to the Seychelles as well as other tropical areas of the world, especially the Indo-pacific islands. It is a small, evergreen foliage tree widely distributed throughout India. In southern India, it usually grows as an ornamental plant and its leaves are used as a dietary supplement in managing diabetes. A number of researches have been carried out to evaluate the herbal potential of this plant. It has been proven to express antidiabetic, wound healing, antioxidant, anti-microbial, anti-cancer, anti-inflammatory, anxiolytic, antipyretic and hepatoprotective activities. The numbers of research papers available in research websites evidence this. Research journal publishers and databases like Springer, RSC, ACS, Taylor and Francis report articles less than 400 for the search keyword '*Pisonia grandis*'. Traditionally this folkloric plant is used by the human community and yet its scientific value has not been much authenticated. Phytochemical investigations reveal the presence of appreciable amounts of primary and secondary metabolites. The study documents the herbal potential of *Pisonia grandis* based on the biological, pharmacological, phytochemical and standardization studies reported and carried out in our laboratory till date.

Keywords: *Pisonia grandis,* herbal potential, standardization

SODIUM ALGINATE: A PROMISING NATURAL POLYSACCHARIDE

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Abstract

Alginates are natural derived biomaterials having various properties and applications for drug delivery. Here sodium alginate is also known as "gummy worm" polymer. Which is a natural polysaccharide and hydrophilic in nature grown in cold water regions. It is obtained from extracted product of kelp and brown seaweed, soluble in hot water when agitate it thickens and bind and less soluble in cold water. Alginic acid and its calcium and sodium salts are usually non-toxic, biocompatible. Sodium alginate forms a gel in the presence of calcium without any heat. Therefore it is mostly used with calcium salts to produce spheres of round or oval shape with liquid inside that burst in the mouth. Hence sodium alginate is used as a hydrogel in drug delivery. As it is used as biopolymer in wide range of applications also as a polymer matrix. Alginate is used in the food industry for increasing the viscosity and as also used as an emulsifier. Alginate is used in indigestion tablets and it has no perceptible flavor.

Keywords: Alginates, biomaterial, polymer, sodium alginate

GC-MS ANALYSIS OF AN ENDANGERED MEDICINAL PLANT *SARCOSTEMMA VIMINALE* (L.) R. BR. FROM THAR DESERT, RAJASTHAN (INDIA)

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ABSTRACT

Medicinal plants contain one or more substances that can be used for therapeutic purpose. *Sarcostemma viminale* (L.) R. Br. is one of the important endangered medicinal plants belonging to the family Asclepiadaceae. It is commonly known as somlata, caustic vine and khir-khimp. Medicinal plants are used by the world population all over for their basic health needs. The aim of present investigation was to determine the possible bioactive phytochemicals from stem of *Sarcostemma viminale* (L.) R. Br. using methanol, chloroform and hexane as solvents. The phytochemical compounds were investigated using Perkin-Elmer gas chromatography-mass spectrometry, the mass spectra of the compounds found in the extract were matched with the National Institute of Standards and Technology (NIST) library. Maximum % area is found for lup-20-(29)-en-3-yl acetate, is present in maximum amount (40.85%) with RT= 43.787 min, followed by 4, 4, 6a, 6b, 8a, 11, 11, 14 b-octamethyl-1, 4, 4a, 5, 6, 6a, 6b, 7, 8, 8a, 9, 10, 11, 12, 12a, 14, 14a, 14b-octadecahydro-2h-picen-3-one$$olean-12-en-3-one# (13.74%) with rt=44.420 min in the methanolic extract; acetic acid 4,4,6a,8a,11,12,14b-octamethyl-1,2,3,4,4a, 5,6,6a,6b,7,8,8a,9,10,11,12,12a,14,14a,14b-eicosahydro-picen-3-yl ester $$ urs-12-en-3-yl acetate, that is present in maximum amount (44.98%) with rt= 48.265 min, followed by. beta.-amyrin (18.51%) with rt= 40.580 min in the chloroform extract; acetic acid 4,4,6a,8a,11,12,14b-octamethyl-1, 2, 3, 4, 4a, 5, 6, 6a, 6b, 7, 8, 8a, 9, 10, 11, 12, 12a, 14, 14a, 14b-eicosahydro-picen-3-yl ester $$ urs-12-en-3-yl acetate is present in maximum amount (45.47%) with RT= 48.514 min, followed by. beta.-amyrin (19.21%) with RT= 40.555 min in the hexane extract of stem of *Sarcostemma viminale* (L.) R. Br. The importance of the study is to investigate and pinpoint biological activity of some of these compounds so that they can be used by pharma or some other industry to find a novel drug.

Keywords: *Sarcostemma viminale,* phytochemical, chromatography

SYNTHESIS AND ANTIBACTERIAL STUDIES OF SOME DERIVATIVES OF N-1 SUBSTITUTED URACIL AND THYMINE

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Abstract

Nitrogen-containing heterocyclic compounds are of great interest because they show some pharmacological and biological activities. Molecules possessing drug-like properties was predicted with the help of Lipinski's rule of five and this was done by using software called Moleinspiration and also were tested for their antimicrobial activity against bacteria. Uracil and thymine are an essential constituent of biomolecules present in the living system. N-1 substituted these bases have significant properties which make them importance as a drug. Keeping this in mind some novel molecules with such structural features have been designed and synthesized as probable antibacterial agents. All the lead molecules were according to the criterion as mentioned by Lipinski's (Modeling), then synthesized and subjected to antibacterial activity. Getting the positive results synthesis of lead molecules were carried out and MIC values are mentioned.

Keywords: Lipinski's rule, Log P, TPSA, MIC, docking

DOCKING RESULTS OF N-3 HYDROXYL DERIVATIVES AS INTEGRASE INHIBITORS

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Abstract

3'-proccessing and strand transfer reactions are an essential part for the life cycle of HIV virus. There are various types of inhibitors; one of them is integrase inhibitor. The integrase inhibitors are the molecules that render HIV integrase inactive, the enzyme responsible for the integration of the provirus with the genetic material of the host cell. Only one integrase inhibitor, raltegravir, is approved so far. HIV-1 integrase is a key enzyme in the replication cycle of retrovirus because it catalyses the integration of the reverse transcribed viral DNA into the chromosomal DNA. The presence of–OH group at 3-position of pyrimidine bases will show significant activity. Keeping this in mind docking was carried out using DS-2.5 and moleinspiration. Results were found significant on the basis of H-bond interaction, π-π interaction and Interaction energy. On the basis of results obtained by docking, synthesis was planned and they all showed good docking results.

Keywords: Interaction energy, dock score, docking

ESTIMATION OF TOTAL PHENOLIC AND FLAVONOID CONTENTS IN *AEGLE MARMELOS* L. RIPE FRUIT EXTRACTS

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Abstract

Aegle marmelos L. belongs to family Rutaceae having a prominent place in Ayurveda. Occurrence of major phytochemical constituents in plants is directly associated with human daily dietary intake of antioxidants. The objective of present study was to determine total phenolic and flavonoid contents in various extracts of *Aegle marmelos* L. ripe fruit pulp. *Aegle marmelos* L. ripe fruits were collected from Pune and authenticated at Botanical Survey of India Pune, Maharashtra. Total phenolic and flavonoid contents were quantitatively estimated in aqueous, acetone, ethanol, methanol, hydro-alcoholic and crude extracts of *Aegle marmelos* L. ripe fruit by using Folin-Ciocalteau assay and an aluminum chloride colorimetric method respectively. Gallic acid and quercetin were used as standards for calibration of the phenols and flavonoids. The total phenolic contents were estimated in the range from 80.41 to 102.3 mg gallic acid equivalent per gm of extract. The total flavonoid contents were found to be in the range from 61.06 to 95.14 mg quercetin equivalent per gm of extract. Highly Significant ($P<0.0001$) contents of phenolic and flavonoid compounds were observed in the hydroalcoholic extract of *Aegle marmelos* L. ripe fruit than all extracts. The results revealed that hydroalcoholic extract possess a significant amount of phenols and flavonoids. Therefore hydroalcoholic extract may be used to study the antioxidant potential of *Aegle marmelos* L. The presence of above mentioned biochemical compounds in plants has the significant role of medicinal properties.

Keywords: *Aegle marmelos* L., phenolic, flavonoids, gallic acid, quercetin, secondary metabolite, antioxidant

SPECTROPHOTOMETRIC DETERMINATION OF TOTAL PHENOLIC AND FLAVONOID CONTENTS IN *AEGLE MARMELOS* L. LEAVES EXTRACTS

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Abstract

The objective of the present study was to determine total phenolic and flavonoid contents in *Aegle marmelos* L. leaf extracts by using the spectrophotometric method. *Aegle marmelos* L. leaves were collected from Pune and authenticated at Botanical Survey of India, Pune, Maharashtra. The leaves were shade dried, powdered and extracted with water, acetone, ethanol, methanol and hydroalcoholic solvents separately. The crude powder was used at the time of experiment and fresh extract of leaves was prepared in hydroalcoholic solvents. A major class of compounds such as phenols and flavonoids were quantitatively estimated spectrophotometrically by using Folin-ciocalteau assay and Aluminum chloride colorimetric method respectively. The total phenolic contents ranged from 34.63 to 58.31 mg gallic acid equivalent per gm of extract and total flavonoid contents ranged from 24.14 to 45.35 mg quercetin equivalent per gm of extract in different extracts of *Aegle marmelos* L. leaves. From the study it is observed that the highly significant ($P<0.0001$) amount of phenols and flavonoids were present in hydroalcoholic extract compared to other extracts. Phenols and flavonoids are very important plant constituents because of their hydroxyl groups and may contribute directly to antioxidative action. The presence of secondary metabolites like phenols and flavonoids in the plants may have the significant role of medicinal properties for curing various ailments. So hydroalcoholic extract may be used to study antioxidant effect of *Aegle marmelos* L. leaves.

Keywords: *Aegle marmelos* L. phenolics, flavonoids, spectrophotometry, gallic acid, quercetin, antioxidant, secondary metabolite

GC-MS ANALYSIS OF BIOACTIVE COMPOUNDS FROM THE ROOT OF *CENCHRUS CILLIARIS* FROM THAR DESERT, RAJASTHAN (INDIA)

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Abstract

Medicinal plants are directly used as medicines by a majority of the culture around the world. Plants produce many chemical compounds that show functional biological defence against microbes. *Cenchrus cilliaris* L. is one of the important medicinal plants that belongs to Poaceae family. It is commonly known as "buffel grass". The phytochemicals have beneficial long-term effects on health when consumed by men and can be used to treat human diseases effectively. The present investigation was carried out to determine the possible bioactive phytochemicals from the root of *Cenchrus cilliaris* using methanol, ethyl acetate, and hexane as solvents. The phytochemical compounds were investigated using Perkin-Elmer gas chromatography-mass spectrometry. The mass spectra of the compounds found in the extract were matched with the National Institute of Standards and Technology (NIST) library. Maximum % area is found for stigmasta-5,22-dien-3-ol is present in maximum amount (12.68 %) with RT=36.461 min, followed by pentadecanoic acid (11.35%) with RT= 17.354 min. in the methanolic extract; 1,2,3-propanetriol, 1-acetate present in max. amount (6.70%) with RT= 6.582 min, followed by 2,3-dihydroxypropyl acetate (6.45%) with RT=8.787 min, and stigmasta-5,22-dien-3-ol (6.45%) with rt= 36.480 min, in the ethyl acetate extract; tetracontane is present in maximum amount (15.33%) with RT= 18.744 min, followed by hexadecanoic acid, 2-hydroxy-1-(hydroxymethyl)ethyl ester (14.96%) with RT= 23.490 min, in hexane extract of root of *Cenchrus cilliaris* (L.). The importance of the study was to investigate the biological activity of some of these compounds so that they can be used in drug development and synthesis by pharma or other industry to find a novel drug.

Keywords: *Cenchrus cilliaris* L, buffel grass, gas chromatography, mass spectrometry

PHYTOCHEMICAL SCREENING, ELEMENTAL AND FUNCTIONAL GROUP ANALYSIS OF *VITEX NEGUNDO* L. LEAVES

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Abstract

Aim of the study was to analyse elemental profile, evaluate functional groups and find out phytochemical constituents of *Vitex negundo* L. leaves. Determination of primary and secondary metabolites for various extracts by qualitative methods. Elemental analysis was carried out by using ICP-MS technique and the functional groups have been determined by using FTIR technique. Soluble extractive percentage of material has been found the maximum in aqueous (6.75%) followed by methanolic (4.35%) and acetone extract (1.8%). Phytochemical screening of material revealed the presence of carbohydrates, proteins, amino acids, steroids, cardiac and anthraquinone glycosides, saponins, flavonoids, tannins and phenolic compounds. The elemental analysis revealed Na, Mg, K, Ca, Cr, Mn, Fe, Co, Cu, Zn, Se, Mo, Li, B, Al, P, Cd, As, Ba, and Hg. FTIR technique was used to identify various functional groups present in three different extracts of the material. The phytochemical screening of three different extracts of the material showed the presence of most of the primary and secondary metabolites in aqueous and methanolic extract than acetone extract. The soluble extractive value was found the maximum in aqueous extract hence aqueous extract is most effective for studying the pharmacological activity of this plant. Elemental analysis showed the presence of trace elements in sufficient concentrations and traces of heavy and toxic metals. The FTIR study revealed the presence of essential functional groups in three different extracts of the material. The present investigation is most essential to discover innovative, dynamic and novel drugs for curing various newly emerged dangerous diseases.

Keywords*:* Phytochemical screening, elemental analysis, FTIR, ICP-MS, secondary metabolites

DEVELOPMENT AND CHARACTERIZATION OF LOSARTAN POTASSIUM LOADED CHITOSAN NANOPARTICLES BY IONIC GELATION METHOD

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Abstract

Hypertension being a chronic medical condition increases the chances of life-threatening diseases. A variety of drugs are used to treat the disorder and losartan potassium (LP) is one of them. LP is a crystalline lipophilic anti-hypertensive drug which acts as an antagonist to Angiotensin II receptor. Due to its low bioavailability (32%), nanoparticles encapsulated with LP were developed to increase the retention time, bioavailability and reduce the toxicity inside a biological system. LP loaded nanoparticles were developed using chitosan and tripolyphosphate (TPP) by ionic gelation method. The process helps to form the cross–linkage between chitosan and TPP and the lattice encloses and entraps the drug. With the help of various optimisation parameters such as the ratio of chitosan to acetic acid, chitosan to TPP, the rate of addition of TPP to chitosan, sonication time and volumes of both chitosan and TPP, the nanoparticles were formulated. The encapsulation efficiency was calculated to be 96.08% with a pH = 6.90 and Conductivity = 7.54 mS/m. The characterization was done by PSA with an average diameter of 180.9 nm (PdI 0.187). The Zeta Potential was-2.74 mV and the TEM results showed a particle size range of 50-200 nm. The developed nanoparticles have conductivity close to that of water and pH is suitable for a biological system indicating that it can be used for further studies in a biological system to increase the drug's bioavailability.

Keywords: Hypertension, losartan potassium, ionic gelation method, bioavailability, chitosan, TEM, PSA, zeta potential, TPP

SYNTHESIS AND *IN VITRO* RELEASES STUDIES OF XYLAN-5-FLUOROURACIL PRODRUGS FOR COLON TARGETED DRUG DELIVERY

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Abstract

Synthesis and *in vitro* releases studies of xylan-5-fluorouracil prodrugs for colon targeted drug delivery were aimed for the study. FT-IR, ^{1}HNMR, UV-Vis spectroscopy, X-Ray diffraction analysis, *In vitro* drug releases study and Cytotoxicity study. Xylan-5-fluorouracil conjugates have been synthesised and characterized by modern analytical techniques. The chemical stability of the conjugates was checked in acidic (pH=1.2) and basic (pH=7.4) buffers which showed their stability in upper gastrointestinal tract. The *in vitro* drug release profile of the conjugates was performed in the presence of rat gastrointestinal contents. The *in vitro* cytotoxicity assay also has been performed against human colorectal cancer cell lines (HT-29 and HCT-15), which shows greater selectivity than free drug. Therefore the results reveal that Xyl-5-FUAC conjugates are the potential candidates for colon-specific drug delivery in the treatment of colonic cancer with minimal undesirable side's effects.

Keywords: Xylan, 5-fluororouracil, *in vitro* releases study, cell cytotoxicity

MICROBIAL TRANSFORMATION OF PENICILLIN-G TO 6-AMINOPENICILLANIC ACID

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Abstract

Penicillin acylase (PGA) producing microorganism were screened among *Arthrobacter viscous*, *Alcaligenes feacalis* and *Pseudomonas species*. On screening, these microorganisms showed maximum PGA activity at the third hour. At resting phase, enzyme activity was 139 µg/ml in *Arthrobacter viscosus,* enzyme activity was 128 µg/ml in *Alcaligenes feacalis* and 102 µg/ml in *Pseudomonas* strain. In growing phase, enzyme activity was found to be 152 µg/ml in *Arthrobacter viscosus*, 148 µg/ml in *Alcaligenes feacalis* and 138 µg/ml in Pseudomonas strain. Penicillin acylase showed maximum activity at 37 °C at pH 7.8. Increased activity was found when biotransformation was done in resting phase of 18 h old culture and during biotransformation in acclimatized cells. Resting phase and acclamatized cells have shown a slight increase in 6-APA (6-amino penicillanic acid) production. Penicillin acylase finds wide applications in the manufacture of the key intermediate i.e. 6APA, in the production of semisynthetic penicillin.

Keywords: Penicillin acylase, *arthrobacter viscous*, *alcaligenes feacalis, pseudomonas species*

ASENAPINE MALEATE MOUTH DISSOLVING FILM: A BREAKTHROUGH TREATMENT IN SCHIZOPHRENIA

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Abstract

Asenapine maleate is a newfangled drug approved by the FDA for the treatment of schizophrenia. Conventionally it is available in oral solid dosage forms, which possess lower bioavailability. Fast dissolving drug delivery system is meant to avert problems associated with the accustomed approach. This delivery system undergoes disintegration expeditiously without administration of water, and drug get access into systemic circulation via lamina propria. A novel mouth dissolving film of asenapine maleate was prepared by using hydroxypropyl methylcelluloses E-5 LV by solvent casting method. Qbd-3^2 factorial design was used to study the effect of independent variables concentration of HPMC and PG on dependent variables viz. % cumulative drug release after 10 min, folding endurance and disintegration time. Films were subjected to *in vitro* drug release studies which showed 85.36–98.31% drug release within 10 min. *Ex vivo* studies of optimized formulation showed 86% drug permeation through oral sheep mucosa within 15 min and no cell necrosis was observed during the histological study. The stability of optimized batch was found to be stable for six months under specified stability conditions. In conclusion, the asenapine maleate mouth dissolving film considers as a successful therapeutic alternative to conventional formulation.

Keywords: Asenapine maleate, mouth dissolving film, optimization, e*x-vivo* study

STRUCTURAL REQUIREMENTS OF N,N'-DISUBSTITUTED PYRIMIDINETRIONE AS CA_V 1.3 CALCIUM CHANNEL-SELECTIVE ANTAGONISTS FOR PARKINSON'S DISEASE

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Abstract

Parkinson's disease (PD) is the most common neurodegenerative disorder, characterized by rigidity, tremor and bradykinesia. These motor symptoms are due to degeneration of dopaminergic neurons in substantia nigra parc compacta (SNc). Studies show the engagement of L-type calcium channel (LTCCs) in PD. The LTCCs increase the mitochondrial oxidant stress in SNc dopaminergic neurons. Interestingly LTCCs are not essential for normal functioning of SNCs dopaminergic neurons. The 1,4 dihidro pyrimidines (DHPs) are the antagonist of LTCCs as these are essentially used in the treatment of hypertension in humans from a long time. But the disadvantage of DHPs is that they are the non-selective antagonist of LTCCs and have some peripheral side effects. There is a real need of new therapeutic agent of high selectivity towards ca_v 1.3 L-calcium channel. Recently high-throughput screening of molecular libraries identified pyrimidine-2,4,6-triones (PYT) as potential inhibitors of ca_v 1.3 LTCCs. In our work, we performed regression (conventional 2D) QSAR on pyrimidine-2,4,6-triones to find out structural requirements for the inhibitory activity. During development of QSAR model, various descriptors were calculated using paDEL software and highly intercorrelated descriptors were eliminated. The pIC50 value was taken as dependent variable. Finally, stepwise regression was used to develop a linear model and the quality of regression model was justified by internal (Q^2) and external (R^2pred) cross-validation parameters.

Keywords: Parkinson's disease, neurodegenerative disorder, calcium channel-selective antagonists

INDUCTION OF AUTOPHAGIC CELL DEATH IN SIHA CELLS BY *ENTEROMORPHA INTESTINALIS* LINNAEUS (NEES) AND *ULVA LACTUCA* L. FROM SUNDARBAN MANGROVE ECOSYSTEM, INDIA

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Abstract

The study investigates the effect of *Enteromorpha intestinalis* and *Ulva lactuca* on cervical cancer and discovers the underlying molecular mechanism. Algal extracts fractionated in different solvents (petroleum ether, chloroform and methanol) were tested against SiHa cells. MTT assay determined the cytotoxic potential of the algal fractions. Nuclear morphology by HOECHST staining, DNA fragmentation assay, MMP assay, cell cycle distribution pattern and acidic vacuoles formation were studied. Genes and proteins were studied through semi-q RT-PCR and western blotting respectively. Phytochemical assays and the GC-MS study revealed the chemical profile of the algal fractions. ECF (*Enteromorpha* chloroform fraction) with an IC_{50} dose of 141.56±8.079µg/ml and UCF (*Ulva* chloroform fraction) with an IC50 dose of 444.48±0.416µg/ml were found to be most cytotoxic. Nuclear morphology showed condensed nuclei. DNA fragmentation assay hinted at non-apoptotic cell death. A lowered MMP and increased acidic vacuoles were observed. An increased subG0 phase and a decreased G1/G0 phase were noted. An up regulated Bax and p53 at the transcriptional and translational level, along with a decrease in the BCl2at transcriptional level were found. LC3BII, p62, atg12 and Beclin-1being up regulated at the protein level indicated an autophagic cell death. Reduced expression of viral oncogene E6 was noted. GC-MS analyses showed the presence of α-linolenic acid, oleic acid, palmitic acid, stearic acid, etc.; some of whose anti-cancerous reports were previously established. The ACFs could induce autophagy in the SiHa cells, suggesting the mas potential candidates for the treatment of cervical cancer.

Keywords: Autophagy, SiHa, LC3B, enteromorpha intestinalis, *ulva lactuca*, palmitic acid, oleic acid

EFFECT OF STRESS CONDITION ON DISSOLUTION STABILITY OF TAPENTADOL HYDROCHLORIDE TABLETS

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Abstract

The present study describes the dissolution analysis of tapentadol in tablet formulation by Rp-HPLC. The method was further utilized to study the effect of stress on the dissolution stability of the drug. The finalized dissolution method parameters for dissolution analysis include dissolution media, dissolution media volume, agitation speed and USP apparatus type. The stress conditions include thermal, humidity, photolytic and pH effect on tablet and packaged formulation (Samples). The stress samples were evaluated for its drug release and drug content using thermal and non-thermal methods of analysis. The non-thermal method includes HPLC, microscopic and spectrophotometric study. Thermal method (Differential Scanning Colorimetry) study of stress samples was carried out. The samples were analysed at zero time, after one month and two months study. The results obtained in all stress conditions were statistically evaluated using two-way ANOVA followed by post hoc Bonferroni test. The samples were found to be significantly affected on chemical stability and drug release under photolytic conditions.

Keywords: Tapentadol, RP-HPLC, anova, Bonferroni test

ESTIMATION OF OLANZAPINE RELATED IMPURITIES IN TABLET FORMULATION USING RAPID RESOLUTION LIQUID CHROMATOGRAPHY

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Abstract

The present work qualified for precise and accurate rapid resolution liquid chromatographic (RRLC) method for determination of olanzapine-related substances and validated as per ICH guidelines. The study was performed on Agilent RRLC 1200 series model with binary pump, autosampler, diode array detector and column used was ACOUITY BEH C_{18} (50 mm×2.1 mm i.d.×1.7 µm). Mobile phase comprises was phosphate buffer pH 7.1 as mobile phase A and acetonitrile and methanol (50:50) as mobile phase B. The detection of the drug was carried out using UV detector at 270 nm. The column temperature was maintained at 40 °C. The mean % recovery of olanzapine-related substance at each level was found to be in the range of 85-115%. The method was further validated with respect to linearity, accuracy, precision and robustness according to ICH guidelines. The method was statistically evaluated and can be applied for routine control analysis of olanzapine in tablet formulations.

Keywords: Olanzapine, RRLC, ICH, related substances, accuracy, precision

VALIDATED RP-HPLC METHOD FOR ASSAY AND DISSOLUTION ANALYSIS OF SAROGLITAZAR IN TABLET

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Abstract

Simple, precise and accurate RP-HPLC method for assay and dissolution analysis of saroglitazar was developed and validated as per ICH guidelines. The drug was estimated from tablets using Phenomenex ODS-3 (250 mm x 4.6 mm, 5µ) and mobile phase comprises of acetonitrile and disodium hydrogen phosphate buffer (pH-7) in ratio 58:42%v/v. The detection of the drug was carried out using UV detector (SHIMADZU, UV-1700) at 294 nm. The calibration curve was linear over the concentration range of 10-150% and correlation coefficient value nearly equal to 1. The mean percent labelled claim was found to be 98.44%. A new dissolution method was developed and using optimized dissolution parameters, percentage recovery was found within the limit range of 95-105%. The developed method was further validated and was found to be linear, rugged and robust. The method was statistically evaluated and can be applied for routine quality control analysis of saroglitazar in tablet formulations.

Keywords: Saroglitazar, RP-HPLC, ICH, filter equivalency, linearity, accuracy and precision

VALIDATEDSTABILITY INDICATING RP-HPLC METHOD FOR ESTIMATION OF CANAGLIFLOZIN IN TABLET

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Abstract

The present work was undertaken with the aim to develop and validate a rapid stability indicating RP-HPLC method for the estimation of canagliflozin in pharmaceutical formulations. RP-HPLC separation was achieved on a C_{18} (ACE 150 x 4.6 x 5µ C18 column) in an isocratic mode. The mobile phase comprised of acetonitrile: 0.1% orthophosphoric acid in the ratio of 60:40 (v/v). The flow rate was monitored at 1.0 ml per min. The wavelength selected for the detection was 290 nm. The retention time of canagliflozin was found to be 2.9 min. Forced degradation studies were performed under conditions of dry heat (thermal studies), hydrolysis (acidic, alkaline and neutral), oxidation and photolysis, humidity studies (45 °C and 75%RH) as per the stress degradation guidelines. The method has successfully separate the stress degradation products that are formed during the stress study. The method was successfully validated as per ICH guidelines

Keywords: RP-HPLC, canagliflozin, stress studies

INDUCTION OF AUTOPHAGIC CELL DEATH IN SIHA CELLS BY *ENTEROMORPHA INTESTINALIS* LINNAEUS (NEES) AND *ULVA LACTUCA* L. FROM SUNDARBAN MANGROVE ECOSYSTEM, INDIA

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Abstract

The study investigates the effect of *Enteromorpha intestinalis* and *Ulva lactuca* on cervical cancer and discovers the underlying molecular mechanism. Algal extracts fractionated in different solvents (petroleum ether, chloroform and methanol) were tested against SiHa cells. MTT assay determined the cytotoxic potential of the algal fractions. Nuclear morphology by HOECHST staining, DNA fragmentation assay, MMP assay, cell cycle distribution pattern and acidic vacuoles formation were studied. Genes and proteins were studied through semi-q RT-PCR and western blotting respectively. Phytochemical assays and the GC-MS study revealed the chemical profile of the algal fractions. ECF (*Enteromorpha* chloroform fraction) with an IC50 dose of 141.56±8.079 µg/ml and UCF (*Ulva* chloroform fraction) with an IC50 dose of 444.48±0.416 µg/ml were found to be most cytotoxic. Nuclear morphology showed condensed nuclei. DNA fragmentation assay hinted at non-apoptotic cell death. A lowered MMP and increased acidic vacuoles were observed. An increased subG0 phase and a decreased G1/G0 phase were noted. An up regulated Bax and p53 at the transcriptional and translational level, along with a decrease in BCl2 at transcriptional level were found. LC3BII, p62, atg12 and Beclin-1 being up regulated at the protein level indicated an autophagic cell death. Reduced expression of viral oncogene E6 was noted. GC-MS analyses showed the presence of α-linolenic acid, oleic acid, palmitic acid, stearic acid, etc.; some of whose anti-cancerous reports were previously established. The ACFs could induce autophagy in the SiHa cells, suggesting them as potential candidates for the treatment of cervical cancer.

Keywords: Autophagy, SiHa, LC3B, *enteromorpha intestinalis*, *ulva lactuca*, palmitic acid, oleic acid

VALIDATED STABILITY INDICATING RP-HPLC METHOD FOR SIMULTANEOUS DETERMINATION AND *IN VITRO* DISSOLUTION STUDIES OF CINITAPRIDE AND PANTOPRAZOLE FROM CAPSULE DOSAGE FORM

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Abstract

A simple, rapid, and robust stability indicating RP-HPLC method has been developed and validated to measure cinitapride (CP) and pantoprazole (PZ) at a single wavelength in order to assess assay and *in vitro* drug release profile of drug from tablet formulation. An isocratic elution of samples was performed on Phenomenex ODS 250 mm X 4.6 mm, 5 µm columns with buffered mobile phase consisting solvent A (0.5 M potassium dihydrogen phosphate, pH 2.5) and solvent B (acetonitrile) 50:50v/v delivered at flow rate 1.0 ml/min. For dissolution study, the sink condition has been established from the quantitative solubility of CP and PZ API in different dissolution medium recommended by USP for sustained release formulation and the optimized dissolution condition was: pH 6.8 deaerated potassium dihydrogen phosphate buffers, a paddle rotation speed 100 rpm and vessel volume 900 ml. Discriminating release of CP achieved around 100% of labelled amount over 12h and PZ around 98% in 60 min and drug dissolution was concluded after 60 min. The Correlation coefficient for linearity for assay and dissolution method was found to be 0.997, 0.998 for CP and PZ respectively. The HPLC method and dissolution test condition were validated to meet the requirement for regulatory filling and this validation inferred from specificity, precision, accuracy, linearity and robustness. In addition, standard and sample solution stability was demonstrated. All results were acceptable and this confirmed that the method is suitable for its intended use in routine quality control and assay of drugs.

Keywords: Cinitapride, pantoprazole, stability indicating, dissolution analysis, HPLC

A REVIEW OF BIOSIMILARS AND ITS COST EFFECTIVENESS

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Abstract

Generic' biologics, defined as a copy of an existing approved biologic with demonstrated similarity in physicochemical characteristics, efficacy and safety. Biopharmaceuticals or biologics have revolutionized medicine, advancing the treatment of diseases from rheumatoid arthritis to cancers. Over the last decade, they have experienced explosive growth and now account for an astounding 30% of global pharmaceutical research and development spending.

The main objective of the study was to review and analyze the cost-effectiveness of generic drug and biosimilars. Clear regulatory guidelines for biosimilars are essential for both manufacturer investment and acceptance by clinicians and patients. In general, international regulatory bodies agree that standards for approval of biosimilars differ from those for small molecule generics, and typically emphasize the need for direct analytical and biological comparison to the reference biologic. Additionally, rigorous post-approval pharmacovigilance programs are mandated to identify any serious adverse effects rapidly. With the increasing prevalence of autoimmune diseases and cancers, the use of biosimilars is bound to increase. However, affordable medicines are the key to increasing the accessibility to quality treatment.

Keywords: Generic drugs, biosimilar, generic biologics, biopharmaceuticals, cost effectiveness

INHIBITION OF 1QKN BY PINORESINOL: AN ALTERNATIVE FOR OSTEOPOROSIS-A COMPUTATIONAL ANALYSIS

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Abstract

Computational analysis of the potential of pinoresinol as an alternative for the treatment of osteoporosis was aimed for the study. The treatments of osteoporosis by alternative methods have been looked through. One such analysis is the usage of dry fruits. Pinoresinol, a component of dried apricot has been used as an alternative and analysed by using *in silico* methods. The structure of the target protein 1QKN and the ligand pinoresinol is retrieved from PDB and Pubchem and the interaction between is studied using Accelrys Discovery Studio. Pharmacophore analysis is also done for the ligand. Results show that the ligand pinoresinol interacts with the estrogen receptor and has the required potential to serve as an inhibitor. The computational analysis show that pinoresinol can be used an alternative in the treatment of osteoporosis. The stoichiometric ratio of the compound has to be worked upon yet.

Keywords: Computational analysis, osteoporosis, pharmacophore analysis

INSILICO ANALYSIS OF ANTIOXIDANT 3-p-COUMAROYLQUINIC ACID AS AN INHIBITOR OF FOR OSTEOPOROSIS

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Abstract

The availability of natural sources as an alternative medicine in the treatment of oste porosis was explored. The tools and software used were phenol explorer which helps in finding the antioxidant compounds present in dry plum; protein data bank, to retrieve the structure of the protein; PubChem compound database, to retrieve the chemical structure of the natural antioxidant component; ADMET to study about the toxicity of the antioxidant component and the docking analysis using Discovery studio. The results show that all the compounds that satisfy the ADMET properties 3-p-Coumaroylquinic acid is favourable to bind with the Estrogen receptor. The docking score of 3-p-Coumaroylquinic acid is 44.97. The docking study reveals that the natural antioxidant compound present in dry plum can be used in the treatment of osteoporosis which helps in reversing bone loss and increasing bone strength.

Keywords: *In silico* analysis, ADMET analysis, antioxidants, osteoporosis

AN OVERVIEW ON INTELLECUAL PROPERTY RIGHTS IN PHARMACEUTICAL INDUSTRIES

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Abstract

The main objective of the study was to have an overview on intellectual property rights in pharmaceutical industries. Intellectual property rights (IPR) have been defined as ideas, inventions, and creative expressions based on which there is a public willingness to bestow the status of property. IPR provide certain exclusive rights to the inventors or creators of that property, in order to enable them to reap commercial benefits from their creative efforts or reputation. There are several types of intellectual property protection like patent, copyright, trademark, etc. The patent is recognition for an invention, which satisfies the criteria of global novelty, non-obviousness, and industrial application. IPR is a prerequisite for better identification, planning, commercialization, rendering, and thereby protection of invention or creativity. Each industry should evolve its own IPR policies, management style, strategies, and so on depending on its area of specialty. Pharmaceutical industry currently has an evolving IPR strategy requiring a better focus and approach in the coming era. Pharmaceutical industry currently has an evolving intellectual property strategy. Since there exists the increased possibility that some intellectual property rights are invalid, antitrust law, therefore, needs to step in to ensure that invalid rights are not being unlawfully asserted to establish and maintain illegitimate, albeit limited, monopolies within the pharmaceutical industry

Keywords: Drug, intellectual property, license, patent, pharmaceutical

A SYSTEMS PERSPECTIVE TO UNDERSTAND THE PROCESS OF AGEING

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Abstract

Ageing has a profound impact on human society and modern medicine, yet it remains a major puzzle of biology. Study of the mechanisms of ageing our work could also have an impact on diseases, like cancer and neurodegenerative diseases, for which age is a major risk factor. No other biomedical field has so much potential to improve human health as research on the basic mechanisms of ageing. Many genes have been shown to regulate ageing in model systems. It is now necessary, however, to study how these genes interact and how they exert their influence as an aggregate to modulate the ageing process. Numerous bioinformatics resources have been developed to understand how the parts-the genes, influence the ageing process as a whole. Our goal was to enhance our understanding of gene networks and transcriptional regulation during ageing and build better models of ageing that help guide experiments, for example by identifying key network regulators of ageing. 307 aging genes were obtained and their networks were constructed using network biology protocols on Cytoscape and their interactions were analyzed using appropriate plugins. The aging gene network of the mouse was also constructed and the results were compared. The upregulated and downregulated genes were also determined and the constructed networks revealed the already established pathways and novel ones too.

Keywords: Ageing, biology, bioinformatics resources

DETERMINATION OF FORMALDEHYDE CONTENT IN DIFFERENT GRADES OF POLYETHYLENE GLYCOLS BY HPLC

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Abstract

The main objective of the study was to determine formaldehyde content in various grades of PEGs by derivatization using and HPLC method and to compare developed methods in terms of sensitivity and selectivity following validation of proposed methods as per ICH guidelines. For method I, instrument: Shimadzu HPLC, diluent: milli q water, column: intersil ODS 3V, 150X4.6 mm x 5µ, mobile phase: acetonitrile: water(50:50), flow rate: 1.0 ML/min, wavelength: 360 nm, column temperature: 30 °C, run time: 25 min and for method-II, column: XTerra RP 18, 150 X 4.6 mm x 3.5µ, mobile phase: acetonitrile: water (50:50), flow rate: 1.0 ML/min, wavelength: 354 nm, column temperature: 40 °C and run time: 20 min was used and maintained for determination. The purposed method was found to be precise, accurate, linear, robust and LOD and LOQ was found to be for method-I 0.034 and 0.102 and method-II 0.215 and 0.645. The results obtained by all the proposed methods for determination of formaldehyde content in PEGs were reliable, accurate and precise.

Keywords: Formaldehyde, Nash Reagent, 2, 4-DNPH, Derivatization, Polyethylene Glycol, HPLC

A COST ANALYSIS STUDY OF ORAL HYPOGLYCEMIC DRUGS AVAILABLE IN INDIAN MARKET

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Abstract

The main objective of the study was to evaluate the cost of oral hypoglycemic drugs of different generic classes and different brand names of one compound and to evaluate the difference in cost of different brands for the same active drug by calculating percentage variation of cost. The cost of a particular drug being manufactured by different companies, in the same strength, number and dosage form was compared. The difference in the maximum and minimum price of the same drug manufactured by different pharmaceutical companies and the percentage variation in price was calculated. Drugs which are manufactured by one company only or being manufactured by different companies, however, in different strengths were excluded. In single drug therapy, glimepiride (1 mg) shows a maximum variation of 793.75%, while vildagliptin shows a minimum variation of 2.01%. Among sulfonylureas, glimepiride (1 mg) shows maximum price variation of 793.75%, while glipizide (10 mg) shows a variation of 19%. In biguanides and thiazolidinedione's, metformin (500 mg) and pioglitazone (15 mg) show maximum price variation of 366.66% and488.23% respectively. Among the α-glucosidase inhibitors, voglibose shows maximum price variation of 310%. In combination treatment, gliclazide (80 mg)+metformin(500 mg) shows maximum variation of 445.45%. It is observed from our results that there is wide variation in prices of drugs manufactured by different pharmaceutical companies. So it is very necessary for regulatory authorities to regulate the wide variation in drug prices to maximize the benefits of the treatment. It is recommended that the appraisal and management of marketing drugs should be well regulated.

Keywords: Drug price, cost, oral hypoglycemic drugs

FORMULATION AND CHARACTERIZATION OF MUCOADHESIVE MICROSPHERES OF NATEGLINIDE

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Abstract

The purpose of this research work was to formulate galactomannan gum coated microspheres containing nateglinide. Microspheres were prepared and characterized. The surface morphological characteristics of galactomannan gum microspheres were investigated using scanning electron microscopy. The polymer ratio, stirring speed and the temperature affected the particle size, shape and surface morphology of the microspheres. Microspheres were evaluated for drug excipients interactions (DSC and IR spectroscopy), % yield, drug content uniformity, particle size distribution, surface morphology (scanning electron microscopy), percentage moisture loss, *in vitro* drug release profile, and mucoadhesion study by *in vitro* wash off test, short term stability. The mucoadhesive strength of microspheres was determined on goat gastric mucosa. Mucoadhesive microspheres prepared were spherical in shape, size in the range of 2.6-5µm. The microencapsulation efficiency was in the range of 64.75 %-78.36 % and microspheres of formulations showed the adequate mucoadhesive property. The preliminary results of this study suggest that the developed microspheres containing nateglinide could enhance drug entrapment efficiency and modulate the drug release.

Keywords: Nateglinide, mucoadhesive, galactomannan, microencapsulation

ANTIBACTERIAL ACTIVITY OF ISOLATED ENDOPHYTIC FUNGI FROM *MORINGA OLEIFERA* LAM

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Abstract

The main objective of the present study was to isolate the endophytic fungi from medicinal plant *Moringa oleifera* Lam. and observe their antibacterial activity against pathogenic bacteria of the most potent fungal isolate. Collection and isolation of the endophytic fungi from the *M. oleifera* was done. Screening of endophytic fungi for antibacterial activity was seen against three pathogenic bacteria *viz*. *Bacillus subtilis*, *Escherichia coli* and *Salmonella typhimurium* by using agar well diffusion method. A total six endophytic fungi *Sclerotium rolfsii*, *Pleurophragmium* sp., *Phomopsis* sp., *Curvularia lunata*, *Aspergillus flavus* and *Alternaria* sp. were isolated from *M. oleifera* and fungal isolate *Phomopsis* sp. was shown the maximum zone of inhibition against *Salmonella typhimurium* (24.0±0.17 mm), *Escherichia coli* (20.4±0.16 mm) and *Bacillus subtilis* (16.3±0.12 mm). In the present study, we found that endophytic fungal strain *Phomopsis* sp. have a potential source of antibacterial compounds as compare to another fungal isolate.

Keywords: Antibacterial activity, bioactive compounds, medicinal plant

FORMULATION AND CHARACTERIZATION OF OIL IN WATER NANOEMULSION BASED TOPICAL APPLICATION OF ANTICANCER DRUG FOR BREAST CANCER

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Abstract

Fish oil and the gelling agent was used to prepare the nanoparticles and effect were seen on vesicle size, drug entrapment and permeability preparation of Nano emulsion were done by lipid layer hydration. Characterization was done by various methods like entrapment efficiency, particle size analysis, morphology analysis and *in vitro* studies formulation of gel and physicochemical characterization of the nanoemulsion-based gel was carried out. The particle size was ranging from 2-200 μm. average particle size distribution was found 2.19-2.73. % entrapment efficiency was observed 2.45%. *in vitro* studies shows 99.44% release of ratio 1:2

Keywords: Nanoparticles, fish oil, phospholipon 90-G

ANTIFERTILITY ACTIVITY OF ETHANOLIC AND AQUEOUS EXTRACTS OF MORINGA OLEIFERA ON FEMALE WISTAR RATS

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Abstract

The aim of this study was to investigate the antifertility activity of *Moringa oleifera b*ark on female wistar rats. Ethanolic and aqueous extract of the bark of *Moringa oleifera* was study, antifertility activity in proven fertile female wistar rats at the doses 500 mg/kg b. wt./day for 30 d. Different parameters were studied in female wistar rats including phytochemical, the effect of the reproductive outcome, anti-implantation, abortifacient and estrogenic and anti-estrogenic activity, were observed. *Moringa oleifera* (Bark) shown a positive test for alkaloids, steroid, flavonoids, terpene, carbohydrates and tannin. The extract of *Moringa oleifera* has the anti-fertility effect the control rats showed a good number of litters. Treatment of animal with different extracts resulted in a significant ($P<0.05$, $P<0.01$). Antifertility activity (45.8% and 33.5%) was exhibited by AMO and WMO respectively. After 21 d of the extracts free period, the antifertility effect of the extracts was reversed. The extract treatment with AMO, an increase in the percentage of resorption index indicates the failure in development of the embryo. The mean percentage of anti-implantation and abortifacient were found to be highest for AMO-33.88%, WMO 15.41, and AMO-39.20%, WMO-14.95% respectively. The decrement in implantation caused by the extracts may be due to estrogenic or anti-estrogenic activity. However, along with standard AMO exhibiting more potent estrogenic and less potent anti-estrogenic when compared with the standard. Female antifertility agents should include acceptability, safety and efficacy during and after the treatment. The above results revealed the potential, reversible Female antifertility effect of alcoholic extract *Moringa oleifera* bark.

Keywords: *Moringa oleifera*, antifertility, reproductive outcome, anti-implantation, abortifacient study, estrogenic activity, antiestrogenic activity

MOLECULAR DOCKING (SWISS-DOCK) STUDIES: RING SUBSTITUTED NAPHTHYL CHALCONES WITH ON MONOACYLGLYCEROL LIPASE (MAGL) ENZYME

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Abstract

In this study, the binding affinity of a series of substituted naphthyl chalcones towards monoacylglycerol lipase (MAGL) was predicted using Swiss Dock. MAGL is a serine hydrolase that catalyzes the hydrolysis of 2-arachidonyl glycerol (2-AG) into arachidonic acid and glycerol. 2-AG is an endocannabinoid and full agonist toward the cannabinoid receptor type 1 (CB1) that regulate various neurological and metabolic functions such as neuropathic pain, anxiety and neuromodulation. Molecular docking studies were performed using SwissDock. x-ray crystallographic structure of the target enzyme was retrieved from Protein Data Bank (PDB ID: 3PE6). Chemdraw office 11.0 was utilized to build the structures and submitted to SwissDock and the results were visualized using UCSF chimera. Ring-substituted naphthyl chalcones were selected for molecular docking using Swiss dock software. Results showed that these compounds good affinity for the MAGL enzyme. The introduction of halogens on ring B of chalcone increased the binding affinity. The presence of hydroxyl group retained the binding affinity; replacement of hydroxy group with methoxy substitution enhanced the interaction energy. The high binding interaction was observed with 3, 4-dimethoxy substitution on ring B of chalcone which showed-8.27 kcal mol^{-1}. The ring substituted naphthyl chalcones showed a good binding affinity towards MAGL enzyme while highest binding affinity was observed with the dimethoxy derivative. These finding might be useful for the future developments of naphthyl chalcones as potential MAGL inhibitors. Pain pathophysiology and neurobiology remain highly complex. Recent advancements suggest the involvement of several new drug targets and novel strategies for the antinociceptive drug development. MAGL is a serine hydrolase that catalyzes the hydrolysis of 2-arachidonyl glycerol (2-AG) into arachidonic acid and glycerol. 2-AG is an endocannabinoid and full agonist toward the cannabinoid receptor type 1 (CB1) that regulate various neurological and metabolic functions such as neuropathic pain, anxiety and neuromodulation. Thus, MAGL inhibition is a promising strategy to treat diseases in which higher 2-AG concentrations would be beneficial such as pain perception, neuromodulation and anxiety disorders. MAGL can be inhibited by chemical entities such as aryl thioamides, organophosphorus compounds, carbamates, disulphides and maleimides. These agents act either by acting on Ser 122 (Ser-His-Asp triad) or by forming Michael adduct with sulfhydryl groups of cysteine present in the active site.

Keywords: Binding affinity, naphthyl chalcones, monoacylglycerol lipase

DEVELOPMENT OF SOFTWARE FOR THE CALCULATION OF THE MOLECULAR WEIGHT DISTRIBUTION IN LOW-MOLECULAR-WEIGHT HEPARINS ACCORDING TO THE EUROPEAN PHARMACOPOEIA

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Abstract

The main objective of the study was to develop software that would allow a user to automate the calculation of the molecular weight distribution in low-molecular-weight heparins according to the European Pharmacopoeia and eliminate errors related to the calibration curve construction. Exclusion liquid chromatography, regression analysis and Java application development method were adopted. For correct calibration, it is necessary to exclude the areas of the chromatogram that cannot be described by a calibration polynomial of the 3rd degree, namely the area of high molecular weights close to the void volume and the area of low molecular weights where the observed peaks are not heparins. The visualization of the calibration curve provided by software ensures the correct choice of the calibration range. For modern chromatographic columns, a partial separation of homologs in low-molecular-weight heparins is observed, which leads to the oscillations of the calibration curve. Software that uses all the points of the calibration chromatograms enables making the objective calibration. The Java programming platform allows using developed software under various operating systems. The calculation of the molecular weight distribution in low-molecular-weight heparins by manual chromatograms processing may lead to a high risk of making an incorrect decision about the specification compliance. The software that allows a user to automate the calculation of molecular weight distribution in low-molecular-weight heparins in accordance with the European Pharmacopoeia was developed. The use of the developed software enables to identify and prevent errors that impossible to detect by manual chromatograms processing.

Keywords: Low-molecular-weight heparins, molecular weight distribution, chromatograms processing, java programming platform

PHYTOCHEMICAL SCREENING OF LEAF OF A MEDICINAL PLANT OF MOLLUGINACEAE FROM THAR DESERT, RAJASTHAN, INDIA

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Abstract

The present study was carried out to determine the bioactive constituents in leaf extract of *Gisekia pharnaceoides* Linn*.* Belonging to family Molluginaceae. The family *Molluginaceae* is in the major group of Angiosperms possessing Herbs, often creeping and well branched. ***Gisekia Pharnaceoides*** **Linn.** is a diffuse sub succulent, glabrous herb. The extract was prepared by using methanol and ethyl acetate as solvents. The extract of this plant was analyzed using gas chromatography-mass spectrometry. The mass spectra of the compounds analysed in the extract were matched with the National Institute of Standards and Technologies (NIST library). Maximum % area is found for Mome Inositol, it is present in a maximum amount (30.74%) with RT=15.273 min, followed by 9,12,15-octadecatrienoic acid,(Z,Z,Z)-(18.47 %) with RT=19.165 min in the methanolic extract. Tetracontane is present in a maximum amount (35.06%) with RT=37.404 min, followed by 9,12,15-octadecatrienoic acid, (Z,Z,Z)-(14.64%) with RT=19.197 min with ethyl acetate as solvent using the leaf of this plant. The present study investigated that *Gisekia pharnaceoides Linn.* is an important medicinal plant of Thar desert that reveals the presence of many phytochemical compounds that are used as antimicrobial, antitumor, antibacterial and anti-fungal agents. Biologicaly, this plant is important because of is medicinal activity and it gives the source for the researchers to investigate the pilot molecules that could bring the effective drug discovery.

Keywords: *Gisekia pharnaceoides,* bioactive constituent, drug discovery

ISOLATION AND SCREENING OF TANNASE PRODUCING ENDOPHYTIC FUNGI FROM *LANNEACOROMANDELICA*

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Abstract

The present work aims at isolating endophytic fungi from *Lannea coromandelica* having tannase producing abilitiy. These enzymes are involved in the hydrolysis of water-soluble polyphenolic secondary metabolites in plants called tannins into gallic acid and glucose. This tannase enzyme finds several applications in various industries such as foods, animal feeds, cosmetics, pharmaceutical, chemical, leather industries, etc. Endophytic fungi from *Lannea coromandelica* were isolated, identified and was screened using tannic acid agar plate method for tannase activity. Further, the presence of tannin substances in the agro waste was initially examined and their crude extracts were used separately as a substrate for the production of tannase through submerged fermentation. Out of 20 isolated endophytic fungi, only five isolates were tannase-producing fungi. The highest tannase yielding endophytic fungi was identified as *Aspergillus niger* from Lannea *coromandelica.* The tannase enzyme showed temperature and pH optima as 35 °C and 5.5 respectively. Tannase production using agro waste extract can be a very simple and suitable alternative to presently used procedures**.**

Keywords: Endophytic fungi tannase, submerged fermentation

PHYTOCHEMICAL ANALYSIS AND ANTIOXIDANT POTENTIAL OF *PTERIS VITTATA* L

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Abstract

The main objective of the study was phytochemical analysis and antioxidant potential of fronds of *Pteris vittata* L. at various growth stages. Fresh fronds of *Pteris vittata* L. were collected from local area around pune at various growth stages like a vegetative stage (Young and mature fronds without sori) and reproductive stage (Mature fronds with immature sori and mature fronds with mature sori stage). They were extracted with water, alcohol and methanol for preliminary phytochemical analysis. The crude extracts were used to estimate important primary and secondary metabolites and antioxidant activity was determined using *in vitro* assays like free radical scavenging activity by DPPH, FRAP and hydroxyl radical-mediated DNA damage. The results pertaining to phytochemical studies revealed the presence of alkaloids, phenolics, flavonoids, tannins and terpenes. The extract showed comparatively more amounts of proteins, total sugars, reducing sugars and secondary metabolites like phenols, alkaloids, tannins in the reproductive stage as that of vegetative stage. The methanolic extract of fronds harvested at reproductive stage exhibited significant antioxidant activity as compared to vegetative stage tested by aforesaid *in vitro* models. The maximum radical scavenging activity EC_{50} at a concentration of 9.66ug was recorded at reproductive stage. The results of the present investigation would suggest the possible use of *Pteris vittata* L. as a potent source of natural antioxidant, however, the clinical value needs to be further evaluated by characterizing the toxic or undesirable effects.

Keywords: *Pteris vittata*, phytochemical analysis, antioxidant, DPPH, FRAP

BLOOD PRESSURE PROFILES AMONG EAST BONGAS AND WEST BONGASPEOPLE IN EFFORT AND SUPPORT FROM UNIVERSITASPADJADJARANAND THE REGENT OF MAJALENGKA REGENCY AND CHIEVES OF THE VILLAGES

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Abstract

The main objective of the study was to support the people in East Bongas and West Bongas villages for prevention and cure of the hypertension disease, avoid its harmful effects and provide proper information on the condition of blood pressure from the public to the government. This was a cross-sectional design while the subjects were taken by a simple random sampling. 323 families, blood pressure were measured of males and females aged between 18 to 65 y. The blood pressure profile was classified based on JNC 7. The normal blood pressure, pre-hypertension, hypertension stage 1, and hypertension stage 2 were 34.3%, 49.5%, 12.1% and 4.1%, respectively. Prevalence based on sex showed that those who had information about hypertension in males were 46.8%, females were 47.9% and the total of both were 47.4%. Prevalence of patients with hypertension in males were 16.8%, females were 15.7%, and the total of both were 16.2%. Prevalence of patients with hypertension based on the age group 30-39, 40-49, 50-59, and 60-69 y were 6.8%, 15.6%, 33.9%, and 37.3%, respectively. The youngest male and female patients of pre-hypertension were 18 and 22 y, respectively. Based on this information, t*he* people in two villages should be given the appropriate knowledge and awareness regarding hypertension, which can reduce the quality of life.

Keywords: Hypertension, east bongas, west bongas, majalengka regency

EVALUATION OF INTRINSIC STABILITY AND ESTIMATION OF BEPOTASTINE FROM BULK AND LPF USING RP-HPLC

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Abstract

A rapid, precise and accurate stability indicating a RP-HPLC method for estimation of bepotastine besylate was developed and validated as per ICH guidelines. The analysis was achieved on Cromasil ODS-C_{18} (250 mm x 4.6 mm, 5µ) using mobile phase comprises of triethylamine buffer (pH 3.0) and methanol in ratio 35:65 v/v at flow rate 1.2 ml/min. The detection of the drug was carried out using UV detector at 225 nm. The observed chromatogram of the drug shows a sharp and symmetrical peak with reasonable retention time. The calibration curve was linear (r^2-0.997) over the concentration range of 10-50 µg/ml. Intrinsic stability of drug evaluated by stress testing which covered acid, base, peroxide, photolytic and thermal degradation and the reasonable degradation with additional peaks was achieved. The mean % estimation of the drug from bulk and its LPF (Tablets and Capsules) was found nearly to 100%. The method was further validated with respect to linearity, accuracy, precision and robustness. The sensitivity of proposed method was determined as LOQ and LOD values. The method was statistically evaluated and can be applied for routine control analysis of bepotastine besylate in its pharmaceutical formulations.

Keywords: RP-HPLC, LPF, bepotastine besylate (BEP), stress studies

RELATED SUBSTANCES RP-HPLC METHOD DEVELOPMENT AND VALIDATION FOR DETERMINATION OF RASAGILINE IN ITS FORMULATION

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Abstract

A rapid, precise and accurate RP-HPLC method for determination of related substances of rasagiline in its tablet formulation was developed and validated as per ICH guidelines. The analysis was performed on Hypersil BDS C_{18}, (250 mm x 4.6 mm, 5µ) column using UV detector with a mobile phase containing a gradient mixture of solvents A and B which comprises of mix buffer and actonitrile in ratio 90:10 and 10:90 v/v. The flow rate of the mobile phase was 1.0 ml/min with a run time of 55 min. The column temperature was 40 °C and detection wavelength at 215 nm. In the present study, related substances were determined using the RP-HPLC method. The method was further validated with respect to linearity, accuracy, precision robustness, LOQ and LOD according to ICH guidelines. Stress testing which covered acid, base, peroxide, photolytic and thermal degradation was performed to prove the specificity of the method and the degradation was achieved. The method was statistically evaluated and can be applied for routine control analysis of related substances of rasagiline in tablet formulations.

Keywords: Rasagiline, HPLC, rasagiline impurity a, stress degradation study

SYNTHESIS AND CHARACTERIZATION OF FLUTAMIDE LOADED CARBOPOL/POLY (VINYL PYRROLIDONE) BLEND MICROSPHERES: *IN VITRO* RELEASE STUDIES

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Abstract

Carbopol/Poly (vinyl pyrrolidone) (CPL-PVP) blend microspheres were prepared by solvent evaporation technique using poly (Vinyl alcohol) as a stabilizer. Flutamide, an anti-cancer drug was successfully loaded into these microspheres. The effect of experimental variables such as the ratio of carbopol to poly (vinyl pyrrolidone) on flutamide encapsulation efficiency, release rate, size and morphology of the microspheres have been investigated. Flutamide loaded and unloaded microspheres were characterized using FTIR, DSC, X-RD and SEM techniques. Fourier transform infrared spectroscopy was used to explain the miscibility of polymers. Differential scanning calorimetry and X-RD techniques were used to investigate the crystalline nature of the drug after encapsulation in the blend microspheres and also through light on the dispersion of flutamide in the CPL/PVP blend matrix. Scanning electron micrographs indicated the formation of spherical microspheres with distinct size. Flutamide was successfully encapsulated up to 72% in these polymeric matrices. *In vitro* dissolution experiments performed in pH 7.4 buffer medium indicated a controlled release of flutamide from blend microspheres up to 16 h.

Keywords: Carbopol, poly (Vinylpyrrolidone), microspheres, flutamide, *in vitro* release

THE INFLUENCE OF AERATED DRINKS ON THE BLOOD PRESSURE AND HEART RATE OF YOUNG ADULTS

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Abstract

The main objective of the study was to study the relationship of aerated drink consumption on the blood pressure and heart rate of the student population. 50 medical students (25 male and 25 female) volunteered to participate in this study. Ethical clearance was obtained from KMC, Manipal University, Institutional Ethical Committee. The blood pressure and heart rate of the student were taken and recorded as initial blood pressure (pre-test, control). The student was then given 250 ml of aerated drinkin a paper cup and asked to drink it. The student was then asked to rest for 20 min. After 20 min, the blood pressure and heart rate of the student were taken once again (post-test), and the reading was recorded. Mean arterial pressure was calculated. Paired t-test was done to evaluate the effect of drinks in mean arterial pressure and heart rate both in male and female individually. The statistical analysis suggests that there was 0.88±0.10 mm/Hg increase in the mean arterial pressure, subsequent to the consumption of the aerated drink in the male student population and 2.85±0.18 mm/Hg in the female student population. Similarly, 0.76±0.03 beats/minute increase in the heart rate in male population and 1.2±0.05 beats/minute was observed in the female population. The increase is slightly more in the female population, but it is statistically insignificant. In our study aerated drink have not shown a significant effect on mean arterial pressure and heart rate in both males and females. Chronic consumption may have the effect on mean arterial pressure and heart rate, but random consumption may not have a significant effect.

Keywords: Aerated drink, blood pressure, heart rate

HEPATOPROTECTIVE AND RENOPROTECTIVE EFFECTS OF STREPTOZOTOCIN INDUCED DIABETIC RATS TREATED WITH AQUEOUS EXTRACT OF BIXA ORELLANA

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Abstract

The present study aimed to evaluate the effects of the aqueous extract of *Bixa orellana* on the liver enzymes such as AST, ALT and ALP and also to evaluate the efficacy of the extract for the protection of the renal function which included urea, uric acid and creatinine in streptozotocin-induced diabetic rats. Diabetes was induced by administering streptozotocin dissolved in saline while the normal control group was given propylene glycol. Diabetes-induced animals were randomly assigned into different groups. Blood samples were collected from all the control and experimental group. Urea was estimated using urease or glutamate dehydrogenase (GLDH) method. Uric acid was estimated by uricase or phenol and 4-aminoantipyrine (PAP) method, creatinine by modified Jaffe's method. Alkaline phosphatase: modified 2-amino-2-methyl-1-propanol (AMP) method. Alanine transferase (SGPT) and aspartate transferase (SGOT): modified IFCC (International Federation of Clinical Chemistry and Laboratory Medicine) method. The estimations were carried out on day 30 only. The 30 d treatment with the aqueous extract (200 mg/kg body weight) showed no statistical significance with respect to urea and uric acid, but there was statistical significance in the levels of creatinine which is an indicator of glomerular filtration rate. The employed dose of the extract is nontoxic to the kidney. The alteration in the levels of ALT and ALP were highly significant statistically but no changes observed in the level of AST. The present results indicate that the leaves of the plant possess the hepatoprotective property and could be exploited for the development of antidiabetic-hepatoprotective agents.

Keywords: Hepatoprotective, renoprotective, antidiabetic, *Bixa orellana*, standard drug (SD)

NANOCARRIER MEDIATED FORMULATION FOR PERCUTANEOUS DELIVERY OF A VINCA ALKALOID DERIVATIVE

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Abstract

Nanocarrier mediated delivery of an active medicament via percutaneous route for the management of Alzheimer's disease was envisaged as a viable option in the present work and accordingly the aim of the study was to develop and evaluate nano-transfer somal formulation for transdermal delivery of a vinca alkaloid derivative, vinpocetine (VIN). Vinpoectine nano-transfer somal formulations (VNTF) were prepared by solvent evaporation technique using factorial design. A three-factor four-level Box-Behnken design using design expert software version 8.0.7.1 was employed to study the effect of independent variables on dependent variables. Seventeen formulations were prepared according to the experimental design. The vinpocetine liposomal suspension was used as a control for ex-vivo skin permeation studies using Franz diffusion cell. Biological studies were carried against marketed formulation of vinpoceinte on rodent model. Results indicated that the nanotransfersomes of vinpocetine provides smaller particle size, reasonable entrapment efficiency, better flux and improved elasticity, more effectiveness for transdermal delivery as compared to rigid liposomes. Optimized nanotransfersomal vinpocetine formulation with mean particle size 32.74±26.11 nm showed 95.29±0.86% entrapment efficiency, achieved mean transdermal flux of 959.63±39.80 μg/cm^2/h and elasticity of 72.87. Ex-vivo study of nanotransfersomal formulation showed a significant increase in flux and entrapment efficiency ($p<0.05$) compared with control vinpocetine liposomal suspension. *In vivo* pharmacokinetic study of nanotransfersomal transdermal therapeutic system showed a significant increase in bioavailability (1.4 times) compared with an oral suspension of vinpocetine tablet (Neurovin®). The above results suggest that our in-house nanotransfersomes based formulation is a promising carrier for transdermal delivery of vinpocetine for effective management of alzheimer's disease.

Keywords: Vinpocetine, Alzheimer's disease, Transfersomes, percutaneous

AN *IN VITRO* STUDY OF ANGIOTENSIN-CONVERTING ENZYME ACTIVITY IN SHEEP TISSUESUSING TWO DIFFERENT SUBSTRATES

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Abstract

Angiotensin-converting enzyme (ACE; dipeptidylcarboxypeptidaseI; EC 3.4.15.1) is a halide-activated endopeptidase that converts decapeptide angiotensin I (ANG I) to the octapeptide angiotensin II, with the release of dipeptide histidyl-leucine from the carboxy terminus of ANG I. ACE has many natural substrates apart from ANG 1. The present *in vitro* study was undertaken to see if any changes occur in the enzymatic/catalytic differences in ACE activity when two different synthetic substrates like Hip-His-Leu (HHL) and Hip-Gly-Gly (HGG) are used. Tissue ACE activity in kidney, lung and testis was measured with Hippuryl-Histidyl-Leucine (HHL) and Hippuryl-Glycyl-Glycine (HGG) as substrates by quantifying the amount of hippuric acid released spectrophotometrically at 228 nm. Substrate saturation study was performed in the presence of tissue extracts with substrate concentration varying from 1 mmol-8 mmol with both substrates. Ethical clearance was taken for this study from the institutional ethical clearance committee. The linearity of ACE activity with kidney, lung, and testis was established with HHL and HGG as substrates for 30 min incubation time. ACE activity (in Unit/gm/min) of the kidney was 17.77 for HHL and 17.79 for HGG; Lung 21.69for HHL and 21.64 for HGG and Testis 29.5 for HHL and 29.37 for HGG. Vmax was observed at 5 mmol for kidney ACE, 5.1 mmol for lung ACE and 4.8 mmol for testicular ACE. Though the substrates were differing in their C-terminal amino acids, a significant difference in ACE activity was not observed between two substrates. ACE acting as dipeptidyl carboxypeptidase cleaves dipeptide from the carboxy terminal end. Our results are consistent with ACE from 3 different sources against two different substrates even with the non-purified enzyme.

Keywords: Angiotensin-converting enzyme, HHL, HGG, captopril

EFFECT OF *ANDROGRAPHIS PANICULATA* METHANOLIC EXTRACT ON RATE OF HAEMOLYSIS OF RBC FROM DIFFERENT BLOOD GROUPS EXPOSED TO NAJA NAJA VENOM

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Abstract

The venom of Indian spectacled cobra (Najanaja) even though primarily neurotoxic, also causes hemolysis due to the presence of phospholipase A_2, which acts on RBC membrane phospholipids. Membranes of RBCs differ between blood groups due to the presence of varied blood group antigens. The present study investigates whether there is a difference in the extent of hemolysis in different blood groups by Najanaja (N. N) venom. The antihaemolytic of the effect of methanolic extract of *Andrographis paniculata*, (*A. paniculata)* a herb which has been used in many Asian countries in the treatment of cobra bites is also studied. The objective of the study was to find the effect of *A. paniculata* methanolic extract on the rate of haemolysis of RBCs from different blood groups exposed to Najanaja venom. IEC permission was obtained for conducting this study. Heparinized blood samples from normal individuals (n = 6 each) with blood groups A^+, B^+ AB^+ and O^+ were obtained. RBC suspensions were prepared according to the method of Robert *et al.* 250µl of the suspensions were treated with 1% triton(group: 1positive control), PBS (group 2:negative control), 100µg venom (group 3: test control). Test groups (4 and 5: containing 200 µg and 500µg AP extract in addition to venom). RBCs of O^+blood group were hemolysed to the highest extent (3.5±0.8%) and AB^+ the least (2.4±1.4%) when exposed to the venom. AP extract reduced the hemolysis to the extent of 20% in A^+ and B^+RBCs. It had no effect on hemolysis of $O^+$and AB^+RBCs. Blood group antigens on RBC membranes influence their stability towards snake venom enzymes. Blood group $O^+$is the most common in the Indian population with a distribution of 35% and it is most susceptible to hemolysis by N. N venom. This is a hitherto unreported finding. AP extract was only partially effective in reducing hemolysis and may have to be used in combination with other herbal constituents to address hemolysis.

Keywords: *Andrographis paniculata,* hemolysis, najanaja

EVALUATION OF THYMOQUINONE AND THYMOQUINONE PRONIOSOMAL FORMULATION IN METHOTREXATE INDUCED HEPATOTOXICITY IN RATS

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Abstract

The present study evaluated the role of thymoquinone and thymoquinone proniosomal formulation in methotrexate-induced hepatotoxicity in rats. Physico-chemical characterization of TQ proniosomal formulation was carried by determining the micromeritic properties, vesicle size and morphology, entrapment efficiency, *in vitro* drug release, differential scanning calorimetry, ex-vivo permeation and stability studies. Animal studies were carried out using Wistar albino rats divided into six groups with five animals in each group. Group I received normal saline (1 ml/kg) per orally (p. o.),Group II received Mtx (20 mg/kg) i. p on day1 as a single dose, Group III received a single dose of Mtx (20 mg/kg) i. p on day1 and TQ (TQ 20 mg/kg p. o), for 7 d, Group IV a single dose of Mtx (20 mg/kg) i. p on day1and N-acetyl cysteine (NAC) 200 mg/kg p. o., for 7 d, Group V received a single dose of Mtx (20 mg/kg) i. p on day1 and placebo formulation (1m/kg) p. o. for 7 d, Group VI a single dose of Mtx (20 mg/kg) i. p on day 1and TQP (TQ proniosomal formulation) equivalent to the dose of 20 mg/kg of TQ p. o. for 7 d. On day 8, rats were anesthetized with ether and blood samples were withdrawn and livers were dissected out for biochemical, markers of oxidative stress and histopathological examinations. Administration of Mtx resulted in significant elevation of ALT, AST, ALP and TBARs. TQ and TQP treatment reduced the levels of ALT, AST, ALP and TBARs. Mtx also showed reduction of GSH, Catalase and SOD levels. TQ and TQP treatment restored these levels. Histopathological examination confirms the protection of liver in different drug treated groups. The present study is one of its kinds to demonstrate the hepatoprotective effect of TQ and TQP in methotrexate-induced hepatotoxicity. Thus, TQ has the potential to be the promising drug for choice in hepatotoxicity.

Keywords: Hepatotoxicity, thymoquinone, methotrexate

GUGGULIPID PROTECTS AGAINST ISCHEMIC BRAIN INJURY IN A MIDDLE CEREBRAL ARTERY OCCLUSION MODEL OF CEREBRAL ISCHEMIA IN RAT

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Abstract

The present study was designed to test the pretreatment doses of guggulipid (50 mg/kg), aspirin (100 mg/kg) per orally and co-administration of both drugs for 28 d followed by middle cerebral artery occlusion-a model of focal cerebral ischemia in rats. Regional blood flow was recorded of control rat. The middle cerebral artery was occluded for 2 h followed by reperfusion for 22 h for the induction of focal cerebral ischemia in rats. Regional cerebral blood flow was performed before sacrificing the animal. After blood flow meter tests, the animals were sacrificed for the measurement of infarction areas and biochemical estimations in the brain. Regional cerebral blood flow was significantly improved in guggulipid and aspirin pretreated rats. Guggulipid and aspirin pretreatment reduced the infarction areas as compared with middle cerebral occluded (MCAO) rats. An elevation of GGT, TNF-α level and caspase-3 levels were observed following MCAO. Pretreatment with guggulipid and aspirin caused a reduction in GGT, TNF-α level and caspase-3 levels as compared with MCAO rats. The protective effects observed in the present study were due to the antioxidant, anti-inflammatory and anti-apoptotic properties of guggulipid. The protective effect of guggulipid in cerebral ischemia that it may have a role in reversing the symptoms and may offer significant neuroprotection in stroke.

Keywords: Guggulipid, aspirin, neuroprotection

PROFILING OF SECONDARY METABOLITES AND ANTIMICROBIAL ACTIVITY OF *CRATEVA RELIGIOSA* G. FORST.-A RARE MEDICINAL PLANT OF MAHARASHTRA INDIA

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Abstract

Profiling of secondary metabolites and antimicrobial activity of different parts of *Crateva religiosa* was carried out for validating the ethno medicinal claims. Three major parts of this plant viz., roots, stem and leaves were studied for physiochemical study, organoleptic study and fluorescent analysis. qualitative and quantitative analysis of major secondary metabolites was also carried out using standard procedures. All three parts were extracted successively using chloroform, dichloromethane and 50% ethanol as solvents which were analyzed by gas chromatography–mass spectrometry (GC-MS) method to separate and identify the individual compounds in all the nine extracts. Antimicrobial activities of all nine extracts of understudy parts (three of each plant part) were tested against 4 pathogenic bacterial strains (Two gram-positive and two gram-negative) and two fungal strains. The results of antimicrobial activity were also compared with the results of standard antibiotics. The physiochemical results determined that percentage of moisture content was higher in leaves while as Ash content was found to be higher in stem followed by its leaves and roots. Highest extractive values were found in 50% ethanol extracts of roots followed by its leaves and stem. The organoleptic study characterized color, texture, taste and smell of powder of understudy plant parts while as chemical behaviour was analyzed by fluorescent analysis. The qualitative analysis showed the presence of various secondary metabolites among which major groups were quantified. By GC-MS analysis a total of 94 compounds were identified among which 25 were secondary metabolites. A profile of identified secondary metabolites was prepared from the results of the GC-MS analysis. Some extracts showed significant activity against both bacterial and fungal strains while as the resistance of these strains to some extracts was also noted. The results suggest that this plant has a vast variety of phytochemicals which can be used as an effective remedy for various ailments and drug formulations in future. The ethnic claims of this plant were also verified by the present study.

Keywords: GC-MS, secondary metabolite profiling, anti-microbial activity

ANTIOXIDANT POTENTIAL OF CRUDE ETHANOLIC EXTRACT AND FRACTION OF *MIMOSA HAMATA*

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Abstract

The present study aimed to evaluate the phenolic compounds and *in vitro* antioxidant properties of ethanolic extract and selected fraction of *Mimosa hamata* whole plant. Studies were carried out in terms of ethanolic extraction of *M. hamata* and for separation of bioactive compounds; the crude extract of *M. hamata* was fractionated by using column chromatography. This study was also determined the highest total phenolic and flavonoid content of extract and fraction of *M. hamata*. Antioxidant activity of extract and selected fraction were screened by DPPH and H_2O_2 radical scavenging activity methods. Phytochemical analysis of the extract of *M. hamata* indicated the presence of phenols and flavonoids in the plant. The highest total phenolic content was observed in the IG fraction of *M. hamata* (654.33±0.008 mg/g). The highest total flavonoid content was observed in the IG fraction of *M. hamata* (689.66±0.032 mg/g) in comparison to other fractions. The present investigation showed that ethanolic extract and fraction of *M. hamata* at various concentrations have the good antioxidant capacity. Therefore, the selected fraction of *M. hamata* (IG Fraction) was contained higher quantities of phenolic compounds, which exhibited significant antioxidant and free radical scavenging activity. The overall results of the present studies were indicated that IG fraction of *M. hamata* was a good source of phenolic compounds. As these bioactive compounds have been of interest for health benefits, the present analytical study proved a potential application to identify and quantify the phenolic compounds in plant extract and fractions.

Keywords: *Mimosa hamata* wild, total phenolic content, antioxidant activity, 2, 2-diphenyl-1-picryhydrazyl (DPPH)

ANTIBACTERIAL ACTION OF CRUDE EXTRACT OF *SCILLA INDICA* BULBS AGAINST PATHOGENIC BACTERIA

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Abstract

The uses of plants in the treatment of various infectious disease is common in traditional medicine. The present investigation was aimed to study the antibacterial activity of crude extract of the bulb of *Scilla indica* belonging to family Asperagaceae, earlier placed in Liliaceae. Soxhlet extract of dried bulb in ethanol and acetone was assessed for their antibacterial activity against two Gram-positive bacteria *Staphylococcus aureus* and *Bacillus sabtilis* and two Gram-negative bacteria, *Escherichia coli* and *Pseudomonas aeruginosa*. Zone of inhibition analysis was done by using disc diffusion method. The extract showed significant activity against all pathogenic bacteria, but the maximum zone of inhibition was seen in ethanol 75% on *Pseudomonas aeruginosa* bacteria. Thus the medicinal plant *Scilla indica* could be a source to obtain new and effective antibacterial medicine to treat infectious diseases and may be used for future antibacterial drugs.

Keywords: Antibacterial activity, *scilla indica*, zone of inhibition, *staphylococcus aureus*, *bacillus sabtilis, escherichia coli*, *pseudomonas aeruginosa*, disc diffusion method

DESIGN, FORMULATION AND *IN VITRO* DRUG RELEASE FROM TRANSDERMAL PATCHES CONTAINING IMIPRAMINE HYDROCHLORIDE AS MODEL DRUG

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Abstract

The aim of the present investigation was to form matrix type transdermal patches containing Imipramine hydrochloride were prepared using two polymers by solvent evaporation technique to minimize the dose of the drug for lesser side effect and increase the bioavailability of the drug. In the present study, drug loaded matrix type transdermal films of imipramine hydrochloride were prepared by a solvent evaporation method with the help of polymers along with Polyethylene glycol (PEG) 400 was used as plasticizer and dimethyl sulfoxide (DMSO) was used as penetration enhancer. Drug polymer interactions determine by FTIR and a standard calibration curve of Imipramine hydrochloride was determine by using UV estimation. The formulated transdermal patch by using PVP K-30, HPMC K100M showed good physical properties. All prepared formulations indicated good physical stability. *In vitro* drug permeation studies of formulations were performed by using K-C diffusion cells using abdomen skin of Wistar albino rat. The result, showed best *in vitro* skin permeation through rat skin as compared to all other formulations prepared with a hydrophilic polymer containing permeation enhancer. It was observed that the formulation containing HPMC: PVP K-30 (8:2) showed ideal higuchi release kinetics. On the basis of *in vitro* drug release through skin permeation performance, Formulation F1 was found to be better than other formulations and it was selected as the optimized formulation. In conclusion, controlled release TDDS patches of imipramine hydrochloride can be prepared using the polymer combinations, with plasticizer and enhancer. The release rate of drug through patched increased simultaneously as the concentration of hydrophilic polymer was increased. However, the mechanism of drug release of all formulations was non-Fickian. The properties of the film did not change during the period of study.

Keywords: Imipramine hydrochloride, transdermal patch, PVP K-30, HPMC K100M, solvent evaporation technique, *in vitro* skin permeation

STUDIES ON MIXED EXTRACT (PETROLEUM ETHER AND ETHANOLIC) OF *CURCUMA AMADA* RHIZOMES AND CURCUMIN LOADED TRANSFEROSOMES FOR WOUND HEALING POTENTIAL

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Abstract

The purpose of this study was to investigate the potential of the curcumin-containing ointments formed in different solvents (Ethanol and Petroleum ether) and a comparative study between the high feasibility containing ointment and curcumin loaded transferosomes. The drug "*Curcuma amada"* rhizome part was selected for the study. Successive solvent extraction is completed using a solvent as petroleum ether, ethanol, ethyl acetate and water. UV spectrophotometry and thin layer chromatography techniques were used for the qualitative and quantitative estimation of phytoconstituents. Formulations of ointments containing different solvent extract and curcumin loaded transferosomes were prepared. Parameters for characterization of transferosomes were optical study, percentage entrapment efficiency. Wound healing evaluation parameters were wound contraction measurement, epithelialization, tensile strength, hydroxyproline estimation. *In vivo* studies on incision and excision wound models. It was found that 10% ethanolic extract of curcumin ointment showed 99% wound contraction on 15^{th} day with increased collagen, fibroblasts and blood vessels and it possesses a distinct prohealing stroke. The curcumin loaded transferosomes also showed better activity compared to ointment demonstrating by a significant ($p<0.001$) increase in hydroxyproline content and tensile strength. All the results were significant ($p<0.001$) when compared to control. *Curcuma amada* has properties that render it capable of promoting wound healing potential and novel drug formulation like transferosomes can be a better option for skin treatment than ointments.

Keywords: *Curcuma longa*, transferosomes, wound healing, incision and excision wound model

EXPLORING THE ROLE OF ECLIPTA ALBA IN WOUND HEALING POTENTIAL AGAINST STEROIDAL DRUG DEXAMETHASONE, RETARDED WOUND HEALING PROCESS

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Abstract

The purpose of this study was to investigate the activity of *Eclipta alba* against the steroidal drug dexamethasone retarded wound healing process. The drug *Eclipta alba* (leaves) was selected for the study. Successive solvent extraction (petroleum ether, ethanol and water) was performed using Soxhlet apparatus. Chromatography studies were used for the detection of phytoconstituents. Formulation (ointment) was prepared by fusion method. The parameters for evaluation of ointment were pH, spreadability, skin irritation. *In vivo* study for normal wound healing potential was performed using incision and excision wound model. The parameters for wound healing activity as epithelization period, tensile strength, % wound contraction measurement, hydroxyproline estimation and histopathological study. The response of 10% ethanolic extract ointment of *Eclipta alba* depicted a good period of epithelization was observed on 20^{th} day, 100% wound contraction was achieved on 24^{th} day, it showed significant results (**$p<0.01$), the histopathological study of skin tissues shown remarkable changes in transverse sections. *Eclipta alba* renders good wound healing activity against steroidal drug dexamethasone that impaired wound healing.

Keywords: *Eclipta alba*, dexamethasone, ointment, wound healing, incision, excision wound model

PHYTOCHEMICAL ANALYSIS AND *IN VITRO* FREE RADICAL SCAVENGING ACTIVITY OF SUCCESSIVE EXTRACTS OF *ALYSICARPUS VAGINALIS* VAR*. NUMMULARIFOLIUS* (DC.) MIQ

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Abstract

The present study was carried to evaluate free radical scavenging activity and phytochemical analysis of successive extraction with hexane (AVH), ethyl acetate (AVE) and methanol (AVM) of *Alysicarpus vaginalis* var*. nummularifolius* (DC), a herb used in home remedies. The entire plant was dried and powdered, successively extracted (soxhlet apparatus) and concentrated using rotary vacuum evaporator. The extracts were quantitatively analyzed for phytochemicals like total phenolic, flavanoids, alkaloids and carbohydrates following standard methods. The free radical scavenging activity was evaluated with DPPH (1,1-diphenyl-2-picrylhydrazyl), nitric oxide radical and hydrogen peroxide scavenging reactions. The quantitative phytochemical studies of the crude extracts showed that AVM extract with highest phenolic, flavanoid, alkaloid and carbohydrate content which is followed by AVE and AVH. The IC_{50} values of AVH, AVE and AVM for scavenging DPPH, nitric oxide and hydrogen peroxide were 589.21±0.09µg/ml, 254.65±0.08µg/ml and 261.40±0.08µg/ml; 533.81±0.09µg/ml, 362.07± 0.09µg/ml and 456.36±0.08µ/ml; 464.66±0.08µg/ml, 38029±0.08µg/ml and 367.6±0.08 µg/ml respectively. The present study revealed that AVM extracts having high polyphenolic compounds when compared with AVE and AVH. The free radical scavenging reaction was greater in ethyl acetate and methanol extracts. This suggests that due to the high antioxidant reactions, these extracts can be useful for the treatment of oxidative stress related diseases.

Keywords: *Alysicarpus vaginalis* var*. nummularifolius* (DC), phytochemical analysis, antioxidant, free radical, phenolic

MOLYBDENUM BLUE METHOD FOR THE SPECTROPHOTOMETRIC DETERMINATION OF CARBAZAPINE AND OXCARBAZEPINE

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Abstract

A simple, accurate, precise and easy spectrophotometric method for the determination of carbazapine and oxcarbazepine in pharmaceutical formulations using molybdenum blue method was developed by the authors. Aqueous solution of the drug sample on reaction with ammonium molybdate solution and hydrazine sulphate solution on heating for 5 min at a temperature of 60 °C gave a clear, stable and intense blue coloured molybdenum blue complex. JASCO V750 UV-VIS double beam spectrophotometer with matched set of cuvettes was used for the absorbance measurements. This molybdenum blue showed a λmax at 823 nm for carbamazepine and 824.5 nm for oxcarbazepine. Beer's law was found to be obeyed in the range 0.02-0.08 mg/ml for the farmer and 0.04-0.08 mg/ml for the latter. The correlation coefficient was found to be 0.998 and 0.997 for the two drugs under study. The method developed and validated was found to be sensitive, accurate, precise, easy and simple on comparison with the existing methods for quantitative analysis. The method was applied for the assay of the commercially available formulations of the drugs under study and found to be useful in quality control in industry.

Keywords: Carbazapine and oxcarbazepine molybdenum blue, ammonium molybdate, spectrophotometry, carboxamides, antiepileptic agent

PREPARATION AND EVALUATION OF MULTI DRUG LOADED GASTRORETENTIVE FILMS FOR EFFECTIVE MANAGEMENT OF *H. PYLORI* INFECTION

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Abstract

The objective of present study was to prepare and evaluate the triple therapy based site specific mucoadhesive gastro retentive (GR) chitosan-polyacrylic acid (PAA) interpolymer complex (IPC) films and chitosan GR films to provide a more direct delivery of the drugs to combat the *H. pylori* bacteria. The mucoadhesive GR films were prepared using solvent casting method. Various formulation variables i.e. the percentage of glycerol plasticizer, the concentration of chitosan and chitosan: PAA ratio, were optimized on the basis of their effect on film weight, thickness, folding endurance and tensile strength. Optimized GR films were evaluated for various attributions viz. percent swelling, *In vitro* residence time. Drug content uniformity, *Ex vivo* drug permeation studies and *In vitro* pH-responsive drugs release profiles of all three drugs in simulated gastric fluid (pH 1.2) were determined using UV spectrophotometry. Further, IPC films were characterized by scanning electron microscopy, Fourier transforms infrared spectroscopy, differential scanning calorimetry. *In vitro* bacterial cell line study was carried out in the isolated culture of *H. pylori* to evaluate the *in vitro* antibacterial efficacy of the formulations. *In vivo* bacterial clearance study and histopathological study were also carried out on wistar rats under fed conditions to evaluate the efficacy of formulations for anti-*H. pylori* effect. The drugs loaded CH-PAA IPC film formulation exhibited better clearance rate and provide 2 times and 3 times greater anti-*H. pylori* activity than CH film formulation and plain drugs solution, respectively due to their mucoadhesive nature and increased residence time in the stomach.

Keywords: Mucoadhesive gastro retentive films, chitosan, polyacrylic acid, *H. pylori*

SYNTHESIS, CHARACTERISATION AND BIOLGICAL EVALUATION IT DOCKING OF SOME NOVEL SUBSTITUTED 1, 3-THAIZINE DERIVATIVES

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Abstract

In the present study, a novel series of biologically active 8-benzylidene-6-tert-butyl-4-phenyl-5, 6, 7, 8-tetrahydro--benzo-1, 3-thiazin-2-imines derivatives (TB_1-TB_{12}) have been synthesized by using 4-tert-butylcyclohexanone on Claisen-Schmidt condensation with various aromatic aldehydes in the presence of dilute sodium hydroxide afforded the corresponding 2, 6-dibenzylidene-4-tert-butylcyclohexanone. Further, these compounds are subjected to cyclocondensation with thiourea, catalyzed by aqueous potassium hydroxide to form 4-aryl 8-arylidene 5,6-dihydro-2-imino-6-methyl-4H,7H-(3,1) benzothiazines. The structures of the newly synthesized compounds have been established on the basis of their spectral data and elemental analysis. The antimicrobial activity of the synthesized compounds was evaluated *in vitro* method against sensitive organisms, and also they are subjected to molecular properties prediction, toxicity, drug-likeness, lipophilicity and solubility parameters determination using Osiris program, Molsoft, Prototox and ALOGPS 2.1 software. The synthesized 1, 3-thaizine derivatives exhibited significant anticonvulsant activity measured by pentylenetetrazole (PTZ) model by using diphenyl hydantain as standard. The binding mode of the synthesized compounds with active protein site was predicted using docking method.

Keywords: Thiazine, anticonvulsant, antimicrobial activities, molecular docking

SYNTHESIS, CHARACTERISATION, BIOLOGICAL EVALUATION and DOCKING OF SOME NOVEL SUBSTITUTED 1, 3-THAIZINE DERIVATIVES

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Abstract

Chalcones and their heterocyclic analogs represent an important class of small molecules having wide pharmacological activities. Therefore, in this study, synthesis and anticonvulsant and antimicrobial activities of some new 1, 3-thiazines were described. The reaction of 4-tert-butylcyclohexanone on Claisen-Schmidt condensation with various aromatic aldehydes in the presence of dilute sodium hydroxide afforded the corresponding chalcones. Further, these compounds are subjected to cyclocondensation with thiourea, catalyzed by aqueous potassium hydroxide to form 4-aryl 8-arylidene 5,6-dihydro-2-imino-6-methyl-4H,7H-(3,1) benzothiazines. The structures of the newly synthesized compounds have been established on the basis of their spectral data and elemental analysis. The newly synthesized compounds were tested for their biological screening. Antimicrobial activity cup plate agar diffusion and antiepileptic activity by pentylenetetrazole (PTZ) induced seizures model using diphenyl hydantain as standard and also they are subjected to molecular properties prediction, toxicity, drug-likeness, lipophilicity and solubility parameters determination using Osiris program, Molsoft, Prototox and ALOGPS 2.1 softwares. The binding mode of the synthesized compounds with active protein site was predicted using docking method. Most of the compounds showed good anticonvulsant as well as antimicrobial activities but is less than the standard drugs. 1,3-thiazines were more potent and among them, Compound TB_7 containing 3,4,5-trimethoxyphenyl moiety was most potent of the series. We described the synthesis and biological screening of some novel 1,3-thiazine derivatives. In particular, compounds with electron withdrawing substituents.

Keywords: Thiazine, Anticonvulsant, Antimicrobial Activities, Molecular Docking

DESIGN AND DEVELOPMENT OF NDDS FORMULATION OF ANTIRETROVIRAL DRUGS FOR THE TREATMENT OF CHRONIC DISEASE HIV/AIDS

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Abstract

Novel drug delivery system presents an opportunity for formulation scientists to overcome the many challenges associated with antiretroviral drug therapy. Most of these drugs bear some significant drawbacks such as relatively short half-life, low bioavailability, poor permeability and undesirable side effects. Effects have been made to develop such dosage forms for antiretroviral agents to reduce the dosing frequency, increase the bioavailability and decrease the degradation in the GIT tract, improve the CNS penetration and inhibit the CNS efflux and deliver them to the target cells selectively with minimal side effects. As per literature review, various systems such as sustained release tablets, ceramic implants, nanoparticles, liposomes, emulsions, aspasome, micro-emulsion, nano-powder, transdermal patches and pheroids are summarized. This review highlights the significant potential that novel drug delivery systems have for the future effective treatment of HIV/AIDS patients on ARV drug therapy.

Keywords: HIV/AIDS, novel drug delivery systems, antiretroviral drugs, transdermal patches

IN VITRO MODELS FOR THE PREDICTION OF *IN VIVO* PERFORMANCE OF ORAL DOSAGE FORM

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Abstract

Developing and optimizing innovative, predictive oral biopharmaceutical tools by overcoming the limitations of traditional pharmacopoeia-listed apparatus was aimed for the study. Accurate prediction of the *in vivo* biopharmaceutical performance of oral drug formulations is critical to efficient drug development. Traditionally, *in vitro* evaluation of oral drug formulations has focused on disintegration and dissolution testing for quality control purposes. The connection with *in vivo* biopharmaceutical performance has often been ignored. Concomitantly, the increasing demand for complex formulations to overcome low drug solubility or to control drug release rates urges the development of new *in vitro* tools. Both pharmacopoeia-listed and more advanced tools along with major issues limiting the predictive power of traditional tools are studied. A combination of physiochemical measurements, *in vitro* tests, *in vivo* methods, and physiology-based pharmacokinetic modelling is expected to create a unique knowledge platform, enabling bottlenecks in drug development to be removed and the whole process of drug development to become more efficient. A toolkit of *in vitro* tests is needed with tools of varying complexity, along with better understanding of when to use which tool for which product, at which state of development. This combination of 'toolbox' and decision tree for their implementation is expected to significantly improve and accelerate the translation of important new drugs to the patient.

Keywords: *In vitro* models, prediction of oral dosage form

PRELIMINARY PHYTOCHEMICAL ANALYSIS OF THE DIFFERENT EXTRACTS OF LITSEA FLORIBUNDA LEAVES SRINIVASS. G. AND Y. L. KRISHNAMURTHY

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Abstract

Litsea floribunda (Blume) Gamble is a dioecious, endemic medicinally important tree belongs to family Lauraceae. In the present study was carried out to investigate the preliminary phytochemical analysis of a different extract of *Litsea floribunda* leaves. The powder material of *L. floribunda* was successively extracted by soxhlet apparatus with different solvents such as aqueous, methanol, petroleum ether and chloroform. The results of the phytochemical analysis of different solvent leaves extracts of *L. floribunda* showed that alkaloids, flavonoids, saponins, sterols, phenol and triterpenoids are present. The phytochemical analysis showed that the tree leaves rich in commercial and pharmaceutical compounds for curing of various diseases. It is expected that the important phytochemical properties recognized by our study in the indigenous medicinal plants of Western Ghats of Karnataka will be very useful in the curing of various diseases of this region.

Keywords: Extraction, *Litsea floribunda,* lauraceae, phytochemicals, Western Ghats

INVESTIGATION OF EFFECT OF OSMOLYTES ON THE ENZYMATIC ACTIVITY OF DHFR UNDER CHEMICAL AND HEAT INDUCED STRESS

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Abstract

The main objective of the study was to study the effect of osmolytes on the functionality of DHFR under stress conditions. The protein is overexpressed. The overexpression is checked on a 12% SDS gel. The protein is purified by Ni-NTA affinity chromatography. The activity of the enzyme DHFR is checked under heat and chemical stress and then in the presence of different osmolytes with the help of spectrophotometer. Dihydrofolate is used as the substrate. The osmolytes such as DMSO, β alanine, maltose, etc., help in enhancing the functionality and stability of the protein. They decrease the formation of inclusion bodies. Osmolytes are widely present molecules typically accumulated during the stress conditions in the cells. They act as osmoprotectants and contribute to protein folding. They enable the protein to bury the backbone into the core of protein fold and thereby impart stability to the protein. In the current study, we observe the effect of these osmolytes on the stability and functionality of DHFR protein. DHFR is one of the important enzymes of the folate metabolism. The present study helps us in determining how osmolytes efficiently enhance the stability and functioning of DHFR in stress conditions. This will enable us in designing of small suitable molecules that can help in imparting stability to aggregation-prone proteins that are of medical or commercial importance.

Keywords: Osmolytes, Protein, Chromatography

NICLOSAMIDE LOADED MESOPOROUS DRUG DELIVERY SYSTEM: PREPARATION, CHARACTERIZATION, RELEASE AND CYTOTOXIC STUDY

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Abstract

Recently, reports on the anticancer potential of niclosamide have emerged which open a new avenue for anticancer treatment. Niclosamide belongs to the BCS class II and faces problems of poor solubility and dissolution. The aim of the study was to improve the dissolution rate of the drug by using mesoporous drug delivery system. The porous silica grades (ordered and nonordered) with different pore size, pore volume and surface area were used for the study. Solvent evaporation method was used for loading the drug on silica carriers. These drug-loaded silica based formulations were characterized by BET surface area analysis, SEM, P-XRD, DSC, and FTIR. A new dissolution medium was developed for performing the *in vitro* dissolution of niclosamide, to enable discrimination between the formulations. All silica based formulations showed improved dissolution rate compared to niclosamide plain drug. The 2:1 drug: carrier loaded systems showed higher dissolution rate high than 1:1 systems. Cytotoxicity effect of screened mesoporous formulations of niclosamide was explored in HCT-116, HCT-15, NCI, MDA-MB-231 and A549 cell lines. Significant enhancement was observed when compared to the plain drug. Silica-based mesoporous drug delivery system show potential in improving drug release and subsequently their therapeutic efficacy.

Keywords: Anticancer, niclosamide, drug delivery system

FORMULATION AND EVALUATION OF CYCLODEXTRIN COMPLEXES FOR IMPROVED ANTICANCER ACTIVITY OF REPURPOSED DRUG: NICLOSAMIDE

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Abstract

Drug repurposing is the process of developing new indications for existing, failed or abandoned drugs or advanced clinical candidates. Recently, drug repurposing studies of an anthelmintic drug niclosamide (NCL) showed promising anticancer activity. NCL belongs to BCS class II and faces problems of poor solubility and dissolution. To address these issues, present study aim towards the development of cyclodextrin (CD) complexes of NCL. CD complexes of NCL prepared based on phase solubility study and jobs plot using β-cyclodextrin (β-CD) and hydroxypropyl (HP-β-CD) by different techniques such as kneading, co-evaporation and freeze drying in different molar ratio. The prepared complexes were characterized by UV spectroscopy, FTIR, SEM, PXRD andDSC. Prepared formulations were evaluated for *in vitro* dissolution and *in vitro* cytotoxicity studies. Phase solubility study and Job's plot indicate and that β-CD and HP-β-CD form complexes in 1:1 and 1:2 ratios. Poor yield, failure to enhance the dissolution and increased bulk of final formulation leads to turn down the all three preparation methods. Use of co-solvent and the combination of rota-evaporation and freeze drying technique along with ionization method provide improved complexation efficiency and the more uniform product was obtained. Significant enhancement in aqueous solubility and dissolution of NCL has been observed due to complexation. Final formulation was screened for it's *in vitro* cytotoxicity studies in different cell lines. However, significant improvement in cytotoxicity was observed with the HCT-15 cell line.

Keywords: Repurposing studies, anthelmintic drug, niclosamide

PHYTOCHEMICAL EVALUATION AND CYTOTOXIC EFFECT OF *SOLANUM MACRANTHUM* ON BREAST CANCER LINE

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Abstract

The study was undertaken to characterize the constituents of *solanum macranthum* fruit extract and it's *in vitro* cytotoxic effects on breast cancer MDA-MB cell line. The constituents of *solanum macranthum* fruits were extracted in four different solvents using cold extraction method followed by its phytochemical screening of the extracts. The cytotoxic effects of the extracts, with various concentrations on the breast cancer MD-MB cell line, was carried out using MTT assay method. The qualitative tests of methonlic and water extract were found to be positive for alkaloids, flavinoids, saponins, glycosides, etc. The MTT assay for methanol and water extract were found to be IC50= 194.2767 ug/ml and IC50= 123.4203 ug/ml respectively on breast cancer MDA-MB cell line. Various qualitative chemical tests were performed for establishing the profile of the extracts to detect various phytoconstituents present in them. Tests were performed using the Petroleum ether extract, chloroform extract, methanol extract and water extract. The qualitative tests of methanol and water extracts were found to positive for various phytoconstituents such as alkaloids, glycosides, phenols, saponin, tannins, terpeniods, etc., MTT assay carried out using these methanol and water extracts, have cytotoxic effect on MDA-MB breast cancer cell line revealing that the fruit of *Solanum macranthum* does possess anticancer property which needs to be further studied.

Keywords: Phytochemical analysis, breast cancer, MTT assay, MDA-MB cell lines

GENOTYPE III OF DENGUE VIRUS SEROTYPE 3 WAS THE MAJOR CIRCULATING STRAIN IN 2015 OUTBREAK IN WEST BENGAL

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Abstract

Dengue virus (DENV) has become an endemic arthropod born infectious disease all over West Bengal, India. The emergence of DENV-3 results in an outbreak as in 2012 followed by 2015. This study was done to determine the evolution of the genetic diversity of DENV along with some demographic data in West Bengal during the 2015 outbreak. NS1 positive patients with less than 5 d of fever were included in this study. Viral RNA was extracted from serum samples followed by multiplex nested RT-PCR for serotyping. Complete envelope gene (1702bp) of DENV-3 serotype was amplified by nested RT-PCR and sequenced for evolution study. 231 (87.83 %) out of 263 dengue NS1 positive samples were DENV RNA positive with DENV-3 (62.34 %) being the highest affected serotype followed by DENV-2 (17.75 %) and DENV-1 (13.85 %). Males (58%) were found to be more affected within the age group of 21-30 y than females (42%). 12 cases of DHF were reported at the time of outbreak, but no cases of DSS was reported in our study. Continuous clinically critical cases were observed within monsoon season whereas small number of sporadic cases was reported throughout other seasons. Phylogenetic analysis showed that 11 complete envelope gene sequences clustered within dengue genotype III (DENV-3). Thus genotype III was the predominant genotype in West Bengal which is also common in India. In most of the dengue outbreaks in West Bengal, dengue serotype DENV-3 was the predominant circulating strain.

Keywords: Dengue virus, circulating strain, DHF, NS1, envelope gene, multiplex nested PCR, genotype, phylogenetic analysis

IV ALERT: AN ACCURATE, COST-EFFECTIVE AND USER-FRIENDLY INDIGENOUS ALARM SYSTEM FOR MONITORING OF INTRAVENOUS INFUSION

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Abstract

'IV ALERT' (Patent application no 201611029938) is a low-cost, indigenous device for monitoring intravenous infusions. It uses a high-accuracy strain gauge, which measures changes in electrical resistance due to the change in weight of fluid attached, displays the volume administered and sounds an alarm at the preset target volume. The main aim of the study was to test the accuracy of our novel device. Infusion bags containing randomly predetermined volumes of normal saline were attached to an infusion set and made to hang from IV alert which was attached to IV stand. The device was configured to provide an alert at 80%, 90% or 100% of the randomly predetermined target volumes. A note of the volume of fluid collected from the infusion set into a measuring cylinder was noted when the device sounded the alert alarm. Results were expressed as percentage error (PE), calculated as: (Volume at which device sounded the alarm–Target volume)/Target Volume. Subgroup analysis was done by ANOVA with posthoc analysis. A total of 465 measurements were made. The mean overall PE was 0.009±0.06 (range: -0.25 to 0.46). Subgroup analysis at 80%, 90% or 100% of target volumes did not reveal any significant differences. The overall accuracy of the device was 96.5%. IV ALERT is accurate, cost-effective and user-friendly. Not only does it obviate the need for constant human supervision of iv infusions but can also prevent medical errors arising from transfusion of more than desired iv fluid volumes. It can prevent blocking of cannula, clot formation and thromboembolism.

Keywords: Strain gauge, PE, ANOVA, thromboembolism

EXPERIMENTAL EVALUATION OF ANTIPYRETIC ACTIVITY OF AQUEOUS EXTRACT OF BALACATURBHADRIKA CHURNA

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Abstract

The balacaturbhadrika churna is a valuable Ayurvedic preparation which was used traditionally in the treatment of vomiting, diarrhea, fever and respiratory disorders. *Balacaturbhadrika churna* has an important place in pediatric practice in Ayurveda. It is prepared by mixing equal proportions of the rhizome of *Cyperus rotundus* Linn. (Cyperaceae), the fruit of *Piper longum* Linn. (Piperaceae), the root of *Aconitum heterophyllum Wall*. ex. Royale. (Ranunculaceae) and gall of *Pistacia integerrima* Stew. Ex. Brandis. (Anacardiaceae). The objective of the present work was to study the efficacy of an aqueous extract of *balacaturbhadrika churna* for antipyretic activity in animal models. Twenty-four wistar rats were divided into four groups. I–Control, II–Drug-treated (low dose), III–drug treated (high dose), IV–diclofenac Sodium (2.90 mg/200 g). Antipyretic activity was studied in rats using Brewer's yeast induced pyrexia. Aqueous extract of *balacaturbhadrika churna* shows significant ($p<0.001$) antipyretic effect in yeast induced pyrexia. Aqueous extract of *Balacaturbhadrika churna* have significant antipyretic activity and which is comparable to that of diclofenac sodium.

Keywords: *Balacaturbhadrika* churna, ayurveda, antipyretic, brewer's yeast

NOVEL DRUG DELIVERY SYSTEMS FOR ANTIFUNGAL THERAPY

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Abstract

Fungal infections of the skin are one of the often faced with dermatological diseases in worldwide. Topical therapy is an attractive choice for the treatment of the cutaneous infections due to its advantageous such as targeting of drugs to the site of infection and reduction of the risk of systemic side effects. Currently, antifungal drugs are generally used as conventional cream and gel preparations in topical treatment. The efficiency of that treatment depends on the penetration of drugs through the target layers of the skin at the effective concentrations. However, *stratum corneum*, the outermost layer of the skin, is an effective barrier for penetration of drugs into deeper layers of the skin. The physicochemical characteristics of drug molecules and the types of the formulations are effective factors in topical drug delivery. Novel delivery systems for topical delivery of an antifungal drug includes ethosomes, liposome, nanoparticles, nanosponges, microsponges and emulgel. Therefore, new formulation strategies are used for development of new delivery systems. The various antifungal drugs are amphotericin B, fluconazole, clotrimazole, itraconazole, miconazole, ketoconazole, voriconazole, terbinafine, etc. Novel Drug delivery systems for antifungal therapy, aiming at reducing the side effects and maximizing the antifungal activity have added a new dimension to the treatment of fungal infections.

Keywords: Novel drug delivery, antifungal

APTITUDE OF HERBAL COSMETICS FOR DEODORANTS SUREKHA

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Abstract

Herbs are the Source of some potent deodorants cosmetics. The Herbs are very safe because they are natural. An herbal chemical compound like minerals reduces odour, attractiveness, provides freshness all day long, absorbs quickly, non-irritating, non-inflammable and leaves no stains. Especially when it comes to the most effective way to keep you fresh and smelling good. Our herbal deodorant allows the body to perspire, which is a natural cleansing process necessary to release toxins. Herbal plants contain vitamin, minerals, essential oil and antioxidant. Therefore the tremandous scope of the formulation of herbal cosmetics deodorants using appropriate bioactive ingredients with suitable minerals, essential oil and additives.

Keywords: Herbs, minerals, odour, bioactive molecules, additives

PLUMBAGIN: A PROMISING FUTURE ANTIDEPRESSANT

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Abstract

Plumbago indica Linn. is a common Indian herb widely found. Presently available antidepressant medications have many adverse effects hence a need to search new antidepressants is on the surge. The present study was undertaken to evaluate the antidepressant-like effect of *Plumbagin* an active constituent of "*Plumbago indica".* Antidepressant activity was evaluated using Forced swim test (FST) and sucrose preference test whereas locomotor activity was evaluated using open field test. Male albino rats were used in the study and were maintained under standard conditions. Plumbagin was administered in different doses viz. 5 mg/kg, 10 mg/kg, 20 mg/kg. Plasma nitrite level and MAO-A was estimated using spectrophotometry for biochemical confirmation. Effect of plumbagin on immobility time of mice was assessed in FST and Sucrose preference Test and was found significant at 10 mg/kg in FST and was found significant at 10 mg/kg and 20 mg/kg in sucrose preference test. No significant difference in locomotor activity was observed with any treatment. It has been found that results obtained in FST and sucrose preference test to support plasma nitrite levels. A downfall in plasma nitrite levels was observed in the animals possessing significant antidepressant activity with plumbagin as well as MAO-A levels also supported the antidepressant activity of plumbagin. The results of the present study indicate that plumbagin possesses significant antidepressant activity and can be a promising antidepressant.

Keywords: Plumbagin, depression, sucrose preference test, plasma nitrite

MAGNETICALLY MODULATED DRUG DELIVERY SYSTEM

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Abstract

Magnetically targeted drug delivery by engineered 'smart' microcarriers is a novel approach of delivery drugs to localized disease sites, such as tumors, which appears to overcome a number of limitations facing current methods of delivering medicines. The drugs are formulated into a pharmaceutically stable formulation which is usually injected through the artery that supplies the target organ or tumour in the presence of an external magnetic field. Non-targeted applications of magnetic microsphere and nanospheres include their use as contrast agents and as drug reservoirs that can be activated by a magnet applied outside the body. Depending on the fabrication method, particle size and nature they are named as magnetic microspheres, magnetic nanoparticles, magnetic liposomes, Magnetic resealed erythrocyte, Magnetic emulsion, etc. This review gives the information regarding the all possible formulations that can be designed using magnetism as the drug delivery mode, also about the principle of magnetic targeting, mechanism of magnetic targeted drug delivery, benefits and drawbacks of magnetic targeting, magnetic micro carriers and application of magnetism in targeted drug delivery and some other field.

Keywords: Magnetic, target, microcarriers, magnetic microspheres, nanosphere, contrast agent

3D PRINTING TECHNOLOGY IN MEDICINE: NEW ERA OF PHARMACEUTICAL RESEARCH

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Abstract

Three-dimensional printing (3D) is a method to make three-dimensional objects by fusing or depositing materials including plastic, metal, ceramics, powders, liquids or living cells in layers. This manufacturing process of 3D objects is also referred as additive manufacturing (AM), rapid prototyping (RP), solid free-form technology (SFF). 3D printers are similar to traditional inkjet printers. 3D printing technology is used in several streams of science including metallurgy, mechanical engineering, chemical engineering, energy technologies, and medicine. Its application in medicine is expected to revolutionalise medical field. The aim of this study was to understand the role of 3 D printing technology in medicine. Secondary data collection method was used to collect relevant information on 3 D printing technology in medicine. This information was collected from different authentic websites, textbooks, scientific journals, magazines, and newspapers. 3D printers are used to manufacture a variety of medical devices. They have the capacity to print medical devices with complex geometry or features that match a patient's unique anatomy. Currently, research is being done to study 3D printing of living organs, such as a heart or liver. However, this research is in early stages of development. Stem cells, those magical cells that can develop into many different kinds of tissue in the body, can now be 3 D printed. The cells could be used to create tissue for testing drugs or growing replacement organs. Printing some tissue types is already a reality. Gabor Forgacs from the University of Missouri in Columbia and colleagues printed blood vessels and sheets of cardiac tissue that 'beat' like a real heart. A group at the German Fraunhofer Institute has also created blood vessels, by printing artificial biological molecules with a 3D inkjet printer and zapping them into shape with a laser. From above information, we can conclude that use of 3 D printing technology is a new approach in Medicine. It has potential to change research dimensions of medical sciences.

Keywords: Three-dimensional printing, medical sciences, 3D objects

DEVELOPMENT OF NOBLE METAL NANOPHOTOSENSITIZERS FOR PHOTODYNAMIC THERAPY

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Abstract

Development of hydrophilic metal nano photosensitizers (MNPSs) to enhance biological delivery of hydrophobic photosensitizers was aimed for the study. Biocojugatable *trans*-AB porphyrin was synthesized using rational route; pyridyl dipyrromethene and ester containing dipyrromethene were prepared by heat method (85 °C) after that zinc-containing *trans*-AB porphyrin was synthesized in the presence of zinc acetate and propionic acid. Carboxyl group of *trans*-AB porphyrin conjugated with the hydroxyl group of bio inspired metal nanoparticles (synthesized by lab group) and formed covalent ester group using EDC coupling. Biocompatibility assay was done at physiological pH and temperature *in vitro.* Trans-AB porphyrin characterized by NMR, mass and UV spectroscopy. Characteristics soret band and four Q-bands at, 410 nm and 500-700 nm, respectively, were observed. More than 95 % purity of *trans*-AB porphyrin was checked by HPLC method. Conjugation was done with 12-16 % drug loading determined by HPLC and UV absorption spectroscopy methods. MNPSs were successfully characterized by FTIR and UV spectroscopy. Synthesized metal Nano conjugates were biocompatible at pH 7.4 and 37±2 °C for 48 h. MNPSs were stable at physiological conditions they possess enhanced biocompatibility as observed. These MNPSs can serve as dual PDT-PTT or PDT agent with improved efficacy compared to native PS or NPs. Taken together, these bioengineered nano photosensitizer probes are potential candidates for photo medicine.

Keywords: Photosensitizers, porphyrins, nanostructure, photodynamic therapy

MAGNETIC MICROSPHERES: A NOVEL TARGETING DELIVERY SYSTEM

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Abstract

Magnetic microspheres comprise the novel drug delivery systems. The major advantage is that reticuloendothelial clearance can be minimized and the drug can reach the target site of action thus producing maximum efficacy and minimum side effects. Various techniques are used for the preparation of magnetic microsphere, among them more common are continuous solvent evaporation technique and phase separation emulsion polymerization. Evaluation techniques involve flow properties study of microspheres, swelling index, magnetic responsiveness of microspheres and effect of pH, It has vast application and various marketed preparations.

Keywords: Novel drug delivery systems, magnetic microspheres, technique

EVALUATION OF FIBER RICH DIETS IN LIPID MANAGEMENT OF HUMAN TYPE II DIABETES MELLITIS

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Abstract

Diabetes mellitus is a common metabolic disorder resulting from defects in insulin action, insulin production, or both. It is mainly characterized by hyperglycemia. Type II Diabetes **i**s the most common form of diabetes mellitus. Diet plays very important role in the management of Diabetes mellitus. Calories in the form of complex carbohydrate and fiber have multiple benefits in this disease. This study is designed to evaluate the effects of fiber in lipid management (blood levels of cholesterol, triglyceride, HDL, LDL, VLDL, RR) of human Type II Diabetes Mellitus. Under this study three diets viz. control diet (no fiber), low fiber diet (5 gm fiber), high fiber diet (10 gm fiber) were given to Control group, Experimental group 1, Experimental group 2 respectively. Data were recorded after three months supplementation and statistically analyzed. It was concluded that prescribed amount of fiber brought about some changes in different lipid levels but the changes were not found significant enough to manage lipid profile of Type II Diabetes Mellitus patients.

Keywords: Diabetes mellitus, fiber, lipid management

DESIGN, SYNTHESIS AND ANTICONVULSANT ACTIVITY OF SOME NEW BIOACTIVE 1-(4-SUBSTITUTED-PHENYL-3-(4-OXO-2-METHYL/PHENYL-4*H*-QUINAZOLIN-3-YL)-UREA

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Abstract

Epilepsy is the fourth most common neurological disorder and affects people of all ages. The search of effective and novel anticonvulsants with more potential and lower toxicity continues to be an area of demanding an investigation in medicinal chemistry. The potency and selectivity in the pharmacological response of quinazolines as anticonvulsant have attracted the attention of many researchers to explore this framework for its biological activity. For the development of new synthetic strategies and their anticonvulsant potential based on the most recent knowledge emerging from the latest research. The design, synthesis and anticonvulsants activity of some novel 4(3*H*)-quinazolinone derivatives have been synthesized. The synthesized compounds were evaluated for anticonvulsant activities. A new series of 4(3*H*)-quinazolinone analogues was designed and synthesized to get the target compounds 1-8, 9-16. The Obtained compounds were evaluated for their anticonvulsant activity using two well-known models i.e. maximal electroshock-induced seizure (MES) and pentylenetetrazol induced convulsions (scPTZ). Compounds proved to be the most active compounds in this study with a remarkable protection against MES and PTZ induced convulsions to suggest that substituents at the 2 and 3 positions are important in the generation of derivatives with strong activity.

Keywords: Epilepsy, neurological disorder, anticonvulsants

SYNTHYSIS AND CHARACTERIZATION OF SILVER AND GOLD NANOPARTICLES USING PLANT EXTRACT"RUTA GRAVEOLENS LINN. SUDAB RUTACEAE"

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Abstract

In recent science, nanotechnology is a burning field for the researchers. Nanotechnology deals with the nanoparticles having a size of 1-100 nm in one dimension used significantly concerning medical chemistry, atomic physics, and all other known fields. Nanoparticles are used immensely due to its small size, orientation, physical properties, which are reportedly shown to change the performance of any other material which is in contact with these tiny particles. These particles can be prepared easily by different chemical, physical and biological approaches. But the biological approach is the most emerging approach of preparation, because, this method is easier than the other methods eco-friendly and less time-consuming. The Green synthesis was done by using the aqueous solution of Ruta plant extract and AgNO3 and Aucl3 solutions. Silver and gold were the particular interest for this process due to its innovative physical and chemical properties. A fixed ratio of extract to metal ion was prepared and the colour change was observed which proved the formation of nanoparticles. The nanoparticles were characterized by UV-visible spectrophotometer and DLS. The Nanoparticles have the size ranges from 100 nm-200 nm.

Keywords: Nanotechnology, nanoparticles, green synthesis

AGMATINE ATTENUATES PRENATAL STRESS AND/OR HIGH FAT DIET-INDUCED SUSCEPTIBILITY TO OBESITY IN RAT OFFSPRING

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Abstract

Prenatal environment exerts a profound influence on the development of an organism and can predispose adaptive disturbances in later life. Stress exposure or consumption of a high amount of dietary fat during pregnancy can also result in postnatal metabolic syndrome. The present study was designed to evaluate the influence of agmatine in stress and/or high-fat diet-induced metabolic complications in rat offspring. Pregnant SD rats were exposed to HFD and/or stress (dexamethasone) with or without chronic agmatine treatment. The total serum cholesterol, triglyceride, HDL, blood glucose levels and body weight, were analysed at different time points during gestation in pregnant rats and postnatally in pups. Agmatine 40 and 80 mg/kg sc significantly attenuated the metabolic impairment induced by HFD and/or stress (dexamethasone) as indicated by normalization of total serum cholesterol, triglyceride, HDL and blood glucose levelsin pregnant rats as well as in pups. Significant inhibition of obesity (weight gain) was also noted in pups exposed prenatally to HFD and/or stress. This finding clearly indicates the role of agmatine in modulating neural pathways that regulate stress responses and metabolic homeostasis impaired by prenatal stress and high-fat diet. Thus, this study suggested agmatine as a novel approach for inhibition of childhood obesity and associated future health consequences induced by prenatal stress and/or high-fat diet.

Keywords: Prenatal stress, obesity, agmatine

QBD BASED SYNTHESIS AND CHARACTERIZATION OF POLYACRYLAMIDE GRAFTED CORN FIBRE GUM

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Abstract

The aim of present investigation was to utilize quality by design approach for the synthesis of polyacrylamide corn fibre gum (PAAm-*g*-CFG) from corn fibre gum (CFG) by varying concentration of acrylamide and initiator. The spectral analysis (ATR-FTIR, ^{1}H NMR, DSC, X-ray and Mass spectroscopy) was conducted to assure grafting copolymerization of CFG with acrylamide. The powder flow properties confirm the porous nature of PAAm-*g*-CFG. The grafted copolymer dispersion showed shear thinning behaviour that follows Herschel-Bulkley model. The viscoelastic analysis suggested viscous liquid-like nature of PAAm-*g*-CFG and its viscosity increases with increase in the concentration of PAAm-*g*-CFG. The mucoadhesive strength of synthesized PAAm-*g*-CFG was found to be higher than moringa oleifera gum, karaya gum, guar gum, xanthan gum, chitosan and gelatin. Further, the results pointed toward enhanced thermal stability of PAAm-*g*-CFG. Thus, PAAm-*g*-CFG has a great potential to be used in food and pharmaceutical industry.

Keywords: Polyacrylamide, corn fibre gum, spectral analysis

ANTIBACTERIAL ACTIVITY OF ISOLATED ENDOPHYTIC FUNGI FROM *MORINGA OLEIFERA* LAM

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Abstract

The main aim of the present study was to isolate the endophytic fungi from medicinal plant *Moringa oleifera* Lam. and observe their antibacterial activity against pathogenic bacteria of the most potent fungal isolate. Collection and isolation of the endophytic fungi from the *M. oleifera* was done. Screening of endophytic fungi for antibacterial activity was seen against three pathogenic bacteria *viz*. *Bacillus subtilis*, *Escherichia coli* and *Salmonella typhimurium* by using agar well diffusion method. A total six endophytic fungi *Sclerotium rolfsii*, *Pleurophragmium* sp., *Phomopsis* sp., *Curvularia lunata*, *Aspergillus flavus* and *Alternaria* sp. were isolated from *M. oleifera* and fungal isolate *Phomopsis* sp. was shown the maximum zone of inhibition against *Salmonella typhimurium* (24.0±0.17 mm), *Escherichia coli* (20.4±0.16 mm) and *Bacillus subtilis* (16.3±0.12 mm). In the present study, we found that endophytic fungal strain *Phomopsis* sp. have a potential source of antibacterial compounds as compare to another fungal isolate.

Keywords: Antibacterial activity, bioactive compounds, medicinal plant

NEUROPEPTIDE Y INHIBITS LIPOPOLYSACCHARIDE INDUCED SICKNESS BEHAVIOR AND BIOCHEMICAL ALTERATIONS IN RATS

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Abstract

The presence of NPY in the hypothalamic paraventricular nucleus and its ability to enhance food intake suggest that NPY is a key regulator of feeding behaviour. However, its role in infection related anorexia and associated sickness behaviour is not clearly understood. Sickness behaviour is characterized by lethargy, prolong sleep, reduced appetite, anhedonia and anxiety and can be induced in experimental animals by bacterial endotoxin lipopolysaccharide (LPS). The present work investigated the effect of intra-PVN NPY administration (1 nmol/rat, i-PVN) on sickness behaviour induced by LPS (100 μg/rat, i. p.) injections in rats. Moreover, analysis of corticosterone, Interleuicin-6 and tumor necrosis factor-α level in rat blood samples was also carried out. Results: We observed that rats challenged with LPS exhibited hyperthermia, hypophagia, reduced water intake. Anxiety in elevated plus maze and decreases in locomotor activity. These neurological abnormalities were biochemically associated with elevation of corticosterone, Interleuicin-6 and tumor necrosis factor-α level in rat blood samples. The present study revealed that LPS induced hyperthermia. Anorexia, depression, anxiety and other symptoms of behavioural sickness were attenuated by NPY pretreatment. Moreover, it also suppressed Interleukin-6 and tumor necrosis factor-a serum levels increased by LPS. In addition, NPY Yl agonist also suppressed the anorexia induced by LPS administration. Considering the present results, inhibition of corticosterone, TNF-α and IL-6 production by NPY is a compelling argument for explaining the reversal of the LPS effect on sickness symptoms and anorexia. This study suggests NPY based therapeutic approach in the treatment of anorexia and other neurological abnormalities associated with bacterial infection.

Keywords: Neuropeptide y, sickness syndrome, paraventricular nuclei, lipopolysaccharide

BIOAVAILABILITY ENHANCEMENT OF VERAPAMIL HCL BY MICROENCAPSULATION USING MUCOADHESIVE POLYMERS

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Abstract

The objective of present study was to formulate controlled release microsphere by a solvent evaporation method and to evaluate control release profile of Verapamil HCL drug *in vitro*. Frequent administration and variable low bioavailability (40-60%) after oral administration are problems of conventional dosage forms of verapamil can be attenuated by designing it in the form of mucoadhesive microspheres which would prolong the residence time at the absorption site to facilitate intimate contact with the absorption surface and thereby improve and enhance the bioavailability. The various formulation of verapamil HCl microspheres was prepared by solvent evaporation method using ethyl cellulose polymer. The various formulations were prepared by varying the concentration of drug, temperature and stirring speed. Different formulations of verapamil HCl microspheres were pre-formulation study of color, taste and bulk density, tapped density, carr's index. The identification of drug studies was done using Fourier transform infrared spectroscopy and differential scanning calorimeter. The maximum encapsulation efficiency observed in the formulation D2 comprised of 73.91±0.836 and formulation B1 almost same encapsulation efficiency comprised of 73.15±0.306. The formulation B3 showed the minimum cumulative percentage drug release in 5 h of *in vitro* drug release, i.e. 35% and after 24 h drug release was 94%. The result of drug excipients studies using differential scanning calorimeter had shown no interaction between drug and other excipients and bioavailability enhancement of verapamil HCL by microencapsulation using mucoadhesive polymers was achieved successfully.

Keywords: Bioavailability, Verapamil, Mucoadhesive, Microencapsulation

DESIGN, SYNTHESIS AND ACTIVITY EVALUATION OF NOVEL SELECTIVE SEROTONIN REUPTAKE INHIBITORS

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Abstract

Depression is a significant contributor to the global burden of disease and affects people in all communities across the world. Today, depression is estimated to affect 350 million people. The World Mental Health Survey conducted in 17 countries found that on average about 1 in 20 people reported having an episode of depression in the previous year. During the past two decades, selective serotonin reuptake inhibitors (SSRIs) have been proved to be a safer and more effective resistance than the first-generation antidepressants (TCAs and MAOIs), and have gained incredible popularity. The research present here in focused on the design and synthesis of novel series of selective serotonin reuptake inhibitors (SSRIs) by taking a Fluoxetine as a reference molecule. Novel chromane moiety with different substituents at 4^{th} position is the structural scaffold of the present study. Series of chromane derivatives have been synthesized having substituted piperazine side chain. All the compounds were synthesized as per the designed synthetic route. Compounds were characterized by physical data like melting point and TLC and spectral data by IR, ^{1}H NMR, ^{13}C NMR and Mass spectra. All the synthesized compounds were found to promising antidepressant activity. Among the series, two compounds were found to more active than standard fluoxetine in tail suspension test (TST). These two compounds were evaluated for serotonin reuptake inhibitor activity by the 5-HTP potentiating test in mice, and both the compounds were found to selective serotonin reuptake inhibitors and highly selective toward serotonin transporter. This new structural scaffold (Chromane) with piperazine side chain may open a new era of antidepressant agents with selective serotonin reuptake inhibitory activity.

Keywords: Depression, antidepressant, SSRIs, chromane derivatives

INHIBITORY INFLUENCE OF AGMATINE IN DIABETESINDUCED DEPRESSION IN RATS: MODULATION BY IMIDAZOLINE RECEPTORS

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Abstract

Several evidences suggest a strong bilinear association between diabetes and depression. However, the exact pathogenesis remains poorly understood. In this study, we explored the effect of agmatine on depression induced in diabetic rats after streptozotocin injection. Animals were injected with streptozotocin (60 mg/kg ip) and were evaluated after 72 h for induction of diabetes which was confirmed by elevated levels of blood glucose, triglyceride and cholesterol. Sucrose preference test (SPT) was carried out on day 7 of the protocol which clearly shown a reduction in sucrose consumption by animals, suggesting the induction of anhedonia, a core symptom of depression in animals. These animals also showed significant in an increase in immobility time when exposed to FST. Agmatine (20 and 40 mg/kg ip) significantly reduced anhedonia and depression-like behaviour in SPT and FST as indicated by an increase in sucrose intake and reduction in immobility time respectively. In separate group Imidazoline II receptor agonist moxonidine (0.25 mg/kg ip), I2 agonist 2 BFI (10 MG/KG IP) potentiated the anti-immobility effect of agmatine (10 mg/kg ip). On the other hand, Imidazoline II antagonist efaroxan (1.0 m/kg ip) and Imidazoline-2(I2) receptor antagonist idazoxan (0.25 mg/kg ip) were found to attenuate antidepressant like the effect of agmatine (40 mg/kg ip). Thus our results clearly showed the involvement of Imidazoline receptors in antidepressant effect of agmatine in diabetic rats. Agmatine and its interaction with imidazoline receptors can be a novel therapeutic agent for the treatment of diabetes-induced depression and other associated comorbidity.

Keywords: Diabetes, depression, streptozotocin

AGMATINE ATTENUATES ETHANOL WITHDRAWAL INDUCED IMPAIRMENT OFCONDITIONING AND EXTINCTION OF FEAR IN RATS

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Abstract

The main objective of the study was to explore the role of agmatine in repeated ethanol exposure and withdrawal-induced impairment of conditioning and extinction of fear. Rats were made ethanol-dependent by LMD for 21 d (2.4%ethanol (v/v) for 4 d followed by 4.8% for 3 d and finally 7.2% for 14 d). Confirmation of withdrawal symptoms in Single ethanol withdrawal (SEW) and repeated ethanol withdrawal (REW) animals. Fear conditioning, Fear extinction training and fear extinction testing were performed on day 1, 2 and 3 after final withdrawal. Different doses of agmatine was administered during withdrawal. REW and SEW animals showed significant impairment in learning of fear during conditioning and also in extinction compared to chronic alcohol exposure (LMD) without withdrawal. Agmatine 60 mg/kg ip significantly altered freezing time during fear conditioning and extinction in single ethanol withdrawal (SEW) group facilitating learning. During repeated ethanol withdrawal (REW), administration of agmatine 60 mg/kg ip from first withdrawal shows significant conditioning and extinction of fear compared with that administered from second and third withdrawal. Agmatine modified small adaptive changes during withdrawal and facilitates fear learning and extinction. It can be suggested a thatcognitive approach for fear, anxiety disorders and alcoholism have stronger therapeutic potential.

Keywords: Fear conditioning, Extinction, Agmatine, Ethanol withdrawal

SYNTHESIS AND SCREENING OF QUINOXALINE DERIVATIVES AS PTP1B INHIBITORS

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Abstract

Type 2 diabetes is the most common form of diabetes. It is characterized by insulin resistance and relative insulin deficiency. Currently, around 65.1 million peoples are suffering from diabetes in India, compared to 50.8 million in 2010. Recently there is a vast rise in the development of the anti-diabetic drug. PTP1B is a negative regulator of insulin signalling. The development of PTP1B inhibitors are aimed to target Type-II diabetes and obesity. In the present study, we aimed to develop small molecules as PTP1B inhibitors by taking quinoxaline as a parent nucleus. Novel 3-heteroaryl quinoxaline-2-ylsulfamic acid derivatives have been synthesized. All the compounds were synthesized by predesigned synthetic rout. The compounds were characterized by physical data like melting point and TLC and spectral data by IR, ^{1}H NMR, ^{13}C NMR and Mass spectra. All the synthesized compounds were subjected to *in vitro* PTP1B inhibitory activity and found to have good activity. Amongst the synthesized derivatives two compounds have shown promising PTP1B inhibitory activity. These novel quinoxaline derivatives may emerge as a new structural scaffold for the development of PTP 1B inhibitors. Further development and improvement of quinoxaline nucleus can lead to better PTP1B inhibitors.

Keywords: Type-II diabetes, PTP 1B, quinoxaline derivative

DEVELOPMENT AND EVALUATION OF INTRANASAL NANOEMULSION FORMULATION FOR TREATMENT OF SCHIZOPHRENIA

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Abstract

The main objective of the study was to prepare and evaluate lurasidone nanoemulsion (LNE) for rapid drug delivery to the brain for treatment of schizophrenia. The LNE formulations were prepared by the high-pressure homogenization. Prepared formulations were subjected to physicochemical characterization and analyzed for accelerated stability studies, *ex vivo* diffusion studies and nasal ciliotoxicity. Pharmacodynamic assessments (apomorphine–induced compulsive behaviour and spontaneous motor activity) were performed using mice. LNE was transparent and stable with mean globule size of 20-200 nm. The diffusion of lurasidone mucoadhesive nanoemulsion LMNE was slightly lower than LNE which is due to the polymer interference in the drug diffusion through the membrane. Further LNE and MLNE were non-toxic to nasal membrane. In pharmacodynamic studies, significant ($P<0.05$) difference in parameters estimated, were found between the treated and control groups. This investigation demonstrates a more rapid and larger extent of transport of lurasidone into the rat brain with intranasal LMNE, which may prove useful for the treatment of schizophrenia patients.

Keywords: Intranasal, Lurasidone, Nanoemulsion, Schizophrenia

MOLECULAR DOCKING OF NOVEL 3-{4-[2-AMINO-4-(SUBSTITUTEDPHENYL)-2H-[1,3] OXAZIN/THIAZIN-6-YL} 2-PHENYL-3H-QUINAZOLIN-4-ONE DERIVATIVES-A POTENTIAL ANTICONVULSANT APPROACH

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Abstract

Epilepsy is the medical condition defined as tendency to have recurrent seizure caused by abnormal neuronal flux in the brain. Quinazolin-4(3H)-one and their derivatives comprise an important class of heterocyclic compounds for example methaqualone (2-methyl-3-o-tolyl-4(3H)-quinazolinone). The molecular docking was performed with quinazolinone derivatives to assess their binding mode to gamma-aminobutyric acid type A ($GABA_A$) receptor in order to rationalize their anticonvulsant activities in a qualitative way. This study has been performed with the help of Chemdraw Ultra 8.0, PyRx and Discovery studio software. Results revealed that ligand-protein interaction affinity of all the synthesized molecules ranges from-9.4 Kcal/mol to 10.1 Kcal/mol. Two compounds 5a and 5d have shown better binding with $GABA_A$ receptor as compared to other derivatives and methaqualone. With good docking score and low RMSD value, these two ligands 5a and 5d can be considered the best ligands among all the derivatives.

Keywords: Epilepsy, quinazolin-4(3H)-One, ligand-protein interaction

CANCER STEM CELLS: A NOVEL APPROACH FOR FUTURE

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Abstract

Despite of recent advances in the treatment of cancer, the clinical outcome is yet far away from expectation. Providing innovative adult stem cell therapies for neurodegenerative disorders is developing a new technology that uses the patient's own bone marrow to treat diseases such as Parkinson's disease, amyotrophic lateral sclerosis and spinal cord Injury. Despite these, use of stem cells in immune-modulation or reconstitution is one of the methods used for decades in cancer therapy stem cells have self-renewal with high replicative potential in multineage differentiation capacity. Cancer stem cells (CSCs) are cancer cells (tumor or hematological cancer) that possess characteristics associated with normal stem cell type, specifically the ability to give rise to all cell type. CSCs generate tumor through the stem cell that self-renew and differentiate into multiple cell type, such cells are proposed to persist in tumors as a distinct population and cause relapses and metastasis by giving rise into a new tumor. The cancer stem cells are now considered as the backbone in the development of cancer. Their role in carcinogenesis and its implications would bring us a step forward in the development of possible new cancer treatment option in future with NDDS approach.

Keywords: Stem cells, cancer, novel drug delivery, tumor

ASSESSMENT OF ANTIULCER ACTIVITY OF ALCOHOLIC EXTRACTS OF *GLORIOSA SUPERBA* TUBERS

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Abstract

Gloriosa superb Linn. (Family: Liliaceae) is one of the oldest species from ancient time having their utility in both traditional and modern phytotherapy. The seeds and tubers of the plant are already known for their use to cure rheumatism and gout. In the present study, it was planned to find out the antiulcer activity of alcoholic extracts of *Gloriosa superba* tubers. Hot continuous extraction method (HCEM) and cold maceration extraction method (CMEM) were used to prepare the extract and further anti-ulcer activity of the same was studied against pylorus ligation induced ulcers, ethanol induced ulcers and indomethacin-induced ulcers in rats. A significant ($p<0.001$, $p<0.01$) antiulcer activity was observed in all models including Pylorus ligation, ethanol-induced and indomethacin-induced ulcer models showing significant ($p<0.001$, $p<0.01$) reduction in pH, gastric volume, free acidity, total acidity, ulcer index is compared to control. Results have also shown protection up to 44.39%, 55.80%, 39.95% and 48.08% in pylorus ligation respectively in control and applied three models, a similar result of 34.1%, 51.72%, 35.1% and 46.8% in ethanol-induced ulcers and 44%, 56.3%, 35.2% and 50.3% in indomethacin-induced ulcers were obtained respectively. On the basis of the present study, it can be said that alcoholic extracts of *G. superba* tubers have shown significant antiulcer activity which can be attributed to the phytoconstituents present in it.

Keywords: Ethanol induced ulcer, indomethacin-induced ulcer, pylorus ligation ulceration. Hot continuous extraction method, cold maceration extraction method

ASSESSMENT OF GROUNDWATER QUALITY OF THE AREA NEAR CEMENT FACTORY

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Abstract

Soil, water, air, and plants are vital natural resources that help to produce food and fiber for humans. They also maintain the ecosystems on which all life on Earth ultimately depends. Freshwater resources are threatened not only by over-exploitation but also by ecological degradation. India suffers from water, air and soil pollution contributing to the overall degradation of the environment. Groundwater is a precious natural resource for several vital functions such as for the public, industrial and agricultural water supply. This study was undertaken to determine the current state-of-knowledge concerning the measurement of the potential benefit of water pollution control on property values, and to analyze the relationship between water quality parameters and property values at several sites where water pollution has been substantially reduced in recent years. Groundwater samples were collected from different areas near cement factories located in Satna, Rewa, Damoh districts of Madhya Pradesh during different seasons over a period of two year (June 2014 to June 2016). The universal accepted methods of analysis were applied–samples were taken to the laboratory in one to two-liter sampling plastic bottles for the analysis. The analysis of various parameters had been carried out as per internationally accepted methods (APHA 1998, R. K. Trivedy and P. K. Goyal 1986). Various parameters studied were as follows: Water temperature (°C), pH, hardness (mg/l), turbidity, total dissolved solids (mg/l), total suspended solids (mg/l), electrical conductivity (μmho/cm), free CO_2 (mg/l), dissolved oxygen (mg/l), magnesium (mg/l), sodium (mg/l), potassium (mg/l), carbonate (mg/l), bicarbonate (mg/l) and sulphate (mg/l). Multiple-regression analysis and an interview technique were employed to study the relationship between residential and recreational property values and water quality components. Water samples were found to be the alkaline type and having decreasing pH with the increase of distance.

Keywords: Groundwater, pollution, alkaline

AN ANTI-TB AGENT: SUBSTITUTED HYDRAZINE CARBOTHIOAMIDE

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Abstract

Tuberculosis treatment involves DOTS which is at least for six months. Thus there is always a need for the development of novel drugs as anti-T. B agents. In the present paper, we describe the designing and screening of a substituted hydrazine carbothioamide for its anti-TB activities. The synthesised compound exhibited good inhibition of mycobacteria. The compound was characterised by NMR, IR and mass spectra. The hydrazine carbothioamide represents a promising bioactive core. The incorporation of the substituent at its structure active site leads to potent anti-TB compounds.

Keywords: DOTS, hydrazine carbothioamide, mycobacteria, anti-TB compounds

"COMPUTATIONAL MODEL IN PHARMACEUTICAL INDUSTRY"

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Abstract

Computational models of cells, tissues and organisms are necessary for increased understanding of biological systems. In particular, modeling approaches will be crucial for moving biology from a descriptive to a predictive science. Pharmaceutical companies identify molecular interventions that they predict will lead to therapies at the organism level, suggesting that computational biology can play a key role in the pharmaceutical industry. We discuss pharmaceutically-relevant computational modeling approaches currently used as predictive tools. Specific examples demonstrate how companies can employ these computational models to improve the efficiency of transforming targets into therapies. New regulations requiring toxicity data on chemicals and an increasing number of efforts to predict the likelihood of failure of molecules earlier in the drug discovery process are combining to increase the utilization of computational models to toxicity. The potential to predict human toxicity directly from a molecular structure is feasible. By using the experimental properties of known compounds as the basis of predictive models, it is possible to develop structure activity relationships and resulting algorithms related to toxicity. Several examples have been published recently, including those for drug-induced liver injury (DILI), the pregnane X receptor, P450 3A4 time-dependent inhibition, and transporters associated with toxicities. The versatility and potential of using such models in drug discovery may be illustrated by increasing the efficiency of molecular screening and decreasing the number of animal studies. With more computational power available on increasingly smaller devices, as well as many collaborative initiatives to make data and toxicology models available, this may enable the development of mobile apps for predicting human toxicities, further increasing their utilization.

Keywords: Computational, versatility, receptor

RESEARCH ARTICLE–HAIR DYES: ITS UNDESIRABLE EFFECTS

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Abstract

Hair dyes can cause a range of unwanted effects. Allergy is the most common reported. There is also a potential link between use of hair dyes and the risk of developing cancer. Hair dyes based on their chemical composition: oxidative (permanent) and Additive (temporary). Permanent hair color contains aromatic amines, a coupling agent and an oxidant commonly used dyes are PDA and PTD, commonly coupling agents are resorcinol and naphthol. Hair dyes because undesirable effects like contact dermatitis, contact urticarial and cancer. The safest way to avoid these undesirable effects is not to dye your hair. If you decide to dyes your hair, avoid temporary tattoos with black henna, avoid dyeing your hair if you have had a rash.

Keywords: Oxidative, additive P-phenylenediamine (PPD), P-toluendiamine (PTD), coupling agents

AFLATOXINS–A POTENT CARCINOGEN

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Abstract

Aflatoxins are a family of toxins produced by certain fungi that are found on agricultural crops such as maize (corn), peanuts, cottonseed, and tree nuts. The main fungi that produce aflatoxins are *Aspergillus flavus* and *Aspergillus parasiticus* which are abundant in warm and humid regions of the world. Aflatoxins are among the most carcinogenic substances known. They are probably the best known and most intensively researched mycotoxins in the world. Aflatoxins have been associated with various diseases, such as aflatoxicosis, in livestock, domestic animals and humans throughout the world. There are four major aflatoxins: B1, B2, G1, G2 plus two additional metabolic products, M1 and M2, that are of significance as direct contaminants of foods and feeds. The aflatoxins M1 and M2 were first isolated from milk of lactating animals fed aflatoxin preparations. Aflatoxins often occur in crops in the field prior to harvest. Postharvest contamination can occur if crop drying is delayed and during storage of the crop if water is allowed to exceed critical values for the mold growth. Insect or rodent infestations facilitate mold invasion of some stored commodities. No animal species is immune to the acute toxic effects of aflatoxins. High-level aflatoxin exposure produces an acute hepatic necrosis, resulting later in cirrhosis or carcinoma of the liver. Chronic exposure increases the risk of developing liver and gallbladder cancer, as aflatoxin metabolites may intercalate into DNA and alkylate the bases through epoxide moiety. This is thought to cause mutations in the *p53* gene, an important gene in preventing cell cycle progression when there are DNA mutations, or signaling apoptosis (programmed cell death). These mutations seem to affect some base pair locations more than others, for example, the third base of codon 249 of the p53 gene appears to be more susceptible to aflatoxin-mediated mutations than nearby bases. Aflatoxins in the feedstuff can be diagnosed by HPLC, TLC, LC-MS, or immunological techniques like ELISA.

Keywords: Aflatoxins, ELISA, immunological techniques

ASSESSMENT OF DOMESTIC WATER QUALITY IN RELATION TO HEALTH and HYGIENIC MANAGEMENT IN SLUM AREAS OF BHOPAL

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Abstract

Water is one of the most important natural resources and plays a vital role in human life, but it is not always in the right place, available at the right time or of the right quality. Industrialization, as well as urbanization, affects the physicochemical quality of water leads to its spoilage (Mishra and Bhatt 2008). On the other hand microbiological quality changes due to improper sewage and sanitary systems and illiteracy. Thus, the importance of water quality assessment has been a compelling fact for avoiding environmental risks and maintenance of healthy atmosphere (Hussain *et al.*, 2001). Depleting ground water level and deteriorating ground water quality are threatening water supply in many parts of India. The socio-economic cost of water pollution is extremely high: 1.5 million children under 5 y die each year and country loses about Rs-366 billion each year due to water-related diseases (Parikh, 2004). These fig. only suggest that the abetment of pollution is socially desirable and economically justified. With the rapid growth in population in India and massive rural to urban movement there happened to an increase in a slum the population in urban areas that may project to 104 million or 9% of total projected national population of 1.28 billion by 2017 (Time of India 2013). Water sanitation and hygiene have an important impact on both health and diseases and any deterioration in its quality have a direct impact on human population, especially in slum areas. According to current estimate, inadequate drinking water, sanitation and hygiene causes 842000 diarrheal disease deaths per year (WHO 2014). All these facts and issues compels to assess the drinking water quality at physicochemical and microbiological parameters and create a community awareness in slum areas of Bhopal for sustainability, resource conservation and socio-economical of M. P State's Capital.

Keywords: Drinking water, conservation, natural resources

PHARMACOKINETIC STUDY OF ACTIVE CONSTITUENT OF TRIGONELLA FOENUM GRAECUM

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Abstract

The objective of the present review was to study the pharmacokinetics of active constituent of 4-hydroxyisoleucine. Diabetes is a serious, chronic disease which occurs either when the pancreas does not produce enough insulin or when the body is unable to utilise the insulin it produces effectively. Despite the introduction of more novel drugs for the treatment of diabetes, the identification of new effective therapeutic agents with relatively low cost and low toxicity that can be used regularly to control diabetes in patients still remains a challenge. Although numerous herbs are reported to possess antidiabetic activity, a significant amount of research and traditional usage suggests that fenugreek seeds are among the best in terms of safety and efficacy. Fenugreek is well known in traditional medicine for its antidiabetic properties. This property is due to the presence of novel amino acid 4-hydroxyisoleucine having insulinotropic properties 4-Hydroxyisoleucine increases glucose-induced insulin release. This compound may be considered as a novel drug with potential for the treatment of diabetes.

Keywords: Pharmacokinetic, diabetes, insulin, efficacy

STUDY OF PROPERTIES OF PIPERINE A NATURAL ALKALOID AND THEIR EFFECTS

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Abstract

Piperine is the active ingredient extracted from the *Piper nigrum* plant. The plant is very commonly cultivated in India. It is used as a spice in different countries of the world. In common *Piper nigrum* refers to black pepper. Piperine is an alkaloid responsible for the pungency of black pepper. It has also been used in some forms of traditional medicine. The plant is grown for its fruit. The fruit of this plant is used after drying it in the sun. It contains 95 percent piperine, which has potential health benefits. Piperine is extracted from black pepper using dichloromethane. Piperine can be very helpful in improving an individual's health. Piperine which is the active ingredient in the black pepper can be helpful in increasing the level of vitamin B6 concentration and coenzyme Q-10 in the blood. One of the biggest benefits of piperine is that it increases the bioavailability of different useful products such as Selenium, vitamin C. Selenium is used in different antioxidant reactions of the body. Selenium also plays a great role in thermoregulation. Vitamin C is also used in antioxidant reactions, which are occurring in the human body. All these micronutrients are boosted by the piperine, it enhances the natural thermogenesis process. The increased metabolic processes create demand and supply for the nutrients which contribute metabolism. It also provides efficient mode of nutrient transportation into the blood. Piperine can help in generating a lot of energy during metabolism of different products. Piperine increases the bone strength and also provides nourishment to the body muscles. Piperine extracted from the black pepper can increase the amount of serotonin and beta-endorphin in the brain. These substances help in increasing the memory of a person It also having anticarcinogenic and antioxidant properties. It can enhance the body growth and allow the individual to live healthy.

Keywords: Piperine, *Piper nigrum*, selenium, thermogenesis, alkaloid, serotonin, beta-ndorphin

A RECENT ADVANCES IN SELF MICRO-EMULSIFYING DRUG DELIVERY SYSTEMS-A NOVEL APPROACH

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Abstract

Basically called as self micro-emulsifying drug delivery systems (SMEDDS) are usually used to improve the bioavailability of hydrophobic drugs. Approximately 65-75% of new chemical entities exhibit poor aqueous solubility and present a major challenge to modern drug delivery system, because of their low bioavailability. SMEDDS is evaluated by various methods like visual assessment, droplet polarity and droplet size, the size of emulsion droplet, dissolution test, the charge of oil droplets, viscosity determination, *in vitro* diffusion study. SMEDDS is isotropic (one phase system) mixture of oil or modified oils, surfactants and co-surfactants, which form the fine oil-in-water microemulsion when introduced into the aqueous phase under the condition of gentle agitation. The digestive motility of the stomach and intestine provide the agitation necessary for self-microemulsion *in vivo*. Triglyceride is the one of the component of SMEDDS, which helps in the absorption of drugs from the GI tract. SMEDDS enhance the bioavailability enabling a reduction in dose of the drug. This article gives an overview of improvement in the rate and extent of oral absorption of drugs by SMEDDS approach. The characterization of SMEDDS and application of SMEDDS is also introduced, with particular emphasis being placed on the developments of solid self micro-emulsifying delivery system and dosage form of SMEDDS.

Keywords: Microemulsion, *in vivo,* bioavailability

SPECTROPHOTOMETRIC ESTIMATION OF PROTEINS: GENERAL CONSIDERATIONS

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Abstract

The concentration of purified protein in solution is most conveniently and accurately measured using absorbance spectroscopy. Basically, spectrophotometry is one of the most widely used analytical procedures in biochemistry. Determining the exact quantity of proteins in a solution is very often necessary in the biochemical practice. There are many ways to measure protein concentration. In chromogenic methods, the absorbance of a colored product formed by the protein and an organic molecule is measured. Protein concentration can also be determined from the protein's own (intrinsic) UV absorbance. It is commonly used to estimate the level of an analyte in solution and is ideal for simple routine determination of small quantities of materials. This method is based on the two laws of light absorption by solutions, namely Lambert's Law and Beer's Law.

Keywords: Proteins, spectrophotometry

THE QUALITY CONTROLES IN BIOTECHNOLOGY: AN ANALYTICAL PERSPECTIVE

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Abstract

"Chemistry is truly behind all of the exciting discoveries and advances that are taking place today in the field of biotechnology and material science." Without molecular science, which is chemistry, all of these advances just wouldn't be possible. Over the years biotechnology has diversified into several branches such as genetic engineering, industrial biotechnology, environmental biotechnology, molecular biology, genomics, etc. Analytical chemistry has contributed significantly to the growth of our understanding and scope of applications in such fields. Biotechnology has been defined as the use of living systems and organisms to develop products and processes for the benefit of mankind in terms of improved agricultural yields, food production, medicines and cleaner industrial manufacturing processes. In this short article, an attempt has been made to list the contributions of common analytical techniques to our understanding of biomolecules and biochemical processes.

Keywords: Biotechnology, analysis

DISCOVER THE SCIENCE OF EVERYDAY LIFE BY CHEMICAL KINETICS

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Abstract

Science is always playing an important role in our life, whether we realize it or not. Anything that we do is always involved some parts of science in it. In chemistry, we have learned about the rate of reaction and its role in our everyday life. The rate of reaction is important and has a crucial effect in our life. It may be defined by chemist as "The amount of particular reactant consumed in mol/l/Sec". Chemical reactions happen all around us every day. "There are reactions when you take medications, light a match, and take a breath". Just like any other types of measurement, such as length, mass, and time, the rate of reaction is playing a major role in our daily life. It is crucial to optimize the rate of reaction to obtain the best performance of the reaction. Every chemical reaction that occurs has its own speed at which product is formed from reactants. This speed is called the rate of reaction for a specific chemical process, and knowledge of the rate can provide scientists with valuable information about the microscopic nature of a reaction.

Keywords: Chemical kinetics, science

GREEN CHEMISTRY–SCIENCE FOR A LESS POLLUTED LIFESTYLE

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Abstract

Our daily lives are filled with products and chemicals that we have grown accustomed to using on a daily basis. However, many of these are filed with toxic substances that can make us sick both in the short term and in the longer term. Since we use these products all the time, it is sometimes difficult to understand which are safe to use. Green chemistry is a field of study that specifically helps address this situation. Green chemistry is the new and rapid emerging branch of chemistry. The beginning of green chemistry is considered as a response to the need to reduce the damage of the environment by man-made materials and the processes used to produce them. Green chemistry could include anything from reducing waste to even disposing of waste in the correct manner. All chemical wastes should be disposed of in the best possible manner without causing any damage to the environment and living beings. This article presents selected examples of implementation of green chemistry principles in everyday life.

Keywords: Green chemistry, pollution

PROS AND CONS OF ONLINE PHARMACY

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Abstract

This paper discusses online pharmacy together with its advantages and disadvantages. Online pharmacy offers advantages and great ways for the patients all across the world to have good medication. Online pharmacy also provides immediate information that a patient need. It is also cheaper compared to the traditional one. However, there are still disadvantages accompanied to online pharmacy when acquiring medication from it such as less accuracy in diagnosis and the big chances of having a wrong prescription. Addition to that, there are also some ethical dilemmas that an online pharmacy experience today. This includes the issue about the assurance of the patient or customer upon acquiring the medication they need as it undergoes proper importation rules.

Keywords: Online pharmacy, advantages and disadvantages

WHAT SHOULD EVERY VEGAN KNOW ABOUT VITAMIN B12?

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Abstract

There is no doubt about it: Vitamin B12 is the big issue in vegan nutrition. It's not that it's difficult to get enough; in fact, it's quite easy. But this is an area where vegan absolutely need a supplement. Vitamin B12, an essential B-vitamin, is of special interest to vegetarians since it is not found in any significant amounts in plant foods. In addition, vitamin B12 deficiency can result in detrimental changes in certain body functions. It is required for the normal maturation of red blood cells and also for the synthesis of the myelin sheath of nerve tissue. Most of the highest natural sources of vitamin B-12 are not suitable for vegetarian diets. These include clams, liver, beef and a variety of fish and seafood products. However, it is not difficult to obtain adequate amounts of vitamin B-12 on a vegetarian diet. By eating fortified foods, eggs and dairy products, you can easily meet and exceed your recommended daily intake of vitamin B-12.

Keywords: Vit B12, vegan

WHAT SHOULD PHARMACISTS KNOW ABOUT THE ZIKA VIRUS?

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Abstract

The two known species responsible for Zika transmission are the *Aedes albopictus*, known as the Asian tiger mosquito, and the *Aedes aegypti* species, the mosquito also responsible for the transmission of dengue and chikungunya viruses. Unlike malaria-carrying mosquitoes, this species is mostly active during the day and so barrier methods such as mosquito nets are ineffective. These mosquitoes can survive in both indoor and outdoor environments. Zika has spread to at least 34 countries and territories. WHO estimates 3 million to 4 million people across the Americas will be infected with the virus in the next year. Zika is commanding attention because of an alarming connection between the virus and microcephaly, a neurological disorder that results in babies being born with abnormally small heads. It causes severe developmental issues and sometimes death, so the U. S. centres for disease control and prevention is warning pregnant women against travel to those areas; health officials in several of those countries are telling women to avoid pregnancy in some cases for up to two years.

Keywords: Zika virus, pharmacist

EBOLA VIRUS DISEASE: INFORMATION FOR THE PHARMACY WORKFORCE

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Abstract

Ebola virus disease (EVD) poses significant clinical care implications for pharmacists. Pharmacists are often the first point of contact with the health system for patients and people with health-related concerns. Given the current outbreak of Ebola virus disease (EVD) in some West African countries and the possibility of it spreading to other parts of the world, it is important that the whole pharmacy workforce is well informed about the disease. EVD is caused by the *Filovirus ebolavirus*. The virus enters the human chain through close contact with infected primates and other animals and can be passed human to human through contact with the bodily fluids of infected persons. Ebola virus normally spreads into the blood and multiplies to various organs. These usually result in the severe damage of lymphatic system, ovaries, testes, liver, kidneys, and testes. Arteries and platelets lining are intensely impaired that results to profuse bleeding. The stomach mucosal surfaces, vagina, and heart membrane are also affected. These usually lead to internal bleeding, distress of acute respiratory system and somehow might lead to death. The incubation period of Ebola virus usually takes 4-16 d starting from the time of infection. Currently, neither a vaccine nor an effective antiviral treatment is available for use in humans. Preventive strategies and supportive therapy are the only options available for high-risk individuals and infected patients.

Keywords: Ebola virus, pharmacy

NATURAL PRODUCTS FOR TREATMENT OF CARDIOVASCULAR SYSTEM

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Abstract

Cardiovascular diseases are the leading cause of mortality worldwide. Hypertension and hyperlipidemia are the two leading causes for cardiovascular diseases like heart attack, stroke, and coronary heart diseases, etc. which are responsible for causing deaths. Hypertension is the elevated blood pressure above the normal level and hyperlipidemia is the increased blood cholesterol level. There are a number of synthetic drugs are available to treat these disorders, can cause myocardial infarction, kidney failure and liver damage. To avoid these side effects, natural products are better replacements to treat hypertension and hyperlipidemia disorder. This review mainly focuses on the herbal plants which are scientifically proved for their antihypertensive and hypolipidemic activity. Plants having antihypertensive properties are *Lepidium sativum, Curculigo Orchioides*, *Evolvulus alsinoides, Prosopis glandulosa*, *Chassalia curvi, Asystasia gangetica*, *Carica papaya, Tribulus terrestris, Passiflora Nepalensis, Laelia speciosa, Achillea Millefolium, Barleria prionitis, Lippia nodiflora, Phyllanthus amarus schum, Thymus linearis, Viscum triflorum, Berberis orthobotrys, Elaeocarpus ganitrus, Viola odorata* and plants having hypolipidemic activities are *Ajuga iva, Brassica oleracea, Cassia tora, Helicteres isora, Ficus mollis, Piper betel, Bersama engleriana, Morinda citrifolia, Cinnamomum tamala, Taraxacum officinale, Sesbania grandiflora, Icacina senegalensis, Melothria maderaspatana, Ilex paraguariensis, Moringa oleifera, Cassia angustifolia, Asparagus racemosus, Sphenocentrum jollyanum, Satureja khuzestanica, Allamanda violacea, Mimosa pudica.*

Keywords: Cardiovascular diseases, antihypertensive, hypolipidemic, medicinal plants

ISOLATION AND STUDY OF XANTHIAZONE.7-HYDRXYMETHYL-8,8-DIMETHYL-4,8-DIHYDROXYBENZO(1,4) THIAZINE-3,5-DIONE-(2-O-CAFFEOYL)-β-D-GLUCOPYRANOSIDE FROM THE ROOTS OF XANTHIUM STRUMARIUM (COMPOSITAE)

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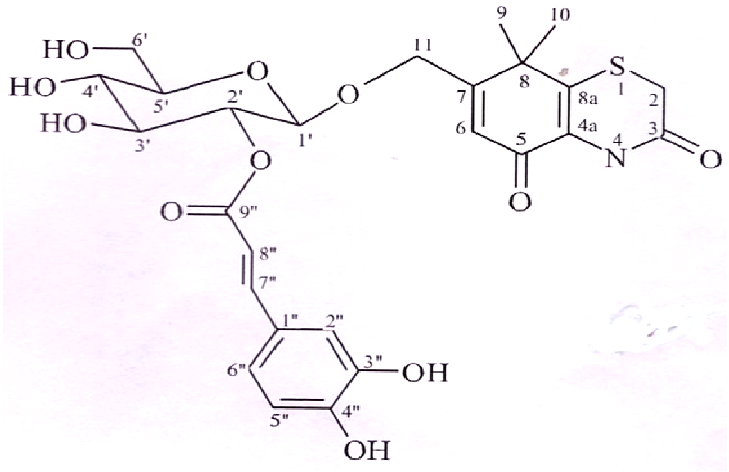
Abstract

The ethyl acetate fraction and methanol extract on repeated column chromatography over silica gel afforded the compound. The identification of the compound was made by concerted use of 1D and 2D-NMR, Mass, UV and IR spectroscopy.



Structure of the compound

Keywords: Column chromatography, 1D and 2D NMR, spectroscopy, fraction, extract

THERMODYNAMIC STUDY AND REMOVAL OF COPPER (II) BY SILICA FROM RICE HUSK

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Abstract

Gram quantities of various copper salts have been taken in suicide attempts and produced acute copper toxicity in humans, possibly due to redox cycling and the generation of reactive oxygen species that damage DNA. Corresponding amounts of copper salts (30 mg/kg) are toxic in animals. Chronic copper toxicity does not normally occur in humans because of transport systems that regulate absorption and excretion. Autosomal recessive mutations in copper transport proteins can disable these systems, leading to Wilson's disease with copper accumulation and cirrhosis of the liver in persons who have inherited two defective genes. The removal of copper ions from aqueous solution by adsorption on hybrid precursor was investigated. The rice husks were obtained from rice mills Shahdol. A silica adsorbent derived from rice husk by nitric acid treatment was used for the removal of Cu (II) from aqueous solution. The solution of copper was prepared of 1000 ppm and analyzed by AAS. Sorption of metal ion has been studied as a function of contact time, temperature, pH of the solution and metal ion concentration. These factors have a remarkable positive effect on sorption process. The adsorption data of RHHP at different initial concentration was fitted to Freundlich and Langumuir adsorption isotherms and monolayer sorption capacity determined was 86.58 (pH 6.0 temperature 40 °C, 105 mts). A thermodynamic parameter such as enthalpy, Gibbs free energy and entropy indicated that the sorption is exothermic, spontaneous with a greater affinity of metal species for the adsorbent. So, RHHP (Rice husk Hybrid Precursor) can be used as a removal agent for removing toxic metal ions Cu.

Keywords: Sorption, RHHP, adsorption, hybrid precursor, activated carbon, AAS, toxicity

EFFECT OF ETHYL ACETATE FRACTION OF *ACACIA NILOTICA* L. ON SEXUAL BEHAVIOR OF MALE RATS

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Abstract

Male sexual dysfunctions such as decreased libido, delayed orgasm, difficulties in maintaining an erection and inhibition of ejaculation are common side effects of selective serotonin reuptake inhibitors. A variety of synthetic medications are reported to used in the treatment and management of male sexual dysfunction, but they are associated with some serious side effects not readily available and are expensive. Therefore, the search for a natural supplement from medicinal plants is being intensified probably because of its less side effects availability and affordability. The aim of the present study was to investigate the potential of ethyl acetate fraction of *Acacia nilotica* L. on male rat sexual behaviour and its effects on androgenic hormones. Ethyl acetate fraction of *A. nilotica* bark part at the dose of 100 mg/kg body weight was administered in male rats. Mount frequency (MF), intromission frequency (IF), ejaculatory frequency (EF), mount latency (ML), intromission latency (IL), ejaculatory latency (EL) and post-ejaculatory interval (PEI) were the parameters observed during the study. Results observed from the study revealed that ethyl acetate fraction at 100 mg/kg bw, significantly enhanced the sexual behaviour as evident from increased MF, IF, EF and reduced ML, IL, EL and PEI. The results indicated that ethyl acetate fraction of *A. nilotica* has a potential to enhance sexual performance of male rats.

Keywords: Male sexual dysfunctions, synthetic medications, medicinal plants

DEVELOPMENT AND EVALUATION OF MICROBALLOON OF LANSOPRAZOLE

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Abstract

In present study an attempt was made to prepare hollow microspheres (micro balloons) of lansoprazole by emulsion solvent diffusion technique for sustained delivery by using polymers like Ethyl cellulose and carbopol 934 in order to extend the drug release for about 12 h in the upper GIT, which may result in enhanced absorption and thereby improved bioavailability. The particle size was determined by optical micrometre and average particle size was found to be in range of189.5±2.63 to 124.33±2.14. Formulation F2 containing ethyl cellulose and carbopol 934 polymer blend showed the best floating ability (97.5%) as compared with other formulations. From scanning electron microscopy (SEM) it was observed that micro balloons were found to be spherical in shape with smooth surface texture with a hollow space within. Among all formulations, F2 showed an appropriate balance between buoyancy and drug release rate of 88.65% in 12 h, which is considered as the best formulation.

Keywords: Lansoprazole, micro balloons, emulsion solvent diffusion technique, buoyancy, bioavailability

SYNTHESIS, CHARACTERIZATION AND ANTIMICROBIAL ACTIVITY OF FIRST SERIES TRANSITION METAL COMPLEXES OF SULPHONAMIDEDERIVATIVES

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Abstract

A variety of sulphonamide derivatives (methyl salicylaldehyde methane sulfonyl hydrazone, and 5-methyl-2-hydroxyaceto-phenonemethanesulfonylhydrazone) and their complexes of first series transition metals have been studied extensively. The binary and ternary complexes have been synthesized and their structure was characterized by solubility, melting point, 1H-NMR, mass and UV-Vis Spectroscopy. Job's method of continuous variation revealed 1:1, 1: 2 and 1:3 metals-ligand stoichiometry for the complexes and majority of complexes shown octahedral geometry. Prepared complexes were screened for their antibacterial activity against gram negative bacteria (*E. coli* and *Pseudomonas aeruginosa*), gram positive bacteria (*B. substilis* and *Sterptococcus pneumoniae*) and antifungal activity against (*Aspergillus fumigates* and *Candida albicans*). The biological activity screening showed the promising antimicrobial biological activity and the activities were also compared with that of individual ligands and the metal complexes.

Keywords: Antimicrobial activity, sulphonamide derivatives, transition metals

STUDY ON PHARMACOGNOSTICAL EVALUATION AND PRELIMINARY PHOTOCHEMICAL SCREENING OF "*SOLANUM SURATTENSE.*"

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Abstract

The aim of present study was to identify morphological and biochemical markers which could help in the identification and to determine taxonomic status of a variant of *Solanum surattense*. We used fruits of *Solanum Surattense* (Solanaceae) of globose, whitish and green blotched, yellow when ripe which were used to treat a cough, asthma, rheumatism stopping vomiting. It has a characteristic smell and yellow color of fruits with the spine. Morphological characters such as point of origin of spines, the arrangement of spines, and the presence of hairs on petiole and stem, flower color, the length of filaments were studied. Photochemical investigation of it reported having alkaloids, sterols, saponins, flavonoids and glycosides. It has a high concentration of solasodine a starting material for the synthesis of cortisone and sex harmones. It is reported in Ceylon and Malacca, roadside throughout India. Pharmacological activities such as antibacterial and antifungal, antinociceptive, antioxidant, hypoglycemic and larvicidal have been reported in this plant. Solvent extraction was performed and reveals that petroleum ether extract contains alkaloids, steroids, chloroform contain alkaloids, steroids, ethanol contain alkaloids, anthraquinone glycoside, steroids, flavonoids, protein. Chloroform water extract contains alkaloids, proteins, carbohydrates, reducing sugar. Pharmacognostic studies reveal that total ash value was 10.50%, water soluble ash value was 2.5% and acid insoluble ash value was 0.65%. *Solenum Surattense* has water soluble extractive value and alcohol (ethanol) soluble extractive values were 8.75% and 5.2% respectively. Successive extraction value in petroleum ether, chloroform, ethanol, chloroform water was found 1.15%, 3.56%, 7.0% and 2.5% respectively. The LOD (loss on drying) value was found 1.71%. After over all studies percentage yield of ethanol extract was found to be more than different extract by successive solvent extraction method.

Keywords: Morphological, successive extraction value, solasodine**,** *solenum surattense*

GENE THERAPY IS THE INNOVATIVE FIELD FOR BRIDGING MEDICAL SCIENCE AND BIOSCIENCE

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Abstract

Therapeutic gene transfer is a novel concept in the treatment of immunologic and other diseases. Advances in *DNA technology provide easy* access to genes which control these events. The earlier concept of recombinant DNA therapy (insulin, erythropoietin) is being extended to somatic gene therapy. Originally gene therapy was directed towards the treatment of *inherited single-gene defects,* but now it is being employed to treat *acquired multiple gene defects like cancer, cardiovascular and infectious diseases.* Human gene transfer can replace a missing gene, replace an inactivated mutated gene, introduce additional copies of a normally expressed gene, or introduce a gene not normally present in the body. Such measures may be used to replace missing functions, amplify existing functions, or confer a new function on a tissue or cell. A number of DNA delivery systems based on viral life-cycle pathways, liposome encapsulation, complexation with carrier proteins and direct injection have been developed. Currently, the majority of gene therapy trials are under way for acquired disorders like AIDS, cancer, and cardiovascular diseases, in contrast to diseases caused by single-gene defects. In short, target diseases for gene therapy may be considered under the following heads: *(i) Organ directed therapy*: hepatitis B, cytotoxic therapy for hepatic carcinoma, familial hypercholesterolaemia, familial emphysema, cystic fibrosis, atherosclerosis, autommune vasculitis, prevention of restenosis of atherosclerotic coronay arteries; *(ii) Cancer gene therapy*: by targeting cancer cells in the bone, liver, lung, brain and other organs with the help of enzyme-prodrug combination; *(iii) Gene transfer into haemopoietic stem cells*: sickle cell anaemia, thalassemias, haemophilia, chronic granulomas, lymphocyte disorders, AIDS, severe combined immunodeficiency (SICD), Gaucher's disease; and *(iv) Others*: parkinsonism, alzheimer's disease, growth hormone deficiency, multiple sclerosis, hypertension, insulin-dependent diabetes mellitus (IDDM), influenza and malaria. Clinical trials are under way. Gene therapy currently is in its developmental stages, and a number of *ethical, toxicological* and *technical problems* are yet to be solved. A major danger of genetic engineering technology is its misuse and wrongful application in man.

Keywords: Therapeutic, single-gene defect, atherosclerosis, haemopoietic, immunodeficiency

PHYTOCHEMICAL CHARACTERIZATION OF *ROSA INDICA* AND *EMBLICA OFFICIALS*

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Abstract

The present study was done in order to find out the phytochemical activity of two different herbal plant extract preparations. Ethanolic and methanolic extracts of *Rosa indica* and *Emblica officals* were prepared by maceration method. Then their phytochemical characterization was done. *Rosa indica* contained the steroidal ring, glycoside and resins. *Emblica officials* contained resins, steroidal ring and saponin.

Keywords: Phytochemical activity, ethanolic extract, methanolic extract, maceration method, *rosa inica, emblica officials*

A SINGLE TOUCH DETECTION OF LEAD IN AYURVEDIC MEDICINES

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Abstract

Ayurveda is a traditional medicine practice of disease treatment originated in India. It uses a combination of remedies and lifestyle modification. Ayurvedic medicines, known as bhasmas, commonly incorporate adjuvant heavy metals into primary herbal formulations, usually for their ascribed therapeutic properties and to enhance potency. Heavy metals mostly observed in Ayurveda are lead, arsenic, and mercury. In present era again we are more inclined towards herbal medicinal forms. Many cases have been reported to have adverse effects of ayurvedic medicines. Hence, it is necessary to know the concentration of such toxic heavy metals and keep it below TLV in formulations. The present work describes the application of an analytical tool to detect the presence of lead in ayurvedic medicines. Thus, such detection can be beneficial from the point of care concern and could prevent the possible hazards to human health on consumption.

Keywords: Ayurveda, detection, health, lead, analytical tool

SYNTHESIS, CHARACTERIZATION AND BIOACTIVITY OF MIXED LIGAND COMPLEXES OF Cu (II) AND Zn (II) WITH ASCORBIC ACID AND ADENINE

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Abstract

Mixed ligand complexes of Cu (II) and Zn (II) involving ascorbic acid (AA) as primary ligand and adenine (Ade) as secondary ligand have been synthesized and characterized by conventional techniques including elemental analysis, molar conductivity, FTIR, mass and ^{1}H NMR spectroscopy. The elemental analysis data confirms the formation of complexes as [M(L1)(L2)(H_2O)]. The FTIR spectral data shows that the chelation behaviour of the ligands towards transition metal ions through enloic oxygen's of AA and exocyclic amine nitrogen and ring nitrogen of Ade. The molar conductivity reveals electrolytic nature of the complexes. The mass spectra and ^{1}H NMR spectra provides additional information of attachment of secondary ligand (Ade) in the second coordination sphere of the complexes. The mixed complexes prepared were found to exhibit enhanced activity on bacterial growth as compared to their binary complexes as well as the pure ligands.

Keywords: Ascorbic acid, adenine, metal complexes, spectral techniques, bioactivity

ANTIOXIDANT ACTIVITY OF ALCOHOLIC EXTRACT OF HERBAL PLANTS

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Abstract

Antioxidants or inhibitors of oxidation are compounds which retard or prevent the oxidation and in general prolong the life of the oxidizable matter. A plant-based diet protects against chronic oxidative stress-related diseases. Dietary plants contain variable chemical families and amounts of antioxidants. It has been hypothesized that plant antioxidants may contribute to the beneficial health effects of dietary plants. The aim of the present study was to investigate the *in vitro* antioxidant activity of alcoholic extracts of *Commiphora mukul* resins and *Withania somnifera*. In the preliminary phytochemical analysis, we observed glycosides, alkaloids, phenolic compounds, steroids, flavonoids and thin layer chromatography were also performed. The antioxidant activity of the plant extract was also determined by DPPH method.

Keywords: Antioxidants, TLC, DPPH

STUDY OF TRADITIONAL HEALTHCARE PRACTICES OF THE TRIBES IN MANDLA DISTRICT OF MADHYA PRADESH

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Abstract

The present paper deals with the traditional knowledge of tribes of Mandla districts of Madhya Pradesh, India regarding the use of plants for the household property and treatment of various diseases prevalent in the tribal pockets. The tribes of these region use plant of their suitable preparation for treating the various ailment and for the other household uses. Information collected from tribes has revealed that plant of several species from Mandla district of forest origin are utilized as paste, powder, juice, decoction and extract for the treatment of various diseases of local people of the area. The knowledge of plants used by tribes would be an immense help to replace synthetic drugs and to utilise plants for the household.

Keywords: Traditional knowledge, herbal healers, medicinal plants, disease

DEVELOPMENT OF SALICYLIC ACID ETHOSOMES FOR TREATMENT OF PSORIASIS

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Abstract

Psoriasis is commonly recognized as itchy, scaly, painful and disfiguring inflammatory condition of the skin that affects approximately 2% of the population characterized by excessive growth and aberrant differentiation of corneocytes and may be reversible with the application of appropriate therapy. In the present work, an attempt has been made to formulate salicylic acid loaded ethosomes in order to enhance bioavailability of drug through the scaly skin and reduce side effects. Ethosomal formulations were prepared by mechanical dispersion method containing soya phosphatidyl choline (2-3%) and ethanol (20-40%). The drug concentration was taken as 10 mg/ml or 1% w/v and the concentration of propylene glycol was fixed as 1% v/v. The entrapment efficiency of the optimum formulation was found to be 78.33% with zeta potential-17.3 mV and vesicle size of 295.4 nm containing 40% ethanol. *In vitro* release study of the optimized formulation containing 40% ethanol exhibited 24.88% of drug release in 1.5 h with 139.65µg/cm^2/h of transdermal flux. *In vivo* study of the formulation showed a marked effect on the de-scaling of the skin with hair growth within 15 d. Hence it can be concluded that the ethosomal formulation possesses great potential for transdermal drug delivery of salicylic acid which can be applied for the treatment of psoriasis and other skin diseases.

Keywords: Psoriasis, ethosomes, salicylic acid, transdermal flux

QUANTITATIVE STRUCTURE-ACTIVITY RELATIONSHIP STUDIES ON A SERIES OF HEPT ANALOGUES AS ANTIVIRAL AGENTS

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Abstract

Many studies show's that the human immunodeficiency virus (HIV) remains a worldwide health care issue. Quantitative structure-activity relationship studies have been performed on a series of (49) HEPT analogues as antiviral agents. A genetic algorithm multiple linear regression (GA-MLR) analysis shown that five-variable model containing RBF, ATS3m, ATSC3m, GATS1s and F04 [N-O] is best for modeling the compounds used in the present study. Using the GA-MLR model, some new compounds have also been proposed which shows higher potency.

Keywords: Quantitative structure activity relationship, QSARINS, HEPT analogues

DEVELOPMENT AND VALIDATION OF UV SPECTROSCOPIC METHODS FOR SIMULTANEOUS ESTIMATION OF ESOMEPRAZOLE AND NAPROXEN IN TABLET FORMULATION

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Abstract

Two simple, accurate, precise, reproducible and economical UV spectroscopic methods (A and B) for simultaneous estimation of esomeprazole and naproxen in tablet dosage form have been developed. Method A employs solving of simultaneous equations based on the measurement of absorbance at two wavelengths, 301.60 nm and 330.20 nm which are the λmax values of esomeprazole and naproxen respectively in methanol 50 %. Method B is based on the principle of Q-analysis wherein the absorbance was measured at 311.50 nm (iso-absorptive point) and 330.20 nm (λmax of naproxen) in methanol 50%. Esomeprazole and naproxen shows linearity at all the selected wavelengths and obeys Beer's law in the concentration range of 5-25µg/ml and 50-250µg/ml respectively. Recovery studies for esomeprazole and naproxen were performed and the percentage recovery for both the drugs was obtained in the range of 96.30-99.10% (Method A) and 97.45-99.03% (Method B) confirming the accuracy of the proposed method. Both the methods showed good reproducibility and recovery with % RSD less than 2. Statistical validation of the data shows that the proposed methods can be successfully applied for the routine analysis of drugs in commercial tablets.

Keywords: Esomeprazole, naproxen, simultaneous equations, Q-analysis, iso-absorptive point, methanol 50%

APPLICATION OF BIOCHEMIC MEDICINES ON THE BODY TISSUE

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Abstract

Biochemic remedies are also known as the tissue remedies or Schussler's tissue salt remedies. It is a system of medicine evolved by Dr. Wilhelm Heinrich Schuessler in 1873. The word 'Biochemistry' comes from the Greek 'Bios' for 'Life', combined with 'Chemistry', the science that studies the composition of elements and the changes they go through. The disease is caused by the inadequate organic salts in the tissues/cells of the body and that the supply of these limited salt(s) cures diseases. Biochemic comibinations or cell salts or tissue salt have been dispensed by a combination. The human body is made up of twelve inorganic substances or cell salts. Each performs a significant role in the body. These exist in equilibrium within each body, mixing up with organic substances in order to maintain the body's cells, while keeping numerous body functions perform up to the mark. If a deficiency occurs in any cell salt,it messes up with the exquisite balance which leads to ill-health such as coryza, cough, fever, constipation, diarrhoea, etc. A micro-dose of the required particular cell salt which will galvanize the body to produce it and heal accordingly is all that is required. Biochemic remedies are usually used in low potencies–3x, 6x, 12x, up to 30x. If a person isn't recovering due to a severe problem, the one's consisting of higher potencies are given to the patient.

Keywords: Biochemic, body tissue, human body, equilibrium

TARGETING CANCER STEM CELLS: A NEW THERAPY TO CURE CANCER PATIENTS

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Abstract

Cancer stem cells (CSCs) have been defined as cells within tumor that possess the capacity to self-renew and to cause the heterogeneous lineages of cancer cells. They have been identified in blood, breast, brain, colon, melanoma, pancreatic, prostate, ovarian and lung cancers. It is often considered to be associated with chemotherapeutic resistance and radiotherapy resistance that lead to the failure of traditional therapies. Most therapies are directed at the fast growing tumor mass but not the slow-dividing cancer stem cells. Eradicating cancer stem cells, the root of cancer origin and recurrence has been thought as a promising approach to improve cancer survival or even to cure cancer patients. Cancer stem cells are the reason for the resistance to the chemotherapeutic agent used to treat the malignant tumor. They are the source of cells that give rise to metastases. This topic deals with the properties of cancer stem cells, the clonal evolution of tumorigenesis, the role of cancer stem cells in the development of resistance to chemotherapy and the therapeutic implications as well as challenges of targeting cancer stem cells. Cancer stem cells are an approach with potential outcomes for the cancer patients and could help to develop novel therapies to eliminate the origin cause of cancer.

Keywords: Cancer stem cell, chemotherapeutic resistance, radiotherapy resistance, melanoma, tumorigenesis

SYNTHESIS, SPECTRAL AND BIOLOGICAL STUDIES OF SOME METAL COMPLEXES OF SCHIFF BASE DERIVED FROM XIPAMIDE: A DIURETIC DRUG

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Abstract

A new unsymmetrical bidentate Schiff base was synthesized using 4-chloro-5-sulfamoyl-2', 6'-salicyloxylidide (xipamide) and salicylaldehyde. The Ni (II) and Cu (II) complexes of this Schiff base of ML_2 type have been synthesized and characterized by elemental analysis, conductivity, magnetic measurements, IR and electronic spectra studies. The conductivity data of the complexes suggests their non-electrolytic nature. The antibacterial activities of the ligand and its complexes are also studied. The antibacterial experiments indicate that the ligand and its complexes possess antibacterial activity against *Escherichia coli* and *Bacilus subtilis* and that the complexes have higher activity than that of the Schiff base.

Keywords: Schiff base, xipamide, elemental analysis, antibacterial activity, conductivity

CURRENT TRENDS AND RECENT ADVANCEMENT IN TABLET TECHNOLOGY

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Abstract

Tablets and capsules are the most commonly used dosage forms all over the world, due to patient compliance, flexibility in dosage regimen and designing of the dosage form. Besides the oral mode of administration, the other tablets may possess more or less the same features which are attributed to conventional oral tablets. Bulks of the research scientist have involved industry, academic liaison to propose an implement newer height in tablet technology. Granulation is one of the most important unit operations in the production of pharmaceutical oral dosage forms. Granulation process will improve flow and compression characteristics, reduce segregation, improve content uniformity, and eliminate excessive amounts offline particles. The results will be improved yields, reduced tablet defects, increased productivity, and reduced downtime. Pharmaceutical products are processed off over the world using the direct compressing, met granulation, or dry granulation methods. Which method is chosen depends on the ingredients individual characteristics and ability to flow, compresses, eject and disintegrate properly. Choosing a method requires a thorough investigation of each ingredient in the formula, the combination of ingredients, and how they work with each other. Then the proper granulation process can be applied.

Keywords: Foam binder granulation, melt granulation, moisture activated dry granulation, all in one granulation

NANOTECHNOLOGY-BASED APPROACHES IN CANCER THERAPEUTICS

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Abstract

Cancer is a highly complex disease to understand because it entails multiple cellular physiological systems. Despite impressive advances in cancer biology, it is the leading cause of death worldwide and remains a challenge. There are over 200 different types of cancer reported all over the globe. In 2008, approximately 12.7 million cancer cases were reported, causing approximately 7.6 million cancer deaths, out of which 64% of the deaths were reported from economically developing countries. The most common cancer treatments are restricted to chemotherapy, radiation and surgery. Moreover, the early recognition and treatment of cancer remains a technological bottleneck. There is an urgent need to develop new and innovative technologies that could help to delineate tumor margins, identify residual tumor cells and micro metastases, and determine whether a tumor has been completely removed or not. Nanotechnology has witnessed significant progress in the past few decades, and its effect is widespread nowadays in every field. Nanoparticles can be modified in numerous ways to prolong circulation, enhance drug localization, increase drug efficacy, and potentially decrease chances of multidrug resistance by the use of nanotechnology. Recently, research in the field of cancer nanotechnology has made remarkable advances. The present review summarizes the application of various nanotechnology-based approaches towards the diagnostics and therapeutics of cancer.

Keywords: Cancer, diagnosis, drug delivery, nanoparticle, nanotechnology, treatment

NATURAL PLANT OCIMUM-SANCTUM

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Abstract

This medicinal herb has a long history as part of the Ayurvedic tradition. The herb grows wild in tropical and sub-tropical regions. It's also widely cultivated for its reputed spiritual and medicinal properties. Any other medicinal herb, consult your health care, provider. It has many traditional health uses, including treatment of eczema, psoriasis and aging effects. It is also used as an antibiotic, an immune system booster, an anti-inflammatory and a stress reducer. In its native India, it is considered a sacred plant and no household would dare be without the plant, according to an article at acadamia. edu. According to an article in "Natural Product Radiance," the *Ocimum sanctum* herb is available fresh, in capsules, tea and in a tincture. The best way to get fresh *Ocimum sanctum* leaves whenever needed is to keep a pot of the herb growing in a kitchen window or on a sunny porch. People have used this herb all over the world for many centuries, in cooking and for medicinal purposes. It's easy to grow on a windowsill, so it can be used fresh, or it can be bought dried in capsules or as tea. The leaves are the useful portion of the plant.

Keywords: Medicinal herb, natural product, treatment of eczema, antibiotic

EFFECT OF TIME OF COLLECTION ON TOTAL PHENOLIC CONTENT AND TOTAL FLAVONOID CONTENT OF *CALOTROPIS GIGANTEA LINN* AND *CALOTROPIS PROCERA LINN*

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Abstract

Phenols and flavonoids present in medicinal plants are considered to be among the most important bioactive components. *Calotropis procera L.* and *Calotropis gigantea L.* are much alike medicinal plants with a wide range of bioactivity. The present study was designed to confirm the effect of time of collection of leaves and flowers of these plants on total phenolic content (TPC) and total flavonoid content (TFC) in methanolic extract of these plants. In this concern, TPC and TFC were quantified by spectrophotometric method using gallic acid and quercetin as a respective standard component. Samples were collected in morning, afternoon and evening. It was observed that highest TPC was available in *Calotropis procera* leaves in the afternoon (20.10 mg/gm) and highest TFC was available in flowers in the evening (36.755 mg/gm). Significant variation in TFC and TPC level was observed in the two selected species. Thus from the present investigation, it can be concluded that there is a significant effect of time of collection of leaves and flowers of *C. procera* and *C. gigantea* on TPC and TFC.

Keywords: C. *gigantea*, TPC, TFC, methanolic extract, *C. procera,* quercetin

SYNTHESIS, CHARACTERIZATION AND BIOLOGICAL EVALUATION OF SOME NOVEL 2, 3-DISUBSTITUED QUINAZOLIN-4-(3H)-ONES

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Abstract

A new series of 2, 3-disubstituted quinazolin 4 (3H) one derivatives was synthesized in good yield with the use of different aldehydes and evaluate their antimicrobial and anti-inflammatory activities. Disubstituted quinazolin 4 (3H) one derivatives were synthesized from semicarbazide hydrochloride and semicarbazone as starting materials through oxadiazole as intermediates. This intermediate on reaction with benoxazinone in acidic media finally converted into corresponding 2, 3-disubstituted quinazolinone derivatives. The synthesized compounds were characterized by their physical properties, Infrared (IR), nuclear magnetic resonance (NMR), Mass spectroscopic (MS) and elemental analysis and evaluated for biological activities. Ten different analogues of 2, 3-disubstituted quinazolin 4 (3H) one were successfully synthesized. All the compounds were active against microbial growth and inflammation. They all give good to moderate result on comparison with a standard drug. The results reveal that pharmacological activity of quinazolin 4 (3H) one nucleus can be increased much times on chemical modification. This is advantageous to approaching the treatment of different kinds of severe diseases.

Keywords: Quinazoline, oxadiazole, quinazolin 4 (3H) one, antimicrobial, anti-inflammatory

EXPLORING THE USE OF OKRA GUM AS MATRIX FORMING AGENT FOR THE MODIFIED DELIVERY OF THERAPEUTICS

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Abstract

Modified and extended release drug delivery using hydrophilic polymers have been proven to be a better and widespread approach to delivering the drugs which are having several limitations like poor bioavailability, short half-life, repeat dosing, etc. At the same time, use of natural polysaccharides has also drawn the attention of formulation scientist for preparing such delivery systems. In the present study, hydrophilic matrix based formulation of thiocolchicoside (Anti-inflammatory and muscle relaxant) was prepared using Okra gum. Initially the polymer: drug ratio was optimized to get the better matrixing property and sustained release of the drug and it was found that 1:2 drug-polymer ratio was found to be optimum for the desired release pattern. A formulation containing guar gum with similar ratio has also been prepared and compared with the okra gum based formulation and the results reveal that okra gum has the similar properties to the guar gum. For better-controlled release of the drug, hydroxypropyl methylcellulose was added in the final formulation and study shows that Hydroxypropyl methylcellulose in combination with guar gum and okra gum can be successfully used for the formulation of matrix tablet of Thiocolchicoside without any interference. It could also be concluded that Okra gum alone or in combination with other polymers may be used for the formulation of any drug delivery system where matrix formation is required.

Keywords: Modified drug delivery, matrix tablet, okra gum, thiocolchicoside

DEVELOPMENT OF THIOCOLCHICOSIDE LOADED MICRO-EMULSION SYSTEM FOR THE ENHANCED TRANS-DERMAL PENETRATION

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Abstract

Thiocolchicoside is competitive $GABA_A$ receptor antagonist and also glycine receptor antagonist acting as anti-inflammatory and muscle relaxant. Considering the side effects and lower bioavailability of thiocolchicoside (25%) with half-life of 5-6 hr, an attempt has been made for the formulation development of micro-emulsion for its transdermal application using peppermint oil as oil phase whereas tween 80 and 1-butanol as surfactant and co-surfactant. On the basis of ternary plot 1:1 ratio (surfactant and co-surfactant) was selected for the development of drug loaded microemulsion formulation. *In vitro* characterization of optimized formulation such as zeta size, zeta potential, conductivity, refractive index and viscosity was performed to evaluate the prepared formulation. Results show the higher stability and optimum drug loading. *In vitro* drug release of the optimum formulation (Micro-emulsion loaded gel) exhibited a drug release of 37.4% at the end of 4 hrs. Flux, as well as permeability coefficient, was calculated and the value was found to be 104.53±5.7 and 0.048 respectively showing the optimum drug permeation through the skin at a higher rate. In the present study, it can be concluded that the microemulsion of thiocolchicoside could be developed for the better penetration and enhanced bioavailability but still an exhaustive study is needed in this regard for developing a better and cost effective formulation of thiocolchicoside.

Keywords: Microemulsion, thiocolchicoside, trans-dermal delivery, drug release

RECENT ADVANCES OF TRANSFEROSOMES: AS TRANSDERMAL DRUG DELIVERY SYSTEM

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Abstract

The transdermal route of drug delivery has gained the great interest of pharmaceutical research, as it circumvents a number of problems associated with oral route of drug administration. The major barrier in transdermal delivery of the drug is the intrinsic skin barrier, the stratum corneum, among these strategies transfer some appear promising. Transferosomes possess an infrastructure consisting of hydrophobic and hydrophilic moieties together and as a result can accommodate drug molecules with a wide range of solubility. Transferosomes can deform and pass through a narrow constriction (from 5 to 10 times less than their own diameter) without measurable loss. This high deformability gives better penetration of intact vesicles. They can act as a carrier for low as well as high molecular weight drugs e. g. analgesic, anaesthetic, corticosteroids, sex hormone, anticancer, insulin, gap junction protein, and albumin.

Keywords: Transferosome, undeformable vesical, skin delivery, pharmacokinetic

SCREENING OF *EUPHORBIA THYMIFOLIA* LINN. ON STZ-NICOTINAMIDE INDUCED DIABETIC NEUROPATHY AND ANTIHYPERLIPIDEMIC ACTIVITY IN RATS

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Abstract

Diabetic Neuropathy is a demonstrable disorder, either subclinical or clinically evident, that occurs in both peripheral and the autonomic nervous systems. Diabetic neuropathy is a peripheral nerve disorder caused by diabetes. Hyperlipidemia is the presence of high levels of lipids in the blood. It is a metabolic dearrangement caused by many diseases, especially the cardiovascular diseases neuropathy, is a secondary complication of diabetes mellitus, is generally considered to be related to duration and severity of hyperglycemia. If the blood glucose level is greater than 250 mg/dl, then it may be because of secondary complication. The main cause of diabetic neuropathy is hyperglycemia. The aim of treatment of diabetic neuropathy should be the treatment of diabetic mellitus and followed by prevention of another side effect. *Euphorbia thymifolia Linn* is a plant having flavonoid, which is responsible for lowering of blood glucose. *Euphorbia thymifolia Linn* is a well-established drug for diabetic mellitus (type-II) *Euphorbia thymifolia* Linn belonging to family Euphorbiaceae, commonly known as Choti Dudhi is an annual herb. The plant has medicinal value like a stimulant, laxative, antihelmanthic, antibacterial, expectorant, blood purifier, diuretic and used in amenorhoea, dysmenorrheal, helminthiasis, intestinal worms and in wound healing. The plant also reported to have antimicrobial, antibacterial antioxidant and antiviral, simplex virus-2 infection laxative and diabetes *Euphorbia thymifolia* are reported to have tannins, steroids, alkaloids, flavonoids, triterpenes, saponins and sugars. Leaves contain 5, 7, 4-trihydroxy flavones-7-glycoside which is responsible for diabetic neuropathy.

Keywords: Diabetic neuropathy, hyperlipidemia, *euphorbia thymifolia,* flavonoid, 5, 7, 4-trihydroxy flavones-7-glycoside, blood glucose, STZ-nicotinamide

RECENT TRENDS IN NUTRACEUTICAL AND FUNCTIONAL FOODS

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Abstract

The term "Nutraceutical" defines the combination of "Nutrition" and "Pharmaceuticals". Nutraceutical can be defined as, " food (or part of food) that provides medical or health benefits, including the prevention and/or treatment of a disease."However, the term nutraceutical as commonly used in marketing has no regulatory definition. We redefine the functional foods and nutraceuticals. When food is being cooked or prepared using "scientific intelligence" with or without knowledge of how or why it is being used, the food is called "functional food." Thus, functional food provides the body with the required amount of vitamins, fats, proteins, carbohydrates, etc., needed for its healthy survival. When functional food aids in the prevention and/or treatment of diseases and/or disorders other than anemia, it is called a nutraceutical. Thus, a functional food for one consumer can act as a nutraceutical for another consumer. Examples of nutraceuticals include fortified dairy products (eg, milk) and citrus fruits (eg, orange juice). Thus, nutraceuticals differ from dietary supplements in as they not only supplement the diet but should also aid in the prevention and/or treatment of disease and/or disorder. The use of nutraceuticals, as an attempt to accomplish desirable therapeutic outcomes with reduced side effects, as compared with other therapeutic agents has met with great monetary success. The preference for the discovery and production of nutraceuticals over pharmaceuticals is well seen in pharmaceutical and biotechnology companies. However, with all of the aforementioned positive points, nutraceuticals still need the support of an extensive scientific study to prove "their effects with reduced side effects."This can be achieved by the enactment of FIM proposed nutraceutical research and education act (NREA).

Keywords: Nutraceutical, functional food, dietary supplement, macronutrients, micronutrients, prebiotics, probiotics, health promoters

NASAL DRUG DELIVERY: NEW DEVELOPMENTS AND STRATEGIES

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Abstract

The use of the nasal route for the delivery of challenging drugs has created much interest in recent years in the pharmaceutical industry. Consequently, drug delivery companies are actively pursuing the development of novel nasal drug delivery systems and the exploitation of these for the administration of conventional generic drugs and peptides, both in-house and with partners in the pharmaceutical industry. This review sets out to discuss some new developments and strategies in nasal drug delivery. An exciting discovery that drugs can be transported directly from nose to brain via the olfactory pathway is discussed and examples of proof-of-concept in man are given. In the past decade, the use of the nasal cavity as a route for drug delivery has been an area of great interest to the pharmaceutical industry, especially for systemically acting drugs that are difficult to deliver via routes other than injection. The possibilities for the use of the nasal cavity for drug delivery are outlined. The nasal route could be important for drugs that are used in crisis treatments, such as for pain, and for centrally acting drugs where the putative pathway from nose to brain might provide a faster and more specific therapeutic effect.

Keywords: Nasal route, drug delivery, pharmaceutical industry

QUALITATIVE AND QUANTITATIVE PHYTOCHEMICAL ANALYSIS OF HIBISCUS ROSA

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Abstract

Hibiscus rosa is an important medicinal plant. The present study deals with the analysis of phytochemical constituents by qualitative and quantitative analysis of Hibiscus rosa leaves were done using methanol extract. Alkaloids, flavonoids, terpenoids, carbohydrates, protein and amino acids were analysed. Phenol and saponin were present in methanol extracts of leaves Steroids, anthroquinone, tannin, oils and resins were absent in the extract. Quantitative analyses were also conducted to determine the amount of alkaloids, flavonoids, phenol and carbohydrate.

Keywords: Phytochemical, qualitative, *hibiscus rosa*

FORMULATION DEVELOPMENT AND EVALUATION OF TOPICAL LIPOSOMAL GEL FOR MANAGEMENT OF ACNE

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Abstract

The main objective of the present work was to develop transdermal delivery of tazarotene, a hydrophobic drug used for the treatment of Acne, from liposome. The aim of the present study was to statistically optimize the vesicular formulations (Liposomes) for enhanced skin delivery of a model drug Tazarotene in combination with gel contains hydroquinone. Tazarotene was potent candidate for liposomal preparation. The need for sustained delivery of Tazarotene is further justified due to the requirement of maintaining un-fluctuating plasma concentrations for the effective management of psoriasis and acne. The gel formulation of Liposomes contain tazarotene in combination with hydroquinone effectively maintain concentrations of active agents to the deep layers of the skin and/or the systemic circulation. It is thought that ethanol fluidizes bilayers of the stratum corneum intercellular lipid; the soft, malleable vesicles then penetrate the disorganized lipid bilayers. All the system was characterized for vesicle morphology, particle size and entrapment efficiency by Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM).

Keywords: Tazarotene, hydroquinone, liposome, acne, SEM, TEM

ANTIMICROBIAL ACTIVITY OF AQUEOUS EXTRACT OF SOME SELECTED PLANTS

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Abstract

The antimicrobial sensitivity test is employed on to the three gram positive (*Streptococcus mutans, Bacillus subtilis, Enterococcus faecalis*), three gram negative bacteria (*Escherichia coli, Proteus mirabilis, Klebsiella pneumonia*) and three fungus (*Candida albicans, Aspergillus niger, Aspergillus flavus*) used under present study. Extracts obtained from aqueous leaves extract of plant *Cassia fistula* L., *Cassia tora* L., and *Cassia occidentalis* L. The disc diffusion method was used to determine the antimicrobial activity of the extracts prepared from the aqueous leaves extract. Results of the experiment are being concluded clearly shows the anti-microbial activity of aqueous extract of *Cassia fistula* L., *Cassia tora* L., and *Cassia occidentalis* L. out of the 6 bacterial and 3 Fungus strains aqueous extracts showed sensitivity against all pathogens against *Aspergillus niger.*

Keywords: Antimicrobial sensitivity, *cassia fistula*, *cassia tora*, and *cassia occidentalis*

METHOD DEVELOPMENT AND VALIDATION FOR THE ESTIMATION OF PREGABALIN USING U. V. SPECTRPHOTOMETRY

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Abstract

The present research work discussed the development of a UV spectophotometric method for estimation and validation of pregabalin. It is simple, fast, accurate and cost efficient and reproducible spectrophotometric method, developed for the estimation of pregabalin as a pure API. The wavelength (λ max) was found to be 420 nm by using 0.1N HCL as a solvent for the pregabalin and methyl orange used as dye solution. The linearity for this drug at the selected wavelength lies between 10-50 µg/ml. Beer's law was obeyed in this concentration range with correlation coefficient of 0.999. The accuracy and precision of the method were determined and validated according to ICH guidelines. The method has good reproducibility with % RSD less than one. Thus proposed method can be successfully applied for pregabalin in routine analysis work.

Keywords: Method development, validation, pregabalin, spectrphotometry

SYNTHESIS, CHARACTERIZATION AND QSAR STUDIES OF NEWLY SUBSTITUTED QUINOLONE DERIVATIVES AS ANTIBACTERIAL POTENTIAL

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Abstract

Quinolones are considered as a big family of multi-faceted drugs; their chemical synthesis is flexible and can be easily adapted to prepare new congeners with rationally devised structures. They are a class of antibiotics with potent bactericidal, broad-spectrum activity against many clinically important pathogens. A number of Schiff bases of 2-quinolone synthesized and evaluated for antimicrobial activity. Synthesized compound of quinolone also characterized for their identity by IR,NMR, Mass and elemental analysis.

Keywords: Quinolones, antimicrobial activity

QUALITATIVE AND QUANTITATIVELY ESTIMATIONS PHYTOCONSTITUENTS IN ETHANOLIC EXTRACT OF SELECTED HERB

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Abstract

Aim of the present study was to evaluate the qualitative and quantitatively estimations of various phytoconstituents in ethanolic extract of *Gymnema sylvestre*. The total phenolic content (TPC) was expressed as mg/gm of gallic acid equivalent of the dry extract sample 12.56 mg/gm. Total flavonoids content (TFC) was expressed as mg gm of quercetin 0.125 mg/gm. The zones of inhibition of ethanolic extracts were found to be 12.375 mm for bacteria 14.35 mm for fungus.

Keywords: Qualitative, quantitative, ethanolic extract

EXTRACTION, PHYTOCHEMICAL EVALUATION AND QUANTITATIVE STUDY OF PHYTOCONSTITUENTS IN AQUEOUS EXTRACT OF EUPHORBIA THYMIFOLIA L

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Abstract

The use of plant extracts to cure many diseased conditions has been the traditional method in many parts of the world. The plant extracts are found to be effective in their mode of action and do not cause any side effects to the patient treated. Therefore present study was planned to evaluate Phytochemical Evaluation and Quantitative study of phytoconstituents in aqueous extract of *Euphorbia thymifolia* L. The phytoconstituents were screened through TLC. The *Euphorbia thymifolia* L has flavonoids and phenols which were screened through TLC and Phytochemical analysis. The leaves of aqueous extracts of *Euphorbia thymifolia* L possessed lots of phytochemical constituents and have a potent antimicrobial activity.

Keywords: Phytochemical evaluation, quantitative study*, euphorbia thymifolia* L

SCREENING OF AMYLASE PRODUCING BACTERIA FROM SOIL

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Abstract

The enzymes from microbial sources are more stable and obtained cheaply. Amylases are amongst most widely used enzymes in industries such as food, fermentation, starch processing, textile and paper. In the present investigation we report the isolation, screening and characterization of amylase producing bacteria from the soil samples collected from local area of Bhopal. Production conditions were optimized (temperature, pH etc.) to achieve high enzyme production and better enzyme activity.

Keywords: Enzyme, isolation, amylases, characterization

PHYTOCHEMICAL INVESTIGATION ON THE LEAVES OF *TAGETES ERECTA* LINN.

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ABSTRACT

Life and its growth cannot be imagined without plants. They not only produce food for survival and serves as helping hand for curing many diseases but also create healthy environment and eco-friendly atmosphere to live. *Tagetes erecta* is an ornamental herbaceous plant with traditional medicinal purposes in many countries. It is widely cultivated commercially. *Tagetes erecta* are traditionally practiced in the treatments of boils, dysentery, indigestion, various Skin infections and urinary tract infection. For the present studies five solvents were used for extraction of bioactive compounds. Solvent were petroleum ether, chloroform, acetone, methanol and aqueous. Result showed that leaves have alkaloids, phenols, flavonoids, tannic, protein and starch. This study also showed that bioactive compound of leaves are better extracted in aqueous and methanol solvent. The presence of valuable compound in this leaves highlights the real potential of the plant in the preparation of versatile drugs in future.

Keywords: Phytochemical screening, *tagetes erecta,* ornamental herbaceous

ESTIMATION OF BIOACTIVE CONSTITUENTS PRESENT IN DIFFERENT LEAVES EXTRACT OF BOUGAINVILLEA GLABRA

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Abstract

The present study was undertaken to find out the phytochemicals present in *Bougainvillea glabra* leaves extract. Fresh leaves of botanically identified plant were collected and were processed for preparation of plant extract using specified technique. The plant extract was then subjected for different qualitative chemical tests to investigate the chemical profile of *Bougainvillea glabra* extracts. *Bougainvillea glabra* showed the presence of glycosides, alkaloids, sterols, triterpenoids, phenolics and flavonoids. Fixed oil and fats were found in except petroleum ether extract. The different extracts/fractions showed a phenolic content (92.13±5.19, 41.73±4.04, 98.9±5.94 and 126.8±8.58 mg GAE/g dry extract) and flavonoid contents (106.45±11.2, 53.11±6.49, 98.01±10.82 and 130.58±8.71 mg QE/g dry extract) in ethanolic extract, aqueous extract, chloroform fraction and ethylacetate fraction respectively. The highest phenolic and flavonoid content was found in the ethyl acetate fraction followed by ethanolic extract, chloroform fraction and aqueous extract.

Keywords: *Bougainvillea glabra,* phenolic content, flavonoid contents

ESTIMATION OF TOTAL PHENOLIC CONTENT AND TOTAL FLAVONOID CONTENT OF *CALOTROPIS GIGANTEA LINN* AND *CALOTROPIS PROCERA LINN*

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ABSTRACT

Phenols and Flavonoids present in medicinal plants are considered to be among the most important bioactive components. *Calotropis procera L.* and *Calotropis gigantea L.* are much alike medicinal plants with wide range of bioactivity. Present study was designed to confirm the effect of time of collection of leaves and flowers of these plants on total phenolic content (TPC) and total flavonoid content (TFC) in Methanolic extract of these plants. In this concern TPC and TFC were quantified by spectrophotometric method using Gallic acid and Quercetin as respective standard component. Thus from present investigation it can be concluded that there is a significant effect of time of collection of leaves and flowers of *C. procera* and *C. gigantea* on TPC and TFC.

Keywords: C. *gigantea*, TPC, TFC, methanolic extract and *C. procera,* quercetin

SYNTHESIS, CHARACTERISATION, BIOLOGICAL EVALUATION and DOCKING OF SOME NOVEL SUBSTITUTED 1, 3-THAIZINE DERIVATIVES

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ABSTRACT

Chalcones and their heterocyclic analogs represent an important class of small molecules having wide pharmacological activities. Therefore, in this study, synthesis and anticonvulsant and antimicrobial activities of some new 1,3-thiazines were described. The reaction of 4-tert-butylcyclohexanone on Claisen-Schmidt condensation with various aromatic aldehydes in presence of dilute sodium hydroxide afforded the corresponding chalcones. Further these compounds are subjected to cyclocondensation with thiourea, catalyzed by aqueous potassium hydroxide to form 4-aryl 8-arylidene 5,6-dihydro-2-imino-6-methyl-4H,7H-(3,1) Benzothiazines. The structures of the newly synthesized compounds have been established on the basis of their spectral data and elemental analysis. The newly synthesized compounds were tested for their biological screening. Antimicrobial activity cup plate agar diffusion and antiepileptic activity by Pentylenetetrazole (PTZ) induced seizures model using diphenyl hydantain as standard and also they are subjected to molecular properties prediction, toxicity, drug-likeness, lipophilicity and solubility parameters determination using Osiris program, Molsoft, Prototox and ALOGPS 2.1 softwares. The binding mode of the synthesized compounds with protein active site was predicted using docking method. Most of the compounds showed good anticonvulsant as well as antimicrobial activities but is less than the standard drugs. 1,3-thiazines were more potent and among them, Compound TB_7 containing 3,4,5-trimethoxyphenyl moiety was most potent of the series. We described the synthesis and biological screening of some novel 1,3-thiazine derivatives. In particular compounds with electron withdrawing substituents.

Keywords: Thiazine, anticonvulsant, antimicrobial activities, molecular docking

SYNTHYSIS AND CHARACTERIZATION OF SILVER AND GOLD NANOPARTICLES USING PLANT EXTRACT"RUTA GRAVEOLENS LINN. SUDAB RUTACEAE"

Indu Arora[a] Mobin Ehsan Siddiqui[b] Vishaka Sharma[b] mohammed Samim*[b]

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ABSTRACT

In recent science Nanotechnology is a burning field for the researchers. Nanotechnology deals with the Nanoparticles having a size of 1-100 nm in one dimension used significantly concerning medical chemistry, atomic physics, and all other known fields. Nanoparticles are used immensely due to its small size, orientation, physical properties, which are reportedly shown to change the performance of any other material which is in contact with these tiny particles. These particles can be prepared easily by different chemical, physical and biological approaches. But the biological approach is the most emerging approach of preparation, because, this method is easier than the other methods eco-friendly and less time consuming. The Green synthesis was done by using the aqueous solution of Ruta plant extract and AgNO3 and Aucl3 solutions. Silver and gold were the particular interest for this process due to its innovative physical and chemical properties. A fixed ratio of extract to metal ion was prepared and the colour change was observed which proved the formation of Nanoparticles. The Nanoparticles were characterized by UV-visible Spectrophotometer and DLS. The Nanoparticles have the size ranges from 100nm*-200nm*.

Keywords: Nanotechnology, nanoparticles, green synthesis

EXTRACTION PHYTOCHEMICAL ANALYSIS OF EXTRACT OF *CURCUMA AMADA*

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Abstract

The preliminary phytochemical analysis of the crude extracts of the *Curcuma amada* indicated the presence of major phytochemical compounds, including carbohydrates, phenolics, alkaloids, glycosides, flavonoids, terpenoids, saponins proteins and amino acid, steroids and tannins which may be dependable for the observed antioxidant activities, antimicrobial activities and antigen toxic activities. The observed results further maintain the analysis that several conventionally used *curcuma amada* are promising sources of potential antioxidants and medicinal compounds**.** *Curcuma amada* of root extracts were prepared. Ethyl acetate, Methanol, ethanol and aqueous were used for the extraction of the active ingredients.

Keywords: Extraction, phytochemical analysis, *Curcuma amada*

QUANTITATIVE STRUCTURE ACTIVITY RELATIONSHIP STUDY OF IMIDAZOLE COMPOUNDS AS ANG II RECEPTOR

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Abstract

The present study describes development of Quantitative structure activity relationship analyses was performed and investigate the role of its structural features substituents imidazole Derivatives on their angiotensin II receptor. A suitable set of molecular descriptors was calculated and PLS was employed to select the descriptors that resulted in the models with the best fit to the data. The good QSAR model was selected having a correlation coefficient (r^2) of 0.7840 and cross-validated correlation coefficient (q^2) of 0.7341. The generated models provide insight into the influence of interactive fields on the activity and, development of new, more potent molecules.

Keywords: QSAR, PLS, Chem-Office 8.0, angiotensin II receptor antagonists, imidazole

ACCUMULATION AND HARMFUL EFFECTS OF HEAVY METALS (CADMIUM AND CHROMIUM) IN SOIL AND VEGGIE PLANTS FROM FLYATH CONTAMINATED AREA OF PARICHHA THERMAL POWER STATION IN INDIA. (M. P.)

Asha Verma

Department of chemistry Govt. Sci. and Comm. College Benazeer Bhopal

ABSTRACT

The Present Investigation deals with the accumulation of Heavy Metals (Chromium and Cadmium) in fields contaminated with fly ash from PTPS (JHANSI) In India, and subsequent uptake of different parts of veggi Plants. The Result of Research Shows that the contamination of Toxic metals in plant leaves are slightls higher and beyond the permissible limits in reference to cadmium and chromium Toxic metal concentration of cd and cr found in root, shoot, stem parts of the plant also in surrounding soils, due to the intake of contaminant veggies they are also found in haven beings, which creates very harmful effects and diseases in the human body. The mean values of concentration of cd and cr found highest in the plant spinach 0.812 µg/g and 10.514 µg/g in apium respectively. similarly the lowest concentration of above toxic metals found in Fenugreek 0.05 µg/g and 0.25 µg/g in cabbage and ledy's finger. The present findings of research work provide's us a clue for the selection of plant species. Which shows natural resistance against toxic metal, and are efficient metal accumulation. Also thus in a need of change and modification in technologies of coal thermal power plants by the site of central government body of ministry of Environment.

Keywards: Analysis, metal toxicity, permissible limits

Scientific Programs

CONFERENCE SCHEDULE

11th February 2017, Day 1		**From**	**To**	**Duration**
Registration / Tea / Breakfast		8:00 AM	9:30 AM	90 min
Inauguration	(Room 1)	9:30 AM	10:30 AM	60 min
Keynote Address 1	(Room 1)	10:30 AM	11:30 AM	60 min
Keynote Address 2	(Room 1)	11:30 AM	12:30 PM	60 min
Lunch		12:30 PM	1:30 PM	60 min
Oral sessions	(Room 1-3)	1:30 PM	4:15 PM	165 min
High Tea / Poster session		4:15 PM	5:30 PM	75 min
Fun & Frolic / Workshop	(PCR & HPLC)	5:30 PM	6:30 PM	60 min
Cultural Event	(Rajsathani Folk Dance)	6:30 PM	7:30 PM	60 min
Dinner	(Rajasthani Cuisine)	7:30 PM	9:00 PM	90 min
12th February 2017, Day 2				
Tea / Breakfast		8:30 AM	9:30 AM	60 min
Keynote Address 1	(Room 1)	9:30 AM	10:15 AM	45 min
Keynote Address 2	(Room 1)	10:15 AM	11:00 AM	45 min
Oral Sessions	(Room 1-3)	11:00 AM	1:30 PM	150 min
Lunch		1:30 PM	2:15 PM	45 min
Poster Sessions		2:15 PM	3:30 PM	75 min
High Tea / Workshop	(Scan Lab)	3:30 PM	4:00 PM	30 min
Closing Ceremony	(Room 1)	4:00 PM	5:00 PM	60 min

Innopharm 2 Oral Presentation Schedule for Day 1 (11th February 2017)

NATURAL DRUG RESEARCH, PHYTOMEDICINE AND BIOTECHNOLOGY | PHARMACOLOGY, CLINICAL RESEARCH, PHARMACY PRACTICE AND PHARMACOVIGILANCE

Day 1	Date: 11-Feb-17 Time: 1:30 PM to 04:15 PM					
Room 1	Natural Drug Research, Phytomedicine And Biotechnology | Pharmacology, Clinical Research, Pharmacy Practice and Pharmacovigilance					
S. No.	Reg. No.	Name	Section	Affiliation	Abstract Title	Duration
11001	Speaker 1	Masitha Devi	Pharmacology	Indonesia	GINKGO BILOBA EXTRACT EFFECT ON OXIDATIVE STRESS MARKER MALONILDIALDEHYDE, REDOX ENZYME GLUTHATION PEROXIDASE, VISUAL FIELD DAMAGE, AND RETINAL NERVE FIBER LAYER THICKNESS IN PRIMARY OPEN ANGLE GLAUCOMA	30 min
11002	Speaker 2	Dr. Diah Dhianawaty	Natural Drug Research	Indonesia	BLOOD PRESSURE PROFILES AMONG EAST BONGAS AND WEST BONGAS PEOPLE IN EFFORT AND SUPPORT FROM UNIVERSITAS PADJADJARAN AND THE REGENT OF MAJALENGKA REGENCY AND CHIEVES OF THE VILLAGES	30 min
11101	20161115	Mr. Jayanta Maji	Natural Drug Research	India	PARAFAC ALGORITHM WITH APPLICATION TO CALIBRATION OF HPLC-DAD FOR SIMULTANEOUS DETERMINATION OF OVERLAPPED POLYPHENOL & FLAVONOID COMPOUND IN DIABETOGEN FORMULATION.	12 min
11102	20161128	Miss sonam sharma	Natural Drug Research	India	IDENTIFICATION AND ISOLATION OF SWERTIAMERIN: AN ACTIVE BITTER PRINCIPLE FROM EXACUM LAWII LINN.	12 min
11103	20161125	Dr. Sunil Pawar	Natural Drug Research	India	ESTIMATION OF PHOTOSYNTHETIC PIGMENTS FROM ANTIALLERGENIC PLANTS AND THEIR POSSIBLE CORRELATION WITH THERAPEUTIC ACTIVITY.	12 min
11104	20161129	Dr. Abhjit Bandyopadhayay	Natural Drug Research	India	EXPLORING SUN PROTECTION FACTOR FROM TROPICAL MEDICINAL PLANTS	12 min
11105	20161114	Mrs. Tulika Tyagi	Natural Drug Research	India	GC-MS ANALYSIS OF INVASIVE AQUATIC WEED, PISTIA STRATIOTES L. AND EICHHORNIA CRASSIPES (MART.) SOLMS	12 min
11106	20161183	Mr. Subhabrata Paul	Natural Drug Research	India	INDUCTION OF APOPTOSIS BY FATTY ACID RICH FRACTIONS OF THREE MEDICINAL PLANT EXTRACTS IN HUMAN CERVICAL CANCER CELLS.	12 min
11107	20161185	Miss Indira Majumder	Natural Drug Research	India	INDUCTION OF AUTOPHAGIC CELL DEATH IN HPV 16 POSITIVE SIHA CELLS BY CHAETOMORPHA BRACHYGONA, A MARINE GREEN ALGAE.	12 min
11108	20161222	Dr. Nanna Swamy	Natural Drug Research	India	PHARMACOLOGICAL EVALUATION OF AQUEOUS LEAF EXTRACTS OF SENNA ALATA USING ANIMAL MODELS	12 min
11109	20161031	Mrs. Sailaja Rao	Pharmacology	India	PHARMACOTHERAPY OF PHYTOMEDICINE ON OXIDATIVE STRESS INDUCED BY STREPTOZOTOCIN IN ANIMALS	12 min

Innopharm 2 Oral Presentation Schedule for Day 1 (11th February 2017)

PHARMACEUTICS, FORMULATION DEVELOPMENT, NDDS, REGULATORY AFFAIRS AND IPR

Day 1	Date: 11-Feb-17 Time: 1:30 PM to 04:15 PM					
Room 2	Pharmaceutics, Formulation Development, NDDS, Regulatory Affairs And IPR					
S. No.	Reg. No.	Name	Section	Affiliation	Abstract Title	Duration
12001	Speaker 1	Prakash V Diwan	Pharmaceutics	India	NANOTECHNOLOGY IN PHARMACOTHERAPY : A SMALL BUT A BIG DEAL IN 21ST CENTURY	30 min
12002	Speaker 2	Swarnlata Saraf	Pharmaceutics	India	MATRIX METALLOPROTEINASES (MMPS): NOVEL TARGETS IN SKIN CANCER	30 min
12003	Speaker 3	M S Sudhees	Pharmaceutics	India	ROLE OF BIONANO INTERFACE IN NANOMEDICINE	30 min
12101	20161079	Mr. Umesh Laddha	Pharmaceutics	India	ENHANCEMENT OF TRANSCORNEAL PERMEATION AND SUSTAIN RELEASE OF TIMOLOL MALEATE FROM DEVELOPED AND OPTIMIZED IN SITU GEL WITH BETTER SAFETY PROFILE	12 min
12102	20161088	Dr. Lalitha P	Pharmaceutics	India	IN VITRO EVALUATION OF SUN PROTECTION FACTOR OF NANOPARTICLE INCORPORATED SUNSCREEN LOTION	12 min
12103	20161071	Mr. Rajasekhar Poonuru	Pharmaceutics	India	SUBLINGUAL DELIVERY OF PROPRANOLOL HYDROCHLORIDE ACROSS ORAL MUCOSA UNDER THE INFLUENCE OF PH	12 min
12104	20161136	Miss Malvika Sharma	Pharmaceutics	India	DEVELOPMENT AND CHARACTERIZATION OF LOSARTAN POTASSIUM LOADED CHITOSAN NANOPARTICLES BY IONIC GELATION METHOD	12 min
12105	20161146	Mrs. Remya Neelakantan Nair	Pharmaceutics	India	FORMULATION, OPTIMIZATION AND IN-VITRO CHARACTERIZATION OF CLINIDIPINE LOADED SOLID LIPID NANO PARTICLES	12 min
12106	20161175	Mr. Taraka K	Pharmaceutics	India	DEVELOPMENT AND EVALUATION OF MATRIX LOADED GELATIN NANOPARTICLES FOR THE DELIVERY OF BORTEZOMIB	12 min
12107	20161336	Mr. Mohd khan	Pharmaceutics	India	FORMULATION AND CHARACTERIZATION OF CURCUMIN LOADED TRANSDERMAL PATCHES FOR WOUND HEALING POTENTIAL	12 min
12108	20161454	Miss Kanupriya Jha	Pharmaceutics	India	EFFECTS OF HLB VALUES OF EXCIPIENTS USED IN OIL IN WATER (O/W) MICROEMULSION SYSTEM	12 min
12109	LNCP	Mr. Sarvesh Sharma	Pharmaceutics	India	ANTICANCER EFFECT OF ARTESUNATE ON BREAST CARCINOMA: AN IN-VIVO STUDY	12 min
12110	Bhaba College	Ms. Priti Tagde	Pharmaceutics	India	RECENT ADVANCES OF NANOPARTICLES FOR ANTICANCER DRUG DELIVERY: A REVIEW	12 min
12111	20161428	Mrs. Vandana Singh Suryavanshi	Pharmaceutics	India	SYNTHESIS AND CHARACTERIZATION OF WATER SOLUBLE CARBOXYMETHYL CHITOSAN BY CHEMICAL MODIFICATION METHOD AND ITS APPLICATION FOR DRUG DELIVERY	12 min

Innopharm 2 Oral Presentation Schedule for Day 1 (11th February 2017)

PHARMACEUTICAL/MEDICAL CHEMISTRY, ANALYSIS, SYNTHESIS AND MOLECULAR DRUG DESIGN

Day 1	Date: 11-Feb-17 Time: 1:30 PM to 04:15 PM					
Room 3	Pharmaceutical/Medical Chemistry, Analysis, Synthesis and Molecular Drug Design					
S. No.	Reg. No.	Name	Section	Affiliation	Abstract Title	Duration
13001	Speaker 1	Dr. Deepti Jain	Pharmaceutics	India	FTNIR: A VERSATILE TOOL FOR PHARMACEUTICAL ANALYSIS	30 min
13002	Speaker 2	Dr. Harish Rajak	Pharmaceutical/Medicinal Chemistry	India	ADVANCED GAS CHROMATOGRAPH COUPLED WITH MASS SPECTROMETER FOR RAPID DETERMINATION OF ACTIVE COMPOUNDS AND RELATED SUBSTANCES IN PHARMACEUTICAL DRUGS	30 min
13003	Speaker 3	Dr. Kanti Shrestha	Pharmaceutical/Medicinal Chemistry	Nepal		30 min
13101	20161026	Mr. Asish Bhaumik	Pharmaceutical/Medicinal Chemistry	India	EVALUATION OF IN VIVO HEPATOPROTECTIVE ACTIVITY OF SOME NOVEL OXADIAZOLE DERIVATIVES FOLLOWED BY MOLECULAR DOCKING AGAINST NF-KB GENE	12 min
13102	20161106	Miss Ritika Srivastava	Pharmaceutical/Medicinal Chemistry	India	DESIGN, SYNTHESIS AND BIOLOGICAL EVALUATION OF BENZIMIDAZOLE DERIVATIVES AS ANTIBACTERIAL AND ANTIVIRAL AGENTS	12 min
13103	20161105	Mr. Vishal Singh	Pharmaceutical/Medicinal Chemistry	India	STUDIES ON N1- ALKYLATED PYRIMIDINE DERIVATIVES AS POTENTIAL ANTIBACTERIAL AGENTS	12 min
13104	20161116	Miss Farha Naaz	Pharmaceutical/Medicinal Chemistry	India	MOLECULAR MODELLING, SYNTHESIS AND ANTIBACTERIAL STUDIES ON SULFONAMIDE ANALOGUES AS PEPTIDE DEFORMYLASE INHIBITORS	12 min
13105	20161126	Dr. Rakesh Kumar	Pharmaceutical/Medicinal Chemistry	India	SYNTHESIS AND MORPHOLOGICAL STUDY OF VALACYCLOVIR IMPRINTED POLYMER FOR DRUG ANTICOUNTERFEITING STUDY	12 min
13106	20161131	Mr. Kapish Kapoor	Pharmaceutical/Medicinal Chemistry	India	FREE-WILSON AND DOCKING APPROACH FOR THE DESIGNING OF CHALCONES AS EPIDERMAL GROWTH FACTOR RECEPTOR TYROSINE KINASE INHIBITOR IN PREVENTION OF LUNG CANCER	12 min
13107	20161112	Mr. Sabya das	Pharmaceutical/Medicinal Chemistry	India	VALIDATION AND STABILITY INDICATING REVERSE PHASE- ULTRA FAST LIQUID CHROMATOGRAPHIC (RP-UFLC) METHOD FOR THE DETERMINATION OF NAPROXEN SODIUM IN PHARMACEUTICAL DOSAGE FORM	12 min
13108	20161132	Dr. Gururaja R	Pharmaceutical/Medicinal Chemistry	India	SYNTHESIS AND CHARACTERIZATION OF SOME NOVEL SERIES OF INDOLO-IMIDAZOLONES AS BIOLOGICAL AGENTS	12 min
13109	LNCP	Dr. Jitender Malik	Pharmaceutical Chemistry	India	APPLICATION OF 3D-QSAR IN DRUG DESIGN- A REVIEW	12 min
13110	Benazir	Ms. Pratibha Saxena	Pharmaceutical/Medicinal Chemistry	India	POTENTIAL PHYTO-PHARMACOLOGICAL ACTION OF SELAGINELLA BRYOPTERIS IN HUMAN LIFE	12 min
13111	Career	Mr. Chaitanya Sarathe	Pharmaceutical/Medicinal Chemistry	India	MODELING OF 5- OR 6- METHYL- 2-SUBSTITUTED BENZOXAZOLES / BENZIMIDAZOLES - A POTENT INHIBITOR OF FUNGAL INFECTION.	12 min
13112	20161280	Mrs. Smita Nair	Pharmaceutical/Medicinal Chemistry	India	COMPARATIVE ANALYSIS OF IN VITRO ANTIOXIDANT POTENTIAL OF CRUDE EXTRACTS OF BRYOPHYLLUM PINNATUM L. LEAVES IN DIFFERENT SOLVENTS AND	12 min

					THE POTENTIAL OF ITS HYDRO ALCOHOLIC EXTRACT IN TREATING DIABETES WOUNDS	
13113	LNCP	Mr. Kaushelendra Mishra	Pharmaceutical/Medicinal Chemistry	India	DEVELOPMENT AND VALIDATION OF UV SPECTROPHOTOMETRIC METHOD FOR ESTIMATION OF GLYCYRRHETINIC ACID IN HYDRO-ALCOHOLIC EXTRACT OF GLYCYRRHIZA GLABRA L.	12 min
13114	LNCP	Ms. Anita Chowbey	Pharmaceutical/Medicinal Chemistry	India	FORMULATION AND CHARACTERIZATION OF HONEY HYDRO GEL WOUND HEALING SPONGE FOR CHRONIC ULCERS	12 min

Innopharm 2 Oral Presentation Schedule for Day 2 (12th February 2017)

NATURAL DRUG RESEARCH, PHYTOMEDICINE AND BIOTECHNOLOGY

Day 2	Date: 12-Feb-17 Time: 11:00 AM to 01:30 PM					
Room 1	Natural Drug Research, Phytomedicine and Biotechnology					
S. No.	Reg. No.	Name	Section	Affiliation	Abstract Title	Duration
21001	Speaker 1	Dr. Sanees Kumar	Natural Drug Research	South Africa	HPLC/LC-MS GUIDED PHYTOCHEMICAL/IN VITRO SCREENING OF INULA HELENIUM L. (ASTERACEAE) AND ALTHAEA OFFICINALIS L. (MALVACEAE), AND PREDICTION OF POSSIBLE CYTOCHROME P450 INTERACTIONS	30 min
21101	20161267	Mr. Badarinath Kulkarni	Natural Drug Research	India	EVALUATION OF ANTIOXIDANT AND ANTI-INFLAMMATORY ACTIVITIES OF AEGICERAS CORNICULATUM (L.) BLANCO. LEAF EXTRACTS- AN IN VITRO STUDY	12 min
21102	20161302	Miss Sumira Mukhia	Natural Drug Research	India	STUDY OF CONSTITUENT PHYTOCHEMICALS AND PHARMACOLOGICAL ACTIVITIES OF SIX LIVERWORTS FROM DARJEELING, EASTERN HIMALAYA	12 min
21103	20161279	Dr. Palash Mandal	Natural Drug Research	India	EVALUATION OF PHYTOCHEMICAL AND PHARMACOLOGICAL ACTIVITIES OF UNDEREXPLORED WILD FRUITS OF DARJEELING HIMALAYA	12 min
21104	20161303	Miss Arunika Subba	Natural Drug Research	India	AN ANTIDIABETIC ETHNOMEDICINE, FRAXINUS FLORIBUNDA: ITS PHARMACOGNOSTIC STUDY AND THE INFLUENCE OF VARIATION IN EXTRACTION PROCESS ON ITS ANTIOXIDANT AND ANTI-DIABETIC ACTIVITY	12 min
21105	20161174	Miss Karthika Periyasami	Natural Drug Research	India	EFFECT OF NATURAL ANTIOXIDANT IN THE PREVENTION OF ENZYMATIC BROWNING REACTION IN ETHNOMEDICINE OF SOLANUM ANGUIVI LAM	12 min
21106	20161229	Miss Sreeharshini Oruganti	Natural Drug Research	India	STUDY OF INTERACTIONS BETWEEN ZIKA VIRAL PROTEINS AND HUMAN AXL RECEPTOR TO DECODE THE POSSIBLE CAUSE OF MICROCEPHALY	12 min
21107	20161436	Mrs. Shweta Kumar	Natural Drug Research	India	EFFECT OF SIDA CORDIFOLIA EXTRACT ON ROS REGULATION AND SACCHAROMYCES RESISTANCE TO OXIDATIVE STRESS	12 min
21108	LNCP	Mr. Dilip K Tiwari	Natural Drug Research	India	PHYTOTHERAPEUTIC APPROACH IN PREVENTION AND TREATMENT OF ALZHEIMER'S SYNDROME & DEMENTIA	12 min

Innopharm 2 Oral Presentation Schedule for Day 2 (12th February 2017)

PHARMACOLOGY, CLINICAL RESEARCH, PHARMACY PRACTICE AND PHARMACOVIGILANCE

Day 2	Date: 12-Feb-17 Time: 11:00 AM to 01:30 PM					
Room 2	Pharmacology, Clinical Research, Pharmacy Practice and Pharmacovigilance					
S. No.	Reg. No.	Name	Section	Affiliation	Abstract Title	Duration
22001	Speaker 1	Dr. Lokesh Deb	Natural Drug Research	India	ETHNOPHARMACOLOGICAL RESEARCH AND DRUG DISCOVERY – A STRATEGIC APPROACH FOR SUSTAINABLE DEVELOPMENT OF THE INDIGENOUS HEALTHCARE PRACTICES OF NORTH-EAST INDIA	30 min
22002	Speaker 2	Pierrot Mwamba	Pharmacology	Congo		30 min
22101	20161144	Mrs. Dipali Saxena	Pharmacology	India	GLUTEN FREE CASEIN FREE DIET AS COMPLEMENTARY AND ALTERNATIVE MEDICINE (CAM) TREATMENT FOR CHILDREN WITH AUTISM SPECTRUM DISORDERS (ASD).	12 min
22102	20161234	Mr. Pratik Jagtap	Pharmacology	India	VALIDATED METHOD FOR THE PHARMACOKINETIC STUDIES OF PHENOTHIAZINE DRUG PROMETHAZINE USING DROP SOLVENT MICROEXTRACTION COUPLED WITH GC-MS	12 min
22103	20161253	Dr. Balaji Ommurugan	Pharmacology	India	DAPSONE INDUCED DRESS: A RARE CASE SERIES	12 min
22104	20161244	Dr. Kajal Shilpi	Pharmacology	India	A PROSPECTIVE OBSERVATIONAL STUDY OF PATTERN AND SEVERITY OF ADVERSE DRUG REACTIONS DUE TO DOTS THERAPY IN PATIENTS OF TUBERCULOSIS IN A TERTIARY CARE HOSPITAL	12 min
22105	20161417	Miss Lekhni Soni	Pharmacology	India	EVALUATION OF ANTI-ARTHRITIC ACTIVITY FOR MOMORDICA CHARANTIA BY USING IN-VITRO AND IN-VIVO MODELS	12 min
22106	LNCP	Puja Kumari	Pharmacology	India	EVALUATION THERAPEUTIC BENEFITS OF TRIMETAZIDINE IN COMBINATION WITH MELOXICAM ON CFA INDUCED RHEUMATOID ARTHRITIS IN RATS	12 min

Innopharm 2 Oral Presentation Schedule for Day 2 (12th February 2017)

PHARMACEUTICAL/MEDICAL CHEMISTRY, ANALYSIS, SYNTHESIS AND MOLECULAR DRUG DESIGN | BIOCHEMISTRY, MICROBIOLOGY, CELL BIOLOGY AND MISCELLANEOUS

Day 2	**Date: 12-Feb-17 Time: 11:00 AM to 01:30 PM**					
Room 3	**Pharmaceutical/Medical Chemistry, Analysis, Synthesis And Molecular Drug Design | Biochemistry, Microbiology, Cell Biology and Miscellaneous**					
S. No.	**Reg. No.**	**Name**	**Section**	**Affiliation**	**Abstract Title**	**Duration**
23001	Speaker 1	Dr. Bm Bachitar	Cell Biology	Indonesia	UNENCAPSULATED ENTEROCOCCUS FAECALIS CPS-2 IS A NON-IMMUNE INDUCED STRAINS	30 min
23002	Speaker 2	Dr. Shashi Sharma	Cell Biology	USA	FLUORESCENT SENSORS TO DETECT BOTULINUM NEUROTOXIN ACTIVITY IN VITRO AND IN LIVING CELLS	30 min
23003	Speaker 3	Dr. Deepak Bharti		India		30 min
23101	20161275	Mr. Talavara Venkatesh	Pharmaceutical/Medicinal Chemistry	India	ONE-POT SYNTHESIS OF NOVEL PYRIMIDINE DERIVATIVES INCORPORATED WITH BENZOTHIAZOLE AS POTENT IN VITRO ANTIMICROBIAL AGENTS	12 min
23102	20161387	Dr. Harish Rajak	Pharmaceutical/Medicinal Chemistry	India	MOLECULAR MODELLING STUDIES ON HYDROXAMIC ACID BASED HISTONE DEACETYLASE INHIBITORS AS ANTICANCER AGENT	12 min
23103	20161422	Mr. Debarshi Kar Mahapatra	Pharmaceutical/Medicinal Chemistry	India	(E)-N-(2-(1H-BENZO[D]IMIDAZOL-2-YL)PHENYL)-2-(SUBSTITUTED-STYRYL)ANILINE EXHIBITED ANTI-PROLIFERATIVE ACTIVITY BY INHIBITION OF EPIDERMAL GROWTH FACTOR RECEPTOR (EGFR) KINASE: REJUVENATING THE IMPORTANCE OF SMALL MOLECULAR WEIGHT LIGANDS IN CHEMOTHERAPY	12 min
23104	20161431	Dr. Preeti Chincholikar	Pharmaceutical/Medicinal Chemistry	India	QSAR STUDY OF CYCLOPENTANOPHENANTHRENE	12 min
23105	20161459	Mr. Chaitanya Sarathe	Pharmaceutical/Medicinal Chemistry	India	MODELING OF 5- OR 6- METHYL- 2-SUBSTITUTED BENZOXAZOLES / BENZIMIDAZOLES - A POTENT INHIBITOR OF FUNGAL INFECTION	12 min
23106	20161485	Miss Deweshri Kerzare	Pharmaceutical/Medicinal Chemistry	India	DEVELOPMENT OF NOVEL INDOLE BEARING AZETIDINONE BASED MAO-A INHIBITORS: SYNTHESIS, ANTIDEPRESSANT ACTIVITY AND DOCKING STUDIES	12 min
23107	20161120	Dr. Sushama Pawar	Miscellaneous	India	EFFECT OF BACOSIDE A ON LIPID PEROXIDATION IN D- GALACTOSE INDUCED AGING MICE	12 min
23108	20161134	Dr. Priyadarshini Pathak	Miscellaneous	India	ANTI-UROLITHIATIC PROPERTY OF AQUEOUS EXTRACT OF OCIMUM SANCTUM	12 min
23109	20161243	Miss Rama Jeba Selvaraj	Miscellaneous	India	EFFECT OF THERMOXIDATION PROCESS ON FLAXSEED OIL USING GCMS AND FTIR	12 min
23110	20161304	Mr. Subhrajyoti Bagchi	Miscellaneous	India	DETERMINING THE POTENTIAL OF BLACK TEA PHYTOCHEMICALS ON DIABETES AND ITS ASSOCIATED DISORDERS THROUGH NETWORK ROBUSTNESS ANALYSIS	12 min
23111	20161386	Dr. Pratima Chaudhuri	Miscellaneous	India	PHYSICO-CHEMICAL ASPECTS AND FOLDING-UNFOLDING EVENTS OF DIHYDROFOLATE REDUCTASE FROM ZEBRAFISH	12 min
23112	Career	Dr. Ruchi Dubey Sharma	Pharmaceutical/Medicinal Chemistry	India	A SINGLE TOUCH DETECTION OF LEAD IN AYURVEDIC MEDICINES	12 min

Innopharm 2 Poster Presentation Schedule for Day 1 (11th February 2017)

Day 1	Date: 11-Feb-17 Time: 4:15 PM to 05:30 PM				
Poster No.	**Reg. No.**	**Name**	**Section**	**Affiliation**	**Abstract Title**
12001	20161087	Dr. Shubashini Sripathi	Natural Drug Research	India	DOCUMENTATION OF THE HERBAL POTENTIAL OF PISONIA GRANDIS (R.BR)
12002	20161122	Mrs. Tejal Deokar	Natural Drug Research	India	SPECTROPHOTOMETRIC DETERMINATION OF TOTAL PHENOLIC AND FLAVONOID CONTENTS IN AEGLE MARMELOS L . LEAVES EXTRACTS
12003	20161121	Miss Manmohini Jadhav	Natural Drug Research	India	ESTIMATION OF TOTAL PHENOLIC AND FLAVONOID CONTENTS IN AEGLE MARMELOS L. RIPE FRUIT EXTRACTS
12004	20161124	Miss Vanita Kamble	Natural Drug Research	India	PHYTOCHEMICAL SCREENING, ELEMENTAL AND FUNCTIONAL GROUP ANALYSIS OF VITEX NEGUNDO L. LEAVES.
12005	20161184	Miss Asmita Pal	Natural Drug Research	India	INDUCTION OF AUTOPHAGIC CELL DEATH IN SIHA CELLS BY ENTEROMORPHA INTESTINALIS LINNAEUS (NEES) AND ULVA LACTUCA L. FROM SUNDARBAN MANGROVE ECOSYSTEM, INDIA
12006	20161224	Mr. Sunil Shah	Natural Drug Research	India	ANTIFERTILITY ACTIVITY OF ETHANOLIC AND AQUEOUS EXTRACTS OF MORINGA OLEIFERA ON FEMALE WISTAR RATS
12007	20161199	Miss Satravada Anusha	Natural Drug Research	India	INHIBITION OF 1QKN BY PINORESINOL: AN ALTERNATIVE FOR OSTEOPOROSIS - A COMPUTATIONAL ANALYSIS
12008	20161200	Miss Maddipatla Chowdary	Natural Drug Research	India	INSILICO ANALYSIS OF ANTIOXIDANT 3-P-COUMAROYLQUINIC ACID AS AN INHIBITOR OF FOR OSTEOPOROSIS
12009	20161237	Dr. Abhijit Limaye	Natural Drug Research	India	PHYTOCHEMICAL ANALYSIS AND ANTIOXIDANT POTENTIAL OF PTERIS VITTATA L.
12010	20161313	Dr. Padmanabha Udupa	Natural Drug Research	India	AN IN VITRO STUDY OF ANGIOTENSIN CONVERTING ENZYME
12011	20161322	Mr. Nasir Wagay	Natural Drug Research	India	PROFILING OF SECONDARY METABOLITES AND ANTIMICROBIAL ACTIVITY OF CRATEVA RELIGIOSA G. FORST. - A RARE MEDICINAL PLANT OF MAHARSHTRA INDIA
12012	20161103	Miss Ruchi Gaikwad	Pharmaceutics	India	SODIUM ALGINATE AS A PROMISING NATURAL POLYSACCHARIDE
12013	20161015	Mrs. Madhavi Kasturi	Pharmaceutics	India	MIXED HYDROTROPY: A NOVEL MIRACULOUS TECHNIQUE EMPLOYED TO DEVELOP AQUEOUS INJECTION FORMULATION OF POORLY WATER SOLUBLE DRUGS
12014	20161136	Miss Malvika Sharma	Pharmaceutics	India	DEVELOPMENT AND CHARACTERIZATION OF LOSARTAN POTASSIUM LOADED CHITOSAN NANOPARTICLES BY IONIC GELATION METHOD
12015	20161143	Miss Archana Nerpagar	Pharmaceutics	India	ASENAPINE MALEATE MOUTH DISSOLVING FILM: A BREAKTHROUGH TREATMENT IN SCHIZOPHRENIA
12016	20161211	Mrs. Megha Sharma	Pharmaceutics	India	FORMULATION & CHARACTERIZATION OF MUCOADHESIVE MICROSPHERES OF NATEGLINIDE
12017	20161220	Miss Sarita Bawankule	Pharmaceutics	India	FORMULATION AND CHARACTERIZATION OF OIL IN WATER BASED TOPICAL APPLICATION OF ANTICANCER DRUG FOR BREAST CANCER
12018	20161272	Mr. Palla Kumara Babu	Pharmaceutics	India	SYNTHESIS AND CHARACTERIZATION OF FLUTAMIDE LOADED CARBOPOL/POLY(VINYL PYRROLIDONE) BLEND MICROSPHERES: IN-VITRO RELEASE STUDIES
12019	20161231	Dr. Natalia Volovyk	Pharmaceutics	Ukraine	DEVELOPMENT OF SOFTWARE FOR THE CALCULATION OF THE MOLECULAR WEIGHT DISTRIBUTION IN LOW MOLECULAR-WEIGHT HEPARINS ACCORDING TO THE EUROPEAN

					PHARMACOPOEIA
12020	20161311	Dr. Mohd Aqil	Pharmaceutics	India	NANOCARRIER MEDIATED FORMULATION FOR PERCUTANEOS DELIVERY OF A VINCA ALKALOID DERIVATIVE
12021	20161351	Mrs. Nidhi Singhai	Pharmaceutics	India	PREPARATION AND EVALUATION OF MULTI DRUG LOADED GASTRORETENTIVE FILMS FOR EFFECTIVE MANAGEMENT OF H.PYLORI INFECTION
12022	20161360	Dr. Ravikant Gupta	Pharmaceutics	India	DESIGN AND DEVELOPMENT OF NDDS FORMULATION OF ANTIRETROVIRAL DRUGS FOR THE TREATMENT OF CHRONIC DISEASE HIV/AIDS
12023	20161362	Miss Anjali Chandani	Pharmaceutics	India	IN-VITRO MODELS FOR THE PREDICTION OF IN-VIVO PERFORMANCE OF ORAL DOSAGE FORM
12024	20161497	Dr. Rashmin Bharatbhai Patel	Pharmaceutics	India	DEVELOPMENT AND EVALUATION OF INTRANASAL NANOEMULSION FORMULATION FOR TREATMENT OF SCHIZOPHRENIA
12025	20161119	Miss Richa Mishra	Pharmaceutical/Medicinal Chemistry	India	DOCKING RESULTS OF N-3 HYDROXYL DERIVATIVES AS INTEGRASE INHIBITORS
12026	20161118	Miss Himani Chaurasia	Pharmaceutical/Medicinal Chemistry	India	SYNTHESIS AND ANTIBACTERIAL STUDIES OF SOME DERIVATIVES OF N-1 SUBSTITUTED URACIL AND THYMINE
12027	20161186	Miss Anvesha Ganorkar	Pharmaceutical/Medicinal Chemistry	India	EFFECT OF STRESS CONDITION ON DISSOLUTION STABILITY OF TAPENTADOL HYDROCHLORIDE TABLETS
12028	20161187	Miss Rashmi Gour	Pharmaceutical/Medicinal Chemistry	India	ESTIMATION OF OLANZAPINE RELATED IMPURITIES IN TABLET FORMULATION USING RAPID RESOLUTION LIQUID CHROMATOGRAPHY
12029	20161140	Mr. Sauraj Singh	Pharmaceutical/Medicinal Chemistry	India	SYNTHESIS AND IN-VITRO RELEASES STUDIES OF XYLAN-5-FLUOROURACIL PRODRUGS FOR COLON TARGETED DRUG DELIVERY
12030	20161189	Mr. Gajanan Mante	Pharmaceutical/Medicinal Chemistry	India	VALIDATED RP-HPLC METHOD FOR ASSAY AND DISSOLUTION ANALYSIS OF SAROGLITAZAR IN TABLET
12031	20161191	Miss Madhuri Dhapade	Pharmaceutical/Medicinal Chemistry	India	VALIDATED STABILITY INDICATING RP-HPLC METHOD FOR ESTIMATION OF CANAGLIFLOZIN IN TABLET
12032	20161196	Mrs. Priyanka Jaiswal	Pharmaceutical/Medicinal Chemistry	India	VALIDATED STABILITY INDICATING RP-HPLC METHOD FOR SIMULTANEOUS DETERMINATION AND IN VITRO DISSOLUTION STUDIES OF CINITAPRIDE AND PANTOPRAZOLE FROM CAPSULE DOSAGE FORM
12033	20161203	Miss Sujata Bhadang	Pharmaceutical/Medicinal Chemistry	India	DETERMINATION OF FORMALDEHYDE CONTENT IN DIFFERENT GRADES OF POLYETHYLENE GLYCOLS BY HPLC
12034	20161166	Miss Sonam Bhargava	Pharmaceutical/Medicinal Chemistry	India	STRUCTURAL REQUIREMENTS OF N,NÃŠÂ¹-DISUBSTITUTED PYRIMIDINETRIONE AS CAV 1.3 CALCIUM CHANNEL-SELECTIVE ANTAGONISTS FOR PARKINSONÃ¢Â,¬Â„¢S DISEASE
12035	20161219	Mr. Ravindra Aharwal	Pharmaceutical/Medicinal Chemistry	India	ANTIBACTERIAL ACTIVITY OF ISOLATED ENDOPHYTIC FUNGI FROM MORINGA OLEIFERA LAM.
12036	20161259	Dr. Atul Hemke	Pharmaceutical/Medicinal Chemistry	India	EVALUATION OF INTRINSIC STABILITY AND ESTIMATION OF BEPOTASTINE FROM BULK AND LPF USING RP-HPLC
12037	20161074	Mr. Shravan Paswan	Pharmacology	India	WOUND HEALING, ANTIMICROBIAL AND INHIBITOR ACTIVITY OF A PHYLA NODIFLORA USED SOLID FORMULATION IN RATS
12038	20161075	Mrs. Pritt Verma	Pharmacology	India	HEPATOPROTECTIVE AND ANTIOXIDANT EFFECT OF ORAL APPLICATION OF ETHANOLIC WHOLE PLANT EXTRACT OF LUCAS ASPARA IN HGCL2 INDUCED HEPATOTOXICITY IN MICE

12039	20161204	Dr. Mithlesh Mehar	Pharmacology	India	A COST ANALYSIS STUDY OF ORAL HYPOGLYCEMIC DRUGS
12040	20161201	Dr. Dinesh Jiwane	Pharmacology	India	AN OVERVIEW ON INTELLECUAL PROPERTY RIGHTS IN PHARMACEUTICAL INDUSTRIES
12041	20161197	Dr. Jayesh Rajgopal	Pharmacology	India	A REVIEW OF BIOSIMILARS AND ITS COST EFFECTIVENESS
12042	20161249	Dr. Diah Djunaedi	Pharmacology	Indonesia	BLOOD PRESSURE PROFILES AMONG EAST BONGAS AND WEST BONGAS PEOPLE IN EFFORT AND SUPPORT FROM UNIVERSITAS PADJADJARAN AND THE REGENT OF MAJALENGKA REGENCY AND CHIEVES OF THE VILLAGES
12043	20161278	Dr. Somashekar Shetty	Pharmacology	India	THE INFLUENCE OF AERATED DRINKS ON THE BLOOD PRESSURE AND HEART RATE OF YOUNG ADULTS
12044	20161315	Dr. Mohd Akhtar	Pharmacology	India	GUGGULIPID PROTECTS AGAINST ISCHEMIC BRAIN INJURY IN A MIDDLE CEREBRAL ARTERY OCCLUSION MODEL OF CEREBRAL ISCHEMIA IN RAT.
12045	20161314	Dr. Revathi Shenoy	Miscellaneous	India	EFFECT OF ANDROGRAPHIS PANICULATA METHANOLIC EXTRACT ON RATE OF HAEMOLYSIS OF RBC FROM DIFFERENT BLOOD GROUPS EXPOSED TO NAJA NAJA VENOM
12046	20161324	Dr. Renu Mishra	Miscellaneous	India	ANTIBACTERIAL ACTION OF CRUDE EXTRACT OF SCILLA INDICA BULBS AGAINST PATHOGENIC BACTERIA
12047	20161264	Miss Rekha Jibhakate	Pharmaceutical/Medicinal Chemistry	India	RELATED SUBSTANCES RP-HPLC METHOD DEVELOPMENT AND VALIDATION FOR DETERMINATION OF RASAGILINE IN ITS FORMULATION
12048	20161465	Mr. Shubham Rahmatkar	Pharmacology	India	NEUROPEPTIDE Y INHIBITS LIPOPOLYSACCHRIDE INDUCED SICKNESS BEHAVIOR AND BIOCHEMICAL ALTERATIONS IN RATS
12049	20161404	Miss Abira Datta	Pharmacology	India	GENOTYPE III OF DENGUE VIRUS SEROTYPE 3 WAS THE MAJOR CIRCULATING STRAIN IN 2015 OUTBREAK IN WEST BENGAL
12050	20161053	Devesh Kumar	Pharmaceutical/Medicinal Chemistry	India	SYNTHESIS AND CHARACTERIZATION OF SOME METAL COMPLEXES WITH A– (1, 3– DIOXO – INDANE – 2–YL) ETHYLIDENE THIOSEMI CARBAZONE AS LIGAND DERIVED FROM 2-ACETLYLINDAN-1,3-DIONE
12051	Truba	Satish Suryavanshi	Pharmacology	India	ASSESSMENT OF ANTIULCER ACTIVITY OF ALCOHOLIC EXTRACTS OF GLORIOSA SUPERBA TUBERS
12052	Sagar	Dr. Neelesh Malviya	Natural Drug Research	India	EFFECT OF ETHYL ACETATE FRACTION OF ACACIA NILOTICA L. ON SEXUAL BEHAVIOR OF MALE RATS
12053	S.V.P.M's	Sumit Pawar	Pharmaceutical/Medicinal Chemistry	Bhopal	SPECTROPHOTOMETRIC ESTIMATION OF PROTEINS: GENERAL CONSIDERATIONS
12054	S.V.P.M's	Prithviraj Deshmukh	Pharmaceutical/Medicinal Chemistry	Bhopal	THE QUALITY CONTROLES IN BIOTECHNOLOGY: AN ANALYTICAL PERSPECTIVE
12055	S.V.P.M's	Ranjit Vhoke	Pharmaceutical/Medicinal Chemistry	Bhopal	DISCOVER THE SCIENCE OF EVERYDAY LIFE BY CHEMICAL KINETICS
12056	S.V.P.M's	Satyajeet Jagatap	Pharmaceutical/Medicinal Chemistry	Bhopal	GREEN CHEMISTRY – SCIENCE FOR A LESS POLLUTED LIFESTYLE
12057	S.V.P.M's	Omkar Golande	Pharmaceutical/Medicinal Chemistry	Bhopal	PROS AND CONS OF ONLINE PHARMACY
12058	S.V.P.M's	Shubham Doshi	Pharmaceutical/Medicinal Chemistry	Bhopal	WHAT EVERY VEGAN SHOULD KNOW ABOUT VITAMIN B12 ?
12059	S.V.P.M's	Navanath Kore	Pharmaceutical/Medicinal Chemistry	Bhopal	WHAT PHARMACISTS SHOULD KNOW ABOUT THE ZIKA VIRUS ?

12060	S.V.P.M's	Akshay Kadam	Pharmaceutical/Medicinal Chemistry	Bhopal	EBOLA VIRUS DISEASE: INFORMATION FOR THE PHARMACY WORKFORCE
12061	S.V.P.M's	Ajinkya U. Manjare	Pharmaceutical/Medicinal Chemistry	Bhopal	NATURAL PRODUCTS FOR TREATMENT OF CARDEOVASCULAR SYSTEM
12062	SRK	Shweta Garg	Pharmaceutical/Medicinal Chemistry	Bhopal	SYNTHESIS, CHARACTERIZATION AND BIOLOGICAL EVALUATION OF SOME NOVEL 2, 3-DISUBSTITUED QUINAZOLIN-4-(3H)-ONES
12063	SRK	Vijeta Rajoria	Pharmacology	Bhopal	SCREENING OF EUPHORBIA THYMIFOLIA LINN. ON STZ- NICOTINAMIDE INDUCED DIABETIC NEUROPATHY AND ANTIHYPERLIPIDEMIC ACTIVITY IN RATS
12064	20161352	Mr. Bairam Ravindar	Pharmaceutical/Medicinal Chemistry	India	SYNTHESIS, CHARACTERISATION, BIOLOGICAL EVALUATION & DOCKING OF SOME NOVEL SUBSTITUTED 1, 3-THAIZINE DERIVATIVES

Innopharm 2 Poster Presentation Schedule for Day 2 (12th February 2017)

Day 2	Date: 12-Feb-17 Time: 02:15 PM to 03:30 PM				
Poster No.	**Reg. No.**	**Name**	**Section**	**Affiliation**	**Abstract Title**
22001	20161340	Mrs. Susan Kurian	Natural Drug Research	India	PHYTOCHEMICAL ANALYSIS AND IN VITRO FREE RADICAL SCAVENGING ACTIVITY OF SUCCESSIVE EXTRACTS OF ALYSICARPUS VAGINALIS VAR. NUMMULARIFOLIUS (DC.) MIQ
22002	20161323	Mrs. Richa Saxena	Natural Drug Research	India	ANTIOXIDANT POTENTIAL OF CRUDE ETHANOLIC EXTRACT AND FRACTION OF MIMOSA HAMATA
22003	20161368	Mr. Srinivas S G	Natural Drug Research	India	PRELIMINARY PHYTOCHEMICAL ANALYSIS OF THE DIFFERENT EXTRACTS OF LITSEA FLORIBUNDA LEAVES
22004	20161373	Miss Naira Rashid	Natural Drug Research	India	INVESTIGATION OF EFFECT OF OSMOLYTES ON THE ENZYMATIC ACTIVITY OF DHFR UNDER CHEMICAL AND HEAT INDUCED STRESS.
22005	20161410	Mrs. Kranti Patil	Natural Drug Research	India	EXPERIMENTAL EVALUATION OF ANTIPYRETIC ACTIVITY OF AQUEOUS EXTRACT OF BALACATURBHADRIKA CHURNA
22006	20161413	Mrs. Surekha Salgar	Natural Drug Research	India	APTITUDE OF HERBAL COSMETICS FOR DEODORANTS
22007	20161193	Miss Preeti Verma	Natural Drug Research	India	INDUCTION OF AUTOPHAGIC CELL DEATH IN SIHA CELLS BY ENTEROMORPHA INTESTINALIS LINNAEUS (NEES) AND ULVA LACTUCA L. FROM SUNDARBAN MANGROVE ECOSYSTEM, INDIA
22008	20161330	Miss Swati Hardainiyan	Pharmaceutics	India	DESIGN, FORMULATION AND IN VITRO DRUG RELEASE FROM TRANSDERMAL PATCHES CONTAINING IMIPRAMINE HYDROCHLORIDE AS MODEL DRUG
22009	20161337	Miss Laxmi Swain	Pharmaceutics	India	EXPLORING THE ROLE OF ECLIPTA ALBA IN WOUND HEALING POTENTIAL AGAINST STEROIDAL DRUG DEXAMETHASONE RETARDED WOUND HEALING PROCESS
22010	20161335	Miss Priyanka Patra	Pharmaceutics	India	STUDIES ON MIXED EXTRACT (PETROLEUM ETHER AND ETHANOLIC) OF CURCUMA AMADA RHIZOMES AND CURCUMIN LOADED TRANSFEROSOMES FOR WOUND HEALING POTENTIAL
22011	20161411	Mrs. Suvarnalata Mahajan	Pharmaceutics	India	NOVEL DRUG DELIVERY SYSTEMS FOR ANTIFUNGAL THERAPY
22012	20161392	Miss Nita Salunke	Pharmaceutics	India	NICLOSAMIDE LOADED MESOPOROUS DRUG DELIVERY SYSTEM: PREPARATION, CHARACTERIZATION, RELEASE AND CYTOTOXIC STUDY
22013	20161424	Mrs. Prerana Jadhav	Pharmaceutics	India	MAGNETICALLY MODULATED DRUG DELIVERY SYSTEM
22014	20161426	Dr. Ajay Pise	Pharmaceutics	India	3D PRINTING TECHNOLOGY IN MEDICINE: NEW ERA OF PHARMACEUTICAL RESEARCH
22015	20161393	Mr. Anurag Lodagekar	Pharmaceutics	India	FORMULATION AND EVALUATION OF CYCLODEXTRIN COMPLEXES FOR IMPROVED ANTICANCER ACTIVITY OF REPURPOSED DRUG: NICLOSAMIDE
22016	20161429	Miss Seema Kirar	Pharmaceutics	India	DEVELOPMENT OF NOBLE METAL NANOPHOTOSENSITIZERS FOR PHOTODYNAMIC THERAPY
22017	20161438	Mrs. Satinder Kakar	Pharmaceutics	India	MAGNETIC MICROSPHERES: A NOVEL TARGETING DELIVERY SYSTEM
22018	20161460	Mrs. Bhumika Mangla	Pharmaceutics	India	QBD BASED SYNTHESIS AND CHARACTERISATION OF POLYACRYLAMIDE GRAFTED CORN FIBRE GUM
22019	20161469	Dr. Neetesh Jain	Pharmaceutics	India	BIOAVAILABILITY ENHANCEMENT OF VERAPAMIL HCL BY MICROENCAPSULATION USING MUCOADHESIVE POLYMERS
22020	20161226	Mrs. Shaheen Begum	Pharmaceutical/Medicinal	India	MOLECULAR DOCKING (SWISS-DOCK) STUDIES: RING SUBSTITUTED NAPHTHYL CHALCONES WITH

			Chemistry		ON MONOACYL GLYCEROL LIPASE (MAGL) ENZYME
22021	20161455	Dr. Mohammed Samim	Pharmaceutical/Medicinal Chemistry	India	SYNTHYSIS AND CHARACTERIZATION OF SILVER AND GOLD NANOPARTICLES USING PLANT EXTRACT RUTA GRAVEOLENS LINN.SUDAB RUTACEAE
22022	20161346	Mr. Yerra Bharath	Pharmaceutical/Medicinal Chemistry	India	MOLYBDENUM BLUE METHOD FOR THE SPECTROPHOTOMETRIC DETERMINATION OF CARBAZAPINE AND OXCARBAZEPINE
22023	20161017	Mr. Maheshkumar Borkar	Pharmaceutical/Medicinal Chemistry	India	UTILITY OF HOMOSAR METHODOLOGY FOR MAPPING ACTIVITY ELEMENTS OF PROTEGRIN ANTIMICROBIAL PEPTIDES
22024	20161399	Mr. Vishal Kalebar	Pharmaceutical/Medicinal Chemistry	India	PHYTOCHEMICAL EVALUATION AND CYTOTOXIC EFFECT OF SOLANUM MACRANTHUM ON BREAST CANCER CELL LINE
22025	20161388	Mrs. Nimisha Jain	Pharmaceutical/Medicinal Chemistry	India	MOLECULAR DOCKING OF NOVEL 3-{4-[2-AMINO-4-(SUBSTITUTEDPHENYL)-2H-[1,3] OXAZIN/THIAZIN-6-YL} 2-PHENYL-3H-QUINAZOLIN-4-ONE DERIVATIVES - A POTENTIAL ANTICONVULSANT APPROACH
22026	20161452	Mr. Rakesh Jain	Pharmaceutical/Medicinal Chemistry	India	DESIGN, SYNTHESIS AND ANTICONVULSANT ACTIVITY OF SOME NEW BIOACTIVE 1-(4-SUBSTITUTED-PHENYL-3-(4-OXO-2-METHYL/PHENYL-4H-QUINAZOLIN-3-YL)-UREA
22027	20161464	Mr. Suneel Kumar	Pharmaceutical/Medicinal Chemistry	India	ANTIBACTERIAL ACTIVITY OF ISOLATED ENDOPHYTIC FUNGI FROM MORINGA OLEIFERA LAM.
22028	20161470	Dr. Vipul Vaghela	Pharmaceutical/Medicinal Chemistry	India	DESIGN, SYNTHESIS AND ACTIVITY EVALUATION OF NOVEL SELECTIVE SEROTONIN REUPTAKE INHIBITORS
22029	20161488	Mr. Dineshkumar Thakkar	Pharmaceutical/Medicinal Chemistry	India	SYNTHESIS AND SCREENING OF QUINOXALINE DERIVATIVES AS PTP1B INHIBITORS
22030	20161405	Mr. Arvind Jindal	Pharmacology	India	IV ALERT
22031	20161418	Miss Deeksha Rajak	Pharmacology	India	PLUMBAGIN: A PROMISING FUTURE ANTIDEPRESSANT
22032	20161065	Mr. Rajesh Mukherjee	Pharmacology	India	MANAGEMENT OF HEPATOTOXICITY BY FICUS RELIGIOSA LINN.
22033	20161443	Dr. Shweta Choudhary	Pharmacology	India	EVALUATION OF FIBER RICH DIETS IN LIPID MANAGEMENT OF HUMAN TYPE II DIABETES MELLITIS
22034	20161456	Miss Utkarsha Ramteke	Pharmacology	India	AGMATINE ATTENUATES PRENATAL STRESS AND /OR HIGH FAT DIET INDUCED SUSCEPTIBILITY TO OBESITY IN RAT OFFSPRING
22035	20161471	Mr. Shreyans Gujar	Pharmacology	India	INHIBITORY INFLUENCE OF AGMATINE IN DIABETES INDUCED DEPRESSION IN RATS: MODULATION BY IMIDAZOLINE RECEPTORS
22036	20161473	Miss Shruti Patil	Pharmacology	India	AGMATINE ATTENUATES ETHANOL WITHDRAWAL INDUCED IMPAIRMENT OF CONDITIONING AND EXTINCTION OF FEAR IN RATS
22037	20161104	Mrs. Sonam Meena	Miscellaneous	India	GC-MS ANALYSIS OF AN ENDANGERED MEDICINAL PLANT SARCOSTEMMA VIMINALE (L.) R.BR. FROM THAR DESERT, RAJASTHAN (INDIA)
22038	20161142	Mrs. Savita Mandan	Miscellaneous	India	MICROBIAL TRANSFORMATION OF PENICILLIN-G TO 6-AMINOPENICILLANIC ACID
22039	20161202	Miss Mounika Kalluri	Miscellaneous	India	A SYSTEMS PERSPECTIVE TO UNDERSTAND THE PROCESS OF AGEING
22040	20161232	Miss Manju Saini	Miscellaneous	India	PHYTOCHEMICAL SCREENING OF LEAF OF A MEDICINAL PLANT OF MOLLUGINACEAE FROM THAR DESERT,RAJ.,INDIA
22041	20161123	Mr. Ganesh Kumar	Miscellaneous	India	GC-MS ANALYSIS OF BIOACTIVE COMPOUNDS FROM THE ROOT OF CENCHRUS CILLIARIS FROM THAR DESERT, RAJASTHAN (INDIA)
22042	20161235	Mr. Rahul Polishetty	Miscellaneous	India	ISOLATION AND SCREENING OF TANNASE PRODUCING ENDOPHYTIC FUNGI FROM

					LANNEACOROMANDELICA
22043	20161308	Dr. Vinutha Bhat	Miscellaneous	India	HEPATOPROTECTIVE AND RENOPROTECTIVE EFFECTS OF STREPTOZOTOCIN INDUCED DIABETIC RATS TREATED WITH AQUEOUS EXTRACT OF BIXA ORELLANA
22044	20161501	Mr. Ashish Garg	Pharmaceutics	India	PREPARATION AND CHARACTERIZATION OF CHONDROITIN SULPHATE DECORATED CELLULOSE ACETATE PHTHALATE (CAP) NANOPARTICULATE FOR EFFECTIVE TREATMENT OF CANCER: DRUG RELEASE BEHAVIOR, IN-VITRO AND EX-VIVO ASSESSMENT
22045	Truba	Shivam Shrivastva	Pharmaceutics	India	DEVELOPMENT OF SALICYLIC ACID ETHOSOMES FOR TREATMENT OF PSORIASIS
22046	LNCP	Yashivi Kesharwani	Pharmaceutics	India	NASAL DRUG DELIVERY: NEW DEVELOPMENTS AND STRATEGIES
22047	LNCP	Sumit Kumar Pandit	Pharmaceutics	India	TARGETING CANCER STEM CELLS: A NEW THERAPY TO CURE CANCER PATIENTS
22048	LNCP	Vandana Sahu	Pharmaceutics	India	RECENT ADVANCES OF TRANSFEROSOMES: AS TRANSDERMAL DRUG DELIVERY SYSTEM
22049	LNCP	Surbhi Rani	Pharmaceutics	India	CURRENT TRENDS AND RECENT ADVANCEMENT IN TABLET TECHNOLOGY
22050	LNCP	Suraj Longre	Pharmaceutics	India	NANOTECHNOLOGY-BASED APPROACHES IN CANCER THERAPEUTICS
22051	LNCP	Vishal Yadav	Pharmaceutics	India	RECENT TRENDS IN NUTRACEUTICAL AND FUNCTIONAL FOODS
22052	Barkatullah	Abhishek Soni	Pharmaceutics	India	CANCER STEM CELLS: A NOVEL APPROACH FOR FUTURE
22053	LNCP	Kirti Pansari	Pharmaceutics	India	A RECENT ADVANCES IN SELF MICRO-EMULSIFYING DRUG DELIVERY SYSTEMS - A NOVEL APPROACH
22054	20161475	Dr. Rachana Akhand Giri	Natural Drug Research	India	STUDY ON PHARMACOGNOSTICAL EVALUATION AND PRELIMINARY PHOTOCHEMICAL SCREENING OF “SOLANUM SURATTENSE”
22055	20161476	Dr. Prithu Pathak Rajput	Pharmaceutics	India	DEVELOPMENT AND EVALUATION OF MICROBALLOON OF LANSOPRAZOLE
22056	20161477	Mrs. Sneha Kulkarni	Pharmaceutics	India	DEVELOPMENT AND VALIDATION OF UV SPECTROSCOPIC METHODS FOR SIMULTANEOUS ESTIMATION OF ESOMEPRAZOLE AND NAPROXEN IN TABLET FORMULATION
22057	20161340	Mrs. Susan Kurian	Natural Drug Research	India	PHYTOCHEMICAL ANALYSIS AND IN VITRO FREE RADICAL SCAVENGING ACTIVITY OF SUCCESSIVE EXTRACTS OF ALYSICARPUS VAGINALIS VAR. NUMMULARIFOLIUS (DC.) MIQ
22058	20161323	Mrs. Richa Saxena	Natural Drug Research	India	ANTIOXIDANT POTENTIAL OF CRUDE ETHANOLIC EXTRACT AND FRACTION OF MIMOSA HAMATA
22059	20161368	Mr. Srinivas S G	Natural Drug Research	India	PRELIMINARY PHYTOCHEMICAL ANALYSIS OF THE DIFFERENT EXTRACTS OF LITSEA FLORIBUNDA LEAVES
22060	20161373	Miss Naira Rashid	Natural Drug Research	India	INVESTIGATION OF EFFECT OF OSMOLYTES ON THE ENZYMATIC ACTIVITY OF DHFR UNDER CHEMICAL AND HEAT INDUCED STRESS.
22061	20161410	Mrs. Kranti Patil	Natural Drug Research	India	EXPERIMENTAL EVALUATION OF ANTIPYRETIC ACTIVITY OF AQUEOUS EXTRACT OF BALACATURBHADRIKA CHURNA