Vidarbha Youth Welfare Society's

INSTITUTE OF PHARMACEUTICAL EDUCATION AND RESEARCH

Borgaon (Meghe), Wardha (M.S.)

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OP-02

IMPROVEMENT IN CILNIDIPINE SOLUBILITY BY AMORPHOUS SOLID DISPERSION AND FORMULATION OF INTERPENETRATING POLYMER NETWORK MICROSPHERES FOR SUSTAINED RELEASE

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ABSTRACT

Cilnidipine a calcium channel blocker has poor water solubility, short half-life and show poor bioavailability. Therefore, in the present investigation amorphous solid dispersion of cilnidipine was prepared and then loaded into interpenetrating polymer network (IPN) microspheres to achieve sustained release. Phase solubility of cilnidipine with solutol gave AL type curve therefore, solid dispersion was prepared by melting method, taking cilnidipine: solutol 1:1. Solubility was increased 86 folds in water (saturated solubility of cilnidipine, 0.0022 mg/ml) with solid dispersion due to amorphization of drug which was revealed in the XRD and DSC analysis of solid dispersion. Amorphous solid dispersion was used to prepare IPN microspheres. IPN microspheres were prepared using chitosan and PVA by emulsion internal phase crosslinking. Formulation and optimization was done using Box-Behnken Design. The three independent variables were amount of chitosan, PVA and ratio of chitosan:TPP, while the dependent variables were entrapment efficiency and drug release in 12 h. The level of chitosan and PVA was between 50 to 100 mg per 10 ml internal phase and ratio of chitosan: TPP was varied from 2.5 to 3. Percent entrapment efficiency was found to increase with the increase in the amount of chitosan while it was found to decrease with the decrease in chitosan: TPP ratio. Drug release was found to decrease with the increase in the amount of chitosan and decrease in the amount of PVA. IPN microspheres prepared with chitosan,50 mg; PVA, 75 mg; and chitosan: TPP 2.5 in the 10 ml of the internal phase gave maximum entrapment efficiency (83.87± 1.5%) and 83.29± 0.9% drug release in 12 h, therefore considered optimum.

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OP-01

DUAL RELEASE FLOATING PULSATILE DRUG DELIVERY SYSTEM OF ATENOLOL FOR THE TREATMENT OF HYPERTENSION

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ABSTRACT

Hypertension shows circadian rhythm which requires release of drugs at the time of symptoms. Blood pressure appears too elevated during night at 7 pm and early in the morning at 4 am. Atenolol is an anti-hypertensive drug, which has narrow absorption window. Therefore, the present study was aimed at preparing and evaluating floating pulsatile capsules for dual release of atenolol in the stomach for effective treatment of hypertension. The floating pulsatile capsule consists of different parts: formaldehyde treated capsule body; untreated cap; a plug layer, containing polymer; atenolol-containing core tablets and swellable polymer layer. The plug layer composed of hydroxypropyl methylcellulose of two different grades (K4M and E50) and xanthan gum alone or in combination. Developed formulations were evaluated for weight variation, drug content, floating behaviour and in-vitro release behaviour. The results showed that lag time of the formulations can be adjusted by composition of plug layer. Thus, formulated floating pulsatile capsule may release first pulse of drug immediately after administration to cover first point of sympto may be expected to release after a lag time to cover the early morning for the treatment of hypertension.

OP-03

DESIGN, SYNTHESIS, CHARACTERIZATION AND IN-VIVO EVALUATION OF ANTI-INFLAMMATORY ACTIVITY OF SUBSTITUTED THIAZOLOTRIAZOLES

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ABSTRACT

In the present work, a simple and efficient practical method for synthesis of a new series of 2-{[5-(2-chlorophenyl)-4H-1,2,4-triazol-3-yl]sulfanyl}-1-(substituted phenyl) ethanone (7a-l) and 2-(2-chlorophenyl)-6-(4-substituted phenyl)-1,3-thiazolo [3,2-b]-1,2,4-triazole (8a-l) was achieved. The structures of these new heterocyclic compounds bearing both thiazole and triazole ring arrangements were supported by spectral (IR, 1H and 13C NMR, Mass) and elemental (C, H, N, S) analysis. These compounds were screened for anti-inflammatory activity by Carrageenan induced rat paw edema method. The results proved that many of the synthesized derivatives exhibited significant anti-inflammatory activities. Compound with fluoro substituents (7l and 8l) was found to be significantly more effective ($P<0.01$) anti-inflammatory agent as compared to other synthesized analogues. Based on anti-inflammatory data, compound 8l was selected for further in-vivo study. A simple, accurate, precise, rugged and economic HPLC method was developed and validated for estimation of compound 8l in serum using Indomethacin as an internal standard. The pharmacokinetic parameters were calculated by a non-compartment approach for the serum concentration of compound (8l) using software Kinetic (version 5.0). Cmax and Tmax for compound 8l were directly calculated by the standard non-compartmental analysis. Cmax, Tmax and T1/2 of compound 8l were found to be 52.54 µg/mL, 3 h and 4.36 respectively. Area under the time curve upto 24 h determined by linear trapezoidal rule was found to be 345.26 µg.h/mL. Area under the serum concentration time curve extrapolated to infinity was found to be 424.22 µg.h/mL and mean residence time was calculated and was found to be 7.63 h.

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PC-11

QUALITY EVALUTION OF WATER IN WARDHA ZILLA

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ABSTRACT

Water is life and covers 70% of total surface of earth. It is transparent, tasteless, odorless and easily available. It contains number of minerals, such as Iron, Aluminium, Copper, Manganese, Zinc, Magnesium, Barium, Calcium, Silver, Selenium, Molybdinum, Boron, Nitrate, Sulphate, Sulphide, Fluoride, Chloride and Ammonia, which are important for growth and development of humans. It also contains heavy metals such as Arsenic, Mercury, Chromium, Cadmium, Lead and Nickel. The problem is that less than 1% of the water on the planet is readily available for drinking or for most agriculture purposes. Most of the water on earth, about 97%, is salt water stored in the oceans; and only 3% is fresh water. In the present work, water samples were collected from 13 different places of Wardha Zilla according to Government guidelines and analyzed in the laboratory for physical parameters, bacteriological analysis, chemical analysis and heavy metal analysis, further, proposed are some eco-friendly techniques for purification of water such as, Aeration, Boiling, Solar Disinfection, Sand Purification, Charcoal Purification and Baker's Yeast. From the study, we concluded that the health of water collected from 13 different places of Wardha Zilla was suitable for drinking purposes and the purification techniques proposed are simple, safe, eco-friendly, and economically cheap as compared to marketed purifiers whose reactivation cost is exorbitant.

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PC-13

CHARACTERIZATION OF POLYMORPHIC BEHAVIOUR OF DACLATASVIR DIHYDROCHLORIDE USING INSTRUMENTAL TECHNIQUES

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ABSTRACT

This study aims with the formation and characterization of various solid-state forms of Daclatasvir dihydrochloride (DDL). The drug was subjected to polymorphic screening using different solvents to explore the possibility of existence of different solid forms and to investigate the factors affecting DDL polymorphic transformations. The polymorphs of DDL were prepared using methanol, ethanol, dimethyl formamide and dimethyl sulphoxide as crystallization solvents. The prepared polymorphs were characterized by differential scanning calorimetry (DSC), X-ray powder diffraction (XRPD), scanning electron microscopy (SEM), fourier transform infrared (FTIR) spectroscopy and measurement of aqueous solubility and melting point; the effect of temperature and humidity was also investigated. Polymorphs prepared from various solvents exhibited differences in melting point when compared with the actual procured drug. The DSC thermograms for bulk drug showed single endothermic peak at 273.50oc while crystals recrystallized from ethanol and DMF exhibited broad endothermic peak at 97.08oc. X-ray diffractogram of crystals obtained from ethanol and DMF exhibited diffused peak when compared with bulk drug confirming the amorphous form of recrystallized polymorph. According to microscophic study, bulk drug exhibited spherical thin plate crystals while ethanolic crystals had rough surfaces of plates with irregularities in the crystals and crystals obtained from DMF showed aggregates of irregularly shaped particles. Thus the methods used for characterization enabled differentiation of DDL bulk drug and its prepared polymorph.

PC-17

FORMULATION AND OPTIMIZATION OF DEFLAZACORT ORAL FILMS USING BOX BEHNKEN DESIGN

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ABSTRACT

The objective of the investigation was to formulate oral disintegrating films loaded with Deflazacort (DZ) and to evaluate it under various parameters. Oral films of DZ were prepared, as suggested Box Behnken design, using HPMC as a polymer and Sodium starch glycolate (SSG), as disintegrant, in various proportions. The oral films were tailored using solvent casting method, and were subjected to evaluation parameters. Physicochemical parameters such as weight variation, folding endurance, surface pH, in-vitro disintegration and dissolution, SEM studies and accelerated stability studies were carried out. FTIR studies revealed that there was no drug-polymer interaction. The films disintegrated within 1 min and the fastest being disintegrated in 20 sec. The SEM images of the DZ strips revealed uniform distribution of drug in HPMC matrix, indicated by clear appearance. Based on all the evaluation parameters, batch containing 300 mg HPMC and 3% SSG, had revealed optimal performance, with drug release 95.87% in 5 minutes. The optimized formulation was found to be stable till three months under accelerated conditions. Results advocated use of HPM[illegible] of fast dissolving strip containing DZ.

PC-23

DESIGN, DEVELOPMENT AND EVALUATION OF pH RESPONSIVE MICROSPHERES CONTAINING CELECOXIB FOR COLON TARGETING BY USING BOX-BEHNKEN DESIGN

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ABSTRACT

Colon targeting is helpful for treatment of colonic diseases such as irritable bowel syndrome, ulcerative colitis, etc. Celecoxib, an anti-inflammatory drug was used as a model drug in current investigation. The pH responsive microsphere formulation may protect Celecoxib from degradation in upper GIT and thus by targeting to the colon, may reduce dosing frequency and provide prolonged drug release. Microspheres were prepared using solvent evaporation method by dispersing drug in the polymeric solution of Eudragit S100 and Ethyl cellulose, and then pouring this mixture into 1% span 80 and paraffin solution to obtain the microspheres. Box-Behnken design were used for optimization of various batches of microspheres. Microsphere were evaluated for particle size determination, drug content, entrapment efficiency, SEM, in vitro drug release and kinetics and accelerated stability study. Results showed that batch containing Eudragit S100 & Ethyl cellulose in 1:1 ratio, indicated maximum drug release (97.69 ± 0.037%) in 12hr and maximum drug entrapment efficiency (83.82%). The drug release followed Hixon Crowell kinetic model and indicated super-c on of polymer. Results suggested that pH responsive r is a promising drug delivery system in the treatment of

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PC-27

DESIGN, DEVELOPMENT AND COMPARATIVE EVALUATION OF MEDICATED ANTIDANDRUFF SHAMPOO WITH MARKETED FORMULATIONS

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ABSTRACT

Hair is an important part of human body. The problems associated with it includes hair loss, dandruff, thinning of hair, dullness etc. Dandruff is small white pieces of dead skin in someone's hair or fallen from someone's hair. It is apparently caused by a fungus called Malassezia restricta and Globosa malassezia. Sertaconazole nitrate is a drug used in fungal infections of skin. The aim of the study is to prepare and determine the medicated shampoo's inhibitory effects on dandruff causing microorganism. Sertaconazole nitrate shampoo was prepared and evaluated in terms of physical (clarity and colour), performance (pH, % solid content, viscosity, dirt dispersion, cleaning, surface tension and foaming) and chemical characteristics (non-volatile alcohol soluble matter, active detergent content). All characteristics of all batches of shampoo were found in limit as specified in Indian standard. Stability study revealed that the formulated shampoo was stable for a prolong period of time as compared to marketed shampoo. The antifungal activity of shampoo was studied against selected fungal strain (Mallassezia furfur) using Sertaconazole as a positive control by cup plate diffusion method and was found to be effective against the selected fungal species. Hence Sertaconazole nitrate can be used as an anti-dand
infections.

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PC-33

FORMULATION AND CHARACTERIZATION OF NATEGLINIDE CRYSTALLO CO-AGGLOMERATES

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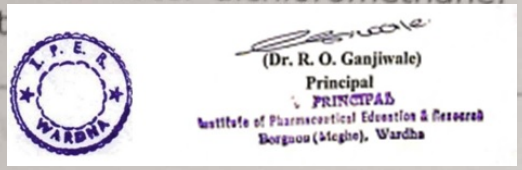
ABSTRACT

Crystallo-co-agglomeration (CCA) is agglomeration processes that transform crystalline drugs directly into compacted spherical form for improving flowability, solubility and compactability by size enlargement of low or high dose, poorly compressible drugs and combination of drugs with or without diluents. Nateglinide is an anti-hyperglycemic drug with poor dissolution and flow properties. The aim of study is to prepare CCA of Nateglinide with the objectives to develop pharmaceutically equivalent, stable, and quality improved agglomerate of Nateglinide with enhanced wettability, solubility, dissolution rate, flow properties and mechanical properties using hydrophilic polymers. CCA of Nateglinide were prepared using three solvent system i.e good solvent, bad solvent and bridging solvent comprising of methanol-water-dichloromethane. Agglomeration was carried out using different concentrat



PC-40

FORMULATION AND EVALUATION OF ENTERIC COATED EXTENDED RELEASE TABLET

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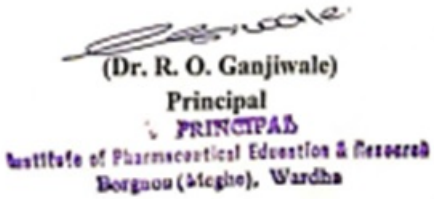
ABSTRACT

Extended release drug formulations are intended to continuously release medication over a prolonged period, after a single dose. Erythromycin is a slightly soluble and weekly acidic drug which degrades in acidic environment of stomach and leads to therapeutic inefficacy. The objective of present study is to formulate and evaluate enteric-coated extended release Erythromycin tablets with an aim to improve the stability of the drug. Erythromycin has low solubility so inclusion complex with beta Cyclodextrin was formulated to increase solubility of erythromycin which was evaluated using FTIR, XRD and DSC. Preformulation study were conducted viz; bulk density, tapped density, angle of repose, compressibility index and Hausners' ratio. Core tablet was formulated by direct compression method using HPMC K15M as an extended release polymer in different concentration. Formulation containing 1:0.75(C1) ratios was selected as optimized formulation, as it was capable of releasing drug up to 10hrs. Batch CE2 was selected as an optimized batch on the basis of lag time and in vitro release i.e 99.27%. The stability studies were carried out an optimized formulation (CE2) at 4± 2°C and 75± 5% R.H. for 3months. No significant changes in drug release were obtained and hence it was concluded that the optimized formulation (CE2) was stable.



PC-42

IMPROVEMENT IN SOLUBILITY AND DISSOLUTION BEHAVIOUR OF A POORLY WATER SOLUBLE DRUG CILNIDIPINE USING SOLUPLUS BY SOLID DISPERSION TECHNIQUE

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Abstract

Solid dispersion is one of the most effective approaches to improve the solubility and dissolution rate and hence, the bioavailability of poorly water-soluble drug. Cilnidipine is a calcium channel blocker use to treat hypertension. The aim of present investigation is o formulate solid dispersion of slightly water soluble drug (Cilnidipine) using water soluble polymer (Soluplus). The solid dispersion is to be evaluated for the changes in solubility and dissolution rate. Solid dispersion was prepared by solvent evaporation method and evaluated for the solubility and dissolution behavior of the drug in solid dispersion. Student t-test is used for comparing % drug dissolution rate and saturated solubility of solid dispersion with pure drug. It indicates that P value is less than 0.05 that means increase in % cumulative drug release was significant. The P value of solid dispersion with pure drug in acid buffer pH 1.2 was insignificant (0.3543) and in phosphate buffer pH 6.8 (0.0112). The solid dispersion of Cilnidipine in the ratio 1:1 showed 4, 3.23 and 4 fold increase in solubility in water, pH 1.2 buffer and pH 6.8 buffer respectively. Thus, it was concluded that soluplus overcomes the dissolution rate limited absorption problem of Cilnidipine and improves its bioavailability.

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stability.

PC-59

FORMULATION DEVELOPMENT OF TOPICAL GEL LOADED WITII NANOSPONGES OF ANTI FUNGAL DRUG

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ABSTRACT

Ketoconazole is Antifungal drug often used in the treatment of fungal infection of skin such as athletes foot, jock itch, ringworm, candidiasis, seborrhea. It has pH dependent solubility and permeability. The drug has a half-life of 1 to 2hours. Because of its short biological half life the drug has to be administered frequently. Furthermore oral ketoconazole causes irritation in gastric mucosal membrane and posses a bitter taste. The present work at designing novel nanosponges as carriers for topical delivery of ketoconazole which minimizes its gastro intestinal side effects and provides consistent drug levels at application site for longer period of time. Methodology included a) The compatibility parameters were studied using IR method. b) The nanosponges were characterized for loading efficiency, entrapment efficiency, particle size and in vitro drug release. c) The gel formulations were evaluated for % drug content, pH, viscosity, spreadability and in vitro diffusion study. The optimized f um pH, viscosity, spreadability and 90.02+-0.30% drug relea gel was evaluated for percent cumulative drug release after (ant changes in drug release were obtained hence it was optim

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PH-14

ANALGESIC AND ANTI-INFLAMMATORY POTENCY OF FLAVONOIDS EXTRACT FROM *RICINUS COMMUNIS*

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ABSTRACT

The aim of present investigation was evaluation of analgesic and anti-inflammatory activity of flavonoidal extracts from Ricinus communis. The Ricinus communis or castor plant has high traditional and medicinal value for maintain the diseasefree healthy life. The present study was conducted to evaluate the analgesic and anti-inflammatory effect of flavonoidal extracts of Ricinus communis leaves in Albino rats. Carageenan induced paw edema was employed to evaluate antiinflammatory activity while analgesic activity was investigated by using hot plate method. In the selected model careggenan was used as inflammation inducing agent. It was found that flavonoidal extract of leaves of Ricinus communis (100mg/kg and 150 mg/kg) has significant analgesic and anti-inflammatory activity whereas the combination drug (std + test) provides more potent results than 100mg/kg and 150 mg/kg alone. On the basis of the results of the current study, it is concluded that the flavonoidal extracts of leaves of Ricinus communis displays considerable potency in analgesic and anti-inflammatory activity

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Both can have lasting consequences on health – especially for the sick persons. Overall, the question is which damages and hazards exist and what risks can be derived from them for the users, and possibly for their environment. For any use of health apps, hazards must be eliminated and risks minimised to reduce potential damage. Perhaps some individuals should not be encouraged to use apps at all, including those who worry excessively about their health, and those unwilling to confer with qualified health professionals able to validate app findings. Most individuals, however, should be encouraged to self-manage. Make changes without communicating further with any health professionals is on the high risk. The biggest risk for covered entities is that the app "could be used as a public-facing gateway by hackers to impermissibly obtain protected health information.

PH-27

PARADIGM SHIFT IN ONCOLOGY: TARGETING THE IMMUNE SYSTEM RATHER THAN CANCER CELLS

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ABSTRACT

Cancer immunotherapy uses the immune system and its component to mount an anti-tumour response. The two main area of it administration of monoclonal antibody and cytokine and adaptive cell transfer. The clinical benefits obtained with rituximab in the treatment of CD20+ B-cell malignancies and of imatinib in the treatment of Phi+ leukaemias have opened a new era in oncology, transforming the concepts of tumour-targeted therapies and personalised medicine into reality. Since then, many tumour-targeted monoclonal antibodies and tyrosine kinase inhibitors have been approved for the treatment of cancers. Compared to conventional chemotherapies, these new drugs have more specificity against cancer cells and less systemic toxicities. However, like conventional chemotherapies, they often provide limited therapeutic benefits with short-lasting tumour responses as the vast majority of cancers become resistant to these drugs over time. Recently, a paradigm shift has been brought to the clinic with drugs targeting immune cells rather than cancer cells with the aim of stimulating the anti-tumour immune response of patients against their own cancer. Immunomodulatory drugs such as anti-CTLA4 and anti-PD-1 have generated long-lasting tumour responses when used as single agent in patients.

PH-28

PHARMACOLOGICAL EFFECTS OF NETTLE ROOT EXTRACT (Urtica-dioica) ON BENIGN PROSTATIC HYPERPLASIA

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ABSTRACT

Benign Prostatic Hyperplasia (BPH) is the nonmalignant enlargement of the prostate gland. It is clinically demonstrated as lower urinary tract symptoms (LUTS) consisting of irritative and obstructive symptoms. The frequency of LUTS increases due to BPH with increasing age. Aim was to evaluate effect of Nettle Root Extract on Benign Prostatic Hyperplasia (BPH) in rats. Testosterone (10 mg/kg i.m.) was used as inducing agent and Finasteride (10mg/kg p.o.) was used as the standard drug. The various groups of animals received Aq. Nettle Root Extract alone (50 mg/kg), Alc. Nettle Root Extract alone (50 mg/kg), Aq. Nettle Root Extract (25 mg/kg) & Finasteride (5 mg/kg) in combination and Alc. Nettle Root Extract (50 mg/kg) & Finasteride (5 mg/kg) in combination respectively once daily per orally for 28 days and various parameters of BPH viz. body weight, prostate weight, determination of hormones and histopathology of prostate were recorded. The present study revealed that Alc. Nettle Root Extract & Finasteride showed significant decrease in body weight, pr... increase in prolactin level as compar... evidence that Nettle Root Extract alo... potential effect on various symptoms of ...

PH-31

A COMPREHENSIVE STUDY ON PHARMACOLOGICAL EFFECTS OF GALLIC ACID AGAINST ALZHEIMER'S DISEASE IN ALBINO RATS

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ABSTRACT

Alz eimer's disease (AD) is defined as prehensile dementia, is a progressive, age de e dent neurodegenerative disorder of the cortex and hippocampus, eventually leading to cognitive impairment of the brain. Gallic acid (GA) a natural polyphenolic compound ound abundantly in grapes, different berries and wine may hold potential compound for intervention of AD due to its ROS scavenging, anticholinesterase and lipid peroxidation prevention property.To investiga nory in rodent model o´ AD. Scopolamine (0.5 mg/k young

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PH-32

PHARMACOLOGICAL SCREENING OF POLYHERBAL FORMULATION ON POLYCYSTIC OVARIAN SYNDROME IN FEMALE ALBINO RATS.

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ABSTRACT

Polycystic ovary syndrome is highly prevalent endocrine disorder. Letrozole inhibit the aromatase enzyme by binding to the subunit of cytochrome P450, which results in abnormal follicular development and polycystic ovarian syndrome. Actifem helps to balance the harmone profile, it is able to decrease the number of cysts and development of healthy follicle along with formation of corpus luteum. Body weight, biochemical parameters and hormonal profile were used for examination of letrozole induced PCOS in rats. Experimental groups consist of five groups. Except normal group all rats were once daily administered with letrozole 1mg/kg p.o. for 21 days to induce PCOS. The standard group received 1mg/kg p.o. of clomiphene citrate while the treatment groups were treated with 3.5ml/kg and 7ml/kg p.o. respectively with Actifem for 15 days after PCOS induction. Body weight, biochemical parameter includes lipid profile and biomarkers of ovarian function, i.e serum testosterone and serum estradiol were estimated on post induction day and at the end of the treatment i.e on 22nd and 38th day respectively. The administration of letrozole led to increase in body weight, abnormality in lipid and serum sex steroid profile. Actifem was able to exert its profitable after effect by bringing back parameters to normal and disappearance of ovarian cyst. Actifem showed a gainful outcome in letrozole induced PCOS in female rats. It decreased the obesity and reduced the level of serum testosterone and estradiol (hyperandrogonism) which helps to prevent infertility

Analgesic activity superior to that of the standards, Ibuprofen. These compounds also exhibited significant Anti-microbial activity comparable to that of sulphonamide.

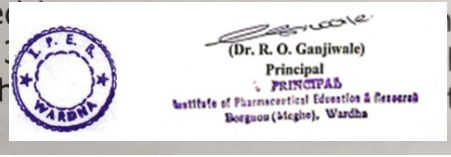
PCH-04

A LINEAR QSAR MODEL FOR PREDICTING THE INHIBITION OF CETP ENZYME BY ARYLBENZOXAZOLE DERIVATIVES AND ACTIVE SITE CHARACTERIZATION BY DOCKING STUDIES

P.G. Swami*, G.R. Kadam, S.J. Wadher, R.O. Ganjiwale

ABSTRACT

Cholesteryl ester transfer protein [CETP] is a plasma glycoprotein which plays an important role in reverse cholesterol transport and maintenance of cholesterol homeostasis. It facilitates the transfer of cholesteryl esters from the atheroprotective HDL to the proatherogenic LDL and VLDL. Inhibition of CETP activity leads to increased HDL-cholesterol. High density lipoprotein [HDL-C] concentration in the blood is independently and inversely associated with an increased risk of coronary heart disease. CETP has become a novel strategy for raising HDL-C in humans. A series of 2-Arylbenzoxazole derivatives recently discovered as CETP inhibitors were studied. Linear QSAR models were built using multiple linear regression of 30 arylbenzoxazole derivatives to probe their CETP inhibition activity. The binding conformations of arylbenzoxazole derivatives were determined and predicte[illegible]ese results demonstrated the power of combining docking / [illegible]lore the probable binding conformations of compounds at th[illegible]tein target.



Priyadarshini J L College of Pharmacy, Nagpur

ABSTRACT

Standardisation of leaf of Guazuma tomentosa is carried out to establish its macroscopic and microscopic characters and its quantitative physicochemical standards. Total ash, water soluble ash, acid insoluble ash, swelling index, extractive value (ethyl acetate, dichloromethne, alcohol and water soluble extractive value both hot and cold) were determined for physicochemical evaluations. Preliminary phytochemical screening was done to detect the presence and absence of phytoconstituents. Thin layer chromatography was carried out which play important role in assuring quality of crude drug. The drug can be identified on the basis of morphology and microscopic characters. Phytochemical screening revealed that leaf extract contain alkaloids, carbohydrate, phytosterol, resin, flavanoids, tannins, diterpenes and protein. TLC chromatogram and different phsicochemical standard has been developed. The present study on pharmacognostic standardisation, physicochemical evaluation of Guazuma tomentosa leaf might be useful to supplement information in regard to its identification parameters assumed significantly in the way of acceptibility of herbal drugs in present scenario.

PG-16

EVALUATION OF FREE RADICAL SCAVENGING PROPERTIES OF *BOMBAX CEIBA* THORNS

Pallavi B. Hatwar*, Shailju G. Gurunani

Priydarshini J.L. College of Pharmacy, Hingna Road, Nagpur

ABSTACT

Bombax ceiba also known as kantesavar & red cotton silk has various medicinal properties like Astringent, Antiacne, Antipyretic, cardiotonic in the traditional system of medicine such as Ayurveda, Siddha and Unani. The present study was performed to determine the yield of extract, qualitative, quantitative analysis and antioxidant activity of the crude extract of *Bombax ceiba.* The qualitative phytochemical screening of crude extract shows the presence of Steroids, Carbohydrate, Tannins, Flavonoids. Total phenolic content was estimated by Folin ciocalteu method and was found to be 216µg/mg & 133.3µg/mg gallic acid equivalent in acetone extract & methanol extract. Total flavonoid content was estimated by Aluminium chloride colorimetric method and was found to be 3.62µg/mg & 3.5µg/mg rutin equivalent in acetone extract & methanol extract. Total carbohydrate content was found to be 0.137µg/mg & 0.3µg/mg glucose in acetone extract & methanol extract respectively. The various extract of *Bombax ceiba* thorns shows significant antioxidant activity by DPPH radical scavenging method. Ascorbic acid used as positive control showed 92.48% scavenging activity which was followed by PEEBC, AEBC, WEBC & MEBC showed 54.18%, 47.47%, 44.95% & 43.25% activity respectively.

PG-17

EFFECTS OF DIFFERENT HOMEOPATHIC POTENCIES OF *GYMNEMA SYLVESTRE* IN TREATMENT OF ALLOXAN INDUCED DIABETES

S. V. Padhare*, M. V. Navadkar, P. R. Itankar, R. O. Ganjiwale

Institute of Pharmaceutical Education and Research, Borgoan (Meghe), Wardha

ABSTRACT

This study was design to evaluate the effect of homeopathic preparation of *Gymnema sylvestre* R Br. (family: Asclepiadaceae) mother tincture (MT), 3x & 10x potencies on diabetic albino mice of either sex. Diabeties was induced by intraperitoneal injection of alloxan monohydrate (150 mg/kg body weight) administration. Mice were divided into 6 groups (n=6). Group 1 & 2 were kept normal control and diabetic control respectively whereas groups 3-5 consists of diabetic mice treated with different doses of *G. sylvestre* MT, 3X and 10 X potencies for 21 days. Insulin (4IU/kg; s. c.) was used as standard. Blood glucose levels were tested by glucose test strips. The fasting blood glucose levels (12 h) and body weights [illegible] 21st of study. Blood glucose levels were redu[illegible]ed that homeopathic potencies of *G. sylvestre* h[illegible]

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PC-05

PREPARATION OF FLOATING MUCOADHESIVE TABLET OF A DRUG HAVING NARROW ABSORPTION IN THE GASTROINTESTIONAL TRACT

Rupali D. Deshmukh*, Shafgupta Khan

Department of Pharmaceutics, Institute of Pharmaceutical Education and Research, Borgaon (Meghe), Wardha

ABSTRACT

Residronate sodium shows the narrow absorption window and short half life in a gastrointestinal tract therefore has low bioavailability. Therefore in the present investigation floating and mucoadhseion tablets were prepared of residronate sodium by using different ratios of fenugreek gum and guar gum. Sodium bicarbonate was used as a gas-former and microcrystalline cellulose as diluents. Tablets were characterized for floating lag time, floating duration, swelling behavior and drug release. Results showed With the increase in the ratio of guar gum: fenugreek gum, swelling increases and decreases the drug release. Floating lag time decreased with by increasing concentration of MCC, floating lag time of one minute was observed with MCC at the 25%w/w. Rapid achievement of floating and prolonged floating and drug release was obtained for 12h within one min.

PC-06

DEVELOPMENT AND EVALUATION OF TOPICAL FORMULATION FOR SKIN WHITENING CONTAINING HERBAL INGREDIENTS

Vijayshri V.Rokde*, Rajayshri Dongarwar, Ujwala Mahajan

Dadasaheb Balpande Co

A

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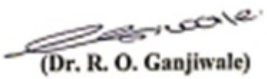

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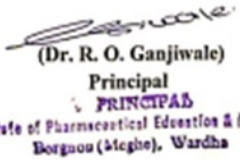
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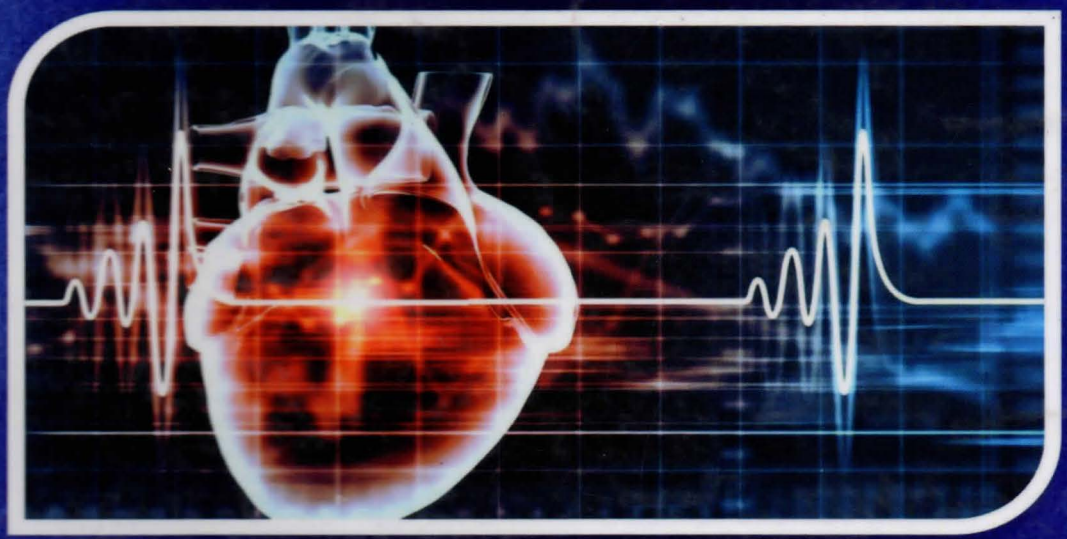

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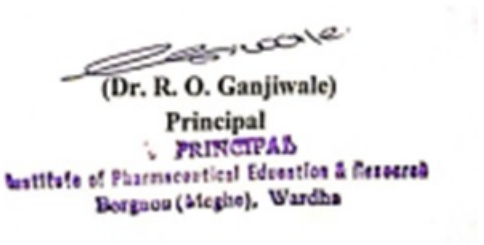
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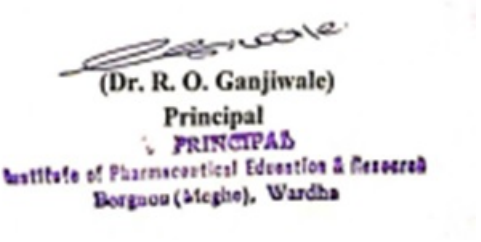
Nanobiotechnology in Neurodegenerative Diseases



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Preface

Neurodegenerative (ND) diseases comprise a range of conditions that primarily affect the neurons in the human brain. Neurons are the building blocks of our brain, which normally don't reproduce or replace themselves if they get damaged. ND diseases include Parkinson's disease, Alzheimer's disease, and Huntington's disease. The most problematic feature of ND diseases is that they are incurable and result in the progressive degeneration of neuron cells. The major cause of ND diseases is related to genetic mutation; apart from this, protein misfolding, DNA damage, apoptosis, mitochondrial dysfunction, and programmed cell death are the other causes of ND diseases. A number of ND disorders have been thoroughly examined, but successful, early diagnoses and treatment have been limited. The key reason for this is the blood–brain barrier that prevents the penetration of the majority of drugs and agents to effectively treat the disorders.

Nanobiotechnology as an emerging tool has the potential to play a pivotal role to improve the understanding and treatment of neurodegenerative diseases. Different types of nanomaterials can be implemented for diagnosis, drug delivery, and treatment of neurodegenerative diseases. Engineered nanoparticles are materials with dimension 1–100 nm. Metal nanoparticles showcase an innovative and promising approach to potentially solve problems related to ND diseases. Due to their smaller size, nanoparticles are able to interact with biological systems at a molecular level. The smaller sized nanoparticles can also cross the blood–brain barrier. Hence, the physical, chemical, and biological properties of nanoparticles can be utilized for diagnosis, therapy, tissue engineering, regeneration, and drug delivery. Similarly, exosomes are also evolving as therapeutic nanobiomaterials for drug delivery in neurodegenerative diseases as they have the ability to cross the blood–brain barrier. Moreover, in recent years, the field of nanobiosensors is growing quickly, and with the help of nanotechnology, it is possible to develop higher sensitivity for nanobiosensors. This area of research is attracting scientists in general and medical experts in particular. In this book, a brief overview of the different ND diseases and advancements in nanobiotechnology for the treatment of ND is discussed by eminent contributors.

This book is beneficial for a wide range of readers including nanotechnologists, biotechnologists, pharmacists, medical professionals, bioengineers, biochemists, and researchers who are involved in the field of research on neurodegenerative diseases.

Amravati, Maharashtra, India

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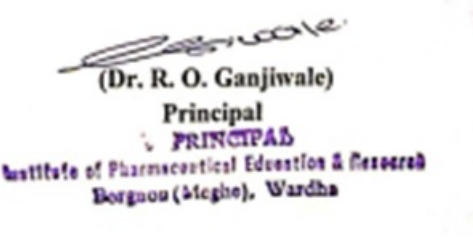
Alka Yadav



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Nanopharmaceuticals for the Improved Treatment of Cerebral Stroke

Nanobiotechnology in Neurodegenerative Diseases pp 369-385 | Cite as

- Shagufta Khan (1)
- Aarti Belgamwar (2)
- Pramod Yeole (3)

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2. SVKM's Institute of Pharmacy, , Dhule, India
3. Dr. Babasaheb Ambedkar Marathwada University, , Aurangabad, India

Chapter
First Online: 03 December 2019

Abstract

Stroke remains the leading cause of death and disability across the globe. However, there is a dearth of effective therapy for its treatment. Over the past decade, use of nanomedicine has gained overwhelming interest for the treatment of cerebral stroke due to the constant failure of the conventional treatment. The most widely investigated nanocarriers include neuroprotective agents loaded on functionalized liposomes and polymeric nanoparticles for targeted delivery to the brain, metal oxide nanoparticles, carbon nanotubes, dendrimers, and scaffolds. This chapter will focus on the investigations undertaken hitherto on different types of nanocarriers for delivery of therapeutic agents for the treatment of stroke.

Keywords

Nanopharmaceuticals Cerebral stroke Nanomedicine Liposomes Nanocarriers Neuroprotective

Nomenclature

Nanomedicines for Improved Antiretroviral Therapy in Neuro-AIDS

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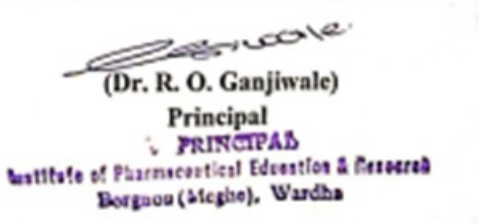
Chapter
First Online: 03 December 2019

Abstract

Human immunodeficiency virus is neurotropic which invades the central nervous system (CNS) in early course of systemic infection and makes the CNS an important dominant reservoir with the capacity to supply virus in low/undetectable viremia. Neuro-AIDS is the major upcoming issue among long-term seropositive survivors as a consequence of incompetence of antiretroviral in complete eradication of HIV from the CNS. Justification behind the low CNS concentration of antiretroviral is anatomical barrier and physicochemical properties of antiretrovirals. Some unmet needs in neuro-AIDS treatment are simplified CNS-targeted treatment regimen and disease-modifying therapies. Target-specific, safe, and controllable nanomedicines have been extensively studied, with particular success, to overcome the natural barriers to the antiretroviral drug delivery posed by the CNS anatomy, histology, and physiology. This chapter insight on current understanding of neuro-AIDS and the pathological mechanisms involved several limitations to the eradication of latent reservoirs and approaches to circumvent these limitations by state-of-the-art nanomedicines.

Keywords



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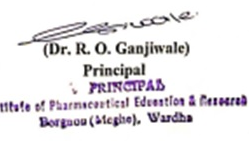

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Development and *in-vivo* evaluation of intranasal dolutegravir sodium nanoparticles for brain targeting in neuro-AIDS

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Background: Neuro-AIDS is a major upcoming issue amongst long term HIV seropositive survivors as a consequence of insufficient antiretrovirals (ARVs) CNS concentration. Dolutegravir sodium (DTG) is HIV integrase strand transfer inhibitor demonstrated impressive antiviral efficacy with limited access in the CNS on oral administration. **Objective**: The present investigation was focused to enhance the CNS bioavailability of dolutegravir sodium by delivering intranasal nanoparticles. **Material and methods**: Dolutegravir loaded nanoparticles (DTG-NPs) were prepared by cross-linking hydroxypropyl-β-cyclodextrin (HPβCD) with diphenyl carbonate to enhance its CNS uptake. NPs were characterized for various parameters like size, drug loading, *in vitro* release, safety and CNS uptake. shaped nanoparticles 1:4.16

Intranasal gelling mucoadhesive microspheres of carboxymethyl fenugreek gum and chitosan for improving bioavailability of gentamicin

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Background: Gentamicin a broad spectrum aminoglycoside antibiotic, is very polar therefore, it is not absorbed through GIT. It is active against broad category of microorganisms but presently administered by parenteral route only. A non-invasive alternative route which can improve its bioavailability is highly desirable. **Objective**: The present study was aimed to improve bioavailability of gentamicin by intranasal delivery via gelling mucoadhesive microspheres prepared from a novel polymer carboxymethyl fenugreek gum (CMFG). **Material and methods**: CMFG and chitosan were used for preparation of microspheres. CMFG was synthesized by treating fenugreek gum extracted from seeds with mono-chloroacetic acid. The prepared CMFG was characterized for degree of substitution, viscosity, FTIR spectroscopy and Differential Scanning Calorimetry. Microspheres were formulated by single emulsion technique using different ratios of CMFG and chitosan and gelation of internal phase using tripolyphosphate (TPP). The microspheres were evaluated for drug content, entrapmen :le size, surface release, permeatio ats and

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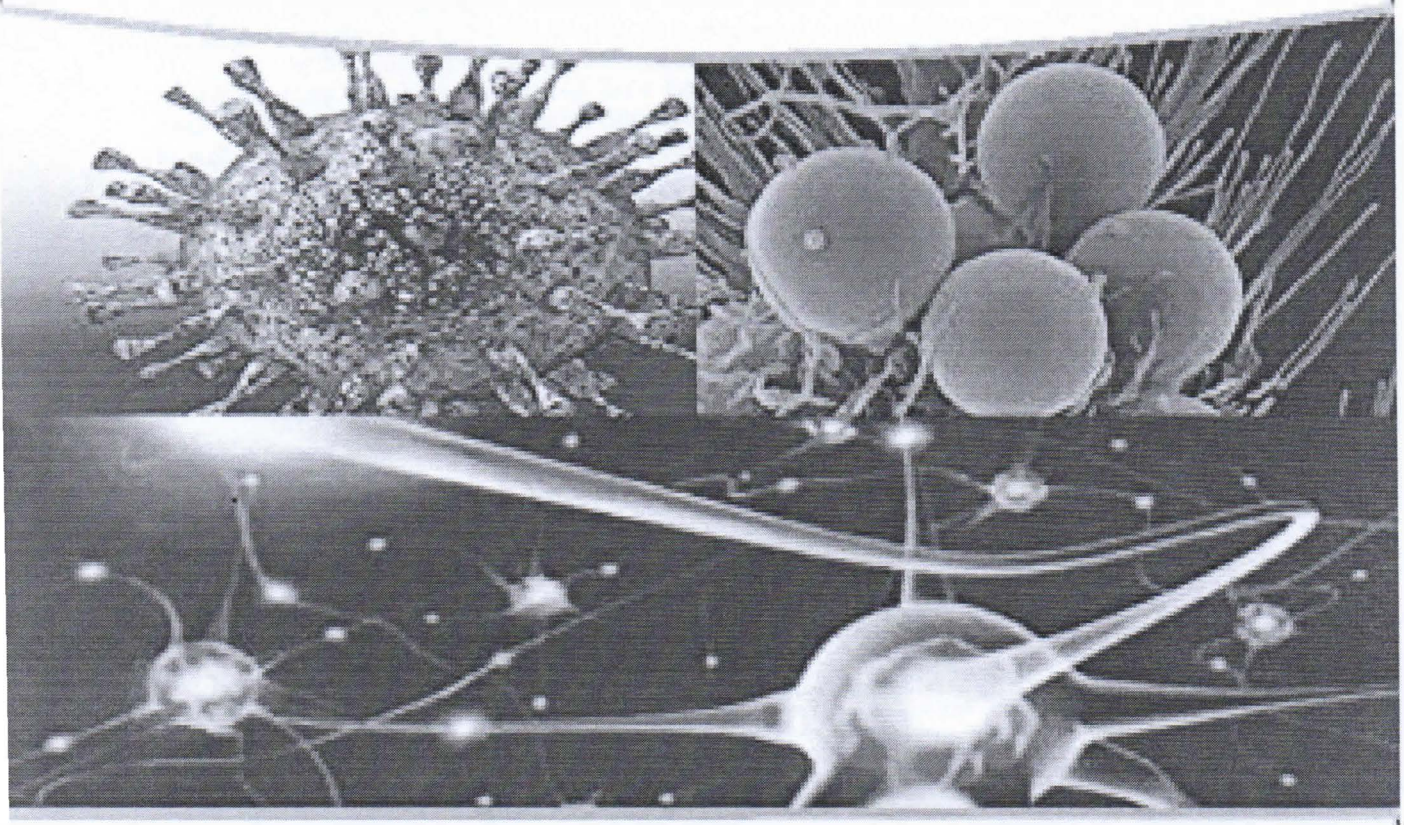

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Dr. Rajendra P. Marathe is currently working as **Principal** at **Government College of Pharmacy, Ratnagiri, Maharashtra.** He holds rich academic experience of around **30 years** in areas of pharmaceutical chemistry, phytopharmacology across various educational settings all over Maharashtra. He has completed his **M. Pharm** from NDMVPS'S College of Pharmacy, Nashik in 1989 and **Ph.D.** from Government College of Pharmacy, Aurangabad in 2010. He is recipient of **"Best Principal Award"** in 1999 from IPER, Pune. He has previously worked as **Chairman, Board of Studies, Dr. B. A. M. University, Board of Studies member** of **Pune University.** He has also served as **Vice President, APTI,** Maharashtra State. He has delivered many guest lectures and conducted many seminars as well as workshops all over India. He has written many books for Diploma and Degree pharmacy students.

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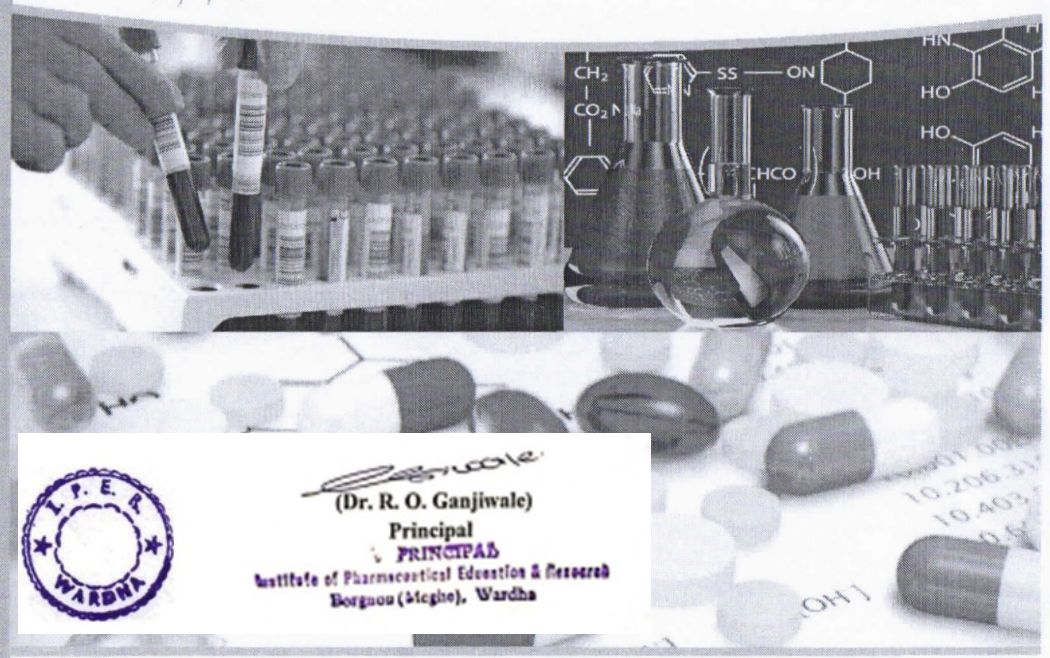

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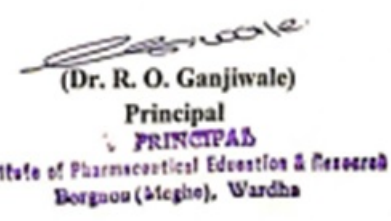

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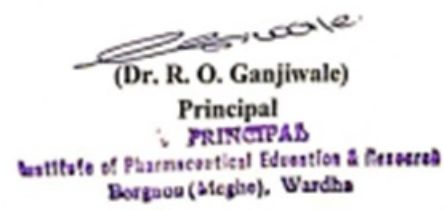

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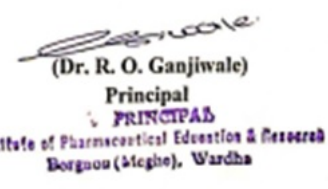

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Chapter 6

Application of Nanotechnology in Transdermal Drug Delivery

Dilesh Jagdish Singhavi, Shagufta Khan,

Book Editor(s):Mahendra Rai, Mehdi Razzaghi-Abyaneh, Avinash P. Ingle,

First published: 17 November 2020

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Summary

The stratum corneum presents a tough barrier for delivery of drugs through the skin. There is interest in the use of nanoparticles as drug delivery carrier systems because these systems are potentially superior to other carrier systems in terms of controlled release, targeting, and stability. In recent years, a great deal of attention has been given to polymeric nanoparticles for delivering drugs to the skin. A detailed explanation of the interaction of the skin and nanoparticles will enhance the reader's understanding of new concepts and the use of drug delivery carriers in transdermal delivery. The mechanism of penetration/permeation of drug from different nanocarriers plays an important role not only in targeting drugs within skin, but also in development strategies of nanocarriers. This chapter provides an overview of the design of nanocarrier-based drug delivery systems for transdermal drug delivery. The potential of nanotechnology in transdermal drug delivery is highlighted. The influence of the physicochemical properties of nanocarriers on transdermal drug delivery has also been given attention. Finally, the chapter concludes with fut l drug delivery.

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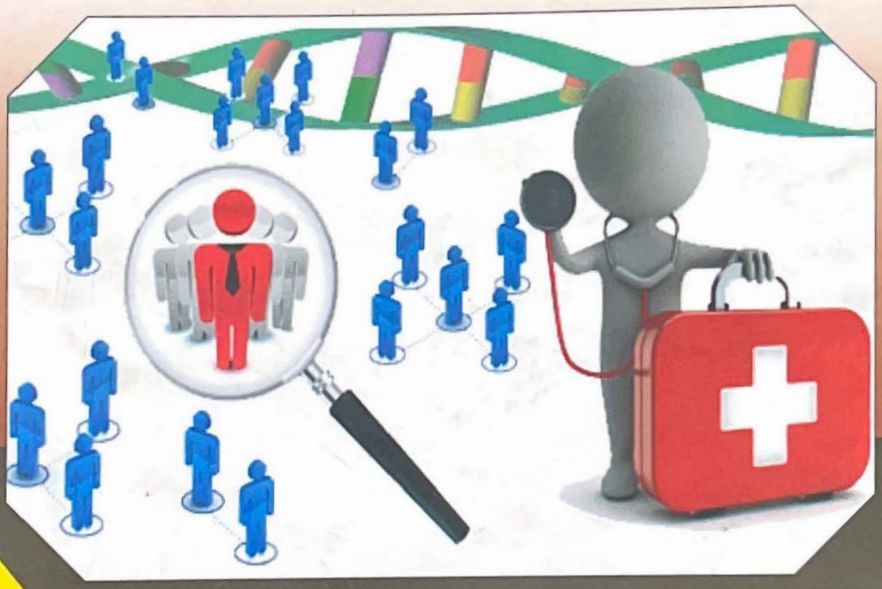

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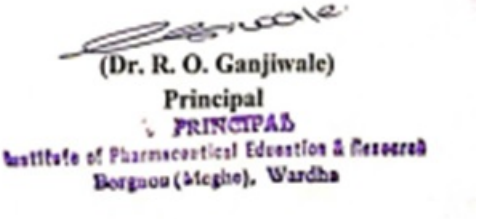

RECENT FACTS AND GLOBAL PERSPECTIVES OF NUTRACEUTICALS IN MEDICINE

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ABSTRACT

The book chapter comprehensively describes the fundamentals of nutraceuticals, translated concepts, plausible benefits, developed new products (vitamin, minerals, herbal, polyphenols, dietary fiber, etc.), paradigms, challenges, global economy, worldwide demands, global scenario, and regulatory aspects (USA, Europe, Japan, and India).

KEYWORDS

- Nutraceutical
- Functional food
- Products
- Scenario
- Regulatory
- Guidelines
- Challenges
- Demands

Liposomal Delivery System for the Effective Delivery of Nutraceuticals and Functional Foods

Pranesh Kumar [1], Debarshi Kar Mahapatra [2]*, Dileep Kumar [3], Mohamad Taleuzzmann [4], Sachin Borikar [5], Vishal S. Gulecha [6], Amar G. Zalte [6], Kanhaiya M. Dadure [7], Manisha Puranik [8], Manik Das [9], Tomy Muringayil Joseph [10]

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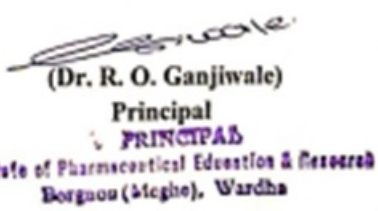

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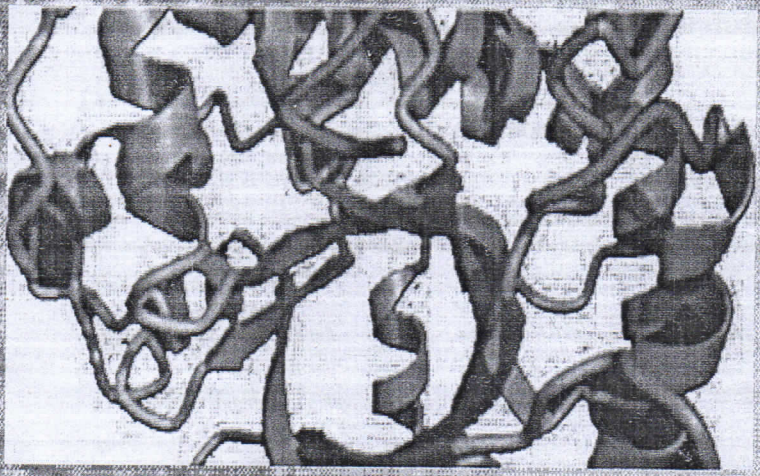

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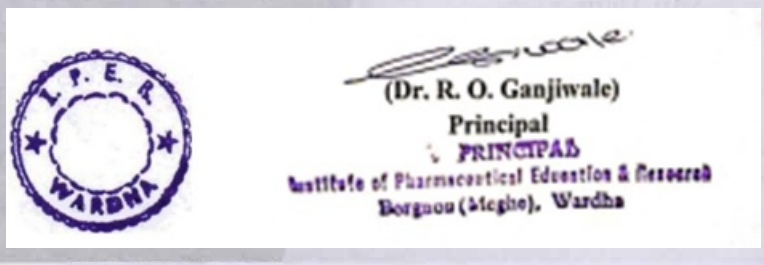

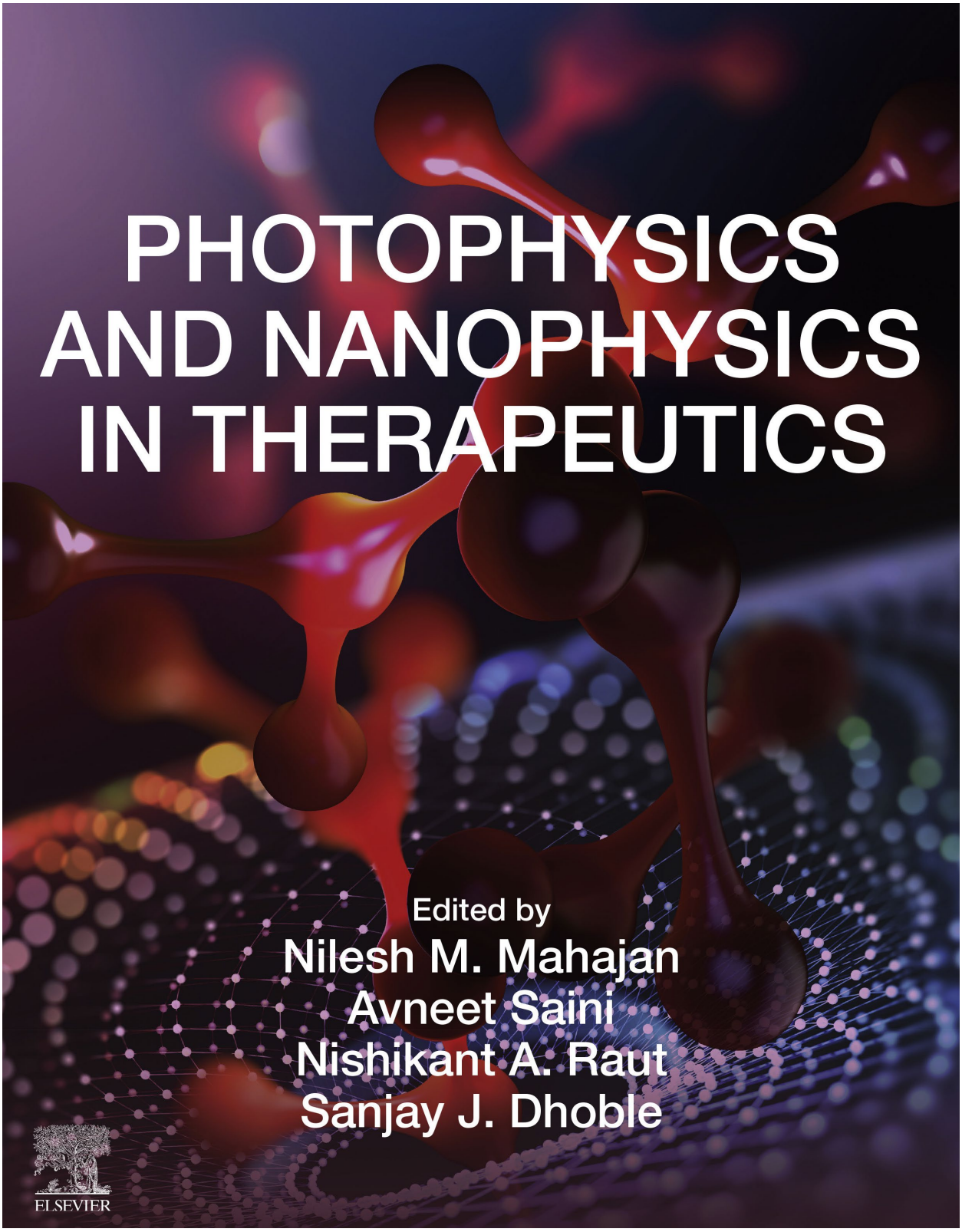

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Chapter 12

Progress in nanotechnology-based targeted cancer treatment

Shagufta Khan[a], Vaishali Kilor[b], Dilesh Singhavi[a], Kundan Patil[c]

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12.1 Introduction

Cancer is a principal cause of death across the globe. The World Health Organization estimates that 13 million people will die by 2030 due to cancer (World Health Organization, 2008).

Despite so much progress in the diagnosis and understanding of cancer, its cure still seems to be out of grip. There are still many types of cancer that are very difficult to treat. Therefore, for effective cancer therapy, it is necessary to understand the cancer pathophysiology, discover new anticancer drugs and develop novel delivery systems which can deliver drug precisely to the cancer cells. It is highly desirable to have innovative treatments that are effective against tumors that have become resistant to conventional therapies.

Until recently, chemotherapy was the only choice to treat most advanced cancers. But these drugs destroy healthy cells in addition to the cancerous ones, causing toxic side (low blood count. Older patients, having anemia or poor ki

With the surge in targeted therapies, there has beer nter- act with the specific genes and proteins in cancer cel nces between the cancer cell and a normal cell, thus target well-

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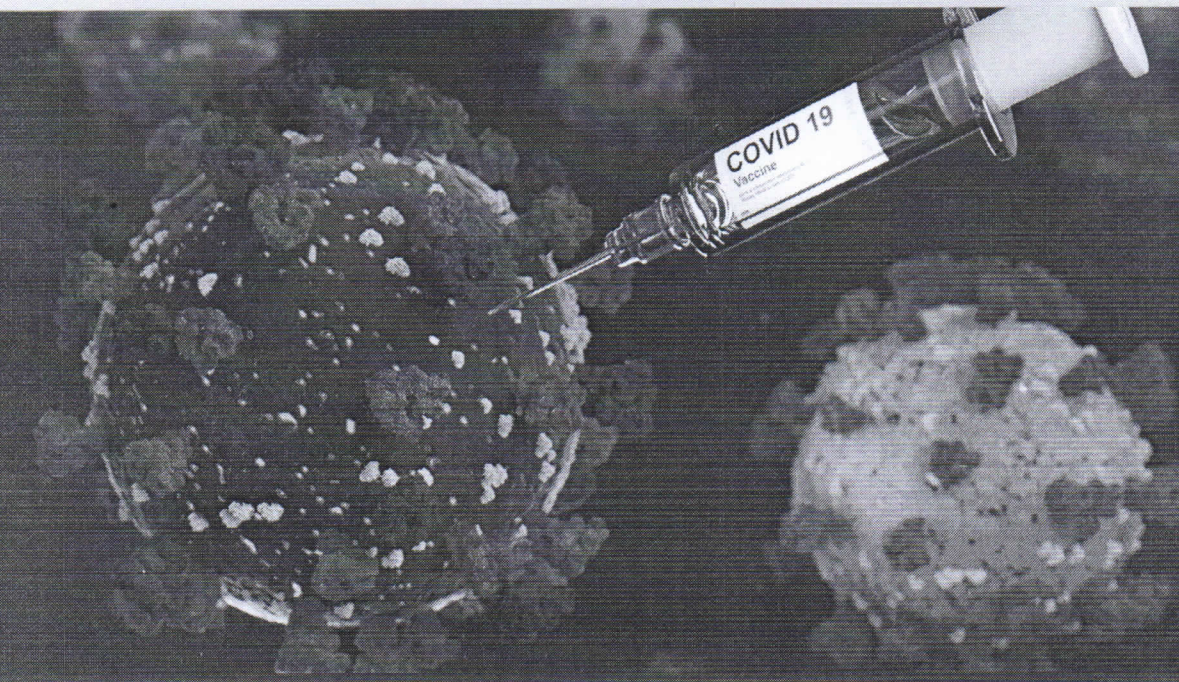

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Chapter 15 - Nanovaccines against viral infections: Current trends and future prospects

Shagufta Khan [a], Aarti Belgamwar [a], Pramod Yeole [b]

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Abstract

In recent years, nanovaccines have gained enormous interest for protection against viral infection because of their capability to provide enhanced specificity, potency, prevent premature degradation, and prolonged action. Nanocarriers including virus-like particles, virosomes, and viral cell-coated particles are being extensively investigated for the delivery of antigens and adjuvants. Nanocarriers, owing to their size and surface characteristics, are capable of activating and being taken up by the antigen-presenting cells readily without the use of adjuvants. This chapter focuses on the advances in nanovaccine development for combating viral infection and challenges in achieving long-term immunity against several viral infections. It will also throw light on single-shot vaccine technology that is stable at room temperature.

CHAPTER

15

Nanovaccines against viral infections: Current trends and future prospects

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OUTLINE

1 Introduction

Conventional vaccines are incapable of controlling the amount of vaccine release and recognize the target tissue; therefore, the vaccine is dispersed throughout the body. Nanotechnology-based vaccines can control the release and deliver the antigen to the desired points.

Nanovaccines have the potential to target the part of the body from where an infection has originated, while co egrity of antigens against d

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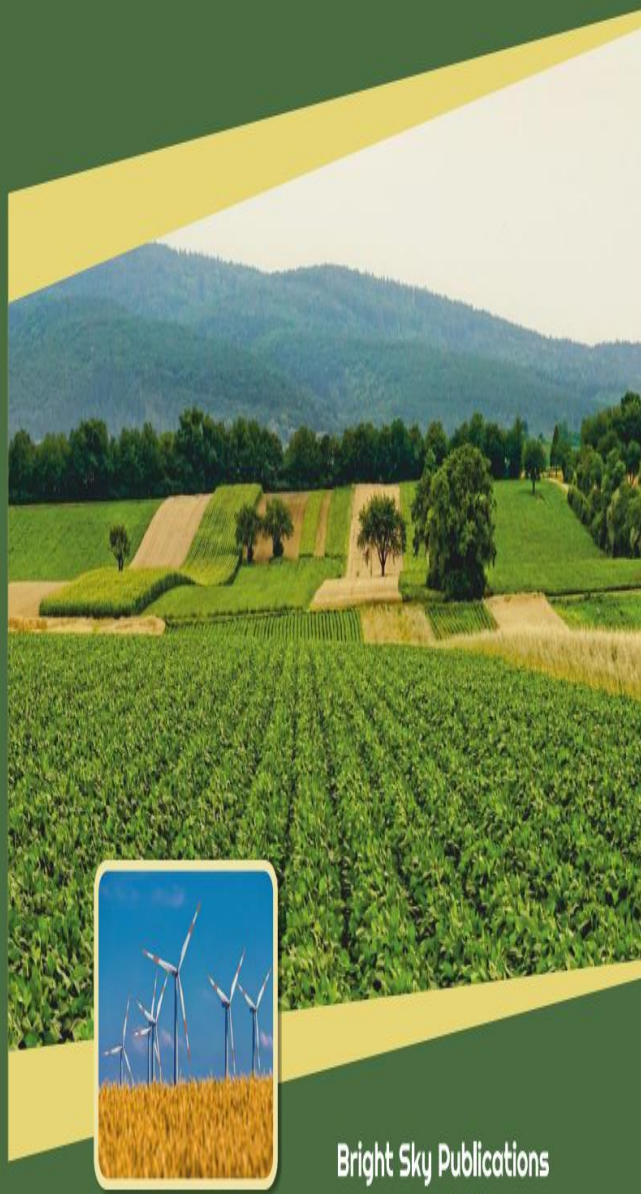

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Chapter - 6

Boron: A Micronutrient yet Indispensable

Akhil Nagar, Ruchita Bardiya, Atul Bendale, Kishor Danao and Nilesh Karande

Abstract

Boron is a metalloid that also serves as a micronutrient for humans (1-2 mg daily) and plants (1-2 µ/g) needed in trace amounts for healthy growth and development. In monocotyledonous and dicotyledonous plants, boron is essential for cell wall synthesis, membrane functionalization, cell division, root elongation, cell differentiation, plant hormonal, and generative growth. Boron is absorbed by plants in the form of Boric acid (96%) and borate anion (4%) via passive diffusion by the Boron transporter 1 while taking into account numerous parameters. Plants obtain boron mostly from the soil, followed by fertilizer and other water sources. Because boron is such a sensitive element, its deficiency and toxicity have a very narrow range. The main causes of deficiency are intensive cropping, liming of acid soils, inappropriate use of manure and chemical fertilizers, soil erosion, and frequent wet and dry conditions. Inadequate boron concentration affects the root, shoot, fruits, vegetables, and leaves of plants, as well as their growth, development, absorption, and reproductivity. Soil degradation is becoming a more serious problem for modern agriculture, as nearly 80% of the soil that was once useful for agriculture has been destroyed by our modern era, and soil micronutrient fertility status degradation is becoming a serious problem threatening modern agriculture's sustainability. We'll look at some of the most essential characteristics of boron in relation to plants, soil types, and boron shortage, as well as different sources of boron, its metabolism, and availability in plants, in this chapter. The numerous varieties of boron fertilizers available on the market, as well as their usage on distinct soil types.

Keywords: Boron, boron deficiency, sources, fertilizer, soil, Rhamnogalacturonan II (RG-II)

Introduction

Plants, like hum
development. There ar