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3RD CYCLE
ASSESSMENT AND ACCREDITATION BY NAAC

Criterion – 3

Research, Innovations and Extension

3.3: Research Publications and Awards

3.3.1: Number of research papers published per teacher in the Journals notified on UGC care list during the last five years

जयवन्ती हॉक्सर शासकीय स्नातकोत्तर महाविद्यालय, बैतूल (मप्र)
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Ref. No. 701/2023

Betul, Date 07/07/2023

DECLARATION

The information, reports, true copies of the supporting documents, numerical data etc. furnished in this file are verified by IQAC and found correct.

Hence this certificate.

Dr Meenakshi Choubey
Coordinator, IQAC

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Academic Session 2021-2022

Name of Faculty: Dr. Chandrashekhar Meshram

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ORIGINAL ARTICLE

Morphometric deterministic model for prediction of sediment yield index for selected watersheds in upper Narmada Basin

Sarita Gajbhiye Meshram[1] · Chandrashekhar Meshram[2] · Mohd Abul Hasan[3] · Muhammad Arshad Khan[4] · Saiful Islam[3]

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Abstract
Soil erosion is common and has a wide range of spatiotemporal variability. It is crucial in determining sediment output, which is essential for proper watershed management. In this research, we propose morphometric deterministic models (MDM) for prediction of sediment yield index using morphometric parameters of 49 watersheds from Upper Narmada Basin of Madhya Pradesh state, India. For this purpose, Shuttle Radar Topography Mission generated Digital Elevation Model was used to extract and analyze 12 morphometric parameters including linear, aerial, and relief parameters. Principle Component Analysis has been applied for the most effective parameter estimation. The linear and nonlinear MDM were discovered to be suitable for the field of sediment research due to the high value of R^2 (over 70%). The sediment yield forecasting is critical for taking the appropriate management measures in the watershed to reduce the sediment load in the reservoir and extend the life of the structure.

Keywords Unguaged watersheds · Morphological parameters · Sediment yield index · PCA

Abbreviations

AISLUS	All India soil and land use survey
Ba	Bamhan
C_c	Compactness coefficient
D_d	Drainage density
DEM	Digital elevation model
F_s	Drainage frequency
GIS	Geographic information system
HI	Hypsometric index
km	Kilometers
km^2	Square kilometer
L_o	Length of overland flow
MDM	Morphometric deterministic models
Ma	Manot
Mo	Mohgaon
MAE	Mean absolute error
NSE	Nash–Sutcliffe efficiency
PCA	Principle component analysis
R^2	Correlation coefficient
RS	Remote sensing
R_e	Elongation ratio
R_f	Form factor
R_h	Relief ratio
R_r	Relative ratio
R_N	Ruggedness number
R_c	Circularity ratio
R_b	Bifurcation ratio
SYI	Sediment yield index
SRTM	Shuttle radar topography mission
SPR	Sediment production rate

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ORIGINAL ARTICLE

Conformal Chebyshev chaotic map-based remote user password authentication protocol using smart card

Chandrashekhar Meshram[1] · Sarita Gajbhiye Meshram[2] · Rabha W. Ibrahim[3] · Hamid A. Jalab[4] · Sajjad Shaukat Jamal[5] · Sharad Kumar Barve[2]

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Abstract
With the rapid advancement and growth of computer networks, there have been greater and greater demands for remote user password authentication protocols. In current ages, smartcard-based authentication protocol has formed the standard with their incredibly insubstantial, user-friendly equipment and low-cost apps. In this study, we proposed an effective robust authentication protocol using the conformable chaotic map, where a conformable calculus is a branch of newly appearing fractional calculus. It has a magnificent property, because it formulates using a controller term. We shall also offer formal proof of smooth execution of the proposed authenticated protocol. Our new protocol is more secure as compared to several comparable protocols.

Keywords Mutual authentication · Smart card · Session key · Conformable chaotic map · Fractional calculus · Conformable calculus · Perfect forward secrecy · Hash function · Cryptography

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Introduction

In recent years, research in chaotic maps and their applications within the field of cryptography has acquired significant attention Chaotic frameworks are defined by subtle need on initial situations and proximity to random behavior; features that appear to be fundamentally analogous to those needed by certain cryptographic primitives [1, 2]. In his doctoral thesis in 1993, Hwu [3] introduced the idea of chaos theory to public-key cryptography (PKC). He defined his chaotic development of a PKC with a quadratic equation of difference and a one-dimensional equation of difference (1DDE), which is a well-qualified one-way function. In contrast, Hwu's scheme uses ElGmal's method [4] to execute the cycle of encryption. The security of this scheme is based on the infeasibility of resolving the given discrete logarithm over finite fields. Nonetheless, it is possible to work out a trapdoor by letting the true owner know the reiteration times of the distinguishing condition.

The smartcard-founded remote client authentication system allows a device to authenticate a remote client through open, unsafe networks. In general, one of the two approaches next is used by a system to identify a client such as (a) use something that is accessible only to the client, like a password, (b) single client has permitted admission to

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ORIGINAL PAPER

Assessing erosion prone areas in a watershed using interval rough-analytical hierarchy process (IR-AHP) and fuzzy logic (FL)

Sarita Gajbhiye Meshram[1] · Vijay P. Singh[2] · Ercan Kahya[3,4] · Mehdi Sepehri[5] · Chandrashekhar Meshram[6] · Mohd Abul Hasan[7] · Saiful Islam[7] · Pham Anh Duc[8]

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Abstract
Soil erosion is one of the major land loss problems in agricultural land and is regarded as a serious environmental hazard worldwide. This study focused on watershed prioritization using morphometric parameters using Fuzzy Logic (FL), Interval Rough-Analytical Hierarchy Process (IR-AHP) and Geographic Information Systems (GIS) integration for Gusru Watershed, India. Fourteen morphometric parameters, including circulatory ratio (R_c), form factor (R_f), elongation ratio (R_e), compactness coefficient (C_c), drainage density (D_d), stream frequency (F_s), texture ratio (T), relief ratio (R_h), relative relief (R_r), ruggedness number (R_N), bifurcation ratio (R_b), average slope (S_a), length of overland flow (L_o), and hypsometric integral (HI) were evaluated to determine the erosion susceptibility. Each morphometric parameter was assigned a weight value by the FL and IR-AHP methods, and mapping and analysis were then carried out in the GIS environment. Our results showed that the sub-watersheds (SW) 9, 2, and 11 were most susceptible to soil erosion and the sub-watershed 1 was the least from the viewpoint of soil erosion ranking.

Keywords Watershed · Morphometric parameter · Soil erosion · AHP · Fuzzy logic

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1 Introduction

Soil erosion is an environmental, economic and social problem that affects all countries. For sustainable development of natural resources to diminish the impacts of natural calamities, a watershed could be taken as developmental unit (UNEP 1997). Although a number of factors are involved in soil erosion, a major agent is the water in the problem of land deterioration in most parts of the world. India's lands are not resistant to this type of natural hazards, since a total of 147 M ha soil loss were estimated in the country (Bhattacharyya et al. 2015).

Soil erosion, excess water flow or runoff, changes in river geometry, degradation of streams, sediment accumulation in river and stream characters are, to some extent, all water borne natural processes, which are related with morphometry (Meshram and Meshram, 2020). This clearly suggests that the morphometry of a basin is fundamental to the basin hydrology. Nowadays the latest technologies such as remote sensing (RS) and geographic information systems (GIS) have been so effectively utilized in the morphometric analyses as the old practices of measuring

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An efficient authentication with key agreement procedure using Mittag–Leffler–Chebyshev summation chaotic map under the multi-server architecture

Chandrashekhar Meshram[1] · Rabha W. Ibrahim[2] · Sarita Gajbhiye Meshram[3] · Sajjad Shaukat Jamal[4] · Agbotiname Lucky Imoize[5,6]

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Abstract

The recent technological advancement and rapid development of computer networks have increased the popularity of remote password authentication protocols. Toward this end, the emphasis has shifted to protocols that apply to smart cards-empowered multi-server environments. In order to defend against the replay attack, these protocols usually depend on the nonce or timestamp. In this paper, an efficient Mittag–Leffler–Chebyshev Summation Chaotic Map (MLCSCM)-enabled multi-server authentication protocol with the key agreement is proposed and generalized to address this peculiarity in multi-server-oriented applications. The security proof and efficiency analysis of the presented MLCSCM authenticated key agreement protocol is rigorously derived and validated. Compared to the recently published literature, the proposed protocol presents high efficiency with unique features, and it is highly resistant to sophisticated attacks and achieves perfect forward secrecy.

Keywords Mittag–Leffler–Chebyshev Summation Chaotic Map (MLCSCM) · Computer networks · Mutual authentication · Multi-server architecture · Key exchange · Smart card

1 Introduction

The widespread adoption of the Internet globally is attributed to its numerous benefits and usefulness in government parastatals, non-governmental agencies, educational institutions, smart cities, industries, private sectors, and others [1]. There are various applications in which clients can access various services from multiple networks remotely, such as healthcare, banking, smart grid, smart agriculture, home

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APPLICATION OF SOFT COMPUTING

A Multi-Layer Perceptron (MLP)-Fire Fly Algorithm (FFA)-based model for sediment prediction

Sarita Gajbhiye Meshram[1] · Chandrashekhar Meshram[2] · Fateme Akhoni Pourhosseini[3] · Mohd Abul Hasan[4] · Saiful Islam[4]

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Abstract
The prediction of river sediment load is an essential issue in water resource engineering problems. In this study, artificial neural network employed in order to estimate the daily sediment load on rivers. Two different algorithms, multi-layer perceptron (MLP) and hybrid MLP-FFA (MLP integrated with the FFA) were used for this purpose in the Lake Mahabad, Iran. For this purpose, nine different scenarios are considered as inputs of the models. Performance of selected models was evaluated on basis of performance criterion namely root mean square error (RMSE), mean absolute error (MAE), coefficient of determination (R^2) for choosing best fit model. The results indicated that the new hybrid model MLP-FFA is successful in estimating sediment load with high accuracy as compared with its alternatives with RMSE = 2018 ton/day, MAE = 1698 and R^2 = 0.95, which were much lower than those of MLP-based model with RMSE = 3044 ton/day, MAE = 2481 and R^2 = 0.90. The results of the present study confirmed the suitability of proposed methodology for precise modeling of suspended sediment load.

Keywords Firefly algorithm · Mahabad River · Multi-layer perceptron · Prediction · Sediment

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1 Introduction

Sediment load information is useful for problems in the design of reservoirs and dams, transport of sediment and pollutants in rivers, lakes and estuaries, design of stable channels and dams, protection of fish and wildlife habitats, determination of the effects of watershed management and environmental impact assessment (Cigizoglu 2004). Water quality and sediment modeling have been a challenging task in the field of computational hydrology (Kişi 2009). Traditionally used methods (e.g., Ahmad et al. 2009, 2010) to determine runoff often do not take into account sediment load. Estimation of sediment load has been approached through empirical relationships, numerical simulations, physically-based models and using remote sensing and Geographic Information Systems (GIS) techniques.

Precise simulation of sediment load is important for sustainable water supplies and environmental systems, because it plays a major role in any decision-making process on water availability. In recent years (Lohani et al. 2007; Boukhrissa et al. 2013; Yadav et al. 2018; Ampomah

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1179: MULTIMEDIA SOFTWARE ENGINEERING: CHALLENGES AND OPPORTUNITIES

Barriers of managing cloud outsource software development projects: a multivocal study

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Abstract
Management of COSD projects is a challenging task due to number of distant development locations in different time zones, client and vendor organizations, different cloud deployment models and range of different service level agreements. The objective of this study is to identify the barriers associated with managing COSD projects. We implemented a Multivocal Literature Review to identify barriers that influence management of COSD projects. We identified 21 COSD management barriers from 165 primary studies. The comparison between the barriers identified from formal and grey literature indicate that there are similarities between the barriers investigated from both types of literature. Moreover, client-vendor analysis shows that there is no significant difference between COSD management barriers associated with both types of organizations. We believe that the study findings will assist both research and industry community to better understand and manage COSD projects.

Keywords Cloud outsource software development · Software outsourcing · Cloud computing · Barriers · Multivocal literature review

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An efficient remote user authentication with key agreement procedure based on convolution-Chebyshev chaotic maps using biometric

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Accepted: 21 December 2021

Abstract

The study of chaotic constructions and their associated cryptographic frameworks has sparked a lot of research interest in recent years. Latest advances in wireless technology and the proliferating limitations posed by open communication channels, biometric-enabled remote client authentication procedures with passwords have recently gained traction. In order to address this problem, this paper proposes a secure biometric-based remote user authentication procedure using convolution-Chebyshev chaotic maps with a key agreement procedure. The extended convolution-Chebyshev chaotic maps-based scheme was developed over the interval $(-\infty, +\infty)$, and the required properties for the procedure were verified rigorously. The proposed procedure provides a secure client authentication mechanism using biometrics. Additionally, the projected procedure provides a good key agreement feature with perfect forward secrecy while reducing the computation loads for smart cards. As a result, the proposed procedure outperforms related authentication procedures in terms of security and computational performance.

Keywords Mutual authentication · Convolution-Chebyshev chaotic maps · Biometric · Anonymity · Smart cards

1 Introduction

There has been a lot of research interest in analyzing chaotic systems and their possible cryptographic structures in recent years [1–3]. Specific cryptographic primitives behave in a way that is fundamentally similar to chaotic frameworks, which are described by their sensitivity to random operations and initial conditions in the

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SBOOSP for Massive Devices in 5G WSNs Using Conformable Chaotic Maps

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Abstract: The commercialization of the fifth-generation (5G) wireless network has begun. Massive devices are being integrated into 5G-enabled wireless sensor networks (5G WSNs) to deliver a variety of valuable services to network users. However, there are rising fears that 5G WSNs will expose sensitive user data to new security vulnerabilities. For secure end-to-end communication, key agreement and user authentication have been proposed. However, when billions of massive devices are networked to collect and analyze complex user data, more stringent security approaches are required. Data integrity, non-repudiation, and authentication necessitate special-purpose subtree-based signature mechanisms that are pretty difficult to create in practice. To address this issue, this work provides an efficient, provably secure, lightweight subtree-based online/offline signature procedure (SBOOSP) and its aggregation (Agg-SBOOSP) for massive devices in 5G WSNs using conformable chaotic maps. The SBOOSP enables multi-time offline storage access while reducing processing time. As a result, the signer can utilize the pre-stored offline information in polynomial time. This feature distinguishes our presented SBOOSP from previous online/offline-signing procedures that only allow for one signature. Furthermore, the new procedure supports a secret key during the pre-registration process, but no secret key is necessary during the offline stage. The suggested SBOOSP is secure in the logic of unforgeability on the chosen message attack in the random oracle. Additionally, SBOOSP and Agg-SBOOSP had the lowest computing costs compared to other contending schemes. Overall, the suggested SBOOSP outperforms several preliminary security schemes in terms of performance and computational overhead.

Keywords: Subtree-based online/offline signature procedure (SBOOSP); 5G WSNs; provably secure scheme; massive devices; conformable chaotic maps

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ORIGINAL PAPER

Prioritization of soil erosion-prone sub-watersheds using fuzzy-based multi-criteria decision-making methods in Narmada basin watershed, India

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Abstract
Every year, soil erosion causes significant damage to humans by reducing soil productivity and filling reservoirs from sediment deposition in the Manot watershed in the Narmada basin, India. Hence, it is important in this basin to recognize soil erosion-prone areas for preventive steps. In this research, prioritization of sub-watersheds of the Manot watershed has been done using fuzzy MCDM approaches such as Fuzzy-SAW, Fuzzy-VIKOR and Fuzzy-TOPSIS methods. For this purpose, the Shuttle Radar Topography Mission (SRTM)-generated Digital Elevation Model (DEM) was used to extract and analyze 12 morphometric parameters, including linear, aerial, and relief parameters. A fuzzy MCDM was successfully implemented for prioritizing watersheds in terms of soil erosion. Overall, the descending order in terms of susceptibility to erosion is found to be MN8 > MN7 > MN2 > MN10 > MN1 > MN9 > MN12 > MN4 > MN5 > MN6 > MN14 > MN3 > MN13 > MN11. The findings showed that morphometric parameters and the fuzzy MCDM approach have high efficiency in recognizing areas that are vulnerable to erosion.

Keywords MCDM · Prioritization technique · Soil conservation · Watershed management · Fuzzy MCDM

Introduction

Soil erosion is one of the major land loss problems on agricultural land and is regarded in modern times worldwide as a serious environmental hazard (Lu et al. 2003; Kim et al. 2005; Srinivasan et al. 2019; Meshram et al. 2021a, b, c; Silakhori et al. 2022; Benzougagh et al. 2022). Water erosion risk is an environmental, economic, and social issue that affects all countries. Soil degradation in India is estimated to be occurring on 147 million hectares (Mha) of land, including 94 Mha from water erosion, 16 Mha from acidification, 14 Mha from flooding, 9 Mha from wind erosion, 6 Mha from salinity, and 7 Mha from a combination of factors (Bhattacharyya et al. 2015). Therefore, the problem needs to be addressed prudently and a systematic solution to reduce the extent of the problem needs to be pursued. To exploit land and water resources efficiently and sustainably, one needs to try to find a sustainable unit so that such resources can be effectively handled and controlled.

Soil attrition or erosion, excess water flow or runoff, changes in rivers geometry, degradation of streams, and sediment accumulation in river and stream characteristics are related to morphometry (UNEP 1997). This suggests that the morphology of a basin's is fundamental to the basin hydrology. At present, geo-morphometric analysis using a new technique, i.e., RS and GIS is being utilized as this tool gives flexibility to analyze spatial data in new manner (Gajbhiye et al. 2014; Meshram and Sharma 2017).

In today's world, the majority of researchers use RS and GIS to evaluate natural disasters, prioritize watersheds, and

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ORIGINAL ARTICLE

Assessing vulnerability to soil erosion based on fuzzy best worse multi-criteria decision-making method

Sarita Gajbhiye Meshram[1] · Mohd Abul Hasan[2] · Chandrashekhar Meshram[3] · Ali Reza Ilderomi[4] · Sithabile Tirivarombo[5] · Saiful Islam[2]

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Abstract
Soil wearing away or erosion is a chief agent of land loss in agricultural land and is regarded worldwide as a serious environmental hazard. This study performed watershed prioritization using morphometric parameters based on fuzzy best worse method (F-BWM) and GIS integration for Gusru Watershed, India. This study prioritizes sub-watersheds of the study area from viewpoint of soil erosion using five major parameters i.e., stream frequency (F_s), relative relief (R_r), length of overland flow (L_o), relief ratio (R_h) and drainage density (D_d). Fuzzy based Best Worse Multi-Criteria Decision-Making (F-BWM) Method was used to assigning weights to used criteria and combining them to achieve erosion susceptibility for each sub-watershed. Results showed that sub-watersheds 9, 14, and 5 were most susceptible to soil erosion and sub-watershed 3 was the least from the viewpoint of soil erosion ranking.

Keywords Soil erosion · Prioritization · Best worse method · Fuzzy logic · Multi-criteria decision-making method

List of symbols

F-BWM	Fuzzy best worse method
GIS	Geographical information system
AHP	Analytic hierarchy process
MCDM	Multi criteria decision making
PCA	Principal component analysis
DEM	Digital elevation model
SRTM	Shutter radar topography mission
TFN	Triangular fuzzy number
F_s	Stream frequency
R_r	Relative relief
L_o	Length of overland flow
R_h	Relief ratio
R_c	Circulatory ratio
D_d	Drainage density
l, m, u	Lower, median and upper numbers of $\tilde{A}$
$\tilde{A}$	Relative importance of criterion
c_B	Best criterion
c_W	Worst criterion
$\tilde{w}_1^*, \tilde{w}_2^*, \ldots, \tilde{w}_n^*$	Optimal fuzzy weight
ξ	Consistency ratio
$c_1, c_1, \ldots, c_j, \ldots, c_n$	Criteria
C_c	Compactness coefficient
R_e	Elongation ratio
R_f	Farm factor

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Stochastic Environmental Research and Risk Assessment
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ORIGINAL PAPER

Prioritization of watersheds based on a picture fuzzy analytic hierarchy process and linear assignment model

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Accepted: 6 July 2022

Abstract
Soil erosion is one of the most dangerous natural dangers, causing a great deal of harm in many parts of the world. In the presented study, the Gusru river watershed in Indi was divided into 14 sub-watersheds, and then 14 morphometric parameters were calculated, including drainage density (D_d), bifurcation ratio (R_b), streams frequency (F_s), average slope (S_a), form factor (R_f), circulatory ratio (R_C), elongation ratio (R_e), relative relief (R_h), ruggedness number (R_N), bifurcation ratio (R_b), texture ratio (T), length of the overland flow (L_o) compactness coefficient (C_C) and hypsometric integral (HI) were derived for each sub- watershed. Afterward, the combination of picture fuzzy-analytic hierarchy process and picture fuzzy-linear assignment model were used to assign weights to selected morphometric criteria and to rank the sub-watersheds based on the level of soil erosion susceptibility. The results of the study showed that sub-watersheds 11 and 2 were the most susceptible sub watersheds, while sub-watersheds 13 and 14 had the lowest susceptibility to soil erosion. Prioritization and ranking of sub-watersheds from the perspective of soil erosion susceptibility can be used as a powerful tool for prevention and mitigation measures.

Keywords Erosion susceptibility · Picture fuzzy · Analytic hierarchy process · Linear assignment model · Watershed prioritization

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Water Supply

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Development and evaluation of a water quality index for groundwater quality assessment in parts of Jabalpur District, Madhya Pradesh, India

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ABSTRACT

Groundwater is an important source for drinking water supply in Jabalpur District, Madhya Pradesh, India. An attempt has been made in this work to understand the suitability of groundwater for human consumption. The parameters of pH, Electrical Conductivity (EC), Copper (Cu), Chromium (Cr), Sulphate (SO_4), Iron (Fe), Nitrate (NO_3), Chloride (Cl), Total Hardness (TH), Total Alkalinity (TA), and Sodium (Na) were analyzed to estimate the groundwater quality. The water quality index (WQI) has been applied to categorize the water quality, which is quite useful to infer the quality of water for the people and policy makers in the concerned area. The WQI in the study area ranges from 17.90 to 176.88. According to the WQI rating, sites 1, 3, and 4 are not appropriate for drinking water or have low water quality and site 2 has moderate drinking condition, whereas site 5 has excellent drinking condition. The current study suggests that the groundwater of the area with deteriorated water quality needs treatment before consumption.

Key words: groundwater, principal component analysis (PCA), water quality, WQI

HIGHLIGHTS

- WQI values in sites 1, 3 and 4 are 106.99, 176.88, 161.25, showing that the groundwater is not suitable for drinking purposes.
- WQI value in site 5 is 17.90, showing that water is fit for drinking purposes.
- Principal component analysis reveals that four parameters are responsible for the high values of WQI.
- The outcome of the study will be helpful in formulating effective drinking water management measures for residents in the Jabalpur region, India.

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CGST: Provably Secure Lightweight Certificateless Group Signcryption Technique Based on Fractional Chaotic Maps

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ABSTRACT In recent years, there has been a lot of research interest in analyzing chaotic constructions and their associated cryptographic structures. Compared with the essential combination of encryption and signature, the signcryption scheme has a more realistic solution for achieving message confidentiality and authentication simultaneously. However, the security of a signcryption scheme is questionable when deployed in modern safety-critical systems, especially as billions of sensitive user information is transmitted over open communication channels. In order to address this problem, a lightweight, provably secure certificateless technique that uses Fractional Chaotic Maps (FCM) for group-oriented signcryption (CGST) is proposed. The main feature of the CGST-FCM technique is that any group signcrypter may encrypt data/information with the group manager (GM) and have it sent to the verifier seamlessly. This implies the legitimacy of the signcrypted information/data is verifiable using the public conditions of the group, but they cannot link it to the conforming signcrypter. In this scenario, valid signcrypted information/data cannot be produced by the GM or any signcrypter in that category alone. However, the GM is allowed to reveal the identity of the signcrypter when there is a legal conflict to restrict repudiation of the signature. Generally, the CGST-FCM technique is protected from the indistinguishably chosen ciphertext attack (IND-CCA). Additionally, the computationally difficult Diffie-Hellman (DH) problems have been used to build unlinkability, untraceability, unforgeability, and robustness of the projected CGST-FCM scheme. Finally, the security investigation of the presented CGST-FCM technique shows appreciable consistency and high efficiency when applied in real-time security applications.

INDEX TERMS Certificateless group signcryption scheme (CGSS), fractional chaotic maps (FCM), provably secure scheme, authentication, Diffie-Hellman (DH) problem, wireless security networks.

I. INTRODUCTION

The study of chaotic structures and their potential cryptographic designs has sparked much research interest in recent years [1]–[3]. The behaviours of certain cryptographic primitives are fundamentally similar to that of chaotic frameworks, which are represented by their sensitive reliance on random operations and initial operations in the vicinity [4]–[6]. In modern wireless communication systems, information security is essential to protect critical user information/data

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Research Article

An Efficient Conformable Fractional Chaotic Map-Based Online/ Offline IBSS Scheme for Provable Security in ROM

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Chaos distributes with a covert method to condense the dynamic of complexity and satisfies the security requirements of a cryptographic system. This study gives an ability online/offline (O/O) ID-based short signature (IBSS) scheme using conformable fractional chaotic maps. Furthermore, we establish its security under IBSS existential unforgeability of identity-based short signature (IBSS) under chosen message attack (EUF-IBSS-CMA) in the random oracle model (ROM). Some of the stimulating preparations of obtainable processes are that they give a multiperiod application of the offline storage, which licenses the agent to recycle the offline pre-registered data in time series (especially the polynomial time), rather than one-period usage in all past IBSS processes.

1. Introduction

Newly, the time-fractional difference [1] provides a robust concept for discrete (not continuous) fractional display. It has a limited fractional alteration formula, which rests on the change consequences of all the past figurines. This attribute can show the disconnected arrangements long historical properties or long interactions. In the meantime, chaos definitions, formulas, ideas, and chaos synchronization have wide uses [2–5]. Discrete maps can produce chaotic signatures. Therefore, they rewarded much care in all areas of mathematical sciences. The logistic map idea (is a well-known repeated record founded on the first-order nonlinear alteration equation) and other types of maps have converted straightforward representations. Nevertheless, fewer works utilized the fractional discrete arrangements, which clamp compound chaotic dynamics. This action presents the disconnected memory, which occurs in the chaotic records. Then, chaos and harmonization of the fractional logistic record are specified. The diverse fractional powers yield different chaotic ranges so that the chaotic activities will take extra problematical [6, 7]. Discrete maps are used regularly in disconnected natural phenomena. The standing fractional disconnected arrangements (equations, inequalities, and inclusions) are typically joined with two techniques: mathematical discretization (the process of changing continuous functions, simulations, variables, and equations into discrete complements) of time-fractional differential equations and fractional time-difference equations. The former one is a numerical formulation of fractional continuous simulations and the Grünwald–Letnikov difference usually accepted in the numerical action. In this study, we shall use the fractional Caputo difference operator. Our aim is to use a new fractional calculus, called fractional conformable calculus, to generalize the Chebyshev polynomials [8].

The inquiry into chaotic constructions and their possible cryptographic structures has been the subject of considerable interest in research over the past few years. Chaotic systems are clearly characterized by their delicate reliance on the initial conditions and random surrounding operations, both

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FIXED POINT RESULTS FOR RATIONAL TYPE CONTRACTION IN A-METRIC SPACES

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Abstract

The goal of this paper is to define rational contraction in the context of A-metric spaces and develop various fixed point theorems in order to elaborate, generalize, and synthesize a number of previously published results. Finally, to illustrate the new theorem, an example is given.

1. Introduction

Fixed point theory is crucial in science and mathematics. This topic has drawn a lot of interest from academics in the last two decades due to its wide range of applications in disciplines such as nonlinear analysis, topology, and engineering difficulties. The Banach contraction principle [2] is the starting

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Article

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An Efficient Three-Factor Authenticated Key Agreement Technique Using FCM Under HC-IoT Architectures

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Abstract: The Human-Centered Internet of Things (HC-IoT) is fast becoming a hotbed of security and privacy concerns. Two users can establish a common session key through a trusted server over an open communication channel using a three-party authenticated key agreement. Most of the early authenticated key agreement systems relied on pairing, hashing, or modular exponentiation processes that are computationally intensive and cost-prohibitive. In order to address this problem, this paper offers a new three-party authenticated key agreement technique based on fractional chaotic maps. The new scheme uses fractional chaotic maps and supports the dynamic sensing of HC-IoT devices in the network architecture without a password table. The projected security scheme utilized a hash function, which works well for the resource-limited HC-IoT architectures. Test results show that our new technique is resistant to password guessing attacks since it does not use a password. Furthermore, our approach provides users with comprehensive privacy protection, ensuring that a user forgery attack causes no harm. Finally, our new technique offers better security features than the techniques currently available in the literature.

Keywords: Three-party authenticated key agreement; anonymity; fractional chaotic maps; Chebyshev polynomial; password table; human-centered internet of things (HC-IoT)

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RESEARCH PAPER

Streamflow Prediction Based on Artificial Intelligence Techniques

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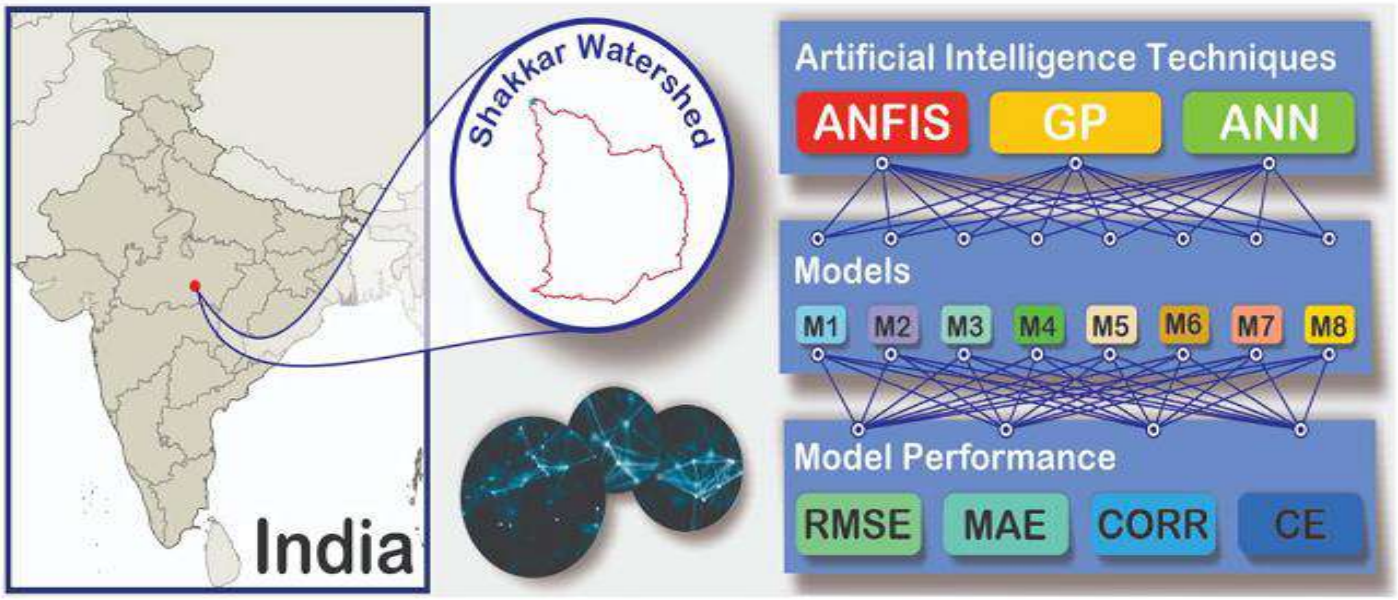
Abstract
The application of Artificial Intelligence (AI) techniques has become popular in science and engineering applications since the middle of the twentieth century. In this present study, three AI techniques (ANFIS, GP and ANN) have been used for forecasting streamflow into Shakkar watershed (Narmada Basin), India. The models have been used considering previous streamflow and cyclic terms in the input vector to provide a suitable time series model for streamflow forecasting. To evaluate the model performance, RMSE, MAE, CORR and CE were employed. Results showed that the ANFIS has the best performance in forecasting streamflow time series for Shakkar watershed. The GP and ANN are in the 2nd and 3rd ranks, respectively. According to the results, in all the AI methods (ANFIS, GP and ANN), the model with cyclic terms had better performance compared to those models not considering periodic nature and being applied by only considering the previous streamflow.

Graphical Abstract



Keywords Artificial Intelligence models · Cyclic Term · Streamflow · Forecasting · Artificial Neural Network

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Ecological niche of *Cryptococcus neoformans* species complex from Betul city of Madhya Pradesh

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Abstract

Globally the risk of outbreaks has been increasing with the expansion of environmental *Cryptococcus neoformans* and *Cryptococcus gattii* pathogens. In this prospective study we analyzed the isolation of *C. neoformans* - *C. gattii* strains from a total of 500 tree samples and *C. neoformans* from 194 pigeon samples collected from different sites of Betul and Bhopal city of Madhya Pradesh (India). Selective isolation of *C. neoformans* sp. complex was done by swabbing and Direct Plating Method. As per the data, out of total 500 tree samples 30 were found positive for *Cryptococcus neoformans* and 36 samples positive for *C. gattii*. Highest cfu was obtained from *Tamarindus indica* ($19x10^4$). Total 35 pigeon samples were found positive for *C. neoformans* and the highest frequency was observed from the pigeon sample collected from Bablu Talab Kothin Bazar (12.08%), Betul city of Madhya Pradesh (India). This study suggested the living tree trunk hollows and pigeon excreta as a possible ecologic niche for *C. neoformans* species complex, hence it gains more attention in the environmental occurrence and role in cryptococcosis.

Keywords: *C. neoformans* species complex, living tree trunk hollows, pigeon excreta

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Introduction

Cryptococcosis is caused by both the varieties of *C.neoformans* species complex, *i.e., Cryptococcus neoformans* and *Cryptococcus gattii* that affects lungs and central nervous system predominantly and is the commonest fungal meningitis (Meyer *et al.*, 2009).

Over the past 2 decades, the case of deadly disease has increased worldwide dramatically in the number of immunocompromised individuals with HIV infection, cancer

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GLOBALIZATION AND MARKETISM IN INDIAN MEDIA (ANALYTICAL STUDIES)
भारतीय मीडिया में वैश्वीकरण और बाजारवाद (विश्लेषणात्मक अध्ययन)

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ABSTRACT

English: There is a famous saying- good things should always be accepted and bad things should always be discarded. But in the context of Indian media, this proverb has a different meaning. In the present era Indian media especially broadcasting media is following western and European countries. This is a worrying situation, which is very important to get control in time. But the way the current media is moving towards digital platforms, the boundaries of news are shrinking. In the case of media convergence, the condition of broadcast journalism cannot be said to be very good. Not everything is negative though. In the era of globalization, the Internet has also served to enrich broadcast journalism. This is the reason that now along with traditional media, digital media has increased penetration among the people. Monopoly has also ended with the news. The truth is reaching the public fast.

Hindi: एक प्रसिद्ध कहावत है- अच्छी चीजों को हमेशा ग्रहण करना चाहिए और बुरी चीजों को हमेशा छोड़ देना चाहिए। लेकिन भारतीय मीडिया के परिप्रेक्ष्य में यह कहावत कुछ अलग अर्थ लिए हुए है। वर्तमान दौर में भारतीय मीडिया खासकर प्रसारण मीडिया पश्चिमी और यूरोपीय देशों का अनुसरण कर रहा है। यह एक चिंताजनक स्थिति है, जिसपर समय रहते नियंत्रण पाना बेहद जरूरी है। Prasad (1989) लेकिन जिस तरह से वर्तमान मीडिया डिजिटल प्लेटफॉर्म की तरफ बढ़ रहा है, वैसे-वैसे खबरों की सीमाएं सिमटती जा रही हैं। मीडिया कंजवर्जेंस की स्थिति में प्रसारण पत्रकारिता की स्थिति बहुत अच्छी नहीं कही जा सकती। हालांकि सबकुछ नकारात्मक भी नहीं है। वैश्वीकरण के दौर में इंटरनेट ने प्रसारण पत्रकारिता को समृद्ध करने का भी कार्य किया है। यही कारण है कि अब पारंपरिक मीडिया के साथ-साथ डिजिटल मीडिया ने लोगों के बीच पैठ बढ़ाई है। खबरों से एकाधिकार भी खत्म हुआ है। जनता तक सच तेजी से पहुंच रहा है।

Keywords: Broadcast, Journalism, Western, Digital, Monopoly, प्रसारण, पत्रकारिता, पश्चिमी, डिजिटल, एकाधिकार।

1. प्रस्तावना

ऐसी मान्यता है कि ऋषि नारद एक लोक से दूसरे लोक तक संचार प्रतिनिधि के रूप में भूमिका अदा करते थे। उन्हें दुनिया के पहले पत्रकार के रूप में भी मान्यता मिली हुई है। उस युग में नारद मुनि एक सूचना को अन्य स्थान तक पहुंचाते थे। वह जस की तस सूचना दूसरे स्थान तक पहुंचती थी। लेकिन वर्तमान समय में मीडिया की छवि में बदलाव आया है। भारतीय मीडिया पर वैश्वीकरण का प्रभाव पड़ा है। Pataanjali (1997) इसके बाद से पत्रकारिता के सिद्धांतों में आमूल-चूल परिवर्तन देखने को मिल रहे हैं। वर्ष 2019 में केंद्र सरकार ने डिजिटल मीडिया में 26 फीसद प्रत्यक्ष विदेशी निवेश (एफडीआई) को मंजूरी प्रदान की है। कई लोग इस फैसले का स्वागत कर रहे हैं। उनका कहना है कि देश में चल रहे तमाम

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व्यावसायिक जगत में महिलाओं की सहभागिता (चुनौतियां एवं समाधान)

- डॉ. मौसमी राय

सहायक प्राध्यापक, वाणिज्य विभाग, शासकीय जे.एच. पी. जी. कॉलेज बैतूल, मध्यप्रदेश

सारांश :

'यत्र नार्यस्तु पूज्यन्ते रमन्ते तत्र देवताः', अर्थात् जहाँ महिला की पूजा होती है वहाँ देवता निवास करते हैं। जहाँ महिला की पूजा नहीं होती है, उनका सम्मान नहीं होता, वहाँ किये गये समस्त कर्म निष्फल हो जाते हैं। हमारे वेद, पुराणों में लिखी यह बातें हमें गौरव की अनुभूति कराते हैं। हमारी सनातन भारतीय परंपरा में महिलाओं को देवी का दर्जा दिया गया है। यह बात शास्त्रों तक ही सीमित नहीं है। किसी भी देश को तब तक लोकतांत्रिक नहीं माना जा सकता, जब तक वहां महिलाओं का बराबर का दर्जा न दिया जाये। वैश्विक परिदृश्य में देखा जाये तो आज हर क्षेत्र में महिलाओं ने परचम लहराया है। व्यवासायिक जगत में अपनी पैठ जमाई है। दुनियाभर के देशों में महिलाओं के प्रति अलग–अलग वर्ताव की खबरें हमेशा आती हैं। कहीं महिलाएं विकास के पथ पर आगे बढ़ रही हैं, तो कहीं महिलाओं को घर के उपभोग की वस्तु बनाकर सीमित कर दिया गया है। लोकतांत्रिक देश भारत की स्थिति संतोषजनक कहीं जा सकती है, लेकिन इसे पूर्ण विकास नहीं कहा जा सकता। देश के व्यावसायिक तंत्र में भी महिलाओं की स्थिति सुदृढ़ हो रही है, लेकिन पूर्ण सशक्त कहने की बात अभी बेमानी होगी।

मुख्य शब्द :

महिला, भारतीय, शास्त्र, व्यावसायिक, सशक्त

प्रस्तावना :

भारत जैसे लोकतंत्र की स्थिति थोड़ा उलट है। आदिकाल से ही महिलाओं का वर्चस्व रहा है। हिन्दू धर्म के शास्त्रों में देवियों की स्थिति देखकर हम सहर्ष अंदाजा लगा लेते हैं कि यहां महिलाएं, बराबरी का दर्जा पाती रही हैं। दुर्गा शक्ति का रूप रही हैं तो लक्ष्मी धन की देवी कहलाईं, सरस्वती ने जगत को शिक्षा से सराबोर कर दिया। भारत माता के पैरों से गुलामी की जंजीर को तोड़ फेंकने वाली महिलाओं की शौर्य गाथा से तो इतिहास भरा पड़ा है। आजादी के बाद राजनीतिक नेतृत्व में भी हमने महिलाओं की पैठ देखी है।अब व्यावसायिक जगत में कहानी हम सभी के सामने है।व्यवसाय हो या अन्य कोई भी क्षेत्र। महिलाएं तभी आगे बढ़ सकती हैं जबकि वे शिक्षित हो। जब भी महिला के सशक्त होने की बात की जाएगी तो शिक्षा ही पहली सीढ़ी मानी जाएगी। परिवार, समाज और देश के विकास में शिक्षित महिला महत्वपूर्ण भूमिका निभा सकती है। शिक्षित महिलाएं समाज में बदलाव ला सकती हैं। पढ़ी–लिखी महिलाओं को बैंक से लेकर सार्वजनिक स्थलों पर कोई गुमराह नहीं कर सकता है। शिक्षित महिला समाज की रीढ़ होती है। शिक्षित महिला मां, पत्नी, बेटी के रूप में एक सभ्य और संस्कारी समाज की शिल्पकार होती है। शिक्षित महिलाएं अपने अधिकारों के साथ ही कर्तव्यों के प्रति भी जागरूक हैं। एक पढ़ी–लिखी महिला अपने परिवार को सभ्य और प्रगतिशील तो बनाती ही है, इसके साथ ही समाज और देश के विकास में अप्रत्यक्ष व परोक्ष रूप से कई भूमिकाएं निभाती है। समाज और देश का सही, सच्चे अर्थों में तभी विकास हो सकता है, जब देश की नारी शिक्षित हो। आज पढ़ी–लिखी महिला घर से लेकर व्यवसाय और अन्य कार्य क्षेत्रों में मुकाम हासिल कर रही है।

अध्ययन के उद्देश्य :

1. वैश्विक स्तर पर महिलाओं की स्थिति का अध्ययन करना?

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Phytochemical screening and quanitative analysis of active phytocontents of Guizotia abyssinica seed to knows of their therapeutic values

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Abstract---*Guizotia abyssinica Cass.* belonging to the family Asteraceae is a vegetable plant with many industrial and medicinal value. Current research describes a simple, effective and reproducible G-in-vitro propagation protocol. *G. abyssinica* and comparative phytochemical analysis of natural seeds, leaf (mature and in vitro regenerated) and *G. abyssinica* Different annotations namely. apical and axilllary buds, leaves and internode were selected for the in vitro regeneration study to assess the effect of differential concentrations on TDZ. Different parts of the plant such as seeds, natural leaf, in vitro leaf and callus were dried and extracted from different solvents and tested with various phytochemical analyzes. Of all the four annotations used, the apical shoot appeared to be the best in terms of shoot reproduction and reproduction. In vitro renewed callus has shown the presence of phenol. It may be concluded that additional suspension of hormonal compounds may be helpful in the widespread distribution and release of drugs for commercial use. The findings provide potential support for tissue tissue techniques in the production of bioactive compounds but further studies are needed as well.

Keywords---phytochemicals, guizotiaabyssinica, callus, in vitro regeneration, TPC, TFC

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Extracellular phospholipase activity in the environmental strains of *Cryptococcus neoformans* and *Cryptococcus gattii* isolated from Betul city of Madhya Pradesh

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Abstract

Cryptococcosis accounts for significantly life-threatening diseases in healthy and immunocompromised individuals by the production of extracellular enzymes in host cell. In the present study we focused on the extracellular phospholipase (PLP) activity which contributes to the most widely concerned issue of these enzymes as prominent virulence factors. For the screening of phospholipase producing strains, 45 environmental isolates of both *Cryptococcus neoformans* and *C. gattii* strains were point inoculated on egg yolk agar. In reference to *C. neoformans* and *C. gattii* isolated from tree samples, 17 (62.9%) strains showed high phospholipase production on 5th day and 18 (66.66 %) on 8th day of incubation with low Pz value (Pz ≤ 0.6). However, in case of yeast strains obtained from pigeon samples showed high phospholipase production that is 10 (55.55 %) and 11 (61.11 %) on 5th and 8th day of incubation. As per the statistical analysis using Independent "t" test, no significant difference was observed between phospholipase production by *C. neoformans and C. gattii* strains.

Keywords: *Cryptococcus neoformans*, *C. gattii*, phospholipase activity, virulence factors

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Introduction

The potential *Cryptococcus* virulence determinants play crucial roles in the fungal pathogenesis, these include extracellular enzymes production, the release of polyol metabolites, interaction with hormones, adherence, and production of mannoproteins (Kronstad *et al.*, 2011).

Cryptococcus neoformans species complex produces phospholipase enzyme which is pathogenic and the mechanism to decline its activity *in-vivo* is a subject less explored.

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"The Comparative Investigation on Physico-Chemical Parameters among Mohi and Junewani Dams of Pandhurna Tehsil of Chhindwara District"

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ABSTRACT

The present study we are try to execute the comparative study on the physico-chemical parameters among Mohi and Junewani Dams of Pandhurna tehsil of Chhindwara district of Madhya Pradesh.The mean pH value of the studied stream for rainy season falls within WHO limit whereas that of dry season was lower than WHO limit.Turbidity pollution index was 0.09 in rainy season against 0.09 of dry season.BOD values, water could be considered as being fairly clean since the observed mean values lie between the range of 2-3 mg/LThe observed mean values of phosphate, sulphate and nitrate in this study were lower than their respective WHO standards. Chloride values observed in the present study ranged from 6.00- 8.11 mg/L in rainy season with a mean value of 7.60 mg/L and 8.00-8.40 mg/L in dry season with a mean value of 8.22 mg/L.The observed variations and mean values for total hardness were lower than WHO standard thus the water quality enhanced the climate balance and ecosystem sustainable environment.

Key Words- Mohi and Junewani Dam, Physico-chemical parameters, WHO

INTRODUCTION

The water bodies are considered to be the most productive ecosystems because it comprises huge biodiversity. The inland water bodies in India such as lakes, tanks and ponds are exhibit distinct seasonal fluctuations in their physico-chemical and biological features. Physico- chemical and biological parameters play very important role in the assessment of water quality. The study of different water bodies is very important in understanding of the metabolic events in physico-chemical parameters for the management and conservation of the of indigenous. Hence in present study we are try to execute the comparative study on the physico-chemical parameters among Mohi and Junewani Dams of Pandhurna tehsil of Chhindwara district of Madhya Pradesh.

The profitability of a water body can without much of a stretch is recognized from its essential efficiency, which structures the foundation of the oceanic evolved ways of life (Bohra and Kumar, 2002) and the macrophytic aquatic weeds develop sumptuously by the advanced and silt and algal species which were engaged with essential creation. The potential impacts of the earth on water quality were accounted for by Joshi (2003), Spanas et al., (2003). In 2005, Harikumar and Madhavan considered the water quality in Kerala. A few examinations have been directed so far to comprehend the physical and chemical properties of lakes, and supplies in India (Gowed and Kotain; 2000 Devi and Sharma; 2003; Vishnavi and Srivastava, 2004). For the upkeep of biological parity physico-chemical parameters are required and distinctive environmental condition featured its status. Kaur et al., (2000) detailed that the natural appraisal is a valuable elective device for evaluating the environmental quality and the hydrophytes of aquatic biological system. Raina and Vobra (1996) proposed that preservation of freshwater environment is required to keep up the physical, chemical and organic nature of water.The present study is conducted at Mohi & Junewani Dam Pandhurna District Chhindwara (M.P.) Mohi Dam is Located at 210 40" North latitude and 780 25" East longitudes and altitude is above 481 m. asl. It is constructed in the year of 1986. Its catchment area is 17.18 sq. km. It's water mainly used for irrigation. It's Comes under Mohi panchayat. It is located 13km from Pandhurna. While Junewani Dam is located at 210 38" north latitude and 780 310 East longitudes and altitude to above 481 an asl. It is Constructed in the year of 1997. Its catchment area is 8.37 sq. km. It's water mainly used for irrigation. It's coming under Junewani gram panchayat. It is located 6km from Pandhurna. Both of the dam is mainly rain-fed and receives the water of the cultivated land around it.

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Phytochemical screening of active phytocontents of linum usitatissimum and guizotia abyssinica plant seeds comparative properties

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Abstract
Many plant Species used in the treatment of different diseases. Plant derived active compound have played an important role in the development of clinically useful agents. Guizotia abyssinica and Linum usitatissimum plant seeds are used for many disease treatment. Aim of the present study is investigate the phytochemical analysis of Methanol, petroleum ether, Chloroform and Acetone extracts of linum usitatissimum and Guizotia abyssinica plants. Qualitative analysis of phytochemical Screening reveals the presence of Phenol, Saponins, Alkaloids, Protein and Carbohydrates. Current research describes a simple, effective and reproducible Comparative phytochemical analysis of natural seeds.

Keywords: medicinal plants, phytochemicals, guizotia abyssinica, linum usitatissimum, antioxidant activity

Introduction
Plants have been an important Source of medicine for thousands of years. Plants are the source of many modern medicine. Phytochemicals are responsible for the healing properties of plants. Plants turn out many secondary metabolites together with flavonoids, Alkaloids, Steroids, Saponins, terpenoids and glycosides to safeguard themselves from the attack of present infectious agent, insects, pest and environmental stresses [1].
Niger (Guizotia abyssinica) is an oil seed plant cultivated for over 5000 years. It is widely grown in Southern India and Ethiopia. In India, it is cultivated on the slopes of hills and plains along the coasts of Madhya Pradesh, Chhattisgarh, Odessa, Maharashtra, Bihar, Karnataka, and West Bengal. G. abyssinica dicotyledonus plant, medium to fine branches, growing up to 2 m high. The plant grows very well in poorly drained, heavy clay soils. An important feature of this plant is that it provides good seed yield even under poor growing conditions. Niger is heavily cultivated for the extraction of Oil used for soap, lighting, lubrication and used as biodiesel. Niger oil absorbs the fragrance of flowers used as a base oil in the perfume industry. The plant is used in various Indian communities for the treatment of rheumatism, rheumatoid arthritis and infectious diseases [2].
Flax (Linum usitatissimum) plant growing to one m tall. The seeds are oval, 2.5-9.5 cm long and 1-3.5 cm. thin shiny in experienced depilatory with a black and a brief stalk regarding are 1-1.8 cm long seeds of Linum usitatisamum plant are used medication for treatment of Rheumatism, Dyspepsia, stomach upset, Dysmenorrheal, Diabetes, Cardiovascular disease, Cancer, Expelling disorders, Skin diseases, Trauma symptom and has sedative and antiviral properties. The seeds and alternative Components of Linum usitatissimum plant periwinkle exhibit inhibitor properties. Therefore, phenoplast compounds have chemical reaction properties that act as reducing agents, chemical element donors. It's multiple applications in foods, cosmetics and Pharmaceutical industries. Besides inhibitor activity, these compounds exhibit antiallergic, medicinal drug, antimicrobial antithrombotic cardio protecting and vasodilatory effects [3].
Phytochemicals are basically divided into two groups of Primary and secondary metabolites based on the activity of plant metabolism. Primary or basic metabolites include regular carbohydrates, amino acids, proteins and chlorophyll while secondary metabolites include alkaloids, saponins, Steroids, flavonoids, tannins and more [4].

Materials and Methods
Collection of Samples
Guizotia abyssinica and Linum usitatissimum are collected from forest region of Betul, M.P., India were Collected in the winter season. The plant calibrated taxonomically and was preserved for extraction.

Preparation of Solvent Extracts of plants
Guizotia abyssinica seeds were properly cleaned with running water then properly removed with purified water. The Seeds dried for 5 days at ambient temperature for shade. Second, dried seeds were coarsely used with a mortar and pestle and then a mechanical blender was used to ground them further. 30gm 340 ml of organic Solution of Methanol & D.W. were collected from the sample extraction at Soxhlet. The extraction was completed in 8 days at 65°c. In order to form a paste, extract were then evaporated at 45°C and further transfer to sterile and refrigerated once used [5, 6].
Linum usitatissimum seeds were properly washed with running water then purified water. The Seeds dried and crushed to urge powder. Dried powder of seeds 50gm was hot extracted with 500 cc fuel exploitation soxhlet

Name of Faculty: Mr. Neeraj

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वैयाकरणों द्वारा अभिव्यक्त क्रिया का स्वरूप, भेद एवं उपयोगिता

नीरज *

मनुष्य को व्यवहार के लिए भाषा रूपी उपहार प्रदत्त है, जो अन्य जातियों मे नहीं पाया जाता। भाषा यादृच्छिक ध्वनि प्रतीकों पर निर्भर है। हम लोक में जैसे—जैसे पदार्थ देखते हैं उसके आधार पर नामकरण किये और उनके आधार पर हम आपस में व्यवहार करते है। भाषा में पाये जाने वाले समस्त शब्द भण्डार को प्रातिशाख्य निरुक्त महाभाष्य और अन्य ग्रंथों में चार प्रकार के पदों (शब्दों) में विभक्त किया है—

1. अक्षर समुदायः पदम् अक्षरं वा तच्चतुर्धा, नामाख्यातोपसर्गनिपाताः। वा. प्रा.शा. 8/50
2. तद्यान्येतानि चत्वारि पदजातानि नामाख्याते चोपसर्ग निपाताश्च भवन्ति। निरुक्त 1/1
3. चत्वारि पदजातानि नामाख्यातोपसर्गनिपाताश्च। महा.भा.पस्पशाह्निक

महर्षि पाणिनि ने भी इन चारों प्रकार के पदों का उल्लेख अपनी अष्टाध्यायी में किया है।[1] परन्तु (सुप्तिङन्तं पदम्) 1/4/14 इस सूत्र में सुबन्त (नाम) तिङन्त (आख्यात) को ही पदों के अंतर्गत स्वीकार किया है। उपसर्ग और निपातों को नाम शब्दों के अंतर्गत ही देखा जाता है।

डॉ. जगदीश चतुर्वेदी ने चारों प्रकार के पदों को (सुप्तिङन्तं पदम्) सूत्र में समाविष्ट किया है। परन्तु यह बात प्रयोग सिद्ध है कि उपसर्ग और निपातों

* सहायक प्राध्यापक, संस्कृत विभाग, जयवंती हाक्सर शासकीय स्नातकोत्तर, महाविद्यालय बैतूल म.प्र।

1 शब्दशास्त्रे सुप्पदेन नामोपसर्गनिपातानां तिङ्पदेन चाख्यातस्य बोधो भवति। पद.प.वि. परि.पृ.8

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Fractional chaotic maps based short signature scheme under human-centered IoT environments

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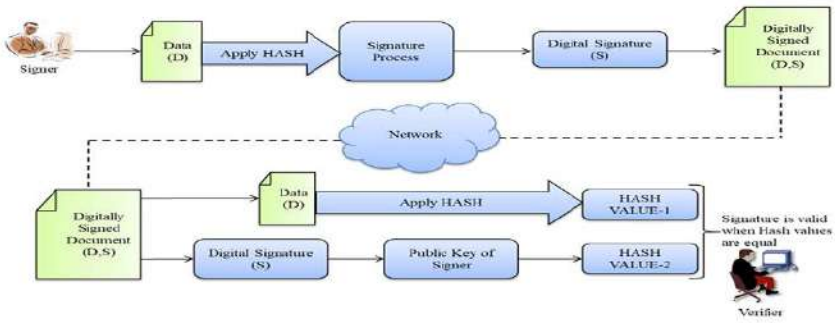
GRAPHICAL ABSTRACT



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ABSTRACT

Introduction: The Internet of Things (IoT) comprises of various smart devices for the sharing of sensed data through online services. People will be directly contacted to check their health parameters and the reports will be collected centrally through smart devices. The requirement is protection of messages during the exchange of data between sender and receiver in order to tackle human malicious attacks. Various signature-based schemes are discussed in the literature to provide secure communication.

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ORIGINAL ARTICLE

Simplified sediment yield index incorporating parameter stream length

Sarita Gajbhiye Meshram[1] · Vijay P. Singh[2,3] · Chandrashekhar Meshram[4] · Mohd Abul Hasan[5] · Saiful Islam[5]

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Abstract
Sediment-Runoff process is highly variable and nonlinear in nature. In the present study an attempt has been made to develop a relationship between watershed stream length and Sediment Yield Index (SYI) and test it on Narmada watersheds, Madhya Pradesh, India. Area (A), Curve Number (CN) and stream length (SL) were utilized as input for model development. The three models (A model, CN model and simplified All India Soil and Land Use Survey (AISLUS) model including parameter SL) performed differently, with the coefficient of R^2 equal to 0.01, 0.02 and 0.71 (Shakkar watershed), 0.11, 0.23 and 0.91 (Bamhani watershed), 0.06, 0.001 and 0.80 (Manot watershed) and 0.40, 0.05 and 0.66 (Mohgaon watershed), respectively. The logarithmic simplified AISLUS model incorporating parameter SL resulted with the coefficient of R^2 as 0.76 (Shakkar watershed), 0.93 (Bamhani watershed), 0.84 (Manot watershed) and 0.66 (Mohgaon watershed). Therefore, the logarithm simplified AISLUS model was chosen as the best regression model for this study. It is observed that the simplified AISLUS model (logarithm form) incorporating parameter SL had a satisfactory efficiency as 76.35% (Shakkar watershed), 66.05% (Mohgaon watershed), 93.36% (Bamhani watershed), and 83.83% (Manot watershed) by Nash efficiency scale. The resulting higher Nash efficiency values support the versatility of the derived relationship and invoke assessment of SYI from the watershed stream length value. The prediction of SYI is important when adopting a suitable soil conservation measure in the watershed for minimizing soil erosion.

Keywords Sediment yield · Runoff · Narmada river · Modeling · Stream length

Introduction

Accurate estimation of the amount of runoff and sediment is important for management of the water resources (Gajbhiye et al. 2014). Surface runoff and sediment yield are two major hydrological response caused by precipitation (Gajbhiye et al. 2014). Water is the major agent responsible for soil erosion may be defined as detachment and then movement of soil particles from one place to another place. At many locations, wind and glacial runoff may also be the agent of soil erosion. To control soil erosion in any area by various soil and water management measures the developmental unit

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Article

An Efficient Electronic Cash System Based on Certificateless Group Signcryption Scheme Using Conformable Chaotic Maps

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Abstract: Signcryption schemes leveraging chaotic constructions have garnered significant research interest in recent years. These schemes have proffered practical solutions towards addressing the vast security vulnerabilities in Electronic Cash Systems (ECS). The schemes can seamlessly perform message confidentiality and authentication simultaneously. Still, their applications in emerging electronic cash platforms require a higher degree of complexity in design and robustness, especially as billions of online transactions are conducted globally. Consequently, several security issues arise from using open wireless channels for online business transactions. In order to guarantee the security of user information over these safety-limited channels, sophisticated security schemes are solely desired. However, the existing signcryption schemes cannot provide the required confidentiality and authentication for user information on these online platforms. Therefore, the need for certificateless group signcryption schemes (CGSS) becomes imperative. This paper presents an efficient electronic cash system based on CGSS using conformable chaotic maps (CCM). In our design, any group signcrypter would encrypt information/data with the group manager (GM) and send it to the verifier, who confirms the authenticity of the signcrypted information/data using the public criteria of the group. Additionally, the traceability, unforgeability, unlinkability, and robust security of the proposed CGSS-CCM ECS scheme have been built leveraging computationally difficult problems. Performance evaluation of the proposed CGSS-CCM ECS scheme shows that it is secure from the Indistinguishably Chosen Ciphertext Attack. Finally, the security analysis of the proposed technique shows high efficiency in security-vulnerable applications. Overall, the scheme gave superior security features compared to the existing methods in the preliminaries.

Keywords: certificateless group signcryption scheme (CGSS); conformable chaotic maps (CCM); electronic cash system (ECS); signcrypter; provably secure schemes; authentication; E-commerce channels

1. Introduction

In modern electronic commerce, digital signatures play a significant role due to integrity and authentication requirements. Integrity is a vital property that helps to monitor

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Article

A Provably Secure IBE Transformation Model for PKC Using Conformable Chebyshev Chaotic Maps under Human-Centered IoT Environments

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Abstract: The place of public key cryptography (PKC) in guaranteeing the security of wireless networks under human-centered IoT environments cannot be overemphasized. PKC uses the idea of paired keys that are mathematically dependent but independent in practice. In PKC, each communicating party needs the public key and the authorized digital certificate of the other party to achieve encryption and decryption. In this circumstance, a directory is required to store the public keys of the participating parties. However, the design of such a directory can be cost-prohibitive and time-consuming. Recently, identity-based encryption (IBE) schemes have been introduced to address the vast limitations of PKC schemes. In a typical IBE system, a third-party server can distribute the public credentials to all parties involved in the system. Thus, the private key can be harvested from the arbitrary public key. As a result, the sender could use the public key of the receiver to encrypt the message, and the receiver could use the extracted private key to decrypt the message. In order to improve systems security, new IBE schemes are solely desired. However, the complexity and cost of designing an entirely new IBE technique remain. In order to address this problem, this paper presents a provably secure IBE transformation model for PKC using conformable Chebyshev chaotic maps under the human-centered IoT environment. In particular, we offer a robust and secure IBE transformation model and provide extensive performance analysis and security proofs of the model. Finally, we demonstrate the superiority of the proposed IBE transformation model over the existing IBE schemes. Overall, results indicate that the proposed scheme posed excellent security capabilities compared to the preliminary IBE-based schemes.

Keywords: public key cryptography; identity-based encryption schemes; Chebyshev polynomial; conformable Chebyshev chaotic maps; human-centered Internet of Things

1. Introduction

Human-centered Internet of Things (IoT) enables seamless processing of electronic transactions, healthcare information systems, efficient operation of intelligent devices,

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Review

Performance Measurement System and Quality Management in Data-Driven Industry 4.0: A Review

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Abstract: The birth of mass production started in the early 1900s. The manufacturing industries were transformed from mechanization to digitalization with the help of Information and Communication Technology (ICT). Now, the advancement of ICT and the Internet of Things has enabled smart manufacturing or Industry 4.0. Industry 4.0 refers to the various technologies that are transforming the way we work in manufacturing industries such as Internet of Things, cloud, big data, AI, robotics, blockchain, autonomous vehicles, enterprise software, etc. Additionally, the Industry 4.0 concept refers to new production patterns involving new technologies, manufacturing factors, and workforce organization. It changes the production process and creates a highly efficient production system that reduces production costs and improves product quality. The concept of Industry 4.0 is relatively new; there is high uncertainty, lack of knowledge and limited publication about the performance measurement and quality management with respect to Industry 4.0. Conversely, manufacturing companies are still struggling to understand the variety of Industry 4.0 technologies. Industrial standards are used to measure performance and manage the quality of the product and services. In order to fill this gap, our study focuses on how the manufacturing industries use different industrial standards to measure performance and manage the quality of the product and services. This paper reviews the current methods, industrial standards, key performance indicators (KPIs) used for performance measurement systems in data-driven Industry 4.0, and the case studies to understand how smart manufacturing companies are taking advantage of Industry 4.0. Furthermore, this article discusses the digitalization of quality called Quality 4.0, research challenges and opportunities in data-driven Industry 4.0 are discussed.

Keywords: Industry 4.0; Internet of Things; Quality 4.0; performance measurement system; cyber–physical production system

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IBOOST: A Lightweight Provably Secure Identity-Based Online/Offline Signature Technique Based on FCM for Massive Devices in 5G Wireless Sensor Networks

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ABSTRACT The fifth-generation (5G) wireless network is commercialized. The need to integrate massive devices in 5G and wireless sensor networks (WSN) to provide several convenient services for network users becomes imperative. However, there are growing concerns that 5G-WSNs pose new security threats to sensitive user information. User authentication and key agreement have been provided for secure end-to-end communication. However, stricter security techniques are required as billions of massive devices are being networked to collect and process complex user data in real-time. Therefore, anonymous authentication and authorization are highly coveted for privacy preservation and prevention of unlawful exploitation of user data. However, guaranteeing data integrity, authentication, and non-repudiation require special-purpose identity-based signature techniques that are quite difficult to design in practice. In order to address this problem, this paper proposes a lightweight, provably secure identity-based online/offline signature technique (IBOOST) and its extension for massive devices in 5G-WSNs using fractional chaotic maps. The IBOOST scheme achieves multi-time use of offline storage at a lower processing time. Therefore, the signer can reuse the offline pre-stored information in a polynomial time. This makes our IBOOST superior to the existing online/offline signature techniques that allow only a single signature. Additionally, the new technique enables the pre-registration process with a secret key, and no secret key is required in the offline stage. Also, the proposed IBOOST proves to be secure in the random oracle unforgeability under the chosen message attack (UF-IBS-CMA). Finally, the IBOOST and its enhanced version (A-IBOOST) give the lowest computational costs compared to several contending techniques. Therefore, the proposed IBOOST shows superior security and performance with better computational overhead than the preliminary techniques.

INDEX TERMS 5G wireless sensor network systems, fractional chaotic maps, identity-based signature scheme, provably secure.

I. INTRODUCTION

The fifth-generation (5G) wireless networks that are rapidly deployed worldwide have ushered in great relief to the proliferating issues inherent in the ubiquitous 4G wireless networks [1]. 5G wireless networks support the application of blockchain technology [2], holographic communication [3], Industrial Internet of Things (IIoT) [4], wireless security networks [5], and more. Wireless sensor nodes are spatially

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An Efficient Provably Secure Verifier-Based Three-Factor Authentication Technique Using PDL for Data Exchange in TMIS

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ABSTRACT In healthcare services, telecare medicine information systems (TMIS) is the viable solution offered currently. Moreover, to provide best security to the TMIS, it attracted the various researchers to investigate the security challenges in TMIS. Subsequently, the security of TMIS is improving but the application becoming widespread hence needs robust security technique. An efficient verifier-based 3-party authentication technique in telecare medicine information systems for data exchange, which permits only two users/patients to store their verifier in the database of an authentication server, computed using own password. The authentication system will then validate the user's verifier and help them safely and easily share electronic medical records. In this work, we present an efficient provably secure verifier-based 3-party authentication technique using partial discrete logarithm (PDL) for exchanging data in TMIS. The presented technique not utilizing any public keys of the server, and does not require additional messages and number for key confirmation rounds. The proposed technique has higher security compared to the related verifier-based methods, has lower computational costs and fewer communications, and is therefore ideal for TMIS.

INDEX TERMS TMIS, partial discrete logarithm, data exchange, authentication, entropy smoothing hash function.

I. INTRODUCTION

With the rapid advancement of the internet and information technology, facilitates the development of telecare medicine information systems (TMIS). TMISs are generally utilized to provide healthcare delivery of Medical services. TMIS offers the storage and maintenance of medical information which is highly sensitive and belongs to the registered users; specifically it stores electronic medical records (EMR) conveniently and efficiently. These sensitive information are accessed and shared through public communication channel by the medical institutes, hospitals, academia, and doctors to enhance decision capability. It supports telecare medicine services directly delivered to the patients at home via public networks. Further, gradual development of e-healthcare systems also provides medical services directly at a doorstep of patient which is an economical alternative for patients and healthcare service suppliers with decrease travel expenses. TMIS require a powerful secured and efficient authentication mechanism for protecting patient's private information such as EMR, healthcare information, etc.

Subsequently, many authentication schemes or methods were developed in the recent times for TMIS. Mostly, it used for data exchange in TMIS that enables two users can share a

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An Efficient, Robust, and Lightweight Subtree-Based Three-Factor Authentication Procedure for Large-Scale DWSN in Random Oracle

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***Abstract*—Wireless sensor networks (WSNs) are the backbones of numerous real-time monitoring systems that are applied to serve many different parts of our everyday lives including traffic management, telecare, pollution control, military application, among others. In most cases, WSN systems involve exchanges of sensitive/private data between the sensor nodes and the outside world. In order to preserve data privacy, illegal data access must be denied, and so the remote client has to be properly authorized by both the base station and the sensor node in order to ensure data access legitimacy. Many authentication procedures have been projected by researchers based on various frameworks of parameters such as (two-factor authentication (2-FA) = Smart card + Password) and (three-factor authentication (3-FA) = Biometric + Smart card + Password) in the literature. Das *et al.* (2015) projected a three-factor technique for resource-constrained distributed WSN to address the existing pitfalls. In this article, we present an analysis of Das *et al.*'s technique and point out some inconsistencies in the technique; demonstrating that the system is vulnerable against a known session-specific particular information attack, which thus prompts leakage of the client identity. We offer a robust subtree-based 3-FA procedure to fix the problem. In addition, we show the security strengths of our devised approach which have been established both informally and formally using the random oracle model and AVISPA tool.**

***Index Terms*—Authentication, biometrics, fuzzy extractor, hash function, random oracle, security attacks, smart cards, subtree, wireless sensor networks.**

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I. Introduction

THE distributed wireless sensor network (DWSN) is a dynamic infrastructure that consists of lightweight, resource constrained, battery-backup sensor nodes, or motes where communication is performed wirelessly in a smaller scope [1]. In DWSN, sensor nodes are normally randomly located everywhere throughout the objective field to form a multihop wireless communication environment among clients, the base station (BS)/sink node, and sensors. In such a network, as shown in Fig. 1, the BS has unlimited storage capacity and computational resources, and it communicates with the external world over a wireless ad hoc network. The BS monitors and controls the whole network and therefore has the authority to read data from sensors. It is assumed to be trustworthy and not subject to compromise by an attacker.

For the BS to do the job, the most convenient design would be one where the BS serves as a gateway to the WSN with all the client queries routed through it, so that it would be the easiest for the BS to monitor and control the whole system. However, when an emergency case occurs in a system for healthcare monitoring such as forest fire detection or natural disaster prevention, the clients would typically want to have direct access to local sensors rather than getting routed through the BS. To offer a design where direct communication is allowed between clients/users and sensor nodes, there are security issues to take care of regarding the authorization of clients before they connect to the network so as to maintain data privacy, especially in a wireless environment where security threats and possible attackers can be anywhere. To us, the greatest challenge is to design a DWSN system that offers optimum security protection with the least overhead.

In the literature, many remote client authentication procedures have been proposed that use various factors such as two factor authentication (2-FA) [2]–[4], elliptic curve cryptography (ECC) [5], [6], and bilinear pairing [7], [8]. However, some latest research proved that for WSN, biometric-based client authentication is more dependable and secure than conventional password-based client authentication procedures [9]–[14]. Inherent advantages of biometric-based methods include the following statements.

1) Biometric values or keys cannot be forgotten or lost; 2) Biometric values or keys are very difficult to share or copy;

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A Lightweight Provably Secure Digital Short-Signature Technique Using Extended Chaotic Maps for Human-Centered IoT Systems

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***Abstract*—Internet of Things (IoT) consists of numerous smart devices for sharing sensed data through the availability of online services. Direct communication by smart devices with people to identify parameters of healthcare and send them to a central repository is crucial. There is a need to secure messages among the sender and recipient during data exchange in order to tackle the malicious attacks by human. To provide secure communication, various signature-based schemes are presented in the literature. However, smart devices require lightweight tasks by guaranteeing essential security strengths. The main difficulty in signature-based methods is more computational cost incurred for signature and verification stages involving large numbers. This article introduces a lightweight provably secure short digital signature technique for safe communication amongst smart devices in human-centered IoT (HCIoT), the security of which is closely related to an extended chaotic maps assumption in a random oracle model (ROM). Moreover, we used less comprehensive operations to accomplish processes of verification and signing, similar to human signing on legitimate documents and then check as per witness. The proposed technique provides a stronger guarantee of protection than existing signature techniques. The key advantage of the presented technique over the DSA techniques is that it takes less computation in the verification stage and signing length; it retains the degree of protection. The presented short signature takes less bandwidth for communication, storage, and computing resources.**

***Index Terms*—Confidentiality, digital signatures, extended chaotic maps and probability security analysis systems, Internet of Things (IoT) complex systems.**

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List of Notations

u	Private key.
v	Public key.
$\mathcal{T}$	Chebyshev chaotic maps.
r	Random number per message.
h_1, h_2	One Way Hash Functions.
$\mathcal{M}$	Message.
$\mathcal{B}$	First parameter of signature.
s	Second parameter of signature.
σ	Digital signature.
q	Large prime number of bit length.
p	Large prime factors of $q-1$.

I. Introduction

TODAY is the era of Internet of Things (IoT) wherein different types of devices are connected to the Internet. These devices can be home appliances, agricultural equipment, manufacturing devices, industry tools, energy meter, mining sensors, healthcare monitoring instruments, environment equipment, surveillance systems, smart homes, smart cities, and smart grids among others, which comprise the machine-to-machine (M2M) model. With the advent of IoT-enabled devices, it is very easy to monitor or control various kinds of systems on the finger tips. IoT devices are smart enough to share and exchange data over public Internet to store on cloud. IoT is a powerful tool to apply on varieties of domains and proves the vital role by providing significant advantages. Ashton presented the notion of "*IoT*" and IoT devices came into existence in 2005. Since then tremendous evolution in IoTs has been reported; starting from the invention of basic smart devices to human centered sophisticated devices [1]. Thus, IoT devices received wide acceptance to use in various areas such as smart environment and human-centered design. The different methodologies have been adopted by the researchers to develop and experiment with IoT-enabled systems in a wide range of applications [2]. In addition, the architectures presented to investigate real-world problems are developed using the notion of IoT [3]. This motivates the research in IoTs to explore more possibilities in order to utilize the tremendous power of IoTs.

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Check for updates

Provably secure lightweight client authentication scheme with anonymity for TMIS using chaotic hash function

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Abstract

Telecare medicine information system (TMIS) is recognized as an important tool for improving the quality and protection of healthcare services. In addition to protecting the privacy of patients, many authentication techniques are being introduced in TMIS. After investigations, it is observed that many authentication techniques have security breaches. In this article, we propose an efficient, secure and lightweight authentication scheme for TMIS using chaotic hash function to achieve user anonymity. Chaotic hash function constitutes potential security a set in modern cryptography with its random behavior. Also, we provide the security proof in the random oracle (RO) model and proof of correctness of algorithm is presented using (Burrows–Abadi–Needham) BAN logic for proposed scheme. The comprehensive formal and informal security review demonstrate that the security of our scheme is resistive against known potential attacks. Additionally, our presented authentication scheme performs significantly better as compared to other existing schemes in the literature and also it is efficient on the basis on high security and low cost for computational and communication.

Keywords Telecare medical information system · Authentication · Smart card · Password-based remote authentication · Chaotic hash function · Subtree · Fuzzy user · Random oracle

1 Introduction

With the advent of various computing resources and storage media, the large amount of data is generated by the different applications over the public communication network. Today, variety of data is available on our finger tips such as social media, stock market, finance, medical and healthcare, etc. All these data are very crucial and vital

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A Provably Secure Lightweight Subtree-Based Short Signature Scheme With Fuzzy User Data Sharing for Human-Centered IoT

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ABSTRACT Internet of Things (IoT) is made up of various smart devices for the exchange of sensed data through online services. Direct contact with people through smart devices to define parameters for healthcare and send them to a centralized repository. At the time of data exchange, messages need to be secure between a source (sender) and target (receiver) in order to confront human malicious attacks. Various signature-based schemes are presented in the literature to provide secure communication. Smart apps, however, require lightweight activities by maintaining critical security strengths. The key challenge in signature-based methods is more incurred computational expense for signing and checking process involving large numbers. In this article, a new lightweight provably secure partial discrete logarithm (DL) based subtree-based short signature with fuzzy user data sharing for human-centered IoT systems is introduced and it's security analysis is demonstrated on random oracle (RO) model. The presented scheme provides assurance of better security than other standing short-signature schemes. For low-storage, low-computation environments and low-bandwidth communication, the presented new provably secure and lightweight subtree-based short-signature scheme is needed. The results demonstrate the strength of proposed scheme, as opposed to existing works.

INDEX TERMS Fuzzy user data sharing, IoT, identity-based signature scheme, partial discrete logarithm, probability security analysis, subtree.

I. INTRODUCTION

In the past, we had witnessed so much development in the security aspects related to numerous domains such as e-commerce, healthcare, IoT, industrial IoT, and cloud computing, etc. Variety of cryptographic algorithms are presented in various domains to satisfy the essential security needs by the users or organizations. Initially, public-key cryptography (PKC) was adopted to offer the security wherein public-key is shared amongst all the users. The message exchange is stared after the generation of key pairs (*encryption, signature*), the certificate request is submitted with identity proof to CA (certificate authority), and hence receive certificates signed by CA for authentication to exchange messages in

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METHODOLOGIES AND APPLICATION

An effective mobile-healthcare emerging emergency medical system using conformable chaotic maps

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Abstract
The developments in telecommunication and online facility resolutions help to connect the digital divide among urban and rural healthcare services administrations, empowering arrangement of appropriate medicinal finding and treatment discussions. Mobile-healthcare (*m*-Healthcare) systems can be used for quality improvement of healthcare and monitoring individuals with chronic diseases like heart disease and diabetes under medical affair. Wireless body area networks are installed in the human body, which transmit the information via Bluetooth or other means to the smartphone. In this study, we introduce a new efficient mobile-healthcare emerging emergency medical system using conformable chaotic maps under cloud computing environment.

Keywords Mobile-healthcare emerging emergency · Smart health homes · Anonymity · Fractional calculus · Conformable chaotic maps · Mutual authentication · Opportunistic computing

1 Introduction

In cloud computing, Internet-based resources such as hardware/software are available for access and sharing. Nowadays, this is used to decrease paper work and manpower in every sector. Cloud computing's general objective is to handle complexity in an efficient manner where simplification is adopted to accelerate the utilization of capacities. Moreover, smartphones and tablet computers are becoming progressively important components of human life. They are most efficient and expedient communication instruments, which do not bound by moment

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APPLICATION OF SOFT COMPUTING

A comparative study between dynamic and soft computing models for sediment forecasting

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Abstract
Runoff–sediment process modeling is highly variable and nonlinear in nature. For sediment yield prediction, the difficulty of rainfall–runoff–sediment yield hydrological processes remains challenging. The present study uses a simple nonlinear dynamic (NLD) model to predict daily sediment yields, taking into account the degree of daily–sediment yield in catchment areas, and its findings were compared to three widely used models including artificial neural networks (ANN), support vector machine (SVM), and gene expression programming (GEP). The daily measured discharge–sediment data for 25 years were obtained from Shakkar Watershed; Central India as in the current study. The coefficient of correlation (CC), Nash-Sutcliff (NS), and root-mean-square error (RMSE) were employed to assess the performance of the models. The results show that the NLD model was found better than ANN, SVM, and GEP model. These models had correlation coefficient (CC = 0.975, 0.887, 0.843, and 0.901), root-mean-square error (RMSE = 0.748, 1.751, 1.961, and 1.545), and Nash–Sutcliffe efficiency (0.952, 0.784, 0.673, and 0.814) correspondingly. Hence, the NLD model can be used for predicting sediment. In order to implement appropriate measures of soil conservation in the watershed to reduce the sediment load in the river, predicting the sediment yield is very necessary to maximize the life of the structure.

Keywords Sediment yield · Runoff · Dynamic model · ANN · SVM · Gene expression programming

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1 Introduction

Research on rainfall and runoff produced sediment-based problems would be very helpful in knowing the broad issue of soil degradation and soil erosion in an agricultural area like India, where there are growing pressures on soil and water resources from the inhabitants (Meshram et al. 2019a,b). The planning, designing, and evaluation of land conservation projects, reservoir design and management, environmental and water-pollution measures, and drought and flood control programs are mostly required in the case of information about a suspended sediment yield (wash load) (Meshram et al. 2018a). Information on suspended catchment sediment yields (wash load) is required on several occasions in order to schedule, plan and review land management systems, park design and operation, environmental and water pollution strategies, as well as drought and water control programs.

Various approaches have been proposed to predict soil loss and sediment transport under current and alternate

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ORIGINAL PAPER

Soil erosion modeling of watershed using cubic, quadratic and quintic splines

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Abstract
Soil erosion is widespread with spatio-temporal variability and is central to the determination of sediment yield, which is vital to proper management of watersheds. We propose a relation between the Curve Number (SCS 1956) and the Sediment Yield Index (SYI) using cubic, quadratic and quintic splines in this research. Using Mohgaon watershed (part of Narmada Basin) data, the relation between observed and computed SYI is found to have a coefficient of determination (R^2) value of 0.87, 0.40 and 0.10 corresponding cubic, quadratic and quintic splines suggesting that such a relation can be used to determine SYI from the available CN value. The cubic spline was found to be the best method with respect to Absolute Prediction Error (*APE*), Integral Square Error (*ISE*), Coefficient of Efficiency (*CE*), Coefficient of Correlation (*CC*) and degree of agreement (*d*) (i.e., APE = 1.35, ISE = 3.09, CE = 62.08, CC = 79.60 and $d = 0.99$). The quintic spline (with an average value of APE = 19.59, ISE = 7.84, CE = − 165.73, CC = 19.30 and $d = 0.26$) and the quadratic spline (with an average value of APE = 20.99, ISE = 8.92, CE = − 199.90, CC = 8.95 and $d = 0.15$) ranked as the 2nd and the 3rd best methods, respectively.

Keywords Sediment yield index · Cubic/quadratic/quintic spline · Mohgaon watershed · Soil erosion

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RESEARCH ARTICLE

Iterative classifier optimizer-based pace regression and random forest hybrid models for suspended sediment load prediction

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Abstract
Suspended sediment load is a substantial portion of the total sediment load in rivers and plays a vital role in determination of the service life of the downstream dam. To this end, estimation models are needed to compute suspended sediment load in rivers. The application of artificial intelligence (AI) techniques has become popular in water resources engineering for solving complex problems such as sediment transport modeling. In this study, novel integrative intelligence models coupled with iterative classifier optimizer (ICO) are proposed to compute suspended sediment load in Simga station in Seonath river basin, Chhattisgarh State, India. The proposed models are hybridization of the random forest (RF) and pace regression (PR) models with the iterative classifier optimizer (ICO) algorithm to develop ICO-RF and ICO-PR hybrid models. The recommended models are established using the discharge and sediment daily data spanning a 35-year period (1980–2015). The accuracy of the developed models is examined in terms of error; by root mean square error (*RMSE*) and mean absolute error (*MAE*); and based on a correlation index of determination coefficient (R^2). The proposed novel hybrid models of ICO-RF and ICO-PR have been found to be more precise than their stand-alone counterparts of RF and PR. Overall, ICO-RF models delivered better accuracy than their alternatives. The results of this analysis tend to claim the appropriateness of the implemented methodology for precise modeling of the suspended sediment load in rivers.

Keywords Hybrid technique · Iterative classifier optimizer · Pace regression · Random forest · River · Suspended sediment load

Introduction

The hydrological modeling of sediment, river stream and rainfall–overflow connection are significant to offer a design insight for the water resources management projects in practice (Firat and Gungor 2009). Sediment transport modeling is required for issues in the outline of transport of sediment in channels, ponds and bays, stable stations and dams, repositories of dams, protection of fish, effect of watershed administration, and ecological effect valuation (Cigizoglu 2004). In the field of computational hydrology, sediment and water quality modeling is a challenging task (Kisi et al. 2009). Sediment load has been estimated using traditionally method such as experimental relations, numerical reproductions, materially grounded models, remote sensing (RS) and geographic information systems (GIS) practices (Gajbhiye et al. 2015).

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AN EFFICIENT KEY EXCHANGE SCHEME USING SANTILLI'S ISOFIELDS SECOND-KIND FOR SECURE COMMUNICATION

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ABSTRACT. We intend to bring out a unique method for constructing key exchange scheme (KES) using Santilli's isofields second kind for safe transmission. The substantial idea of our offer KES is to utilized isopolynomials with general isonumber coefficient. Suggested KES is an unusual advantage for afore application as Santilli's isofields second kind framework permutable permutation of isocongruence and isoarirthmetic progressions.

1. INTRODUCTION, MOTIVATIONS AND ORGANIZATION

The framework for KES introduced by Diffie–Hellman, permits two users to simultaneously build a mutual private key over an unconfident mechanism [1]. At present, most of KES build on the number theory. The primary concerns on that the public key cryptography is design are discrete logarithm problem (DLP) [2, 3] along with the elliptic curve DLP [4, 5]. The methodically enumerable groups in which DLP structure plays are a fundamental part in cryptosystem [6]. Various implementations of the Diffie-Hellman procedure in matrix rings and diversity of matrices are suggested in [7, 8]. Various cryptographic schemes constructed on DLP and double DLP proposed in [9–12,

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A New Remote Fuzzy User Password Authentication Scheme Using Sub-tree for Cloud Computing

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Abstract—Recent advancements in internet technology and the infrastructure have attracted more people and organizations to do everything online. Internet technologies have provided amazing and smooth ease for electronic sales and purchases. However, many people have refused to use these internet technologies in electronic purchases because of unstable and insecure forms. New hacking techniques and new types of attacks have been tackled to make these internet technologies better and safer. Smartcard-based password authentication schemes have been the mainstream in recent years, featuring their highly lightweight, easy-to-use equipment and low-cost apps. Various secure and faster authentication schemes have been proposed in the literature. However, most of the existing authentication schemes have found vulnerable to recent attacks and have security flaws. This paper provides and efficient way for authentication using the partial discrete logarithm and sub-tree structure. The proposed scheme has seen effective and more useful in cloud computing environment. The analysis based on the security and the computational cost shows that the proposed authentication scheme proves to be more secure and efficient compared to other protocols that serve the same purposes.

Keywords— Mutual authentication; session key; smartcard; sub-tree; partial discrete logarithm, cloud computing.

I. Introduction

SMARTCARD-based remote user authentication schemes allow a server to authenticate a remote user over public, insecure networks. The systems for authentication typically follow some of the two methods below to identify a user:

- Using something only known to the user, such as a password.
- Using something only the user has legal access to, such as a smart card.

The technology that uses both methods is sometimes referred to as two factor authentications. A smartcard-based password authentication system includes an authentication server AS and a user U. Usually there is three basic phases to the system: registration, login and authentication. However, sometimes an extra phase may also be included for user password change using

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Identification of Critical Watershed for Soil Conservation Using Game Theory-Based Approaches

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Abstract
Soil erosion causes significant damage to humans by reducing soil productivity and filling reservoirs from sediment deposition in Narmada Basin, India; hence, it is important to recognize soil erosion prone areas for preventive steps in this basin. In this research, prioritization of sub-watersheds of Narmada Basin has been done using game theory-based approaches such as Condorcet and Fallback bargaining. For this purpose, Digital Elevation Model (DEM) generated by Shuttle Radar Topography Mission (SRTM) was used to extract and analyze 12 morphometric parameters including linear, aerial, and relief parameters. Based on the Condorcet and Fallback bargaining methods, the Mohgaon watershed came at the first priority ranking, that means it's the most vulnerable watershed from the point of soil erosion (SE). Game theory was successfully implemented for prioritizing watersheds in term of SE. The findings showed that morphometric parameters and game theory approach have a high efficiency in recognizing areas that are vulnerable to erosion.

Keywords Game theory · Prioritization technique · Soil conservation · Watershed management

1 Introduction

Soil erosion is one of the major land loss problems in agricultural land and is regarded as a serious environmental hazard (Lu et al. 2003; Kim et al. 2005; Srinivasan et al. 2019). Water erosion risk is an environmental, economic and social issue that affects all countries (Meena et al. 2017). India's regions are not resistant to this type of natural hazards, whose soil loss is estimated at 147 M ha (Bhattacharyya et al. 2015).The average annual soil erosion for Narmada basin watershed (Shakkar River watershed) was estimated to be 10.04 t/ha/ year (Patil et al. 2015). Therefore, the problem needs to be addressed prudently and a systematic solution to reduce the extent of the problem needs to be pursued. To exploit land and water

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COINCIDENCE POINTS AND COMMON FIXED POINTS OF EXPANSIVE MAPPINGS IN A_b-METRIC SPACES

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Abstract: In this study, we prove some fixed point theorems for expansive mappings on A_b-metric spaces. Finally, the example is presented to support the new theorem proved. Our results extend/generalize many pre-existing results in literature.

Keywords and Phrases: A_b-metric space, expansive mapping, fixed point.

2020 Mathematics Subject Classification: 47H09, 47H10.

1. Introduction

Fixed point theory has great importance in science and mathematics. Since this area has been developed very fast over the past two decades due to huge applications in various fields such as nonlinear analysis, topology and engineering problems, it has attracted considerable attention from researchers. The study of expansive mappings is a very interesting research area in the fixed point theory. Wang et al. [37] proved some fixed point theorems for expansion mappings, which

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RATIONAL TYPE CONTRACTION IN CONTROLLED METRIC SPACES

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Abstract: The aim of this paper is to establish a fixed point theorem for rational type contraction in a complete controlled metric space. Our results extend/generalize many pre-existing results in literature. We also provide example which show the usefulness of these results.

Keywords: fixed point theory; rational type contraction; controlled metric space.
2010 AMS Subject Classification: 47H10, 54H25.

1. INTRODUCTION AND PRELIMINARIES

Dass and Gupta [26] established first fixed point theorem for rational contractive type conditions in metric space.

Theorem 1.1 (see [26]). Let (X, d) be a complete metric space, and let $\mathcal{T}: X \to X$ be a self-mapping. If there exist $\alpha, \beta \in [0, 1)$ with $\alpha + \beta < 1$ such that

$$d(\mathcal{T}x, \mathcal{T}y) \leq \alpha d(x, y) + \beta \frac{[1 + d(x,\mathcal{T}x)]d(y,\mathcal{T}y)}{1 + d(x,y)} \qquad (1.1)$$

for all $x, y \in X$, then $\mathcal{T}$ has a unique fixed point $x^* \in X$.

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Study of all Subgroups of the Symmetric Group S_6

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Abstract: In this paper, we aimed at determining all subgroups of the Symmetric group S_6 up to Automorphism class using Sylows theorem and Lagranges theorem. This is achieved by finding all subgroups of order m for which $\frac{m}{O(S_6)}$ and are subsets of S_6. Further, the Symmetric group S6 is centerless and every automorphism of it is inner. Also, every natural homomorphism to the automorphism group is an isomorphism.

Keywords: Symmetric group, Conjugacy class, Isomorphism, Automorphism, Complete group

1.Introduction

In mathematics, the notion of permutation is used with several slightly different meanings, all related to the act of permuting (rearranging in an ordered fashion) objects or values. Informally, a permutation of a set of values is an arrangement of those values into a particular order. Thus there are six permutations of the set 1,2,3, namely, (1,2,3), (1,3,2), (2,1,3), (2,3,1), (3,1,2), and (3,2,1). In algebra and particularly in group theory, a permutation of a set S is defined as a bijection from S to itself . To such a map f is associated with the rearrangement of S in which each element s takes the place of its image f(s). Given any non empty set S, define A(S) to be the set of all bijections mapping of the set S onto itself. The set A(S) is a group with respect to composition of function. If the set S is finite with n elements, then the group A(S) is denoted by Sn. The order of Sn is n! And will be called Symmetric group. Any subset of S_n which is itself a group is called a subgroup of Sn. There are many references on subgroups of S_2, S_3, S_4 and S_5 ([2], [7], [8] and [10]). Our aim in this paper is to critically examine all subgroups of S6 up to automorphism class and their conjugacy class size. The set of all symmetry operations on all objects in the set S, can be modeled as a group action g : G × S → S, where the image of g in G and x in S is written as gx. If, for some g, gx = y then x and y are said to be symmetrical to each other. For each object x, operations g for which gx = x is the symmetry group of the object, a subgroup of G. If the symmetry group of x is the trivial group then x is said to be asymmetric, otherwise symmetric.

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COINCIDENCE AND COMMON FIXED POINT THEOREMS FOR EXPANSIVE MAPPINGS IN *A*-METRIC SPACES

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ABSTRACT

In this article, we established some fixed point results for expansive mappings on *A*-metric spaces. Finally, the example is presented to support the new theorem proved. Our results extend/generalize many pre-existing results in literature.

KEYWORDS: *A*-metric space; expansive mapping; fixed point.

MSC: Primary 47H10; secondary 54H25

1. Introduction

Fixed point theory has great importance in science and mathematics. Since this area has been developed very fast over the past two decades due to huge applications in various fields such as nonlinear analysis, topology and engineering problems, it has attracted considerable attention from researchers. The study of expansive mappings is a very interesting research area in the fixed point theory. Wang et al. [36] proved some fixed point theorems for expansion mappings, which correspond to some contractive mappings in metric spaces. In 1992, Daffer and Kaneko [8] defined an expanding condition for a pair of mappings and proved some common fixed point theorems for

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Fixed Point Results for Rational Type Contraction in *S*-Metric Spaces

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ABSTRACT

The goal of this paper is to define rational contraction in the context of *S*-metric spaces and develop various fixed-point theorems in order to elaborate, generalize, and synthesize a number of previously published results. Finally, to illustrate the new theorem, an example is given.

KEYWORDS:*S*-metric space; rational contraction; fixed point.

MSC: Primary 47H10; Secondary 54H25

1. Introduction

Fixed point theory is crucial in science and mathematics. This topic has drawn a lot of interest from academics in the last two decades due to its wide range of applications in disciplines such as nonlinear analysis, topology, and engineering difficulties. The Banach contraction principle [2] is the starting point for most generalizations of metric fixed point theorems. It's difficult to enumerate all of this principle's generalizations. The Banach fixed-point theorem [2] ensures the existence and uniqueness of fixed points of particular self-maps of metric spaces, as well as a constructive approach for discovering them. The S-metric space was introduced by Sedghi et al. [9]. It's a three-dimensional space called the S-metric space. The concept of A-metric space was established by Abbas et al. [1], which is a generalization of S-metric space. Jaggi [7], Das and Gupta [3] discovered the fixed-point theorem for rational contractive type conditions in metric space. The goal of this paper is to define rational contraction in the setting of S-metric spaces, as well as to create various fixed-point theorems to elaborate, generalize, and synthesize several previously published results. Finally, an example is given to demonstrate the new theorem.

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SIFK based Isobeta Cryptosystem

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Abstract *— The current effort takes the unique technique to construct is beta cryptosystem, whose security is established on santilli'sisofields first-kind (SIFK), generalized discrete logarithm problem (GDLP) and integer factorization problem (IFP) in the isomultiplicative isogroup of finite SIFK. The attacker have to find isoelement from SIFK and simplify both distinct GDLP and IFP together in the isomultiplicativeisogroup of finite SIFK in order to get back comparable massage from the secured cipertext and so this technique is probable to achieve a higher level of security.*

Keywords — *Public Key Cryptosystem (**PKC**), **SIFK**, **GDLP** and **IFP**.*

I. INTRODUCTION

The technique of *PKC* suggested in article "New Directions in Cryptography" by Diffie-Hellman [1]. After that several *PKC* were suggested. Among these *PKC* techniques based on hard mathematical problems, which security be dependent on the impracticable of factoring a large integer. Among these *PKC* techniques based on hard mathematical problems, which security be dependent on the impracticable of factoring a large integer [2] and the complexity of derive the square root modulo a massive composite integer [3]. ElGamal offered an efficient *PKC* based on *DLP*, which is too hard to simplify as deal with prime field or elliptic curve defined over a finite field [4]. All *PKC* based on *DLP* and *IFP* are not reliable if mathematical structure for *DLP* and *IFP* are solved. The techniques build on a single mathematical structure have security issues, so researchers proposed *PKC* based on multiple hard mathematical structure. Various *PKC* have been built on together *DLP* and *IFP* [5-22]. Some *PKC* have been built on dihedral group and suzuki-2 group [23-25]. At the latest, Meshram A. suggested key exchange protocol based on ring isopolynomials with isointeger coefficient [26]. Dani M. offered santilli'sisofields second-kind based key exchange protocol for secure communication[27]and key exchange protocol based on *SIFK*[28].

Regrettably, we observed that *DLP* and *IFP* based unified presented *PKC* cannot be considered as secure. Hence, we construct a unique beta cryptosystem based on *SIFK*, *GDLP* and *IFP* along its assured security, we additionally demonstrated that it is extremely capable to be enforce in the physical world applications.

The rest of this article summarize as below; in section-II, we explained *SIFK*, offered beta cryptosystem based on *SIFK* in section-III, supporting example for confirmation of suggested cryptosystem in section-IV, security investigation and efficiency performance examine in section-V and in final section-VI we conclude the article.

II. *SIFK*

Santilli [29] offered the generalization of arithmetic operations $\langle +,-,\times,\div\rangle$ termed as isomathematics. *SIFK* is the ring $\hat{\mathfrak{F}} = \hat{\mathfrak{F}}(\hat{y},+,\hat{\times})$ along with isonumbers $\hat{y} = y\hat{I}, y \in \mathfrak{F}, \hat{I} = \frac{1}{\hat{T}} \notin \mathfrak{F}$ along with arithmetic operations $\langle \hat{+},\hat{-},\hat{\times},\hat{\div}\rangle$, $\hat{y} + \hat{x} = (y + x)\hat{I}$an isosum, with additive unit $0 = 0\hat{I} = 0$, $\hat{y} + 0 = 0 + \hat{y} = \hat{y}$ and isoproduct $\hat{y} \hat{\times} \hat{x} = \hat{y}\hat{T}\hat{x} = y\hat{I}\hat{T}x\hat{I} = (yx)\hat{I}$, where, the left and right new unit $\hat{I}$, $\hat{I} \hat{\times} \hat{y} = \hat{y} \hat{\times} \hat{I} = \hat{y}$ is called isounit and $\hat{T}\hat{I} = 1, \hat{T}$ is called inverse of isounit $\hat{I} \neq 1$.

III. ISOBETA CRYPTOSYSTEM BASED ON*SIFK*

The mechanism for isobeta cryptosystem involves three steps;

Step-A: Key Formation Algorithm

Client-1 runs following algorithm for key formation;

i. Select two large isoprimeisonumbers$\hat{A}$ and $\hat{B}$ of the same size.

ii. Numerate the IsoEulerphi function $\varphi(\hat{N}) = (\hat{A} - 1)(\hat{B} - 1)$ for isointeger $\hat{N} = \hat{A} * \hat{B}$.

iii. Pick an arbitrary isointeger $\hat{q}$, $1 \leq \hat{q} \leq \varphi(\hat{N})$ such that, $\gcd\left(\hat{q}, \varphi(\hat{N})\right) = 1$.

iv. Pick an arbitrary isointeger $\hat{w}$ such that $2 \leq \hat{w} \leq \varphi(\hat{N}) - 1$.

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New decomposition of soft supra locally α-closed sets applied to soft supra continuity

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Abstract

In this paper, firstly we introduce the notions of soft supra locally α -closed sets in soft supra topological spaces. We investigate the relationships with different types of subsets of soft supra topological spaces. Secondly, we introduce the notion of SSL- α C-continuous functions and a decomposition of soft supra continuity is obtained.

Subject Classification: (2010) 54A05, 54A40, 54B05, 06D72.

Keywords: *Soft supra topological spaces, SSL-α-closed sets, SSL-α C-continuous functions.*

1. Introduction

Since soft set theory [13, 14] has rich potential for practical applications in several domains, it has been studied by many authors [5, 6, 8, 11, 13, 15]. In 2011, Shabir et al. [16] initiated the notions of soft topological spaces (sts's). The notions of soft supra topological spaces (ssts's) were first introduced by El-Sheikh et al. [7] which generalized in [2]. A new concept of supra open soft sets, named soft supra strongly generalized closed sets was initiated by Abd El-latif in [3]. In 2018, Abd El-latif [1] introduced the concepts of soft supra locally closed sets and SSLC-continuous functions in ssts's. The notion of supra soft pre-locally closed sets was introduced in [9] as a generalization to that's in [1].

Our purpose of this paper, is to use the notion of soft supra α -open sets with a different manner of [9] to investigate new notions named, Soft

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Common fixed-point theorem for a sequence of fuzzy mappings satisfying a rational contractive condition involving non-expansive mapping

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Abstract
In this article, we establish a common fixed-point theorem for a sequence of fuzzy mappings satisfying a rational contractive condition involving non-expansive mapping.

Keywords
Fuzzy sets, common fixed point, fuzzy mapping, non-expansive mapping.

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Contents

1. Introduction

The first important result on fixed points for contractive type mappings was the well-known Banach contraction principle [1] appeared in explicit form in Banach's thesis in 1922, where it was used and established the existence of a solution for an integral equation. Zadeh[2] familiarized the idea of a fuzzy set as a new way to represent vagueness in everyday life. The study of fixed point theorems in fuzzy mathematics was investigated by Weiss [3], Butnariu [4], Singh and Talwar [5], Mihet [6], Qiu et al. [7], and Beg and Abbas [8] and many others. Heilpern [9] first used the concept of fuzzy mappings to prove the Banach contraction principle for fuzzy mappings on a complete metric linear space. The result obtained by Heilpern [9] is a fuzzy analogue of the fixed point theorem for multivalued mappings of Nadler et al. [10]. Bose and Sahani [11], Vijayaraju and Marudai [12], improved the result of Heilpern. In some earlier work, Watson and Rhoades [13],[14] proved several fixed-point theorems involving a very general contractive definition. In this paper, we prove a common fixed point theorem for sequence of fuzzy mappings satisfyinga rational contractive condition involving nonexpansive mapping.Our results extend and generalized the correspondingresults of Bose and Sahani [11], Vijayaraju and Mohanraj [12] and Rhoades [15],[16], Salujaet al. [18] and Das and Gupta [19].

2. Preliminaries

We recall some mathematical basics and definitions to make this paper self-sufficient (see [9]).

Definition 2.1. *Let (M,m) be a complete linear metric space and $\mathcal{F}(M)$, the collection of all fuzzy sets in M. A fuzzy set in Mis a function with domain M and values in $[0,1]$. If Ais a fuzzy set and $\sigma \in M$, then the function value $A(\sigma)$ is called the grade of membership of σ in A. The α -level set of Ais denoted by*

$$A_\alpha = \{\sigma : A(\sigma) \geq \alpha\} \text{ if } \alpha \in (0,1]$$
$$A_0 = \overline{\{\sigma : A(\sigma) > 0\}}$$

where $\bar{B}$ stands for the (non-fuzzy) closure of a set B.

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Dass and Gupta Rational Type Contraction in Controlled Metric Spaces

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Abstract

The aim of this paper is to establish a fixed point theorem for rational type contraction in a complete controlled metric space. Our results extend/generalize many pre-existing results in literature. We also provide example which show the usefulness of these results.

Keywords: Fixed point theory; Rational type contraction; Controlled metric space.

MSC: 47H10; 54H25

1. Introduction and Preliminaries

Dass and Gupta [26] established first fixed point theorem for rational contractive type conditions in metric space.

Theorem 1.1 (see [26]). Let (X, d) be a complete metric space, and let $\mathcal{T}: X \to X$ be a self-mapping. If there exist $\alpha, \beta \in [0, 1)$ with $\alpha + \beta < 1$ such that

$$d(\mathcal{T}x, \mathcal{T}y) \leq \alpha d(x, y) + \beta \frac{[1 + d(x, \mathcal{T}x)]d(y, \mathcal{T}y)}{1 + d(x, y)} \quad (1.1)$$

for all $x, y \in X$, then $\mathcal{T}$ has a unique fixed point $x^* \in X$.

Nazam *et al.* [27] proved a real generalization of Dass-Gupta fixed point theorem in the frame work of dualistic partial metric spaces.

Czerwik [1] reintroduced a new class of generalized metric spaces, called as b-metric spaces, as generalizations of metric spaces.

Definition 1 ([1]). Let X be a nonempty set and $s \geq 1$. A function $d_b: X \times X \longrightarrow [0, \infty)$ is said to be a b -metric if for all $x, y, \omega \in X$,

(b1). $d_b(x, y) = 0$ iff $x = y$
(b2). $d_b(x, y) = d_b(y, x)$ for all $x, y \in X$
(b3). $d_b(x, \omega) \leq s[d_b(x, y) + d_b(y, \omega)]$

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SCREENING OF PHYTOCHEMICAL CONTANTS OF LINUM USITATISSIMUM PLANT EXTRACTED BY DIFFERENT SOLVENT

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Abstract:

Many plant species that have reportedly been used in the treatment of different diseases. Plant derived compound have played an important role in the development of several clinically useful agents. *Linum usitatissimum* plant seeds are used for many diseases treatment. Aim of the present study is to investigate the phytochemical analysis of Petrolium Ether, Chloroform, Acetone, and Methanol extracts of *Linum usitatissimum plant*. Qualitative analysis of phytochemical screening reveals the presence of Alkaloids, Phenol, Saponins and Protein.

Keywords: Medicinal Plants, Phytochemical analysis, *Linum usitatissimum*is, Antioxidant activity.

Introduction:

Plants chiefly used for form of sickness relating to bacterium treatment. Plants turn out many secondary metabolites together with alkaloids, flavonoids, saponins, steroids, glycosides and terpenoids to safeguard themselves from the attack of present infectious agent, insects' pests and environmental stresses. on top of activity of these compounds ought to depend upon the ways and solvent used for extraction (Verma, S *et al*., 2021; Shalini and Prema, 2012).

Most probably plants utilized in ancient medication include big selection of bioactive compounds which will be used as different therapeutic tools for the hindrance or treatment of the many contagious diseases. medicative plants ar thought of as clinically effective and safer alternatives to the artificial antibiotic (Govindasamy and Srinivasan, 2012; Kaur and Mondal, 2014)

*Linum usitatissimum*is associate plant growing to one m tall. The seeds are oval, 2.5- 9.5 cm. long and 1-3.5 cm. thin shiny inexperienced depilatory with a black and a brief stalk regarding one- 1.8 cm. long. *Linum usitatissimum*is a very important medicative plant that contains quite seventy completely different sort of alkaloids and therapy agents that ar effective in treating varied sort of cancers-breast cancer, carcinoma, ulterine cancer, melanomas, Hodgkin's and nonhodgkin's cancer (Govindaraji, 2007)12. Generally, it's referred to as Cape periwinkle, *Linum usitatissimum*

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ANTIMICROBIAL ACTIVITY OF *SPHAERANTHUS INDICUS* LINN AGAINST SOME SELECTED HUMAN PATHOGENIC BACTERIA.

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Abstracts- *Sphaeranthus indicus* linn is a very useful medicinal plant which found near rice field throughout in India. Whole plant *Sphaeranthus indicus* there are six crude extracts were prepared using different solvents by cold maceration method. Antimicrobial activity against *Basillus subtilis, Klebsiella pneumonae* and *Candida albicans* were detected with extracts and Ciprofloxacin and fluconazole use as standard by cup plat agar diffusion method. The extracts were subjected to screening to detect potential antimicrobial activity against *Basillus subtilis, Klebsiella pneumonae* and *Candida albicans,* Ciprofloxacin and Fluconazole as standard by cup plate agar diffusion method. In present study, our aim was to find out the antimicrobial activity of different extracts of whole plant *Sphaeranthus indicus* linn. Some different extracts such as methanol, petroleum ether, chloroform and aqueous extract exhibits comparable antimicrobial activity with the standard.

Keywards - Meceration method, antimicrobial activity, *Sphaeranthus indicus* linn, *Basillus subtilis, Klebsiella pneumonae, Candida albicans.*

Introduction

Plants have been a valuable source of natural products since long period of time. They are maintaining human health, from the last decade, with more intensive studies for natural therapies. Now-a-days, in many countries the use of phytochemicals for pharmaceutical purpose has increased. The survey of world health organization was found that the medicinal plants would be best source to obtain a variety of drugs. About 80% of individuals from developed countries use traditional medicine, which has compounds derived from medicinal plants (Haidan Yuan, 2016). The plant extracts used as crude, the known antimicrobial properties of their parts and phytochemicals it can be most significant in the therapeutic treatments. For antimicrobial activity the plant product screenings had shown a potential source of novel antibiotic (Afolayan, 2003). It has been an increasing incidence of multiple resistances created in human pathogenic microorganisms. Maximum plants have been used because of their antimicrobial traits or properties, which are due to the secondary metabolites synthesized by the plants. The active substances are known by their products as phenolic compounds which is the part of the essential oils, as well as in tannin. In current years, largely indiscriminate use of commercial antimicrobial drugs employed in the infectious diseases treatment, microbial resistance has developed. It has forced to scientist for search for newer anti-microbial substances from various sources like the medicinal plants. Plant produces a large range of secondary metabolites it is used either directly as as lead compounds or precursors in the chemical or pharmaceutical industries. Plant extracts shows target sites other than used by antibiotics. It will be active against drug resistant pathogenic microorganisms. There is a little information is available on such activity of medicinal plants and very large number of plant species on earth, only a small number has been systematically investigated for their antimicrobial activities (Shyamala, 2012). In the plant cells bioactive compounds are normally accumulated secondary metabolites but concentrations varies according to the plant parts, season climate and particular growth phase. The plant part leaf is one of the highest accumulations of such compounds. People are generally preferred this part of the plant used for therapeutic purposes. The growth of disease is inhibited by some active compounds (Dhia, 2006). The vast potentiality of plants as sources for antimicrobial drugs to antibacterial agents, a step wise investigation was undertaken to screen the local flora for antibacterial activity of *Sphaerantus indicus.* The plant *Sphaeranthus indicus* linn belonging to Asteraceae family used traditionally in Ayurveda for jaundice, diabetes, leprosy, hyperlipidemia, epilepsy, mental illness, AIDS, fever, cough, hernia, hemorrhoids, dyspepsia, helminthiasis, and skin

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Physico-chemical parameters apply for analysis of quality improvement of cosmetic product lipsticks

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ABSTRACT
This research work has been used for the study of physico-chemical properties focused on cosmetic (lipstick) products, applying selected parameters such as pH, viscosity, surface tension and absorbance. In which the pH of water soluble samples was found range of pH 5.7-7.5. The viscosity and surface tension analyzed by the formula used were determined in water-soluble cosmetic samples. In which the absorbance efficiency of cosmetic samples were quantities analyzed after being dissolved in water in different wavelength range from 280 nm to 380 nm.

Keywords: Cosmetic, pH, Viscosity, Surface tension, and Absorbance.

I. INTRODUCTION

Cosmetics are incredible in demand from historical times to the present day. Lipsticks are most commonly used to enhance the beauty of lips and to add glamor touch to makeup. It is difficult to apply lipstick on dried, chapped, cracked, wound lips with lesions and sores. In such cases, medicinal lipsticks can used for the purpose of beautifying lips. [1] Lipstick is a cosmetic product that beautifies lips, changing their natural color to beautiful and attractive. The basic lipstick ingredients are made up of wax, oil, alcohol, fragrance and dyes, used for Gives lipstick different extra properties, such as moisturizing, luminous property.[2]. The manufacturing process consists of steps such as melting, mixing, shaping and packaging. [3] The choice of these ingredients is carefully considered to provide the desired colour, glossiness, and indelibility.[4] Waxes are perhaps the most important for the structure and shape of the lipstick. Beeswax is composed of around three hundred different chemical compounds includes organic acids and hydrocarbons.[5] several type of waxes used is Candelilla and Carnauba wax, obtained from the Mexican Candelilla shrub and Brazilian Carnauba Palm, and others Jojoba, Mineral, Paraffin, and Ceresin waxes which at approximately 85°C has the highest known melting point.[6-8] The most commonly used is castor oil, olive oil and mineral which can utilized lipstick emollient, skin-softening properties; glossiness to its appearance. The pigments and dyes are certainly the most important for the colour of the lipstick.[9] Several gradients are added in small quantities to provide moisturizing qualities and pleasant fragrance available in the lipstick.[10] The wax mixtures using for the gloss and hardness of lipsticks rarely depends on the amount of wax mixtures. The oil mixture needs to be blended properly to provide a suitable film that spreads easily on the lips. The dyes mixture using for essentially a solution of the staining dye to enable the color of the lipstick is most important from commercial and appealing view. Some natural or synthetic gradients are added to the fragrance, which is also fragrant enhance the smell of flavored with the beauty of lips. The preservatives and antioxidants keep lipstick fresh, safe and protects it from damage. The characteristic of lipsticks preservatives are used to prevent microbial growth and play a role as antimicrobial agents. Perfume is used to mask the smell. Surfactants are used to promote wetting properties.

II. MATERIALS AND METHODS

Sample Collection: The cosmetic lipstick samples were purchased from local beauty shops in Betul district, so some variety name were available on wrappers such as Aleen red colour (ARC), Larsen magic green (LMG), Local light pink (LLP), Magnet light pink (MLP), Roopam baby pink (RBP), Roopam dark purple (RDP), Roopam

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बैतूल जिले के औद्योगिक विकास में नई आर्थिक नीति का प्रभाव

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सारांश :— आर्थिक नीति का तात्पर्य सरकार द्वारा की जाने वाली ऐसी औपचारिक घोषणा से है, जिसके द्वारा सरकार विकास के प्रति अपनायी जाने वाली सामान्य नीतियों का उल्लेख करती है। किसी भी नीति के दो भाग होते है प्रथम सरकार की विचारधारा जो औद्योगीकरण का स्वरूप निश्चित करती है, तथा द्वितीय इसको कार्यान्वित करने वाले नियम तथा सिद्धान्त जो इस नीति के पीछे विद्यमान विचारधारा को निश्चित स्वरूप प्रदान करते हैं। इस प्रकार आर्थिक नीति एक व्यापक विचारधारा है, जो उद्योगों की स्थापना और कार्य प्रणाली के लिए नीति सम्बन्धी ढॉचा और मार्गदर्शन प्रदान करती है। 1915 में पहली बार यह अनुभव किया गया कि भारत में उद्योगों का विकास किया जाना चाहिए। अतः औद्योगिक आयोग की नियुक्ति सन् 1916 में की गयी जिसने अपनी रिपोर्ट सन् 1921 में दी। इस आयोग ने भारत में उद्योगों के विकास के लिए अनेक सुझाव दिये, किन्तु तत्कालीन सरकार ने उन पर कोई विशेष ध्यान नहीं दिया। सन् 1956 की औद्योगिक नीति की घोषणा 30 अप्रैल 1956 को की गई। 1948 की औद्योगिक नीति के पश्चात् लगभग 8 वर्षो के अंतराल के बाद 1956 की नीति निर्धारित की गई। इस बीच देश के औद्योगिक परिवेश में अनेक परिवर्तन हो चुके थे और इन परिवर्तनों के अनुरूप औद्योगिक नीति में कुछ संशोधन करना आवश्यक हो गया था। 1948 की औद्योगिक नीति आजादी के एक वर्ष बाद ऐसे समय निर्मित की गई जब देश अनेक राजनैतिक एवं आर्थिक समस्याओं से ग्रसित था। उस समय तक आजाद भारत के भावी आर्थिक विकास की स्पष्ट रूपरेखा सरकार के सामने नहीं थी परन्तु देश के औद्योगिक उत्पादन में वृद्धि करने के लिए एक विशेष वातावरण बनाने के उद्देश्य से शीघ्रता में सन् 1945 की औद्योगिक नीति घोषित की गई थी। जिसमें बदलती हुई परिस्थितियों के अनुसार बदलना आवश्यक समझा गया। इसलिए द्वितीय औद्योगिक नीति प्रस्तावित की गई।

प्रस्तावना :— आर्थिक नीति से आशय सरकार द्वारा की जाने वाली ऐसी औपचारिक घोषणा से है, जिसके द्वारा सरकार विकास के प्रति अपनायी जाने वाली नीतियों, नियमों एवं सिद्धान्तों का उल्लेख करती है, जिससे देश का विकासशील ढॉचा प्रभावित होता है। स्वतंत्रता पश्चात देश समाजवादी व मिश्रित अर्थव्यवस्था के तहत पंचवर्षीय योजना के माध्यम से विकास का मार्ग चुना। किसी भी देश के विकास में निजी एवं सार्वजनिक दोनो क्षेत्रों का संतुलित विकास आवश्यक है। देश में सार्वजनिक क्षेत्र के विकास परिणामस्वरूप लोगों को समानता का तो अधिकार प्राप्त हुआ, व देश खाद्यान व कुल गिनी चुनी वस्तुओं पर आत्मनिर्भर भी हुआ किन्तु देश का आर्थिक विकास विश्व की आर्थिक शक्तियों का सामना करनें में सक्षम नही था अतः देश में विदेशी मुद्रा के भण्डारण में कमी आने लगी। हमारे देश में निरंतर आयात में वृद्धि व निर्यात में कमी होती जा रही थी। जून 1991 में एक ऐसी स्थिति निर्मित हुई कि देश में विदेशी मुद्रा के भण्डारण मे कमी के कारण अभूतपूर्व आर्थिक संकट उत्पन्न हो गया। तभी तत्कालीन सरकार ने देश में नई आर्थिक नीति की घोषणा की जिसे नई आर्थिक नीति 1991 के नाम से जाना जाता है। नई आर्थिक नीति पिछली आर्थिक नीति 1956, 1973, 1980 की भॉति मूल 1948 की नीति में संअध्ययनन है। नई आर्थिक नीति में उदारीकरण, निजीकरण तथा वैश्वीकरण पर विशेष बल दिया गया है। इस नीति के अन्तर्गत सरकारी नियंत्रण मे कमी, पिछडे क्षेत्रों का विकास, संरचनात्मक उद्योगों का प्रोत्साहन, सार्वजनिक क्षेत्र के उद्योगो में निजी क्षेत्र की सीमा बढ़ाना व निर्यात प्रोत्साहन के साथ एकाधिकारी व्यापार अधिनियम में उदार दृष्टि कोण आदि अपनाया गया। अब विदेशी निवेश को लेकर भूमि तैयार की जा रही है, एफ.डी.आई. के माध्यम से विदेशी पूँजी को आकर्षित करने का प्रयास किया जा रहा है। निश्चिततौर पर नई आर्थिक नीति का देश के आर्थिक विकास पर सकारात्मक प्रभाव चारो ओर देखा जा सकता है।

नयी आर्थिक नीति 1991 जो निजीकरण वैश्वीकरण व उदारीकरण नीति आदि नामों से जानी जाती है। का मूल उद्देश्य देश की आर्थिक नीतियों में परिवर्तन कर अधिकाधिक निजी क्षेत्र को बढाना व सरकारी हस्तक्षेप कम कर विश्व बाजार का निर्माण

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ग्रामीण उद्यमिता विकास संबंधी आर्थिक योजनाओं का विश्लेषणात्मक अध्ययन (मध्यप्रदेश के विशेष संदर्भ मे)

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प्रस्तावना – उद्यमिता एक कौशल दृष्टिकोण एवं कार्यपद्धति है। साधारणतया उद्यमी को उसके कार्यो से ही परिभाषित किया जाता है। उद्यमी वह व्यक्ति है जो कुछ विशेष कार्य (उद्योगों, व्यवसाय, व्यापार सेवा) करने के लिये विचारों को जन्म देता है और उन विचारों को क्रियान्वित करने के लिये अपनी तरफ से निश्चित तौर पर पहल और आत्मबल दिखाता है। जिससे यह विचार एक उद्यमशील कार्य का रूप धारण कर सके। राष्ट्र के आर्थिक विकास को बढ़ाने हेतु ग्रामीण उद्यमिता को बढ़ावा देने के लिये ग्रामीण उद्यमिता के अंतर्गत अनेक वर्ग पेशेवर संस्थाएं नियोजक वर्ग प्रवर्तक मिलकर उद्यमी का कार्य करते हैं।

हमारा देश एक ग्राम प्रधान देश है तथा ग्राम प्रधान देश होने के कारण यहाँ की 72 प्रतिशत जनसंख्या गॉव में निवास करती है तथा प्रत्येक गॉव की विभिन्न प्रकार की समस्याएं होती है। इन सारी समस्याओं में से एक मुख्य समस्या बेरोजगारी तथा आर्थिक स्थिति की समस्या है, जिसके लिए वर्तमान में क्या बहुत पहले से अपने देश की सरकार शुरुआत से ग्रामीण क्षेत्रों की समस्या को लेकर प्रत्येक गॉव में गरीबी निवारण तथा आर्थिक स्थिति सुदृढ करने के लिए शुरू से ही प्रयास करती आ रही है। लेकिन पूर्ण रूप से इस समस्या का समाधान अभी तक नहीं हो पाया है।

इन आदि समस्याओं को ध्यान में रखते सरकार ने गरीब परिवारों के उत्थान के लिए तथा उनके जागरूकता पैदा करने के लिए अनेक प्रकार के जनजागरूकता के अभियान तथा विभिन्न प्रकार की योजनाओ का क्रियान्वन किया जा रहा है जिससे कि गरीब परिवारों की सामाजिक तथा आर्थिक एवं महिलाओं की स्थिति अधिक मजबूत को सके। इसके लिए S.H.G. के माध्यम से पुरूष/महिलाओं को जोडा जा रहा है जिससे कि समूह में जुड़कर आपसी भाई चारा तथा लिंग भेद तथा समूहों के माध्यम से छोटे-छोटे कुटीर उद्योग या व्यवसाय स्थापित करवाये जाते है, जिससे उनकी आर्थिक स्थिति मजबूत हो सके और अपने परिवार का भरण पोषण आसानी के साथ कर सकें।

सामान्यत: महिलाओं की आर्थिक तथा सामाजिक एवं राजनैतिक रूप से पिछड़ी हुई थी तथा उनको समाज में लिंग भेद तथा अन्य सामाजिक दुर्बलताओं के कारण और महिलाओं की बेरोजगारी तथा उनकी सभी समान स्थितियों के ध्यान मे रखते हुए सरकार द्वारा अनेक प्रकार की महिलाओ से सम्बंधित योजनाओ का क्रियान्वयन किया जा रहा है।

शोध का क्षेत्र – संपूर्ण म.प्र. शोध क्षेत्र के रूप मे लिया गया है। जिससे कि प्रदेश मे ग्रामीण उद्यमिता की वास्तविक स्थिति का अनुमान लग सके।

शोध का उद्देश्य – ग्रामीण उद्यमिता का क्षेत्र जितना विकसित होगा। उतनी ही पूंजी के विनियोजन का विस्तार होगा, ग्रामीण क्षेत्रो मे रोजगार बढ़ेगा। आय बढने से उपभोग बढ़ेगा। इस प्रकार औद्योगिक विकास से उपभोग बढ़ेगा एवं औद्योगिक विकास से देश की अर्थव्यवस्था का विस्तार हो कर देश प्रगति के मार्ग पर अग्रसर होगा। अत: ग्रामीण उद्यमिता के मार्ग मे आने वाली चुनौतियां एवं बाधाओं का अध्ययन करना। इस शोध का मुख्य उद्देश्य है। ताकि इनके समाधान के उपाय खोजे जा सके।

शोध प्रविधि – किसी भी शोध कार्य को उद्देश्यहीन एवं ज्ञानरहित नहीं कहा जा सकता है। इसके लिए कुछ निश्चित कारकों से प्रेरित होकर ही निश्चित उद्देश्यों की प्राप्ति के लिये शोध-कार्य किया जाता है। ज्ञान के क्षेत्र में शोध कार्य अपरिहार्य है। वर्तमान युग में शोध या अनुसंधान का अत्यधिक महत्व है, क्योंकि किसी भी क्षेत्र से संबंधित तथ्यों का प्रमाणीकरण, नवीनीकरण, एवं सत्यापन अनुसंधान के द्वारा ही किया जा सकता है।

शोध कार्य में मध्यप्रदेश में ग्रामीण उद्यमिता विकास संबंधी आर्थिक योजनाओं से सम्बन्धित वास्तविक एवं विश्वसनीय आंकड़ों को प्राप्त करने के लिये प्राथमिक एवं द्वितीयक दोनों प्रकार के आंकड़ों को एकत्र कर पूर्ण किया गया है। प्राथमिक आकड़े स्वयं कार्य स्थल पर जाकर मूल स्रोतों एवं साक्षात्कार अनुसूची द्वारा एकत्र किये गये हैं। जबकि द्वितीयक आंकड़े मध्यप्रदेश में ग्रामीण उद्यमिता विकास संबंधी आर्थिक योजनाओं से संबंधित विभिन्न प्रकाशित- अप्रकाशित पुस्तकों, शोध पत्र-पत्रिकाओं, समाचार पत्रों, आदि से एकत्र कर प्रयोग किये गये हैं।

म.प्र. मे ग्रामीण उद्यमिता की स्थिति – ग्रामीण उद्यमिता की स्थिति म.प्र. के सभी जिलो मे संतोषजनक नही है। वास्तव मे ग्रामीण विकास के लिये आवश्यक है कि ग्रामीणो के जीवन स्तर मे वृद्धि की जाय एवं रोजगार के पर्याप्त संसाधनो का विकास किया जाए एवं ग्रामीण स्तर पर के लघु एवं कुटीर उद्योगों की स्थापना कर काम उपलब्ध कराया जाय। आज म.प्र. के सभी जिलों मे उद्यमिता विकास मार्गदर्शक प्रकोष्ट संचालित है। जिसके अंतर्गत कृषि एवं उन पर आधारित उद्योग सौंदर्य प्रसाधन, प्लास्टिक कंप्यूटर, संचार उपकरण, मशीन एवं पुर्जे, पैकिंग सामग्री, औषधि रसायन, भवन सामग्री तथा विभिन्न वस्तुओं के निर्माण हेतु उद्यमिता विकास मार्गदर्शन केन्द्र से सलाह लेकर लघु मध्य तथा अथवा उंची पूंजी वाली उत्पादन इकाइयों के स्थापना के प्रयास किये जा रहे है। जिनमे काफी हद तक सफलता

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डॉ अलका सरावगी के उपन्यास में नारी के बदलता स्वरूप का अध्ययन

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प्रस्तावना

नवे दशक में भारतीय साहित्य में एक महत्त्वपूर्ण बदलाव नारी विमर्श के कारण आया, जिसके कारण नारी ने साहित्य के केन्द्र बिन्दु से होकर मुख्यधारा में अपनी जगह बनायी। हिन्दी कथा-साहित्य इससे सर्वाधिक प्रभावित हुआ। वर्तमान दौर में स्त्री चेतना से जुड़ी स्त्री मुक्ति और अस्मिता के संकट व पहचान के संघर्ष को व्यक्त करने वाली अनेकानेक कथा लेखिकाएँ हैं, जिनमें उषा प्रियंवदा, चन्दकिरण सौनरेक्सा, कृष्णा सोबती, शशिप्रभा शास्त्री, मेहरुन्निसा परवेज, मन्नू भंडारी, ममता कालिया, मृदुला गर्ग, मृणाल पांडेय, सूर्यबाला, राजी सेठ, चन्द्रकान्ता, नासिरा शर्मा, प्रभा खेतान, मैत्रेयी पुष्पा, चित्रा मुद्गल, गीतांजलि श्री, अलका सरावगी, अर्चना वर्मा, अनामिका आदि प्रमुख हैं। इन महिला कथाकारों में अलका सरावगी एक ऐसी लेखिका हैं, जिन्होंने अपने उपन्यासों 'कलिकथा वाया बाइपास' (1998) 'शेष कादम्बरी' (2001), 'कोई बात नहीं' (2004) और 'एक ब्रेक के बाद' (2008) में स्त्री जीवन के विभिन्न पहलुओं और उसकी नितान्त बदली हुई तस्वीर को सामने रखा है। अलका सरावगी चरित्रों और देशकाल को प्रमाणिकता के साथ प्रस्तुत करने वाली कथाकार हैं। उनके उपन्यास स्त्री अस्मिता के नये प्रश्न हमारे सामने रखते हैं।

आधुनिक हिन्दी उपन्यासों की नवीनतम् धारा को आधुनिकता बोध का उपन्यास कहा जा सकता है। औद्योगीकरण, बदलते हुए परिवेश, भ्रष्ट व्यवस्था, महानगरीय जीवन और यान्त्रिक सभ्यता केपरिणाम से आज जीवन में अकेलापन एवं निराशा घर कर गई है। कुण्ठा, संत्रास एवं असुरक्षा की भावना ने हमें संत्रस्त कर दिया है। बीसवीं सदी के नवें दशक में भारतीय साहित्य में एक महत्वपूर्ण बदलाव नारी विमर्श के कारण आया, जिसके कारण नारी ने साहित्य के केन्द्र बिन्दु से होकर मुख्य धारा में अपनी जगह बनायी। हिन्दी कथा साहित्य इससे सर्वा धिक प्रभावित हुआ। वर्तमान दौर में स्त्री चेतन से जुड़ी स्त्री मुक्ति और अस्मिता के संकट व पहचान के संघर्ष को व्यक्त करने वाली अनेकानेक कथा लेखिकाएँ हैं जिनमें अलका सरावगी का नाम प्रमुख साहित्यकारों में से एक है।

हिंदी साहित्य के इतिहास का अध्ययन करने के पश्चात् यह बात स्पष्ट हो जाता है कि आज जो बहुप्रचलित तथा लोकप्रिय विधा 'उपन्यास' है वह आधुनिक काल में ही आरम्भ हुई। हिंदी उपन्यास का प्रारंभिक युग सामान्य जन जीवन से दूर रहा। इस तथ्य को कभी भी अस्वीकार नहीं किया जा

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Assertive Girl Child Protagonist by Mrinal Pande in Daughter's Daughter

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Abstract:

Mrinal Pande is one of the leading Indian feminist writers, does not write to entertain her readers but her works scrutinized the fact. In both stories 'Daughter's daughter' and 'Girls', same structure is been followed; one mother with her three daughters who expecting the fourth child and everybody prays the unborn child to be the boy this time. Mrinal draws reader's attention on the inferior status of girls and women in Indian families through unnamed narrator in 'Girls' and Tinu is the narrator of 'Daughter's daughter'. Both works have some pathetic cry and glorification of how girls survive as daughter's daughter. The story of Tinu spans from two to eight years; revolve around Grandmother's house in Almora and Maternal Uncle's house in Gorakhpur due to nomadic job of her father. She curves for her own home and enjoys seclusion want to live in her own imaginative world. She loves cropped hair, seat in widow side while travel even she like worms. She does not believe in superstition like one eyed person, Anchharis etc. Mrinal depicted a girl child in non-traditional fashion within the boundaries of traditional outlet. She dislikes grandmother's orthodoxy and elder's snobbery. She rejects Anu's supremacy and Aunt's suggestion. Mrinal highlighted many sombre issues as disparity in girl and boy child, different behavioural pattern and status, religious sanction for boys, poor education for girls, marriage, elder's hypocrisy, concept of Step-mother. But, Mrinals' optimistic treatment gave new perspective to read it. Tinu understands her mother's inferior status in the family at a very early age and sympathies with her mother. She denies Dinu's concept of step-sister. and at the end of the novel, decides to live on her own terms.

Keywords: Discrimination, Marriage, Education, Male chauvinism, Orthodoxy, Snobbery.

Introduction

''No, survival is no easier for our young girls today than it was for us'' - Mrinal Pande

The Hindu culture is best be understood by stories, tales and songs; it is an integral part of Indian culture. Children grow up by listening these tales told by their mother or grandmother. The novelist Graham Greene said, 'childhood is the bank-balance of the writer. Perhaps he meant by this that the novelist tends to draw upon the vividness of childhood experience for the rest of her or his writing life or infant fantasy is very much like the novelist's material' (Foreword). Indian literature is enriched with the short stories

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"संस्कृत वाङ्मय में वर्णित आयुर्वेद शास्त्र की उपयोगिता"

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संस्कृत साहित्य में अन्य साहित्यों (यूनानी, फारसी, इंग्लिश, उर्दू) आदि की तुलना में असीमित वैशिष्ट्य मुखरित होते हैं। जैसे –

1. **वैषयिक दृष्टि –**
   संस्कृत साहित्य में सर्वविध विषयों की सांगोपांग चर्चा मिलती है। परन्तु अन्य साहित्यों में एका³~xh चर्चा होती है। सर्वांगी नहीं होती है और विषय भी बहुसीमित होते हैं।
2. **विस्तार की दृष्टि –**
   संस्कृत साहित्य संक्षेप पद्धति का अनुपालन करता है। परन्तु टीकाओं प्रटीकाओं के माध्यम से विस्तृत होकर वह अध्येताओं में विषय के प्रति सौकर्यता प्रदान करता है। परन्तु अन्य साहित्यों में इस पद्धति का भी अभाव प्रतीत होता है।
3. **वैज्ञानिक दृष्टि –**
   से तात्पर्य संस्कृत साहित्य में प्रकृति से सम्बद्ध नियमों का उल्लंघन नहीं मिलता है। और विषय भी तर्काश्रित होता है। परन्तु अन्य साहित्यों में इसका अभाव प्रत्यक्ष मिलता है।
4. **पारम्परिक दृष्टि –**
   संस्कृत साहित्य के वैशिष्ट्य का मूल "परम्परा" है जो अद्यतन सजीवता को प्राप्त किये है। संस्कृत में श्रुतिपरम्परा, गुरुपरम्परा, शास्त्रपरम्परा, रीतिरिवाजों की परम्परा आदि ने संस्कृत साहित्य को गम्भीरता, साधुता, श्रेष्ठता, उपयोगिता आदि की दृष्टि से अन्य साहित्यों से उत्कृष्टता प्रदान की है।
5. **वैदिक दृष्टि –**
   संस्कृत साहित्य को एक धागे में सैकड़ों मोतियों को पिरोने का कार्य वेद से ही सम्भव है। संस्कृत साहित्य बहुविध परम्पराओं, बहुविध सम्प्रदायों, बहुविध शास्त्रों के माध्यम से ही विस्तार को प्राप्त हुआ। परन्तु सभी ने एक स्वर से वेदों का वेदत्व स्वीकारने में कोई आपत्ति नहीं की। परन्तु अन्य साहित्यों में एकता के केन्द्रबिन्दु का अभाव होने से उत्कृष्टता में न्यूनता लक्षित होती है।

उपरोक्त तथ्यों के आधार पर स्पष्ट है कि संस्कृत वा³~मय सागर से गहरा और नभ से भी व्यापक है। जिसमें मानव जीवन को उन्नत बनाने के लिए बहुविध ग्रन्थों का प्रचलन अद्यावधि जीवित है। अपौरूषेय वेदों से लेकर अद्य प्रभृति संस्कृत साहित्य, में प्रत्येक क्षेत्र में कार्य हो रहा है। इस विस्तृत लाखों वर्षीय साहित्य में आयुर्वेद विषयक जो कि जीवन का प्रत्यक्ष उपकारक है। बहु उपयोगी वर्णन संस्कृत साहित्य में उत्कृष्ट रूप में समुपलब्ध है।

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FIXED POINT THEOREMS FOR DUALISTIC EXPANDING MAPPING IN DUALISTIC PARTIAL METRIC SPACES

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Abstract

In this paper, we define dualistic expanding mappings in the setting of dualistic partial metric spaces analogous to expanding mappings in partial metric spaces. We establish some new fixed point theorems for dualistic expanding mappings defined on a dualistic partial metric space. Our result extends and generalizes some well-known results of [5] and [17]. We also provide an example which shows the usefulness of these dualistic expanding mappings.
2010 Mathematics Subject Classifications: 47H10.
Keywords and phrases: Fixed point theorem, dualistic partial metric, dualistic expanding mappings.

1 Introduction

Metric fixed point theory is playing an increasing role in mathematics because of its wide range of applications in applied mathematics and sciences. There have been a number of generalizations of the usual notion of a metric space. One such generalization is a partial metric space introduced and studied by Matthews [7]. He confirmed the precise relationship between partial metric spaces and the so-called weightable quasi-metric spaces. There are some generalizations of partial metrics. For example, O'Neill [14] proposed one significant change to Matthews' definition of the partial metric, and that was extending their range from $[0, \infty)$ to $(-\infty, \infty)$. According to [14], the partial metrics in the O'Neill sense will be called dualistic partial metric and a pair $(\mathfrak{D}, \eta^*)$ such that $\mathfrak{D}$ is a nonempty set and η^* is a dualistic partial metric on $\mathfrak{D}$ will be called a dualistic partial metric space. In this way, O'Neill developed several connections between partial metrics and the topological aspects of domain theory.

Contractive conditions have been started by studying Banach's contraction principle. These conditions have been used in various fixed point theorems for some generalized metric space. Then expansive conditions were introduced [17] and new fixed point results were obtained using expansive mappings. Some fixed point results have been still investigated using the notions of metric space and partial metric space for various contractive or expansive mappings. For more details, see [3], [4], [5], [6], [8] [15], [16], [19].

The aim of this paper is to prove some fixed point results under various dualistic expansive mappings in a dualistic partial metric space. Our result extends and generalizes some well-known results of [5] and [17]. Also, we verify our results with an example.

2 Preliminaries

We recall some mathematical basics and definitions to make this paper self-sufficient.

***Definition* 2.1** *(see* [7]*) Let* $\mathfrak{D}$ *be a non-empty set. A partial metric on* $\mathfrak{D}$ *is a function* $\eta : \mathfrak{D} \times \mathfrak{D} \to [0, \infty)$ *complying with following axioms, for all* $\sigma, \varsigma, \nu \in \mathfrak{D}$

$(\eta_1)\sigma = \varsigma \Leftrightarrow \eta(\sigma, \varsigma) = \eta(\sigma, \sigma) = \eta(\varsigma, \varsigma)$;
$(\eta_2)\ \eta(\sigma, \sigma) \leq \eta(\sigma, \varsigma)$;
$(\eta_3)\ \eta(\sigma, \varsigma) = \eta(\varsigma, \sigma)$;
$(\eta_4)\ \eta(\sigma, \varsigma) \leq \eta(\sigma, \nu) + \eta(\nu, \varsigma) - \eta(\nu, \nu)$
The pair $(\mathfrak{D}, \eta)$ *is called a partial metric space.*

***Definition* 2.2** *(see* [14]*) Let* $\mathfrak{D}$ *be a non-empty set. A dualistic partial metric on* $\mathfrak{D}$ *is a function* $\eta^* : \mathfrak{D} \times \mathfrak{D} \to (-\infty, \infty)$ *satisfying the following axioms, for all* $\sigma, \varsigma, \nu \in \mathfrak{D}$

$(\eta_1^*)\ \sigma = \varsigma \Leftrightarrow \eta^*(\sigma, \varsigma) = \eta^*(\sigma, \sigma) = \eta^*(\varsigma, \varsigma)$;

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Water Resources Management
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Application of Artificial Neural Networks, Support Vector Machine and Multiple Model-ANN to Sediment Yield Prediction

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Abstract
Sediment yield is important for maintaining soil health, reservoir sustainability, environmental pollution, and conservation of natural resources. The main aim of the present work is to develop four machine learning models, artificial neural networks (ANNs), radial basis function (RBF), support vector machine (SVM) and multiple model (MM)-ANNs for forecasting daily sediment yield. These models were applied to the Shakkar and Manot watersheds covering 25 years (1990–2015) and 10 years (2000–2010) of rainfall and discharge data, respectively. Results showed that the MM-ANNs model satisfactorily predicted sediment yield and outperformed the other models providing the highest correlation coefficient (0.921, 0.883) and Nash-Sutcliffe efficiency (0.744, 0.763) and the lowest relative absolute error (0.360, 0.344) and root mean square error (23,609.5, 269,671.5) for the Shakkar and Manot during the test period, respectively. Hence, the MM-ANNs model can be successfully used for sediment prediction.

Keywords Machine learning models · Sediment yield · ANN · RBF · SVM · Multiple model

1 Introduction

Watershed sediment load is an ecological hazard and its estimation is needed for developing measures for environmental protection, sustainability of reservoirs and hydropower generation, avoiding blockage of water supply systems, flood control, and maintaining soil fertility (Lin et al. 2006; Xu et al. 2012; Men et al. 2012).

In many waterways, sediment is transported in suspension and estimation of suspended sediment (SS) is basic for designing channels, dams, and culverts (Targhi et al. 2017). Awareness of potential sediment loads is important for programmes for water resource

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The Feasibility of Multi-Criteria Decision Making Approach for Prioritization of Sensitive Area at Risk of Water Erosion

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Abstract
Morphometric analysis is not only important for a hydrological analysis, but also necessary in the management and development of a basin. In this study, we attempted to prioritize twenty sub-watersheds of Bamhani watershed considering the linear, aerial and relief aspects of the watershed that will be further used in the multi-criterion decision making (MCDM) analysis. ELECTRE, Vlsekriterijumskaoptimizacija I kompromisno resenje (VIKOR), and aggregate method. Remote sensing and GIS approach were employed in the morphometric analysis. Percentage of changes and intensity of change indices were used in the MCDM model validation. Based on the range of Borda/Copland model values, the sub-watershed 11 took place at the first rank, while the Compound Factor (CF) model placed in the second rank, implying to be the most susceptible sub-watersheds for erosion. Vulnerability of sub-watersheds to soil loss (erosion), the VIKOR models showed four vulnerability classifications as very high, high, moderate and low. In conclusion, our results of the morphometric studies appeared to be effective in estimating the erosion status and prioritization of the watershed concerned for the purpose of easy and early development and management of natural resources. A high reductive accuracy was observed by VIKOR in comparison to CF and ELECTRE models.

Keywords Watershed · Prioritization · Morphometric parameters · Soil erosion · Geographic information system · Multi-criteria decision making (MCDM)

1 Introduction

For sustainable development of natural resources to reduce impact of natural calamities, watershed is taken as developmental unit (UNEP 1997). Watershed management planning is

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Application of SAW and TOPSIS in Prioritizing Watersheds

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Abstract
Prioritization of watersheds for conservation measures is essential for a variety of functions, such as flood control projects in which the determination of top priority areas is an important management decision. The purpose of this study is to examine watershed morphological characteristics and identify critical sub-watersheds, which are prone to be damaged, using Remote Sensing/Geographical Information Systems (GIS) and SAW/ TOPSIS (Simple Additive Weighting/ Technique for Order of Preference by Similarity to Ideal Solution). Fourteen morphometric parameters were chosen to organize sub-watersheds using SAW/TOPSIS, which examines sub-watersheds (as susceptible zones) from the perspective of classification in four priority levels (namely, low, moderate, high and very high levels). The SAW/TOPSIS approach is a useful strategy to find out potential zones provided that the ultimate goal is to achieve successful management strategies, particularly in particular zones where information accessibility is limited and soil assorted variety is high. Without facing with high cost and exercises in futility, sub-watersheds could be organized through morphometric parameters in executing conservational measures to save soil and the earth at the same time. In short, our results showed that morphometric parameters are highly efficient in identifying erosion-prone areas.

Keywords SAW · TOPSIS · RS and GIS · Morphometric parameters · Prioritization

1 Introduction

The total geographical area of India is 328 Mha (million hectares), of which 69 Mha area are critically degraded, and another 106 Mha area are seriously eroded. This endless soil erosion by numerous agents is a serious issue all around the world (Gajbhiye and Sharma 2017). It has been assessed that a total of 16.4 tones/ha of soil has been detached yearly in India due to

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ORIGINAL PAPER

An effective dynamic runoff-sediment yield modeling for Shakkar watershed, Central India

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Abstract
Modeling of the watershed runoff and sediment yield method is very variable and nonlinear in nature. The Shakkar watershed of the Narmada river basin, Central India, has been taken under the study. The linear dynamic (LD), nonlinear dynamic (NLD), and logarithm dynamic (LogD) sediment yield prediction models based on the concept of determining and assigning the varying weightings to the antecedent events for the runoff-sediment process were developed for the watershed. The data set (1990–2005) model was developed only by using active daily runoff data, together with the antecedent runoff index (AQI) and antecedent sediment yield index (ASYI). Due to the high value of R^2 (over 60%), the linear, nonlinear, and logarithm dynamic model was discovered to be appropriate for the field of research. The Nash-Sutcliff efficiency (NSE), mean absolute error (MAE), and Willmott's index (WI) were employed to assess the performance of the models. The results showed that the NLD model was found better than linear and logarithm models. These models had Nash-Sutcliff efficiency (NSE = 92.69, 64.93, 79.66), mean absolute error (MAE = 5744.20, 12,618.83, 0.02), and Willmott's index (WI = 0.98, 0.88, 0.95) correspondingly. Hence, the NLD model can be used for predicting sediment. In order to take the right conservation steps in the watershed to minimize the sediment load in the reservoir to boost the lives of the structure, the forecast for the sediment yield is of great importance.

Keywords Sediment yield · Runoff · AQI · ASYI · Daily dynamic model

Abbreviations

LD	Linear dynamic
NLD	Nonlinear dynamic
LogD	Logarithm dynamic
AQI	Antecedent runoff index
ASYI	Antecedent sediment yield index
NSE	Nash-Sutcliff efficiency
MAE	Mean absolute error
WI	Willmott's index
Q	Runoff
S	Sediment
SY	Sediment yield
MT	Metric Tonne
m^3/s	Meter cube per second
k_0, k_1, k_2, k_3	Regression coefficient
R^2	Correlation coefficient

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Introduction

Research on rainfall and runoff produced sediment-based problems would be very helpful in knowing the broad issue of soil degradation and soil erosion in an agricultural nation like India, where there are growing pressures on soil and water resources from the inhabitants (Renard 1980; Dhruv Narayana and Babu 1983; Meshram et al. 2019a, b). The need for accurate information on watershed runoff and sediment yield has grown rapidly during the past decades because of various watershed management programs for conservation,

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ORIGINAL PAPER

Long-term temperature trend analysis associated with agriculture crops

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Abstract
Temperature is one of the most significant elements in climate and weather forecasting. There was an increase in the earth's surface (land and ocean) temperature by 0.6 ± 0.2 °C during 1901–2000 (NOAA, Global Climate Report 2017). In evaluating the effects of climate change, the spatiotemporal variability of temperature was examined in the Chhattisgarh State, India, using monthly data at 16 stations over the period 1901–2016 with a length of 116 years. The standard normal homogeneity test was used to evaluate the homogeneity of temperature data. Linear regression analysis and four altered versions of the Mann-Kendall (MK) method were utilized to analyze the existence of trends in temperature series. These four versions of the MK tests include the conventional Mann-Kendall method (MK1), the removed influence of noteworthy lag-1 autocorrelation (MK2), the removed influence of all noteworthy autocorrelation coefficients (MK3) and the considered Hurst coefficient (MK4). The results of both parametric and non-parametric tests indicated an increase in the annual and seasonal temperature in the Chhattisgarh State over the period 1901–2016. The most likely change year in the state was 1950. There was a decreasing trend at some stations during the period 1901–1950, which reversed in the following period 1951–2016. Overall, annual and seasonal temperature time series showed increasing trends in all stations over the course of the long-term period. Our results confirmed a fact that the agriculture crop production has been decreased due to climate change.

1 Introduction

Environment variations and its effects on temperature vary across global spatiotemporal scales, which has resulted in unexpected impacts and changes in regions around the world. As many regions on the earth normally experience both short- and long-term climatic variability (Houghton 1994; Gardner et al. 1996), its understanding is so critical in exploring not only present and future climatic conditions due to climate change but also its effects on water resources to support the implementation of suitable adaptation strategies. Temperature patterns provide basic evidence when assessing claims with respect to anthropogenic environmental change (Nazeri Tahroudi et al. 2019). An important change in temperature can also impact soil quality since temperature and water are vital physical elements for plant growth. Non-ideal levels of water and temperature conditions can unequivocally hinder plant growth, particularly at the early phases of development, such as during seed germination and rise (Helms et al. 1996), which has major implications for future food production.

The Intergovernmental Panel on Climate Change (IPCC) reported that over the course of the twentieth century, there was an increase in the earth's surface temperature by 0.6 ± 0.2 °C (Obiekezie et al. 2010). Likewise, the temperature has been increasing by 0.13 ± 0.07 °C every decade in the past

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COMMON FIXED POINTS OF FUZZY MAPS UNDER NONEXPANSIVE TYPE CONDITION

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Abstract: In this paper, we obtain a common fixed-point theorem for a sequence of fuzzy mappings satisfying a rational contractive condition involving nonexpansive mapping.

Keywords: fuzzy sets; common fixed point; fuzzy mapping; nonexpansive mapping.

1. INTRODUCTION

Fixed point theory plays a basic role in applications of many branches of mathematics. The term metric fixed point theory refers to those fixed point theoretic results in which geometric conditions on the underlying spaces and/or mappings play a crucial role. For the past twenty five years metric fixed point theory has been a flourishing area of research for many mathematicians. Although a substantial number of definitive results now has been discussed, a few questions

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FIXED POINT THEOREMS FOR DUALISTIC CONTRACTIONS OF RATIONAL TYPE IN PARTIALLY ORDERED DUALISTIC PARTIAL METRIC SPACES

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Abstract. The purpose of this paper is to establish some fixed point theorems for mappings involving rational expressions in the frame work of complete ordered dualistic partial metric spaces using a class of pairs of functions satisfying certain assumptions. These results unify, extend and generalize most of the existing relevant fixed point theorems from the literature. We give examples to explain our findings.

Keywords: fixed point; dualistic partial metric; dualistic contractions.
2010 AMS Subject Classification: 47H09, 47H10, 54H25.

1. INTRODUCTION

The Banach contraction principle is a classical and powerful tool in nonlinear analysis. Banach contraction principle has been generalized in various ways either by using contractive conditions or by imposing some additional conditions on the ambient spaces. Das and Gupta [7] were the pioneers in proving fixed point theorems using contractive conditions involving rational expressions. Following Das and Gupta [7], Cabrera *et al.* [5] proved a fixed point

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Numerical Treatment of Fourth Order Self-Adjoint Singularly Perturbed Boundary Value Problems via Septic B-Spline Method

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Abstract- In this communication, A septic B-spline method (SBSM) is descrived for numerical treatment of fourth order self adjoint (FOSA) singularly perturbed boundary value problems (SPBVPs) and method is directly implemented on the problems without decreasing the order of the original differential equations. Convergence of the SBSM is proved and found that it gives 4^{th} order convergence results. The present technique is applied on two numerical problems which supports the theoretical proofs .

***Keywords*:** Septic B-spline method, Singularly perturbed boundary value problems, Fourth order self-adjoint, Uniform Convergence.

Mathematics Subject Classification (MSC)2010: 65L11

1. Introduction

We consider the following fourth order self adjoint SPBVPs:

$$-\varepsilon u^{iv}(y)+a(y)u(y)=r(y), \qquad y\in[p,\ q] \tag{1}$$

with the boundary condition (BC):

$$\begin{aligned} y(p)&=\alpha_1, & y(q)&=\beta_1,\\ y'(p)&=\alpha_2, & y'(q)&=\beta_2. \end{aligned} \tag{2}$$

where α_1, α_2, β_1 and β_2 are constants and perturbation parameter ε is $0<\varepsilon \square 1$. We suppose that the functions $a(y)$ and $r(y)$ are smooth functions in $[p, q]$. A singular perturbation problems (SPPs) is arise in nuomarus regions of mathematical and engineering science for instant fluid dynamics, optimal control theory, chemistry, hydrodynamics, quantum physics, chemical reactor theory and reaction-diffusion process etc.

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Multicriteria Decision Making Taxonomy of Cloud-Based Global Software Development Motivators

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ABSTRACT The software organizations widely consider the cloud based global software development (CGSD) as it offer the quality projects with low cast. The adoption of CGSD is challenging due to the geographical distance between practitioners. This study aims to identify and analyses the motivators that could positively impact the implementation of CGSD paradigm. The systematic literature review approach was applied to identify the CGSD motivators reported in the literature, and were further validated with industry experts using questionnaire survey study. Moreover, the fuzzy-AHP approach was applied to prioritize the investigated motivators concerning their significance for the successful adoption of CGSD. The findings of the study provide the prioritization-based taxonomy of the investigated motivators that assists the software organizations to develop and revise their strategies for the successful implementation of CGSD.

INDEX TERMS Cloud-based global software development, motivators, systematic literature review, fuzzy-AHP.

I. INTRODUCTION

The cloud computing is increasingly adopted in the geographically distributed software development environment as it provides significant opportunities to execute and manage the software development process. The availability, scalability and the dynamic attracted th e software firms to consider the cloud based global software development (CGSD). Dhar [1]stated that in software industry the outsources includes the development practices, process and decision management and the services were transformed in different geographical location across the globe.

Currently, the adoption of CGSD paradigm is significantly increased [1]. Fan *et al.* [2] mention that the CGSD paradigm educate the software development organization in terms of marked demand and the future trends.

Clemons and Chen [3] argued that it is necessary to take the rite decision and rite time for development of quality projects. They also mentions that CGSD assists to make the right decisions considering the trend and demand of international market. Chang and Gurbaxani [4] mention that it is important to make the right decision at right time contributed to develop the quality projects within time and budget. In this study, the definition of Leimeister *et al.* [5] is used i.e. "an IT deployment model based on virtualization, where resources in terms of infrastructure, applications and data are deployed via the internet as a distributed service by one or several service providers. Services are scalable on-demand and can be priced on a pay-per-use basis."

The development of good quality projects with low cost and time is always the priority of every software development organization. Though, the CGSD provides the opportunity to achieve to software organization to achieve such objective by hiring the skilled human resource from developing countries and by arranging the development activities round

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RESEARCH ARTICLE

WILEY

An efficient ID-based cryptographic technique using IFP and GDLP

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Abstract
Implementing an improved ID-based cryptographic mechanism is the main objective of the proposed work. In this article, an ID-based cryptographic (IBC) technique using generalized discrete logarithm problem (GDLP) and the integer factorization problem (IFP) presented by Meshram et al have improved. Meshram et al have given IBC technique without using the bilinear pair and also, reveal that their technique can attain data protection and security objectives. Besides, their technique will deter the adversary from eavesdropping the encrypted information or the secret key of the user. However, it has found that their system carries a deadlock problem. Encryption process, as expected by the user, is not guaranteed to be secure. It is because the user may require private information about key authentication center (KAC), which has kept secret from users. Pang et al have proposed an improved technique that overcomes the deadlock problem. It has found that Pang et al have not discussed the analysis and proofs of security. In this article, generalized discrete logarithms in multiplicative group over finite fields and IFP have used to improve the technique and also a key distribution system has discussed. It has analyzed that the proposed strategy is safer than the technique described by Pang et al. Also, it has found that the proposed technique addresses the deadlock problem.

KEYWORDS
cryptography, GDLP, ID-based cryptosystem, IFP, security proof

1 | INTRODUCTION

Nowadays, computer technologies and use of the internet has evolved in the daily life of every individual. The internet of things (IoT) has changed the way of living daily life as well as business life. Secrecy over the internet has become the prime concern of every individual. Secrecy has become essential for the data, that is, transferred over insecure public channels. Before establishing secure communication, secrete session keys to be shared between the communicating parties in an

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RIPIC BASED KEY EXCHANGE PROTOCOL

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ABSTRACT. In this article, we intend to bring out a unique system of designing key exchange protocol (KEP) based on isomathematics. The significant concept of our proposal is to use ring isopolynomials with the usage of general isointegral coefficient. This class of KEP is an interesting asset for further study because of isomathematical structure permutable permutation of ring isopolynomials with isointeger coefficient (RIPIC).

1. INTRODUCTION

A KEP is a key formation technique where a common secret key is determined by more than two users as a component of data deliberated by, or connected with each of these users, in an ideal situation in such a way that no user can foreordain the subsequent value [1, 2]. In a symmetric key cryptography based protocols, two conveying users use a commonly identified algorithm and a secret key that is shared by the users. Secret key exchange can be made possible by employing few ways like- utilizing out-of-band correspondence, (for example, by telephone, via mail, manual entry etc.), utilizing a trusted third party key distribution center, and so forth. The greater parts of these techniques require approximately from the earlier secret key creation between the protocol and single users. Secret key

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RIPIC BASED KEY EXCHANGE PROTOCOL 11177

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Preliminary phytochemical evaluation of *Sphaeranthus indicus* Linn of Asteraceae family

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Abstract: Phytochemical analysis of whole plants of *Sphaeranthus indicus* Linn was performed using petroleum ether, chloroform, methanol and aqueous extracts using Soxhlet apparatus standard methods outline (Trease GE and Evans WC, 1989; Sofowora A, 1993) were followed *Sphaeranthus indicus* Linn is a very useful medicinal plant of asteraceae family and common annual spreading herbs found in rice field throughout India. The presence of Alkaloids, Flavonoids, Glycosides, Diterpenoids, Tennins, Proteins, Carbohydrates and Total Phenolic Content (TPC) estimation was analysed by Soxilation method. Traditional medicines of the plants are great significance of the ethnomedicine in India.
Keywords: *Sphaeranthus indicus* Linn, Phytochemical analysis, Proximate analysis.

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1. Introduction

In recent years plants has been in the main stream as an economically and commercial alternatives. The therapeutic evaluation of these plants and studies on their biological constituents has been the main focus of research in development countries (Edeoga HO *et al*, 2005). The practice of plants in therapeutic drug system for examples Ayurveda, Unani and Siddha are well conceded. Approximately 3000 plants are authoritatively documented for their therapeutic worth and over 6000 plants are used in established herbal and old used in established, herbal and old drug organization in india (Prakash UNK, 2014). This fertile world is with natural and medicinal plants, and have the capability many benefits of society for the humanity and pharmacological. Medicinal importance of these plants lies in constituents of photochemicals that is responsible for changes in the human body (Akinmoladun AC *et al*, 2007). Whole herb contain obtained by steam distillation of ocimen, alfa-terpine, bita ionone, d-codinene, alfa-ionone, alfacitral, geranion, p-methoxycinnamaldehyde (Basu NK *et al*, 1946) and alkaloid sphearanthine (Gupta RK *et al*, 1996). The alcoholic extract of powered Capitula contains stigmasterol, bitasistosterol, hentriacontane, sesqueterpinelactone (Gogat MG *et al*, 1986), sphaerathanolide (Yadav RN and Kumar S, 1998) flavone and isoflavone glycoside. The potential of plant has producing new drugs of great benefit to human being. *Sphaeranthus indicus* Linn was found to possess powerful medicinal properties to cure skin infections, diseases of the liver, jaundice, bronchitis, In view of the medicinal importance of *Sphaeranthus indicus* Linn. The system, it was decided to work on the phytochemical investigations on *Sphaeranthus indicus* Linn.

Material and Method- The fresh plant of *Sphaeranthus indicus* Linn was simultaneously collected from cultivated farms and open field of Betul district M.P. India. A fresh part of the plant was identified for phytochemical analysis. After 15 days plants was completely dried and it was grinded into powdered with 1mm size by using Grider machine before phytochemical screening.

1.1 Preparation of extracts- Four solvents were used to extraction of arial part of *Sphaeranthus indicus* Linn. The solvents are Petroleum ether, Ethanol, Chloroform and Aqueous 30gm of the powdered of *Sphaeranthus indicus* Linn were extracted with different solvents in soxlet apparatus in 250ml of each solvent separately for 48hours (Harbone JB, 1973).

1.2 Extraction Method

Preparation for extract, there are following method was adapted - Powdered and shade dried whole plant material of *Sphaeranthus indicus* Linn was taken (Khandelwal KR, 2005; Kokate CK, 1994).

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A New Common Fixed-Point Theorem for Two Pairs of Mappings in Parametric Metric Space

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Authors' contributions

All authors contributed equally and significantly to writing this paper. All authors read and approved the final manuscript.

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Original Research Article

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Abstract

Our aim of this paper is to prove a new general common fixed point theorem for two pair of mappings under a different set of conditions using the idea of weakly compatible mappings satisfying a general class of contractions defined by an implicit relation in the frame work of parametric metric space, which unify, extend and generalize most of the existing relevant common fixed point theorems from the literature. Some related results and illustrative an example to highlight the realized improvements is also furnished.

Keywords: Parametric metric space; common fixed point; implicit relation; weakly compatible mappings; contractions.

1 Introduction and Preliminaries

Fixed point theory has attracted many researchers since 1922 with the admired Banach fixed point theorem (see [1]). Banach's contraction principle is one of the pivotal results of analysis. Its significance lies in its

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Botany and Zoology

Evaluation of Extracellular Proteinase and Phospholipase Activities of Indian Clinical Strains of *Candida Albicans* and Non-*Albicans* and Their Correlation with the Source of Isolation and Minimum Inhibitory Concentration Values of Antifungal Drugs

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Abstract **Original Research Article**

The present study was aimed to evaluate some of the virulence traits, *viz*., extracellular proteinase and phospholipase activities, of *Candida albicans* (n=130) and non-*albicans Candida* (n=60), such as *C. tropicalis, C. parapsilosis, C. glabrata, C. guilliermondii*, and *C. krusei*. The isolates of *Candida* species that were investigated in the current work were obtained from diverse clinical sources in Jabalpur, Madhya Pradesh, India. The correlation between the clinical sources of isolation and minimum inhibitory concentration of antifungal drugs was also determined. A screening for the production of extracellular proteinase and phospholipase enzymes was done using the Yeast Carbon Base–Bovine Serum Albumin medium and the Egg Yolk Plate method, respectively. The Minimal Inhibitory Concentration against the tested antifungal drugs was determined by the M–27A CLSI/NCCLS macrodilution method. Of the 190 *Candida* isolates, 150 (80%) were positive for extracellular proteinase and 141 (74.2%) for phospholipase secretion. A non-significant difference was observed for extracellular proteinase and phospholipase activities among *C. albicans* and non-*albicans* as determined by ANOVA ($p > 0.05$). The comparison of individual extracellular proteinase and phospholipase activities among the sources studied also demonstrated non-significant difference and almost comparable results using Dunnett's t-test and Tukey's HSD Post Hoc test for the secretion of both the enzymes. A significant positive correlation between enzyme secretion and MIC of antifungal was demonstrated ($p < 0.05$), which suggested some role of extracellular enzymes among the *Candida* spp. in increasing the resistance against commonly used antifungal drugs.

Keywords: *Candida albicans*, non-*albicans*, proteinase, phospholipase, virulence factors, minimum inhibitory concentration.

INTRODUCTION

Candida albicans and non-albicans *Candida* species usually thrive as normal commensal flora in the human oral mucosa [1]. However, in immune compromised patients, the fungi can become opportunistic pathogens of the oral mucosa [2]. Nawange *et al*., previously reported a naturally acquired disseminated dual infection that was caused by *C. famata* and *C. catenulata* in a group of albino rats [3]. The transformation from a harmless to a virulent pathogen under the conditions of a dysfunctional host defense system can be attributed to an extensive repertoire of selectively expressed virulence determinants, including the ability of the yeast to produce extracellular hydrolytic enzymes, especially, extracellular proteinases and phospholipases that play important roles in adherence, penetration, and subsequent invasion of the infected tissues [3-6]. Hydrolytic enzymes, such as extracellular proteinases and phospholipases, have been regarded as the major determinants of pathogenicity of *C. albicans* [7-10].

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Father-Daughter Relationship in Vijay Tendulkar's *Kanyadaan*

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Assistant Professor,

Abstract: Vijay Tendulkar's *Kanyadaan,* one of his most controversial plays, besides having the theme of casteism, dwells on the issue of devastating impact of the ideology of a father on a dutiful daughter. Jyoti, an educated daughter of a socially and politically active Brahmin family, informs her parents about her decision of marrying Arun Athawale, a dalit whom she has known only for two months. Whereas Seva, being a conscientious mother, is naturally worried to hear it, her father Nath Devlalikar takes it to be a radical step on the part of their daughter, for it will serve their purpose of eradicating the evil of untouchability from the society.

Though during the very first meeting of Arun with Jyoti's family his ill manners and prejudices against upper caste people come to fore, Nath supports her decision in his zeal for expedition against casteism. He even considers it to be 'a very precious experiment'.After the marriage takes place, Arun's alcoholism and his violent behaviour towards Jyoti make both the father and the daughter realize the difference between idealism and reality. Jyoti finds herself engulfed in the sea of misery. Apprehending the amount of torture Arun may inflict upon his daughter, Nath accepts his invitation to preside over the discussion on his unrealistic autobiography, and praises the book in his speech. Jyoti, being a staunch follower of the ideals of her father since her childhood, is completely shattered to see his hypocrisy. She accuses him for rearing her as a'guinea pig' for his 'experiments' and leaves her home to let him burn in the fire of repentance forever.

The research paper attempts to delve deep in the psyche of the characters to understand the playwright's skill in delineating the intricacies of father-daughter relationship.

Keywords: casteism, hypocrisy, idealism, prejudices, reality, relationship, social reform.

.....

> I have written about my own experiences and about what I have seen in others around me. I have been true to all this and have not cheated my generation. I did not attempt to simplify matters and issues for the audience when presenting my plays, though that would have been the easier option. Sometimes my plays jolted society out of its stupor and I was punished I faced this without regrets' [1]
>
> – Vijay Tendulkar

Vijay Tendulkar's *Kanyadaan,* one of his most controversial plays, won him *Saraswati Samman* and this is the play for which once a slipper was hurled at him. As a creator, he respected both verdicts. The play having the theme of casteism, also dwells on the issue of father-daughter relationship.

Nath Devlalikar is an MLA. Seva, his wife, is also an active social worker working for the upliftment of women's causes in society. Their daughter Jyoti is a working woman and their son Jayapraksh is doing his BA. Jyoti informs her parents about her decision of marrying Arun Athawale, a dalit whom she has known only for two months. Nath Devlalikar is elated to hear it. Ignoring Jaya's concerns about his family background and his career he supports Jyoti. He takes it to be a radical step on the part of their daughter, for it will serve their purpose of eradicating the evil of untouchability from the society.

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Ethno-botanical survey of some selected sacred natural sites of Betul district of Madhya Pradesh, India

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Abstract
Present research survey focused on sacred natural sites of Betul district of Madhya Pradesh. Present survey revealed that 25 plants species belonging to 16 families are used as sacred, religious, medicinal, rituals food and agricultural purposes by indigenous peoples of Bhopali, Jathandeo, Chandi devi, Lakha banjara, Maddeo and Salbardi. Ethno-botanical data is of significant value for conservation purposes. The high fidelity level (FL) of plant species *Cocos nucifera* 100% and *Ocimum sanctum* 100% indicates the prevalence use of plant and use value (UV) of plant determines the relative importance on use of plant species. The highest UV was calculated for *Bauhinia varigata* (0.157) and lowest *Gossypium hirsutam* (0.035) these finding demonstrate the extensive use of species in different purposes, similarly lowest UV shows minimum uses of species. The observed plants presented as main deity wise with scientific name and family.

Keywords: Ethno-botany, SNS, religious beliefs, Betul

Introduction
Ethno biology is the study of the biological knowledge of particular ethnic groups or communities, their cultural knowledge about plants and animals and their interrelationships. Ethno biological knowledge is far too important to ignore. It is important in the traditional cultures of the indigenous and rural societies of the world and these societies do not want to vanish it. Ethno biology contributes to be a source for knowledge about medicine, crops, agricultural techniques, conservation and management [1].

Ethno biology becomes an important and interesting branch of science. This new field of research gain importance by thoroughly and systematically investigation of unexplored areas of country. Plants and animals have become infinite sources for ethno biologists, anthropologists, plant geographers and other researchers. Ethno botany is considered as a branch of ethno biology. According to Schultes (1962), ethno botany is "The study of the relationship which exists between people of primitive societies and their plant environment." Though ethno-botany have different approaches in plant research [2], here only the plant resources which has traditional values in reference to religious beliefs and myths of primitive tribes of Betul, is mentioned.

Worshipping nature and various living beings has been practiced in our country from the time immemorial. There was a belief that all creation of nature had to be protected. Such beliefs preserved several virgin forests in pristine form. Sacred natural sites are precious as well as traditional resources for learning the native utilization pattern of plant varieties. SNS are defined by IUCN as "areas of land or water having special spiritual significance to people and communities [3] Rutte, 2011 defined it as paradigmatic example of community based resource management [4]. Present survey held in some selected SNS of Betul district of (M.P.) could see a total 25 plant species belonging to 15 Families. Many of the SNS have opulence of vegetation having ethno botanical and mythological significance.

Betul district is tribal dominated area of centrally located state Madhya Pradesh of India which is lying on the southern part of the state, almost wholly on the Satpura Plateau and extends between 21° 22′ and 22°24′ North latitude and 77° 04′ and 78°33′ East longitude occupy 10,078.1 sq. km. Gond and Korkus are main tribes resides in Betul [5]. Their economical status is very poor. So most of the tribal people rely on traditional agricultural techniques, traditional food, traditional medicine, and traditional healers like Bhagat, Bhumka and Vaidya. Advantage in preferring traditional medicine is that they believe in spiritual power and traditional herbal healers who are found within a short distance, most of them are familiar with the patient's culture and the environment and the cost associated with treatments are very less [6].

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Evaluation of Keratinophilic Fungi and Dermatophytes in Garbage Soil around the Beauty Parlours of Betul City (MP)

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Abstract – Keratinophilic fungi are a highly specialized group of fungi growing on specific substracts containing the complex nitrogenous material keratin. They are potentially pathogenic to man and animals as they include dermatophyte which parasitize man and animals by invading the keratinized layers of epidermis and epidermal appendages.

Key Words: Pathogenic Fungi, Beauty Parlour.

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INTRODUCTION

Soil that are rich in keratinous materials are the most conductive for the growth and occurrence of keratinophilic fungi (Moallai and Zaini, 2006). Therefore soil rich in keratin residues constitutes a permanent or occasional reservoir for dermatophytes and other keratinophilic fungi and are a source of potential infection for man and animals. On the other hand keratinous material does not accumulate in nature, keratinophilic saprophytes may be presumed to accomplish its degradation and removal. Therefore their survived in soil has great epidemiological as well as ecological significance. In the present paper a study was conducted to explore the keratinophilic mycoflora present in garbage soil around the beauty parlours of Betul city, which is enriched with keratinous material particularly hair.

MATERIAL AND METHODS:

A total of 40 soil samples were collected from around the beauty parlours of Betul city, Toma - Karling - Vanbreuseghem (1952) technique was followed for isolation of fungi from soil samples. Keratinophilic fungi if present in soil sample, appeared on different baits. When growth occurred, a part of this growth was examined microscopically and transferred aseptically in petridishes containing sabourauds dextrose agar media. Isolated fungi were identified on the basis of their cultural and morphological characteristics.

RESULTS AND DISCUSSION:

The different species of kerationophilic fungi isolated from soil samples from around beauty parlour are presented in table-1. All the 40 samples investigated proved to be positive for the colonization of keratinophilic fungi. A total of 4 genera namely *Chrysosporium*, *Microsporum*, *Scopulariopsis* and *Aspergillus* were isolated from soil samples on different baits.

In all the soil samples only two genera were isolated more frequently. Maximum number of fungi isolated were the genus *Chrysosporium* (103) followed by *Microsporum* (55). Table-3 shows the frequency of occurrence of *Chrysosporium* genus in collected soil samples was 85% and frequency of *Microsporium Scopulariopsis* and *Aspergillus* was 52.5%, 7.5% and 2.5%, respectively. Table-2 shows the bait specificity of each fungus. *Chrysosporium* Sps were grown on nails in 23 soil samples, on hair in 18 soil samples, on horn in 27 soil samples, on feather in 20 soil samples and on hoof in 15 soil samples. Similarly *Mircrosporum* Sp. were found growing on nail in 6 soil sample, on hair in 17 soil samples, on horn in 8 soil samples, on feather in 13 soil samples and on hoof in 9 soil samples. *Scopulariopsis* Sp. was isolated from 01 soil sample on nails from 01 soil sample on horn and from 2 soil samples on feather. *Aspergillus* species was isolated only from one soil sample on nail. Nail was found to be the best keratin source for the colonization of keratinophilic fungi.

Garbage soil, collected from around the beauty parlour located in different residential areas of city, is rich in keratinous material specially hair, showed more prevalance of keratinophilic fungi and dermatophytes. In the present study isolation of *Microsporum* Sps are significant as it is the well established causal organism of dermatophytosis. Out of 55 isolates of *Microsporum*, 16 were of

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Distribution of Keratinophilic Fungi in the Soil Surrounding the Slaughter Houses of Betul City, MP India

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Abstract *– A total of six soil samples were examined for the isolation of keratinophilic fungi. All soil sample were collected from around the slaughter houses located in different areas of Betul City. A total of 28 isolates including 4 species belonging to 03 genera were reported using hair-bait technique. The fungi so isolated belongs to two species from genus Chrysosporium, and one species from each of the genera Trichophyton and Scopulariopsis.*

Key Words: *Keratinophilic Fungi, Pathogenic Fungi, Slaughter House.*

----------X----------

INTRODUCTION

The soils represent the main reservoir of fungi. Soil that are rich in keratinous material are the most conductive for the growth of occurrence of keratinophilic fungi. The majority of the fungi producing disease in human beings and animals exist freely in nature as soil saprophytes. (Kumari et.al. 2005) The presence of keratinophilic fungi and their distribution patterns in environment depends, in part, on human and animal presence in the environment itself. Such a relationship is therefore important in determining the epidemiology of diseases caused by these fungi. In recent past many investigations have been carried out to find the distribution pattern of the keratinophilic fungi in, many parts of India (Jain & Sharma, 2011, Singh et.al. 2009, Sharma et.al. 2008, Anbu et.al. 2004, Deshmukh 2002, 2004, Ghosh and Bhatt 2000, Sarkar Ashis et.al. 2014). The study was undertaken to explore the occurrence of keratinophilic mycoflora from soils of garbage areas around / near the slaughter houses located in different areas of Betul city.

MATERIAL AND METHODS:

Soil samples was collected from superficial layer at the depth of 3-6 cm. from six garbage sites around / near the slaughter houses located in different areas of Betul city. The soil samples were placed in sterile polythene bags, brought to the laboratory and stored in refrigerator at 4°C until processed. Approximately 20 to 25 gms of soil from each samples were placed in sterile petri-plates in five replicates. Short (1-2 cm length) pieces of sterilized hair, nails, horn hoof and feathers were scattered on the surface of soil for baiting in each soil sample. The petri-plates were moistened with sterilized distilled water and incubated at room temperature (26 + 2° C) for a period of 4-6 weeks. The plates were examined daily, if cottony growth was observed then baits were selected at random from each petri-plate and transferred aseptically to plates containing Sabourauds Dextrose Agar (SDA) medium supplemented with cycloheximide (0.5 mg/ml) and chloromphenical (0.05 mg/ml). The SDA plates were incubated at room temperature (26 + 2° C) for further examination. Fungal colonies were examined under the microscope and identified by preparing the slide in cotton blue on the basis of morphological characteristics.

RESULTS :

A total of 28 keratinophilic fungi represented by 3 genera, were isolated from the six soil samples collected from different slaughter houses located in different areas of Betul city (Table-1).

Table-1 also showed the bait specificity for isolated keratinophilic fungi. *Chrysosporium* sps. were reported from all the baits (Nail, Hair, Horn, Feather, Hoof) used in present investigation, while *Scopulariopsis* spp. were reported on hair and feather. *Trichophyton* sp. were growth on hair only.

Table-2 showed that out of 28 colonies isolated, 22 were *Chrysosporium* sps (78.57%) followed by *Scopulariopsis* Spp. (17.85%) and *Trichophyton* sp. (3.57%).

Table-3 revealed that all the sites examined for keratinophilic fungi were positive for

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Physico–Chemical Study of Tapti River Water at Multai, District - Betul (M.P.)

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Abstract: ***Tapti, a holy river is the key source for drinking, domestic and irrigation purpose in Madhya Pradesh. In the present study water samples of Tapti River from Multai have been studied physico-chemically to evaluate its suitability for drinking, domestic and irrigation purpose in the month of Jul., Aug. and Sept-2019. Monthly variation in important parameters taken into consideration as Temperature, Turbidity, pH, Specific Conductivity, Total Alkalinity, Total Hardness, Calcium Hardness, Magnesium Hardness, Total Dissolved solids, Suspended Solids, Chlorides, Nitrates, DO, BOD, and COD were determined. These physico-chemical parameters were determined as per standard methods of APHA (2012). Results revealed that Tapti River water quality is suitable and safe for domestic and irrigation purposes.***

Keywords: Tapti River, Physico-Chemical Parameters, Multai, Quality of water

1. Introduction

Water is god's gift to all living creatures from unicellular to multicellular and from plants to animals on earth. The quality of water is of vital concern for human beings, since it is directly linked with human health. Water plays an important role in various life processes in the human body. In our daily life, water is used for drinking, bathing, cooking and washing purposes. But relentless increase in the demand of water for multipurpose brought about by the two interdependent and parallel lines of forces i.e. industrialization and urbanization, which is one hand usually reflects the all around development and progress but on the other hand posses strong concern about the fate of fresh water habitate. The requirement of water in all lives, from microorganisms to human beings, is increased day-by-day but it is a serious problem to provide a safe drinking water because all water resources have reached to a point of crises due to unplanned urbanization and industrialization. Water is the best solvent also called a universal solvent and the most abundant component on earth's surface comprising about 70% of earth's surface in solid, liquid and gaseous state. The impact of rapid urbanization on the water front is of great concern. Millions of people all over the World, particularly in the developing countries are losing their lives every year from water borne diseases. Numbers of observations are reported on the pollution of water resources. The anthropogenic activities and population pressure are the major cause of the degradation of water quality.

The objective of the present study is to provide information on the physico-chemical characteristics of river Tapti to assess the quality of river water as well as to discuss its suitability for human consumption and irrigation purposes.

2. Study Area

Multai is a Tehsil place and a small town. Actually the name Multai was derived from Multapi, which is the origin place of Tapti river. Now-a-days, Tapti river and its ponds located in Multai have been polluted by immersion of lord Ganesha and Durga's idols, washing and cleaning of cloths, domestic sewage and other recreational activities. It has a total length of around 724kms. Its catchment area in Multai is about 8.0 sq. kms and the longitude and the latitude are 78°21'00" and 21°04'00" respectively. The water of this river is supplied to the people of the city Multai for drinking and irrigation purposes. The deterioration of water quality of river has posed a serious problem for human beings, animals and plants.

3. Material and Methods

The present study was carried out at Tapti river water in Multai, district– Betul (M.P.), India. The study was conducted between the months of Jul; Aug. and Sept-2019. Samples were collected from six main sampling points, where various pollution activities have large impact on water quality. For water collection acid cleaned plastics containers were utilized. Parameters like Temperature and pH were measured at sampling sites while remaining parameters were analyzed immediately after reaching in laboratory. For analysis of water samples standard methods of Trivedi and Goyal and APHA (2012) were followed.

4. Results and Discussion

The mean data of the present study of physico-chemical analysis of Tapti river water have been given in Table1.

Temperature: Temperature is one of the most important factors. The water temperature followed the change in solar radiation and ambient air temperature. The temperature of surface water was found 23.3°C in Jul; 22.8°C in Aug. and 22.5°C in Sept.-2019 respectively. Temperature has been considered as an important factor in aquatic environment (Singh R.P.et. al, 2005).

Turbidity: The clarity of water is an important factor for determining its health and productivity. Turbidity in water is caused by suspended and colloidal matter such as clay, slit, finely divided organic and inorganic matters, paints and other microscopic organisms. The turbidity was found 4.8 NTU in Jul; 5.6 NTU in Aug. and 6.1 NTU in Sept.-2019 respectively.

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Physico - Chemical Assessment and Impact Determination of Chemical Fertilizers on the Quality of Water at Sapana Reservoir in District - Betul (M.P.)

Dr. D. S. Saluja

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Abstract: ***Chemical Fertilizers are used extensively in modern agriculture, in order to improve crop yield. However, nutrient leaching from agriculture soil into ground water and surface water cause a major environmental and public health concern. During present investigation, 06 water samples were collected from selected sampling stations of Sapana reservoir, District Betul (M.P.). The water samples were analyzed for physico-chemical characteristics and fertilizer residues. From the study it is concluded that, application of chemical fertilizers has severe impact on water quality. The pH of the ground water was found to be alkaline in some of the water samples. Nitrates and Phosphates concentration were to be higher than the permissible limits of WHO standards, due to leaching and surface run off of chemical fertilizers from agriculture lands. In order to overcome water pollution problems, effective management of chemical fertilizers has to be implemented.***

Keywords: Chemical Fertilizers, Ground water, Nitrate, Phosphate, Physico – Chemical Assessment, Sapana Reservoir

1. Introduction

Sapana reservoir like many others in the state was constructed for irrigation purpose and it is an important source of water supply to the wide agriculture, industrial and domestic area of District- Betul and also being used for fish culture. The dam was constructed in the year 1956 and its longitude and latitude are 77°59'05" and 21°15'15" respectively. Total length of the reservoir is 1790 Sq.m. and its catchment area is 44.75 Sq.m. The gross capacity of the reservoir is 16903 Th.cu.m. The shallow part of the reservoir gets exposed during summer session and exposed land is used for agriculture purpose where in the farmers also used huge amount of chemical fertilizers and pesticides. For the purpose of this study, 06 sampling stations were identified. The first three sampling stations were located near village Ankawari, and the next two were near village Partapur, where chemical fertilizers were extensively used and the last one was at reference sample station i.e. center of the reservoir.

2. Material and Methods

Water samples were collected in fresh one liter plastic containers previously washed with 1:3 HNO3 in the month of Oct-2019 from surface and bottom water level. pH was determined using digital pH- meter. Conductivity was measured using digital conductivity meter. Dissolved Oxygen (DO) was determined by the Wrinkler's method with Azide modification. Biological Oxygen demand (BOD) and Chemical Oxygen Demand (COD) were determined by five days method and Potassium Dichromate Pen Reflux method. Nitrates and Phosphates were estimated by UV-Visible Spectrophotometer. Potassium was determined by using Flame Photometer.

3. Results and Discussion

Water quality standards and guidelines corresponding to the WHO and ISI have been compared with the mean data results under the given table1.

pH :- pH is largely depend on carbonates, bicarbonates and carbon dioxide. The results of pH range in between 7.2 – 7.8 indicated that the reservoir water is slightly alkaline. Desirable pH range is 7.0 – 8.5 as per WHO and ISI.

Specific Conductance (SC):- Specific Conductance (SC) depends upon sulphates, chlorides, phosphates, heavy metals and total concentration of dissolved ions. The values of Specific Conductance range between 86 – 482 m. mhos/cm. The standard value of specific conductivity is 50 – 1500 m. mhos/cm.

Dissolved Oxygen (DO):- DO in water is of great importance to all aquatic organism and is considered to be the factor that reflects the biological activity taking place in a water body and influences the biological changes. In the present study DO values were found in between 1.4 – 7.8 mg/l against the standard value of 6.0 mg/l.

Biological Oxygen Demand (BOD):- BOD is directly linked with decomposition of dead organic matters present in the reservoir and hence the higher values of BOD can be directly correlated with pollution status and inverse relation with DO concentration. The BOD values were observed in between 1.3 – 8.1 mg/l. The permissible limit is 3.0 – 6.0 mg/l.

Chemical Oxygen Demand (COD) :- The range of COD was observed in between 46.1 – 62.3 mg/l, while the its permissible limit is 10.0 mg/l.

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Status of Subsurface Water Quality of Different Sampling Stations with Respect to Some Physico-Chemical Parameters at Betul City, (M.P.)

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Abstract: ***In the present study an attempt has been made to find the subsurface water quality with a view to water utilization for drinking and domestic use. In this paper, the various physico-chemical parameters as Colour, Odour, Taste, Temperature, Electrical Conductivity (EC), Total Dissolve Solids (TDS), pH, Free co_2, Total Hardness (TH), Chlorides, Dissolve Oxygen (DO), Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) were examined. Almost all these parameters satisfy the guidelines of drinking water at maximum places except a few, especially with respect to hardness.***

Keywords: Subsurface Water, Ground Water, Physico-Chemical Parameters, Atmospheric Contaminations, Adverse Health effect.

1. Introduction

Fresh water is the most precious material for life on earth. This natural resource is available with surface and subsurface sources. The quality of subsurface water depends upon the quality and quantity of salts that prevail in the soil. The industrial and domestic wastes not only affect the water bodies of the area, but also exert an impact on physico-chemistry of ground water, therefore continuous monitoring of water quality is necessary (Will&Yeh,1987). While the underground water is usually free from pathogens, the long process of natural filtration dissolves some salts and cause health problems to consumers. It has been found that approximately within 30 feet, except soluble metal compounds, almost all bacteria are filtered out (Black,1977).

It is estimated that around 3% of fresh water available on the earth is in the rivers and lakes and the rest 97% is underground (Bollenbach,1983). Rapid industrialization, utilization and consequent increase in population make it imperative to tap ground water resources to meet the increasing water requirements. Improper drainage system, septic tanks and solid waste disposal resulted in contamination of ground water.

The aim of the present study is to analyze the physico-chemical characteristics of subsurface water at Betel City (M.P.), which is, situated nearly about 199 kms. In east of capital city, Bhopal (M.P.) at latitude 21.55^{0}E and longitude 77.54^{0}N. In the city region with 18 places including open wells, tube wells and hand pumps were kept under investigation.

2. Material & Methods

The study area was divided into three zones for convenience of collection, transportation and examination of samples. The sampling stations were selected on the basis of water lifting for drinking and domestic uses. Sampling stations are presented in table1. The samples were collected in winter season (Nov.-2018) and between 10.00 a.m. to 06.00 p.m. The collections of samples will be followed as internationally accepted APHA and BIS proposed standard methods. Water samples were collected in one-liter plastic cans. Before sampling, the plastic cans were cleaned thoroughly to remove all surface contamination, rinsed double with distilled water and dried. The collected samples were properly transferred to the laboratory, to avoid atmospheric contamination and to reduce any evaporation loss during storage. The methods for analysis were followed as standard method prescribed in APHA, AWWA, BIS and WPCF.

3. Results & Discussions

The results of the study are given in table 3.

Table 1: List of areas (sampling stations) covered in the study

S.No.	Zone A	Zone B	Zone C
1	Vivekanand ward	Kidwai ward	Kosami industrial area
2	Lohiya ward	Arya Pura	Bhagatsingh ward
3	Rajendra ward	Krishna pura	Azad ward
4	Jawahar ward	Durga-chouk	Subhash Ward
5	Ganesh ward	Desbandu ward	Link-road
6	Civil line	Moti ward	Dist. hospital

Table 2: Information on the type of water sources (sampling stations)

S. No.	Details of sources	No. of types of water sources		
		Open wells	Tube wells	Hand pumps
1	Sampling Source	2	13	3
2	Uses : (i) Drinking	2	13	3
	(ii) Domestic	2	13	3
3	Lifting device: (i) Manual	2	-	3
	(ii) Pump	-	13	-
4	Depth (feet)	40 – 70	80 – 310	60 - 180

Colour : In natural waters, colour may occur due to the presence of humic acids, fulvic acids, metallic ions, suspended matter, phytoplankton, weeds and industrial effluents. In the present study, all the water samples were found to be colorless.

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श्री दिगम्बर जैन सिद्ध क्षेत्र "मुक्तागिरी मंदिर"

डा. विजेता चौबे
प्राध्यापक - इतिहास
ज. ह. शासकीय स्नातकोत्तर महाविद्यालय, बैतूल (म.प्र.)

सतत् सतपुड़ा कह रहा अक्षत् न्याय सतधार,
मुक्तागिरी आ देख लो, दिखता शिवपुर द्वार,
गगन चूमते शिखर हैं, रहे एक से एक,
युवा मेहा ही जल भरे, करते हैं अभिषेक।
- आचार्य विद्यासागर

जैन तीर्थ मुक्तागिरी

विहंगम दृश्य

महाराष्ट्र और बैतूल (मध्यप्रदेश) के सीमावर्ती क्षेत्र परतवाड़ा के निकट खरपी ग्राम में स्थित सतपुड़ा की पर्वत श्रृंखला के मध्य जैन तीर्थंकरों के मंदिरों की एक अनोखी श्रृंखला है, जो तीर्थ मुक्तागिरी के नाम से प्रसिद्ध है। मुक्तागिरी को प्राचीन जैन प्राकृत ग्रंथ में निर्वाण क्षेत्र कहा गया है, जिसमें मुक्तागिरी का उल्लेख मेंढागिरी के नाम से किया गया है। इस ग्रंथ में लिखा गया है कि -

अचलपुर - वार न्यारे - ईसान मयनि मेंढागिरी सिहारे।
ओघ्याय कोटि मुनि निव्वान गया नामो तैसीम।।

Name of Faculty: Dr. B. D. Nagle

WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
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ASSESSMENT OF BIOMOLECULES FROM LEAVES EXTRACT OF ETHNIC PLANTS

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INTRODUCTION

Plants derived of several kinds substances was given great interest in used as traditional medical practices, modern medicines, nutraceuticals, food supplements, folk medicine, drug intermediates and chemical entities for synthetic drugs and plants have to ethno medicinal valued and in decoration at societies level interaction of peoples given happiness and joy show as like fragrance, natural beauty of aroma, colors and shapes. Elements are the constituents of phytochemical presence in parts of plants such as flowers, seeds, leaves and stems. The products derived from plants are relatively complex mixture of metabolites, in the liquid state, after removing the solvent from extract material in dry to powder form. The most active components extracted in using methanol organic solvent for plants leaves of species such as *C. citratus, T. cordifolia, S. mukorossi, T. grandis, P. emblica, A. concinna, H. rosasinensis, D. metel, R. communis, M. pudica*. The plants phytochemical are extracted by Soxhlet in alcoholic solvent under steam distillation employed. Useful conclusions have been taken with the use of carbohydrate such as sugars, glucose and fructose estimation through used methods of the biochemical estimation applied of Molishch, Benedict, Selvynoff and Fahling Test.

MATERIALS AND METHODS

Plant Materials

The plants materials leaves was collected from plants species such as C. citratus, T. *cordifolia, S. mukorossi, T. grandis, P. emblica, A. concinna, H. rosasinensis, D. metel, R. communis, M. pudica* from local area of Betul district and the plants leaves were wet free

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Remarking An Analisation

Histochemical Atterations in The Liver of Oreochromic Mossambicus Fingerlings Caused by Herbicide "Pursuit"

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Abstract

The Pollution of aquatic environment by Pesticides adversely affects the survival of aquatic organisms including commercially important fish species. In order to assess the effects of herbicide Pursuit in liver of fish fingerlings of Orcochromis mossambicus the fingerlings were exposed to sublethat concentration (63.7ppm) of pursuit for 15 and 30 days. The histochemical reaction of PAS-Test for carbohydrate in the liver of fingerlings gave different response under controlled and treated condition. Hepatocytes, pancreatic tissue and cytoplasmic inclusions of control liver have good amount of carbohydrate contents. After 15 days exposure of 63.7ppm pursuit toxicity few patches of hepatic cell lost the carbohydrate contents showing moderate to weak positive reaction respectively where as 30 days exposure of 63.7ppm pursuit exhibit heavy reduction of carbohydrate contents in comparison to control liver in which whole liver mast become weak positive to negative reaction towards the PAS test. Liver was seen in slightly improved condition in case of one month recovery treatment in fresh water, Hence it may be concluded that pursuit is highly toxic to fish life and its long term effect is less repairable.

Keywords: Herbicide, Fingerlings, Histochemical, Liver, Recovery, Alteration.

Introduction

Convalescing from the excitement of Green Revolution. India is now batting from Perils of excitement used chemicals. Fertilizers and Pesticides. The Pollution of aquatic environment by pesticides adversely affect the survival of aquatic organisms including commercially important fish species.

Fish fingerlings are very sensitive to their environment and widely used as bioindicaters for the assessment of the degree of pollution. However earlier stages of fishes are more susceptible to toxic ants. The Test herlricide pursuit is widely uses in terrestrial crops of soybean and groundnut to control annual grasses, broad leaf weeds and is applied by spraying on standing crops. Liver plays an important role in detoxification process so toxicant may affect it. Due to its contact with the blood it is directly get affected by pollutants and serves as a suitable inhere to the toxicity of surrounding water . The Present Research work was carried out to exhibit toxic effects of pursuits on the liver of Oreichromis mossambicus fingerlings.

Material and Method

Living Fingerlings of Fresh water tallest O mossambicus were collected from the local fish farm and kept in glass aquaria for acclimatization. After determining the Lc50 (0.51 ml/l) Fingerlings were exposed to 63.7ppm Sub-lethal Concentration of pursuit for 15 and 30 days respectively. After 30 days exposure these fingerings were kept fresh water for one month to observe recon By routing microtome serial sections were prepared 7my for host chemical observations and stained in PAS Test.

Result and Discussion

The Histochemical reaction of Pas test for carbohydrate in the liver of fingerlings under controlled and traded conditions gave different response. Hepatocytes, Pancreatic tissue alls, and cytoplasm inclusions of control liver tissue have rich amount of carbohydrate content

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Sadism in the Plays of Vijay Tendulkar

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Abstract : The word sadism comes from the name of a historical figure, Marquis de Sade, (1740- 1814) a French Count, writer and philosopher. Sadism is a type of behaviour in which a person obtains pleasure from hurting other people and making them suffer physically, emotionally or mentally. The key components in sadism are the intention to harm, pleasure in causing another's distress, a lack of remorse and failure to take the responsibility. The present paper is an attempt to study sadism as perceived in the male protagonists of Vijay Tendulkar's three plays - Silence ! The Court is in Session, Kanyadaan and Sakharam Binder. Vijay Tendulkar's male protagonists have the animalistic qualities like violence, brutality, ferocity and cruelty ingrained in them which result in their inflicting pain, torture, and violence on the second sex.

In the play, *Sakharam Binder,* Sakharam, a Brahmin by caste, lives like an animal rejecting all the outdated social codes, rituals and marriage systems and follows his own ideology. This self-proclaimed womaniser, Sakharam searches the helpless and forsaken women, whom he brings home, gives them food, shelter and clothes and then brutally tortures them to satisfy his sexual desire and domestic needs. In *Kanyadan* Arun has the traits of a sadist. He takes pleasure in torturing Jyoti verbally, emotionally, psychologically as well as physically. The emotional, verbal and psychological violence against women in Vijay Tendulkar's play *'Silence! The Court is in Session'* may also be seen as a result of sadism of male characters of the play.

Keywords: Distress, brutality, violence, cruelty, pleasure,

.....

The word sadism comes from the name of a historical figure, Marquis de Sade, (1740- 1814) a French Count, writer and philosopher. The term was first used by the psychiatrist Richard von Krafft- Ebing (1840-1902).

Sadism is a type of behaviour in which a person obtains pleasure from hurting other people and making them suffer physically, emotionally or mentally. A sadist humiliates people intentionally in presence of others, treats them in an unkind and harsh way, would lie without any apparent motive behind it, frightens and puts restrictions on others, admires dictators, has fantasies which involve hurting people, would disclose the secrets of others, portrays others falsely to damage their reputation, ruins another person's relations. If the target of the sadist is weak and unlikely to retaliate, the intensity of the attack is increased. No provocation is needed for his sadistic activities. He would never take the responsibility or feel remorse for harming others.The key components in sadism are the intention to harm, pleasure in causing another's distress, a lack of remorse and failure to take the responsibility.

The present paper is an attempt to study sadism as perceived in the male protagonists of Vijay Tendulkar's three plays - *Silence ! The Court is in Session, Kanyadaan* and *Sakharam Binder.*

Vijay Tendulkar's male protagonists have the animalistic qualities like violence, brutality, ferocity and cruelty ingrained in them which result in their inflicting pain, torture, and violence on the second sex.

In the play, *Sakharam Binder,* Sakharam, a Brahmin by caste, lives like an animal rejecting all the outdated social codes, rituals and marriage systems and follows his own ideology. This self-proclaimed womaniser, Sakharam searches the helpless and forsaken women, whom he brings home, gives them food, shelter and clothes and then brutally tortures them to satisfy his sexual desire and domestic needs. In his contractual cohabitation or live-in-relationship with woman, if a woman fails to keep him happy for long or there is no spark left in her, he discards her and brings another woman who can live with him as his married wife. The play begins when he has left the sixth woman and brings the seventh woman, Laxmi, a typical Indian

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Fixed Point Theorems for Expansive Mapping in *A*-Metric Space

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ABSTRACT

In this paper, we prove some fixed point theorems under different expansive type conditionsin the setting of a A-metric space. Our results generalize and extend various results in the existing literature.

Keywords: A-metric space, expansive mapping, fixed point.

1. INTRODUCTION

The study of expansive mappings is very interesting research area of fixed point theory. In 1984, Wang *et al.*[26] introduced the concept of expanding mappings and proved some fixed point theorems in complete metric spaces. In 1992, Daffer and Kaneko[7] defined an expanding condition for a pair of mappings and proved some common fixed point theorems for two mappings in complete metric spaces. In 1989, Bakhtin[2] introduced the concept of a b-metric space as a generalization of metric spaces, in which many researchers treated the fixed point theory. In 1993, Czerwik[4-5] extended many results related to the b-metric spaces. In 1994, Matthews[14] introduced the concept of partial metric space in which the self-distance of any point of space may not be zero. Gähler[11] claimed that 2-metric space is a generalization of an ordinary metric space. He mentioned in[11] that $d(x, y, z)$ geometrically represents the area of a triangle formed by the points $x, y, z \in X$as its vertices. On the other hand, Ha *et al.*[12] and Sharma[23] found some mathematical flaws in these claims. It was demonstrated in[23] that $d(x, y, z)$ does not always represent the area of a triangle formed by the points $x, y, z \in X$. Dhage[8] suggested an improvement in the basic structure of 2-metric space. In 1984, Dhage in his Ph.D. thesis[8] identified condition second as a weakness in Gähler's theory of a 2-metric

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COMMON RANDOM FIXED POINTS RESULTS FOR (ψ, φ)-CONTRACTIONS VIA THE CONCEPT OF $\mathcal{C}$-CLASS FUNCTIONS

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Abstract: *We prove a new approach for some common random fixed point results in partially ordered complete separable metric spaces for weakly increasing self-mappings satisfying (ψ, φ)-contractions via the concept of $\mathcal{C}$-class functions.*

2010 Mathematics subject classifications: Primary 47H10; Secondary 54H25.

Keywords: *common random fixed point, partially ordered metric spaces, random variable, weakly increasing, $\mathcal{C}$-class functions.*

1. Introduction

The existence of fixed points for self-mappings in partially ordered sets has been considered in [1,2], where some applications to matrix equations are presented. This result was extended by Nieto et al. [3] and Nieto and Rodriguez-Lopez [4, 5] in partially ordered sets and applied to study ordinary differential equations.

The problem of fixed points for random mappings was initiated by the Prague school of probability research. The first results were studied in 1955-1956 by Špaček and Hanš in the context of Fredholm integral equations with random kernel. In a separable metric space, random fixed point theorems for contraction mappings were proved by Hanš [8, 9], Hanš and Špaček [10] and Mukherjee [11, 12]. Then random fixed point theorems of Schauder or Krasnosel'skii type were given by Mukherjea (*cf.* Bharucha-Reid [6], p. 110), Bharucha-Reid [13] and Itoh [14]. Now it has become a full-fledged research area and a vast amount of mathematical activities have been carried out in this direction (see, for examples, [15–18]). The existence of a random fixed point for mappings in partially ordered metric spaces and partially ordered probabilistic metric spaces was studied, for example, in [19, 20]. In 2014, Ansari [1] introduced the concept of C-class functions and proved the unique fixed point theorems for certain contractive mappings with respect to the $\mathcal{C}$-class functions.

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Original Research Article

An investigation of pollution status of Machna river water, Dist. Betul Madhya Pradesh

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Abstract

In the present study, an attempt has been made to evaluate the water quality of "Machna River" flowing through Betul city (M.P.) for a period of 06 months to assess the suitability of water for irrigation and drinking purposes. The parameters observed for this present study were Sodium Absorption Ratio (SAR), Electrical Conductance (EC) and Sodium Percent (SP). Present observations confirm that the water quality of Machna River water is suitable for irrigation and drinking purposes.

Key Words: Machna River, Water Quality, Irrigation, Sodium Absorption Ratio, Electric Conductance, Sodium Percent, Salinity.

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INTRODUCTION

An attempt has been made in the present study to evaluate the the quality of "Machna River" water of Betul city (M.P.) with respect to its suitability for irrigation and drinking purposes. Betul, one of the districts of Madhya Pradesh is situated nearly 190 kms. South-west of capital city Bhopal. The need of water for irrigation, industrial and other purposes is not only fulfill from Machna River water but also the life-line of drinking water need of the most part of Betul city. The river originates from village Barsali and ultimately confluence with river Tawa and finaly joins the river Narmada.

MATERIAL AND METHODS

Water quality assessment was made during 06 months from Jun. 2017 to Nov. 2017. The samples were collected from different points to cover the complete area of river water flow. The analysis of water samples were performed employing standard methods for examination of water and waste water (APHA 1992) and evaluated for its suitability for irrigation and drinking uses with reference to Sodium Absorption Ratio (SAR), Electrical Conductance (EC) and Sodium Percent (SP). Quantitative determination of Sodium was made with the help of Flame Photometer, Electrical Conductance was measured by Digital Conductivity Meter. SAR and SP were calculated by the formula given in IS-2296 (1982).

RESULT AND DISCUSSION

The mineral components of the water is directly related to agricultural utility and its parametrically values decide the suitability for irrigation purposes. WICOX- (1995) has made and attempt to clarify the quality of water with respect to irrigation and drinking purposes by taking into consideration Sodium and Electrical Conductance as vital parameters (Table 2). It is well known that Electrical Conductance is good index of dissolved solids and excessive presence of Sodium in water is not only unsafe for irrigation but also makes soil uncultivable.

Table 1: Salinity Classification of Irrigation Water Based on SAR

Water Class	SAR
Excellent	10
Good	10 – 18
Fair	18 – 26
Poor	26

Table 2: Quality of Drinking and Irrigation Water Based on VICOX (1955)

Water Class	Sodium Percent (SP)	Electrical Conductance µmhos/cm
Excellent	20	250
Good	20 – 40	250 – 750
Permissible	40 – 60	750 – 2000
Doubtful	60 – 80	2000 – 3000
Unsuitable	80	3000

Name of Faculty: Dr. D. S. Saluja

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A STUDY OF POLLUTION STATUS OF MACHNA RIVER WATER IN MADHYA PRADESH

D. S. Saluja

(Received : Sept 4, 2018 ; Revised : Nov. 12, 2018)

ABSTRACT : In the present study, an attempt has been made to evaluate the water quality of "Machna River" flowing through Betul city (M.P.) for a period of 06 months to assess the suitability of water for irrigation and drinking purposes. The parameters observed for this present study were Sodium Absorption Ratio (SAR), Electrical Conductance (EC) and Sodium Percent (SP). Present observations confirm that the water quality of Machna River water is suitable for irrigation and drinking purposes.

KEYWORDS: Machna River, Water Quality, Irrigation, Sodium Absorption Ratio, Electric Conductance, Sodium Percent, Salinity.

1. INTRODUCTION

An attempt has been made in the present study to evaluate the the quality of "Machna River" water of Betul city (M.P.) with respect to its suitability for irrigation and drinking purposes. Betul, one of the districts of Madhya Pradesh is situated nearly 190 kms. South-west of capital city Bhopal. The need of water for irrigation, industrial and other purposes is not only fulfill from Machna River water but also the life-line of drinking water need of the most part of Betul city. The river originates from village Barsali and ultimately confluence with river Tawa and finally joins the river Narmada.

MATERIAL AND METHODS

Water quality assessment was made during 06 months from Jan. 2018 to Aug. 2018. The samples were collected from different points to cover the complete area of river water flow. The analysis of water samples were performed employing standard methods for examination of water and waste water (APHA 1992) and evaluated for its suitability for irrigation and drinking uses with reference to Sodium Absorption Ratio (SAR), Electrical Conductance (EC) and Sodium Percent (SP).