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Dec 28-29, 2018


Editors

Dr. Ratnakar D B
Dr. Reddy P B

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Dear Associates

Welcome to each and every one of you congregated for the prestigious IMRF’s 97th International Gathering - Proceedings of the International Academic Research Conference Goa 2018 at Carmel College for Women, Nuvem, Goa organized by Carmel College for Women, Goa and International Multidisciplinary Research Foundation (IMRF), India which is considered to be one of the premier events for the distinguished academic and research cult.

We know that an academic conference is a symposium for inventive academicians and imaginative researchers to give academics an opportunity to present their academic works, concepts and new discoveries and to exchange their ideas and develop their works and also to share idea in presenting for development in the new research and topics and so forth. Together with academic or scientific journals, conferences plausibly provide a central channel for exchange of information among earnest researchers.

IMRF with its Academic Chapters in many Countries, since inception, has a great academic, research and social priorities to promote the spirit of values and orientations in multidisciplinary research functions of education by working out in dexterity required by the integrity of a sophisticated social world order duly transmitting central heritage with scientific bent of mind forming socialization process in respect of reformation of attitudes to confer a serene status for a rational being called man on this civilized planet, of course, from the threshold of Ratna Prasad Multidisciplinary Research and Educational Society.

IMRF has left no stone unturned for the accomplishment of its vision and mission catering its influential services in the academic and research disciplines comprising the streams of Human Rights, Social Sciences, Arts and Education, English Studies, Business Sciences, Engineering Sciences, Mathematical Sciences, Life Sciences, organizing International Conferences humbly witnessing the virtuous presence and innovative presentations of investigating pioneers, potential leaders, promising researchers, intellectual academicians, working faculty, industry magnates, advanced educationists, eminent scientists, rational thinkers, earnest scholars and superior students with their bonafide work of discovery from as many as 50 and more countries in the world (with their recurring presence) including home towards showcasing their professional performance with excellent communication skills based on their accumulated experience in the fields concerned successfully.

Globalization is a fact. Its internalization process integrates multidisciplinary fields to embark on an adventure in the realm of academics and research. As such, this conference by International Multidisciplinary Research Foundation (IMRF). I am pleased to unveil the fact that this Copy of Proceedings marked with ISBN No 978-93-86435-63-7 presents an educative network of research with strength of quality, originality and contribution to knowledge of significant fields of multidisciplinary realms duly identified by the solemn research portals and academic destinations in the world.

While presenting you with this sonata of latest academics and research findings, I humbly place on record my loyal acknowledgement of sincere appreciation, due recognition and heart-felt thanks to all intellectual paper presenters, article contributors, members on the esteemed Editorial Board, centres of higher learning in collaboration with IMRF, foreign-national delegates, erudite plenary speakers, scholarly participants and all those who are directly or indirectly in conformity with this IMRF conferences from home and abroad for their righteous everlasting support in one and all aspects and my sincere thanks to Carmel College for Women, Nuvem Goa for their ever dynamic support and cooperation. Gratitude is attitude!

With effusive thanks,

Dr.Ratnakar D. Bala
Conference Chairman
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Advances in Mathematics,
Engineering & Technology
MATHEMATICAL MODELS & SPECTRA OF GRAPHS

S.A.MARIADOSS

Abstract: A mathematical model is an attempt to describe a real life phenomenon in terms of, an equation/a set of equations, variables & constants.


Deterministic Models:
Example 1: Malthusian Model: \( P_n = P_0 \times (1 + \frac{r}{1000})^n \), where \( P_0 \) = population for year \( n = 0 \), \( r \) = rate of population growth/\( 1000 \). \( b/d \) are number of births/deaths in one year. It is used to predict population after \( n \) years from, base year. Also used in population dynamics. Human/fish population in the sea...

Example 2: The Fibonacci sequence 1, 2, 2, 3, 5, ... is a model to describe how the population of rabbits grow.

Example 3: Finite State Machine (F.S.M./finite Automata)...models of computers...
\[ M = (Q, S, q_0, \delta, F) \]
where
- \( Q \) is a finite set of states,
- \( q_0 \) is initial state,
- \( S \) = finite set of symbols,
- \( \delta: Q \times S \rightarrow Q \) is a transition function that assigns a unique next-state function.
- \( F \) = set of final states, may contain at least one state & a subset of \( Q \).

Example 3': \( Q = \{ q_0, q_1, q_2, q_3 \} \), \( S = \{ 0, 1, 2 \} \), \( F = \{ q_3 \} \), transition function \( \delta \) is given by table;

<table>
<thead>
<tr>
<th>States</th>
<th>0</th>
<th>1</th>
<th>2 (inputs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>q0</td>
<td>q0</td>
<td>q1</td>
<td>q2</td>
</tr>
<tr>
<td>q1</td>
<td>q1</td>
<td>q2</td>
<td>q0</td>
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<td>q2</td>
<td>q0</td>
<td>q3</td>
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<tr>
<td>q3</td>
<td>q2</td>
<td>q3</td>
<td>q1</td>
</tr>
</tbody>
</table>

This finite state machine is \( M \) & its representation is a digraph.having loops & parallel edges..Given a machine \( M \), we can find the language accepted by \( M \)...

Non-Deterministic Models:
Example 2: In the FSM of previous example, if the transition function \( \delta \) is defined as \( \delta: Q \times S \rightarrow \mathcal{P}(S) \), power set of \( S \), then for each pair \( (q_i, s_j) \) \( \delta \) gives a set of next states...that is \( \delta \) is a set valued function & so next state is not-unique...so it is a non-deterministic model.

Example 2: We have probability Models...Non-deterministic also means some amount of Randomness/fuzzyness is inherent in the model. Random process is known as Stochastic Process.

What is “Randomness”?
Problem: Select one number at “Random” from 10 to 99..
Step 1: Give me a name of a flower.
Step 2: Replace let \( a = 1, b = 2 \), etc.
Step 3: Add all digits to get sum=x, this number is random. Suppose Rose is name of flower, \( R = 18 \), \( o = 15, s = 19, e = 5 \), so \( x = 57 \).
This is a Random process...no pre-plan to get number,

What are random numbers? Numbers selected without bias/prejudice...impartial...that is any number is having equal chance to be selected...

How to generate Random numbers?
Method 1. Use random numbers table...select arbitrary row & select...
Method 2. Linear congruence method...seed.method...to generate a set of random numbers...
\[ X(n+1) = a \times X(n) + c \pmod{m} \]
for fixed constants \( a, m, c \) and \( X(0) \) is the initial number...
For example, if \( m = 100, a = 17, c = 5, X(0) = 7 \), then for \( n = 0 \), \( X(1) = a \times X(0) + c = 17 \times 5 + 5 \pmod{100} = 119 + 5 \pmod{100} = 24 \)
\( X(2) = 24, \)
For \( n = 1 \), we get \( X(2) = a \cdot X(1) + c = 17.24 + 5 \mod 100 = 413 \mod 100 = 13 \).

For \( n = 2 \), \( X(3) = 17 \cdot X(2) + 5 \mod 100 = 226 \mod 100 = 26 \).

So random numbers are 7, 24, 13, 26,... are distinct...random numbers are distinct...only if we select constants \( a, m, c \) and initial random number \( X(0) \) are chosen carefully...

**Algorithm:** is a step by step method to find a solution for the problem with a specific purpose.

**Remark:** The linear congruence method is a definite set of steps to get random numbers...in fact it is an algorithm to find random numbers...That means we plan to get random numbers...so it is not random...So at the most we call them as pseudo-random numbers...

**Pseudo random numbers** are numbers that are not exactly random...

**Random Process:** is a method to find random numbers...

**What is a Random Process?**

***

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SOME FUNDAMENTAL THEOREMS
WITH BICOMPLEX AND HYPERBOLIC SCALARS

ROMESH KUMAR

Abstract: In this paper, we develop topological modules over the ring of bicomplex numbers and also discuss Some Fundamental Theorems With Bicomplex And Hyperbolic Scalars of functional analysis in the framework of bicomplex F-modules. We introduce the bicomplex convexity, hyperbolic-valued seminorms and hyperbolic-valued Minkowski functionals in bicomplex modules and give some properties of linear functionals on topological bicomplex and hyperbolic modules.

Keywords: Bicomplex Modules, Hyperbolic Modules, Hyperbolic Norm, Bicomplex And Hyperbolic Linear Functionals.

***
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A TECHNIQUE FOR PARTIALLY SOLVING A FAMILY OF DIFFUSION PROBLEMS

DR AYAZ AHMAD

Abstract: Our aim in this paper is to expose the interesting role played by differ integral (specifically, semi derivatives and semi integrals) in solving certain diffusion problems. Along with the wave equation and Laplace equation, the diffusion equation is one of the three fundamental partial differential equation of mathematical physics. I will not discuss conventional solutions of the diffusion equation at all. These range from closed form solutions for very simple model problems to computer methods for approximating the concentration of the diffusing substance on a network of points. Such solutions are described extensively in the literature. My purpose, rather, is to expose a technique for partially solving a family of diffusion problems, a technique that leads to a compact equation which is first order partially and half order temporally. I shall show that, for semi infinite systems initially at equilibrium, our semi differential equation leads to a relationship between the intensive variable and the flux at the boundary. Use of this relationship then obviates the need to solve the original diffusion equation in those problems for which this behavior at the boundary is of primary importance. I shall, in fact, freely make use of the general properties established for differ integral operators as if all my functions were differ integrable.

Key word: Semi derivatives, semi integrals, Simple model problem, Semi infinite system and porous media.

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KULLBACK-LEIBLER DISTANCE AND STATISTICAL MODEL

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Abstract: Kullback-Leibler distance is discovered in statistical mechanics of the 19th century and is a concept called the relative entropy. In the 20th century, it came to be known that it is an important quantity in statistics and learning theory. We cannot only define it in Euclidean space, but also can expand the concept in general probability distribution. Kullback-Leibler distance is not only important as the concept, but also derive an algorithm. Kullback-Leibler distance is not only an important concept, but also it can derive the algorithm. As for the information science meaning of Kullback-Leibler distance and the relations with the mathematic properties, there exist many unknown structures. We constituted some examples about the pole using a computer algebra system and explored the properties.

Keywords: Kullback-Leibler Distance, Bayesian Statistics.
THE EFFICIENCY OF ARTIFICIAL NEURAL NETWORKS
IN CONTINUOUS DATA MODELING

MONTASIR OSMAN

Abstract: Data analysis such as modeling, clustering, classification and forecasting are greatly improved in the last two decades. Several statistical techniques are developed to update the data analysis requirements. Artificial neural networks algorithms may the most important technique in this regarding. This paper investigated the efficiency of Artificial neural networks, comparing to the Box-Jenkins approach to forecast a time series data. The research data is the annual productivity of wheat and cotton crops in New Halfa project in Kassala state, eastern Sudan, from 1964 to 2017. For each crop, two different models are fitted using these approaches. The results of both crops reveal that the artificial neural networks algorithms are more accurate than the Box-Jenkins method for forecasting crops. The evaluation criteria which used to assess the models are the mean of errors (MSE), the root of mean of errors (RMSE), mean of absolute error (MAE), mean of absolute percentage error (MAPE) and Bayesian information criteria (BIC).

Keywords: Modelling, Forecasting, Neural Networks, Time Series.

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DESIGN AND ENGINEERING OF FIRE PROTECTION SYSTEMS WITH PORTABLE FIRE EXTINGUISHERS IN THE COMPRESSOR HOUSE IN INTEGRATED PROCESSING INDUSTRIES UNDER GLOBAL ENVIRONMENT.

PRABHAT KUMAR DHARA

Abstract: Compressed air is widely used in processing industries and crafts for versatile purposes due to its various technological advantages like safe handling, force accuracy, cleanliness, ease of use, flexibilities, availability, high operating speed, force, etc. It is largely used in automation, paint spraying, shot blasting, Sealing, Packaging pneumatic tooling & conveying, cleaning & polishing, maintenance, sanding, mixing, grinding processing and its control, etc depending on the type of industries. General duty compressed air and also dry air (Instrument quality) are directly used for production and also its associated unit operations and activities. Therefore, safety of compressor house in respect of fire incidents is mandatory. In this paper, a compressor house with the specified dimensions (70m X 20m) has been considered to be provided with the fire protection systems with portable fire extinguishers. Compressor house consists mainly with compressors, driving motors, diesel engines, cooling water systems, air dryers, air receivers, piping, valves, accessories, motor control rooms, control panels, electrical cablings, computer and ups rooms, office and store room and other associated premises and all these equipments and premises are involved with different kinds of fire hazards. Design, distributions and installations of the fire extinguishers have been made generally in conformity with the requirement of IS: 2190-2010 and other statutory provisions. Locations and installations of the extinguishers have been made in such a way that extinguishers can be accessed within a radius of 10m from any point of the floor of the premises. All compartments have also been provided with minimum four no of extinguishers in each for its protections. Extinguishers have been installed near exit and doors and at a minimum height of 750 mm as per the design standards and ergonomic requirement. Considering the classes of fire and type of hazards and its potentialities, dry chemical powder (DCP) and Carbon di-oxide (CO) type fire extinguishers along with fire buckets (sand) have been provided as first-aid devices provided for immediate use on fires in its incipiency and are effective only at the initial stage. Incidents of fire not only hamper the production but also cause loss of life and properties and pollute the environment. Therefore, fire incidents need to be prevented and in case of incident, the same need to be extinguished at its early stage to minimize the losses.

Keywords: Fire Hazards, Extinguishers, Compressors, Flammability.

***

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**URBAN WATER CONSERVATION-LEARNING FROM THE PAST: COMPARATIVE STUDY OF URBAN WETLANDS AND MAN MADE WATER BODIES**

**AR SHAMA PARWEEN, AR NAZISH ABID**

**Abstract:** Through the ages, environmental factors like water, topography and vegetation has influenced man's choice for settlement. Wetlands and water bodies have played crucial role in stemming the human society and have sculpted the human settlements time and again around the world. This dynamic system of water bodies which has been in a constant interaction with cities has contributed in the morphology of cities, its activities and socioeconomic well-being. Urban wetlands have acted as major spine of Indian cities since thousands of years nurturing and feeding millions relentlessly. These water bodies have shaped the cities and societies imbibing rich cultural and religious values to people inhabiting them. It have been observed that, settlements which were not located near or large lakes, humans have constructed tanks or retention ponds to collect and store water from water shed. The rain water was collected and stored during monsoon and used during dry seasons. Presently about 330 million people in India are facing regular water shortage. In 2016, 300 districts spread across 13 states in India, suffered from acute shortage of drinking water. In this paper, various urban wetlands and manmade water bodies in 4 Indian cities have been discussed for understanding the importance of water bodies with respect to the urban life through various determinants. The cities selected for study are Bundi, Bangalore, Hampi and Chandan Nagar. The aim of this research paper is to study the various traditional water conservation techniques used in these 4 cities and to come up with a solution for present day urban water crisis, prevalent in most of the country.

**Keywords:** Urban Wetlands, Water Bodies, Water Conservation, Urban Water Crisis.

***

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DISCRETE CUBIC SPLINE TECHNIQUE
FOR ONE DIMENSIONAL BRATU'S PROBLEM

POOJA KHANDELWAL, TALAT SULTANA

Abstract: In this paper, discrete cubic spline method based on central differences is developed to solve one dimensional Bratu's problem. Convergence analysis is briefly discussed. Numerical examples are given to demonstrate the efficiency of the presented method. Comparisons are made to confirm the reliability and accuracy of the proposed technique.

Keywords: Discrete Cubic Spline, Numerical Method, Convergence Analysis, Bratu's Problem, Truncation Error.

2010 Mathematics Subject Classification: 34B15, 65D07.

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MELTING POINT DEPRESSION OF NANO-SOLID

SEEMA

Abstract: Melting temperature at the nano scale is analyzed using different melting models like Pawlow theory, Liquid drop model, Homogenous growth model, Heterogeneous growth model, Liquid nucleation growth model, Liquid shell model, Homogeneous melting growth model, Surface phonon instability model, Gibbs Thomson equation, Bond order length strength model, Homogeneous melting hypothesis, Liquid skin melting model, Reiss melting model, Rie melting model and Semi-empirical model. Due to large surface to volume ratio nano solid show melting point reduction. Melting temperature of the Al, Si, Pb and Au nano particles is calculated using Liquid drop mode, Gibbs Thomson equation and Surface phonon instability model. Experimental value of Al is in with reasonable agreement with the Gibbs Thomas equation and for Si it is in agreement with the Surface phonon instability model. Pb shows the agreement with the liquid drop model where Ag and Au show significant difference with the experimental value. All models predict the melting temperature of the nano solid and the simple solution should be preferred.

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REPLICATION OF DATA IN DATABASE SYSTEMS FOR BACKUP AND FAILOVER

P. SWATHI, V. SRUJANAMMA

Abstract: The production database are transactions intensive transactions can be insert, update on the tables, failover is the replica of the production server, if there is any change we have to implement on the production and it will be automatically implemented on failover or standby database. Now a days the data on the production server is increasing and we need extra storage space on production server to keep data and this is same required on the failover. To generate reports from that data will increase load on the production server and can affect the performance of the server. There are also some threats which can cause loss of data from which we have to protect our database like Hardware failure, loss of machine. Replication is one of the methods for Backup of the running database and its immediate failover during failure. This paper tries to identify some parts for the replication techniques, failover, and transaction states.

Keywords: Asynchronous, Active, Commit, RAID, Rollback, Synchronous.

***

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A MULTILEVEL ANALYSIS TO SHOW THE LINKAGE OF STI AND GENITAL ULCER AMONG WOMEN WITH NUMBER OF SEX PARTNERS

SAMPURNA KUNDU, ISHITA PAL

Abstract: "Sexually transmitted infections (STI) are infections that are commonly spread by sexual activity, especially vaginal intercourse, anal sex and oral sex." On the other hand, "a genital ulcer is located on the genital area, usually caused by sexually transmitted diseases such as genital herpes, syphilis, chancroid, or Chlamydia trachomatis." These are associated with increased transmission of HIV, and poor reproductive and sexual health. These diseases are more dynamic than other infections prevailing in the community and it is important to acknowledge and keep track of these diseases in a vast and populous developing country like India, particularly in this HIV era. According to research reports, young people (male and females) who have sex with multiple partners or have sex with a partner that has many sexual partners, and gay and bisexual men are at a greater risk to have STI than others. In this paper, we critically examine the association of STI and Genital Ulcer with number of sex partners at State and District level of India.

The basic objective of this study is to study the how women who has STI and genital ulcer in the past one year, during the NFHS-4 2015-16, related with their total number of sex partners.

To fulfil our objective, we took help from the fourth round of the National Family Health Survey (NFHS), a large-scale survey conducted during the period 2015-16 under the supervision of the Ministry of Health and Family welfare (MOHFW), where the International Institute for Population Sciences (IIPS) Mumbai served as the nodal agency. The women's file of NFHS-4 has been specifically used for the analysis.

A case-control odds ratio analysis and a multi-level mixed effects logistic regression analysis has been done taking whether the women had STI or not and also whether she had genital ulcer or not as the dependent variables. The total number of sex partners has been treated has the independent variable and also the exposed variable. A spatial analysis is carried out to check the distribution of these women with STI at state level as well as district level, using dot map at state level and graduated color map at the district level.

From the spatial analysis it is found that mainly in the states of Haryana, Punjab and Goa there is more prevalence of STI. The Bijapur, Chitradurga and Bidar districts of Karnataka, Sirsa, Yamunanagar, Kaithal and Panipat district of Harayana, Kishhtwar district of Jammu and Kashmir, are some of the districts where STI is highly prevalent. The case-control study suggests that the odds of developing STI among women who are exposed i.e. having more sex partners is 6.45 times more than women who are unexposed. The chi-square test which has the null hypothesis as H0: odds of developing STI is same for both the exposed and the unexposed women is rejected at 5% level of significance, showing that the odds of developing STI is not the same for the exposed and unexposed group of women. Similarly, the odds of developing genital ulcer is 5.87 times more for the exposed women. The, chi-square test which has the null hypothesis as H0: odds of developing genital ulcer is same for both the exposed and the unexposed women is rejected at 5% level of significance, showing that the odds of developing genital ulcer is not the same for the exposed and unexposed group of women. The mixed effects logistic regression at state level shows that as the number of sex partners increases by one unit, on an average the odds of developing STI increases by 6.66 times and at the district level as the number of sex partners increases by one unit, on an average the odds of developing STI increases by 6.3 times. Coming to the multi-level analysis of genital ulcer, we find from the mixed effects logistic regression model at state level that as the number of sex partners increases by one unit, on an average the odds of developing genital ulcer increases by 6.03 times and at the district level as the number of sex partners increases by one unit, on an average the odds of developing genital ulcer increases by 5.83 times.

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SOLVING INTUITIONISTIC FUZZY SOLID TRANSPORTATION PROBLEM VIA NEW RANKING METHOD BASED ON SIGNED DISTANCE: NECESSARY MODIFICATIONS

AKANSHA MISHRA, AMIT KUMAR

Abstract: Aggarwal and Gupta (International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems Vol. 24, No. 4 (2016) 483-501) pointed out the flaws of some existing method for ranking Generalized Symmetrical Trapezoidal Intuitionistic Fuzzy Numbers (GSTRIFNs) and proposed a new ranking method based on signed distance for the same. Aggarwal and Gupta also proposed a method for solving Intuitionistic Fuzzy Solid Transportation Problem (IFSTP) based on the proposed ranking method. It is well known fact that the ranking function of GSTRIFN should depend upon the degree of membership as well as degree of non-membership. However, the ranking method proposed by Aggarwal and Gupta is independent of the degree of membership and degree of non-membership. In this paper, the required necessary modifications in the ranking method, proposed by Aggarwal and Gupta, are suggested to resolve the above mentioned flaw.

Keywords: Intuitionistic Fuzzy Number, Signed Distance, Solid Transportation Problem.

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A NOTE ON “AN INTERVAL TYPE-2 FUZZY LINMAP METHOD WITH APPROXIMATE IDEAL SOLUTIONS FOR MULTIPLE CRITERIA DECISION MAKING

ARSHDEEP KAUR, AMIT KUMAR

Abstract: Chen (Inform. Sci. 297 (2015) 50-79) proposed the normalized version of the Minkowski distance between two interval type-2 trapezoidal fuzzy numbers and showed that the city block distance is a particular type of Minkowski distance. Chen also proposed a LINMAP (linear programming technique for multidimensional analysis of preference) method based on proposed Minkowski distance as well as a LINMAP method based on proposed city block distance for solving MCDA (Multi criteria decision analysis) problems within the interval type-2 fuzzy number environment. Furthermore, Chen solved an existing supplier selection problem by their proposed LINMAP methods. In this note, it is shown that the Minkowski distance as well as city block distance, proposed by Chen, are not valid in their present form and hence, the LINMAP methods, proposed by Chen, are also not valid in their present form. Also, the modified version of Minkowski distance and city block distance between two interval type-2 trapezoidal fuzzy numbers are proposed. Furthermore, using these modified distances the exact results of a supplier selection problem, chosen by Chen, are obtained.

Keywords: LINMAP, Multi Criteria Decision Analysis, Interval Type-2 Trapezoidal Fuzzy Number, Supplier Selection.

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ON THE DIOPHANTINE EQUATION \((p^k - 1)^x + (p^k)^y = z^2\)

GAWKHARE MAHESH

Abstract: In this paper, we apply Catalan’s conjecture to find the solutions of the titled equation when \(p = 2\) and \(p = 3\), where \(x, y, z\) are non-negative integers and \(k\) is a positive integer.

Keywords: Diophantine Equations, Exponential Diophantine Equation.

***

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MULTI-TIER SUSTAINABLE GLOBAL SUPPLIER SELECTION USING A FUZZY AHP-VIKOR BASED APPROACH: A DISCUSSION

SHAHID AHMAD BHAT, AMIT KUMAR

Abstract: Awasthi et al. (International Journal of Production Economics, 195 (2018): 106-117) used an integrated fuzzy AHP-VIKOR approach-based framework for sustainable global supplier selection. In this approach the fuzzy analytic hierarchy process (FAHP) is used to generate criteria weights for sustainable global supplier selection. To do the same Awasthi et al. have transformed the fuzzy pairwise comparison matrix into a crisp pairwise comparison matrix and then the crisp AHP is applied on the transformed crisp pairwise comparison matrix. After a deep, study it is observed that Awasthi et al. have transforming the fuzzy pairwise comparison matrix into the crisp matrix, but the transformed crisp matrix will not be a crisp pairwise comparison matrix and hence the crisp AHP approach cannot be used. Therefore, the approach, proposed by Awasthi et al., is not valid in its present form. Keeping the same in mind, the required modification is suggested for its validity.

Keywords: Analytic Hierarchy Process, FAHP, Pairwise Comparison Matrices.

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MODIFIED METHOD FOR SOLVING NON-LINEAR PROGRAMMING FOR MULTI-CRITERIA DECISION MAKING PROBLEMS UNDER INTERVAL NEUTROSOPHIC SET ENVIRONMENT

AKANKSHA SINGH

Abstract Garg and Nancy (Applied Intelligence, 2017, https://doi.org/10.1007/s10489-017-1070-5) proposed a non-linear programming (NLP) method for solving interval neutrosophic multi-criteria decision making (INMCDM) problems (decision making problems in which rating value of each alternative over each criteria is represented by an interval neutrosophic set). In future, other researchers may use the same method in their research work as well as for solving real life INMCDM problems. However, after a deep study, it is observed that Garg and Nancy have used some mathematical incorrect assumptions in their proposed method. Therefore, it is scientifically incorrect to use this method in its present form. Keeping the same in mind, the method, proposed by Garg and Nancy, is modified.

Keywords: Neutrosophic Set, Interval Neutrosophic Set, Non-Linear Programming Model, Multi Criteria Decision-Making, TOPSIS.

***

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SOME FIXED POINT AND INVARIANT APPROXIMATIONS RESULTS IN CONVEX METRIC SPACES

SUMIT CHANDOK, T.D. NARANG

Abstract: The purpose of this paper is to prove some results on fixed points, common fixed points and invariant approximations in convex metric spaces. The results proved extend and generalize various known results on the subject.

***

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MOLYBDENUM SULFO-SELENIDES ALLOY FOR SODIUM-ION BATTERIES: FIRST-PRINCIPLES CALCULATIONS

ARCHANA SHARMA, MOHD. SHAHID KHAN, MUSHAHID HUSAIN

Abstract: Due to the increasing energy storage demands, rechargeable non-lithium ion batteries (NLIBs) are becoming popular. However, the key challenge is to search for suitable anode materials for serving as battery components of NLIBs [1]. In this study, we have explored the electrochemical performance of single layer molybdenum sulfo-selenides alloy for sodium (Na) ion batteries using DFT implemented Vienna ab initio simulation package [2] within GGA approximation. Na-ion migration, theoretical capacity and open circuit voltage are calculated with respect to different atomic configurations. The stable adsorption sites of single Na atom are found to be top site of Mo coordinated with 3 S atoms (Site 1), while the least stable is top site of Mo coordinated with 2 Se atoms (Site 6). The various possible adsorption sites are shown in Fig. 1 along with their corresponding adsorption energies. Adsorption of Na atoms on both sides of alloy is considered, where capacity is calculated by adding Na atoms to the sites in descending order of their stability, leading to multi-layer adsorption, and yielding the theoretical storage capacity of 375 mA h g⁻¹, as shown in Fig. 2. The theoretical specific capacity of the anode is calculated using:

\[ C = \frac{x_{\text{max}} nF}{M_{\text{anode}}} \]

Where \( x_{\text{max}} \) represents total number of adsorbed Na ions, \( n \) is number of valence electrons (\( n=1 \) in case of Na), \( F \) is the Faraday’s constant (26,801 mA h mol⁻¹), and \( M_{\text{anode}} \) is the molar weight of the anode material. The calculated average open circuit voltage is 0.73 V during sodiation process, which belongs to low voltage window and hence suitable as anode material.

![Fig. 1: Adsorption Energy of Na atom on Various Sites](image1)

![Fig. 2: Side view of Adsorbed Molybdenum Sulfo-Selenides with Na Atoms](image2)

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HIGH PERFORMANCE THIN LAYER CHROMATOGRAPHY (HPTLC) FINGERPRINTS OF ESSENTIAL OILS OF \textit{THYMUS SERPYLLUM} L. AND \textit{ORIGANUM VULGARE} L. PLANTS GROWN AT MIDDLE HILL CLIMATIC CONDITIONS OF WESTERN HIMALAYAS

SHWETA GOYAL, HEMANT.K. PANDEY, ANJALI KUMARI, N.S. BHANDARI, MADHU BALA

**Abstract:** Medicinal plants have been used from ancient times but there are no standardized and authentic data about the phytochemical constituents present in these plants. Owing to the therapeutic as well as economical utility, the standardization of the phytochemical constituents in the medicinal plants is of utmost importance. HPTLC fingerprinting is an important tool for the chemical imaging of the distribution of the compounds within the matrix of the plant. The chemical portrait obtained from the fingerprinting helps in better understanding of the growing capacity of the plant in selected environmental conditions and determines whether the chemical phenotype obtained in fingerprinting pattern are useful or not. In this study, the modern analytical technique i.e. HPTLC has been used for the fingerprinting and identification of the essential oils of two therapeutically important aromatic plants i.e. \textit{Thymus serpyllum} L. and \textit{Origanum vulgare} L. of Lamiaceae family, grown at DIBER field station, Pithoragarh in open and green house conditions. The TLC plate was developed in twin trough glass chamber saturated with toluene: ethyl acetate (9.3:0.7v/v) at room temperature (25 ± 2 °C). The TLC chromatogram before derivatisation showed a single intense band (Rf 0.56 ) under UV 366 nm in all the samples suggesting it to be the major compound but when derivatised with vanillin sulphuric acid, the essential oil of \textit{Thymus serpyllum} L. and \textit{Origanum vulgare} L. grown in open fields showed 4 intense colourful bands while, essential oil of both the plants grown in green house showed 5 intense colourful bands representing total number of terpenoid constituents present in the essential oils of the plant. These fingerprint pattern can give information on purity of the oils which can be used in various herbal formulations. Further identification and quantification of terpenoid constituents present in these essential oil is in progress.

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PHYTOCHEMICAL EVALUATION AND GC MS PROFILING OF BIOACTIVE COMPONENTS PRESENT IN CAMELINA SATIVA L. LEAVES

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Abstract: Background: Camelina sativa L. is a well known oil seed crop and also gaining attraction of various researchers as a source of biofuel. It is not only just an oilseed crop but its leaves have many bioactive components present which has been not investigated and analysed so far.

Objective: The present study is aimed to evaluate the phytochemical constituents and characterization of various bioactive components present in Camelina leaves.

Material and Method: In the present article, spectrophometric method was used to analyze phenolic and flavonoid content of the leaves. GC MS spectroscopy was studied to identify chemical constituents of methanolic extract of leaves. It was performed on GC MS equipment [GC–MS QP-2010 model (Shimadzu Scientific Instruments, Kyoto, Japan equipped with a CombiPAL AOC-20i+s auto sampler (CTC Analytics, Zwingen, Switzerland)].

Results: Result revealed the presence of phenolics content in various polar extract of Camelina sativa leaves, FRSA activity was also reported in each solvent extract. GC MS report shows the presence of almost 65 compounds in the methanolic extract but only 14 compounds are in noticeable amount.

Conclusion: From the results, it can be concluded that the leaves of Camelina contains many phytoconstituents which are neutraceutically important and leaves can be recommended as pharmacological applications.

Keywords: Camelina sativa, Methanol, GC MS, Phytochemicals, Polar solvents.
APPLICATIONS OF FOURIER ANALYSIS IN MUSIC, USED TO DECOMPOSE A SONG 'DANCING ON MY OWN' BY 'CALUM SCOTT'.

DIVYA MAHESH

Abstract: This paper discusses the relationship between Fourier series and music. It gives a brief introduction to music theory, covering the concepts of the note, harmony, chord and fundamental frequency. Through the course of the paper, the various connections between the Fourier series and music are discussed; including the roots of the relationship, how the Chinese solved the problem of equal temperament, as well the mystery behind the ‘clang’ in the Beatles’ song ‘A hard day’s night’. The main reason behind choosing this topic was to understand the connection between mathematics and music and investigate where exactly mathematics and the fourier series can be applied. The fourier series is used extensively in song and chord analysis, and is definitely a boon to the music world. The author’s study was conducted on the waveform representation of the song ‘Dancing on my own’ by Calum Scott. The background music in the song consists mainly of a repetitive keyboard sequence. To analyse the song and derive its Fourier decomposition, the software called ‘Audacity’ is being used. It is a sound editing software that creates a waveform representation (an amplitude vs time graph) of an audio file. The equation of the wave in consideration was determined, after which its Fourier decomposition was derived. To compute larger values in the Fourier series, MathLab version 2014 was used.

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EVALUATION OF AN EFFICIENT DESIGN OF EXPERIMENT FOR HIGH-DENSITY APPLE PLANTATION.

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Abstract: A relative horticultural experiment is a methodology for gathering logical information methodically to boost the possibility of testing a research hypothesis accurately. In this regard a comparative study of the two complete block designs viz. CRD and RCBD were held on the Yield data of High-Density Apple viz. Gala Redlum maintained at HDP Plate-I of SKUAST-K, Shalimar. The overall efficiency of RCBD over CRD was assessed utilizing elongated blocks in a North-South direction and separately taking 1, 2 and 3 plants as the test unit. The units were grouped based on their Trunk Cross-Sectional Area, and consequently was the criterion for blocking. The designs were evaluated utilizing 3 replications and 9 theoretical treatments.

Keywords: High-Density, RCBD, CRD, Efficiency, MSE, Coefficient of Variation.

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ENHANCING XML KEYWORD SEARCH APPROACH XDMA
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Abstract: The XML keyword search approach using Dual indexing and Mutual summation based Algorithm XDMA has been designed and developed to be an effective approach for keyword search that is considered to be an effective information discovery from data-centric XML datasets. XDMA primarily focuses on solving four possible keyword ambiguity problems to extract the most appropriate information from the XML datasets. Also, XDMA finds the ranking of retrieved information. However, query processing in XDMA has a significant overhead when compared with other XML keyword search approaches like XReal. The efficiency of the dual indexing and mutual summation based keyword search algorithm XDMA, to some extent, depends on the size of datasets and the type of keywords in queries. Furthermore, XDMA is not applicable to document-centric XML datasets. XDMA is not well suited for Boolean queries and proximity queries. In this project, the query processing technique of XDMA is enhanced so as to address the above mentioned drawbacks. The enhanced XDMA will be an effective and efficient keyword search approach for XML datasets.

Keywords: Keyword Search, XML Datasets, Dual Indexing, Mutual Summation, XDMA.

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MODELING ELASTIC-PLASTIC STRESS IN BORON-ALUMINUM AND GRAPHITE MAGNESIUM FIBER REINFORCED COMPOSITE SPHERICAL SHELLS

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Abstract: Elastic-Plastic stress analysis of spherical shells subjected to internal pressure is of much significance in the theory of structural components. This paper considers the study of elastic-plastic stress distributions in orthotropic spherical shells made of composite materials subjected to internal pressure. The elastic-plastic stresses are calculated using Seth’s Transition theory, which considers the non-linear character of elastic-plastic deformation. The material parameters have been taken from available literature. The results of analytic solution are plotted graphically. It is observed that the orthotropic composites required high levels of pressure for initial yielding. It is concluded that stress concentrations are higher close to the inner surface of the shell and the values diminish as we approach the outer layer of the shell.

Keywords: Composite Materials, Stresses, Orthotropic materials, Seth’s Transition Theory, Spherical Shell.

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CONTENT BASED COLLABORATIVE FILTERING FOR DIGITAL LIBRARIES USING BOOK RECOMMENDATION ALGORITHM

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Abstract: A personalized content based and time sequence information collaborative filtering recommendation algorithm to improve book recommendation. The main contribution of our methods is that it combines students learning trajectories with content and time-sequence-based collaborative filtering recommendation algorithm in order to increase recommendation accuracy rate. The greatest advantage of our method is that it combines knowledge learning systems of college students in different majors, providing a new way for universities book recommender systems. Definite time sequence regularity exists in the borrowing process. Integrating time series information into the traditional book recommendation algorithm plays an important role in improving the accuracy of book recommendations. The content-based information can provide reasonable and effective book recommendation for the readers who are about to learn some knowledge.

Keywords: Content Based Collaborative Filtering, Book Recommendation, Sequence-Based, Algorithms.

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GUIDE TO MEDITATION

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Introduction: Modern life is full of activities and everyone in work place are in a state of stress. The symptoms are high blood pressure, insomnia, headaches, increase of acid in the stomach and the vascular disease. In short, stress in excess is harmful. Meditation is a boon to deal with stress and strain. The medium for meditation is SILENCE, in this world full of noise, we aim at seeking silence that is even free of the inner chatter that goes on in our minds.

Meditation is Timeless: suitable to all times and is relevant even at modern times.

Meditation is Ageless: suits any age group, old or young. Universal

Meditation is a Universal medicine (panacea), for many illness of the mind/body.
The concept of Medical Meditation is due to Dr. Dharma Singh Khalsa M.D. When we meditate, we take one yogic posture, depending on the illness corresponding to the chakra. For example, for thyroid problem corresponding to 5th chakra, he suggested Gyan mudra with meditation for 11 minutes.

Three aspects of Meditation:
Silence, Stillness and Simplicity:
i) Silence: to calm the wandering thoughts.

ii) Stillness: to control the desires.

iii) Simplicity: to let go the ego and to be humble. Keep your vessel empty. If it is already full, you can not receive further.

Buddha's example: One day Buddha went to beg on the street, where Buddha’s palace was. His wife told her son, to ask for his property. And when Buddha came to his home his son asked for his share of property. But Buddha gave him his empty begging vessel. This is letting the ego out.

The tradition of Meditation goes back to 2500 years.
The saints, sages and yogis in the Himalayas and Buddhists, Sufi saints like poet Khaleel Gibran have meditated.

The Christian Monastic Traditions existed from the time of St. Dominic, St. Benedict, St. John Cassian, (5th century), the Desert fathers and sisters, St. Ignatius of Loyola, the mystics saints like St. John of the Cross and St. Theresa of Avila: “The dark night of the soul” has a spirituality on its own. The 14th century classic "The Cloud of Unknowing" is a spirituality that is similar to that of St. John of the Cross. The carmelite spirituality.

Fr. John Main (1926-1982), a Benedictine meditation.

Purpose of Meditation: is to increase the quality of your life; to have joy-peace-bliss and to have the divine touch; to long for the divine and to long for the truth. This longing is itself is joy and it is a seed to grow and to blossom.

And to bloom an environment is required and to go closer to God and to find the divine inside you.

Ordinary Benefits: better concentration/ higher level of creative/ innovative thinking; blood pressure reduces; heart-beat shows down....you are relaxed... 

Atmosphere/requirement for Meditation:
1. Set aside a time for Meditation everyday: 20mts in morning and evening.
2. Be optimistic....if there is a single person who experienced divine bliss - you too can experience it...
3. Make some changes: talk as little as possible...

The benefits of SILENCE:
a) you save energy.
b) Disconnect with others and be alone...
Make a sincere effort to stop the chattering that goes inside you—the self-talk, if it is stopped, you can have a calm mind.

How to Meditate?
1. Sit comfortably on a chair (or in lotus position)—sit with your back straight.
2. Sit still with both feet touching the ground, and left palm resting on the right palm and keep hands around the navel.
3. Close your eyes and keep them gently closed.
4. Feel your face muscles and other muscles in your body will begin to relax.
5. Concentrate on your breathing: breath in slowly. 1, 2, 3, 4, 5 breath out slowly. 5 counts. 1, 2, 3, 4, 5 focus your attention on your nostrils...
6. When you realize your mind wanders, come back to your breathing...
7. After 10 minutes, slowly open your eyes.

What happens during Meditation?
1. We enter into our subconscious mind. You may ask why to enter into the subconscious. Any one who achieved greatness in life had lived the life to the full or utilized his mind fully: both conscious and the subconscious mind.
2. The process is to purify the mind just by breathing; breathe in 'oxygen' and breathe out 'carbon-dioxide'. Body purifying by 'breathing'. It purifies the blood and accelerate circulation, from toe to head. If there is insufficient blood supply to the brain, people get "stroke". Mind purification consists in reaching a thoughtful state.
3. Brain waves are measured by number of cycles/minute. When the five senses are at work, brain is in beta-state: 13 to 18 cycles/min. If we remove sensory-stimuli, and enter "silence", we reach Alpha-state with 7 to 12 cycles/minute. It is the purest state of mind, like that of a child 2-7.
4. Lymph-nodes are activated by a special breathing pattern 1:4:2—in:hold:out.
5. It delays the ageing process, by increasing the cortical thickness of hippo-campus, a part of the brain. And you be young for all the times.

How to reach Alpha-state? Methods are
Eastern: i) yoga—takes years of practice
Western: ii) Bio-feedback—very costly, everyone cannot afford...
Universal iii) Meditation—natural method—requires minimum time and effort...

How to Purify The Body?
If you are angry, it goes and accumulates in some part of your body...it will become a block...recent studies show that out of 100 illness 50 of them are not of the body but of the mind.
a) Exercise will reduce the blocks. Exercise is important for the body, because all the elements of the body is made to expand with exercise. When your lungs are filled with oxygen and all the carbon dioxide is thrown out, impurities are cleaned out.
b) You've to nourish the body: Be careful about your diet and what you eat. Do not eat much as to make you lethargic. Your food, your diet should create energy. After you eat you should feel refreshed and energized (not to give you excitement that can cause imbalance)

How to Purify Your Mind?
Three major impurities are money, sex and power. Thoughts of dishonesty, cheating are minor, but money, sex and power are major impurities. What is a pure thought? Truth, beauty and goodness. Pure thought focus on these 3 states. Find time to think of truth, goodness and beauty.

How to Purify your Emotions?
Focus your attentions to 4 antidotes for impure emotions.
a) Friendliness, b) compassion, c) cheerfulness and d) Gratitude
To understand this think opposites: 1) Enmity and hatred 2) Cruelty and Violence
3) Sadness, anguish and misery and ingratitude.

a) The foundations of friendliness is LOVE... awaken the centre of friendliness by not missing any opportunity to do something, without expecting anything in return. When you to do those acts of love everyday, it will activate love-centre in our personality. This will speed up the process of meditation tremendously.

b) **Compassion**: life is short far us humans---it is better to have compassion for the other person. Everyone has so much of pain and suffering, a little compassion will comfort the other and add to the friendliness.

c) **Cheerfulness**: Life must be transformed in to laughter. A person who enters Meditation in this space will move faster like an arrow-the further you want to go the lighter the arrow must be. The biggest burden is your misery, your sadness, your enmity. You become lighter if you leave this burden.
Make your life into a song, it can be filled with joy, life can be a cheerful music.

d) **Gratitude**: it is divine. In the present days, gratitude is a lost virtue.Your body is an amazing and greatest of miracles. Be grateful to your body. Be happy for the sun, the moon, and all things in nature...Find ways to develop gratefulness and your meditation deepen .. your life will become a wonderful one.

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RETURN ON NET WORKING CAPITAL AS A DIRECT MEASURE OF PROFITABILITY – AN EMPIRICAL APPROACH

DR. RAVICHANDRAN KRISHNAMURTHY

Abstract: The extant literature on working capital management of firms used three significant categories to establish the relationship between liquidity, efficiency and utilization aspects of working capital [independent variables] with profitability of the firms [dependent variable]. None of the available metrics of working capital management is directly related with the profitability of the firms. This paper considers Return on Net Working Capital (RONWC) as the dependent variable and cash conversion cycle, number of days of inventory, number of days of accounts receivables, number of days of accounts payables as independent variables and firm size, sales growth and debt to total assets as the control variables used to measure the relation between the firm’s profitability measure, RONWC and working capital management using fixed effects model for the sample of non-financial Indian firms for the period 1997 to 2016.

The Researcher applied fixed effects model and found a negative relationship between RONWC and cash conversion cycle & number of days inventory (supportive of the previous studies Deloof, 2003). Also relationship of cash conversion cycle and number of days’ inventory with RONWC is statistically significant while the relationship of number of days’ receivables and payables with RONWC is not statistically significant.

Keywords: Working Capital Management, Return On Net Working Capital, Profitability, Cash Conversion Cycle, Fixed Effects Model.

JEL Classifications: G32, M21, H21.

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INTERTWINING ETHICS INTO CLIMATE CHANGE: ISSUES AND CHALLENGES

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Abstract: Climate change has emerged as the greatest challenge for the global economy. The UNDP has declared Sustainable Development Goals (SDGs) which are mandatory for all the countries; developed or developing. Sustainable development is a principle which involves “care of posterity” (Perman, 2003) and, by definition, requires avoiding wasteful uses of scarce resources. Sustainable development is a normative concept which involves trade-offs among various objectives and which satisfies the requirements of sustaining the integrity and viability of the overall system. Further it has the ethical imperative of equity within and between generations which goes beyond the mere satisfaction of basic human needs of masses. This paper therefore brings out the ethical aspect of the problem of climate change along with the complexities involved in it with reference to India. Further it throws light on the major climate negotiations worldwide. And finally it offers some suggestions to mitigate the climate change for India with a special focus on vulnerable sections of the population.

Keywords: Climate Change, Sustainable Development, Ethical Issues, Carbon Emissions, Adaptation, Mitigation.

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‘PETRO-YUAN’: A GAME CHANGER IN THE PETRODOLLAR WORLD ORDER

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Abstract: With an annual trade value of $14 trillion, crude oil is the world’s most traded commodity. Since the mid-1970s, all oil market transactions have been conducted in the US dollars, as a result the term ‘petrodollar’ was coined. Petrodollar is any U.S. dollar paid to oil-exporting countries in exchange for oil, and it has been an infallible means of transaction for the past 4 decades. However, for the first time, the petrodollar dominance is being challenged. China, the world’s largest importer of crude oil, is embarking on an ambitious plan to reshape the global economy by overpowering the petrodollar with its own ‘Petro-Yuan’. The topic has the potential to subvert the existing geopolitical landscape as it marks the beginning of a new petro-monetary era. The Chinese Yuan may topple the US dollar as the world’s leading reserve currency. With the help of various government publications, research papers of individuals & international agencies and news articles, this paper attempts to study the feasibility of the ‘Petro-Yuan’ as a possible contender for global petro exchange currency considering both pros and cons against the backdrop of the current international macroeconomic environment.

Keywords: Petro-Yuan, Petrodollar, Crude Oil, Reserve Currency.

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IS INDIAN MILK-MAN IN DOMAIN OF DISTRESS IN THE POST-GLOBALIZED ERA?

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Abstract: In India, after a huge success of green revolution in 1960s, India achieved a status of self sufficiency in the production of food grains particularly wheat and rice, where it remained as an exporter of food grains. After this, Indian government took one program viz; “Operation Flood” under the National Dairy Development Board (NDDB) in 1970, with the help of forward and backward linkage of supply chain formed “National Milk Grid” and ensured high producer’s share in consumer rupee which resulted into ‘White Revolution’. Though India has achieved the status of highest milk producer in the world, there is a grave crisis underway in the Indian milk market which is threatening to undermine the multifunctional role of livestock and the way of life of entire dairy community. At domestic and global level, demand for milk has decreased down but the supply is more. Dairy processors are competing with each other to sell milk at extremely low prices in cities. In order to compete in global market & create additional demand for Indian dairy products, it has pressurized the Indian milk producers to reduce the prices to the lowest. This is also a result of heavy subsidy granted to milk producers in European nations. A large number of these producers are small and marginal farmers, whose livelihood depends only on selling milk. Some stringent steps need to be taken for securing interest of stakeholders particularly small and marginal milk man. In this paper, researcher made a small attempt to peep into various issues and challenges related to dairy crisis in India during the post liberalised period. Further the researcher analyses the emerging future trends and recommends a road map ahead in view of Indian dairy industry.

Keywords: Dairy Industry, Economic Growth, Globalisation, Small and Marginal Farmers.

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CRITICAL OVERVIEW OF AGRICULTURAL CREDIT
IN MAHARASHTRA STATE

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Abstract: Agriculture plays a crucial role in the life of economy. It is a backbone of our economics system. Agriculture not only provides food and raw material but also employment opportunities to large ratio of population. Despite large industrialization in last 50 years, agriculture still occupies a place of pride. There are many government schemes to finance agricultural sector through banking and financial institutions. Agricultural credit is one of the main components of Agricultural finance. Government has initiated focusing towards agricultural credit through various banks and financial institutions. Finance to the agriculture has played an important role in supporting agricultural productivity and production. The green revolution is characterized by the greater use of inputs like use of high yielding verities (HYV seeds), pump sets, tractors, and machines and so on, which has resulted into an immense rise in the agricultural production. Agricultural loan is said to be the lifeblood of increased production in modern farming. Nearly 80% of rural population is directly dependant on agriculture in Maharashtra. As there is weak financial condition of rural population, there is a need to provide timely credit or loan to small and marginal farmers which will enable them to cater the agricultural inputs. Importance of agricultural credit is to help in purchasing new technological inputs, increase farm income, purchasing new land. The objective of this research paper is to study the need of agricultural credit, role of bank in providing loan, to explore the economic impact of agricultural credit. The researcher made a small attempt to find out root causes and consequences of agricultural credit. On the basis of research findings, we the researcher try to sketch the alternative solutions to redress the illness of agricultural finance. The study is basically confined to the Maharashtra state.

Keywords: Agriculture, Bank, Credit, Finance, Waiver.

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FOSTERING LEADERSHIP SELF-EFFICACY IN EMPLOYEES THROUGH MODERN HRD INTERVENTION-MENTORING.

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Abstract: It requires a strong belief in one self to embark on any sort of venture, no matter how comforting or hard-hitting it would appear. Leadership is a position which impose array of demands on the leader to strive oneself in order to take the team towards the achievement of the presumed goal. A leader, should therefore, undoubtedly possess a belief in one’s own capability. The self-belief that one is capable of motivating, directing, leading the team, being a leader is referred to as leadership efficacy. Leaders with high leadership-efficacy feel confident about themselves to be in a leadership situation. But unfortunately, because of the increasing demands to strive in the highly competitive business as well as social environment, the ones who are expected to be in the leadership position, at times fall short to develop or maintain the belief in one’s self. This could in turn mislead the way decisions are taken, act to the team members in an uncanny manner, vulnerable to set indefinite goals for the team, fail to take challenges which could weaken the team’s place value and compress the team’s morale. The act of mentoring could help this situation to a good extent as a mentor facilitates the individual by giving adequate guidance, suggestions without judgments, develop a sense of right and wrong, capacity to analyze a person/situation without bias and also in reaching the best decisions out of many available options. The study highlights on how mentoring capacitates in enhancing a person’s leadership self-efficacy. The paper attempts to throw light on the role of mentoring in developing leadership self-efficacy and also discusses about the ways to foster leadership self-efficacy taking a travel route through the ancient to modern mentors and the mode in which they enriched efficacy in their mentees.

Keywords: Achievement, Goal, Leadership, Leadership-efficacy, Mentoring, Self-belief, Organization.

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TELECOM SPECTRUM AUCTIONS IN INDIA: “A NORMATIVE ANALYSIS”

ROHIT SINGH

Abstract: Telecom Spectrum is a scarce natural resource whose misallocation is likely to have an adverse impact on an economy. It is therefore vital for an economy to ensure efficient and optimal allocation of telecom spectrum. The availability of spectrum varies considerably between different countries due to national regulatory decisions and policies. The focus of this term paper is on India, where telecom operators have access to a very limited amount of spectrum. This paper analyses the value of spectrum by estimating the opportunity cost, which is calculated by the savings that can be achieved by acquiring appropriate amount of spectrum rather than investing in additional base stations. This paper outlines the various stages of spectrum policies in India and highlights the underlying principle of maximal and efficient usage of spectrum advocated across various implemented telecom policies in India. The paper also argues that the allocative efficiency is a more appropriate policy measure and illustrates the absence of allocative efficiency in the Indian Telecom sector. The result in the paper shows that the opportunity cost of spectrum in relation to auction prices is lower than prices that telecom operators paid for 3G telecom spectrum in the metro circles, while the value derived from the opportunity cost was higher than auction prices in the remaining circles.

Keywords: Spectrum, India, Telecom, Auction Design, Public Service Regulation, Efficiency, Allocation, Welfare.

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SWEEP OF THE SPECIAL ECONOMIC ZONES AND WHERE HAVE THEY FAILED?

SHOBHIT SINGH

Abstract: Special Economic Zone as envisioned in many other Countries is any area set apart for developing businesses and trades with eased laws. Loosely, the Special Economic Zones have many varieties including free trade zones, export processing zones, free economic zones, industrial parks and urban enterprise zones among others. The common objectives of the Special Economic Zones include gain of foreign exchange, generate employment, bring about foreign capital and technical expertise home, fostering investment and refinement of infrastructure etc. The United States of America, China and India have pioneered in initiating industrial units to secure an internationally emulous and unveing atmosphere for exports. Continuing its past experiences, India got the Special Economic Zones Act in 2005 to work towards promoting exports and related economic management. The Act confirming the organisation of the Special Economic Zones sets up a three-tier system to regulate their functioning. However, the grounds for concern so far while dealing with the Special Economic Zones are job concentration in few specified sectors only; thickening in the economically developed States; leaving out in cold the displaced farmers; the hitherto feckless importance gained by existing Special Economic Zones; being dominated by big private players and discriminatory tax slashes causing revenue loss etc. The Special Economic Zones Act of 2005 sustaining legal infrastructure for the Special Economic Zones suffers from some handicaps such as firstly, clause (2) of section 3 allows persons to venture for a Special Economic Zone which should have been confined only to the Companies in order to have better hold on the settlement and activities of the Special Economic Zones established under the Act; secondly, clause (4) of section 3 makes way for a Special Economic Zone to be established by a State Government which prima facie turns up to be puerile because State Governments have many other options to get such Units in existence through special laws which is also supported by the proviso appended to this clause; thirdly, section 5 authorising the Central Government to notify any area as Special Economic Zone or an additional area to be included in the Special Economic Zone on the basis of certain parameters leaves some important aspects such as ‘diversification of economy’ in its sub-clause (a), ‘while facilitating ease of doing business’ in its sub-clause (c), ‘vis a vis maintaining social security’ in its sub-clause (d) and ‘paying special attention to technical upgradation’ in its sub-clause (e). The research paper in full further debates the defects in the legal structure building up the Special Economic Zones in India with other demanding reasons behind the fact that why India has not been capable to reap the kind of success China’s ‘Open the Door: Change the System’ policy has got. The research paper reveals why Indian villages could not be turned into cities failing to compete internationally where as some other countries have been able to get their pseudo corporate economic structures into large outsourcing industries.

Keywords: Competitiveness in Exports, Employment, Investment and Regulation.
VIRAL MARKETING: A TOOL FOR INTERNATIONAL MARKETING

DR. AMIT PHILLORA

Abstract

Viral Marketing is one of the strongest tools used for online marketing. I have taken Orkut.com which had used Viral Marketing as the tool for marketing their website at international level. Viral Marketing has many advantages and disadvantages for usage. Viral Marketing is a very effective tool for quick promotions, web communication, bringing out all customers at one place and making easy communication with the company and consumers using its products and services.

Keywords: Viral Marketing, Social Networking, Orkut.Com, Google.Com, Web Communications Etc.

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Recent Trends in Advanced Biology, Health and Environmental Sciences
THE DENIAL OF CLIMATE CHANGE

DR.P.B.REDDY

Abstract: The debate on climate change is an unending dispute about the impacts of humans on global climate and about implementation of policies should to avoid possible detrimental effects of climate change. The current scientific agreement on climate change reveal that the current trend is mainly anthropogenic, and that severe harm may result at some future time, if preventive measures are not taken. The major conventional scientific organizations worldwide like IPCC and American Association for the Advancement of Science concur with the evaluation that most of the examined warming over the last 50 years is likely to have been due to human induce increase of green house gases (GHG) the human-caused increase in greenhouse gas concentrations. On the other hand, there is also little number of scientists in climate and climate-related fields that disagree with the consensus view.

The climate change accord characteristically takes a back seat to feeding, housing, and employing the people of poor nations. There is a fundamental disparity when it comes to global emissions. Rich nations have stolen and burned enormous quantities of fossil fuels and become rich. Poor nations looking for to grow their economies are now rejected from using the same fuels. So as part of the Paris agreement, richer countries, like the US, are supposed to send $100 billion a year in aid by 2020 to the poorer countries. In addition, that amount is set to increase over time. Yet again, like the other necessities of the agreement, this is not a total obligation and no definite penalty for breaking the agreement.

In this review article, we provided first round data that the pseudo-scientific disagreements that strengthen climate science denial are mutually confused. The lack of mechanisms to self-correct the scientific incoherencies manifest in denials conversation further confirms the role of conspiracist beliefs in the political realm. Climate science contradiction is therefore perhaps best understood as a normal activity that substitutes a coherent body of science with an incoherent and conspiracist body of pseudo-science for political reasons and with considerable political coherence and effectiveness.

Keywords: Conspiracy, Climate Change, Paris Treaty, Poor Nations.
FROM ‘TRAGEDY OF COMMONS’ TO ‘WISDOM OF CONSERVATION’: MANAGEMENT ISSUES CONCERNING COASTAL FISHERY RESOURCES OF KARNATAKA

S.M. SHIVAPRAKASHA

Abstract: India is facing the dual problem of overexpansion of its fishing fleet and overexpansion of marine fishery resources. Though it has made tremendous strides in fish production attaining 11.41 m.t. during 2016-17 (of which 3.64 m.t. are from marine fisheries), of late, it is showing symptoms of overexploitation with fisher folk raising hue and cry complaining of 'fish famine'. Karnataka has 320 Km coastline and 27,000 km² of continental shelf area with rich pelagic fishery resource. Karnataka's share of EFZ is 87,000 km². Karnataka occupies a preeminent position among the maritime states of the country with excellent infrastructure in fisheries sector.

Marine fishery resource potential of Karnataka is estimated at 4.25 lakh tonnes, of which 2.25 lakh tonnes are from 70 m water depth and the remaining 2.0 lakh tonnes are from offshore/deep sea zone. The present annual marine fish yield being 4.14 lakh tonnes. Realizing the dire necessity to conserve fish resources, the government of India has taken a decision to impose a uniform fishing ban from 1st June to 31st July (61 days) during monsoon season (consequent to the Hon'ble High Court of Goa’s verdict) along the west coast of India which came into effect in 2003-04. The whole idea is that at least one chance shall be given for each fish to breed during monsoon season so that there will be a natural revival of the stock. In order to create awareness among fisher folk on the need to observe FAO's Code of Conduct for Responsible Fisheries, an effort was made to sensitize fishermen through street plays, exhibitions, demonstrations, film shows etc. at selected ten fish landing centres along coastal Karnataka, the results of which are highlighted. Besides, trends in marine fish production, issues facing the fisheries sector and the management issues to solve some of the problems facing the industry are also focused.

Keywords: Coastal Fishery Resources, Overexploitation, Fishing Ban, Conservation, Management.

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KNOWLEDGE, ATTITUDE AND PRACTICE OF ADULT POPULATION REGARDING BLOOD DONATION IN LETANG MUNICIPALITY, MORANG DISTRICT OF EASTERN NEPAL

KHANAL VK, KAPADI P, RANABHAT J, LAGEJU N, SHARMA KR, GHIMIRE A

Abstract: Background: Blood donation is a voluntary procedure that can help save lives of others. An adequate and reliable supply of safe blood can be assured by a stable base of regular, voluntary, unpaid blood donors. Regular, voluntary, unpaid blood donors are also the safest group of donors as the prevalence of blood borne infections is lowest among these donors. This study aims to learn about the knowledge, attitude and practice regarding blood donation among the residents of Letang Municipality.

Objective: To assess knowledge, attitude and practice towards voluntary blood donation among adult population of Letang Municipality, Morang District of Eastern Nepal.

Methods: A community-based cross-sectional study was carried out among the adult population (18-60 years) of Letang Municipality. Three wards (5, 8 and 9) out of 9 wards were randomly selected. Semi structured questionnaire was used for face to face interview of 530 respondents. The duration of the study was 2 weeks (10th Dec-23rd Dec, 2017).

Results: All 530 respondents were in the age range of 18-60 years with a mean age of 35.90yrs± 11.89yrs. 42.26% were male, 81.5% were literate and most of them (38.9%) were agricultural workers. Adequate knowledge (58%), positive attitude (84%) but practices about blood donation were found to be very low i.e.14.3% only.

Conclusion: Despite having adequate knowledge and positive attitude regarding blood donation, the practice was very low among the residents of Letang Municipality. The reason was found to be mainly due to fear about blood donation, belief that it causes weakness and unawareness about blood donation.

Keywords: Blood Donation, Knowledge, Attitude, Practice.

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A STUDY ON ANTIBIOTICS USE AMONG RESIDENTS OF LEITANG MUNICIPALITY OF MORANG DISTRICT IN EASTERN NEPAL

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Abstract: Background: More than two third of all antibiotics are used in the community, of which about 30% is used inappropriately leading to antibiotic resistance, according to World Health Organization. Resistance is rising to very concerning levels in all parts of the world, threatening the ability to treat common infections. This study aims to assess the knowledge and practice of antibiotic use among the people of Letang Municipality.

Objectives: To assess the knowledge and practice on the usage of antibiotics and estimate the extent of inappropriate use of antibiotics in residents of Letang Municipality.

Methods: A community based cross-sectional study was conducted over 15 days duration in the municipality. Pretested semi-structured questionnaire was used to assess the knowledge and practice regarding antibiotic use by means of face to face interviews among 336 respondents.

Results: The mean age of respondents was 39.87±13.67 years. Among the respondents, 35.42% were farmers, 34.52% were homemakers and 28.87% were illiterate. Almost half of them (48.51%) had an opinion that antibiotics were safe and could be used commonly. Regarding the use of antibiotics, 43.15% preferred taking antibiotics even in common cold while majority of them (81.84%) did not have any knowledge about antibiotic resistance.

Conclusion: The results of this study shows poor knowledge and practice on antibiotic use in the residents of Letang Municipality leading to inappropriate use of antibiotics which calls for Behaviour Change Communication activities at community level.

Keywords: Antibiotics misuse, Resistance, Knowledge.
FREQUENCY ANALYSIS OF RAINFALL FOR OLUYOLE LOCAL GOVERNMENT AREA, OYO STATE, NIGERIA

SASANYA, B.F, ADESOGAN S.O

Abstract: Rainfall is one of the major sources of water natural supply which recharges other sources. The water source can be harnessed for use even during dry periods if adequate planning and management is put in place. The occurrence of rainfall is probabilistic in nature, thus probability plotting positions, regression models and existing predictive models were employed to predict monthly rainfall amounts up to 200 years. The high correlation coefficient values of 0.917 between the model from the California plotting position and the observed data indicated a strong correlation. The Powel's and the Ven Te Chow models gave reverse prediction and thus negative correlation coefficients. The predicted rainfall amounts for other models employed showed increment in rainfall amount as the year’s passes. The result reveals that the amount of rainfall in an area tells much on the health of the people.

Keywords: Analysis, Rainfall, Oluyole Local Government, Nigeria.

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IMPACTS OF CLIMATE CHANGE ON SALINITY INTRUSION IN SOUTH CENTRAL COAST OF BANGLADESH

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Abstract: The water quality in the coastal region was affected by various climatic parameters, i.e., temperature, humidity, precipitation and as well as anthropogenic reasons. The study was conducted to investigate the impacts of climate change on water quality at South Central coastal region (Kalapara Upazila in Patuakhali District) of Bangladesh. The study has collected some meteorological data of Kalapara station from 1975 to 2015 and water samples were collected from the open sea, channels, rivers, ponds and tube wells in the study area. The analysis results were compared with some published reports on water quality in the coastal areas and interpreted accordingly. Major physicochemical parameters of the samples were analyzed in the laboratory using various standard methods of analysis as well as the Arithmetic Quality Index was used to assess the existing water quality of the study area. The metrological data analysis results illustrate that an average of 0.6°C temperature has increased over the last 40 years and the projected average temperature will increase up to 1.2°C by the year 2050. The analysis results also show the increasing trend in humidity and precipitation in the area. The water samples analysis results illustrated that most of the tubewell and surface water are unsuitable for drinking, domestic or agricultural purposes due to saline water intrusion in the area. The water quality comparison results indicated that the salinity intrusion occurred in the area has threatened the ecosystem of coastal areas of Bangladesh. Further studies on this issue are to be needed for the sustainability of water resource and the environment as well.

Keywords: Coastal, Monsoon, Salinity, Surface, Water Quality.

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ENVIRONMENTAL IMPACTS OF BRICK KILN EMISSIONS IN RAJSHAHI AND GAZIPUR DISTRICTS OF BANGLADESH

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Abstract: Brick kilns are one of the major sources of air pollution in south Asia. The adverse effects the emitted gases from a brick kiln on physical and chemical properties of the ambient air, surface water, surrounding soil quality, crop production and human health are now a matter of great concern. The study was aimed at addressing the impacts of brick kiln emissions on human health and the environment. Air, water and soil samples were collected from some selected brick kiln areas in Rajshahi and Gazipur District of Bangladesh during the period from October 2015 to July 2016. The samples were analyzed using various standard methods of analysis. A questionnaire survey was conducted to understand the people’s perceptions around the kiln areas. The questionnaire survey report revealed that the natural environmental around the kiln areas are continuously degrading due to brick kiln emissions. Various human respiratory diseases including asthma, shortness of breathing and bronchitis have been reported in the study. So, the conflicts between the kiln owners and community people were increasing day by day in almost every kiln area. The emitting gasses from brick kilns contained mainly are sulfur dioxide, nitrogen oxides and suspended particulate matter (ash). The air quality results illustrate that emitted CO₂ concentration was found highest among all types of ambient air quality parameters during the production period. The analysis results reveal that the concentration of heavy metals such as cadmium (Cd) and chromium (Cr) was found higher in almost all collected water and soil samples. The analysis results of ash and fly ash samples show that the amount of Cd, Cr, and Pb concentration was found higher indicating the source of heavy metals in water and soil samples. The study results successfully identified the source of pollutants in brick kiln emitted gases and their effects on air, water and soil quality. The survey results illustrate that the brick kiln emissions produced environmental stressed to fruit productions including mango, banana, and jackfruit) and declined the agricultural and farming crop productions as well. Coal and rubber tires used as burning materials during brick manufacturing are the sources of air pollutants in emitting kiln gases leading to the adverse effects on the environment.

Keywords: Brick Kiln, Emission, Environment, Heavy Metals.

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ARTIFICIAL INTERFERENCE AFFECT NESTING BEHAVIOUR
AND CERTAIN REPRODUCTIVE TRAITS IN PET ZEBRA-FINCH

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Abstract: The zebra-finch (Taeniopygia guttata), a passerine-bird of family Estrildidae, evolved to be able to breed readily and quickly as soon as conditions are made right and is hardy and easy to keep which makes them ideal for pets and to study their behaviour. This study aims to observe whether certain human-interference could affect the normal-behaviour in a pet-variety. The interference used were: i). Disturbance in nests (removing or introducing straw or sticks), ii). Artificial night-light introduced in cages. For each parameter, control groups were set. There results showed some interesting changes. In nest-building, the pair, especially the male, dismantled the disturbed nest and built it anew. Finally the females added finishing touches introducing a straw, stick or wool here and there, to suit her egg-laying. Artificial-light is already reported to disrupt normal avian-ecology. Here too, night-light caused changes: they foraged at night leading to fatigue, expedited their breeding by nearly one month, the egg-laying too were earlier by 20 days, 21 days and 19 days respectively in 3 lit-cages compared to control birds. In control birds out of 4-8 eggs laid in average, 2-3 eggs in average (i.e., 50%) were unfertilized. After night-light treatment 80% eggs in average were observed to be unfertilized. These indicate that there is disruption in normal reproductive-cycles as normal periodicity of light-dark cycle was altered. Thus artificial interference was indicated to cause disruption of certain aspects of normal-ethology and ecology of zebra-finch

Keywords: Avian-Ethology, Human-Interference, Zebra-Finch.

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ROLE OF CELL FREE NUCLEIC ACIDS (cfDNA) 
AS A BIOMARKER IN CLINICAL PATHOPHYSIOLOGY

BHAWNA SRIVASTAVA, DR. REDDY, P.B

Abstract: The present review article is aimed to assess on a rapidly increasing area in biomarkers focuses on the value of markers derived from circulating or cell free DNA (cfDNA) in plasma or serum. The assessment of cell free nucleic acids is gaining thrust as promising biomarkers in various disease conditions like cancer, inflammation, prenatal diagnosis, trauma, autoimmune diseases, cardiovascular disease and diabetes. This review article provides an orientation to methodological considerations and refers the readers to important literature in the fields of cfDNA biomarkers. Cell free DNA (cfDNA) is starting to inform on cancer genetics, problem and mechanisms of progression and drug resistance. It also establishes an encouraging approach for clinically relevant assays. The present review assess and sum up the history of cfDNA discovery, its' biological properties and explores growing clinical technologies for sequence-based analysis of cfDNA among various patients. At present molecular barcoding (or Unique Molecular Identifier, UMI)-based approaches seem to offer an ideal balance between sensitivity, flexibility and cost. With the developments in molecular biology techniques and coupled with the increasing understanding in the molecular pathogenesis of the disease, it is expected that the detection and analysis of cfDNA will become more specific and sensitive in the future. Simple, low-cost and faster techniques in future can make cfDNA identification and quantification as a routine biochemical laboratory investigation.

Keywords: cf DNA, Biomarker, Cancer, Plasma.

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STUDY ON THE TOXIC EFFECTS OF WASTE WATER IN CAT FISH (HETEROPNEUTUS FOSSILIS)

DR. REDDY, P.B

Abstract: The present investigation deals with the toxic effects of combined (municipal and industrial) wastewater effluents collected from an industrial complex of Nagda Town (Madhya Pradesh, India). It was identified that the values of DO, TDS, pH, chloride, BOD and COD levels in wastewater effluents were higher than the standards. Fish, Heteropneustes fossilis was selected as an experimental model and LC50 values for 96 hours determined by probit analysis. The LC50 value for 96 hours was found to be 5.8 % concentration of effluent by volume. Fish, H.fossilis was exposed to various sublethal concentrations (1/10, 1/20 and 1/30%) of effluent for 21 days and several serum toxicological endpoints were evaluated. The blood sample was collected by severing the caudal peduncle and processed for the estimation of total plasma protein content, glucose, Aspartate aminotransferase (AST/GOT), Alanine transaminase (ALT/GPT), superoxide dismutase (SOD), catalase (CAT) and malondialdehyde (MDA) were examined. The results have shown that combined effluent was highly toxic to the fish Heteropneustes fossilis. Results showed that plasma lipid peroxidation was high in fish exposed to waste water. Exposure to sublethal concentrations of effluent showed a significant and gradual increase in AST (SGOT), ALT (SGPT), SOD and CAT all experimental groups. On the whole, our study predicts that the combined effluents could induce oxidative stress, affect general physiology and might also disturb the reproductive physiology. Thus, the integrated biochemical, oxidative stress and histopathological findings can be used as valuable biomarkers for the assessment of pollution and also monitoring of water quality.

Keywords: H.Fossilis, Waste Water, Integrated Biomarkers.
NUTRITIONAL SECURITY FOR SUSTAINED FUTURE – A CASE STUDY OF AN NGO IN MAHARASHTRA.

DR. MEENAL ANNACHHATRE

Abstract: World Health Organization has specified that ‘fortification’ is the practice of deliberately increasing the content of an essential micronutrient, i.e. vitamins and minerals (including trace elements) in a food, so as to improve the nutritional quality of the food supply and provide a public health benefit with minimal risk to health. For example, high iron rice, zinc-enriched rice, pro vitamin-A (carotene-) enriched sweet potato, etc. Biofortification is highly useful to address the various micronutrient deficiency problems in a population.

India is the largest and fastest growing economy (US$2.180 trillion) and makes up almost 82% of the South Asian economy. But these growth numbers will surely not make any sense if the World Bank estimates show that India is one of the highest ranking countries in the world for the number of children suffering from malnutrition. Such deficiencies are observed when the intake and absorption of vitamins and minerals are too low to sustain good health and overall development of the human body. While catering to such a huge population, access to diverse diets and other micronutrients is very difficult in India leading to the issue of malnutrition.

Agricultural activity is carried out on a large scale in India and so this malnutrition issue can be sorted out in-house with the help of biofortification. Biofortification has two key comparative advantages, one is, it is much more cost effective and it has a wide scope to reach the underserved and rural population. Both the advantages are in favour of the Indian economy.

Biofortification can be done either by conventional breeding or by biotech breeding way. But mainstreaming biofortified traits into plant breeding programs is a challenge. To reach the scale, biofortification must be integrated in the public and private patterns.

Researchers intend to track one such private activity carried out by an Non-Governmental Organization (NGO) based in Pune, Maharashtra, named ‘Eco-factory foundation’. Eco Factory Foundation is a subsidiary of Suhana Spices (Suhana Masale). Parent company produces spices used in cooking. It covers the major portion of the state market and plus export spices to 21 odd nations. Now the Eco Factory Foundation, subsidiary of Suhana Spices work in the 24 acre land and is into conventional breeding patterns of biofortification. The organic manure and compost required for the farming is provided by the parent company using their kitchen waste, biodegradable wastes of spice production processes. The cattle used on the farm is serving for the whole farm in terms of the cow dung and excreta (known as Jeevamrut) as the most productive and natural manure and also a pesticide. The mulching here had retained the fertility of soil, which is seen clearly from the Soil Nutrient Reports. Their 'Pancha Sutri', i.e. five layers of farming method has contributed in terms of quality of the farm products and retaining soil fertility. Lab examinations of grown vegetation and other farm products have already proved the rise in the vitamins and mineral contents in their food crops.

The methodology researchers have used here starts with empirical evidences, gathered from the systematic observations we made while studying the case of Suhana spices. This case creates positive externalities as it encourages other nearby farmers to practice the same.

Researchers intend to focus on the detailing of this biofortification activity carried out by the Eco Factory Foundation. Main objective of this research is to document how the biofortification has naturally become a farming pattern for this particular NGO, and the way in which they are helping others to replicate the same.

Keywords: Demographic Dividend, Malnutrition, Organic Manure, Positive Externalities, Soil Nutrients, Etc.

Thematic Area: Economic and Agronomic Performance of Biofortified Crops for Farmer.
SYNTHESIS OF SILVER NANOPARTICLES USING *MENTHA ARVENSIS* 
AND EVALUATION OF THEIR ANTIMICROBIAL PROPERTIES

ANUPAM JYOTI

**Abstract:** Synthesis of nanoparticles is gaining more attention due to its diverse applications including in wound dressing, biosensing, textile industry and other antisepsics. The present study was carried out to synthesize silver nanoparticles (AgNPs) by using *Mentha arvensis* and evaluation of antibacterial properties. *Mentha arvensis* leaves were crushed in water and the filtrate was collected by centrifugation. AgNO₃ was added to the filtrate and incubated for 2 hours at 37°C. The formation of AgNPs was monitored by UV-visible spectroscopy and characterized using transmission electron microscope (TEM) and fourier transform infrared (FTIR). The antimicrobial activity of AgNPs against *Escherichia coli* and *Klebsiella pneumoniae* was investigated with variable amount of AgNPs solution by disc diffusion assay. UV-Vis spectra showed maximum absorbance at 430 nm which confirmed AgNPs synthesis. TEM analysis revealed spherical shape AgNPs having size up to 20 nm. FTIR spectra confirmed the presence of proteins bound to AgNPs act as reducing and stabilizing agent. AgNPs were found to be bactericidal against *E.coli* and *K.pneumoniae* as demonstrated by disc diffusion and percentage kill assay.

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FORMULATION AND CHARACTERIZATION PLGA-NANO CAT FOR TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISORDER (COPD)

JUHI SAXENA, PAYAL GUPTA

Abstract: Oxidative burden and high inflammation are major cause of Chronic Obstructive Pulmonary Disorder (COPD). Therefore, targeting oxidative stress with antioxidants/ redox modulating agents has beneficial effects in the treatment of COPD. Nanotechnology has attracted tremendous attention in medicine and more specifically drug delivery in recent years. Because of low cost, least toxic and more environment friendly properties, nanoparticles could be used as carrier for targeted delivery of antioxidant enzymes in the treatment of COPD. Catalase has a protective role in pathogenesis of COPD. Biocompatible Poly lactic-co-glycolic Acid (PLGA) is commonly used as agent for encapsulating enzymes like catalase through nano-formulations. In the present investigation oil-water emulsion method has been used to synthesize control PLGA nanoparticles and PLGA-NANO CAT formulations. Scanning electron micrographs revealed the spherical shaped nanoparticles with size in the range 100-200nm. Zeta potential confirms stability and FTIR reveals the complexation through bond rearrangements. Further these formulations will be tested for their bio-efficacy under in vitro model.

Keywords: Antioxidants, COPD, Nano Formulations.

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EVALUATING SINGLE AND MULTILOCUS DNA BARCODES FOR DELINEATING THE CLERODENDRUM SPECIES OF NORTHEAST INDIA

BARBI GOGOI, SIDHARTH PROTEEM SAIKIA

Abstract: DNA barcoding, an innovative molecular technique is looming towards the generation of the universal standard in taxonomy and opt as an identifier for species discrimination, with short standardized gene regions. In this study, we attempted to develop efficient barcode locus in the genus Clerodendrum of Northeast India. This genus is widely diversified and possess a higher degree of morphological and cytological variation amongst the species that depicts the paraphyletic and polyphyletic origin of the genus. Therefore, proper documentation and assessment of classification through the DNA barcoding could portray the accurate origin of the genus that is still lacking behind. We analyzed 522 accessions of 9 species representing different subgenera of Clerodendrum and evaluated the efficacy of four potential barcode candidates using barcoding gap, applied distance similarity, and tree-based methods. Our results indicate that single-locus matK or combined with plastid regions (YCF) showed the best species discrimination with distinctive barcode gaps. Therefore, we tentatively propose the combination of matK+YCF as core barcode for the genus of Clerodendrum. Furthermore, using this standard DNA barcodes, different species of Clerodendrum can be effortlessly characterized, sketch in mislabeling and set a preliminary assessment of its biodiversity.

Keywords: DNA barcoding, Clerodendrum, barcode gap, tree-based method.

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PHYSIOLOGICAL AND METABOLIC RESPONSES OF DIFFERENT CULTIVARS OF Cymbopogon flexuosus AND Cymbopogon pendulus TO WATER STRESS

MARINE HUSSAIN, SIDDHARTHA PROTEEM SAIKIA

Abstract: Limited water supply is an important factor affecting growth and metabolic responses and has a negative effect on plant growth and development. However, positive impact of water stress has also been reported as far as the synthesis of secondary metabolites, enzyme activities and solute accumulation is concerned. The effect of water stress on growth and essential oil metabolism was studied in two species of aromatic grasses under induced water stress conditions. Cultivars of Cymbopogon flexuosus and C. pendulus varied considerably in their response to water stress. Plant growth, oil yield and water potential decreased while proline accumulation increased in the different genotypes under water stress. Proline accumulation under stress is observed as an adaptive response and its higher accumulation under stress in drought resistant cultivars has been reported. In this study we examined a wide variation in essential oil composition, protein content and in activities of PEP carboxylase and nitrate reductase in the different genotypes in terms of increase, decrease or no change upon induced stress. The physiological and biochemical basis of drought tolerance in C. flexuosus has been explicated based on growth and metabolic responses.

Key Words: Cymbopogon, Essential Oils, Metabolic Response, Water Stress.

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CLUSTER MATRIX ANALYSIS OF PLANKTON DIVERSITY WITH HYDROGRAPHY OF DHAMRA COASTAL WATER, BAY OF BENGAL, EAST COAST OF INDIA

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Abstract: Dhamra ecosystem is a rich hotspot of biological diversity which supports a patch of mangrove along with unique flora and fauna. The present study was carried out in Dhamra coastal waters. Samples were collected using standard methods from 0 km to 20 km for a period of one year from January 2017 to February 2018. Water quality parameters like Total Dissolved Solids (TDS), Sea Surface Temperature (SST), pH, transparency, salinity, and nutrients like silicate, orthophosphate, sulphate nitrite, and nitrate were analyzed during the study period. The pH range was found to be between 7.95 to 8.34. Salinity was highest i.e. 29.74 ppt in the month of February 2018 indicating maximum evaporation and less freshwater influx during this month and low of 16.29 ppt during September 2017 with an average 23.21 ppt during the sampling period. The low salinity in September can be attributed to the high influx of freshwater. The study reported highest transparency of water in the month of December i.e. 0.76 meter and lowest in July i.e. 0.08 meter. Similarly, Salinity showed a variation from 16.29ppt to 28.68ppt during the sampling period. Dissolved Oxygen concentration was between 3.04-3.68 mg/l. Nutrients are essential for survival, reproduction and growth of plankton. It serves as a bio-indicator in aquatic environment. The total phosphate concentration varied from 0.0147-0.327 mg/l and orthophosphate ranged from 0.0086-0.112 mg/l. Silicate concentration was between 4.90-62.59 µg/l and sulphate concentration was found to vary between 210-773.03 mg/l. The nitrate concentration was found to vary between 2.29-9.80 µM/l whereas nitrite concentration ranged between 0.151- 3.55 µM/L. A total of 31 species of Plankton were identified during the sampling period and the total plankton count was 660. Diversity index is a quantitative measure of the biodiversity of an ecosystem. The diversity of a community depends on the species richness and evenness. Shannon diversity index was calculated to be 3.2468, Simpson index 0.0442, Berger-Parker index 11.000 and McIntosh index 0.9585. Phytoplankton abundance and distribution in tropical waters varied remarkably due to seasonal fluctuation. PAST 3.0 statistical tool and XL Stat version 16.0 was used to analyze the biological indexes such as Shannon, Simpson diversity index and to evaluate the relationship between the plankton community and the environmental variables. Similarity matrix was plotted for phytoplankton and zooplankton. Ceratium sp. exhibited greatest diversity with Thalassionema sp. forming the most abundant species group during the study period followed by Synedra sp., Chaetocerous sp., Coscinodiscus sp. and Pseudo-nitzchia. Coastal waters of Dhamra is regulated by the discharge coming from the riverine ecosystem, fishing jetty activities and port operations and requires long term monitoring.

Keywords: Bay of Bengal, Dhamra, Shannon Index.

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EVALUATION OF THE POLYCLONAL ANTIBODIES RAISED AGAINST
THE FLAGELLIN PROTEIN FOR IMMUNODETECTION OF
RALSTONIA PSEUDOSOLANACEARUM

SHALINI BHATT, MERWYN P. RAJ, NEHAFARIDI, SHRADDHA P. MISHRA, ANKURAGARWAL, MADHU BALA

Abstract: Ralstonia pseudosolanacearum, a widely distributed and economically important plant pathogen, causes the lethal bacterial wilt disease. Polyclonal antibodies raised against the whole cells of the pathogen is widely used for immune-detection of the pathogen. In R. pseudosolanacearum, the Flagellin protein is encoded by the gene fliC. In this work, the fliC gene from R. pseudosolanacearum strain DIB-117 was cloned into E.coli using pQE-30 vector and over expressed by IPTG induction to produce recombinant flagellin protein (rfliC). The recombinant protein was purified by affinity chromatography using Ni-NTA agarose column and polyclonal antibodies were raised in rabbit. The antibodies were evaluated by ELISA against the R. pseudosolanacearum strain DIB-117 to confirm the presence of flagellin. The antibodies could not locate the flagellin protein in the pathogen. This may be due to the absence of flagella in the tested strain which has to be verified further.

Keywords: Ralstonia Pseudosolanacearum, Recombinant Flagellin Protein, Polyclonal Antibodies, ELISA

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EVALUATION OF PRH GENE FOR DETECTING VBNC FORMS OF RALSTONIA PSEUDOSOLANACEARUM

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Abstract: Ralstonia pseudosolanacearum causes bacterial wilt disease in a variety of vegetable crops. The pathogen survives in soil and infects healthy hosts leading to bacterial wilt disease. The bacterium survives in environment as “Viable But Non Culturable” (VBNC) forms which are not culturable in microbial media but pathogenic to host plants. Specific PCR assays are available to detect the presence of the pathogen present in the environment, whereas the gene targets for detecting the VBNC forms are found to be non specific. In this work we evaluated the virulent gene prh for detecting VBNC forms of R. pseudosolanacearum.

The gene prh encodes Proline Rich Homeodomain protein, which is one of the virulent factors of the pathogen. VBNC form of R. pseudosolanacearum strain DIB-117 was prepared by maintaining the live cells at 4°C for 180 days and confirmed by fluorescence microscopy, plate count and RT-qPCR. RNA was extracted from live cells, dead cells and VBNC forms of the pathogen using Trizol reagent. RT-qPCR was performed with primers targeting prh gene. RNA from live cells and dead cells were used as positive and negative controls respectively. Our results suggest that VBNC forms could not be detected using prh gene as target.

Keywords: Viable But Non Culturable (VBNC), Proline Rich Homeodomain, Ralstonia Pseudosolanacearum,
CASE STUDIES OF EFFECT OF DIET AND LIFESTYLE INTERVENTION ON PATIENTS UNDER TREATMENT FOR GLIOBLASTOMA MULTIFORME GRADE IV.

NIKHIL CHAUDHARY

Abstract: Introduction: Surgical resection, radiation therapy and chemotherapy are standard treatments for Glioblastomas, the most deadly form of cancers arising in the brain with a median survival of only 12 months and 5 year survival rate <5%. Diet and Lifestyle impacts the prevention as well as prognosis of cancer.

Objective: To show the impact of healthy diet and lifestyle choices on the prognosis of high grade glioblastoma multiforme grade IV patients undergoing conventional treatment.

Methods: Two post operative patients undergoing similar treatment for high grade glioblastoma multiforme grade IV were advised dietary changes and followed for compliance along with necessary timely changes and the outcomes evaluated.

Results: 52 year old male who complied with the dietary changes is still surviving after 15 months without any health issues with a more than 95% reduction in post operative residual tumor while the 38 year old female who had a smaller tumor size but did not comply to dietary suggestions had recurrence, multiple episodes of seizures, various related health problems and died.

Conclusions: Keeping in view the various research pointed out in the introduction regarding the effects of diet and lifestyle on prognosis of cancer and the different outcomes of similar tumor in two individuals undergoing very similar treatment while complying and not complying with healthy diet and lifestyle, it can be concluded that diet and lifestyle plays a vital role in the prognosis of high grade Glioblastoma Multiforme grade IV and should not be neglected.

Keywords: Glioblastoma Multiforme, Diet, Lifestyle, Cancer.

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HEMATOLOGICAL ALTERATIONS AND OXIDATIVE STRESS AMONG FARMERS OCCUPATIONALLY EXPOSED TO ORGANOPHOSPHATE PESTICIDES IN MANGO ORCHARDS OF LUCKNOW REGION

MOHAMAMAD FAREED, CHANDRASEKHARAN NAIR KESAVACHANDRAN

Abstract: Background: Farm workers during spraying of pesticides do not follow protective and safe work practices which lead to occupational exposure among them causing various adverse health effects.

Methodology: A cross sectional study was performed among 166 male pesticide sprayers working in mango orchards of Lucknow district in Uttar Pradesh state of India, who were compared with 77 control subjects. Pesticide sprayers for investigation of oxidative stress parameters were selected on the basis of clinical examination for acute and chronic health symptoms and altered hematological profile associated with pesticide exposure. Among those pesticide sprayers who reported these symptoms, investigation of oxidative stress parameters were performed. Cholinesterase level as biomarker of organophosphate pesticides was investigated to ensure the exposure among pesticide sprayers.

Findings: Clinical examination of pesticide sprayers showed some acute and chronic symptoms for different organ systems. Activities of acetylcholinesterase and butyrylcholinesterase were found to be significantly depleted (p<0.05) among pesticide sprayers as compared to controls. The haematological profile viz. RBC, WBC, monocytes, neutrophils, MCV, MCH, MCHC and platelet count were significantly altered (p<0.001) in pesticide sprayers than controls. Activity of blood CAT was found to be higher but not found to be statistically significant; activity of blood GPx was found to be significantly higher (p<0.05); blood GSH was found to be significantly decreased (p<0.05); blood MDA level was found to be more in pesticide sprayers as compared to control subjects.

Conclusion: Our study shows that occupational exposure of organophosphate pesticides lead to adverse health risks associated with hematological abnormalities and alterations in anti-oxidants enzymes, eventually leading to the oxidative stress condition.

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A STUDY ON PLANT GROWTH PROMOTION AND BIOCONTROL POTENTIAL OF *Bacillus cereus* STRAIN DIB-76/BCS-19

**SHRADDHA P. MISHRA, ANFAL ARSHI, ANKUR AGARWAL, S.MERWYN, AKASH MISHRA, NEHA FARIDI, SHALINI BHATT, MADHU BALA**

**Abstract:** *Bacillus cereus* is a naturally abundant Gram-positive rod shaped bacterium and a well-known PGPR. Recently *B. cereus* has attracted considerable attention as a potential PGPR agent for the growth of many crops. This organism has also potential antagonism activity towards certain plant pathogens. In this study, both in-vitro and in-vivo; the plant growth promotion activity and the bacterial wilt disease-suppressing activity of *B. cereus* strain DIB-76/BCS-19 was examined. In in-vitro study, the strain was positive for the plants growth promotion activities like phosphate solubilization, IAA production and ammonia production. Antibiosis of this strain against the bacterial wilt pathogen *Ralstonia solanacearum* and *R. pseudosolanacearum* strains produced average inhibition zones of size 22mm and 20mm respectively. Treatment of tomato seeds with *B. cereus* culture showed greater seed germination percentage, seed germination rate and less germination time than that of control. Again treatment of tomato seeds with *B. cereus* culture followed by challenge inoculation with *Ralstonia pseudosolanacearum* strains, the causal agent of bacterial wilt disease considerably suppressed the development of wilt symptoms in test plants as compared to control plants. This disease suppression in tomato plants was reproduced by pretreatment of seeds with washed cell cultures (WCC) of *B. cereus* strain DIB-76/BCS-19 prepared by centrifugation and re-suspension in sterile demineralised water. Thus this study reveals the potential of *B. cereus* in plant growth promotion and biocontrol as well.

**Keywords:** *Bacillus Cereus, Ralstonia Solanacearum, Ralstonia Pseudosolanacearum*.

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RESPONSE OF GLOMUS MOSSEAE AND ACAULOSPORA LAEVIS ALONE AND IN AMALGAMATION WITH TRICHODERMA VIRIDE AND/OR PSEUDOMONAS FLUORESCENS ON GROWTH AND FLORAL TRAITS OF LILIUM ASIATICUM

ISHAN SAINI, PROF. ASHOK AGGARWAL

Abstract: In the present decade people’s curiosity has increased for the eminence of floral crops concerning economic values of the nation. In the present investigation we tested whether the two foremost AMF (Arbuscular Mycorrhizal Fungi) - Glomus mosseae and Acaulospora laevis independently is better choice or their combination with Trichoderma viride and/or Pseudomonas fluorescens in improving the growth and floral traits of Lilium asiaticum. The experimental design was incorporated in a complete randomized blocks having 1 plant per pot and 5 replicates per treatment. The results suggested that amalgamation of G. mosseae, A. laevis and P. fluorescens verified to be the best treatment for morphophysiological parameters viz. shoot and root fresh and dry weight; flower number and age; flower size and weight; corm size and weight; total chlorophyll, carotenoid and anthocyanin content; total sugar; total phosphatase activity and total phosphate content. Using microbial approach is far better, sustainable, and cheaper that can replace harmful costlier chemical fertilizers. Therefore it is highly recommended that use of these microbes instead of harmful inorganic fertilizers should be adopted for the betterment of plant as well as soil ecosystem.

Keywords: AM Fungi, Growth, Floral Parameters, Pseudomonas Fluorescens, Trichoderma Viride.
SELECTION OF EFFICIENT HOST FOR MASS MULTIPLICATION OF GLOMUS MOSSEAE USING WORSHIPPED FLOWERS (THEVETIA PERUVIANA) AS SUBSTRATE

ISHAN SAINI, PROF. ASHOK AGGARWAL

Abstract: Application of any inorganic compound for increasing the production of any crop is a question of hazards and profits. Growers and farmers use fertilizers to enhance the crops production but at the same time the soil may face risk of slope in soil quality. Therefore, a better and sustainable strategy should be chosen and one such strategy can be the use of microbes. Microbes such as mycorrhizal fungi can not only enhance the production but also improves and regain the soil quality. One such mycorrhizal fungi which is very dominant and commonly in use is Glomus mosseae. As the mycorrhizal fungi are obligate symbiont, they need any host for their multiplication. Hence the present investigation was performed to select the appropriate host between maize and pearl millet, using flowers of Thevetia peruviana as substrate for mass multiplication. The results indicated that both hosts can be used for mass multiplication of G. mosseae but the host, pearl millet with substrate concentration 200 g pot$^{-1}$ is more suitable. So, it is recommended at filed and nursery level to opt utilizing the mycorrhizal fungi for better growth as it also promotes sustainable development.

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ANTIMICROBIAL EFFICACY OF DIFFERENT BRANDS OF TOOTHPASTE ON THE ORAL MICROORGANISMS

NEHA JOHRAM, REEMA CHOURASIYA

Abstract: A number of anti-microbial agents have been used to improve oral hygiene. The present study was aimed to determine antimicrobial efficacy of various brands of toothpastes against the oral pathogens. A sum of five brands of toothpastes and five mouth rinses were tested for their antimicrobial activity against four oral pathogens namely, Streptococcus aureus, Lactobacillus, E.coli and Bacillus by well agar diffusion assay.

Results reveal that that close up brand tooth paste given largest zone of inhibition on Streptococcus mutans and smallest on E.coli. Dant kanti from patanjali gave largest zone of inhibition on E.coli and smallest on Lactobacillus and Bacillus. Pepsodent brand gave largest zone of inhibition on Streptococcus mutans and smallest on S.aureus. Dabur and Babool brands gave largest zone of inhibition on S.aureus and E.coli and smallest on Lactobacillus. The Colgate brand gave largest zone of inhibition on Bacillus and smallest on S.aureus. In the present study, it has been confirmed that toothpastes with triclosan are more effective in control of oral microflora compared to other synthetic toothpastes.

Keywords: Antimicrobial Activity, Toothpaste, Triclosan.
THYROID ENZYME STATUS IN ZINC SUPPLEMENTED LITHIUM TREATED RATS

DR. RAJIV PATHAK, DR. ASHIMA PATHAK

Abstract: Background and Objective: Lithium is used in the prophylaxis and therapy of bipolar depressive disorder in augmentation treatment of depression. Lithium affects cell function via its inhibitory action on adenosine triphosphatase (ATPase) activity, cyclic adenosine monophosphate (cAMP), and intracellular enzymes. Zinc, being an essential trace element, has a role in several biological activities. Therefore, present study was aimed at investigating the potential role of zinc supplementation on thyroidal enzyme activities following lithium administration.

Methods: Male Wistar rats (150-195g) were divided into four groups; Group 1 animals were fed standard pellet feed and tap water ad lib. Group 2 rats were fed lithium in the form of lithium carbonate through diet at a concentration of 1.1g/kg body weight. Group 3 animals received zinc treatment in the form of zinc sulfate (ZnSO₄·7H₂O) at a dose level of 227 mg/L mixed in drinking water of the animals. Group 4 animals were given lithium and zinc in the same way as was given to the animals belonging to group 2 and 3 respectively. All these treatments were continued for 8 weeks.

Results: MAO activity was found to be significantly increased after 8 weeks in lithium treatment in comparison with the normal controls. However, the activity was found to be reduced when zinc was given to the lithium treated group. Thyroid peroxidase activity was found to be significantly reduced after 8 weeks in lithium treated compared to the normal control group. On the other hand, combined lithium and zinc treatment showed a statistically significant elevation in the enzyme activity as compared to the lithium treated rats, thereby clearly indicating the effective role of zinc in regulating this activity. Co-administration of lithium and zinc resulted in a statistically significant depression in the Na⁺/K⁺ ATPase activity as compared to the normal controls but no significant change was observed in lithium treated rats.

Conclusion: It appears that zinc supplementation is playing an effective role in reducing the toxic effects of lithium on enzyme activities in thyroid and this could possibly be related to the antioxidative nature of zinc under such experimental conditions.

Keywords: Zinc, Lithium, Thyroid, Monoamine Oxidase, Peroxidase, Na⁺/K⁺ ATPase.
POLLEN DIVERSITY IN HONEY COLLECTED BY HONEY BEES (APIS CERANA) IN DAKSHINA KANNADA, KARNATAKA, INDIA.

SUHAS KRISHNA A.G, RAJASHEKHAR K. PATIL

Abstract: Honey bees go to flowers and collect nectar and pollen. Pollen serves as a source of protein and nourishment. To understand the dependence and preference of Apis cerana, study was conducted to analyze the pollen in honey from various sites in the coastal plains of Western Ghats. Fourteen honey samples from different sites ranging an elevation, from 55 meters to 135 meters (amsl) were sampled. Using Acetolysis and Centrifugation pollen was extracted from honey samples, added with glycerin jelly and was transferred to glass slide and a microscopic analysis was conducted. The principle source of pollen as revealed by the study was found to be Areca catechu, Cocos nucifera, Ixora coccinea, Mimosa pudica and Psidium guajava. The morpho types revealed 12 plants to be the source of pollen. However each sample has 3 to 6 types indicating that honey bees visit a narrow or a small number of pollen sources. Therefore pollen sources must be conserved and protected for the wellbeing of honey bees and environment.

Keywords: Flowers, Honey, Nectar, Pollen.

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WATER QUALITY OF RESERVOIR IN NIMACH DISTRICT, M. P.

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Abstract: Sitaram Jaju Sagar Dam situated in Nimach district and it is commonly known as harkiyakhal reservoir many stream or khals cannals flow in to Nimuch district. Dam was constructed in year 1985 dam is to provide water for the irrigation and drinking purpose for 26 villages of Nimach. Present study was carried out from the month of Jan 2015 to Dec 2017. Sample was collected on seasonal basis from 3 sampling site of Nimach i.e. Jajusagar dam, Morwan dam and Sanjiwani nala. The physic-chemical parameters like temperature, pH, depth of visibility, total hardness, conductivity, TDS, nitrate, phosphate, dissolved oxygen etc. were analyzed during the course of study. The study revealed the jajusagar dam harkiyakhal village site showed higher concentration of nitrate, phosphate due to many domestic activities as compare to other site Eutrophication is increasing.

Keywords: Water-Quality, Nimach, Sampling Site, Water Supply and Physico-Chemical Parameters.

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VERTISCAPING - A NEW DIMENSION OF GROWING SMALL STEM CROPS FOR ENVIRONMENTAL SUSTAINABILITY.

ALAMURU KRISHNA CHAITANYA

Abstract: In today's age of shrinking urban green spaces in mega cities, in the name of urbanization, poses a threat to environmental integrity. Urbanization is consuming vast volumes of natural greenery, replacing with concrete-built jungles leading to the 'urban heat island effect'. An innovative, environment-friendly solution to combat concrete jungles is through 'vertiscaping' - an idea to embrace concrete buildings with greening systems, through clinging/climbing plants, or, with living-plant-wall systems to harness socio-ecological and environmental benefits. Vertiscaping is growing as a major horticulture science in 'green/living architecture' that combines the fields of landscape - building architecture and horticultural science. Vertiscaping is seen as the new language of landscape designs in contemporary architecture in relation to environmental sustainability. Vertical greenery systems are increasing their presence in building designs, providing a range of ecosystem services to cities, ranging from reduced urban heat-island effects and energy costs, to increased psychological well-being, besides providing social and aesthetic value. Integration of greenery into urban landscape will improve perception about that area and will help regenerate our crowded mega-cities. Championing for 'green' living will inspire a positive change for a healthier/ sustainable world, and the future of vertiscaping seems encouraging to green-up our blue planet for building aesthetic eco-cities.

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SYNTHESIS AND ANTIMICROBIAL ACTIVITY OF SOME BENZOFURAN DERIVATIVES

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Abstract: The benzofuran compounds occur in various natural substances. In the present research, various new benzofuran derivatives of clinical importance like (a) 1-(3-methyl-6-hydroxybenzofuran-2-yl)-carbohydrazide-3-chloro-4-phenyl azetidine-2-one, (b) Synthesis of 5-(3-methyl-6-hydroxy benzofuran-2-yl)-2-phenyl-1,2,3 oxadiazole, (c) Synthesis of 5-(3-methyl-6-hydroxy benzofuran-2-yl)-2-phenyl-1,3,4 oxadiazole, (d) Synthesis of 5-(3-methyl-6-hydroxy benzofuran-2-yl)-2-thiol-1,2,3 oxadiazole and (e) Synthesis of 5-(3-methyl-6-hydroxy benzofuran-2-yl)-2-thiol-1,3,4 oxadiazole were synthesized and were characterized by melting point, TLC, FT-IR, 1H NMR and Mass spectral analysis. The synthesized compounds were tested for antimicrobial activity against Escherichia coli, Pseudomonas aeruginosa and Streptococcus aureus. Among the synthesized compounds (b) 5-(3-methyl-6-hydroxy benzofuran-2-yl)-2-phenyl-1,2,3 oxadiazole and (d) 5-(3-methyl-6-hydroxy benzofuran-2-yl)-2-thiol-1,2,3 oxadiazole was found the most effective derivative against Escherichia coli and Streptococcus aureus. The other compounds displayed modest activity against the other experimental microbes.

Keywords: Antimicrobial Activity, Benzofuran, Mass Spectral Analysis.

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IMPACT OF MULTIDISCIPLINARY APPROACH TOWARDS QUALITY OF LIFE IN SCHIZOPHRENIA PATIENTS ON ATYPICAL ANTIPSYCHOTICS USING A VALIDATED TOOL QUESTIONNAIRE

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Abstract: Atypical Antipsychotic class is a preferred therapy for schizophrenia prevalence. Antipsychotics impact on Quality of Life (QOL) of schizophrenic patients. Hence, tolerability of the therapy becomes a spotting factor with implications for patient’s quality of life (QOL) and clinical outcomes. To measure the QOL, TOOL (Tolerability and Quality Of Life) questionnaire reflects the subjective interpretation of side-effects in patients treated with antipsychotic medications. Demographic details of the patient’s stress on the factors such as age, body mass index, height, weight, which are basics for any psychiatry study and as well as for the individualized dosage regimen in standard clinical practice. Further categorical demographics having domains such as gender, religious, marital status, socioeconomic status, habits were analyzed to understand the impact of psychiatric disorder in the patient’s routine life. The objective of the study was to assess the effectiveness of TOOL through multidisciplinary approach by clinical pharmacist towards QOL in schizophrenic patients on Atypical Anti-psychotics. A concealed randomized study design of 6 months duration was conducted with 60 patients consisting of 30 in each arm stable on Atypical Antipsychotics with the follow-up of 2 months. The result indicates towards effect of psychometric properties of TOOL leading to total score of $p < 0.05$ using Student ‘t’ test. TOOL presents to be authentic and valid assessment scale which focuses on the pattern of Adverse Drug Reactions (ADR) of Atypical Anti-psychotics on QOL in schizophrenic patients.

Keywords: Tolerability and Quality of Life (TOOL), Schizophrenia, Atypical Anti-Psychotics, Concealed Randomized Study, Psychometric Properties, Quality of Life (QOL), Adverse Drug Reactions (ADR).

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CORACIIFORMES BIRD FAUNA OF RATLAM MADHYA PRADESH, INDIA

MILIND DANGE, PRADIP KUMAR

Abstract: The Coraciiformes is an extant order of colorful birds including the kingfishers, the bee-eaters, the rollers. Birds are important members of food chain in environment. They feed on various harmful insect and pests. India being a mega diversity centre harbors 1,200 species of birds which contributes to 13 percent of the world avian species. Ratlam is located at coordinates: 23°19′0″N 75°04′0″E. The city has an area of 50.0 km². The district forms the unit of central India. Geologically, the Central Indian Plateau is a part of the Gondwana Plate. The rocks of the area are amongst the oldest in the world, dating back to pre-Cambrian and Paleozoic period.

The paper presents a comprehensive account of the Coraciiformes avifauna of Ratlam District of Madhya Pradesh. It includes the list of birds recorded so far from this district and provides information on their habitat. In all 11 species of birds belonging to 4 families are reported.

The study was designed to evaluate bird’s diversity and distribution of Ratlam. Observations were carried out, using distance count method. The list of birds, observations on behavior and conclusion will be presented and discussed along with some photographs of birds.

Keywords: Birds, Coraciiformes, Ratlam, Madhya Pradesh.
ORAL ADMINISTRATION OF BUTYRIVIBRIO FIBRISOLVENS F7 ACCUMULATES HIGH LEVELS OF CONJUGATED LINOLEIC ACID (CLA) IN INTESTINE AND ADIPOSE TISSUE IN MICE

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Abstract: Background: Conjugated Linoleic Acid (CLA) is an anti-cancerous, anti-oxidant and anti-atherogenic omega fatty acid. Among other rumen microbes, Butyrivibrio fibrisolvens (B. fibrisolvens) converts Linoleic Acid (LA) to c9, t11-CLA, a highly active isomer of CLA. The aim of this study was to isolate a high CLA B. fibrisolvens to delineate their capability as potential probiotic for animals.

Results: We identified a total of 24 Butyrivibrio sp. isolates based on 16SrRNA sequencing of 257 anaerobic isolates from buffalo, cattle and goat rumen samples. A total of 91.66% of Butyrivibrio sp. isolates belonged to B. fibrisolvens (91.66%). These isolates were screened for CLA production capability at varying concentrations of LA (substrate) (0, 100, 200, 300, 400, 500 μg/mL) at different cultivation periods (0, 2, 4, 6, 12, 24 and 36 h). Gas chromatographic analysis revealed that bacterial isolate B. fibrisolvens F7 (GenBank Accession no: KU507371) produced highest CLA (147.39 μg/mL) at 200 μg/mL of substrate concentration after 24 h, converting almost 74% of supplemented LA to CLA. B. fibrisolvens F7 was screened for probiotic attributes and was found to be acid and bile tolerant. Oral administration of B. fibrisolvens F7 with high LA diet increased CLA concentration in adipose tissue (3.5 folds) and intestinal content (3.4 folds) in mice.

Conclusion: The results of present study greatly extend the possibilities of using B. fibrisolvens F7 as a probiotic feed additive for animal to provide a continuous dose of CLA naturally.

Keywords: Conjugated linoleic acid, Butyrivibrio fibrisolvens, Probiotics, Gas chromatography, Linoleic acid.

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