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pure and Applied Science



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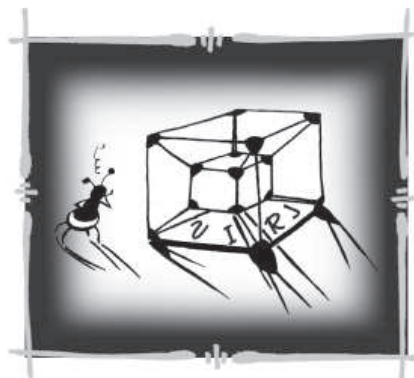
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- \* To provide a venue for the publication of Conference / Seminar Proceedings.

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## Editorial

It is with great joy and high expectations, that the third edition of *Vimala International Research Journal for Pure and Applied Science* (VIRJ) is being released envisioned as Vimala's contribution towards fuethering and enhancing advanced studies in Science and Technology. VIRJ aims at providing a platform for original ideas and possibilities to be expressed and defended. Over the period of time, scientific research has evolved both in terms of specialization and target audience. Scientific journals supposedly are multidimensional open access gateways for procuring authoritative information on newly explored fields of scientific relevance. Such publications are intended to pass on to the scientific community, the most recent cutting edge research findings and theoretical deliberations which would eventually contribute to the progress of mankind. Vimala believes in supporting new research findings which carry the potential of fuelling new assumptions ,eventually fashioning a path leading to further discoveries. The humble attempt of VIRJ would be to open this world and reveal new avenues of research before a target audience.

Warm words of gratitude and appreciation are extended to scientists and scholars who have joined in this venture and whose patronage is held in high regard. Peer review of all published articles was undertaken uncompromisingly and meticulously. Every attempt has been made towards ensuring the quality and validity of the research findings contained herein. Also all efforts have been made to publish a balanced mix of high quality theoretical and empirical research articles, case studies and reviews. The sincerest of appreciation is also conveyed to advisory board, editors, the press and Vimala fraternity for their indispensable encouragement and co-operation in this venture. A word of assurance to all the stake holders, that integrity, impartiality and a strict adherence to the fundamental principles of research ethics and transparency has always been the guiding force and shall be maintained in all future ventures. We bow before the Almighty and present the third volume of the Vimala International Research Journal.

**1 September 2017**

**Editor**

VIRJ for Pure &Applied Science



## Birnubaum Joint Importance Measures for Multi-State System

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### Abstract

In this paper we consider Birnubaum Importance Measures of components and introduce joint importance measures for components with respect to reliability, availability and risk, for multistate systems (MSS) constituted by multi-state elements. Physically, these measures characterize the importance and joint importance for multi-state elements of achieving a given level of performance and their definitions entail evaluating the system availability, reliability, risk and/or expected performance when the functioning of the element of interest is restricted in performance. Following Chacko and Manoharan (2008), for a multistate system, we introduce Birnubaum joint importance measures (BJIM) of multiple components which achieve a given level of performance with respect to the output performance measures (OPMs). An approach based on the universal generating function (UGF) technique is proposed for the evaluation of the joint importance measures. Illustrative examples are provided.

**Key words :** Multistate system, reliability, availability, risk, joint importance measure, UGF.

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## A Review on Vitamin D Deficiency Among Peri and Postmenopausal Women

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### **Abstract**

Many women experiences vitamin D deficiency in peri and post menopausal period. Vitamin D has multiple rates in the body. Low levels of vitamin D have been associated with many diseases and health condition including cancer, obesity, cardiovascular diseases, depression, defective brain function, high blood pressure etc. These symptoms produce negative impact on the quality of life, work performance and personal relationships. Symptoms of women experience during the transition through menopause. Therefore hypothesized that Vitamin D may be associated with menopause related symptoms .Vitamin D deficiency is an alarming issue among postmenopausal women in india . Encouraging women to adhere to healthy lifestyles and maintain optimum Body Mass Index (BMI) is indispensable to achieve optimum vitamin D level.

**Keywords :** Vitamin D deficiency, peri and post menopausal period, Body Mass Index (BMI )



## **Phyto-morphological And Pollen Viability Analysis *Tecoma stans* (L.) Juss, ex Humb., Bonpl. & Kunth. of Bignoniaceae Family**

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### **Abstract**

Phyto –morphological and pollen viability analysis was studied in the two types [Type-1(mixed type of both simple and compound leaves) and type-2 (imparipinnately compound leaves)] of *Tecoma stans* (L.) Juss, ex Humb.,Bonpl. &Kunth of Bignoniaceae family. Two types showed similarity and distinct differences in the nature and texture of leaves, epidermal hairs, petiole length, number of leaflets etc. *In vitro* germination test of pollen grains using 10% sugar solution, staining method of acetocarmine and glycerine, using 2, 3, 5-triphenyl tetrazolium chloride (TTC) test in both types revealed that the percentage of germinating or viable pollen grains were greater amount in type - 2 plants (79.8%, 71.9%, 89.2%) when compared to type– 1 plants (71.7%, 59.7%,79.9%) respectively. This present study is a comparison and variations in the morphology and pollen viability analysis in two types of *Tecoma stans*.

**Keywords:** *Tecomastans* [Type -1 (mixed type of both simple and compound leaves) and Type-2 (imparipinnately compound leaves)], Phyto-morphology, Pollen viability analysis.

## **Diversity of Raptors at Manassas National Battlefield Park, Virginia, USA.**

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### **Abstract**

We conducted a study on Raptors in the Manassas Battlefield Park, Virginia, USA from April through June 2009 to determine the abundance of the raptor species in the park and their and habitat preference. Altogether nine different raptor species were identified in the park in order. Red-tailed Hawk was the most common species in the park. Most raptor species stay around conifer forests and grasslands.

**Keywords:** Raptors, National Battlefield Red tailed hawk

## **Cyclic Voltammetric & Spectral studies of Zn (II) Schiff Bases Derived from 3- aminopropanoic acid in DMSO**

**Shaju K. S.<sup>1\*</sup>, Joby Thomas K.<sup>2</sup>, Vinod P. Raphael<sup>3</sup>, Nimmy Kuriakose<sup>4</sup> and Binsi M. Paulson<sup>5</sup>**

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### **Abstract**

Anovel Schiff base derived from anthracene-9 (10H)-one with 3-amino propanoic acid and it's Zn(II) complex have been synthesized. The Schiff base and complex were characterized by elemental analysis, UV, IR, and NMR spectroscopic techniques. The redox properties of the schiff base and complex were extensively investigated by electrochemical method using cyclic voltammetry (CV). The effect of scan rate on the redox behaviour of compounds was also evaluated.

**Keywords :** Cyclic voltammetry, Schiff base, 3- aminopropanoic acid

## **A Study on Effect of Periphyton in Water Quality Management of Ornamental Fish Farming**

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### **Abstract**

Periphyton based ornamental fish farming is a novel technique in aquaculture. The coconut rachis which is locally available and easily biodegradable used as substrate for periphyton growth. The amount of nitrite nitrogen showed a decrease in periphytonbased culture system This may be due to the utilization of nitrite nitrogen by microorganisms of periphyton mass. Periphyton-based systems have shown higher nutrient utilization efficiency when compared to traditional substrate-free systems So the water quality management in periphyton based culture system is easy when compared to non periphyton system. Thus the cost of farming is very much reduced.

**Keywords:** Periphyton, biodegradable, nitrite nitrogen, cost of farming

## **Synthesis and characterization of CuO nanoparticles by using Solanum Trilobatum plant extract**

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### **Abstract**

Green Synthesis techniques are one of the most cost effective and ecofriendly techniques for the preparation of nanoparticles .In the present investigation, Copper oxide (CuO) nanoparticles were synthesized by the bio- reduction of aqueous Cu<sup>+</sup> ions in copper acetate by the leaf extracts of SolanumTrilobatum plant .The formation of CuO nanopartiles were confirmed from the analysis of UV-Vis Absorption spectrum and FTIR spectrum of the samples. The X-ray Diffraction (XRD) analysis confirmed the presence of CUO nanoparticles and the average crystallite size of the particles calculated from the Scherrer's formula is 40 nm.The morphological and compositional analysis was carried out using Field Emission Scanning Electron Microscopy (FE-SEM) measurements.

**Keywords:** Green Synthesis,CuO nanoparticles, XRD, FTIR, FE-SEM

# Effect of Protein Supplementation in Chronic Renal failure (CRF) Patients with Dialysis

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## Abstract

Chronic kidney disease (CKD) is becoming a major global public health concern, the incidence and prevalence of chronic kidney disease is growing around the world with an annual growth rate of 7% to 8%. The present study was conducted to determine the effects of protein supplementation in chronic renal failure patients undergoing dialysis. Dialysis patients need more protein than the average healthy adults, because there is loss of protein during dialysis. To know the effect of protein supplementation a subsample of 20 subjects were supplemented with NeproHp and Renopro (commercially available protein supplements) and the changes were observed for a period of 2 months. A comparison of the biochemical parameters of the subjects before and after supplementation was done in order to get a clear clinical picture. Details regarding socioeconomic status, life style data, medical history and food habits of the subjects were collected. Anthropometric measurements like height, weight, body mass index, waist hip circumference, and mid upper arm circumference were assessed for all the subjects. Dietary assessment was done by using a food frequency score and 24 hour recall method. Health status of the subjects was assessed by Subjective global assessment (SGA) method. It is found that the values of biochemical parameters before and after supplementation of dialysis subjects were significant at 0.01 level. Hemoglobin level of the subjects was below the standard and slight increase was noticed after supplementation. Also slight improvement in calcium, protein and albumin was noticed among the subjects after supplementation. Improving the nutritional status of these patients will improve the quality of life, which can be done by diet counseling, planning suitable dietary guidelines and also by giving protein supplements. The present study shows that, Supplementation of protein generally improves the serum markers of nutrition overall.

**Keywords:** Chronic kidney disease (CKD), Dialysis patients, Subjective global assessment (SGA) Dietary assessment, Protein Supplementation

## On the Synthesis and Structural Characteristics of $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$ (LSMO) and $\text{La}_{1-x}\text{Sr}_x\text{FeO}_3$ (LSFO) Nanoparticles

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### Abstract

Perovskite Manganites and ferrites have recently attracted much attention because of their technical applications. Strontium substituted  $\text{LaMnO}_3$  ( $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$  or LSMO) and strontium substituted  $\text{LaFeO}_3$  ( $\text{La}_{1-x}\text{Sr}_x\text{FeO}_3$  or LSFO) nanoparticles are particularly of interest due to their good magnetic, electrical and catalytic properties and are nowadays potential candidate materials for applications ranging from the field of biology to magnetic data storage devices. The present investigation on LSMO and LSFO nanoparticles are carried out on two different strontium compositions  $x=0.4$  and  $x=0.3$ . The modified citrate sol-gel route is adopted for the preparation of samples from nitrate precursors of Lanthanum, Manganese and strontium. The prepared powder samples are characterized by using X-ray powder diffractometer (XRD). With the increase in strontium content the particle size is found to increase. Morphological Studies are done using Scanning Electron microscopy (SEM). The results of the different structural properties are correlated and analyzed.

**Keywords** : Perovskites, Lanthanum Manganites, Lanthanum ferrites, Sol-gel method, XRD, SEM

## Effectiveness of Some Plant Extracts on Iron Rebar Corrosion in Simulated Concrete Pore Solution Contaminated with NaCl

Neethu Joy<sup>1</sup>, Vinod P. Raphael<sup>2\*</sup>, Shaju K. S.<sup>3</sup>, Nimmy Kuriakose<sup>4</sup> and Binsi M. Paulson<sup>5</sup>

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### Abstract

Nine plant extracts were prepared and checked their inhibition efficacy on Fe rebar corrosion in simulated concrete pore solution contaminated with NaCl. For this evaluation, half cell potentials of Fe rebars were measured using high impedance voltmeter in conjunction with saturated calomel electrode. The study was conducted for a period of 18 days. A blank experiment was also performed for the comparison. Average of half cell potential values revealed that Fe rebar treated with concrete pore solution containing phyllanthusniruri (PN) extract showed more cathodic shift than all other extracts. Fe rebar treated with beta vulgaris displayed high protective power towards end of the investigation period. Among the effective plant extracts, the potential value shifted to more cathodic side in the order Alliumsativum < Beta vulgaris < Chromolaenaodorata < Allium cepa < Phyllanthusniruri.

**Keywords** : corrosion, rebar, concrete



## Luminescent studies in Europium doped Zinc Aluminate Nanophosphor

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### Abstract

Spinel aluminates have been extensively investigated owing to their high stability and versatile industrial processing characteristics suitable for various high-performance novel displays, optoelectronic device applications and bio-imaging techniques. This article discusses the luminescent response observed in undoped and europium doped zinc aluminate nano phosphors synthesized via hydrothermal and microwave assisted synthesis routes that seldom involves laborious procedures and high temperature annealing. Even without post-annealing, the as-prepared undoped sample gave a room temperature luminescence in the blue region and the Eu doped samples showed an emission in the red region of the electromagnetic spectrum. The nature of the photo-luminescent emissions does assert the incorporation of  $\text{Eu}^{3+}$  in the samples and the CIE coordinates reveal the color purity of the luminescent emissions. UV-Visible spectroscopic studies confirmed the band gap of the samples to be between 5-5.2 eV. Structural characterization using X-ray diffraction technique gave patterns that could be indexed to face-centered cubic spinel-structured  $\text{ZnAl}_2\text{O}_4$ .

**Keywords:** Nanophosphor, hydrothermal synthesis, microwave route, CIE coordinates

## A Study on Mittag - Leffler Distribution

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### **Abstract**

The Mittag-Leffler distribution has been studied extensively during the last two decades. It finds application in solving problems of physical, biological, engineering, earth science etc. In this survey paper we discuss various distributional properties and characterizations related to Mittag-Leffler distributions. Applications of Mittag-Leffler distribution in various areas are presented.

**Key Words:** Autoregressive Process, Class L, Complete Monotonicity, Geometric Infinite divisibility, Laplace Transform, Mittag- Leffler Function.

## Preparation of Dye Sensitized Solar Cells Using Quantum Dots

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### **Abstract**

The mankind has witnessed an enormous increase in energy consumption during the last 100 years. Development of reliable energy sources is necessity of the present century. Solar energy emerged as solution for this problem. Dye-sensitized solar cells (DSSCs) and quantum dot-sensitized solar cells (QDSSCs) are two promising alternatives. In the present work, attempt was made to incorporate the features of both quantum dots CdS and natural dyes within the same cell. DSSCs were fabricated using nanoCdS, TiO<sub>2</sub>, black plum dye/ pomegranate dye and nano crystalline carrier layer. All the cells, except the one with nanoCdS as counter electrode showed good photo response. Maximum efficiency was obtained for the cell containing (TiO<sub>2</sub>+pomegranate dye+ single dip CdS)

**Key Words:** Dye sensitized solar cells (DSSC), Quantum dot sensitized solar cells (QDSSC), Natural dyes

## Application of Spider Web Graph in Communication Network

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### **Abstract**

Communication system is a fast developing technology in this era. Innovative technologies from different fields of studies have been introduced to make the existing technologies much easier. Spider web is such a technology, which has been used effectively in previous studies. In this paper, a spider web graph is constructed using finite fields to track different communications in a system. Also certain properties have been identified.

**Keywords:** Spider web graph, communication system

## Study on Certain Heavy Metal Contamination in Fishes-A Case Study in Chalakudy River

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### Abstract

The fresh water contamination is a global issue, wide range of heavy metals takes prime hold for it. The increased level of effluents from industries and anthropogenic additives add 'sufficiently more inorganic chemicals' to the water bodies. The emission of these polluted materials is been hazardous to both the silent aquatic creatures and to human population for it vividly reveals serious health issues as it is assimilated by human since fishes add high nutritive value to our diet. And it's extended to that level via bio magnification through food chain. The present study reports the accumulation of heavy metals like Cd, Pb, and Ni in the fishes *Etroplus suratensis*, *Horabagrus brachysoma*, *Dawkinsia filamentosa* and *Puntius mahecola* from three locations of Chalakkudy River. The fish samples were air dried thoroughly and grounded in high energy ball mill. Predigested samples were thrown for digestive process in digestion block at 420°C for two hours. And examined for heavy metal contents in an atomic absorption spectrophotometer using direct flame method. The exposition of result show cased increased level of pollution by the respective metals in the middle and downstream of an industrial area in comparison to the upstream location except for a single metal.

**Keywords :** Bioaccumulation, toxicity, heavy metals, contamination *Etroplus suratensis*, *Horabagrus brachysoma*, *Dawkinsia filamentosa* and *Puntius mahecola*

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Dated : 1 September 2017

**Dr. Sr. Marriette A Therattil**  
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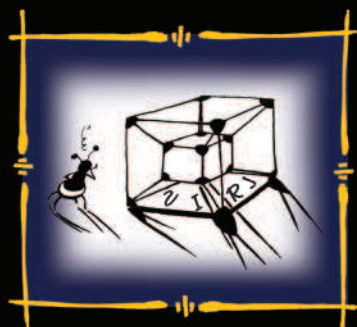




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