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Abstract

Review Articles

Self Emulsifying Drug Delivery System, A Novel Approach in Drug Delivery: A Review

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ABSTRACT:

Lipid formulations for oral administration of drugs generally consist of a drug dissolved in a blend of two or more excipients, which may be triglyceride oils, Partial glycerides, Surfactants or co-surfactants. The primary mechanism of action, which leads to improved bioavailability, is usually avoidance, or partial avoidance, of the slow dissolution process, which limits the bioavailability of hydrophobic drugs from solid dosage forms. Ideally the formulation allows the drug to remain in a dissolved state throughout its transit through the gastrointestinal tract. The availability of the drug for absorption can be enhanced by presentation of the drug as a solubilizer within a colloidal dispersion. This objective can be achieved by formulation of the drug in a self-emulsifying system or alternatively by taking advantage of the natural process of triglyceride digestion. In practice 'Lipid' formulations range from pure oils, at one extreme, to blends which contain a substantial proportion of hydrophilic surfactants or co solvents.

KEYWORDS: Self emulsifying drug delivery system (SEDDS), Surfactants, Co solvent.

Nanoparticle Drug Delivery to Brain – A Review

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ABSTRACT:

The brain is the most delicate and most protected organ of the body. Many pharmaceutical approaches are rendered ineffective in delivering the drug to the brain. The methods that can enhance drug delivery to brain are, therefore of great interest. The nanoparticles are emerged as effective means of delivering the drug to the brain. The present review details the problems in crossing blood brain barrier, the possible mechanisms to cross the BBB, examples of nanoparticles targeted to brain and the methods to prepare them and their characterization. Though less information is available on toxicity, the nanoparticle approach for drug delivery to brain may prove to be very useful in treatment of brain tumour, epilepsy, cerebrovascular diseases and neurodegenerative disorders.

KEYWORDS: Nanoparticles, brain targeting, Blood brain barrier, Solid lipid nanoparticles

Human Milk: Excellent Anticancer Alternative

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ABSTRACT:

There is no dispute that Human breast milk is the best possible food for an infant but the uses for breast milk go far beyond nutrition. Breast milk contains antibodies that help fight infections both internally and externally. And can be used topically as a treatment as well food for your baby. But in the acid environment of an infant's stomach, the normal α -lactalbumin protein changed shape and transformed into a killer of cancer cells. The apoptosis inducing activity was in the casein fraction of human milk and was characterized as a multimeric form of human α -lactalbumin (MAL). MAL induced apoptosis in transformed and non-transformed cell lines. Using optical and NMR spectroscopy, it has shown that the apoptosis inducing variant has an altered fold relative to native α -lactalbumin and has a more loosely organized tertiary structure. The necessary conditions to convert native α -lactalbumin purified from human milk to the apoptosis-inducing form, which is called HAMLET (Human Alpha-lactalbumin

Made Lethal to Tumor cells) is that it requires, the protein is first partially unfolded through the removal of the tightly bound calcium ion and then exposed to a specific fatty acid. HAMLET enters tumor cells (but not healthy cells), accumulates in their nuclei, and kills them by apoptosis as seen by confocal fluorescence microscopy and a characteristic DNA fragmentation pattern. From the results obtained by various studies it is clear that HAMLET shows great promise as a new therapeutic agent with the advantage of selectivity for tumor cells and lack of toxicity.

KEYWORDS: Human breast milk, α -lactalbumin, cancer, apoptosis, HAMLET.

Current Advances in Technology of Proton Pump Inhibitor Formulations

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ABSTRACT:

Since the identification of gastro erosive reflux disease and peptic ulcer in the early 1900's, the line of treatment of the disease has evolved reasonably. The antisecretory agents used in the treatment regime have developed, beginning with the introduction of cimetidine in the mid-1970s to proton pump inhibitor (PPI) omeprazole in 1989 and subsequently dexlansoprazole dual delayed release in 2009. This development was done to address the unmet needs of patients suffering from severe esophagitis and nocturnal acid breakthrough (NAB). The available PPI formulations which had short plasma elimination half life of less than 2 hours could not inhibit the proton pumps synthesized in the nighttime hours. The inadequacy in symptom control and high prevalence of NAB in patients with more severe gastro esophageal disease still prevailed after medication. This was identified as the unmet needs of PPI formulations. Although novel formulations, including immediate release omeprazole may offer some advantages over existing formulations, it does not address many of the potential unmet needs of patients with these disorders. However, these needs are addressed by dual delayed release technology which delivers dose in a pulsatile manner and provides acid suppression for prolonged period of time.

KEYWORDS: Proton pump inhibitors; Dexlansoprazole; Unmet needs; Nocturnal acid breakthrough.

Study and Evaluation of Microbubble Drug Delivery system

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ABSTRACT:

Microbubbles are formed in a liquid, e.g., blood in order to alter the transmission characteristics thereof to electromagnetic and sonic waves transmitted there through, by dissolving therein a solid particulate material, preferably as a suspension in a carrier liquid in which the particulate material is at least temporarily stable, the particles of which are substantially free of microbubbles and have a plurality of gas-filled voids communicating with the surface of the particles and providing nuclei for microbubble formation and the ratio of the mass of the particles to the volume of gas in the voids is sufficient to render the liquid in which the particulate material is dissolved supersaturated with respect to the gas in the voids in the area of the liquid surrounding the microbubbles when they are formed.

KEYWORDS: Microbubbles, Electromagnetic and Sonic waves, Gas-filled voids.

RESEARCH ARTICLE

Development and *In Vitro* Evaluation of Mucoadhesive Buccal Tablets of Timolol Maleate

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ABSTRACT:

The present investigation is concerned with formulation and evaluation of mucoadhesive buccal tablets containing antihypertensive drug i.e. timolol maleate to circumvent the first pass effect and to improve its bioavailability with reduction in dosing frequency and also dose related side effects. The tablets were prepared by direct compression method. The mucoadhesive polymers used in formulation were chitosan, HPMC K4M and HPMC K15M. Tablets were tested for hardness, thickness, weight variation, friability, drug content, swelling, surface pH, bioadhesive strength and *in vitro* drug release properties. All tablets were acceptable with regard to hardness, thickness, weight variation and friability. The pH of all batches was in acceptable range of 5.6 to 6.6. Batch F10 showed maximum 101.22 % drug content and batch F1 showed maximum swelling index of 59.23 % after 6 hr. Batch F4 showed highest bioadhesive strength of 31.11gm and maximum drug release of 94.52 % in 10 hr. The best mucoadhesive performance and *in vitro* drug release profile were exhibited by batch F4 and hence it was optimized.

KEYWORDS: Buccal drug delivery, Surface pH, Swelling index, Timolol Maleate, Bioadhesive strength, *In vitro* drug release

Screening of Methanolic Extract of *Euphorbia hirta* linn for Antiinflammatory Activity in Experimental Animals

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ABSTRACT:

In the present study an attempt has been made to evaluate the anti inflammatory effect of methanolic extract of *Euphorbia hirta* Linn in experimentally induced inflammation. The anti inflammatory activity was evaluated using acute inflammatory model like Carrageenan induced paw edema. Oral administration of the extract at the doses 100,200,400mg/kg/b.w exhibited dose dependent and significant anti inflammatory activity in animal models.

KEYWORDS: Anti inflammatory, *Euphorbia hirta*, Carrageenan, Diclofenac.

Comparative Evaluation of Zidovudine Loaded Hydrogels and Emulgels

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ABSTRACT:

Zidovudine (AZT) is the widely used anti-retroviral drug associated with serious gastric side effects upon oral delivery also having short half life and poor partition coefficient. Upon oral administration it also undergoes first pass metabolism. Transdermal delivery of AZT encounters all the problems associated with oral route. In the present study we developed hydrogels as well as emulgels loaded with AZT and investigated the ability of hydrogels as well as emulgels to deliver the AZT via transdermal route. All the gels were evaluated for their physical properties, drug content, viscosity, pH, spreadability and *in vitro* drug release. *In vitro* release pattern for all the formulations were

found to be zero order diffusion controlled. All the formulations were found to be compatible with skin and stable as per ICH guidelines. Among all the formulations emulgels were found to be effective vehicles to deliver AZT because of the effective partition in both oil and aqueous phases.

KEYWORDS: Transdermal route, hydrogels, emulgels, *in vitro*, zidovudine.

A Spectrophotometric Assay for the Simultaneous Analysis of Mifepristone and Misoprostol in Tablets Using Vierodt's and Absorbance Ratio Methods

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ABSTRACT:

Two simple, accurate and rapid methods have been developed for the quantitative determination of mifepristone and misoprostol in their dosage form. Method-I is based on constructing and solving two simultaneous equations at 304nm and 257.6nm for mifepristone and misoprostol respectively. In the quantitative assay of two components in admixture by the absorbance ratio method, absorbances are measured at 264.6nm (iso-absorptive point) and 304nm (Method-II). These two methods were validated in terms of linearity, accuracy, precision, limit of detection, limit of quantitation and robustness. The linearity was in the concentration range of 8-24µg/ml for both the methods.

KEYWORDS: Mifepristone, Misoprostol, Simultaneous equations, Absorbance ratio, Spectrophotometry

Design and Development of Modified Pulsincap Technique for Oral Controlled Release of Rosiglitazone Maleate

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ABSTRACT:

Oral controlled release of rosiglitazone maleate was studied by using modified pulsincap technique. Modified pulsincaps were prepared with different proportions of the hydrophilic polymer, HPMC (Hydroxy Propyl Methyl Cellulose). Drug-polymer mixtures were prepared in the ratios 5:2, 5:3, 5:4, and 5:5 respectively. The prepared drug-polymer mixtures were evaluated for micromeritic properties and to conform the reproducibility of the method of mixing. Drug-polymer mixture equivalent to 8 mg of rosiglitazone maleate was filled into the hardened body of the capsule for the preparation of modified pulsincaps. The prepared pulsincaps were evaluated for weight variation, drug content and drug release kinetics. Rosiglitazone maleate release from the prepared pulsincaps was uniformly slow and extended for a period of time more than 12 hrs in case of RH5 pulsincaps. The drug release from the prepared pulsincaps followed Zero order kinetics. The Zero order release rate constant K_0 was decreased as the polymer concentration increased. The plots of log fraction drug released versus time of all the pulsincaps were found to be linear and found that the mechanism of drug release followed peppas model. It was found that diffusional exponent (n) values of all the pulsincaps were ranging from 0.5737- 0.6948 indicating that the drug release mechanism followed non-Fickian diffusion. Drug -polymer interaction studies by using FTIR, DSC were performed on the pure drug and drug-polymer mixtures which indicated no drug- polymer interaction.

KEYWORDS: Roseglitazone maleate, pulsincaps, HPMC, Zero order, peppas model.

Solubility Enhancement, Physicochemical Characterization and *In Vivo* Evaluation of the Anti-Inflammatory Activity of Sulfasalazine in Complex with β -Cyclodextrin

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ABSTRACT:

A complex with β -cyclodextrin was prepared to increase its solubility characteristics. The drug formulations were characterized in the solid state by Fourier transform infrared spectroscopy (FTIR) and differential scanning calorimetry (DSC). By these physical determinations, drug-polymer interactions were found. Both the solubility and the dissolution rate of the drug in these formulations were increased. Drug contents were determined by UV spectrophotometry at a λ_{max} of 359 nm. The phase solubility behavior of sulfasalazine in various concentrations of β -CD, in distilled water was obtained at 37 ± 2 °C. The dissolution of sulfasalazine is increased with increasing amounts of the hydrophilic carriers. The complexes of sulfasalazine with β -CD were prepared at 1:1, 1:3, 1:5 and 1:7 drug/carrier ratios. The FTIR spectroscopic studies show the stability of sulfasalazine and the absence of well-defined drug-polymer interaction. The anti-inflammatory activity of sulfasalazine β -CD complex was evaluated against Carrageenan-induced rat paw oedema and Formaldehyde-induced rat hind paw edema. The Sulfasalazine β -CD (1:7) complex exhibited a higher anti-inflammatory activity than the free drug.

KEYWORDS: Sulfasalazine; Fourier transform infrared spectroscopy; Differential scanning Calorimetry; Anti-inflammatory activity.

Simultaneous Estimation of Telmisartan and Indapamide in Bulk and Capsule Dosage Form by Reverse Phase High Performance Liquid Chromatography

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ABSTRACT:

A selective and sensitive reverse phase high performance liquid chromatography (RP-HPLC) method has been developed for the separation and quantification of telmisartan and indapamide in capsule dosages form has been first developed and validated. Quantification carried out using Stainless Steel C₁₈ 130 x 4.6, 5 μ m column as a stationary phase and mobile phase comprised of 50mM KH₂PO₄, Acetonitrile and methanol in proportion of 50:20:30 (v/v/v) with pH adjusted to 3.0 ± 0.1 by using *o*-phosphoric acid. The flow rate was 1.0 ml/min and monitored at 280 nm. The retention time for telmisartan and indapamide were 11.1 and 4.458 minutes, respectively. The method was validated in terms of linearity, precision, accuracy, ruggedness, and specificity, limit of detection and limit of quantification. The linearity (r^2) and percentage recoveries of telmisartan and indapamide were 0.9998 and 99.85 μ g/ml and 0.9988 and 99.91 % respectively. The proposed method is suitable for simultaneous determination of telmisartan and indapamide in capsule dosage form.

KEYWORDS: RP-HPLC; Telmisartan; Indapamide; simultaneous determination.

Anti-Hemorrhoidal Activity of Leaf Extract of *Adenia lobata* (Jacq.) Engl. (Passifloraceae)

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ABSTRACT:

Next to modern therapeutic, many plants resulting from the African traditional pharmacopeia are used by the traditional healers as anti-hemorrhoidal remedies. The aim of this study was to evaluate the anti-hemorrhoidal activity of leaves of *Adenia lobata*. This work has focused on the inflammatory aspect of the hemorrhoid. Induction of inflammation was made with kaolin mixed with arabic gum. Solutions of *A. lobata* leaves used with preventive measure delay the inflammatory process of hemorrhoidal disease and for curative cure hemorrhoidal inflammation. Also, the anti-inflammatory activity observed is due to flavonoids present in leaves of *A. lobata*. Preparation of solutions with cool water is more effective than that carried out with the hot water which denatures the active

ingredients of the remedy. At the doses used, this remedy is deprived of acute toxicity and can be taken safely by patients. A six times higher solution concentration than that of the traditional healer gives a similar anti-inflammatory response to it. Thus, there is a minimum concentration of *A. lobata* leaves solutions from which the anti-inflammatory effect is maximal. The anti-hemorrhoidal action of leaves of *A. lobata* was established and tests on veinotonic aspect are in progress.

KEYWORDS: *Adenia lobata*; anti-hemorrhoidal activity; Côte d'Ivoire; leaf; traditional healer

Formaldehyde Levels in Some Fish and Milk Products Obtained From Makurdi Metropolis – Benue State Nigeria.

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ABSTRACT:

The study investigated the formaldehyde levels in some selected fish and milk products by Hantzsch spectrophotometric method using Acetoacetaldehyde, a β -ketone. Twelve (12) samples namely Breast milk (fresh milk), Fresh fish, Peak milk brand (liquid), Cow milk (raw milk), Crown brand milk (powder), Cowbell brand milk (liquid and powder forms), Frozen fish, Dry fish, Smoked fish, Fried fish and Nunu brand milk (powder) were analysed. The results of the analysis were as follows 30 g Kg⁻¹ for Breast milk, 49.55 g Kg⁻¹ for Cowbell brand milk (liquid), 33.93 g Kg⁻¹ for Cowbell brand (powder), 53.45 g Kg⁻¹ for Fresh fish, 53.45 g Kg⁻¹ for Peak brand milk (liquid), 31.83 g Kg⁻¹ for Cow milk (raw milk), 66.67 g Kg⁻¹ for Crown brand milk (powder), 35.75 g Kg⁻¹ for Frozen fish, 37.96 g Kg⁻¹ for Dry fish, 37.23 g Kg⁻¹ for smoked fish, 57.36 g Kg⁻¹ for fried fish and 29.43 g Kg⁻¹ for Nunu brand (powder) milk samples. These results are significant compared to the reported toxic values of 0.8 g Kg⁻¹ HCHO for humans.

KEYWORDS: Formaldehyde levels, Hantzsch spectrophotometric method, Acetoacetaldehyde reagent, Fish and milk products.

Hydrotropic Solubilisation Technique of Metaxalone by U.V. Spectroscopy and First Order Derivative Spectroscopy

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ABSTRACT:

Solubility of various poorly water-soluble drugs can be increased by the use of hydrotropic solubilisation technique. In the following investigation, solution of 0.5 M sodium acetate was employed as solubilising agent to solubilise poorly water soluble drug. Metaxalone showed absorbance maxima at 278nm. Beer's law is obeyed in the concentration range of 40-240 μ g/mL in two methods. Method-A UV Spectroscopy which involves measurement of absorbance maxima. Method- B Derivative spectroscopy involves the derivatisation of the primary absorption spectra for the first order. The amplitude (D_L) of the long wave peak satellite of the first order curve was measured in mm. The results of analysis and the recovery studies which were validated statistically were found to be satisfactory. Presence of sodium acetate did not interfere in the analysis of Metaxalone and therefore both methods are accurate providing additional advantages of being cost effective and environmental friendly.

KEYWORDS: Metaxalone, UV Spectroscopy, First order derivative spectroscopy, Sodium acetate.

Formulation and Evaluation of Metoprolol Succinate Extended Release Tablet

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ABSTRACT:

The aim of the present study was to develop an extended release formulation of Metoprolol Succinate to maintain constant therapeutic levels of the drug for over 24 hrs. An efficient extended release formulation of Metoprolol Succinate could be designed as extended release Matrix tablet. The optimized formulation (B-8) was developed by using HPMC [Benecel K35M] and HEC [Natrosol 250HHX] Regulated drug release in first order manner was attained by using these polymers. This extended release formulation (B-8) was found similar and comparable to the innovator product. The developed extended release formulation was quite stable with regard to physical properties and dissolution rate in the accelerated stability studies.

KEYWORDS: Metoprolol Succinate, Aerosil, Ethocel, Rotary tablet Machine

Preliminary Phytochemical Screening and Antibacterial Activity of Ethyl Acetate Extract of *Cuscuta reflexa* Roxb.

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ABSTRACT:

The plant *Cuscuta reflexa* Roxb. belonging to family Convolvulaceae was selected for the project, on the basis of ethnobotanical information and easy availability. The whole plant of *Cuscuta reflexa* Roxb. were successively extracted with Petroleum ether and Ethyl acetate by soxhlet extraction. Preliminary Phytochemical screening of Ethyl acetate extract of whole plant of *Cuscuta reflexa* Roxb. resulted in the identification of various chemical constituents such as - Cardiac glycosides, Phenols and Tannins. Further the Ethyl acetate extract were vacuum dried and subjected for Antibacterial activity by Agar well diffusion method. Zone of inhibition produced by Ethyl acetate extract in dose 25, 50, 100, 150mg/ml against human pathogenic bacteria stains gram positive and gram negative respectively *Mycobacterium tuberculosis* (MTCC 300) and *Salmonella typhimurium* (MTCC 98) were measured and compared with standard antibiotics Ciprofloxacin (10µg/ml). The present study demonstrated that the Ethyl acetate extract of *Cuscuta reflexa* Roxb. shows potent Antibacterial activity against MTCC 98 and MTCC 300 at concentration 150mg/ml respectively. So on the basis of the zone of inhibition we are concluded that Ethyl acetate extract shows more potent Antibacterial activity against gram negative *Salmonella typhimurium* (MTCC 98) bacterial stains and studies revealed that the Ethyl acetate extract of *Cuscuta reflexa* Roxb. having Antibacterial activity.

KEYWORDS: *Cuscuta reflexa* Roxb., Antibacterial activity, Agar well diffusion method, *Mycobacterium tuberculosis* (MTCC 300), *Salmonella typhimurium* (MTCC 98) .

Phytochemical Screening of the Extract of the Root-Bark of *Morinda tinctoria* (Rubiaceae) for Secondary Metabolites

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ABSTRACT:

Morinda tinctoria Roxb. is one of the medicinally important plants belonging to the family Rubiaceae and traditionally the leaves and roots are used for treatment of various ailments. Chloroform, Ethylacetate and methanol extracts of the root-bark was subjected to standard biochemical test for the presence of several plant secondary metabolites. Alkaloids, anthroquinones, saponins, steroids, triterpenoids, quinones and cardiac glycosides were

present in the root-bark. The extracts were further subjected to chromatographic separation using GC-MS. The chromatogram revealed 21 peaks from Chloroform, 17 from Ethyl acetate and 14 from Methanol extracts. The Chloroform and methanol root-bark extract consist of the potent biologically active phyto-constituents such as Heptacosane, Eicosanedioic acid and Nonadecenoic acid.

KEYWORDS: *Morinda tinctoria*, Heptacosane, Eicosanedioic acid, Nonadecenoic acid, Phytochemical screening.

Evaluation of Preliminary Phytochemical and Physicochemical Studies on *Juniperus Communis* L. Fruit Used In Ayurvedic Formulations

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ABSTRACT:

Plants are the great sources of medicines, especially in traditional system of medicine, which are useful in the treatment of various diseases. The recent global resurgence of interest in herbal medicines has led to an increase in the demand for them. Commercialization of these medicines to meet this increasing demand has resulted in a decline in their quality, primarily due to a lack of adequate regulations governing this sector of medicine. There is now a need to develop a systematic approach for the authentication of herbal plants and to develop well-designed methodologies for their standardization. The biological diversity in the Indian Himalayan Region especially in Kumaun Himalaya has been a source of medicine for millions in the country and elsewhere. Pharmacological Activities of *Juniperus communis* L. are diuretic, Anti-bacterial activity, Hepatoprotective and anti-hepatic cancer, Anti-fertility activity, Anti-inflammatory, Effect on blood platelets, anti-tumor and anti-oxidant etc. The set parameters were found to be sufficient to evaluate the raw material and can be used as reference standards for the quality control/quality assurance purposes. The analysis and quality control of herbal medicines are moving towards an integrative and Comprehensive direction, in order to better address the inherent holistic nature of herbal medicines. In the present study, it was observed that all ingredients of commercial samples matched exactly with that of authentic standards after performing the standardization as per WHO guideline.

KEYWORDS:

Synthesis and Study of Fluorimetric Properties of Lisinopril Derivatives

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ABSTRACT:

Lisinopril is antihypertensive drug acts by Inhibition of Ace enzyme. Lisinopril derivatives synthesized by coupling or condensation reactions with fluorophores or reagents which produce fluorescent compounds. The fluorescent derivatives of Lisinopril are confirmed by the spectral data like IR, NMR, physical properties such as MP, R_f Value, solubility, and chemical properties. The intensity of fluorescence is higher for Ia, IIa, IIIa, IVa and low for Va, VIa and the derivatives VIIa show no fluorescent properties. The derivatives show different fluorescent property depending upon the reagents coupled. The synthesized products are measured for their fluorescent properties which can be used for identification and estimation of drug.

KEYWORDS: Synthesis, Florescent compound, Lisinopril, Flourophore.

Physico-Chemical and Antibacterial Characteristics of *Apis* Honeys from Karnataka, India.

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ABSTRACT:

Honey is a natural sweet substance produced by honeybees from nectar of flowers. It consists of major sugars, acids, vitamins, proteins, enzymes and volatile substances. It is a chief source of glucose and fructose. Henceforth, it plays an important role in food industries. Besides, honey is widely used in medicine as antibacterial agent. The selected strains of bacteria namely – *Pseudomonas aeruginosa*, *staphylococcus species*, *Bacillus species* and *Escherichia coli* were studied against the dilutions of honey by Agar-well diffusion technique. The honey sample from Coorg district, exhibited relatively high antibacterial activity.

KEYWORDS: honey, antibacterial agent, dilution, inhibitory zones, physico-chemical properties.

Development and evaluation of extended release Ambroxol HCl and Guaifenesin suspension

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ABSTRACT:

The main objective of the present work was to develop extended release suspension of Ambroxol HCl and Guaifenesin. An oral extended release suspension was prepared using ion-exchange resin technology. A strong cation exchange resin Dowex50 was utilized for the sorption of the drug and the drug resinate was evaluated for various physical and chemical parameters. The drug-resinate complex was microencapsulated with a polymer Ethylcellulose to further retard the release characteristics. Ethylcellulose coated ion exchange resinate of Ambroxol HCl and Guaifenesin were prepared using Dowex50 by Spray Drying technology. Among the various formulation of microcapsule (drug resinate-Ethylcellulose ratio) prepared. An ideal formulation (drug resinate 1:1) and 10% Ethylcellulose coating was selected for the formulation of an extended release suspension. Prepared drug-resinate complex was then microencapsulated and the microencapsulated drug resin complex were suspended in a palatable aqueous suspension base and evaluated for extended release characteristic. Three formulation of suspension were prepared having varying concentration of coating polymer ethylcellulose to study the drug release profile from the suspension. This suspension was evaluated for physical stability, redispersibility and in vitro drug release pattern. The result showed that the suspension prepared with ethylcellulose with 10% concentration shows uniform extend drug release, and is suitable for preparation of good extended release suspension.

KEYWORDS: Extended release suspension; Ambroxol HCl; Guaifenesin; Ion exchange resinate; Ethylcellulose

Hydrogel Beads Composed of Sodium Carboxymethyl Xanthan and Sodium Carboxymethyl Cellulose for Controlled Release of Aceclofenac: Effect of Formulation Variables

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ABSTRACT:

Treatment of musculo-skeletal disorders with non-steroidal anti-inflammatory drugs (NSAIDs) produces moderate to severe gastric adverse effects. This work describes the development of Aceclofenac, a model NSAID, loaded hydrogel beads which could deliver minimal amount of drug in stomach and provide complete release in small intestine in a controlled manner. Various single and bipolymeric hydrogel beads were prepared using modified natural polymers like sodium carboxymethyl xanthan and sodium carboxymethyl cellulose through ionotropic gelation process using $AlCl_3$ as a cross linking agent. Compatibility of the drug in the hydrogel beads were evaluated through FTIR, XRD and DSC analyses. Effect of various formulation parameters in addition to viscosity of polymers or polymer combination were studied on physical properties of the beads. Morphology, size and drug entrapment efficiency of beads, and in-vitro drug release in hydrochloric acid solution and phosphate buffer (PB) solution (pH6.8) were found to be influenced by the viscosity of polymer dispersion in addition to the ratios of the two polymers, initial drug load, and concentration of total polymer and $AlCl_3$. The beads released considerably less amount of drug in acid solution (maximum 14.2%) and provided controlled release in PB solution. The mechanism of drug release varied from Fickian to non-Fickian model in acid solution and from non-Fickian to case II transport model in PB solution.

KEYWORDS: sodium carboxymethyl xanthan; sodium carboxymethyl cellulose; hydrogel beads; aceclofenac; drug release.

Comparative Standardization of Roots of *Boerhaavia diffusa* Linn. From Two Different Geographical Regions

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ABSTRACT:

Boerhaavia diffusa Linn., belonging to family Nyctaginaceae, commonly known as “Punarnava”, is a perennial creeping herb, up to a height of 1-1.2 m. Parts of the plant have been used since long time in the treatment of various diseases. The roots have been reported to possess activities like diuretic, anti-inflammatory, laxative anthelmintic, stomachic, febrifuge, antileprosy, antiscabies, antiviral, and antitumour properties. In the present study, comparative standardization of the root of *B. diffusa* from two different geographical regions (Punjab and U.P) have been studied as per the WHO Guidelines to determine the correct identity and purity of the plant part and for the detection of adulteration as well. Botanical authentication and physicochemical parameters gave an idea about the quality of drug. The root powder was extracted with different solvents including Petroleum ether, Benzene, Chloroform, Ethyl acetate, Methanol and Water. Pharmacognostic study (macroscopic and powder microscopic) and physicochemical parameters (extractive values, ash values, foaming index, foreign matter, moisture content) were studied. The extractive values of hot extraction with methanol was found 15.3% w/w and 14.8%w/w and aqueous hot extractive was found 19.3%w/w and 19.7%w/w in Punjab and U.P. regions respectively. Total ash values were found 8.5%w/w and 9.15%w/w in Punjab and U.P. regions respectively. Further phytochemical screening revealed the presence of alkaloids, flavonoids, triterpenoids, phenolic compounds (tannins), saponins and steroids.

KEYWORDS: *Boerhaavia diffusa*, Nyctaginaceae, Root, Punarnava, Comparative standardization

A Study on Phytochemical Constituents and *In Vitro* Antioxidant Activity of *Carica papaya*

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ABSTRACT:

Antioxidant activity of methanolic extract of seeds of *Carica papaya* was investigated for its free radical scavenging activity by adapting *in vitro* models of free radical production. Phytochemical screening revealed that the extract possess tannins, pseudotannin, flavonoids, glycosides,alkaloids. The extract was investigated for its antioxidant activity using 1,1-Diphenyl 2-picrylhydrazyl(DPPH).The extracts showed good antioxidant activity that was better than ascorbic acid. It has been concluded that the derivatives of *Carica papaya* has significant antioxidant activity.

KEYWORDS: *In vitro* antioxidant activity, phytochemical analysis, *Carica papaya*.

Radical Scavenging Activity and Total Phenolic Content in Selected Fruits and Vegetables

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ABSTRACT:

There is a strong association between the intake of fruits and vegetables and the prevention of degenerative diseases due to the presence of antioxidant phytonutrients in them. Therefore, the antioxidant properties of selected fruits and vegetables commonly consumed in Rajasthan were evaluated by the DPPH radical scavenging assay and Superoxide radical scavenging assay. The total phenolic content was determined by the method of Farkas and Kiraly using the Folin-Ciocalteu reagent. The present study suggests that all the tested fruits and vegetables are moderate to potential sources of natural antioxidants.

KEYWORDS: Antioxidant activity, phenols, fruits, vegetables

Hypoglycemic and Hypolipidemic Potentials of *Psidium guajava* in Alloxan Induced Diabetic Rats
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ABSTRACT:

Diabetes mellitus, a global public health problem, is now emerging as an epidemic world over. Over the last century changes in human behavior and lifestyle have resulted in a dramatic increase in the incidence of diabetes world over. Diabetes not only affects glucose metabolism but also lipid, a high risk factor for cardiovascular disease (CVD). Oral hypoglycemic agents and insulin is the mainstay of treatment of diabetes, they have prominent side effects and fail to significantly alter the course of diabetic complications. Plants have always been an excellent source of drugs and many of the currently available drugs have been derived directly or indirectly from them. *Psidium guajava* (Guava) is an economically important plant of high medicinal value. This study was undertaken to evaluate the hypoglycemic and hypolipidemic potential of ethanolic extract of *Psidium guajava* leaf on normal and alloxan induced diabetic rats. Male 6-8 week old albino rats were selected for the experiments and these were divided into five groups. Diabetes was induced by alloxan. Glucose, total cholesterol (TC), triglycerides (TG), high-density lipoprotein (HDL) cholesterol, low-density lipoprotein (LDL) cholesterol and very low-density lipoprotein (VLDL) cholesterol levels were measured. Significant decreases in the blood glucose level and TC, TG, and LDL cholesterol and increase in HDL cholesterol, were observed after 9 days treatment of ethanolic extract *Psidium guajava* leaf. It is concluded that the consumption of *Psidium guajava* possess blood glucose lowering properties but are also beneficial in decreasing the risk factors for CVD through lowering blood lipid levels.

KEYWORDS: Diabetes, cardiovascular disease, *Psidium guajava*, lipid profile

Spectral and Antimicrobial Study of Some Novel Schiff Bases and β -Lactam Derivatives.
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ABSTRACT:

In this report, synthesis and antimicrobial study of some Schiff bases and β -lactam derivatives has been reported. The synthesized Schiff bases and β -lactam derivatives were characterized by spectral data, including ¹H-NMR, IR, Mass and Elemental analyses. All the compounds were screened for their in vitro antibacterial activity against two Gram +ve (Staphylococcus aureus, Bacillus subtilis) and two Gram -ve (Escherichia coli, Pseudomonas aeruginosa) bacterial strains by agar-well diffusion method. The Schiff bases were found to exhibit either no or low to moderate activity against one or more bacterial species. On contrary, all the β -lactam derivatives exhibited varied activity against different bacteria.

KEYWORDS: Schiff bases, β -lactams, spectral data, antibacterial activity and bacterial strains.

Determination of Emtricitabine in Human Plasma by LC-MS/MS
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ABSTRACT:

Emtricitabine is a nucleoside agent that has activity against both human immunodeficiency virus and hepatitis B virus. There are very few methods reported in the literature for estimation of emtricitabine using liquid chromatographic with mass spectrometer. The aim of the experiment was to develop a selective, sensitive, rugged and high throughput high performance liquid chromatography tandem mass spectrometric method for the estimation

of Emtricitabine from human plasma. Emtricitabine was extracted from human plasma by solid phase extraction using Water Oasis HLB cartridges. The samples were chromatographed on Hypurity Advance, 50 x 2.1 mm, 5 μ column using a mobile phase consisting of 5 mM ammonium acetate: Acetonitrile (30:70 v/v). The chromatographic separation is achieved in 1.2 minutes. The method was validated over a concentration range of 50.07 ng/mL to 5006.59 ng/mL. Method was validated for its sensitivity, selectivity, accuracy, precision, matrix effect, recovery and various stabilities. The validated method was used for analysis of plasma samples of bioequivalence study.

KEYWORDS: LC-MS/MS; Emtricitabine; Solid Phase extraction, Method Validation and Human Plasma

Development and validation of spectrophotometric fingerprint method of 6-gingerol in herbal formulation: Talisadi Churna

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ABSTRACT:

The poly herbal formulations containing ginger are widely used for different medicinal properties. The present paper deals with the development of spectrophotometric fingerprint for estimation of 6- Gingerol in raw materials and market formulations. However, there has been an attempt to standardize the polyherbal formulations containing 6- Gingerol as the main ingredient in terms of its active principal or marker compound. Selective and efficient analytical methods are required not only for quality assurance but also for authentication of herbal formulations. A simple, rapid and valid fingerprint method has been first carried out for estimation of 6-Gingerol in Talisadi churna an ayurvedic formulation. Talisadi churna is well known herbal formulation described in classical text Sarangdharsamhita and Ayurvedic Formulary of India. The estimation was carried out with two laboratory batches and three marketed formulation by spectrophotometric approach at 282 nm.

KEYWORDS: Talisadi churna, 6- Gingerol, ethanol, Spectrophotometer.
