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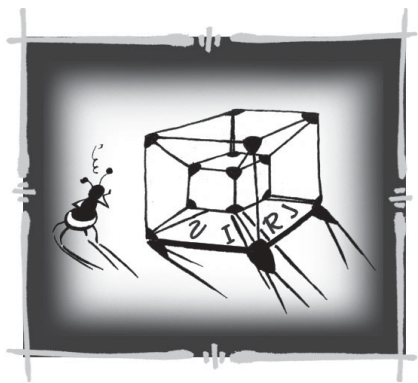

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Aims & Objectives

- To promote original and quality research in various disciplines of science.
- To develop an interdisciplinary research culture.
- To encourage an environment-friendly research promoting sustainable development.
- To provide a venue for the publication of Conference / Seminar Proceedings.

Instructions to Authors

Papers that have not been published elsewhere only will be accepted. Manuscripts should be composed in MS Word (2500 – 3000 typed words) and mailed to virj@vimalacollege.edu.in.

Editorial

Vimala International Research Journal for Pure and Applied Science (VIRJ) is a multi-disciplinary annual peer-reviewed Journal published by Vimala College (Autonomous) Thrissur. It is the sixth volume that is enduring its inspirational journey unraveling the Science in our Nature; who is shaping her forms forever and ever.

The world of Science is always searching and unravelling new truth and theories. Through the corridor of different disciplines, it is opening the door of knowledge and makes all of us fascinating. Science is such a discipline which is home to a large number of branches. It is always extending its territory to wide and versatility. It is the features of any study at the borders of knowledge that you never know where it will go, but at the end of the day, if everything goes well, a regular pattern in one's ideas and understanding can frequently be discerned. A science journal is meant to encourage the research and writing skills of enthusiastic researchers in the multidisciplinary areas of science. This journal is doing the same by providing a platform to those who are keen in research and is searching for an opportunity to expose them in front of the world.

The story of development of each article in the journal symbolizes totally new directions in research which seems to be quite exciting. The journal carefully presents a wide variety of themes; Carbon nanotubes based polymer nanocomposites, Drug delivery systems, Half Logistic Geometric Distribution, Relevance of Chloroplast Genetic engineering, Silver colloidal nanoparticles, Machine learning, Covid symptoms checker, Covid-19 and online learning, Importance of Yogic practises, Glycemic Response in Diabetic Subjects etc. We hope that all the contributors will continue their research to realize the fruitful research outcomes that meet societal needs and global challenges.

We are grateful to all the executive editors, the editorial board and the press for their unstinted support and for encouraging us to work on this publication. Special appreciation to Vimala Science community to make this volume a reality. This publication would not have seen the light of the day without their personal interest and involvement. VIRJ fosters cross-disciplinary approach in research, seeks eminent scholars, serious researchers as well as innovative young writers as its contributors to Experience, Expertise and Excel in Science. We sincerely thank the almighty God for His graces, strength, sustenance and above all, His faithfulness and love throughout this successful endeavor.

September 2020

Editor
VIRJ for Pure and Applied Science

Carbon nanotube based polymer blend nanocomposites for EMI shielding

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Abstract

The demand for high-performance EMI shielding materials has constantly increased for the development of sophisticated electronics. The performance of the EMI shielding nanocomposites depends on the conductivity, dimension, filler dispersion, and so on. Hence, it is expected that CNTs in polymer blend should show a higher EMI shielding effectiveness because of its excellent conductivity, double-percolation phenomenon and related with the selective localisation of the CNTs in the blend. The performance of EMI shielding in different polymer blend nanocomposites was briefly discussed.

***Key words**:* EMI shielding, CNT, Polymer, nanocomposites

Role of Metal nanoparticles in drug delivery systems

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Abstract

Development of novel drug delivery systems has been a hot topic of research for decades. Many materials, including those in nanometer dimensions have been developed around the world in the field of biomedicine and biotechnology. Nanomaterials, especially, nanoparticles have been used as drug delivery systems or drug carriers. Biocompatible, non-toxic materials are usually preferred in drug delivery. Biobased polymers and their nanocomposites are the best candidates for this application. This chapter is elaborating the role of metal based nanoparticles or nanocomposites in the field of drug delivery. Different possible materials for the aforementioned field such as porous, biodegradable and polymer based materials will be discussed.

Key words: Drug delivery, Nanomaterials, Metals, Biomedicine

On some Characterization Results based on Generalized (K) Record Values from Half Logistic Geometric Distribution

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Abstract

In this work we consider the generalized upper (k) record values (GURV's) and generalized lower (k) record values (GLRV's) arising from half-logistic geometric distribution (HLGD) and inverse half-logistic geometric distribution (IHLGD). We derive some characterization results of HLGD based on some moment relations of generalized upper (k) record values and those of generalized lower (k) record values and accordingly devised some diagnostic tools to identify HLGD as a model to the distribution of a population. Similar characterization theorems and diagnostic tools are developed for IHLGD as well.

Key words: Characterizations; Diagnostic methods; Generalized upper (k) record values; Generalized lower (k) record values; Half-logistic geometric distribution; Inverse half-logistic geometric distribution; Recurrence relations.

Mathematics Subject Classification

62G30; 62E10; 60E05

Scope and relevance of chloroplast genetic engineering and crop improvement

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Abstract

In recent years the development and adoption of transgenic chloroplast technology has progressed rapidly. This progress leads to the better understanding about the DNA recombination technology and cause the sustainable and economic use of biotechnology for crop improvement. Chloroplasts are semi-autonomous genetic systems and pilot to numerous insights into the biogenetic engineering and their advancement. Chloroplast alteration machinery of crop plants proposes numerous rewards over nuclear alterations, including elevated intensity of transgene appearance, transgene expression via motherly heritage, and multi-gene appearance in a single transformation occurrence. But there are limited transformation occur in the agriculturally important plants. The current information on plastid transformation may provide an insight towards construction of species-specific plastid vectors. Chloroplast serves as specialized organelles in DNA recombinant technology of the agronomic behavior in advanced plant groups. It has also been subjected to major research in photosynthesis and phylogenetics of land plants. Chloroplast transformation has been achieved for expression of genes in plants and also causes the transformation events in plants and can be accept it as an ecofriendly approach.

***Keywords*:** Chloroplast, Genetic engineering, RNA editing, Translation, Transgene.

Floating mirrors using Metal Liquid Like Films of Silver Colloidal Nanoparticles

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Abstract

Metal liquid-like films (MELLFs) exhibit metallic luster and the macroscopic properties of a fluid which makes them use as reflecting liquid mirrors. In the present work the attempts are made to fabricate reflecting mirrors using silver MELLF. For MELLF synthesis, colloidal suspension of silver nanoparticles is synthesized using silver nitrate ($AgNO_3$) by chemical reduction using and trisodium citrate ($C_6H_5O_7Na_3$). Structural characterization of silver nanoparticles are carried out using X-ray Diffraction Analysis. The silver colloidal particles are coated with a surfactant 2, 2-bypiridine (surfactant) dissolved in an organic ligand 1, 2-dichloroethane to form the MELLF film. Water based ferrofluids based on magnetite nanoparticles are also synthesized based on co-precipitation. The MELLF film is separated from the solutions and is experimented for use as reflecting mirrors.

Keywords*:* Metal liquid like films (MELLF's), silver colloid, liquid mirrors, X-ray Diffraction

Perfomance Analysis of Machine Learning Algorithms in CreditCard Fraud Detection

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Abstract

Online purchasing using credit has been commercialized quickly for its ease and flexibility of use. With the increase in the rate of online purchasing, fraudulent transactions have also increased with an alarming rate. Credit card fraud detection is a typical model of classification. In this article, we have concentrated on analyzing and pre-processing data sets as well as the deployment of supervised machine learning algorithms such as Decision tree, Logistic Regression, Random Forest, Naïve Bayes on the PCA transformed Credit Card Transaction data. Dataset is collected from Kaggle and it contains total of 2,84,807 credit card transactions that occurred over two days in September 2013 by European cardholders. Each record is classified as genuine (class "0") or fraudulent (class "1"). Specifically, there are 492 fraudulent credit card transactions out of a total of 284,807 transactions, which is a total of about 0.173% of all transactions. Considering the imbalance ratio, the accuracy is not the best metric to measure the performance. The performance is evaluated based on Recall, Precision, F1 measure and MCC (Mathews Correlation Coefficient). The comparative results shows that the Random Forest performs better than other algorithms.

Keywords : Fraud detection; Credit card; machine learning algorithm; Imbalanced dataset; F1measure; MCC.

Impact of Yogic Practices on Balance and Flexibility of College Men Students

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Abstract

The investigation of the study was to find out the impact of yoga practice on balance and flexibility of college men students. The study was formulated as a random group design consisting of one experimental group and one control group. For the randomly selected 30 subjects and pre –test was administrated. They were assigned randomly into yoga practice and control groups of fifteen each. Group I underwent yoga practice and group II acted as control. All the subjects of two groups were tested on balance and flexibility. Analysis of covariance was used to determine the significantly difference existing between pre - test and post - test on balance and flexibility. The result of the study proved that due to the effect of yoga practice improved on balance and flexibility of the students.

***Key words*:** Yoga, balance and flexibility

Covid Symptom Checker

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Abstract

Covid-19 is an irresistible infection brought about by a new found infection called Coronavirus. The spreading pace of this illness is high. There are such countless issues brought about by this illness. Individuals are consistently tense about this sickness. Most of the people are trying to find answers to their health condition through online. Covid-19 symptom checker is an initiative to understand your set of symptoms better and to understand at what level of risk you are at, when it comes to being affected by the coronavirus. We established a machine learning approach that trained on records from 99 tested individuals. Using computerized algorithms, symptom checkers ask a series of questions about their symptoms, and based on the user's responses, provide recommended actions and suggest self-care. The results imply that we can easily recognize whether there is any chance for covid-19 or not. This paper presents a clever thought regarding Covid 19 Symptom Checker and its benefits.

***Keywords*:** Artificial Intelligence, Covid 19 Symptom Checker, Coronavirus.

Isolation and characterization of nitrogen-fixing bacterial strain Hydrogenophaga laconesensis vzmkn and its effect upon growth regulation in Cucumis sativus

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Abstract

The prolonged use of chemical fertilizers has heavily affected the soil fertility resulting in less production of desired food. In order to overcome and have a sustainable development in plant growth the introduction of biofertilizers had shown a positive result among crops. Hence we introduced a new strain of nitrogen bacteria as a biofertilizer. The strain of nitrogen bacteria was isolated and incubated then screening was done. Here we introduced two different pots; a control and test of *Cucumis sativus*. The inoculum prepared from the nitrogen bacterial broth culture was introduced in the test. The comparison between the control and test was done. The result indicated that test showed maximum nitrogen fixing capacity promoting its growth.

Key words : Serial dilution, pouring plate, 16S rRNA screening, nitrogen broth culture

Impact of Covid-19 on Student Engagement in Online Learning

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Abstract

Covid-19 has created widespread impact all over the world. Hence all the educational institution in Kerala were forced to conduct online teaching by making all educational resources available through internet system. This research paper aims at analysing the student engagement and their experience in online learning during covid-19. To understand student's reaction, questionnaires were prepared using Google form based on their psychological conditions, knowledge transfer, time duration, network connectivity speed, and affordability of network devices. The collected data is analysed using Python language in the jupyter notebook and finally the results were presented using bar Figure. The results of the survey show that students were affected by decreasing concentration level, disturbed sleeping habits, laziness, nervousness etc. by the use of mobile phones in learning. E-learning is not a solution for education system but it is a substitute to face to face education amidst this pandemic situation.

***Keywords*:** e-learning, impact of covid-19 in students, survey using Python and Jupyter notebook, learning in pandemic situation, psychological impact in e-learning

Optimal Designing Of Three Stage Chain Sampling Plan With Conditional Repetitive Group Sampling Plan As Reference Plan

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Abstract

This article outline the operating characteristic function and Average Outgoing Quality of three stage chain sampling plan with conditional repetitive group sampling plan as reference plan. Poisson unity value Approach is used to tabulate to facilitate the operation and construction of the plan. The tables are constructed by unity value approach by considering the various combinations of acceptable and limiting quality levels. An example is given for illustration purpose.

***Key Words*:** Three Stage Chain Sampling Plan , Conditional Repetitive group Sampling Plan, Acceptable Quality Level, Limiting Quality Level, Indifference Quality Level and Average Outgoing quality.

A Comparitive Study on the Glycemic Response of Different Cereals Among Diabetic Subjects

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Abstract

The prevalence of pre diabetes known as "impaired Glucose tolerance" is a precursor to diabetes and is 1.4 times higher than the diabetes prevalence. The study comprises documentation of systematic investigations of the selected hundred subjects in the age group of 35-65 years in Thrissur district. A specially designed interview schedule was formulated to elicit the demographic details, medical history, dietary pattern analysis and biochemical profile of the selected subjects. An experimental study was conducted in a micro sample who were supplemented with breakfast recipes made from cereals like rice, wheat and oats and results analysed based on the comparison of their fasting and post prandial sugar values for three consecutive days. A pilot study conducted on less frequently used cereals like corn and ragi (millet) showed that ragi was having a higher glycemic response than corn. The results were statistically analysed using paired't' test. The study showed that there is a significant correlation between the type of cereal consumed and glycemic response. And also proved that rice was a better choice for a diabetic subject compared to wheat.

Keywords: Impaired glucose tolerance, glycemic response, diabetes, cereals

Evaluation of the genotoxic potential of Sodium Potassium Tartrate, a food additive

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ABSTRACT

The current study analyzes the genotoxicity of sodium potassium tartrate using *Allium cepa* as the biological material**.** Onion bulbs were treated with different concentrations of Na-K tartrate viz. 0.01%, 0.1%, 1% and 10%. Control bulbs were treated with distilled water. Toxic effect of Na-K tartrate on the mitotic behavior of Onion was assessed by analyzing its germination percentage, mitotic index, mitotic aberrations and frequency of aberrations. The values of germination percentage and mitotic index were found to be decreased and mitotic aberrations and frequency of aberrations were increased with increasing concentrations of Na-K tartrate. The results obtained indicate that the tested chemical may be a risk to human health and to our environment.

Key words**:** Sodium potassium tartrate, genotoxicity, *Allium cepa*, Mitotic behavior

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I Dr. Sr. Beena Jose, Principal, Vimala College (Autonomous) Thrissur hereby declare that the particulars given above are true to the best of my knowledge.

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Dated : 3 September 2020

Dr. Sr. Beena Jose
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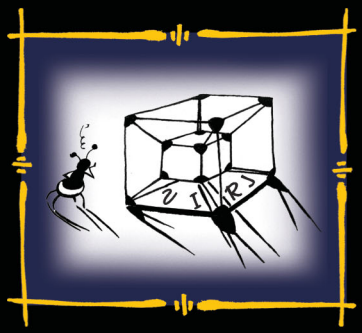

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