



**Bharati Vidyapeeth's
Dr. Patangrao Kadam Mahavidyalaya, Sangli**

Accredited with 'B++' grade by NAAC, Bengaluru (CGPA-2.96)
DST-FIST Funded College (Level 0)
Affiliated to Shivaji University, Kolhapur

**First National Conference on
Recent Trends in Pure and Applied Sciences
(RTPAS-2019)**

Saturday, 23rd March 2019

**Organized by
INTERNAL QUALITY ASSURANCE CELL**

**In Association with
INNERWHEEL CLUB OF SANGLI MIDTOWN SUNRISE**



Souvenir



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About Bharati Vidyapeeth:

During the last 50 years, Bharati Vidyapeeth has made astonishing strides in the field of education, particularly, higher and professional education. Today Bharati Vidyapeeth conducts more than 180 educational units of various kinds' right from pre-primary schools to postgraduate institutions and a fully-fledged professional university (BVDU). Among these are colleges of Medicine, Dentistry, Ayurved, Homeopathy, Nursing, Pharmacy, Law, Biotechnology, Engineering, Management, Hotel Management & Catering Technology, Environment Science, Agriculture, Physical education and more. With a view to promote research activities and to create a research culture on its campuses, Bharati Vidyapeeth has established five specialized research institutes in the areas of Health-Related Sciences, Biotechnology, Information Technology, Applied Chemistry and Social Sciences. Today, Bharati Vidyapeeth has its major campuses in New Delhi, Navi Mumbai, Pune, Solapur, Kolhapur, Sangli, Karad, Satara, and Panchgani and at quite a few other places.

About the College:

The College was established on 16th September 1985, as Arts, Science and Commerce College, Sangli, and it was renamed as Dr. Patangrao Kadam Mahavidyalaya, Sangli on 8th January 1999. The college boasts of a spacious, beautiful. The college is trying to bridge disparity between the rural and urban culture. Recently, UGC, New Delhi grant two Diploma courses under Community College Scheme. College also selected by DST, India to develop Instrumentation facilities under FIST scheme. In 2016-17, our college has been selected as a "Lead College" by Shivaji University, Kolhapur, for two academic years, for the second time, taking into account our academic, social and sports achievements. NAAC committee Re-accredited it with 'B⁺⁺' grade, in August 2018. We are the proud recipients of the Maharashtra State Award for our substantial work through N.S.S.

Theme of Conference:

This conference will provide an excellent forum for sharing knowledge and results in theory, methodology and applications of pure and applied sciences. The conference looks for significant contributions to the applied science in theoretical and practical aspects. The theme of conference is related to Chemistry, Statistics, Physics, Botany, Zoology, Microbiology, Engineering, Mathematics, Computer and Information Sciences, Environmental Sciences, Biomedical Engineering, Nanotechnology, and many other topics in related areas. Conference is expected to provide an opportunity for an interchange of ideas among researchers and practitioners in different fields of Sciences.

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Internal Quality Assurance Cell
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Saturday, 23rd March 2019
 DAY PROGRAMME SCHEDULE

| | | |
|----------------|-------------------------------|--|
| 09:00-10:30 am | Registration, Breakfast & Tea | |
| 10:30-11:00 am | Inaugural Function | At the Hand of: Hon. Prof. (Dr.) M. M. Salunkhe Vice Chancellor, Bharati Vidyapeeth (Deemed to be University), Pune |
| | | In the Chair: Hon. Dr. Vishwajeet Kadam Secretary, Bharati Vidyapeeth, Pune |
| | | Guest of Honour Hon. Prof. (Dr.) R. K. Kamat Coordinator, IQAC, Shivaji University, Kolhapur |
| | | In the August Presence of Hon. Prin. Dr. H. M. Kadam Regional Director, Bharati Vidyapeeth, Pune |
| | | Hon. Dr. D. G. Kanase Principal, Dr. Patangrao Kadam Mahavidyalaya, Sangli |
| | | Dr. Mrs. P. M. Patil President, Innerwheel Club of Sangli Midtown Sunrise |
| 11:00-12:00 pm | Key Note Address | Speaker: Prof. (Dr.) M. M. Salunkhe |
| 12:00-01:00 pm | Technical Session I | Resource Person: Prof. (Dr.) P. S. Patil Dean, Faculty of Science and Technology, SUK Subject: Nanotechnology and Nanomaterials Chairperson: Dr. B. V. Tamhankar Principal, Willingdon College, Sangli |
| 01:00-02:00 pm | Lunch | |
| 02:00-3:00 pm | Technical Session II | Resource Person: Prof. (Dr.) A. D. Jadhav Department of Zoology, Shivaji University, Kolhapur Subject: Application of Sericulture as an Applied Science Chairperson: Dr. G. V. Mali M.B.S.K. Kanya Mahavidyalaya, Kadegaon |
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Invited Lectures

APPLICATION OF SERICULTURE AS AN APPLIED SCIENCE

Dr. A. D. Jadhav

Advisor, National Sericulture project, Govt., of Cuba Member, Maharashtra State Biodiversity Board & Faculty, Department of Zoology, Division of Sericulture, Shivaji University, Kolhapur-416004.

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The Sericulture is an agro based rural industry, which comprises of land based activities like raising silkworm host plantation along with rearing of silkworm, reeling of cocoon, twisting wearing and processing of fabrics, sericulture provides a rear means for environmental conservation and checking migration of people from the rural to urban areas by proving production employment in their houses itself. Thus sericulture provides a medium for resources from the rich to the poor. In a nutshell, sericulture provides a solution to the issue of sustainable development in “Bridging the Rich poor divide” on the one hand and “Taking care of the environment “ on the other. Specific advantages like low gestation period, good market, environmental friendly nature and scope for generating productive employment on a relatively low capital investment have been exploited in using sericulture in as a tool for human empowerment in general and empowerment of woman in particular.

India is the second largest producer in the world accounting for about 19.45% of total world raw silk production, next only to China..At present the country produce 31906 MT (2017-18) of raw silk of which the contribution of mulberry silk is 22066 MT and non mulberry silk 7032 MT. The non mulberry silks are eri (6661 MT),tasar (2988 MT) and muga (192MT). (APSERI-2019,pp.7-11) ,Silk industry provides employment to 7.9 million people in the country. The contribution of woman is about 54%and rural population about 90%. Thus the industry plays a major role in woman empowerment and distribution of

Advantage of Sericulture

- Low investment - High Returns, fertile soil, rainfall and other factors favour sericulture
- Involvement of family labour
- Employment for 4 people throughout the year from 1 acre
- Four to Six crops per year
- Checks movement of rural people to urban areas (migration)
- Employment opportunities for women

Entrepreneurship Development:

In the recent years sericulture is turning into a business venture and is attracting entrepreneurs. Central Silk Board and state departments are encouraging such entrepreneurs by extending required support in the areas of training, technical advice / inputs, preparation of bankable projects, facilitating credit from financial institution and establishing forward and backward linkages etc. The well-designed training programmes help the entrepreneurs to mould themselves into successful businessmen in silk. Effective utilization of available resources and thereby, achieving the reduced cost of production. Raising of good quality mulberry and production of raw silk. Establishment of Chawki Rearing Centres with well-equipped chawki rearing houses. Supporting the members to adopt new technologies. To assist the members in undertaking effective disinfection to prevent the disease occurrence/spread. Supply of quality chawki worms, disinfectants etc. at reasonable prices.

There are numerous opportunities for value addition with respect to mulberry and silkworm as a fodder, protein supplement, medicines for human health etc.

Abstracts

DEVELOPMENT OF TARGET ORIENTED INHIBITORS OF MYCOLIC ACID SYNTHESIS AS ANTI-TUBERCULAR DRUGS

Pramod A. Ramane^{1*}, Rushikesh R. Shirgaonkar¹, S. A. Pishawikar²

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Abstract:

Despite unquestionable success of the combination drug therapy, tuberculosis (TB) very recently has drawn major attention because of the global upsurge of MDR-TB, XDR –TB and HIV-TB co-infection cases. The mycolic acid synthesis in *M.Tb.* is favored by genes like *cmaA2*, *mmaA2* or *orcaA* which encodes for enzymes involved in the cyclopropanated mycolic acid synthesis. Cyclopropane synthase genes have been shown to be implicated in pathogenicity.

Synthetic scheme consisting of two step in the form of synthesis of mannich bases and condensation with thiosemicarbazide to form Thiosemicarbazide derivatives of mannich bases was designed. Docking study of synthesized compounds was carried out on mycolic acid cyclopropane synthase *CmaA2* using Vlife MDS 4.3. **Synthesized compounds were screened for anti-tubercular activity by carrying out Micro Plate Alamar Blue Assay (MABA) method using Pyrazinamide, Streptomycin as standard drugs.** Encouraging results in relation to proposed hypothesis have been obtained.

SIMPLE BIOLOGICAL MODEL FOR ANGIOLYTIC ACTIVITY ASSESSMENT OF BENZIMIDAZOLE ANALOGS

Sadaf A. Mutwalli^{1*}, Puja S. Patil¹, Deepak V. Shanbhag¹, Sagar U. Jadhav²,
N. M. Bhatia¹, Rakesh P. Dhavale³

¹Department of Pharmaceutical Quality Assurance,
Bharati Vidyapeeth College of Pharmacy, Kolhapur.

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Bharati Vidyapeeth college of Pharmacy, Kolhapur

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Abstract:

Angiogenesis plays main role in metastasis and the spread of cancer. Anti-angiogenesis is being investigated as a way to prevent the growth of tumours and other angiogenesis dependent diseases. In this study, a set of reported ligands of VEGFR-2 (PDB-2OH4) and VEGFR-2 (PDB-3EWH) were virtually screened using MOE software to ascertain structural requirements for interaction with the selected targets. Based on the analysis of the generated data few benzimidazole analogues were designed and docking studies were performed. The screened molecules were synthesized as per reported literature. The angiolytic activity of the virtual hit molecules was studied using chick chorioallantoic membrane (CAM) assay with calf serum as growth factor for positive control. The synthesized compounds were added in appropriate concentration in chick embryo and percent inhibition of vasculature were calculated. The bioactivity results were analysed in light of the virtual screening interactions to propose a possible mode of action. The results for the lead compounds identified were statistically validated.

LC-MS ANALYSIS OF NATURAL DYE OBTAINED FROM PODS OF *Senna alata* L.

Patil S.H., Kurlapkar D.D. and Gaikwad D.K.

Department of Botany, Shivaji University Kolhapur

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Abstract:

Natural dyes obtained from flora and fauna are non-toxic, non-carcinogenic and biodegradable in nature and do not cause pollution and waste water problems. There is correlation of chemical structure with colour, chromogen – chromophore with auxochrome. For textile coloration chromophore and auxochrome are considered as most important chemical constituents of dyes. Synthetic dyes are having harmful effects. Hence researcher's attention has shifted towards the use of natural dye for dyeing textiles materials. Present study focussed on the aqueous extraction and isolation of natural dye from the pod husk of *Senna alata* L. The chemical constituents of isolated dye analysed by employing LC-MS technique. LC-MS analysis of aqueous extract of dye obtained from *S. alata* revealed several chemical compounds. Present study showed compounds imparting colour are Emodic Acid, Apigenin 7-(3''-acetyl-6''-E-p-coumaroylglucoside), Kaempferol 3-(2''-hydroxypropionylglucoside)-4'-glucoside, Patuletin 3-(4''-acetylramnoside)-7-(2''-acetylramnoside) and Isorhamnetin 3-(6''-(E)-sinapoylsophoroside), which are derivatives of flavonoids and anthraquinones.

Key words: Natural dye, LC-MS, *Senna alata*.

**PHYSICOCHEMICAL CHARACTERS OF SOIL SAMPLES OF THREE
HILLY REGIONS IN PATAN TEHSIL, SATARA DISTRICT (M. S.)
INDIA**

A.R.Padule *, V.D.Gaikwad*and I. F. Pailwan**

Department of Zoology
Lal Bahadur Shastri College of Arts, Science and Commerce Satara*,
Kisan Veer Mahavidyalaya, Wai**
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Abstract:

Hilly area in the Patan Tehsil District Satara is located in the Western Ghats. The study area is surrounded by forest and paddy fields. The soil is the most important constituent which fulfils all the basic needs of human beings. Soil is an essential component to flourish plant growth. Thus the physico-chemical study of territory is very significant because both physical and chemical properties are responsible for soil productivity. This, physico-chemical study of soil is based on various parameters like temperature pH, moisture, density, porosity, texture, water holding capacity, organic matter, chloride, ammonia, nitrite, phosphorus, sulphate, copper, zinc, lead and cadmium. This knowledge provide a baseline information about quality status of soil for proper implementation of the other management practices.

Keywords: Soil composition, physico-chemical parameters, quality status.

ANALYSIS OF METHODS OF MONEY TRANSACTION USED BY PEOPLE IN BANKING SECTOR: A STATISTICAL VIEW

Prakash R. Chavan*

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Dist.: Sangli (M. S.), Affiliated to Shivaji University, Kolhapur, INDIA.
E-mail: prchavan83@gmail.com

Abstract:

The Government wants India to be cashless economy. In our country people used various methods of money transaction like passbook, cheque-book, ATM, online banking. In these methods some are traditional methods, and some are cashless methods like ATM, online banking. Before demonetization peoples are mostly used the traditional methods but after demonetization cashless money transaction method is mostly used by peoples.

In this paper we study the transaction methods in rural and urban areas with age, gender and literacy of people. The method of data collection is primary data survey with a structured questionnaire both rural and urban area.

Keywords: traditional methods, cashless methods, demonetization, structured questionnaire

CHRONIC OBSTRUCTIVE PULMONARY DISEASES AND BODY MASS INDEX RELATION IN WOMEN FROM RURAL AREA MOUJE KHOTWADI OF SANGLI DISTRICT.

Prabha M. Patil*

Head, Department of Zoology

Dr. Patangrao Kadam Mahavidyalaya, Sangli.

Abstract:

In rural areas must common cause of Chronic Obstructive Pulmonary diseases (COPD) is the indoor air pollution. In majority of rural areas biomass fuel such as wood, cow dung and crop residue is easily available. Poor families use these biomass fuels for cooking and heating purposes. Majority of poor families lives in Kutchha type of houses. In kutchha type of houses kitchens are not properly ventilated. Incomplete combustion of biomass fuel release smoke which contains high volume and number of air pollutants such as respirable particulate matter PM₁₀, CO, NO₂, SO₂, formaldehyde and other organic compounds. Prolonged exposure to such air born pollutants, have adverse effect on the respiratory system of women which causes COPD. There is strong relation between COPD and Body Mass Index. To study relation between COPD and Body Mass Index, total 100 women were selected from rural area of Sangli District Mouje Khotwadi. Mouje Khotwadi is situated 6 to 7 kms away from Sangli city. Out of 100 women 50 women using chulla and 50 women using LPG were selected. Women using chulla were considered as Subject and women using LPG were considered as Control. All women were underwent spirometry to detect COPD. Spirometric parameter, FEV₁%, FVC%, FEV₁%/FVC% were recorded. Body Mass Index of all women was calculated. Body Mass Index was categoried in four groups (Underweight <20kg/m², Normal Weight 20.0-25.0kg/m², Overweight 25.0-30.0kg/m², Obese >30.0 kg/m²) In this study we found that out of 50 women who were exposed to biomass fuel smoke 31 women were suffering from Obstructive type COPD (FEV₁%<80%). In subject women Body Mass Index in underweight category, normal weight category, overweight category and obese category was lower than control group.

Key word: COPD, Body Mass Index, FEV₁% (Forced Expiratory Volume per one second), Forced Expiratory Volume per one second / forced vital capacity, COPD.

A PROTOTYPE SYNTHESIS OF HYDROXYAPATITE BIOCERAMICS NANOCRYSTALLITES

Narayan V. Yadav, Ganesh S. Salunkhe, Jyoti N. Kadam, Susmita K. Khot,
A. R. Supale*
PG Department of Chemistry,
Bharati Vidyapeeth's Dr. Patangrao Kadam Mahavidyalaya, Sangli.
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Abstract:

Biomaterials especially the inorganic, calcium phosphate the one among many does have the extensive applications in medicinal sector. Currently, hydroxyapatite (HAP, $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$) is an example of promising ceramic biomaterial because of its bioactivity, nontoxic, and non-inflammatory properties. Sinter ability, solubility, fracture toughness, castability and absorption are the basic physical properties of HAP. Controlled and calculative tailoring of particle size, morphology along with help of different physical parameters, these can be adapted in various fields. In the present work bioactive AgNO_3 nanocrystallites were synthesized by auto-Combustion technique. The synthesized material was successfully tested for antibacterial activities.

Keywords: Nanocrystallites, hydroxyapatite, porous material

NANOSTRUCTURED DRUG DELIVERY SYSTEM FOR DENGUE MANAGEMENT

Vrushali V. Sonar*, Shreya M. Durgule, Rakesh P. Dhavale

Bharati Vidyapeeth College of Pharmacy, Kolhapur

Abstract:

The prevalence of Dengue in India is severe due to transmission of virus by arthropod-borne vector. Flavivirus is the main vector for spreading dengue among humans. Dengue Human Fever is antibody-dependent, T cell and Th-1 to Th-2 response which releases cytokines in body fluids. Mast cells are "master regulators" of the immune system located in all tissues containing secretory granules as mediators. Mediators are released after triggering of mast cells to lead allergic and inflammatory diseases. The papain isolated from *Carica papaya* Linn. is a cysteine protease enzyme responsible for increasing immunity by increasing platelet count. The development of nanostructured lipidic system of papain and cromolyn sodium can bring blockage of mast cell stabilizer thereby preventing viral leakage and activation of immunological response. The present study aims at entrapment of papain and cromolyn sodium in lipidic system containing phospholipid, cholesterol and sodium deoxycholate. The papain from latex of unripe papaya fruit were isolated and purified sequentially by salt precipitation and by dialysis. The determination of protein by Lowry assay from Papaya latex, salt precipitated and dialysate was found to be 1.497, 1.110 and 3.410 mg/ml. The protease activity in terms of unit per mole was found to be 296.32, 233.93 and 224.83 respectively for Papaya latex, salt precipitated and dialysate. The recovery of protease activity was determined to observe the protease activity at each purification step. The liposomal formulations containing papain and cromolyn sodium prepared by thin film hydration technique were optimized at various phospholipid, cholesterol and sodium deoxycholate (edge activator) ratio. The optimized batch of formulation was characterized for by entrapment efficiency, particle size determination, zeta potential and microscopic studies. Thus, the effective herbal formulation containing papain from available plants and cromolyn sodium in nanostructured form will serve to potentiate dengue management.

Keywords: Dengue, phospholipid, mast cell stabilizer, etc.,

MIXED METAL OXIDE NANOPARTICLES -SYNTHESIS, CHARACTERIZATION AND APPLICATIONS

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Abstract:

The oxide containing two or more different kind of metal cations are known mixed metal oxide. Oxide can binary, ternary and quaternary. Several researchers have prepared mixed iron oxide and aluminum oxide nanoparticles by various methods like sol-gel method, combustion method and hydrothermal method.

In present work we have synthesized the mixed iron oxide and aluminum oxide by the hydrothermal method for use as adsorptive degradation of Congo red dye from aqueous system. The adsorption of Congo red dye by $Fe_2O_3-Al_2O_3$ completed within 5 Minute. Another ternary metal oxide of Aluminium+Nickel+Iron prepared by the using of combustion method and used as adsorptive degradation of Congo red dye from aqueous system. The adsorption of Congo red dye by $Al_2O_3-NiO-Fe_2O_3$ completed within 40 minutes. The thermodynamic combustion reaction shows that as fuel to oxidant ration increases, the amount of gases produced also increases so the presence of well crystallized oxide after calcinations at 750⁰ C for 4 hours. The $Al_2O_3-NiO-Fe_2O_3$ was also tested successfully for antibacterial activities.

Keywords: Metal oxide, Hydrothermal method, Combustion method, Congo red dye, Degradation

**SYNTHESIS OF SUGARCANE JUICE MEDIATED $MgFe_2O_4$
MAGNETIC NANOPARTICLES FOR PHOTOCATALYTIC
APPLICATIONS**

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Abstract:

Herein we report the synthesis and characterization of $MgFe_2O_4$ magnetic nanoparticles (MNPs) using sugarcane juice as a fuel in combustion method. The obtained MNPs were characterized by UV-visible, FTIR, XRD and BET for its optical, structural and surface properties. The band gap of obtained material was found to be 2.43 eV and is active in the visible region. The XRD patterns confirm the formation of spinel ferrite and the 311 peak is used to determine the crystallite size using Scherer's Equation and it was found to be 10-15 nm. The surface area of the obtained NPs was found to be 64.47 M^2/g with micro porous nature. The MNPs were explored for its photocatalytic properties using methylene blue as model dye under direct sunlight which shows good efficiency for photo degradation.

EFFECT OF PHENOLIC COMPOUNDS AND LEAF LEACHATES OF *TERMINALIA CATAPPA* ON *SENNA UNIFLORA*

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Abstract:

Senna uniflora (Mill.) H.S.Irwin and Barneby is a noxious invasive weed. It is considered as pest in agro ecosystems and it grows rapidly and densely surrounding the agricultural field. In present work effect of phenolic compounds (Tannic acid, Gallic acid and Catechol) was compared with red and green leaf leachates of *Terminalia catappa* L. against *S. uniflora*. In petriplate bioassay root length was inhibited and shoot length was increased due to phenolic compounds (20ppm Tannic acid, 20ppm Gallic acid and 20ppm Catechol) and 5%, 10% and 20% red and green leaf leachates. But seed germination was not altered due to treatment. In soil bioassay shoot length of *S. uniflora* was inhibited due to phenolic compounds and leaf leachates and root length was not adversely affected. Hexadecanoic acid, 1-(+)-Ascorbic acid, Pentadecanoic acid, Eicosanoic acid, 9-Octadecenoic acid, Oleic Acid, Bis (2-ethylhexyl) phthalate, Phthalic acid, Diisooctyl phthalate, Phenol are the phytochemicals found in both green and red leaf leachates. Further effect of Phthalic acid at low concentrations (5, 10 and 15ppm) on growth of the weed was studied. Increase in germination, root length and shoot length was observed due to Phthalic acid except inhibition of germination and root length due to 15ppm concentration. Root length and shoot length was decreased due to Phthalic acid in soil bioassay. As the weed belongs family Leguminosae, the soluble protein content was estimated and found increase in the soluble protein content due to 20% green and red leaf leachates in petriplate bioassay as compared to phenolic compounds. In soil bioassay elevation in soluble protein content was observed due to phenolics than the leaf leachates. In petriplate and soil bioassay 15ppm of Phthalic acid caused increase in soluble protein.

Key words- Phenolic compounds, Phthalic acid, *Senna uniflora*, Soluble Protein, *Terminalia catappa*

PRODUCTION OF BIODIESEL USING HETEROGENEOUS CATALYST

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Abstract:

Biodiesel is used in place of diesel or other petroleum product which produces an energy. It was a nontoxic and environment friendly fuel. It is also biodegradable and renewable source of energy. We have successfully utilised silica supported PMA in transesterification reaction of coconut oil. The reaction was carried out in methanol at 80°C. The reaction gives biodiesel in high yield.

Key words:- fuel, biodiesel, free fatty acid, transesterification, Silica supported heteropoly acid

ISOLATION OF ENZYME AND DEVELOPMENT OF EX VIVO ASSAY FOR MYELOPEROXIDASE

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Abstract:

Cardiovascular diseases (CVDs) have now become the leading cause of mortality in India. A quarter of all mortality is attributable to CVD. Ischemic heart disease and stroke are the predominant causes and are responsible for >80% of CVD deaths. The Global Burden of Disease study estimate of age-standardized CVD death rate of 272 per 100 000 population in India is higher than the global average of 235 per 100 000 population. As there is steady increase in cardiovascular diseases, there is an increased need of new drug discovery for cardiovascular diseases along with more promising ex vivo bioassay techniques for speedy evaluation. Breakthroughs in elucidating the basic molecular pharmacology in cardiac/vascular function, thrombosis/coagulation and lipid metabolism, has lead to significant advancements in the current treatment paradigm for patients with heart disease.

Research has identified many molecular targets playing a role in controlling cardiovascular pathophysiology viz. creatine kinase, cardiac troponin, myoglobin, C-reactive protein, Myeloperoxidase etc. Myeloperoxidase (MPO) belongs to the family of heme -containing peroxidases, produced mostly from polymorphonuclear neutrophils. MPO plays an important role in neutrophil microbicidal action through catalysing chloride ion oxidation to hypochlorous acid, which is a potent antimicrobial agent. It was demonstrated that MPO causes oxidative modification of low-density lipoprotein (LDL) to a high uptake form that is considered to be a key event in the promotion of atherogenesis. Hence myeloperoxidase is believed to participate in the initiation and progression of cardiovascular diseases. MPO possesses potent proinflammatory properties and may contribute directly to tissue injury. MPO levels are associated with the presence of angiographically proven coronary atherosclerosis. In addition to clinical history and other tools MPO has been approved by FDA as cardiac biomarker to evaluate the patients with chest pain and at high risk for coronary artery disease.

The enzyme myeloperoxidase was isolated efficiently from various organs like Heart, brain, spleen etc. by regulating various parameters like pH, proportion of solution and tissue, temperature etc. Enzymatic activity assessment protocol was developed on basis of substrate O-dianisidine, concentration and volume of hydrogen peroxide, volume of supernatant, volume of HCl, incubation time etc. the protein precipitation carried out by using Ammonium sulphate and acetone. The isolated enzyme was used for development of bioassay design and tested for bioactivity assays of some of drugs for cardiovascular disorders.

The enzyme myeloperoxidase was isolated efficiently and can be effectively used for bioactivity assays of various drugs for cardiovascular disorders and thus will limit the use of animals for experimental studies.

Keywords: Myeloperoxidase, bioassay, Cardiovascular diseases

PHYTOCHEMICAL AND NUTRITIONAL STUDY OF RIPEN AND UNRIPEN FRUIT *SPONDIAS PINNATA* L.

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Email: suvidnyasuryawanshi@gmail.com and vdj_botany@unishivaji.ac.in**Abstract:**

Spondias pinnata L. belongs to the family Anacardiaceae. This plant traditionally used in the treatment of infectious diseases such as bronchitis, ulcer, dysentery and skin diseases. Fruits are useful in the treatment of bilious dyspepsia, diarrhea and general debility. In preliminary phytochemical screening some compounds are observed such as alkaloids, phenols, tannins, saponins, Xanthoprotein, coumarins and glycosides. In proximate analysis dry matter content was 32.46% and fat was 6% , both are higher in ripen fruit, whereas moisture (80.24%), crude fiber (8.0%) and ash (20%) contents are more in unripen fruit. In antioxidant activity such as DPPH and FRAP higher in methanolic extract of unripen fruit. Therefore *Spondias pinnata* is important for nutritional, antioxidant as well as medicinally purposes.

Keywords: Phytochemical, Proximate, Antioxidant, Unripen, Ripen fruit, *pondias pinnata* L.

SYNTHESIS OF POLYHYDROQUINOLINE BY USING HETEROGENEOUS CATALYST

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Abstract:

Silica gel-supported phosphomolybdic acid (PPMA-SiO₂) was found to be an efficient catalyst for the one-pot four-component Hantzsch condensation reaction of benzaldehydes, dimedone, ethyl acetoacetate and ammonium acetate, gives the corresponding polyhydroquinoline derivatives in high yields. The main advantages of the present approach are short reaction times, clean reaction profiles, simple experimental and workup procedures.

Keywords: Multicomponent reaction; One-pot synthesis; Hantzsch Condensation; Silica-supported phosphomolybdic acid (PPMA-SiO₂).

NANOTECHNOLOGY- A TECHNIQUE OF ENHANCED DELIVERY OF HERBAL AND CONVENTIONAL FORMULATION

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Abstract:

In recent years, more peoples throughout the world are turning to use Herbal Medicine in the Healthcare system and it is estimated that worlds 80% population prefer herbal products due to its less side effects, but with the drawback of low bioavailability, solubility, dissolution, stability problems, etc. This drawback can be overcome by developing the Novel Drug Delivery System (NDDS) which includes the Nanotechnology. It can be **defined** as 'It is the ability to manipulate and use matters & materials at an extremely small scale'. These included solid lipid nanoparticles, vesicles, niosomes, etc. For the enhanced delivery of conventional formulation includes Vesicular carriers are one of the recently invented carriers. In the past few years, various research reports on the development of topical carrier systems showed that these carriers have emerged as a novel vesicular carrier. This are the new hope which has been in discussion and helpful for the treatment of various types of diseases.

Keywords: Herbal Medicine, Healthcare, Nanoparticles, Nanotechnology, vesicular

AN EVALUATION OF PHYSICO-CHEMICAL PARAMETERS TO ASSESS TUBEWELL WATER QUALITY FROM DEVRUKH CITY, MS, INDIA

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Abstract:

Natural water contaminates due to weathering of rocks and leaching of soils, mining processing etc. It is necessary that the quality of drinking water should be checked at regular time interval, because due to use of contaminated drinking water, human population suffers from varied water borne diseases. The availability of good quality water is an indispensable feature for preventing diseases and improving quality of life. It is necessary to know details about different physico-chemical parameters such as color, temperature, acidity, hardness, pH, sulphate, chloride, DO, COD, used for testing of water quality. Some water analysis reports of devrukh city with physico-chemical parameters have been studied and reported.

Key words: Water, temperature, pH, hardness, sulphate, DO, COD.

DEVELOPMENT OF ELECTROSPUN FIBROIN NANOFIBERS FOR GASTRORETENTIVE DRUG DELIVERY SYSTEM

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Abstract:

Development of tailor-made pharmaceutical nanofibers has gained vital prominence due to ease of fabrication and versatility as it has number of advantages like low density, high pore volume, high surface to volume ratio, high charge to volume ratio, large surface area for solvation and dissolution process. Nanofibers can be fabricated by self-assembly, phase separation, and electrospinning. We prepared floating silk fibroin (SF) nanofibers by electrospinning technique as its more efficient process and it provides limitless opportunity to modify physico-technical properties of the nanofibers towards desired floating and release behaviour by altering the electrospinning process parameters. Altering the electrospinning parameters tune crystallinity of nanofibers which leads to modification of release profile of drug. Lafutidine (LF) is an excellent proton pump inhibitor belonging to BCS II class, mainly used in the treatment of gastric ulcer needs long term treatment, thus it is necessary to prepare the modified release dosage form of LF. Hence we have prepared LF loaded SF nanofibers as processing technology for the floating drug delivery system. This nanofiber formulation, may be useful for treatment of gastric ulcers.

LF loaded SF nanofibers were successfully prepared by electrospinning and characterized for drug content, percent entrapment efficiency, spectral, thermal and diffractometric analysis, scanning electron microscopy (SEM), floating profile studies, uptake of 0.1 N HCl, in vitro degradation study, mucoadhesive test, anti-oxidant activity and invitro dissolution studies. Lafutidine loaded SF nanofibers showed good entrapment efficiency, spectral, thermal and diffractometric analysis reveals changes in conformations of SF inducing crystallinity in nanofibers, it showed excellent floating behaviour, 0.1N HCl uptake, degradation, mucoadhesive strength, antioxidant activity. Invitro dissolution shown appreciable floating time >18 hrs. Appreciable percent buoyancy with sustained release up to 24 h in 0.1 N HCL and FSSGF. Thus Essential floating and drug release profile can claim this drug delivery system as novel dosage form.

Key words: SPN loaded nanofibers, floating drug delivery system, electrospinning, crystallinity, modification of release profile of drug

TOXICOLOGICAL STUDY OF BIFENTHRIN AND ITS METABOLITES ON EARTHWORM (*Eisenia fetida*)

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Abstract:

Bifenthrin, a synthetic pyrethroid is used in agricultural to control pests on variety of crops. It is a broad spectrum insecticide that acts mainly on the nervous system of vertebrates and invertebrates. Earthworms are common soil organisms that play an important role in improving texture, structure and soil aggregation, physical and chemical properties of the soil with improved fertility. However, they are sensitive and susceptible to agrochemicals because they lack hard cuticle around their body. The present paper deals with the toxicological studies of bifenthrin and its metabolites benzene 1,1(methylthio) ethylidene, resorcinol and monochlorotri-fluoromethane that were produced by a newly isolated strain of *Paracoccus signidrum* APGM1. The toxicity was assessed by 48 hrs filter paper contact test, 14 days soil test and histopathological methods. The results of filter paper contact test revealed that the bifenthrin and its degraded metabolites vary in their contact toxicities. Earthworms were more susceptible to bifenthrin than their metabolites. The LC₅₀ value of bifenthrin was 6 ppm while LC₅₀ value of metabolites was 20 ppm. Fourteen days soil test are showed that at 6 ppm concentration of bifenthrin, half numbers of earthworms were died after 14 days and with the increase in the concentration, mortality was increasing. At 10 ppm concentration, all earthworms were died. However, half numbers of earthworms were died after 14 days at the metabolites concentration of 20 ppm. The histopathological results also indicated the adverse effects of bifenthrin and very little effect of metabolites on the morphological properties and structural integrity of the tissues. Thus, it was concluded that the metabolites of bifenthrin are less toxic to earthworm than the bifenthrin.

Keywords: Bifenthrin, metabolites, histopathology, filter paper contact test, 14 days soil test.

ANTIMICROBIAL ACTIVITY OF NANO-STRUCTURED MIXED METAL OXIDE - $ZnAl_2O_4$

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Abstract:

Nanostructured mixed metal oxide $ZnAl_2O_4$ was synthesized by sol gel auto combustion method. X-Ray Diffraction (XRD), Field Emission Scanning Electron Microscopy (FESEM), Fourier Transform Infrared Spectroscopy (FTIR) and Energy Dispersive X-ray Analysis (EDAX) were used to characterize the material. XRD study shows the formation of cubic spinel structure with the crystallite size having 33.23 nm. The microstructural analysis shows the formation of nanomaterials. EDAX analysis confirms the presence of $ZnAl_2O_4$ without any impurity. The absorption bands were analyzed by FT-IR spectroscopy. In the present study, the synthesized mixed metal oxide was checked for its antibacterial activity against few Gram positive and Gram negative bacteria. Using Kirby-Bauer method for antibiotic susceptibility, some of these Gram positive and Gram negative bacteria showed positive results against $ZnAl_2O_4$, indicating probable future use of this nanomaterial in maintaining human health.

Key words: Antibacterial activity, $ZnAl_2O_4$, Gram positive and Gram negative bacteria, XRD, FESEM, FT-IR, EDAX., Antibiotic susceptibility

APPLICATION OF CADD IN DEVELOPMENT OF ANTIDIABETIC POLYHERBAL FORMULATION

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Abstract:

India has emerged as the diabetic capital of world, unless urgent preventive steps are taken it will become a major health problem. Despite tremendous strides in modern medicine stringent control over insulin resistance or restoration of normoglycemia has not yet been achieved.

Synthetic oral hypoglycemic drugs act by various mechanisms to control the blood glucose level. However, many side-effects such as hypoglycemia, lactic acid intoxication and gastrointestinal upset, etc. have been reported in patients.

Herbal medicine is thought to provide comparative advantage by reason of the diverse secondary metabolites present. However, adequate research on these medicinal plants beyond screening for biological activity, should be conducted with the aim to systematically standardize and develop them into natural products or dosage forms which would effectively complement or supplement existing conventional measures.

The aim of the present work was to carry out the study of probable phytochemical bioactive constituents which might be responsible for showing antidiabetic activity. Their structures were drawn and a comparative docking study of each phytochemical bioactive with selected targets was carried along with use of synthetic hypoglycaemic agent metformin.

The intention was, it would give exact idea about probable mechanism of action of phytochemical bioactives, which would help in development of more authentic polyherbal antidiabetic formulation on the basis of application of concept of CADD.

INDUSTRIAL PRODUCTION OF AMYLASE ENZYME BY WATER ISOLATES

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Abstract:

Amylase enzyme is extracellular , exoenzyme have showing the enzymatic activity where it act's on starch and get converted in to glucose and galactose such glucose and amylases has number of significance in food and beverage industries. Concern with fact and wide application of glucose as well amylase, amylase enzyme is most essential. These amylase producing microorganism are present in soil and air also. Such enzyme was synthesized by no of microorganisms viz. Bacillus Spp., isolated form available water sources of Miraj.

Starch Agar plate was used for isolation of bacterial Spp. Serially diluted soil sample was selected for streaking purpose plates were made in triplicates and were incubated at room temperature for 24-48 hours. Starch hydrolyzing zone around the colony indicated amylase producers rather subjected for characterization.

Key Words : Amylase, Water and Starch Hydrolysis

ISOLATION OF LECITHINASE PRODUCING MICROBE FROM SOIL OF MIRAJ.

Rakhi Rajabhau Barde , Salma Maheboob Pathan, Jahin Arif Kalangade , Tahera Najir Inamdar & Fiza Ashfaq Bagwan.

Department of Microbiology,
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Abstract:

The bacterial strains have been isolated and describe as lecithinase producers based on their ability to grow aerobically on egg yolk agar . The lecithinase is converted into phosphoric acid and di-glyceraldehyde as loop, of white precipitate it gives opaque zone from media. Isolates were categorized in to low moderate and high lecithinase produces is group. The micro-organism which have ability to produce lecithinase enzymes were isolated by doted plate method and around the colony opaque zone were observed .The selected samples of water and soil was collected from **Miraj** area, **Sangli** district of **Maharashtra** state, micro-organism showing maximum lecithinase prouducers.

Keywords: Soil, Micro-organism, Lecithinase.

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ISOLATION OF LIPASE PRODUCING MICROBE FROM SOIL OF MIRAJ.

Alisha Gous Shaikh, Munnisa Maheboob Sayyad, Barira Khudbuddin Peerzade,
Pooja Balaso Kore & Saniya Noor Mohammad Patel.

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Abstract:

The cultures were isolated from soil & water samples, Collected from **Miraj**, situated in **Sangli** district, **Maharashtra** state, **India**. Primarily the culture were isolated by using nutrient agar media. The culture were isolated by streaking method, Lipase is an extracellular enzyme that hydrolyzed fat's and Lipids, they play an important role in digestion of food and transport with processing of dietary lipids. The bacteria which have ability to produce Lipase enzyme, which hydrolyzed triglycerol to glycerol and fatty acid. In this present study clear zone was observed around the colony of micro-organism which has ability to produce Lipase enzyme. The selected soil was positive for the production of Lipase Enzyme.

Keywords: Lipase, Soil, Micro-organism

SCREENING OF ANTIBIOTIC PRODUCER FROM WATER

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Patil Vinayak Popat, Rajmane Nagesh Uttam

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Abstract:

Antibiotic production by Microbe Present in water sample is used for primary screening in this experiment the water samples were collected from different 2 states were selected as **Maharashtra & Karnataka**. In primary screening the desired bacteria isolated and collected. The water sample used for detection of antibiotic produces check whether the microorganism does produce antibiotic or not, use Nutrient agar media for screening. Water dilution was spreaded on sterile nutrient agar plate and kept at 37° c for 24 hrs. After incubation seen that crowd growth and some colony shows clear zone around them, that's shows the antibiotic production. Conclude that same organism is present in water which is capable to produce antibiotics.

Keywords: - Antibiotic, Microbe & Water

SCREENING OF AMYLASE PRODUCERES

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Alate Akshata Appasaheb

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Abstract:

Among different types of enzymes obtained from microbial sources. Amylases are the most widely used in industries. In present study, bacteria were isolated from sewage soil and screened for the production of alpha-amylase. Among four bacterial isolates, one isolate produced maximum zone of starch hydrolysis. The bacterial isolate was identified as *Bacillus spp.* and later was used for further characterization. Maximum yield of amylase was obtained after 48 hours of incubation. The optimum pH for enzyme activity was found to be at pH 7 and the optimum temperature for the activity was found to be at 37⁰C. The selected soil samples were positive for amylase producing organisms.

Key Words: Amylase, Starch Hydrolysis, *Bacillus*.

A VERTICAL AND HORIZONTAL DISTRIBUTION SOIL OF PARAMETERS AT CATCHMENT AREA OF MORNA RIVER AND ITS EFFECT ON FERTILITY

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Abstract:

Western Ghats contains rich quality of soil towards the fertility of land. Morana river provides a good quality of soil in its catchment area. The region around the river having land which contains different amount of Organic carbon, N, K, Ca, S and P. They are participated in the fertility of soil. The objective of this study was to determine such a parameters using different analytical instruments such as pH meter, conductometer, visible spectrophotometer, and S.T.F.R.T. instrument. From those results, it's observed that it needs to increase soil fertility to increase the crop yield like the cane, rice and groundnut etc. Our work is very important for farmers residing in this area to improve their soil quality and fertility.

Keywords: Soil, Parameters, Fertility, Quality, Instruments.

MICROBIAL STUDY OF TOOTH PASTES

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Abstract:

It is believed that good health depends on a healthy stomach, which in turn depends on good oral hygiene. Oral hygiene comprises of dental hygiene. A large number of dental problems are due to microbial infections caused by pathogens like those belonging to genera *Streptococci*, *Spirochetes* and *Bacteroides*, specifically, *Streptococcus mutans*, *Escherichia coli* and *Candida* are responsible for caries and pus causing diseases. Dentifrices or tooth pastes used to clean teeth, claim to have antimicrobial properties, but very little research has been conducted to investigate these claims. The present investigation presents the count of normal micro flora of commonly used ten tooth paste samples, at various intervals like; after just opening the tooth paste for first use, after 15 days of use & after using it for 30 days, with the help of Standard Plate Count Method and results compared. Almost all samples show presence of microorganisms, which defies normal health standards; on zero day, 15th and 30th day samples. Microbial count goes on increasing with the period interval, showing that it is a better idea to use small volume tooth pastes than large, family size tubes.

Key words: Oral hygiene, microbial infections, antimicrobial, dentifrices, pathogens

**USE OF AGROCHEMICALS IN THE MANAGEMENT OF LEAF
BLIGHT OF CARROT CAUSED BY CARBENDAZIM RESISTANT
*ALTERNARIA DAUCI***

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Abstract:

There was large variation in the MIC of carbendazim among the 12 isolates of *Alternaria dauci* causing leaf blight on the carrot leaf agar plates and also on *Daucus carota* plants. MIC on leaf agar plates ranged from 6 -20% while it was 5.5-18%. On carrot plants. Isolate Ad 2 is highly resistant. Use of carbendazim in mixture with agrochemicals, such as insecticides (Prime, Phorte and Sunsulf) inhibited the growth on agar plates and on carrot plants. There was 100% control efficacy on carrot plants by using mixture of above mentioned insecticides.

Key words: Carbendazim, isolate, resistant, *Daucus carota*, insecticides

CHEMOTHERAPEUTIC POTENTIAL OF COW URINE: A REVIEW

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Abstract:

The “cow (Kamdhenu)” considered as a mobile medical dispensary and as said by Pathak and Kumar cow urine is a panacea of all diseases, The cow urine, is capable of treating many curable and also incurable diseases and has been used mainly in ayurvedic preparations since long years ago even unmemorable as cited in ancient texts. Cow urine consists of certain volatile and non volatile compounds, few essential components such as estrogen, Nitrogen, Phosphorus, Pheromones, Potassium, enzymes, certain phenols and cytokines along with vitamins. Cow urine have an potential to serves as antimicrobial, antifungal, antiheleminthic, antioxidant and anticancerous properties because of their compositions.

Keywords : Cow urine, antibacterial, antifungal, anticancerous.

CHEMICAL KINETIC STUDY AND DETERMINATION OF MECHANISM BY END PRODUCT ANALYSIS OF CONVERSION OF HYDRAZIDES TO CORRESPONDING ACIDS

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Abstracts:

Hydrazides are obtained by preparing derivatives of Carboxylic acids and hydrazines. It's multiple use in various branches of chemistry especially pharmaceutical Chemistry, needs to study the mechanism of their oxidation by applying kinetic approach. The process of oxidation reaction is an important transformation in an organic chemistry. The formation of corresponding acids is observed during the most of the oxidation reactions of hydrazine's. Literature survey shows that, the chemical kinetic study of oxidative degradation of Heterocyclic acid hydrazides by vanadium (v) is not extensively studied. Therefore kinetic study of hydrazides by vanadium (v) was undertaken. The study of Chemical kinetics deals with the rate at which the chemical reactions occur and the influence of various factors such as concentration, temperature, catalysts etc. on the reaction rates. The activation parameters Temperature Coefficient, Energy of activation, Enthalpy of activation, Entropy of activation, Free energy of activation were determined and the values support the proposed mechanism as evidenced by considerable decrease in entropy of activation. The progress of reaction was followed by measuring absorbance of the reaction mixture spectrophotometrically using UV-Vis. Spectrophotometer using water as a reference solvent. The reaction was studied under pseudo-first order condition in which, concentration of hydrazide was in excess as compared to that of ammonium metavanadate. The reaction was found to proceed through formation of complex between vanadium (v) and hydrazide. The pseudo-first order rate constant K was obtained by plotting the log of absorbance against time for hydrazide and was found to be fairly constant at different concentrations of vanadium.

Keywords: Hydrazides, End Product analysis, activation parameters, Temperature Coefficient, Chemical Kinetics,

NATURAL INDICATOR BEST ALTERNATIVE FOR SYNTHETIC INDICATOR IN ACID BASE TITRATION

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Abstract:

Acid base titration is regular practices in chemistry laboratories in academic institutes. For neutralization volumetric estimation various synthetic indicators are used. In present study we have made comparison between regular phenolphthalein, methyl orange and methyl red indicator with our developed natural indicator. *Jasminum officinale* leaves, teak (tectanganodris) leaves and Spathodia flower extract were employed for neutralization titration and compared results with aforesaid regular indicators. Distinct different colours were observed for all herbal indicators in acidic and basic media and confirmed with spectrophotometer with λ_{\max} values. Along with titration we have tried for preparation of litmus papers and applies for acidic and basic reals samples. Our developed litmus papers with regular filter paper and leaves or flower extract we have observed good results. Finally we may conclude that natural indicators are best alternatives for synthetic indicators.

Key words: Natural indicators, acid base titration, flower extract, leaves extract, litmus paper

STUDY OF ANTIBIOTIC SENSITIVITY OF STAPHYLOCOCCUS AUREUS AND KLEBSIELLA PNEUMONIAE ISOLATED FROM BIOMEDICAL WASTE

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Abstract:

The biomedical waste is likely to contain pathogens. These pathogens are continuously exposed to various antibiotics which may induce resistance to antibiotics in them. *Staphylococcus aureus* is a potentially dangerous opportunistic pathogen associated with community acquired as well as nosocomial infections and is gaining resistance to commonly used antibiotics. Studies have indicated it as a common cause of septicemia. The antibiotic resistance is rapidly increasing in *Klebsiella pneumoniae* which is also a common opportunistic hospital-associated pathogen. In the present study *Staphylococcus aureus* and *Klebsiella pneumoniae* were isolated from biomedical waste collected from different hospitals and studied for their sensitivity to commonly used antibiotics.

Antibiotic susceptibility pattern of *Staphylococcus aureus* showed highest sensitivity to **Vancomycin (97.22%)**, followed by Streptomycin (91.66%), Amikacin (88.88%), Gentamycin (83.33%), Ceftazidime (80.55%), Tetracycline (80.55%), Nitrofurantoin (80.55%), Cephalexin (75%), Doxycycline hydrochloride (75%), Chloramphenicol (61.11%), Ciprofloxacin (58.33%), Cotrimoxazole (55.55%), Ofloxacin (50%), Norfloxacin (44.44%), Pefloxacin (38.88%), Erythromycin (33.33%), Lomefloxacin (27.77%), Ampicillin (25%), Netilmicin /Netilin (13.18%), Nalidixic acid (13.18%) and all the isolates were resistant to Penicillin G.

Antibiotic sensitivity study of *Klebsiella pneumoniae* isolates showed that it is sensitive to Streptomycin (90.47%) followed by Tetracycline (80.95%), Amikacin (66.66%), Netilmicin /Netilin (61.90%), Cotrimoxazole (57.14%), Norfloxacin (52.38%), Nalidixic acid (47.61%), Nitrofurantoin (47.61%), Gentamycin (23.80%), Lomefloxacin (23.80%), Cephalexin (19.04%), Ceftazidime (14.28%), Ofloxacin (9.52%), Pefloxacin (4.76%), Erythromycin (04.76%) and all the isolates were resistant to Penicillin, Doxycycline hydrochloride, Chloramphenicol, Ciprofloxacin, Ampicillin and Vancomycin. Emergence of resistance highlights the value of prudent prescribing of antimicrobials and avoiding their indiscriminate use.

Key words: biomedical waste, nosocomial infections, antibiotic resistance, *Staphylococcus aureus*, *Klebsiella pneumoniae*.

SYNTHESIS OF Fe₂O₃ BY COMBUSTION METHOD AND ITS PHOTOCATALYTIC ACTIVITY

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Abstract:

In recent years, the use of semiconductor metal oxides as photocatalysts for degradation of pollutants has attracted attention of scientific community. The photocatalytic process starts with the irradiation of a semiconductor material by light with sufficient energy to excite the electrons from the valence band to the conduction band generating extremely reactive electron/hole (e⁻/h⁺) pairs that migrate to the adsorbed species leading to reactive species such as hydroxyl radicals. Iron oxides are one of the most important transition metal oxides of technological importance. Characteristics of these oxide compounds include mostly the trivalent state of the iron, low solubility and brilliant colors. In present study Fe₂O₃ was synthesized by auto-combustion method. The synthesis was carried out with the Fe(NO₃)₂·9H₂O as the Fe source, and glycine used as fuel. The solution mixed under constant stirring and pH adjusted by using ammonia. Phase formation of Fe₂O₃ was investigated by the thermal analysis of powder after autocombustion. The effect of time on the photocatalytic activity of the Fe₂O₃ photocatalyst for the degradation of malachite green diluted in distilled water under UV-light irradiation was carried out, Fe₂O₃ material exhibited good photocatalytic activity towards the malachite green.

SYNTHESIS OF ZnO BY COMBUSTION METHOD AND ITS APPLICATIONS

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Abstract:

ZnO is an important semiconductor material due to its direct energy gap and large excitation binding energy at room temperature. It has the unique electrical properties which can be used in a variety of applications, such as high transmittance conductive oxide coatings for solar cells, gas sensors, UV photodetectors, and bulk acoustic wave resonators. It has direct bandgap energy of 3.37 e V. ZnO is bio- safe and biocompatible, and may be used for biomedical applications. In present study ZnO sample was synthesized by auto combustion method. The synthesis was carried out with the $\text{Zn}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ as the Zn source, and glycine used as fuel. The solution mixed under constant stirring and pH adjusted by using ammonia. Phase formation of ZnO was investigated by the thermal analysis of powder after autocombustion. Cell adhesion assay showed that the ZnO powder provided a more adequate environment for cell adhesion and proliferation and good biocompatibility. The present work attempts to explore novel applications in biomedical field.

**ENUMERATION OF MEDICINAL PLANTS OF SANGLI DISTRICT,
MAHARASHTRA**

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Abstract:

Sangli district is one of southern district of Maharashtra State .It is situated between the latitudes of 16° 43' and 17° 38' N and the longitudes of 73° 41' and 75° 41' E. The district is bordered by Satara district on the north – western side .On the north – eastern side it is bordered by Solapur district . On the southern side it is bordered by Belgaum and Bijapur district of Karnataka State . It meets Kolhapur district in south – western side and Ratnagiri district lies on the west of Sangli district. Total area of district is 8501.05 sq. km. and lying mainly in the basin of river Krishna and tributaries Warana , Yerala ,Agrni and Man. District has ten talukas , of which Shirala taluka and to some extent Atpadi taluka are hilly , while the greater part of district lies in plains . The average rain fall of the district is 692.40 mm per annum . Petlond region of the Shirala taluka and its adjoining is a part of Chandoli Wild Life Sanctuary recently declared as Chandoli National Park and Sahyadri Tiger Project .Another Wild Life Sanctuary in the Sangli district is Sagreshwar Wild Life Sanctuary . Westward part of the district is situated in the Western Ghats ranges shows tropical evergreen , tropical semievergreen and tropical moist deciduous type of vegetation , while eastern part and major region of district shows tropical dry deciduous and open thorny scrub vegetation . Various types of vegetation of district harbours variety of medicinal plants . Survey of plant wealth of Sangli district resulted in enumeration of over 300 plant species of some therapeutic value . List of the medicinal plants with their botanical and vernacular names , part of plant used , medicinal values along with their status of occurrence are discussed in the present paper .

CHEMICAL BATH DEPOSITED $\text{Co}_{1-x}\text{Cd}_x\text{S}$ THIN FILMS: PREPARATION AND CHARACTERIZATION

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Abstract

Chemical bath deposition of $\text{Co}_{1-x}\text{Cd}_x\text{S}$ ($0 \leq x \leq 0.35$) thin films has been studied. The effect of various process parameters on the growth and the film quality are presented. The growth parameters were optimized to obtain the excellent quality deposits for solar cell applications. The synthesized films are characterized using X-ray diffraction (XRD), UV-VIS absorption spectroscopy and scanning electron microscope (SEM) techniques in order to study its structural, optical, compositional and morphological properties. The influence on the growth rate of thin film composition and the structural, optical properties of the $\text{Co}_{1-x}\text{Cd}_x\text{S}$ thin films deposited by this method have been studied. The film composition was decided by appropriate volume of cadmium sulphate. The preparative parameters, such as growth temperature (56°C), time (80 mins.), reaction pH (11 ± 0.2) and the rate of mechanical churning (70 ± 2) etc, were used as-optimized. The samples were thin, uniform, and tightly adherent with color changing from dark green to dark chocolate as x was varied from 0 to 0.35. The polycrystalline growth of $\text{Co}_{1-x}\text{Cd}_x\text{S}$ and CoS thin films is made feasible and the deposits exhibit hexagonal wurtzite structure. The grain sizes are of the order of few nm. SEM's revealed a network of long elongated thread type crystallites tapered or pointed at both ends; randomly oriented and threaded into each other. The optical absorption studies on $\text{Co}_{1-x}\text{Cd}_x\text{S}$ thin films showed increase in the band gap, typically from 1.13 eV to 1.85 eV

Keywords: Chemical bath deposition, $\text{Co}_{1-x}\text{Cd}_x\text{S}$, thin film, XRD, SEM.

Acknowledgments

Author is grateful to Prof. L.P. Deshmukh, Thin Film and Solar Studies Research Laboratory, Department of Physics (Appl. Elect.), Solapur University, Solapur - 413255, M.S., India for promoting this work, providing laboratory facilities and encouragements throughout this work.

STUDIES ON $Cd_{1-x}Co_xS$ DMS THIN FILMS: SYNTHESIS AND CHARACTERIZATION

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Abstract

There has been a great deal of interest in diluted magnetic semiconductor (DMS) thin films. This is because they are the potential candidates of high performance and low production cost. They are expected to play an important role in the future electronic science because charge and spin are coupled into a single material known as spintronics. Among the DMS materials, II- VI compound systems have a prominent place in modern semiconductor device technology as they show high efficiency of radiative recombination, high absorption coefficients and direct band gaps corresponding to a wide spectrum of the wavelengths from ultra-violet to infrared regions.

In this sense, Cd-chalcogenides are considered to be very important DMS materials for their potential use in optoelectronic devices, thin film transistors, photovoltaic solar cells, gamma ray detectors, etc. Our interest is in Co-doped CdS system because it has spin-orbit interaction and a large exchange interaction. Further, energy gaps and lattice parameters are tunable that makes these DMS materials useful in solar PV-applications, diodes, sensors, spin-valve transistors, ultrafast optical switches and optical isolators. Attempts were therefore made to deposit CdS and $Cd_{1-x}Co_xS$ ($0 \leq x \leq 1$) thin films using our modified chemical bath deposition technique, as it has been proved to be a versatile technique. Our attempt in this regards is to prepare the $Cd_{1-x}Co_xS$ DMS materials in thin film form and to characterize them thoroughly and to apply them in electrochemical photovoltaic solar cells.

Keywords: $Cd_{1-x}Co_xS$ thin films, Chemical bath deposition, DMS.

Acknowledgments

Author is grateful to Prof. L.P. Deshmukh, Thin Film and Solar Studies Research Laboratory, Department of Physics (Appl. Elect.), Solapur University, Solapur - 413255, M.S., India for promoting this work, providing laboratory facilities and encouragements throughout this work.

AN EFFICIENT SYNTHESIS OF N-ARYL SULFONAMIDES USING NOVEL GRAPHENE SUPPORTED IONIC LIQUID PHASE COMPLEX

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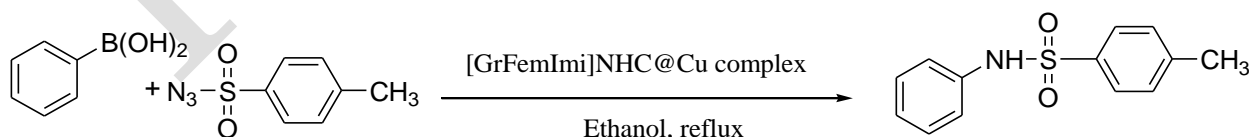
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Graphene, the amazing two-dimensional carbon nanomaterial, has attracted extensive interest in recent years. Graphene based materials hold great promise for facilitating a wide range of transformations and offer extraordinary potential in the design of novel catalytic systems. Amongst these, graphene oxide (GO) represent a promising derivative which is obtained by chemical oxidation of graphene. The surface decorated myriad oxygenated functions in GO allow the functionalization of graphene by covalent or non-covalent methods which as a consequence, can improve its solubility, dispersibility and chemical stability. Furthermore, the high surface area of graphene, reaching up to $2600 \text{ m}^2 \text{ g}^{-1}$, represents a desirable characteristic as two-dimensional support. Moreover, the influence of chemical and physical properties of graphene can assist in obtaining more selective and active heterogeneous catalyst system as seen in the generation of ammonia, hydrogenation of carbon oxides and hydrotreating reaction.

Considering amazing properties of graphene, we have synthesized novel graphene supported ionic liquid phase complex. The complex is synthesized by reacting ferrocenyl imidazole with chloropropyl modified graphene oxide (GO) to prepare graphene modified ferrocenyl imidazole acronymed as [GrFemImi]Cl which will be subsequently treated with copper iodide to afford complex. Thus, in the present work, we have synthesized N-aryl sulfonamides from phenylboronic acid and azides using graphene supported ionic liquid phase complex acronymed as [GrFemImi]NHC@Cu complex (Scheme I).

Complex is fully characterized by the techniques used IR, TGA, XRD, BET, XPS, EDX, Raman, Solid state C13-NMR & TEM which gives confirmation of the structure.



Scheme - I