



UNION CHRISTIAN COLLEGE ALUVA-2



Criterion 3

SSR 5th CYCLE 2023

3.3.1: Research papers published in 2021

Fabrication and Characterization of Type-II Heterostructure $n:\text{In}_2\text{O}_3/p:\text{In-TiO}_2$ for Enhanced Photocatalytic Activity

Sinitha B. Nair, K. Aijo John, Julie Ann Joseph, Shinto Babu, V. K. Shinoj, Stephen K. Remillard, Sadasivan Shaji, and Rachel Reena Philip*

The photodegradation rate of anatase TiO_2 is enhanced by about 11 times (from 0.0015 to 0.016 min^{-1}) by construction of a type-II p–n heterostructure of configuration $n:\text{In}_2\text{O}_3/p:\text{In-doped TiO}_2$. A simple and cost-effective two-stage electrochemical anodization is used for the fabrication of this comparatively stable and recyclable photocatalyst of vertically aligned indium-doped TiO_2 nanotubes with an overlayer of n-type In_2O_3 nanoparticles. The modified structural, morphological, compositional, optical, and electrical properties of the TiO_2 nanotubes are studied in detail by X-ray diffraction, X-ray photoelectron spectroscopy, Rutherford backscattering, field-emission scanning electron microscopy, reflectance measurements, and electrical conductivity measurements. The enhancement in device performance by the heterostructure is attributable to the tuning of optical bandgap to the visible energy region of solar spectrum, the effective electron–hole pair separation at the potential barrier, and the increase in surface-to-volume ratio and effective adsorption area of the photocatalyst by the structural modification with nanoparticles and the nanotube formation.

1. Introduction

Photocatalysis is an environment-friendly technology that uses solar energy for environmental cleansing through degradation of various organic pollutants.^[1,2] It is well known that the following criteria are to be satisfied for good photocatalytic applications: 1) a high surface-to-volume ratio that offers large adsorption area; 2) high light absorption efficiency to make use of the entire solar spectrum; and 3) effective separation of the photogenerated charge carriers to produce more active radicals for photodegradation.^[3] Among many semiconductor metal oxide photocatalysts, TiO_2 is widely investigated due to its excellent photochemical stability, low cost, and nontoxicity.^[4,5] However, the photocatalytic degradation activity of TiO_2 is low, due to its fast electron–hole recombination rate and poor absorption in the visible region of the solar spectrum.^[6,7] Investigations to circumvent the aforementioned limitations are being carried out by using different techniques such as surface modification, metal or nonmetal doping, codeposition of noble metals, and coupling of 1D nanostructures of TiO_2 with narrow bandgap semiconductors forming heterostructures.^[8,9] Of these the last method is found to be very effective to tune the bandgap and to improve the adsorption rate and the charge separation.^[10,11] Coupling of TiO_2 with narrower bandgap semiconductors such as CdS , CdSe , Cu_2O , CeO_2 , Bi_2VO_4 , PbS , and so on has been reported in the literature as a means to improve its photocatalytic efficiency.^[12–14] Chen et al.^[15] prepared p-type NiO/n -type TiO_2 structure which showed improved photoactivity with a degradation rate (0.348 h^{-1}) which is 4 times than the degradation rate (0.129 h^{-1}) of pure TiO_2 by wetness impregnation method. Dai et al.^[16] synthesized p–n junction bismuth iodide oxide (BiOI/TiO_2) nanotube (NT) arrays by coating BiOI on the tube wall of the self-organized TiO_2 NTs by the impregnating hydroxylation method and reported enhanced photocatalytic degradation rate (92% within 160 min) for methyl orange. A few studies on heterostructures based on nanoparticles and films of TiO_2 and In_2O_3 are also reported.^[17–19] However, the method used with the nanoparticle heterostructure preparation was time-consuming, including tedious separation/recycling processes such as centrifugation and/or filtration. This led to relatively high cost and photocatalysts loss, thus restraining their scalable

S. B. Nair, J. A. Joseph, S. Babu, Dr. V. K. Shinoj, Dr. R. R. Philip
Thin Film Research Lab
Union Christian College
Aluva, Kerala 683102, India
E-mail: reenatara@gmail.com

S. B. Nair
Department of Physics
Sree Sankara College
Kalady, Kerala 683574, India

Dr. K. A. John
Department of Physics
St. Albert's College (Autonomous)
Ernakulam, Kerala 682018, India

Dr. S. K. Remillard
Department of Physics
Hope College
Holland, MI 49423, USA

Dr. S. Shaji
Facultad de Ingenieria Mecanica y Electrica
Universidad Autonoma de Nuevo Leon
Av. Universidad s/n, Cd. Universitaria, San Nicolas de los Garza, Nuevo Leon 66455, Mexico

 The ORCID identification number(s) for the author(s) of this article can be found under <https://doi.org/10.1002/pssb.202000441>.

DOI: 10.1002/pssb.202000441

Article

Analysis of a k -Stage Bulk Service Queuing System with Accessible Batches for Service

Achyutha Krishnamoorthy ¹, Anu Nuthan Joshua ^{2,†} and Vladimir Vishnevsky ^{3,*}¹ Centre for Research in Mathematics, CMS College, Kottayam 686001, India; achyuthacusat@gmail.com² Department of Mathematics, Union Christian College, Aluva 683102, India; anunuthanjosua@gmail.com³ V. A. Trapeznikov Institute of Control Sciences of Russian Academy of Sciences, 65 Profsoyuznaya Street, 117997 Moscow, Russia

* Correspondence: vishn@inbox.ru

† Working for Doctoral degree at Department of Mathematics, Cochin University of Science and Technology, Cochin, Kerala 682022, India.

Abstract: In most of the service systems considered so far in queuing theory, no fresh customer is admitted to a batch undergoing service when the number in the batch is less than a threshold. However, a few researchers considered the case of customers accessing ongoing service batch, irrespective of how long service was provided to that batch. A queuing system with a different kind of accessibility that relates to a real situation is studied in the paper. Consider a single server queuing system in which the service process comprises of k stages. Customers can enter the system for service from a node at the beginning of any of these stages (provided the pre-determined maximum service batch size is not reached) but cannot leave the system after completion of service in any of the intermediate stages. The customer arrivals to the first node occur according to a Markovian Arrival Process (MAP). An infinite waiting room is provided at this node. At all other nodes, with finite waiting rooms (waiting capacity c_j , $2 \leq j \leq k$), customer arrivals occur according to distinct Poisson processes with rates λ_j , $2 \leq j \leq k$. The service is provided according to a general bulk service rule, i.e., the service process is initiated only if at least a customers are present in the queue at node 1 and the maximum service batch size is b . Customers can join for service from any of the subsequent nodes, provided the number undergoing service is less than b . The service time distribution in each phase is exponential with service rate μ_j^m , which depends on the service stage j , $1 \leq j \leq k$, and the size of the batch m , $a \leq m \leq b$. The behavior of the system in steady-state is analyzed and some important system characteristics are derived. A numerical example is presented to illustrate the applicability of the results obtained.



Citation: Krishnamoorthy, A.; Joshua, A.N.; Vishnevsky, V. Analysis of a k -Stage Bulk Service Queuing System with Accessible Batches for Service. *Mathematics* **2021**, *9*, 559. <https://doi.org/10.3390/math9050559>

Academic Editor: Manuel Alberto M. Ferreira

Received: 15 January 2021

Accepted: 2 March 2021

Published: 6 March 2021

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Keywords: queuing system; Markovian Arrival Process; accessible service batches; transport systems

1. Introduction

A detailed literature survey of bulk service queueing systems can be found in [1,2]. In most of the works, customer service is provided in batches of varying sizes with minimum batch size a and maximum batch size b —also called general bulk service (GBS) rule (introduced by Neuts [3]). In that paper, the author assumes that a minimum of a customers are required to start a service. This is referred to as the quorum. The maximum permissible batch size is set as b ($a < b$). Therefore, at a service completion epoch, if more than b customers are in the queue, the server takes the first b among those waiting for service and the remaining customers have to wait until their turn comes. If the number of customers waiting when the service of the current batch is completed is between a and b , both included, then all of them are taken together for service. On the other hand, if only less than a customers are waiting in the queue at the epoch of service completion, then the server stays idle or goes on a vacation. The motivation for this assumption is economic—that offering service with at least a customers in each service batch reduces

A $BMAP/BMSP/1$ QUEUE WITH MARKOV DEPENDENT ARRIVAL AND MARKOV DEPENDENT SERVICE BATCHES

ACHYUTHA KRISHNAMOORTHY

Centre for Research in Mathematics
C.M.S. College
Kottayam-686001, India

ANU NUTHAN JOSHUA

Department of Mathematics
Union Christian College
Aluva-683102, India

(Communicated by Bara Kim)

ABSTRACT. Batch arrival and batch service queueing systems are of importance in the context of telecommunication networks. None of the work reported so far consider the dependence of consecutive arrival and service batches. Batch Markovian Arrival Process ($BMAP$) and Batch Markovian Service Process ($BMSP$) take care of the dependence between successive inter-arrival and service times, respectively. However in real life situations dependence between consecutive arrival and service batch sizes also play an important role. This is to regulate the workload of the server in the context of service and to restrict the arrival batch size when the flow is from the same source. In this paper we study a queueing system with Markov dependent arrival and service batch sizes. The arrival and service batch sizes are assumed to be finite. Further, successive inter-arrival and service time durations are also assumed to be correlated. Specifically, we consider a $BMAP/BMSP/1$ queue with Markov dependent arrival and Markov dependent service batch sizes. The stability of the system is investigated. The steady state probability vectors of the system state and some important performance measures are computed. The Laplace-Stieltjes transform of waiting time and idle time of the server are obtained. Some numerical examples are provided.

1. Introduction. Batch arrival and batch service queueing systems have wide application in telecommunication networks. Most networks have a non stationary (bursty), self similar input flow wherein the inter-arrival times are highly correlated. Batch Markovian Arrival Process ($BMAP$) can accurately model such input flows. Also $BMAP$ form a generalization of Markovian processes and hence are analytically tractable. Like $BMAP$'s, to model those service processes in which the customers are served in batches of random size with service times exhibiting high degree of correlation, Batch Markovian Service Process ($BMSP$) is used. The existing literature on queueing systems is abundant with cases in which both the

2010 *Mathematics Subject Classification.* Primary: 58F15, 58F17; Secondary: 53C35.

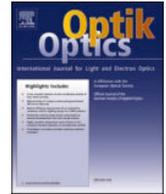
Key words and phrases. Queueing system, batch Markovian arrival process, batch Markovian service process, Markov dependent arrival/service batch sizes.

The first author is supported by UGC, Govt. of India, Emeritus Fellow (EMERITUS 2017-18 GEN 10822(SA-II)) and DST, Indo-Russian project: INT/RUS/RSF/P-15.



Contents lists available at ScienceDirect

Optik

journal homepage: www.elsevier.com/locate/ijleo

Original research article

Metal–semiconductor–metal visible photodetector based on Al-doped (Cd:Zn)S nano thin films by hydrothermal synthesis

Joissy Mathew^{a,b}, Sebin Devasia^{b,c}, Sadasivan Shaji^c, E.I. Anila^{b,d,*}^a St. Xavier's College for Women, Aluva 683101, Kerala, India^b Optoelectronics and Nanomaterial's Research Lab, Department of Physics, Union Christian College, Aluva, Ernakulam 683102, Kerala, India^c Facultad de Ingeniería Mecánica y Eléctrica, Universidad Autónoma de Nuevo León, San Nicolás de los Garza, Nuevo León, Mexico^d Department of Physics and Electronics, CHRIST (Deemed to be University), Bangaluru 560029, India

ARTICLE INFO

Keywords:

ACZS

Hydrothermal method

Photodetectors

Responsivity

Detectivity

Sensitivity

ABSTRACT

High quality undoped and Al-doped nanocrystalline (Cd:Zn)S films [CZS and ACZS] were deposited on glass substrates by hydrothermal assisted chemical bath deposition. The Al concentration was varied from 0.5 mol.% to 2 mol.% in steps of 0.5 mol.% replacing cadmium while keeping other deposition parameters constant. XRD, SEM, and EDX were used to observe crystallinity, morphology and composition of the as prepared samples. X-ray diffraction revealed the hexagonal phase of CZS films with prominent orientation along the (002) plane. XPS analysis was used to confirm the doping concentration of Al in to CZS lattice. Repeatable photoresponse was recorded under 100 s cycle light-on and light-off conditions. 1 mol.% Al doped film being optimised as good photoconductor; a photodetector was fabricated with Ag/ACZS/Ag device structure. The ACZS photodetector exhibits similar time response, good photocurrent reproducibility and a sharp photoresponse at blue radiation with high photo-dark current ratio of 95. The device exhibits peak responsivity of 3.48 mA W^{-1} and detectivity of 1.26×10^{11} Jones at 470 nm. These properties suggest that the ACZS photodetector holds great potential for application in high-performance visible photodetectors, especially in the blue region.

1. Introduction

II–VI binary semiconducting compounds like CdS, ZnS and their ternary alloy (Cd:Zn)S are very important materials due to their wide range of opto-electronic applications. These materials possess explicit physical properties such as direct bandgap, sensitivity in UV to NIR part of solar spectrum and good electrical properties like carrier mobility and life-time [1]. Photodetectors based on intrinsic CdS usually show response to the spectral region around 510 nm. Being a wide band-gap material ZnS has shown a fast response to UV light, indicating the higher potential of ZnS in UV-light detection. The UV and near infrared direct bandgaps of ZnS and CdS make them suitable candidates for the conversion of light energy into electricity. The ternary (Cd:Zn)S is a more promising material compared with binary compounds ZnS and CdS as their optical properties can be modified by tuning the particle size, constituent composition and morphology for optoelectronic applications in the UV to visible region of electromagnetic spectrum [2–4]. Further the charge transport of a photodetector can be modified through appropriate doping. The impurities added in semiconductor will change the

* Corresponding author at: Optoelectronics and Nanomaterial's Research Lab, Department of Physics, Union Christian College, Aluva, Ernakulam 683102, Kerala, India.

E-mail address: anila.ei@christuniversity.in (E.I. Anila).

<https://doi.org/10.1016/j.ijleo.2021.166878>

Received 10 September 2020; Received in revised form 17 March 2021; Accepted 30 March 2021

Available online 6 April 2021

0030-4026/© 2021 Elsevier GmbH. All rights reserved.



Highly luminescent ZnS:Mn quantum dots capped with aloe vera extract

K.R. Bindu^{a,d}, S. Ajeesh Kumar^b, M. Anilkumar^c, E.I. Anila^{d,e,*}

^a Sree Sankara Vidyapeetom College, Valayanchirangara, Kerala, 683556, India

^b School of Pure and Applied Physics, M G University, Kerala, 686560, India

^c Department of Botany, U C College, Aluva, Kerala, 683102, India

^d Optoelectronic and Nanomaterials' Research Laboratory, Department of Physics, Union Christian College, Aluva, Kerala, 683102, India

^e Department of Physics and Electronics, CHRIST (Deemed to be University) Bengaluru, 560029, India

ABSTRACT

This study demonstrates the optical properties of ZnS:Mn²⁺ quantum dots synthesized by simple and eco-friendly chemical precipitation method using aloe vera (AV) extract as the stabilizing agent. The nanoparticles have been characterized by transmission electron microscopy (TEM), Fourier transform infrared (FTIR) spectroscopy, diffuse reflectance spectroscopy (DRS), photoluminescence (PL) and time-resolved PL spectroscopy. Increase in band gap energy with decrease in particle size was observed from DRS studies due to quantum confinement effect. Dominant yellow emission was observed from characteristic ⁴T₁→⁶A₁ transitions of the Mn²⁺ ions in the ZnS:Mn/AV nanoparticles. The results provide insight to the quantum confinement effect that occur and how it affect decay life time of the ZnS:Mn²⁺/AV nanoparticles.

1. Introduction

Among the nanoscale materials, ZnS is a wide band gap II-VI semiconductor (3.68 eV) with remarkable optical properties. Special attention is given to transition metal ion doped ZnS nanoparticles which find its applications in LEDs and lasers owing to their optoelectronic properties [1–6]. Among the transition metals, Mn has attracted much attention because of its luminescence intensity, biocompatibility, and bioimaging capability [6–8]. Our previous work focused on luminescence properties of white light emitting ZnS:Mn nanocrystals prepared without any capping agent [9]. Because of less size controllability and particle agglomeration various chemical based capping agents, complexing agents, etc. were used in the synthesis of ZnS:Mn nanocrystals with controllable size distribution and less aggregation [10–13]. The capping agents provide surface passivation and thus minimize the electronic trapping capabilities of surface defects, resulting in higher photoluminescence intensity [14,15]. Since these chemicals are highly toxic, synthesized nanoparticles are not useful in medical or biological applications. The synthesis and optical characterization of water dispersible, ZnS:Mn nanocrystals capped with L-Valine, L-Cysteine, histidine, arginine, methionine and chitosan have already been reported earlier [16–19]. Various bioactive components of aloe vera have effective antibacterial, anti-inflammatory, antioxidant, and immunomodulatory effects that promote both tissue regeneration and growth. Therefore in this work we used aloe vera as the capping agent to reduce

cytotoxicity problems of ZnS:Mn nanocrystals, a major limitation in biomedical application. T. Muralikrishna et al. used aloe vera to cap the gold nanoparticles [20]. The biomolecules present in the plant extracts stabilizes the growth of nanoparticles, thus leads to the decrease of surface energy and prevent them from further aggregation [21,22]. Methanol extract of aloe vera gel consists of coumarins, alkaloids, tannins, steroids, quinines, anthraquinones, phenols, resin, glycoside and carbohydrate as analysed by phytochemical screening and it provides surface passivation of ZnS:Mn nanoparticles prepared by chemical precipitation method. We have reported the biocompatibility and antibacterial property of these ZnS:Mn/AV quantum dots [23]. The observed pure yellow emission of aloe vera capped ZnS:Mn (ZnS:Mn/AV) finds potential applications in the advance of luminescence devices. Besides, the measurement of fluorescence decay time is an important parameter to realize the influence of host on energy levels of dopants and mechanism of energy transfer. It was reported [24–26] that the lifetime of yellow emission of Mn²⁺ in ZnS:Mn²⁺ nanoparticles is of the order of milliseconds. The shortening of lifetime of ZnS:Mn nanocrystals from milliseconds to nanoseconds based on quantum confinement induced ligand-TM hybridisation theory is also reported [27]. In this work we have measured life time for the yellow emission of Mn²⁺ in ms and ns range. We report the optical properties of aloe vera capped biocompatible ZnS:Mn quantum dots (ZnS:Mn/AV) with controlled size and enhanced luminescence for possible use as nanoscale fluorescent probes in pharmaceutical and biomedical field.

* Corresponding author. Optoelectronic and Nanomaterials' Research Laboratory, Department of Physics, Union Christian College, Aluva, Kerala, 683102, India.
E-mail address: anilaei@gmail.com (E.I. Anila).

Article

Analysis of a Batch Arrival, Batch Service Queuing-Inventory System with Processing of Inventory While on Vacation

Achyutha Krishnamoorthy ¹, Anu Nuthan Joshua ^{2,t} and Dmitry Kozyrev ^{3,4,*}

- ¹ Centre for Research in Mathematics, C.M.S. College, Kottayam 686001, India; achyuthacusat@gmail.com
² Department of Mathematics, Union Christian College, Aluva 683102, India; anunuthanjosua@gmail.com
³ Applied Probability and Informatics Department, Peoples' Friendship University of Russia (RUDN University), 6 Miklukho-Maklaya St, 117198 Moscow, Russia
⁴ V.A. Trapeznikov Institute of Control Sciences of Russian Academy of Sciences, 65 Profsoyuznaya Street, 117997 Moscow, Russia
* Correspondence: kozyrev-dv@rudn.ru
† Working for Doctoral Degree at Department of Mathematics, Cochin University of Science and Technology, Cochin-22.

Abstract: A single-server queuing-inventory system in which arrivals are governed by a batch Markovian arrival process and successive arrival batch sizes form a finite first-order Markov chain is considered in this paper. Service is provided in batches according to a batch Markovian service process, with consecutive service batch sizes forming a finite first-order Markov chain. A service starts for the next batch on completion of the current service, provided that inventory is available at that epoch; otherwise, there will be a delay in starting the next service. When the service of a batch is completed, the inventory decreases by 1 unit, irrespective of batch size. A control policy in which the server goes on vacation when a service process is frozen until a quorum can initiate the next batch service is proposed to ensure idle-time utilization. During the vacation, the server produces inventory (items) for future services until it hits a specified level L or until the number of customers in the system reaches a maximum service batch size N , with whichever occurring first. In the former case, a server stays idle once the processed inventory level reaches L until the number of customers reaches (or even exceeds because of batch arrival) a maximum service batch size N . The time required for processing one unit of inventory follows a phase-type distribution. In this paper, the steady-state probability vector of this infinite system is computed. The distributions of inventory processing time in a vacation cycle, idle time in a vacation cycle, and vacation cycle length are found. The effect of correlation in successive inter-arrival times and service times on performance measures for such a queuing system is illustrated with a numerical example. An optimization problem is considered. The proposed system is then compared with a queuing-inventory system without the Markov-dependent assumption on successive arrivals as well as service batch sizes using numerical examples.

Keywords: queuing-inventory system; batch Markovian arrival process; batch Markovian service process; Markov-dependent arrival and service batches; vacation; N -policy



Citation: Krishnamoorthy, A.; Joshua, A.N.; Kozyrev, D. Analysis of a Batch Arrival, Batch Service Queuing-Inventory System with Processing of Inventory While on Vacation. *Mathematics* **2021**, *9*, 419. <https://doi.org/10.3390/math9040419>

Academic Editor: Elvira Di Nardo

Received: 15 December 2020

Accepted: 31 January 2021

Published: 20 February 2021

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Bulk arrival and bulk service queues have been extensively analyzed in the literature (for example, see Chaudhry and Templeton [1] for an in-depth study on bulk queues). The earliest work considered arrival and service processes to be mutually independent. Furthermore, inter-arrival times and successive service times were assumed to be independent. The next stage of development had a relaxed assumption of independence between successive inter-arrival times and/or successive service times. One such extension is the Markovian arrival process (MAP) or Markovian service process (MSP) (single or multi-server queues), in which successive inter-arrival times or successive service times are correlated through the respective semi-Markov processes. Its extension to the batch Markovian arrival



Bayesian Estimation of Time To Test Transform for The Lomax Distribution Using Censored Sample under Different Loss Functions

Sowbhagya S Prabhu^a and E. S. Jeevanand^b

^a Department of Statistics, Nirmala College, Muvatupuzha, India ^b Department of Mathematics, Union Christian College, Aluva, India

ARTICLE HISTORY

Compiled June 20, 2021

Received 07 February 2021; Accepted 14 June 2021

ABSTRACT

The concept of Time To Test Transform (TTT) is well known for its applications in different fields of study such as reliability analysis, econometrics, stochastic modeling and ordering distributions. In this article, we estimate the TTT for the Lomax function based on censored sample. The Bayes estimates are evaluated under squared error, entropy, precautionary loss functions. The empirical evaluation of the estimates is done using a simulation study.

KEYWORDS

Time To Test Transform; Censored sampling; Entropy loss function; Lomax distribution; Precautionary loss function; Prior distribution; Squared error loss function.

1. Introduction

In reliability and life testing, the important determinants are testing time and cost of sample units. To achieve reduction in testing time and cost of sample units, different censored sampling procedures are suggested. In the statistical literature, many researchers have concentrated on providing estimators of different parameters and parametric functions useful in reliability studies using different life distributions and under various censored sampling schemes. In general, censored sampling mechanism is to observe the complete life time of few experimental units out of n units.

The TTT-plot an empirical and scale invariant plot based on failure data, and the corresponding asymptotic curve, named the scaled TTT-Transform were introduced by [1] and used for model identification purposes. Since then these tools have proven to be very useful in several applications in reliability. The applications of this transform in econometrics and its close relationship with the Lorenz curve have been studied by many authors including [3], [4], [6], [5], among others.

Let $F(x)$ denote the life distribution of a certain type of units, i.e. $F(t)$ is the

International Journal of Statistics and Applied Mathematics

ISSN: 2456-1452
 Maths 2021; 6(1): 153-156
 © 2021 Stats & Maths
www.mathsjournal.com
 Received: 30-10-2020
 Accepted: 28-12-2020

Sowbhagya S Prabhu
 Department of Statistics,
 Nirmala College, Muvattupuzha,
 Kerala, India

Dr. ES Jeevanand
 Department of Mathematics,
 Union Christian College, Aluva,
 Kerala, India

Quasi-Bayesian estimation of time to test transform under asymmetric loss functions

Sowbhagya S Prabhu and Dr. ES Jeevanand

Abstract

In the present paper, Quasi-Bayesian estimation of Total Time on Test transform (TTT) for the Lomax distribution. A two parametric Lomax distribution is considered for the analysis. Estimators are obtained by using extension of Jeffrey's prior and Gamma prior under Entropy loss function and Precautionary loss function. Both the classical and Bayes estimators have been developed.

Keywords: entropy loss function, informative and non-informative priors, Lomax distribution, precautionary loss function, Quasi-Bayesian estimation, total time on test transform

1. Introduction

In the 1970s the total time on test plot, and its theoretical counterpart, the scaled TTT transform, was presented by R. E. Barlow *et al.* as a tool for model identification based on data representing lives of non-repairable equipment. Later, Klefsjo (1982) [4] presented some relationship between the TTT transform and other ageing properties (with their duals) of random variable. Chacko *et al.* (2010) [2] discussed use of TTT transform in identifying failure rate model of semi-Markov reliability system. Total Time on Test transform plots are ALSO useful for analyzing non-negative data. The plots help in choosing a mathematical model for the data and provide information about failure rate. Also incomplete data can be analyzed and there is a theoretical basis for such an analysis. The TTT-Transform has also been found quite useful in theoretical applications such as looking for test statistics for particular purposes and to study their power. Kochar *et al.* (2002) [5] defined TTT transform order and Shaked and Shanthikumar (2007) [8] studied it explicitly. Nair *et al.* (2008) [6] provided applications of TTT of order n in reliability analysis. The scaled total time on test (TTT) transform of F is defined as

$$\Phi(t) = \frac{1}{\mu} \int_0^{F^{-1}(t)} \bar{F}(x) dx \text{ for } 0 \leq t \leq 1 \quad (1.1)$$

$$\bar{F} = 1 - F, \quad \mu = \int_0^{\infty} \bar{F}(x) dx \text{ and } F^{-1}(y) = \inf\{x: F(x) \geq y\} \text{ for } 0 \leq y \leq 1$$

The main common types of Pareto distribution are known as Pareto Type I, II, III, IV, and Feller Pareto distributions. One of the popular hierarchies of Pareto distribution is Pareto Type II which has been named as Lomax distribution. Lomax distribution is an advantageous lifetime distribution in reliability analysis. The applicability of the Lomax distribution is not restricted only to reliability field, but it has broad application in the field of economics, actuarial statistics, queuing problems, biological sciences, etc. Lomax distribution has been applied in a variety of fields such as engineering and reliability and life testing. Lomax distribution has been used as an alternative to the exponential, gamma and Weibull distributions for heavy tailed data by Bryson (1974) [1]. Golaup *et al.* (2005) [3] introduced the size distribution of computer files on servers using Lomax distribution. Nasiri and Hosseini (2012) [7] also studied Lomax distribution regarding the MLE and various Bayesian estimation

Corresponding Author:
Sowbhagya S Prabhu
 Department of Statistics,
 Nirmala College, Muvattupuzha,
 Kerala, India

International Journal of Statistics and Applied Mathematics

ISSN: 2456-1452
 Maths 2021; 6(6): 01-05
 © 2021 Stats & Maths
www.mathsjournal.com
 Received: 16-07-2021
 Accepted: 02-10-2021

Athira NR
 Department of Statistics,
 Nirmala College, Muvattupuzha,
 Kerala, India

ES Jeevanand
 Department of Mathematics
 Union Christian College, Aluva,
 India

Estimation of the residual entropy function of the Finite range distribution using record values

Athira NR and ES Jeevanand

Abstract

Residual entropy has a very significant role in reliability and survival analysis. It is one of the modified form of the Shannon entropy function used to study the uncertainties associated to a non- negative random variable. In this paper, we focus on the Bayesian estimation of the residual entropy function of the Finite range distribution based on record breaking data. The performance of the estimator is evaluated using simulated data sets.

Keywords: Bayes estimation, finite range distribution, record values, residual entropy

Introduction

Entropy, is appropriately associated with lack of information, uncertainty and indefiniteness as one of the most appropriate measure of this probability. Shannon (1948) ^[5] was the first to introduce entropy, known as Shannon's entropy or Shannon's information measure, into information theory. In the context of information theory, Shannon's entropy plays an important role. Since this entropy is not applicable to a system that has survived for some unit of time, the concept of residual entropy has been developed in Statistics literature. In the reliability context, if X is a random variable representing the life time of a component or a device, a characteristic of special interest in the residual life distribution which is the distribution of the random variable $(X - t)$ truncated at $t (\geq 0)$. A comparison of the residual life distribution and the parent distribution as well as characterization of distributions based on the form of the residual lifetime distributions has received a lot of interest among researchers. The works of Gupta and Gupta (1983), Gupta and Kirmani (1990), Sankaran (1992) focuses attention on this aspect.

Ebrahimi and Pellerey (1995) ^[6] and Ebrahimi and Kirmani (1996) ^[7] have used the Shannon's entropy applied to the residual life as a measure of stability of a component. They pointed out that, the measure H does not take into account any information one may have about the current age of the system. Thus, if a unit of life length X is known to have survived to age t , it is the residual entropy of X_t (the remaining lifetime of the system of age $t \geq 0$), rather than that of X , which is relevant. The residual entropy function can advantageously use as a tool at the stage of design and planning in reliability engineering.

For a non-negative random variable X , Ebrahimi (1996) ^[7] defines the residual entropy function as the Shannon's entropy associated with the random variable $(X - t)$ truncated at $t (\geq 0)$, namely

$$H(f, t) = - \int_{x=t}^{\infty} \frac{f(x)}{\bar{F}(t)} \ln \frac{f(x)}{\bar{F}(t)} dx, \quad \bar{F}(t) \geq 0 \quad (1.1)$$

Corresponding Author:
Athira NR
 Department of Statistics,
 Nirmala College, Muvattupuzha,
 Kerala, India



ON RESIDUAL ENTROPY FUNCTION OF FINITE RANGE DISTRIBUTION WITH TYPE II CENSORING

N. R. Athira* and E. S. Jeevanand

Department of Statistics
Nirmala College
Muvatupuzha - 686661, India
e-mail: aathira31@gmail.com

Department of Mathematics
Union Christian College
Aluva 683102, India
e-mail: radhajeewanand@gmail.com

Abstract

The finite range distribution is one of the well-established probability distributions used by many of the researchers for the purpose of reliability and Bayesian analysis. This paper presents the Bayesian estimation of the residual entropy function of the finite range distribution using type II censored data. Residual entropy, the modified form of Shannon entropy has a very significant role in the reliability analysis. It gives the motive for the major focus of this paper to estimate the residual entropy and cumulative residual entropy of the type II censored finite range distribution model using Bayesian analysis. In our study, we use different symmetric and asymmetric loss

Received: December 31, 2020; Accepted: January 11, 2021

2020 Mathematics Subject Classification: 62F15, 62F10, 54C70.

Keywords and phrases: residual entropy, cumulative residual entropy, loss functions, Bayesian analysis, type II censoring.

*Corresponding author

BAYESIAN ANALYSIS OF RESIDUAL ENTROPY FUNCTION OF FINITE RANGE DISTRIBUTION UNDER DIFFERENT PRIORS

ATHIRA .N.R

Department of Statistics, Nirmala College, Muvatupuzha- 686661, India

And

E.S. JEEVANAND

Department of Mathematics

Union Christian College, Aluva 683102, India

Abstract

In this paper we discuss the problem of residual entropy function of the finite range distribution under various priors. The maximum likelihood estimate is also find out for the purpose of comparison. The performances of the estimators are analyzed using simulated study.

Keywords: Finite Range Distribution, Residual entropy, Bayes estimators, Prior Distributions

1. Introduction

Bayesian methods of estimation incorporate wide range of information about the parameters in the process of estimation and various uncertainties in the parameters due to the lack of knowledge and are expressed via probability distributions. This upgrades the Bayesian

BAYESIAN ESTIMATION OF STRESS STRENGTH RELIABILITY $P[X > Y]$ OF LOMAX AND EXPONENTIAL DISTRIBUTION

NEETHU JACOB¹ AND .E.S. JEEVANAND²

¹Department of Statistics, Nirmala College, Muvattupuzha, India

²Department of Mathematics, Union Christian College, Aluva, India

Abstract

The stress strength reliability are applied in different fields such as Quality Control, Engineering Statistics, Medical Statistics and Bio Statistics. The main concept of this article is to study the estimation of stress strength reliability $R=P[X>Y]$ when X and Y are independent random variables follows Lomax and Exponential Distribution. The main aim of this paper is to estimate the Maximum Likelihood and Bayesian estimate of stress strength reliability of Lomax and Exponential Distribution for complete sample. We illustrate the performance of the estimator by simulation study.

Keywords:-Lomax Distribution, Exponential Distribution, Maximum Likelihood Estimation, Bayesian Estimation, Squared Error Loss function, Linex Loss Function.

Author for Correspondence E mail: neethujacob3986@gmail.com

1 Introduction

The stress strength model plays an important role in reliability analysis. The term stress strength was first introduced by Church and Harris (1970). In the context of reliability R is defined as the probability that the unit strength is greater than stress, that is $R= P[X>Y]$ where X is the random strength of the unit and Y is the instant stress applied on it. Moreover R provides the probability of system failure.

The stress strength model was discussed in literature from different point of views. The Maximum Likelihood Estimates (MLE) of $R=P[X>Y]$ when X & Y are normally distributed was considered by Govidarajulu (1967), Down town (1973), Wood ward and Kelly (1977) and Owen .et.al (1977). The estimation of $P[X>Y]$ was studied by Ahmad. et.al (1997) and Surles and Padgett (1998) when



ESTIMATION OF TIME TO TEST TRANSFORM FOR LOMAX DISTRIBUTION

Sowbhagya S. Prabhu and E. S. Jeevanand

Department of Statistics
Nirmala College
Muvatupuzha, India
e-mail: sowbhagyasprabhu@gmail.com

Department of Mathematics
Union Christian College
Aluva, India
e-mail: radhajeewanand@gmail.com

Abstract

This paper deals with the estimation of total time on test (TTT) for two parameter Lomax distribution. Both the maximum likelihood estimator and the Bayesian estimator of TTT are obtained. The performance of each of the estimators obtained is evaluated using Monte Carlo simulations method.

1. Introduction

The total time on test (TTT) plot is a concept introduced in the second half of the last century, developed and popularized in the seventies, especially by Barlow and Campo [1]. Since then, it has been a subject of

Received: December 2, 2020; Accepted: January 5, 2021

2020 Mathematics Subject Classification: 60E10, 60E99.

Keywords and phrases: asymptotic distributions, Bayes estimator, generalized Pareto distribution, Lomax distribution, maximum likelihood estimator, TTT.

α -Fe₂O₃/ZnO heterostructure for enhanced photocatalytic and antibacterial activity

Julie Ann Joseph¹, Sinitha B Nair^{1,2}, Sareen Sarah John³, Sadasivan Shaji⁴ 
and Rachel Reena Philip^{1,*} 

¹ Thin Film Research Lab, Department of Physics, Union Christian College, Aluva 683102 Kerala, India

² Department of Physics, Sree Sankara College, Kalady 683574 Kerala, India

³ Department of Biosciences, Union Christian College, Aluva 683102 Kerala, India

⁴ Facultad de Ingenieria Mecanica y Electrica, Universidad Autonoma de Nuevo Leon, Av. Universidad s/n, Cd. Universitaria, San Nicolas de los Garza 66455 Nuevo Leon, Mexico

E-mail: reenatara@gmail.com

Received 2 March 2021, revised 18 May 2021

Accepted for publication 3 June 2021

Published 27 July 2021



Abstract

This paper reports the accomplishment of a noticeable enhancement in the photodegradation and antibacterial activity of α -Fe₂O₃ by a heterostructure formation between α -Fe₂O₃ and ZnO flakes. The heterostructure yields 97% photodegradation of methylene blue pollutant in water within 180 min, which is a fourfold increase compared to that observed with a pure α -Fe₂O₃ nanostructure. Further characterisations indicate that the improved results are attributable to the reduction in optical band gap, the increased electrical conductivity, the improved spatial separation of carriers and the enhanced amount of available hydroxyl radicals for the reaction. The stability and reusability of the photocatalysts are confirmed for four consecutive cycles of operations. The phase identification and structural studies are done using x-ray diffraction, transmission electron microscopy and x-ray photoelectron spectroscopy in conjunction with surface morphology from field emission scanning electron microscopy. The enhancement of room temperature electrical conductivity by five times and band gap reduction from 1.98 eV to 1.75 eV for the heterostructures, when compared with α -Fe₂O₃ nanostructures, are obtained from voltage–current measurements and optical reflectance spectra.

Keywords: iron oxide, anodisation, heterostructure, photocatalysis, antibacterial

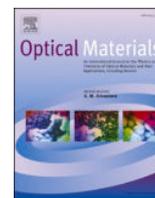
(Some figures may appear in colour only in the online journal)

1. Introduction

Rapid growth of population and industrialisation have led to widespread and acute contamination of air, soil and water bodies, which poses a serious threat to life on earth. The textile and agricultural industries dispose of heavy metals, organic and inorganic compounds, dyes and pesticides into water bodies. These are toxic and carcinogenic [1, 2]. This has aroused general concern, especially in the face of devastating

pandemics and environmentalists, scientists, industrialists and other individuals are aware of the need for concerted attempts to combat pollution for the continued sustenance of nature and life. A few existing methods for wastewater treatment are precipitation, electrolysis, reverse osmosis, ion exchange, coagulation, Fenton's reagent oxidation and photocatalysis [2, 3]. Among these methods, photocatalysis has proven to be an environmentally friendly, cost-effective and efficient technique to remove contaminants from water [4]. The photocatalysts of wide research interest are TiO₂, ZnO, WO₃, ZrO₂, CdS and ZnS [5–7]. Many studies are being done to improve the catalysis efficiency of these catalysts by

* Author to whom any correspondence should be addressed.



Research Article

Tailoring the properties of tin dioxide thin films by spray pyrolysis technique

Ebitha Eqbal^{a,b}, E.I. Anila^{b,c,*}^a Department of Basic Sciences and Humanities, KMEA Engineering College, Edathala, Aluva, 683561, Kerala, India^b Optoelectronic and Nanomaterials' Research Laboratory, Department of Physics, Union Christian College, Aluva, 683102, Kerala, India^c Department of Physics and Electronics, CHRIST (Deemed to Be University), Bengaluru, 560029, India

ARTICLE INFO

Keywords:

Tin dioxide
Photoluminescence
Texture coefficient
Dislocation density
Grain size

ABSTRACT

Nanostructured transparent conducting SnO₂ thin films have been grown on glass substrates via an environmentally benign chemical route viz spray pyrolysis. All samples were grown for various concentrations of precursor solution with the substrate kept at 350 °C maintaining a spray rate of 10 mL/min. The characterizations revealed orthorhombic crystal structure with preferential growth in (112) plane for all samples. Ellipsometric analysis confirmed the good quality of the films. The sample prepared at 0.2 M concentration of precursor solution showed average transmission of 60% in the visible region with maximum conductivity of 24.86 S/cm. As synthesized samples exhibited overall Photoluminescence (PL) emission colours of green, greenish white and bluish white depending on the intensities of excitonic and oxygen vacancy defect level emissions.

1. Introduction

Tin dioxide (SnO₂) is an n-type semiconducting material with tetragonal rutile structure having a wide band gap of 3.6–4.0 eV [1,2]. The studies on the transparent conducting oxide thin films are significant in the world of semiconducting materials. The vital features of SnO₂ nanostructured thin films include its nontoxicity, high optical transmittance, better electrical conductivity, good piezoelectric behaviour, consistency, stable to heat and not the least its low cost [3–5]. SnO₂ has wide variety of applications in gas sensor devices [6], transistors [7], solar cells [8], optoelectronic devices [9] etc. Literature survey shows that tin oxide thin films could be synthesized by various chemical and physical techniques such as sol-gel method [10], chemical bath deposition [11], spin coating [12], electron beam evaporation [13], PLD [14], sputtering [15], spray pyrolysis [16] etc.

In the present work, SnO₂ thin films are deposited for different molarities of precursor solution via an environmentally benign chemical route viz spray pyrolysis and tailored their structural, optical and electrical properties.

2. Experimental

The AR grade tin chloride dihydrate (SnCl₂·2H₂O) was liquified in

distilled water to get 0.05 M, 0.15 M, 0.2 M and 0.3 M concentration of precursor solutions. For removing any precipitate in solution, few drops of concentrated hydrochloric acid was added. Then the mixture was vigorously stirred at 60 °C for about 1 h. Pre cleaned and ultrasonically cleaned substrates were placed on the substrate holder of the spray equipment and sufficient heating was given to obtain even films. The spray parameters were optimised as 350 °C, 10 mL/min, 0.2 kg/cm² and 15 cm for substrate temperature, spray rate, carrier gas pressure and source substrate distance respectively.

The glass slides were taken immediately after the spray process and allowed to cool to room temperature. This resulted in the formation of uniform, well adherent and transparent SnO₂ thin films.

Structural parameters like average grain size, dislocation density, lattice strain, crystallite size etc. have been analysed using the X-ray diffraction plots (XRD) recorded on a Rigaku D-Max Geigerflex X-ray diffractometer using Cu-K_α radiation source of wavelength 1.5418 Å for 2θ values from 20° to 80° at room temperature. The surface morphology of the as grown films was studied using JEOL JSM 7600F field emission scanning electron microscope. The thickness of the films was measured by Ellipsometry technique using Woollan USA.

The optical characterization of SnO₂ thin film samples were carried out by using Shimadzu UV–Vis spectrophotometer UV 1800. PL characterizations of the samples were done using Fluoromax-4

* Corresponding author. Optoelectronic and Nanomaterials' Research Laboratory, Department of Physics, Union Christian College, Aluva, 683102, Kerala, India.
E-mail address: anila.ei@christuniversity.in (E.I. Anila).



Anti-inflammatory, antioxidant, and dye removal properties of mucilage isolated from *Litsea quinqueflora* (Dennst.) Suresh

Sumin Mary Jose¹ · M. Anilkumar¹

Received: 28 February 2021 / Accepted: 11 August 2021
© Institute of Chemistry, Slovak Academy of Sciences 2021

Abstract

We isolated leaf mucilage from *Litsea quinqueflora* (Dennst.) Suresh, a plant that belongs to the Lauraceae family. Leaves of *L. quinqueflora* are medicinally important as the traditional healers of Kerala use it in different inflammatory conditions. Various analytical methods such as Fourier transform infra-red analysis, Powder X-ray diffraction pattern, scanning electron microscopy, thermogravimetry analysis, and differential scanning calorimetry were done to characterize the leaf mucilage of *Litsea* (LML). The results revealed the thermal stability, amorphous nature, aggregate structure, and polysaccharide nature of LML. The evaluation of antioxidant property of LML revealed significant activity against free radicals such as DPPH and ABTS with $P \leq 0.001$. LML is exhibiting an IC 50 value 97.8 $\mu\text{g/ml}$ by inhibiting protein denaturation and thus revealed significant anti-inflammatory potential with $P \leq 0.01$. The dye adsorption capacity of LML in aqueous media against malachite green and methylene blue showed its role in phytoremediation.

Keywords Antioxidant · Anti-inflammatory · Dye adsorption · *Litsea* · Mucilage

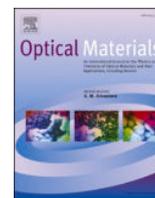
Introduction

Natural polymers drew the attention of the scientific community because of their multifaceted use, especially in medicine and food. The detailed structural and functional study of polymers became the need of the hour owing to its applications as oral drugs in pharmaceuticals. Polymers of plant origin are more acceptable than artificial polymers because of their reduced toxicity, biodegradable nature, easy availability, and lesser production cost (Ngwuluka et al. 2014, 2012). Natural polymers have been used as efficient vehicles for drug delivery systems (Sung and Kim 2020). They comprise mainly gums and mucilage in which they secrete the former outside the plant system and the latter remains inside. Gums are hydrocolloids that are easily soluble in water, whereas mucilage is a product of plant metabolism, less soluble in water and forms swelled or slimy masses (Farook et al. 2013). We can use natural polymers as tablet binders, emulsifiers, suspending agents, gelling agents, and thickening agents in pharmaceutical industry (Prajapati et al. 2013).

Plants belonging to the family Lauraceae are excellent sources of mucilage (Morton 1990). The presence of mucilage in the anatomical sections of foliar regions of Lauraceae plants was reported earlier (Singh et al. 2015). A good deal of mucilage and gum-yielding plants remained as traditional sources of medicines without proper utilization. In this study, *Litsea quinqueflora* (Dennst.) Suresh, of the family Lauraceae, has been selected for the isolation and characterization of mucilage and also to evaluate its anti-inflammatory, antioxidant, and dye adsorption properties. *L. quinqueflora* is an ethnomedicinally important plant used by the traditional healers of Kerala, and the antioxidant and anti-inflammatory activity of the leaf extract was reported (Jose and Anilkumar 2018; Anilkumar and Johny 2015). Mucilage is an unavoidable content of leaf paste and an immiscible part of leaf extracts of *L. quinqueflora*. We have traditionally used different species of *Litsea* as a remedy for many ailments owing to their diverse properties such as antioxidant, anti-inflammatory, antibacterial, antifungal, anti-cancer, anti-diabetic, and cytotoxicity (Kamle et al. 2019). The mucilage got from *L. glutinosa* has been used as a poultice in different inflammatory conditions, especially for skin diseases, and possesses tablet binding properties (Mishra et al. 2010). The significance of mucilage in pharmaceutical industries as a diluent, binder, and dis-integrant in tablets,

✉ M. Anilkumar
drmakumar@gmail.com

¹ Department of Botany, Union Christian College Aluva, Ernakulam, Kerala 683 102, India



Research Article

P type copper doped tin oxide thin films and p-n homojunction diodes based on them

Ebitha Eqbal^{a,b}, E.I. Anila^{a,c,*}^a Optoelectronic and Nanomaterials' Research Laboratory, Department of Physics, Union Christian College, Aluva, 683102, Kerala, India^b Department of Basic Sciences and Humanities, KMEA Engineering College, Aluva-683561, India^c Department of Physics and Electronics CHRIST (Deemed to be University), Bengaluru, 560029, India

ARTICLE INFO

Keywords:

Spray pyrolysis

Orthorhombic

p-n junction

B M effect

Band gap narrowing

ABSTRACT

P-type copper doped tin oxide (SnO₂:Cu) thin films were prepared by chemical spray pyrolysis method on glass substrates for different doping concentrations. Their structural, optical, surface morphological, elemental and electrical studies were investigated. We fabricated two transparent homojunction diodes using optimized sample of SnO₂:Cu which are p-SnO₂:Cu/n-SnO₂ and p-SnO₂:Cu/n-SnO₂:F. These diodes are reported for the first time by this method.

1. Introduction

There is an extensive variety of transparent conducting oxides (TCOs) obtainable for wide applications in optoelectronic devices [1]. Distinctive commercially active TCOs are greatly n-type doped wide bandgap oxide materials such as indium tin oxide (ITO), doped zinc oxide (ZnO:Al, ZnO:Ga, ZnO:In), fluorine doped tin oxide (FTO) etc. Due to their commercial success, wide research is being undertaken to find viable hole conducting counterparts (p-type TCOs). There are several reasons for the deficiency of p-type TCOs. In order to achieve p-type conductivity, a material with a relatively low work function is required. The metal oxide systems such as tin oxide are characterized by relatively large work functions due to the nature of the metal – oxygen bond. The size differences in cation (anion) dopant with respect to those comprising the base material is another reason. The robust localization of O 2p states that form the upper edge of the valence band also cause trouble in producing p-type TCO's. Oxides showing p-type conductivity have been found in delafossite crystal structure family [2,3], corundum-type oxides [4] etc. Apart from discovering new p-type transparent conductors, there is a parallel effort to transform the usual n-type oxides such as ZnO and SnO₂ to p-type compounds in order to obtain p-type TCOs for application in the field of optoelectronic device technology.

Tin oxide (SnO₂) is a transparent semiconductor with a direct optical band gap of about 3.6–4 eV [5]. The undoped SnO₂ is an n-type semiconductor due to the presence of intrinsic defects like oxygen vacancies.

When it is doped with suitable elements (Al, Cu, Ga, Fe etc), carrier transformation takes place and get transformed to p type semiconductor. The ionic radii of Cu²⁺ is 0.73 Å. This is close to that of Sn⁴⁺ (0.69 Å). The Sn⁴⁺ ions substituted with Cu²⁺ acts as an acceptor energy level near the valence band thus increasing the p-conductivity. There are a few reports of copper doped tin oxide thin films synthesized by chemical spray pyrolysis method [6,7].

In the present work, p-type SnO₂:Cu thin films have been prepared by spray pyrolysis (SP) technique at substrate temperature 350 °C for different doping concentrations. We fabricated two homojunction diodes p-SnO₂:Cu/n-SnO₂ and p-SnO₂:Cu/n-SnO₂:F using optimized sample of copper doped SnO₂ by spray pyrolysis method. These homojunction diodes based on p-SnO₂:Cu are reported for the first time.

2. Experimental

The SnO₂:Cu and SnO₂:F thin films were spray deposited on ultrasonically cleaned glass substrates using dihydrate stannous chloride (SnCl₂·2H₂O), copper nitrate (Cu(NO₃)₂·3H₂O) and ammonium fluoride (NH₄F) as tin, copper and fluorine precursors. Required amount of SnCl₂·2H₂O to make 0.2 M solution was dissolved in 5 ml of concentrated hydrochloric acid and was heated at 90 °C for 10 min. This mixture was diluted by adding distilled water up to 25 ml which served as the starting solution. For copper doping, copper nitrate dissolved in doubly distilled water (25 ml) was added to the above solution, so that copper doping was in the range of 1 at.%, 3 at.%, 5 at.%, 7 at.% and 10

* Corresponding author. Optoelectronic and Nanomaterials' Research Laboratory, Department of Physics, Union Christian College, Aluva, 683102, Kerala, India.
E-mail address: anila.ei@christuniversity.in (E.I. Anila).



PAPER

Nano fibers of lead free perovskite Cesium Titanium Bromide (CsTiBr₃) thin films by in-house deposition techniqueRECEIVED
7 November 2020REVISED
18 February 2021ACCEPTED FOR PUBLICATION
26 February 2021PUBLISHED
8 March 2021K A Benazeera Beegum¹, Saranya Sasi¹, Alex Mathew¹, A S Asha² and R Reshmi¹¹ Optoelectronic and Nanomaterials Research Laboratory, Department of Physics, Union Christian College, Aluva, Kerala—683102, India² Nano Materials for Emerging Solid State Technology Laboratory, Department of Physics, Cochin University of Science and Technology, Kochi, Kerala 682022, IndiaE-mail: rreshmi@gmail.com

Keywords: Cesium Titanium Bromide, two stage deposition, lead free, grain boundary grooving

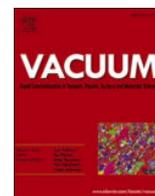
Abstract

A novel lead free nano fibers of Cesium Titanium Bromide (CsTiBr₃) perovskite is synthesized on commercial glass substrate by a two stage deposition method for the first time. Cesium Bromide thin film prepared by vacuum evaporation by resistive heating is the substrate for deposition of Titanium Bromide (TiBr₄) vapor by an in-house deposition arrangement. The duration of deposition of TiBr₄ vapor on CsBr thin film plays a key role on the structural, compositional and morphological properties of CsTiBr₃. The mechanism behind the formation of nano fibers of CsTiBr₃ from polygonal grains of CsBr is discussed in detail. The grain boundary grooving of CsBr polygonal grains influences the evolution and dimension of CsTiBr₃ nano fibers. The nano fiber structure and lead free nature makes this novel perovskite a promising candidate for sensors, nanolasers and for future nanoelectronics.

1. Introduction

Organic-inorganic halide perovskites and all-inorganic halide perovskites have received attention in various applications like solar cells [1–5], light emitting diodes [6–11], field effect transistors [12, 13], photo detectors [14–17] and sensors [18–20]. The combined advantages of flexibility and low cost of the organic part and high mobility and thermal stability of inorganic part make the hybrid organic-inorganic perovskites (HOIP) as a good choice for the above applications. Methyl Ammonium Lead Halide (MAPbX₃) and Formamidinium Lead Halide (FAPbX₃) perovskites are the pioneers among these HOIPs due to their remarkable properties of long charge diffusion length, band gap tunability and ambipolar charge transport. The intrinsic thermal instability of these compounds attributed to their organic part is a limitation for the fabrication of MAPbX₃ and FAPbX₃ based electronic devices. The inorganic part of these compounds is toxic too [21–24]. All-inorganic metal trihalide perovskites, on the other hand, show more electronic and thermal stability than the organic-inorganic metal halide perovskites and are remarkable for optoelectronic applications [25–28]. The first synthesized perovskite was all-inorganic metal trihalide CsPdX₃ (X = Cl, Br, I) [29]. The frequency dependent photoconductivity of these compounds was demonstrated in 1950's. Among the various all-inorganic perovskites, Cesium Lead Halides CsPdX₃ and Cesium Tin Halides CsSnX₃ are the mostly studied. All-inorganic perovskites are good as active layers of solar cell, photo detectors, light emitting diodes and sensors. These compounds are also used as flexible printable devices [30–37].

The chemical and physical properties of perovskite materials depend on the dimensionality and morphology. Lower dimensional (2D and 1D) perovskites are superior to their three dimensional structure, being potential building blocks for photo detectors, nano-lasers, mini-solar cells, sensors and nano-electronics [38–40]. 2D MAPbI₃ synthesized by solution process and CsPbX₃ prepared by lower temperature synthesis were good in functioning as Light Emitting Diodes, Solar cells, Photo-field effect transistors, cold converters and wave-guides. 1D perovskites have high crystalline quality, longer carrier diffusion length, superior carrier transportation and high quantum-efficiency. The photo-electronic performance is found to be enhanced in 1D



Porous silicon/ α -MoO₃ nanohybrid based fast and highly sensitive CO₂ gas sensors

Tijin Thomas^a, Y. Kumar^{b,d}, Jesús Alberto Ramos Ramón^b, V. Agarwal^b,
Selene Sepúlveda Guzmán^c, Reshmi R^e, Soorya Pushpan^f, Shadai Lugo Loredo^a, K.C. Sanal^{a,*}

^a Facultad de Ciencias Químicas, Universidad Autónoma de Nuevo León, Av. Universidad, Cd. Universitaria, San Nicolás de los Garza, Nuevo León, 66455, Mexico

^b Centro de Investigación en Ingeniería y Ciencias Aplicadas, Universidad Autónoma del Estado de Morelos, Av. Universidad 1001, Colonia Chamilpa Cuernavaca Mor., 62209, Mexico

^c CHDIT- Universidad Autónoma de Nuevo León, Apodaca, Nuevo León, 66000, Mexico

^d Facultad de Ciencias Físico Matemáticas, Universidad Autónoma de Nuevo León, Cd. Universitaria, San Nicolás de los Garza, N.L., 66451, Mexico

^e Optoelectronic and Nanomaterials Research Laboratory, Department of Physics, Union Christian College, Aluva, Kerala, 683102, India

^f Facultad de Ingeniería Mecánica y Eléctrica, Universidad de Autónoma de Nuevo León, Av. Universidad, Cd. Universitaria, San Nicolás de los Garza, Nuevo León, 66455, Mexico

ARTICLE INFO

Keywords:

Porous silicon
Molybdenum trioxide nanorods
Thermal evaporation
Transmission electron microscopy
CO₂ gas sensor

ABSTRACT

We report a high-performance CO₂ gas sensor developed from porous silicon/molybdenum trioxide nanohybrid structure (p-Si/MoO₃) synthesized via a simple vacuum thermal evaporation over an electrochemically fabricated microporous silicon substrate. The crystal structure, morphologies, and elemental composition of the proposed gas sensor were analyzed using, X-ray diffraction, Field emission scanning electron microscopy, Transmission electron microscopy, and X-ray photoelectron spectroscopy techniques, respectively. The p-Si/MoO₃ nanohybrid sensor exhibited an excellent sensing performance towards CO₂ gas with high sensitivity (15% at 150 ppm CO₂), good repeatability along with fast response time (8 s at 100 ppm CO₂) at 250 °C, which makes it promising for practical CO₂ sensing applications. Additionally, the sensor presented a low working temperature of 150 °C along with a lower detection limit of 50 ppm CO₂.

1. Introduction

The increment in carbon dioxide (CO₂) emission has concerned the scientific community for the last few decades due to the serious environmental threat of global warming [1]. The major contributions to the CO₂ emissions are from the burning of fossil fuels in automobiles, industries, electric power generators, etc. [2]. The detection of CO₂ has been carried out utilizing different types of sensors such as catalytic, electrochemical, infrared, and semiconductor [3–6]. Among these, nanostructured metal oxide-based semiconductor (MOS) gas sensors are well known for their gas sensing behavior towards a variety of reducing as well as oxidizing gases due to the excellent sensitivity, good chemical and thermal stability, fast response, and recovery times [7–9]. MOS gas sensors work by the measurement of change in the electrical resistance or conductivity when a target gas is exposed to its surface [7]. The detection of CO₂ using various MOS like ZnO, SnO₂, CdO, La₂O₃, TiO₂, LaFeO₃, CuO, FeYO₃, WO₃/SnO₂, NiCo₂O₄/r-GO, BaZrO₃, etc. have been

reported by different groups [8–27]. In this regard, nanostructured molybdenum trioxide (MoO₃), which is an *n*-type MOS exhibits excellent sensing characteristics due to its wide bandgap (~3.2 eV) [28]. For instance, Yu et al. [29] have studied the gas sensing mechanism α -MoO₃/ZnO nanocomposite sensors working at 270 °C and measured the response over a concentration range of 500 ppm–100 ppm of H₂S gas. Yang et al. [30] reported the influence of doping in the sensing response towards ethanol when Zn is doped with MoO₃ nanobelts. For their sensor, the better response obtained was 326 for an ethanol concentration of 1000 ppm and a working temperature of 240 °C. Sui et al. [31] reported the fabrication of triethylamine gas sensors using α -MoO₃ with a flower-like morphology. They studied the response within a concentration range of 0.5 ppm–100 ppm, and working temperatures between 250 °C and 370 °C. However, the detection of CO₂ gas using MoO₃ based gas sensors are the least studied. Wang et al. [22] reported the detection of CO₂ potentiometric sensors using the MoO₃ doped Li₂CO₃ electrode with a higher working temperature (500 °C) and with

* Corresponding author.

E-mail address: sanal.kozhiparambilch@uanl.edu.mx (K.C. Sanal).

<https://doi.org/10.1016/j.vacuum.2020.109983>

Received 11 September 2020; Received in revised form 30 November 2020; Accepted 1 December 2020

Available online 8 December 2020

0042-207X/© 2020 Elsevier Ltd. All rights reserved.



Zinc-doped iron oxide nanostructures for enhanced photocatalytic and antimicrobial applications

Julie Ann Joseph¹ · Sinitha B. Nair¹ · Sareen Sarah John² · Stephen K. Remillard³ · Sadasivan Shaji⁴ · Rachel Reena Philip¹

Received: 15 May 2020 / Accepted: 7 December 2020

© The Author(s), under exclusive licence to Springer Nature B.V. part of Springer Nature 2021

Abstract

A simple, cost-effective method of two-step anodization is used to prepare environmentally benign zinc-doped iron oxide nanostructures for photocatalytic and antimicrobial applications. The effect of zinc doping on the structure and morphology of iron oxide nanostructure is analysed with the help of X-ray diffraction, Raman spectroscopy, X-ray photoelectron spectroscopy (XPS) and field emission scanning electron microscopy. A detailed analysis of the changes in the binding energy positions of Fe 2p, O 1s, Zn 2p and valence band maximum with variation in doping concentration is carried out with X-ray photoelectron spectroscopy. A combined analysis of valence band X-ray photoelectron spectra and optical reflectance spectra indicates a shift in Fermi level characteristic to a conversion from n-type in pure α -Fe₂O₃ to p-type in 5-s zinc-doped α -Fe₂O₃. The room-temperature electrical conductivity of the doped is improved by five orders compared to the undoped nanostructures. The zinc-doped iron oxide nanostructures with p-type conductivity are found to show high photocatalytic degradation efficiency for the organic dye methylene blue. Significant antimicrobial activity is observed with the nanostructures for the microbes *Pseudomonas aeruginosa*, *Bacillus subtilis* and *E. coli*.

✉ Rachel Reena Philip
reenatara@gmail.com

¹ Thin Film Research Lab, Department of Physics, Union Christian College, Aluva, Kerala, India

² Department of Biosciences, Union Christian College, Aluva, Kerala, India

³ Department of Physics, Hope College, Holland, MI 49423, USA

⁴ Facultad de Ingenieria Mecanica Y Electrica, Universidad Autonoma de Nuevo Leon, Av. Universidad s/n, Cd. Universitaria, 66455 San Nicolas de los Garza, Nuevo Leon, Mexico

Influence of Magnesium Doping on the Photocatalytic and Antibacterial Properties of Hematite Nanostructures

Julie Ann Joseph, Sinitha B. Nair, Surya A. Mary, Sareen Sarah John, Sadasivan Shaji, and Rachel Reena Philip*

Herein, the effect of magnesium doping on hematite nanostructures prepared by a simple and cost-effective electrochemical method is reported. Photocatalytic and antibacterial studies on the undoped and doped samples suggest improved performance for the Mg-doped samples. Structural studies using X-ray diffraction, Raman spectroscopy, and X-ray photoelectron spectroscopy (XPS) in combination with field-emission scanning electron microscopy for surface morphology confirm the Mg presence in the nanostructured hematite phase of iron oxide. Analyses of the valence band (VB) XPS spectra along with optical reflectance spectra indicate a shift in VB edge, characteristic of a conductivity type conversion from n-type in hematite to p-type in Mg-doped hematite. The room temperature electrical conductivity is increased by three orders, and the optical bandgap is reduced by around 0.08 eV for moderately doped hematite nanostructures.

produced by the pollutants and infected habitat, the research for techniques and materials for the removal of pollutants and the disinfection of pathogenic bacteria is gaining wide interest in the present world.

Photocatalysis is one of the cheapest and most eco-friendly techniques employed for the removal of dyes and other organic pollutants from water.^[1,2] The significant improvement noted in the photocatalytic efficiency of the most stable oxide of iron, hematite ($\alpha\text{-Fe}_2\text{O}_3$) when doped with metals such as Pt, Sn, Zn, Cr, and Ta has been previously reported.^[3–7] The reason for the increased efficiency has been attributed to reduced recombination rate of e-hole carriers and increased charge separation.

In this article, the effect of Mg doping on

the photocatalytic and antimicrobial action of hematite is investigated. A few reports are available in the literature on the study of photoconversion and water-splitting efficiency of Mg-doped iron oxide as adsorbents of various chemicals.^[8–10] A study undertaken by Ingler et al.^[8] using Mg-doped iron (III) oxide thin films prepared by spray pyrolysis reported a maximum photoconversion efficiency of 0.33%. A hydrothermal method was utilized by Cai et al.^[9] to prepare tin and magnesium co-doped hematite films as photoanode for water splitting that attained a maximum photocurrent density of 1.1 mA cm^{-2} , which was better than the pristine $\alpha\text{-Fe}_2\text{O}_3$ by three times. The improvement in its performance was ascribed to the increase in charge injection efficiency and charge separation efficiency due to Mg doping. Li and coworkers^[10] fabricated a homojunction photoelectrode by a hydrothermal method with Mg-doped $\alpha\text{-Fe}_2\text{O}_3$ on phosphorous-doped $\alpha\text{-Fe}_2\text{O}_3$ and studied its performance in photoelectrochemical water splitting. The higher charge separation resulted due to the formation of homojunction which created a built-in electric field. In contrast, nano-structured Mg-doped Fe_2O_3 -ferrihydrite powders synthesized by co-precipitation technique were utilized by Mohapatra and group^[11] for the removal of cations—Pb(II), Cd(II), Cu(II), and Co(II)—from aqueous solution. The maximum rate of adsorption of 0.024 min^{-1} was obtained by them for the cobalt cation. They also prepared Mg-doped nano-ranged hematite by surfactant cetyl trimethyl ammonium bromide (CTAB) mediation-precipitation technique for fluoride adsorption, and an adsorption rate of 0.0072 min^{-1} was achieved.^[11] However, our literature survey revealed that no reports are available on the use of Mg-doped hematite for

1. Introduction

This is an era when concerted efforts are put in by environmentalists and scientists in planning strategic techniques for restoring a clean and healthy environment for habitation. The conventional practice of discharging harmful chemicals and pollutants into water bodies and poisonous gases into the air from factories pose a serious threat to living beings. Due to the havoc

J. A. Joseph, S. B. Nair, S. A. Mary, R. R. Philip
Thin Film Research Lab, Department of Physics
Union Christian College
Aluva, Kerala 683102, India
E-mail: reenatar@gmail.com

S. B. Nair
Department of Physics
Sree Sankara College
Kalady, Kerala 683574, India

S. S. John
Department of Biosciences
Union Christian College
Aluva, Kerala 683102, India

S. Shaji
Facultad de Ingenieria Mecanica y Electrica
Universidad Autonoma de Nuevo Leon
Av. Universidad s/n, Cd. Universitaria, San Nicolas de los Garza, 66455
Nuevo Leon, Mexico

 The ORCID identification number(s) for the author(s) of this article can be found under <https://doi.org/10.1002/pssb.202100437>.

DOI: 10.1002/pssb.202100437



Calcium Oxalate Crystals as Raw Food Antinutrient: A Review

Justin R. Nayagam^{1*} and Renu Rajan¹

¹Department of Botany, Union Christian College, Aluva, India.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2021/v33i41B32368

Editor(s):

(1) Dr. Koteswara Mudigonda, Propharmex Company, India.

Reviewers:

(1) Tsehayneh Geremew Yohannes, University of Gondar, Ethiopia.

(2) Rosany Piccolotto Carvalho, Universidade Federal do Amazonas, Brazil.

Complete Peer review History: <https://www.sdiarticle4.com/review-history/72576>

Mini-review Article

Received 14 June 2021
Accepted 19 August 2021
Published 24 August 2021

ABSTRACT

The nutritional value of food can be altered by the presence of antinutrients such as oxalates present abundantly in plants as ergastic crystals. High oxalate content in plant-based raw food can lead to oxalonephropathy, nephrolithiasis and renal dysfunction. Presence of oxalate can hinder the absorption of other minerals such as calcium and magnesium present in food. CaOx antinutrient intake can be minimised by avoiding plant with high oxalate content or by decreasing oxalate levels through cooking practices like, boiling, fermenting, treating with baking soda, adding yoghurt and milk etc. More sophisticated ways of minimising antinutrient intake through raw diet is by choosing genetically modified crops which are bred for low oxalate content or by choosing mutant varieties which are devoid or low in oxalate content in food crops. The future for sustainable antinutrient management and nutritional value enhancement is by incorporating genes from bacteria or fungi which are capable of breaking down oxalate using the enzyme oxalate decarboxylase, on to plants and thereby modifying them to have less antinutrient effects in raw consumption.

Keywords: Calcium oxalate crystals; ergastic crystals; antinutrient; raw food; CaOx crystals; nephrolithiasis.

*Corresponding author: E-mail: drjustinmayagam@gmail.com;

Body Image Perception in Relation to BMI and Self-esteem in Adolescent Girls

Sneha Mary Jayan¹ and Malini R.²

Department of Psychology, Sociology and Politics, Sheffield Hallam University, England, UK¹

Department of Psychology, Union Christian College, Aluva, Kerala²

The concept of BMI and body image and the impact it has on adolescent perceptions and attitudes have been a serious matter of discussion among researchers world-wide. Numerous studies have identified its importance in determining physical as well as mental health especially in the case of adolescents. The present study was undertaken to identify the perceptual and attitudinal dimensions of body image and its relationship to BMI and self-esteem in adolescent girls. A cross-sectional descriptive research design was used and the participants were 165 adolescent girls in the age range of 16-22 years, selected from the different districts of Kerala using simple random sampling technique. Participants were administered a General Information Schedule, the Body Image Instrument (Pulvers et al., 2004) and the Self-Esteem Inventory (Thomas & Sanandaraj, 1981). Data analysis was done using Chi-square test, Student's t test and One-way ANOVA. The results obtained indicated discrepancy in actual BMI and perceived body image of adolescent girls with lower self-esteem in the case of girls who perceived themselves as having thin and fat body image. Attitudinal dimensions of body image also indicated a greater preference for thinness and a strong desire to reduce body weight even in the case of girls possessing normal BMI. The findings call for greater attention to adolescent concerns, which may otherwise lead to health-compromising behaviours and poor mental health.

Keywords: BMI, self-esteem, body image perception, adolescence

Body image forms an important component of one's self-concept, especially during the period of adolescence. It is during this period that adolescents develop their sense of identity and establish themselves as individuals worthy of respect and self-worth. The term 'body image' was introduced by the Australian neurologist and psychoanalyst Schilder (2013) and he presumed it as 'body schema', referring to it in terms of how one perceives his or her body and parts of body. Thompson (2004) defined body image as the internal representation of your own outward appearance or your own unique perception of your body.

It has been identified that body image contributes a lot to one's self-esteem (Soohinda et al., 2019). Right from the time of childhood, children experience a lot of problems related to their self-esteem, mostly related to their own perceptions of body image (Sánchez, Suárez, & Smith, 2018). The society to a large extent, place excessive emphasis on slenderness in women and that has been frequently portrayed in movies and advertisements. This preference for thin body image in women has been regularly identified across the world by several researchers (Alipour et al., 2015). Therefore, it

is of no wonder that body image becomes one of the predictors of self-esteem (Moreno, Cervello, & Moreno, 2008). Body image is found to be influenced by socio-cultural factors, peer influence, media etc. even to the point of determining one's ideal body image, and thereby leading to body dissatisfaction (Rajagoplan, 2020).

It has been identified that body image concerns are present in about 10% to 30% of adolescent school and college-going girls in India (Goswami, Sachdeva, & Sachdeva, 2012). They may have body dissatisfaction which refers to negative evaluations of one's own body and involves a discrepancy between one's current body image and ideal body image (Grogan, 2016). The total prevalence of body image dissatisfaction and distortion were 51.63 % and 64.13 %, respectively according to a study (Alipour et al., 2015).

Body Mass Index (BMI) gives an idea about the proportion of body fat to height (WHO Expert Consultation, 2004). Individuals with normal BMI are considered to have proportionate weight-height ratio, while underweight individuals have less fat than required in proportion to their height and those who are overweight have excess fat than required in proportion to their height (WHO, 2018). Moderate to high correlations have been found between BMI and body dissatisfaction according to several studies conducted in India and in the Western context (Mellor et al., 2010; Sonnevile et al., 2012). Women are more often found to pursue a thin body image as ideal (Soohinda et al., 2019) compared to men who desire to have a muscular body type. Women are also identified as having low scores on body image measures and BMI was found to have a negative association with most body image measures (Swami et al., 2018).

Studies of the past have indicated that body dissatisfaction increases with BMI and is high among overweight and obese adolescent girls (Calzo et al., 2012). Body dissatisfaction has been correlated not only with issues of self-esteem but have also been

Author Note

¹Sneha Mary Jayan, MSc Developmental Psychology, Department of Psychology, Sociology and Politics, Sheffield Hallam University England, UK

E-mail: snehamj09@gmail.com

²Malini R., Assistant Professor, Department of Psychology, Union Christian College, Aluva, Kerala

We have no known conflict of interest to disclose

Correspondence concerning this article should be addressed to Malini R., Assistant Professor, Department of Psychology, Union Christian College, Aluva, Kerala

E-mail: malinir@uccollege.edu.in



VOL. I, No.5
2021 JANUARY-JUNE
1196 ധനു-ഇടവം



CHENGAZHI

Included in UGC-CARE list
A peer reviewed research journal



പുരാവൃത്തപഠനം : സൈദ്ധാന്തിക സമീപനങ്ങളും

സമകാലിക പ്രസക്തിയും

ഡോ. എം. ഐ. പുനൂസ്

അസ്സോസിയറ്റ് പ്രൊഫസർ, മലയാളവിഭാഗം, യു.സി.കോളേജ്, ആലുവ

വിവിധ വിജ്ഞാന മേഖലകളെ ഒരുപോലെ ആകർഷിക്കുകയും പ്രചോദിപ്പിക്കുകയും ചെയ്തിട്ടുള്ള വിഷയമാണ് പുരാവൃത്ത പഠനം. സംഘവേദനയുടെ സൃഷ്ടികളാണ് പുരാവൃത്തങ്ങളെന്ന തുകൊണ്ട് എല്ലാ സാമൂഹികശാസ്ത്ര വിഷയങ്ങൾക്കും ഇതൊരു പ്രധാന പഠന വിഷയമാണ്. പുരാവൃത്തങ്ങളെ സൃഷ്ടിക്കുന്നതും നിലനിർത്തുന്നതും സമൂഹ മനസ്സാണ്. വൈയക്തികമായ അനുഭവങ്ങൾക്കിവിടെ വലിയ പ്രസക്തി ഇല്ല. സമൂഹത്തിന്റെ സ്വപ്നങ്ങളും പ്രതീക്ഷകളുമാണ് പുരാവൃത്തങ്ങൾ ആയി പുനർജനിക്കുന്നത്. പുരാവൃത്തങ്ങളുടെ ഒരു സാമൂഹികാനുഭവ പ്രക്രിയയുടെ പുനരാഖ്യാനങ്ങളായി മാറുകയാണ്. തന്മൂലം പുരാവൃത്തങ്ങളുടെ അപഗ്രഥനവും വിശകലനവും നാടോടിവിജ്ഞാനീയത്തിലും ചരിത്രത്തിലും മനോവിജ്ഞാനീയത്തിലും മറ്റ് സാമൂഹ്യ വിഷയങ്ങളിലും ഒന്നുപോലെ പ്രസക്തമായി മാറുന്നു. ആൻഡ്രൂ ലാങ് പുരാവൃത്തങ്ങളുടെ ബഹു വിഷയബന്ധം സൂചിപ്പിച്ചുകൊണ്ട് ഇങ്ങനെ രേഖപ്പെടുത്തുന്നു: “The early physicist thought that myth concealed a physical philosophy; the early etymologist saw in it a confusion of language; the early political speculator supposed that myth was an invention of legislators; the literary Eumerus found the secret of myths in the course of an imaginary voyage to a fabled island” (Andrew Lang; 1993)

പുരാവൃത്തങ്ങളുടെ പ്രസക്തിയെയും പ്രയോഗത്തെയും സംബന്ധിച്ച കാഴ്ചപ്പാടുകളിൽ അന്തരമുണ്ടായിരിക്കുമ്പോഴും വിവിധ വിജ്ഞാന മേഖലകളിൽ മിത്തുകളുടെ പഠനം എത്രമേൽ പ്രസക്തമായിരിക്കുന്നുവെന്നയാഥാർത്ഥ്യം കൂടി ഇത് വ്യക്തമാക്കുന്നുണ്ട്. പുരാവൃത്തപഠനത്തിലുണ്ടായിട്ടുള്ള പ്രസക്തമായ വ്യവഹാരസമീപനങ്ങളും വിശകലന പദ്ധതികളുമാണിവിടെ പഠന വിധേയമാക്കുന്നത്.

മനോവിശകലന സിദ്ധാന്തങ്ങളും പുരാവൃത്തവും

മനഃശാസ്ത്രപഠനങ്ങളിൽ പുരാവൃത്തങ്ങൾക്ക് വലിയ പ്രാധാന്യമുണ്ട്. ശരീരത്തിന്റെ

‘Learning by Doing’: Understanding the Gandhian Approach to Education

G. GEETHIKA

Union Christian College

Mahatma Gandhi was a visionary who walked ahead of his times. His vision and dreams of an Indian society embodying the values of brotherhood and equality in the true sense were rooted on the twin pillars of satyagraha and ahimsa. His hopes were anchored on the youth of the country. Gandhi strongly believed that only education could liberate the youth from the vices of the Indian society and propel them towards progress, freedom and self-realisation. One of the key components of his Constructive Programme was education. Gandhi spent a lot of time deliberating on how to structure and realise it so that all Indians would benefit. This paper intends to explore the idea of education proposed by Gandhi and his compatriots, especially the concept of ‘learning by doing’. The paper would briefly assess the new National Education Policy in this light.

Keywords: NEP 2020, Nai Talim, Mahatma Gandhi, Education

India has a rich heritage of knowledge creation and dissemination, deeply rooted in a system of education which considered learning a revered and pious pursuit. The caste system marred it, denying educational opportunities to many communities. The setting up of schools by Christian missionaries may have democratised the educational sector, but one cannot ignore the deliberate intentions of the British Empire in encouraging it. Like many of the stalwarts of our national struggle, Mahatma Gandhi was educated in the system established by the British, in India and England. The more opportunities he got to interact with this system, the greater was his realisation that it had many inherent defects which were severely incapacitating the Indian society. He said, "the system divorced the child from his social surroundings, created new castes, laid emphasis on literary education, and there was a neglect of mass education" (Patel, 1953). From this understanding of the incompetence of the existing pedagogical structure, Gandhi evolved a theory of education intended to overcome the glaring discrepancies.

Education is the process of receiving systematic instruction, the basis for human capital, imperative for shaping a better society. Gandhi expressed unbridled faith in education as a superior alternative to remove the vices of modernity and all the injustices in Indian society. He envisaged education beyond literacy and numeracy. Gandhi firmly believed that only an inclusive and experiential educational system could help the young and the marginalised in freeing themselves to imbibe the true spirit of truth and non-violence. This paper proposes to look deep into the idea of education proposed by Mahatma Gandhi, often referred to as 'basic education'.

As we discuss the Gandhian philosophy of education, it is coincidental that the Government of India is proceeding towards adopting a new National Education Policy. The draft policy was released in 2019 and has been open for commentaries. It has been subjected to exhaustive yet inconclusive reviews on its implications on

www.ezhuthu.org

2021 ഫെബ്രുവരി പുസ്തകം 6 ലക്കം 4 ₹ 30

ഫോക്കസ്
സമാന്തര
രാഷ്ട്രീയം

എഴുത്തു മാസിക

ചിന്തിക്കുന്ന ഹൃദയങ്ങൾക്ക്

ബദൽരാഷ്ട്രീയത്തിന്റെ ഭാവം

ഡോ. ജി.ഗോപകുമാർ | എൻ.എം.പിയേശ്വരൻ
കുസുമ ജോസഫ്



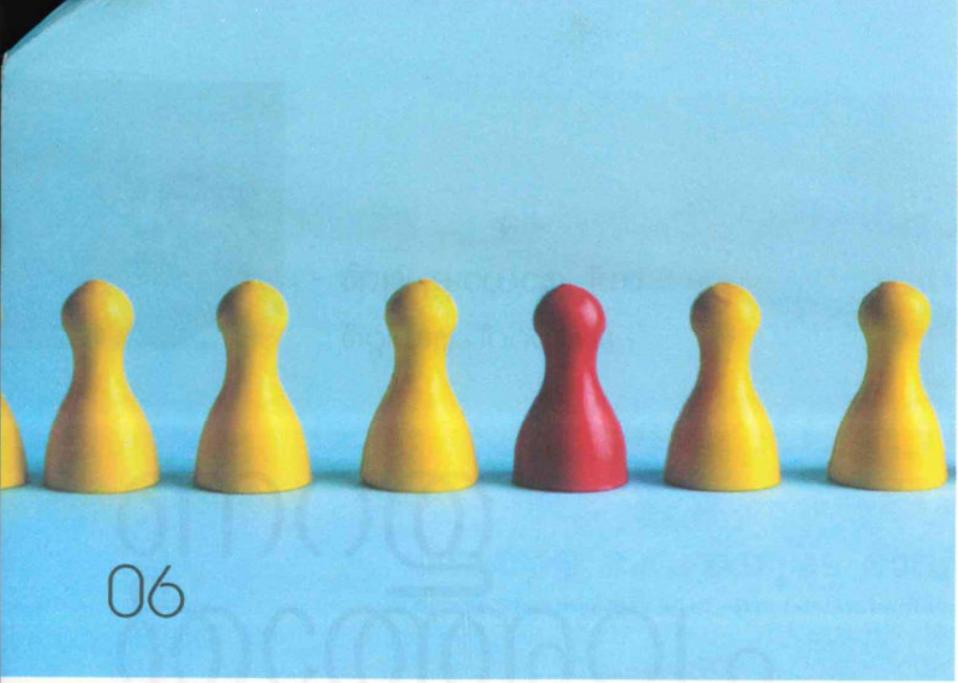
കഥ
ജോസ് പനച്ചിപ്പുറം
ഡോ.അഖില കെ. എസ്

ലേഖനം
പ്രാന്തവത്കരണവും
അധികാരവും

മതവും രാഷ്ട്രീയവും
അംബേദ്കറിന്റെ
ചിന്തകളിൽ



9 772456 277701 >



06

മുൻവാക്ക്

03 | തുറന്നു പറഞ്ഞാൽ സി. രാധാകൃഷ്ണൻ

ഫോക്കസ്

06 | രാഷ്ട്രീയവും അരാഷ്ട്രീയബദലുകളും ഡോ. ജി. ഗോപകുമാർ

10 | ബദൽരാഷ്ട്രീയത്തിന്റെ ഭാവി എൻ.എം. പി.യേശുസൺ

17 | ബദലുകളുടെ രാഷ്ട്രീയം എന്ത്? കസുമ ജോസഫ്

20 | നുള്ളിക്കളഞ്ഞ പൊന്നിളെ ഒരു സമരം ജി. ഗോമതി

അഭിമുഖം

13 | ട്വന്റി 20 യുടെ രാഷ്ട്രീയപാഠങ്ങൾ സാബു എം. ജേക്കബ് / രാജേശ്വരി പി.ആർ.

ലേഖനം

22 | മതവും രാഷ്ട്രീയവും അംബേദ്കറിന്റെ ചിന്തകളിൽ ഡോ. വൈ.റ്റി. വിനയരാജ്

54 | മനുഷ്യക്കടത്തിന്റെ പ്രവർത്തനവഴികൾ ഡോ. രവിന്ദ്രനാഥ് ഷാൻബാഗ്

62 | പ്രാന്തവൽക്കരണവും അധികാരവും ഡോ. കെ.എസ്. മാധവൻ

പംക്തി

26 | മൊഴിയാഴം എൻ.ഇ. സുധീർ

ആഗോളഗ്രാമം

30 | ലൈംഗികപോർട്രെയ്റ്റുകളുടെ പ്ലോറിയം ഫോനയും ടി.കെ. സന്തോഷ്കുമാർ

കവിത

35 | താരാട്ടമ്മ പത്മനാഭൻകാവുനായി

42 | ഇലത്തോടണിഞ്ഞവൾ സ്റ്റേല്ല മാത്യു

43 | പ്രിയ കവിക്ക് രാജേന്ദ്രൻ കർത്ത

49 | കൊച്ചു കൊച്ചു യുദ്ധങ്ങൾ അമൃത കേളകം

75 | നടത്തം ദിവ്യ എൻ.

75 | ജീവിതപുസ്തകം രാജീവ് മാന്യുള്ളി

കഥ

36 | അതിരമ്പുഴയും ഷേബാ രാജനിയും ജോസ് പനച്ചിപ്പുറം

44 | അമ്മക്കളളി ഡോ. അഖില കെ.എസ്

അനുഭവകണ്ണാടി

50 | ജോബും ജോളിയും ഗോപി മംഗലത്ത്

ബോധി

52 | ജയ് കിസാൻ! എസ്. പൈനാടത്ത് എസ്.ജെ

കാർമ

56 | രുചിയോർമകൾ ഡോ. മിനി ആലിസ്

കുറിപ്പ്

60 | പകയുടെ കണലുകളും മൈത്രിയും കെ. അരവിന്ദാക്ഷൻ

എഴുത്ത്

പുസ്തകം ആറ് | ലക്കം നാല്
2021 ഫെബ്രുവരി | 1196 മകരം -കുംഭം

എഴുത്ത് മാസിക, ലുമൻ, പോണോത്ത് റോഡ്, കല്ലൂർ, കൊച്ചി-17, ഫോൺ-0484 2334048, മൊബൈൽ: 81292 16033

ezhuthumagazine@gmail.com

പ്രസാധനം: ലോയോള ഇൻസ്റ്റിറ്റ്യൂട്ട് ഓഫ് പബ്ലിസിറ്റി ഇന്റർനാഷണൽ, റിലേഷൻസ്, കൊച്ചി-17

ഒരു ജന്മിറ്റ് സംരംഭം

രക്ഷാധികാരി : ഇ.പി. മാത്യു എസ്.ജെ.

മുഖ്യ ഉപദേഷ്ടാവ് : കെ. ബാബു ജോസഫ്

ഓണററി എഡിറ്റർ : സി. രാധാകൃഷ്ണൻ

ഉപദേശകസമിതി : എ. അടപ്പൂർ എം. തോമസ് മാത്യു തമ്പി ആന്റണി കുര്യൻ പാണ്ടിക്കാട്ട് വൈക്കം മുരളി മൂസ് മേരി ജോർജ് എൻ.ഇ.സുധീർ

മാനേജിങ് എഡിറ്റർ : ബീനോയ് പിച്ചുക്കോട്ട്

എഡിറ്റർ : റോയ് എം. തോട്ടം

കൺസൾട്ടന്റ് : വി.ജി. തമ്പി



ഓർമ ■
ഡോ. മിനി ആലീസ്

രചിയോർമകൾ

മധ്യതിരുവിതാംകൂറിലെ നഷ്ടപ്പെട്ടുപോയ ഭക്ഷ്യസംസ്കൃതിയുടെ കൊതിയുറ്റം രചിയോർമകൾ കുറിയാക്കോസ് പാമ്പാടിയുടെയും കെ.ജെ.ഏലിയാമ്മയുടെയും സ്മരണയിൽ.

നിറവും മണവും ലഹരിയും ചവർപ്പുമൊക്കെ നിറയുന്നതാണ് രചിയോർമകൾ. അതൊരു പത്തനംതിട്ടയിലെയും അധ്വാനത്തിലെയും ഭൂമികയിൽ നിന്നുയിർക്കൊള്ളുമ്പോൾ അതിനിരട്ടി രചിയുണ്ടാകും. പുതുക്കാലസ്വാദുകൾ നമ്മുടെ രസമുകളുടെ കൈയടക്കുമ്പോഴും ചില രചിയോർമകൾ നാവിൽ കൊതിയുറിക്കുകതന്നെ ചെയ്യും. മറ്റു ചിലവ ദാരിദ്ര്യത്തിലെയും കഠിനാധ്വാനത്തിലെയും പശ്ചാത്തലത്തിൽ നിന്നു കടന്നുവന്നു കണ്ണുനിറയിക്കും. മായമില്ലാത്ത ഭക്ഷണത്തിന്റെ സവിശേഷതയും കൈപ്പണവും കഴിക്കുന്നയാളിന്റെ വിശപ്പുമൊക്കെ ചേരുമ്പോൾ സ്വാദു നിറയുന്ന വിഭവങ്ങളായി അവ കടന്നുവരുന്നു. ഏതാണ്ട് എൺപതുവർഷം പഴക്കമുള്ള മധ്യതിരുവിതാംകൂർ രചിയുടെ ഒരേമൊഴുമാണ് ഈ ഓർമക്കുറിപ്പുകളിലൂടെ തിരിച്ചുപിടിക്കുന്നത്.

കോട്ടയത്തിനടുത്ത് പാമ്പാടിയിലെ പുതക്കുഴിയെന്ന പ്രദേശവും അവിടുത്തെ യാക്കോബായക്കാരുടെ ഭക്ഷണരീതികളുമൊക്കെ ഈ ഓർമകളിൽ മേൽക്കൈ നേടിയിട്ടുണ്ട്. അമ്മയുടെ നാടായ തോട്ടയ്യാ



VOL. I, No.5
2021 JANUARY-JUNE
1196 ധനു-ഇടവം



CHENGAZHI

Included in UGC-CARE list
A peer reviewed research journal



Chengazhi

Included in UGC Care list

A peer reviewed research journal

Bilingual, Half Yearly

Published in India by

Department of Malayalam, Payyanur Centre,

Sree Sankaracharya University of Sanskrit, Kalady

Volume 1, Issue-5, Jan-June, 2021

Registered with The Registrar of Newspapers for India

No.KERBIL/2019/77103.

ISSN: 2581-9585.

Licensed under Creative Commons Share Alike license.

Book & Cover Design

Ashokkumar P.K.

Typeset using unicode Malayalam Fonts (smc.org.in, rachana.org)

Data entry using Malayalam Unicode by:

Ms. Philomina Mathew, Ms. Kavitha E.

Cover Photo: Cyril Mathew

Price ₹550/-

Printed and published by Dr. V. Lissy Mathew, on behalf of Department of Malayalam, Sree Sankaracharya University of Sanskrit, Regional Centre, Payyanur, Printed at Varnamudra Graphics, Pm. XX 402 A5, Perumba, Payyanur, Published from: Department of Malayalam, Sree Sankaracharya University of Sanskrit, Regional Centre, Payyanur, Edat P.O., Kannur District, Kerala, 670327. Editor Dr. V. Lissy Mathew

ഉള്ളടക്കം

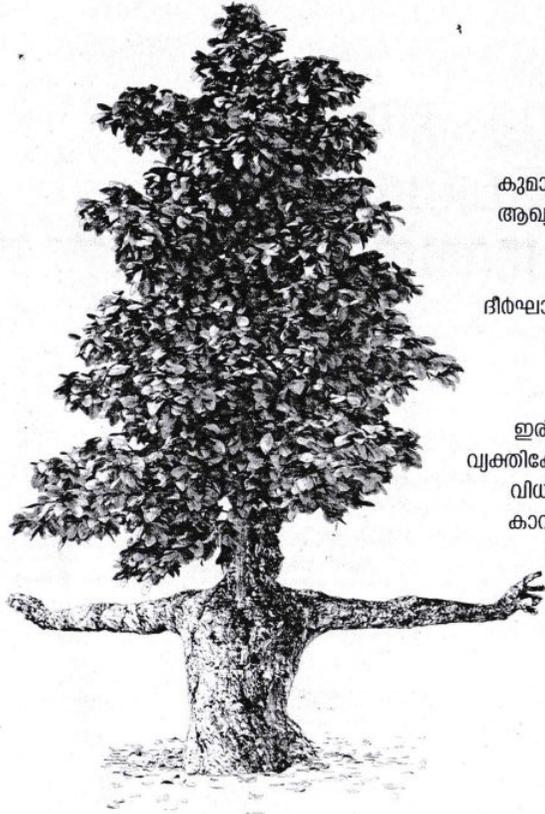
പുരാവൃത്തപഠനം : സൈദ്ധാന്തിക സമീപനങ്ങളും സമകാലിക പ്രസക്തിയും ഡോ. എം. ഐ. പുന്തസ്	9
ബെട്ടക്കുറുമ്പരുടെ പുരാവൃത്തങ്ങളും കലകളും; ഗോത്രജീവിതത്തിന്റെ വ്യതിരിക്തത ഡോ. ഇന്ദു മേനോൻ	19
കൂട്ടറിവിലെ സംസ്കൃതിയും നാട്ടറിവിലെ ചരിത്രവും ഡോ. നജ്ജം	29
മുള്ളക്കുറുമ്പരുടെ വൈദ്യം: അറിയും പ്രയോഗവും ബിജു കെ.കെ.	50
അനുഷ്ഠാനം, കല, ആധുനികീകരണം ഇ. ദിനേശൻ	66
മടവതിയിലെ അനുഷ്ഠാനപാഠങ്ങൾ ദിവ്യ എസ്. കേശവൻ	74
പാഠകളിലെ ബന്ധുത്വം: കടൽചേലാളരും റോബർട്ട് പനിപ്പിള്ളയും ഭുവനേശ്വരി കെ. പി.	78
കേരളീയ ചുവർച്ചിത്രങ്ങളിലെ വർണ്ണസംയോജനം ആരതി എ.മാരാർ,	83
പെരുങ്കളിയാട്ടം: സാംസ്കാരിക വിനിമയത്തിന്റെ ഇടം ഡോ. പ്രദീപ് കുമാർ ഇ. വി.	88
മലബാർ മാനുവൽ കേരളത്തിലെ കോളനികാല ഫോക്ലോർ പഠനവും അതുൽ കെ.വി,	97
പാങ്കളി ഡോ. സ്നീത കെ.പി.	106
തിരുനിഴൽമാല: മലയരുടെ സ്വത്വബോധത്തിന്റെ നിഴൽ ഡോ. പ്രജിത പി.	111
കേരളത്തിലെ മാപ്പിളസംസ്കാരം—ഗോത്രീയതയും സ്വത്വരാഷ്ട്രീയവും ദൂന മറിയ ഭാർഗ്ഗവി	118
ഭാഷയും പരിസ്ഥിതിയും ഡോ. സിബു മോടയിൽ	127
നവമാധ്യമങ്ങളുടെ സംസ്കാര നിർമ്മിതി എ.എസ്. പ്രതീഷ്	134

ഭാഷയും പരിസ്ഥിതിയും

ഡോ. സിബു മോടയിൽ

മലയാളവിഭാഗം, യു.സി.കോളജ്, ആലുവ

ഭാഷ പരിസ്ഥിതിക ഉല്പന്നമാണെന്നതിന് അടിസ്ഥാനമായി മുന്നോട്ടു വയ്ക്കാവുന്ന ഏറ്റവും സാമാന്യമായ പ്രത്യേകത ഭാഷയുടെ വൈവിധ്യമാണ്. ഭൂപ്രകൃതിക്ക് വൈവിധ്യമുള്ളതുപോലെ ഭാഷകളും വ്യത്യാസപ്പെട്ടിരിക്കുന്നു എന്ന ധാരണയ്ക്ക് നൂറ്റാണ്ടിന്റെ പഴക്കവുമുണ്ട്. എങ്കിലും 1990-കളിലാണ് പരിസ്ഥിതിഭാഷാശാസ്ത്രം ഒരു സവിശേഷശാഖയായി ശ്രദ്ധിക്കപ്പെട്ടത്. അതിനും വളരെ മുമ്പുതന്നെ പ്രസ്തുതസങ്കല്പനം പ്രചരിച്ചിരുന്നു. എഡ്വേർഡ് സപീർ ഒരു നൂറ്റാണ്ടു മുൻപുതന്നെ 'ലാബ്ലെങ്ങ് ആൻഡ് എൻവയോൺമെന്റ്' എന്ന പ്രബന്ധത്തിൽ ഭാഷയുടെ പരിസ്ഥിതികബന്ധത്തെപ്പറ്റി അഭിസംബോധന ചെയ്തിരുന്നു. ഒരുവന്റെ ഭാഷയെ രൂപപ്പെടുത്തുന്നതിൽ ചുറ്റുപാടുകൾ നിർണ്ണായകപങ്കു വഹിക്കുന്നു എന്നതിൽ സപീറിനു രണ്ടു പക്ഷമില്ലായിരുന്നു. ഒരു സമൂഹത്തിന്റെ പ്രതികരണങ്ങളും വിനിമയങ്ങളും പ്രധാനമായും ഭാഷയിലൂടെയാകുന്നതിനാൽ ചുറ്റുപാടുകളുമായി ബന്ധപ്പെട്ട ആവിഷ്കാരങ്ങളായി അവയെ കാണേണ്ടതുണ്ട്. വിദേശത്തുള്ള സ്വന്തം അമ്മയെ ആന്റി എന്നും ലാളിക്കുന്ന വേലക്കാരിയെ അമ്മ എന്നും കൊച്ചു കുഞ്ഞുങ്ങൾ വിളിക്കാൻ സാധ്യതയുണ്ട്. ഉപ്പു നുണയാത്തവന് പ്രസ്തുതധ്വനി ഒരു തരത്തിലുമുള്ള അനുഭവസ്മൃതിയും ഉണ്ടാക്കില്ല. ഭാഷ അതുകൊണ്ട് അടുപ്പത്തിന്റെയും അനുഭവത്തിന്റെയുമൊക്കെ ആവിഷ്കാരമാണ്. അടുപ്പം കൂടുമ്പോൾ പുതിയപദങ്ങൾ പോലും ഉണ്ടായെന്നു വരാം; പ്രത്യേകിച്ച് പ്രണയകാര്യങ്ങളിൽ. ചക്കര, പഞ്ചാര, തേൻ തുടങ്ങിയവ തനിരൂപമങ്ങളായി (Unique Morpheme) പ്രത്യക്ഷപ്പെടുന്ന ഒരു സാഹചര്യവും അതാണല്ലോ. ശൈത്യരാജ്യങ്ങളിലെ ഭാഷയും ഉഷ്ണമേഖലയിലെ ഭാഷയും തമ്മിൽ നിരവധി വ്യത്യാസങ്ങൾ കാണാൻ കഴിയും. സ്വന്തതലത്തിലുള്ള ഭേദങ്ങളായിരിക്കും പെട്ടെന്നു തിരിച്ചറിയപ്പെടുക. വന്യസാഹചര്യമുള്ള മലമ്പ്രദേശങ്ങളിൽ പരുക്കൻ സ്വനങ്ങൾക്കും സൗമ്യസാഹചര്യമുള്ള സമതലങ്ങളിൽ മൃദുസ്വനങ്ങൾക്കും പ്രാമുഖ്യമുണ്ടാകുമെന്നാണ് സപീറിന്റെ നിരീക്ഷണം. (2001:18) എന്നാൽ ഇത്തരം നിരീക്ഷണങ്ങളെ കേന്ദ്രീകരിച്ചുള്ള തുടർഗവേഷണങ്ങളൊന്നും പിന്നീട് കാര്യമായി നടന്നില്ല. അതേസമയം സമീപകാലത്ത് പരിസ്ഥിതികഭാഷാചിന്തകൾ സജീവമാകുന്നതിനു പിന്നിൽ പൊതുവായ പരിസ്ഥിതിക അവബോധവുമുണ്ട്. ഭൂമിയുടെ വീണ്ടെടുപ്പിനു സജ്ജമാകുന്ന തരത്തിൽ എല്ലാ വിജ്ഞാനമേഖലകളും ഹരിതമയമാകുന്ന സാഹചര്യമിന്നുണ്ട്. ഹരിതഭൗതികവും ഹരിതരസതന്ത്രവും ഹരിതസാമ്പത്തികശാസ്ത്രവും എല്ലാം ഇന്ന് സങ്കല്പമല്ല.



ഗുണം എന്ന പരികല്പന
 കുമാരനാശാന്റെ കവിതകളുടെ
 ആഖ്യാനത്തെ രണ്ടു വിധത്തിൽ
 സ്വാധീനിക്കുന്നുണ്ട്. ഒന്ന്:
 ഗുണികൾക്ക് ഭൂമിയിൽ
 ദീർഘായുസ്സില്ല. രണ്ട്: ഗുണികളെ
 ലോകം കാരണമില്ലാതെ
 അപവദിക്കുന്നു.
 ഗുണപുഷ്പകലയുടെ
 ഇരിപ്പിടമായ ഒരു വസ്തുവിനോ
 വ്യക്തിക്കോ ഹൃസ്വജീവിതം മാത്രമേ
 വിധിച്ചിട്ടുള്ളൂ എന്ന് ആശാന്റെ
 കാവ്യാദർശം സൂക്തമായ ഒരു
 വിചിന്തനം നിർമ്മിച്ചിട്ടുണ്ട്.



കേരള സർക്കാർ
 സാംസ്കാരികവകുപ്പ്



സാഹിത്യ ലോകം

വാല്യം 50 | ലക്കം 3 • 2021 മെയ്-ജൂൺ

സാഹിത്യലോകം | 2021 മെയ്-ജൂൺ | വാല്യം 50 | ലക്കം 3



കുമാരനാശാന്റെ പിന്തുടരുമ്പോൾ

അകത്തും പുറത്തും: പെൺകഥകളിലെ വീട്ടുചിത്രങ്ങൾ

വീട് എന്ന മുഖ്യധാരാവിഷ്കാരം, ഭൗതികമായ നിർമ്മിതിയിലും അനുഭവലോകം എന്ന നിലയിലും മൂല്യസങ്കല്പനങ്ങളുടെ സൂക്ഷിപ്പുകേന്ദ്രം എന്ന രീതിയിലും സ്ത്രീരചനകളിൽ പുനരാഖ്യാനത്തിന് വിധേയമാകുന്നുണ്ട്. അധികാരത്തിന്റെ ബലാബലം പ്രത്യക്ഷമായും പരോക്ഷമായും ഓരോ അടരുകളിലും നിലകൊള്ളുന്ന ഇടമെന്ന നിലയിലാണ് വീട് പുനർനിർമ്മിക്കപ്പെടുന്നത്. അന്നുവരെ ആദർശവൽക്കരണത്തിന്റെയോ നിലവൽക്കരണത്തിന്റെയോ മേലങ്കി അണിഞ്ഞു പ്രത്യക്ഷമായിരുന്ന വീടനുഭവങ്ങൾക്ക് സ്ത്രീപക്ഷത്തുള്ള അനുഭവാവിഷ്കാരം വ്യത്യസ്തമാനം പകർന്നു. “ഘടനാപരമായ അധികാരബന്ധങ്ങളിലൂടെയും ക്രമീകരണങ്ങളിലൂടെയും ഒരു സംഘം മറ്റൊരു സംഘത്തെ നിയന്ത്രിക്കുവാൻ ഇനിയുന്നതിനെ രാഷ്ട്രീയം എന്ന വ്യാഖ്യാനിക്കാവുന്നതാണ്” (കേറ്റ് മില്ലറ്റ്, 1970:23) എന്ന് ഹൈംഗികരാഷ്ട്രീയത്തെ വിശകലനം ചെയ്യുന്ന വേളയിൽ കേറ്റ് മില്ലറ്റ് വ്യക്തമാക്കുന്നുണ്ട്. ആൺകോയ്മാധിഷ്ഠിത സമൂഹം സ്ത്രീജീവിതത്തിനുമേൽ നിലനിർത്തിയിരുന്ന അധികാരരാഷ്ട്രീയത്തിനോടുള്ള വിമർശനാത്മക സമീപനത്തെ പല നിലകളിൽ നിന്നുകൊണ്ട് അവതരിപ്പിക്കുവാൻ സ്ത്രീരചനകൾക്ക് സാധിച്ചിട്ടുണ്ടെന്ന് തെരഞ്ഞെടുത്ത

സ്ത്രീകഥകളെ മുൻനിർത്തി വിശകലനം ചെയ്യുവാനാണ് ഈ പഠനത്തിലൂടെ ശ്രമിക്കുന്നത്.



കെ. സരസ്വതിയമ്മ

സ്ത്രീയുടെ സർഗ്ഗാത്മകവാങ്ങരെയും സ്വാതന്ത്ര്യബോധത്തെയും ഞെരുക്കുന്ന വീട്ടുകളെ തുറന്നുകാണിക്കുന്ന ലളിതാംബിക അന്തർജ്ജനത്തിന്റെ ‘ഇത് ആശാസ്യമാണോ’ എന്ന കഥ 1935-ൽ രചിച്ചതാണ്. വിപ്ലവാവേശത്തിൽ നവവധുവിനെ പരിഷ്കൃതവേഷധാരിണിയായാക്കുകയും പ്രസംഗവേദികളിൽ കൊണ്ടുവരികയും അതുവഴി പത്രവാർത്തകളിൽ ഇടം നേടുകയും ചെയ്ത തളിപ്പറമ്പത്തു മനയിലെ എൻ.പി.യും ഭർത്തുപ്രേരണയാൽ സ്വാതന്ത്ര്യബോധം ആർജ്ജിച്ചവളാണെങ്കിലും അതിന്റെ തീക്കനൽ കെട്ടടങ്ങാതെ ഉള്ളിൽ സൂക്ഷിക്കുന്ന പാപ്പിഅന്തർജ്ജനവുമാണ് പ്രധാന കഥാപാത്രങ്ങൾ. ആദ്യാവേശം കെട്ടടങ്ങിയപ്പോൾ തന്റെ ഭാര്യ യാഥാസ്ഥിതികമട്ടിൽ വീട്ടിലൊതുങ്ങിക്കൂടണമെന്നു തിരിച്ചുചിന്തിക്കുന്ന ആളാണ് എൻ.പി. പരിഷ്കാരദ്രവം വരുത്തിവെച്ച വിനയെക്കുറിച്ച് നിരന്തരം പൊറ്റുപൊറ്റുക്കുന്ന മുത്തശ്ശിയുടെ ശബ്ദവും ഈ വീട്ടകത്തിലെ സംഭാഷണങ്ങൾക്ക് പശ്ചാത്തലമാകുന്നുണ്ട്. യോഗക്ഷേമ പത്രത്തിൽ വന്ന ഭർത്താവിന്റെ ലേഖനത്തിലെ സ്ത്രീവിരുദ്ധമായ ആശയത്തിന് പേരുവയ്ക്കാതെ പാപ്പി എഴുതിയ മറുപടി ഒരു പുരുഷനെഴുതിയതാണെന്നു സങ്കല്പിച്ച് എൻ.പി. മറുപടി എഴുതുന്നു. സ്ത്രീക്ക് പരസഹായമില്ലാതെ സ്വയം പേനയെടുക്കുവാൻ കഴിവില്ലെന്നാണ് അയാളുടെ ന്യായം. ഉച്ചയുറക്കം കഴിഞ്ഞുവരുമ്പോൾ കഞ്ഞിന് മൂലകൊടുത്തുകൊണ്ടിരുന്ന ഭാര്യ കാപ്പി തയ്യാറാക്കിയില്ല എന്നതിന്റെ പേരിലുള്ള വീട്ടുകലഹത്തിൽ നിന്നാണ് കഥ ആരംഭിക്കുന്നത്. അന്തർജ്ജനത്തിന് മറുപടി എഴുതാനാകാതെ വലയുന്ന ഭർത്താവിന്റെ മാനം കാത്തുസൂക്ഷിക്കാൻ, ഭാര്യ തന്നെ മറുപടി തയ്യാറാക്കുന്നതും സത്യം തിരിച്ചറിഞ്ഞ് ആ മറുപടി കിറിക്കളഞ്ഞ് അന്തർജ്ജനങ്ങളുടെ ജയമാണ് തന്റെയും ജയമെന്നു പ്രഖ്യാപിക്കുകയും ചെയ്യുന്നിടത്താണ് കഥ അവസാനിക്കുന്നത്. കസേരയിലിരുന്ന് കടലാസു വായിക്കുന്ന സ്ത്രീ, കപ്പായമിട്ട സ്ത്രീ, പേനകൊണ്ടെഴുതുന്ന സ്ത്രീ എന്നീ വീട്ടുകഥകളിലും സഭയിൽ സംസാരിക്കുന്ന സ്ത്രീ, യാത്ര ചെയ്യുന്ന സ്ത്രീ എന്നീ വീടിനു പുറത്തുള്ള ചിത്രങ്ങളും കഥയിൽ കടന്നുവരുന്നുണ്ട്. 1950-കളിൽ രചിച്ച ഈ കഥ മുന്നോട്ടുവെച്ച പ്രശ്നവൽക്കരിച്ച വീട്ടുചിത്രങ്ങൾ സമകാലത്തും പ്രസക്തമാണ്.



VOL. I, No.6
2021 JULY-DECEMBER
1197 മിഥുനം-വൃശ്ചികം



CHENGAZHI

Included in UGC-CARE list

A peer reviewed research journal



Chengazhi

Included in UGC Care list

A peer reviewed research journal

Bilingual, Half Yearly

Published in India by

Department of Malayalam, Payyanur Centre,

Sree Sankaracharya University of Sanskrit, Kalady

Volume 1, Issue-6, July-December, 2021

Registered with The Registrar of Newspapers for India

No.KERBIL/2019/77103.

ISSN: 2581-9585.

Licensed under Creative Commons Share Alike license.

Book & Cover Design

Ashokkumar P.K.

Typeset using unicode Malayalam Fonts (smc.org.in, rachana.org)

Data entry using Malayalam Unicode by:

Ms. Philomina Mathew, Ms. Kavitha E.

Proof: Smitha K.P.

Cover Photo: Cyril Mathew

Price ₹550/-

Printed and published by Dr. V. Lissy Mathew, on behalf of Department of Malayalam, Sree Sankaracharya University of Sanskrit, Regional Centre, Payyanur, Printed at Varnamudra Graphics, Pm. XX 402 A5, Perumba, Payyanur, Published from: Department of Malayalam, Sree Sankaracharya University of Sanskrit, Regional Centre, Payyanur, Edat P.O., Kannur District, Kerala, 670327. Editor Dr. V. Lissy Mathew

ഉള്ളടക്കം

സാങ്കേതികമാനവികവിജ്ഞാനകാലത്തെ മലയാളഗവേഷണം സന്തോഷ് എച്ച്.കെ.	9
ഹോർത്തൂസ് മലബാറിക്കസ് മുതൽ എൽ നിനോ വരെ ജസ്റ്റിൻ മാത്യു	21
പത്തൊമ്പതാം നൂറ്റാണ്ടിലെ ഇന്ത്യ: കൊളോണിയൽ ഭാഷാനയങ്ങളും ഭാഷാസൂത്രണവും രാജേന്ദ്രൻ എടത്തുംകര,	29
എൻ.വി.യും കവിയുടെ കലാതന്ത്രവും പി.പി. പ്രകാശൻ	43
സൈബർ ഭാഷാശാസ്ത്രം: ഒരു ആമുഖം ജോസ് കെ. മാനവൽ	53
ബിരുദലതലത്തിലെ ഇംഗ്ലീഷ് ഭാഷാപഠനം നജീബ് പി.എം.; ഷീബ കെ.	62
സംസ്കാരത്തിന്റെ അകപ്പറക്കാഴ്ചകൾ ശ്രീശൈലം ഉണ്ണിക്കൃഷ്ണൻ	72
കുടുംബിനി: സ്ഥാപനവും സംഘർഷവും ആർ. രാജശ്രീ	77
ആധുനികതയുടെ വിലാപങ്ങൾ: പ്രരോദനത്തിലെ ചരമാനന്തരചിന്തകൾ സജീവ് പി.വി.	85
പുരാവസ്തു ശാസ്ത്രത്തിന്റെ ചരിത്രവും സ്വഭാവവും തോമസ് സ്റ്റീവ്	94
അറബി മലയാളവും സൂഫിസവും അബ്ദുൾ ഗഹൂർ പി.	101
പുതുകഥകളിലെ നവമാനവിക ഭാവനകൾ: ലിജി എൻ.	111
കവിയുടെ വർത്തമാനങ്ങൾ: പ്ലമേനമ്മായിയെ മുൻനിർത്തി ഒരു പഠനം എൻ. രജനി	118
ഭാഷയും ദേശവും ദേശീയതയും പത്മനാഭൻ എം.വി.	127
ക്രിയാരൂപങ്ങളിലെ കർതൃത്വവിവക്ഷകൾ അഞ്ജു മാത്യൂസ്	132
കന്യൂട്ടേഷണൽ ഫോക്‌ലോറിസ്റ്റിക്ലും ഫോക്‌ലോർ പഠനത്തിന്റെ ഭാവിയും വിഷ്ണു രവി	138

സ്വാതന്ത്ര്യനിരാസത്തിന്റെ മനഃശാസ്ത്രം പ്രിയദർശൻ ഐ.	145
നാടോടിസംസ്കൃതിയുടെ ആഖ്യാനം 'കർമ്മബന്ധങ്ങളുടെ നൂലിഴ'യിൽ രാഗിണി ഇ.വി.	149
തോറ്റം പാട്ടുകളുടെ നിർമ്മിതിയും വടക്കെ മലബാറിലെ നാട്ടെഴുത്തച്ഛൻമാരും പ്രജിത പി.	156
സാഹിത്യ സിദ്ധാന്തങ്ങളുടെ ലയനം താര ഗംഗാധരൻ	163
കപ്പൽ എന്ന രൂപകം കപ്പപ്പാട്ടിൽ നൂറ വി.	171
സമൂഹമാധ്യമത്തിലെ മീനറിവുകൾ മുനവൂർ ഹാനിഫ് ടി.ടി.	179
അധീശത്വസ്ഥാപനവും മതരാഷ്ട്രീയവും ഷിമി പോൾ ബേബി	185
ശ്രീനാരായണ ദർശനം: ഗുരുവിന്റെ കൃതികളെ മുൻനിർത്തിയുള്ള അന്വേഷണം അമൽ സി രാജൻ	194
ക്ഷേത്രപ്രവേശനാവകാശസമത്വവും, പൗരസ്വാതന്ത്ര്യവും നീതു. വി. എസ്.	201
പശ്ചിമകൊച്ചിയിലെ ഭാഷാന്യൂനപക്ഷങ്ങൾ സിനി ജി.പി.	210
ഗാലവചരിതം: പാഠാന്തരങ്ങളിലൂടെ അജിത ടി.എസ്.	219
ആഖ്യാന വിന്യാസം സിനിമയിലും നോവലിലും സുധ മാത്യുജോട്ട്	228
ഭരണകൂടഹിംസയുടെ സാഹിത്യസന്ദർഭങ്ങൾ നൗഷാദ് എസ്.	233
കൊളോണിയൽ മലബാറിലെ ബ്രിട്ടീഷ് പട്ടാളക്യാമ്പും സ്പോട്സും രമ്യ കെ.	239
'ചൈത്രപ്രഭാവ'ത്തിന്റെ കാലികപ്രസക്തി സുമി ജോൺ കെ.ജെ.	243
നവകവിതയും ഭാവനാലോകവും എ.എസ്. പ്രതീഷ്	248

അധിശത്വസ്ഥാപനവും മതരാഷ്ട്രീയവും ഉദയംപേരൂർ സൂനഹദോസിന്റെ കാനോനുകളിൽ ഷിമി പോൾ ബേബി

അസി. പ്രൊഫസർ, യു.സി. കോളേജ്, ആലുവ.

പോർച്ചുഗീസ് അധിനിവേശം കേരളത്തിന്റെ സാംസ്കാരികചരിത്രത്തിൽ നടത്തിയ നിർണ്ണായകമായ ഇടപെടലുകളുടെ രേഖയാണ് ഉദയംപേരൂർ സൂനഹദോസിന്റെ കാനോനുകൾ. കച്ചവടബന്ധത്തിലൂടെയും മറ്റുമായി കേരളത്തിലെത്തിയ വ്യത്യസ്തമതവിഭാഗങ്ങളിലെ ജനങ്ങൾ സഹവർത്തിത്തത്തോടെ നിലകൊള്ളുകയും മതവീക്ഷണസങ്കീർണ്ണതയെ സ്വതന്ത്രമായി പ്രവർത്തിക്കുകയും ചെയ്തിരുന്ന സാംസ്കാരിക സാഹചര്യമാണ് ക്രിസ്തുവർഷം ആദ്യശതകങ്ങൾ മുതൽ കേരളത്തിൽ നിലനിന്നത്. മതവീക്ഷണ വൈവിധ്യങ്ങൾ അത്രയൊന്നും തന്നെ ഗൗരവമായി കണക്കാക്കിയിരുന്നില്ല അക്കാലത്തെ നാട്ടുഭരണാധികാരികൾ. മതവൈവിധ്യത്തിന്റെയും മതമേളനത്തിന്റെയും തെളിവുകൾ കേരളീയസമൂഹം ഇതരമതവിശ്വാസികളോട് പുലർത്തിയ തുല്യബഹുമാനബോധത്തിന്റെ മാതൃകകളാണ്.¹ പൊതുസമൂഹവുമായുള്ള നിരന്തര സമ്പർക്കത്തിലൂടെ വളർന്ന കേരളക്രൈസ്തവർ വിശ്വാസത്തിൽ ക്രിസ്തുമാർഗ്ഗത്തെ പിന്തുടർന്നു. 'മാർത്തോമ്മായുടെ മാർഗ്ഗവും വഴിപാടും' എന്ന കുറമൊഴിയായിരുന്നു വിശ്വാസസംബന്ധമായി അവർ പകർന്നുപോന്നത്. (സ്റ്റീവിയ സക്കറിയ, ഉദയംപേരൂർ സൂനഹദോസിന്റെ കാനോനുകൾ, 1994: 11) ക്രിസ്തുവിന്റെ പിന്തുടർച്ചാപാതയുടെ നേർവഴിയായിരുന്നു ഈ കുറമൊഴി. അതോടൊപ്പം മദ്ധ്യപൗരസ്ത്യദേശത്തെ ക്രൈസ്തവസഭകളുമായി സുദൃഢ ബന്ധം കേരളക്രൈസ്തവർ നിലനിർത്തിയിരുന്നതിന്റെ തെളിവുകൾ ഉദയംപേരൂർ കാനോനയിലെ രണ്ടാംയോഗവിചാരം 8-ാം നിയമാവലിയിലും 19-ാം നിയമാവലിയിലും വ്യക്തമാണ് (ഉ.സു.കാ., 1994: 133, 143). ഭരണകാര്യങ്ങളിൽ സ്വയംഭരണനിലപാട് സ്വീകരിച്ചും മദ്ധ്യപൗരസ്ത്യദേശത്തെ ക്രൈസ്തവ ആത്മീയാചാര്യന്മാരുമായി സൗഹാർദ്ദബന്ധം നിലനിർത്തി ആത്മീയകാര്യങ്ങൾ നിർവ്വഹിച്ചും നിലനിന്നുപോന്ന കേരളക്രൈസ്തവർ 16-ാം നൂറ്റാണ്ടുവരെ യൂറോപ്പിനെ കേന്ദ്രീകരിക്കുന്ന ക്രൈസ്തവസഭയ്ക്ക് പുറത്തായിരുന്നു.

ക്രിസ്തുമതപ്രചാരണം സാമ്രാജ്യത്വ അജണ്ടയായി മിഷണറിമാരുടെ മേൽനോട്ടത്തിൽ കേരളത്തിലാരംഭിച്ചത് പോർച്ചുഗീസ് വരവോടെയാണ്. മദ്ധ്യകാല യൂറോപ്പിൽ മതവും സാമ്രാജ്യത്വവും തമ്മിൽ നടത്തിയ അഭേദ്യമായ കൂട്ടുകെട്ടുകൾ ഇതിൽ നിർണ്ണായക പങ്കുവഹിക്കുന്നുണ്ട്.

ലിംഗനീതിയും പരസ്യങ്ങളും

ഡോ. സിബു മോടയിൽ

ലിംഗപദവിയെക്കുറിച്ചുള്ള സംവാദം മുന്നോട്ടുവയ്ക്കുന്ന പ്രധാനപ്പെട്ട ഒരു ആശയമാണ് ലിംഗനീതി എന്നുള്ളത്. ലിംഗപദവി സാംസ്കാരികനിർമ്മിതിയാണെന്ന് നമുക്കറിയാം. പ്രസ്തുത നിർമ്മിതിയെ 'തുല്യത' എന്ന മാനകത്തിലൂടെ നാം വിശകലനം ചെയ്യുന്നതിന് കലയും സാഹിത്യവും രാഷ്ട്രീയവും എല്ലാം ഉപാധിയാക്കാം. പരസ്യങ്ങളിലെ ലിംഗനീതി മാത്രമാണ് ഈ പ്രബന്ധത്തിൽ വിശകലനം ചെയ്യുന്നത്. അതിൽത്തന്നെ സവിശേഷമായി പരാമർശിച്ചിരിക്കുന്നത് അച്ചടിമാധ്യമങ്ങളിലെ പരസ്യങ്ങളെക്കുറിച്ചാണ്.

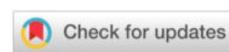
ലിംഗനീതി അട്ടിമറിക്കുക പരസ്യങ്ങളുടെ ലക്ഷ്യമായിരിക്കില്ല. കാരണം സാമ്പത്തിക ലക്ഷ്യങ്ങളായിരിക്കും പരസ്യങ്ങൾക്ക് പിന്നിൽ പ്രവർത്തിക്കുന്നത്. ആധുനിക മുതലാളിത്തം അതിന്റെ വിപണിയുടെ ഭാഗമായി ഉണ്ടാക്കിയ തന്ത്രപരമായ ഇടപെടലുകളാണ് പരസ്യമേഖലയെ സജീവമാക്കിയത്. നവോത്ഥാനകാലത്തെ പരസ്യങ്ങൾക്ക് ഉൽപ്പന്നപരിചയം എന്ന ദൗത്യം കൂടി നിർവ്വഹിക്കാനുണ്ടായിരുന്നു. ചായപ്പൊടിയുടെ പരസ്യത്തിൽ ചായ ഉണ്ടാക്കുന്ന വിധംകൂടി അന്ന് പ്രത്യേകിച്ച് സ്വാതന്ത്ര്യപൂർവ്വഘട്ടത്തിൽ നൽകിയിരുന്നു. ഇന്ത്യാ തേയിലയുടെ പരസ്യം ഉദാഹരണം.

പൂർവ്വപഠനങ്ങൾ

പരസ്യങ്ങളുമായി ബന്ധപ്പെട്ട പഠനങ്ങൾ ധാരാളം നടന്നുകഴിഞ്ഞിരിക്കുന്നു. പരസ്യകല പ്രലോഭനത്തിന്റെ മാർഗ്ഗം (പെരുന്ന കെ.ആർ.), പരസ്യങ്ങൾക്ക് പിന്നിലെ രഹസ്യങ്ങൾ (വർഗ്ഗീസ് ജോർജ്ജ് കണ്ണന്താനം), ശരീരി (സന്തോഷ് മാനിച്ചേരി), (Gender Advertisements (Goffman Erving) Reading Ads socially (Goldman Robert) Codes of Advertising Fetishism and Political economy of meaning (Jhally sut) തുടങ്ങിയവ ഏതാനും ഉദാഹരണങ്ങളാണ്.

ഉൽപ്പന്നം വിറ്റഴിക്കപ്പെടുക എന്ന ലക്ഷ്യത്തിലേക്ക് പരസ്യനിർമ്മാതാ

ഡോ. സിബു മോടയിൽ: ആലുവ യൂണിയൻ ക്രിസ്ത്യൻ കോളേജിൽ അദ്ധ്യാപകൻ. ദിക്കാരി, പണ്ടു സാറ്റുകളിച്ചപ്പോൾ, വെശനും വെഷമിച്ചു (കവിതാസമാഹാരങ്ങൾ), അരങ്ങു മുതൽ അഭ്രപാളി വരെ (ചലച്ചിത്രപഠനം), കത്തുന്ന കാലുകൾ (കവിതാപഠനം), ഭാഷാഭേദ നിഘണ്ടു, പ്രതീക നിഘണ്ടു (നിഘണ്ടു), ഭാഷ: നവീനപഠനവഴികൾ (എഡി.), സിനിമ: കലയും രാഷ്ട്രീയവും (എഡി.) തുടങ്ങിയ പുസ്തകങ്ങൾ രചിച്ചു.



RESEARCH ARTICLE

LCMS/MS analysis and evaluation of anti-inflammatory and antioxidant activities of the polyphenol fraction of *Litsea quinqueflora* (Dennst.) Suresh

Sumin Mary Jose & Anilkumar M*

Department of Botany, Union Christian College, Aluva 683 102, Kerala, India

*Email: drmakumar@gmail.com

ARTICLE HISTORY

Received: 01 May 2021
Accepted: 13 July 2021
Available online: 21 August 2021

KEYWORDS

ABTS
DPPH
Free radical scavenging
HPTLC
LCMS/MS
Protein denaturation

ABSTRACT

The main aim of the work was to scientifically prove the anti-inflammatory property of the polyphenol-rich fraction of hydro-alcoholic leaf extract of *Litsea quinqueflora* (Dennst.) Suresh by protein denaturation and free radical scavenging activity. The polyphenol-rich fraction of hydro-alcoholic leaf extract was obtained via acid-alkali hydrolysis, followed by fractionation with chloroform and ethyl acetate. HPTLC profiling of the finally obtained ethyl acetate fraction and consequent derivatisation with aluminium chloride revealed the presence of flavonoids in a more purified form. LCMS/MS analysis tentatively identified the presence of bioactive polyphenolic compounds such as gallocatechin, sinapic acid, pinocembrin, paeonol and umbelliferone in the separated fraction. The polyphenol-rich fraction of hydro-alcoholic extract of leaves showed anti-denaturing activity in heat-induced bovine serum albumin denaturation with an IC_{50} value of 23.59 $\mu\text{g/ml}$ and was statistically significant at 0.1% level. The antioxidant property of the polyphenol-rich fraction determined by its free radical scavenging ability against DPPH and ABTS showed IC_{50} values 122.98 and 135.44 $\mu\text{g/ml}$ respectively and was also statistically significant at 0.1% level. Hence, the traditional use of *Litsea quinqueflora* as an anti-inflammatory agent can be attributed to the presence of polyphenols.

Introduction

Plant-derived medicines attracted the attention of researchers due to the presence of different phytochemicals having a multitude of health benefits to humans (1). Among these phytochemicals, polyphenols are of much importance owing to their specific biological properties. They are the organic foods produced by plants as secondary metabolites. Polyphenols are involved in the physiological and other diverse functions such as lignification, growth, predator resistance etc. (2). These inevitable plant products play an important role in human health as they regulate metabolism, weight, cell proliferation and chronic diseases (3). Biological properties such as anti-inflammatory, immunomodulatory, antioxidant, cardioprotective and anticancer activities can be attributed to polyphenols (4). The diverse structure of phenolic compounds influences the anti-inflammatory activity of a drug. Even though a variety of non-steroidal anti-inflammatory drugs (NSAIDs) are available, natural phenolic compounds are also equally good and can inhibit the pro-inflammatory mediators such as interleukins, cyclooxygenase, lipoxigenase, nuclear factors etc. Traditional healers

could identify the efficacy of plant-derived compounds, and they used them widely even before the advent of allopathy drugs (5).

The genus *Litsea* belongs to the family Lauraceae, which possess various pharmacological properties and have been used in traditional medicines to treat influenza, stomachaches, inflammatory diseases, bruises, insect bites etc. (6). Phytochemical analysis of different *Litsea* species identified flavonoids and terpenoids as their major constituents (7). Flavonoids obtained from different *Litsea* species such as *Litsea cubeba* Pers., *Litsea glutinosa* (Loureiro) Robinson and *Litsea coreana* H. Lev. act as anti-inflammatory and antioxidant compounds and inhibited different inflammatory pathways (8). Flavonoids like pinocembrin chalcone and kaempferol 3,4'-di-O-L-rhamnopyranoside were isolated from the leaves of *Litsea fruticosa* (Hemsl.) Gamble through column chromatography (9). Leaves of *Litsea quinqueflora* (Dennst.) Suresh was selected as the test material in this study as its leaf paste has been frequently used by the local healers of Kerala as an anti-inflammatory drug. The anti-inflammatory property of crude methanolic extract of *L. quinqueflora* leaves was



Anti-inflammatory activity of endophytic bacterial isolates from *Emilia sonchifolia* (Linn.) DC.

Sithara K. Urumbil^a, Madhavan Nair Anilkumar^{b,*}

^a Department of Botany, Little Flower College, Guruvayoor, India

^b Cell Culture Lab, Department of Botany, Union Christian College, Aluva, Ernakulam, Pin-683 102, Kerala, India

ARTICLE INFO

Keywords:

Endophytes
Cyclooxygenase
Lipoxygenase
Carrageenan-induced paw oedema

ABSTRACT

Ethnopharmacological relevance: In the traditional medicine system, plants have been utilized as a rich source of anti-microbial, anti-inflammatory, anti-cancer, anti-viral and anti-oxidant compounds. The biological properties of plant-based drugs depend on their interaction with endophytes which persist as an important provider of bioactive secondary metabolites. Bacterial endophytes secrete anti-inflammatory molecules whose activity can be the base for the anti-inflammatory property of the plant.

Aim of the study: During the screening of endophytes from *Emilia sonchifolia*, we isolated six different bacteria whose potential as the sources of anti-inflammatory compounds have been aimed at in this study.

Materials and methods: Anti-inflammatory activity of the ethyl acetate extract of endophytes was studied by both *in vitro* and *in vivo* analyses. *In vitro* study was done using protein denaturation, COX, LOX, iNOS, myeloperoxidase and nitric oxide assays and *in vivo* analysis was carried out by carrageenan-induced and formalin-induced paw oedema tests. The expression level of anti-inflammatory genes such as COX-2 and NfκB was confirmed by real time PCR.

Results: We confirmed anti-inflammatory activity of the ethyl acetate extract of bacterial endophytes of *E sonchifolia* by both *in vitro* and *in vivo* experiments. Carrageenan- and formalin-induced inflammations in mice were effectively reduced by the administration of the bacterial extract. Among the isolates, strain ES1 effectively reduced inflammation. Gene expression studies confirmed reduction in the expression of COX-2 and NfκB genes in the presence of ES1 extract.

Conclusion: The present investigation demonstrated the anti-inflammatory property of the isolated bacterial endophyte ES1 (*Bacillus subtilis* strain-MG 692780) and thus justifies the possible role of endophytes in contributing anti-inflammatory property to *E sonchifolia* which is ethno-botanically important as a source of anti-inflammatory drug.

1. Introduction

The identification of bioactive compounds from natural sources is gaining more significance due to their decreased side effects. The traditional medicinal systems in India employ plant-based formulations for the treatment of a wide range of diseases (Pandey et al., 2013). Plants have been used as medicines either directly or after processing, right from the ancient period. Therefore, the widespread screening of medicinal plants was in progress to find out the scientific bases for their indigenous medicinal applications (Souissi et al., 2020). Plant metabolism has been studied in detail for the identification of new and novel compounds with a wide range of applications. Many compounds with

pharmaceutical applications were produced on a large scale with the help of new gene modification techniques. Microorganisms associated with plants are usually monitored for their plant-growth-promotion activities (Vacheron et al., 2013; Zhu and She, 2018; Urumbil and Anilkumar, 2019). However, of late the involvement of these microorganisms in plant-growth-promotion has captured the attention of researchers. Endophytes can offer resistance against pathogen attack and enhance the defense mechanisms of the host by the production of different compounds. In fact, the search for plant-derived anti-inflammatory compounds produced by an endophytic microflora is a new area of research. The identification of chemo-preventives from natural resources in treating many inflammatory disorders including cancer is of

* Corresponding author.

E-mail address: manilkumar@uccollege.edu.in (M.N. Anilkumar).

<https://doi.org/10.1016/j.jep.2021.114517>

Received 14 May 2021; Received in revised form 8 August 2021; Accepted 9 August 2021

Available online 10 August 2021

0378-8741/© 2021 Elsevier B.V. All rights reserved.



RESEARCH ARTICLE (SPECIAL ISSUE)

Metagenomic insights into plant growth promoting genes inherent in bacterial endophytes of *Emilia sonchifolia* (Linn.) DC

Sithara K. Urumbil¹ & Anilkumar M^{2*}

¹ Department of Botany, Little Flower College, Guruvayoor 680 103, India

² Cell Culture Lab, Department of Botany, Union Christian College, Aluva, Ernakulam 683 102, India

*Email: drmakumar@gmail.com



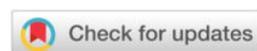
ARTICLE HISTORY

Received: 06 July 2021

Accepted: 17 September 2021

Available online

Version 1.0 : 09 December 2021



Additional information

Peer review: Publisher thanks Sectional Editor and the other anonymous reviewers for their contribution to the peer review of this work.

Reprints & permissions information is available at https://horizonepublishing.com/journals/index.php/PST/open_access_policy

Publisher's Note: Horizon e-Publishing Group remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Indexing: Plant Science Today, published by Horizon e-Publishing Group, is covered by Scopus, Web of Science, BIOSIS Previews, Clarivate Analytics, etc. See https://horizonepublishing.com/journals/index.php/PST/indexing_abstracting

Copyright: © The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited (<https://creativecommons.org/licenses/by/4.0/>)

CITE THIS ARTICLE

Urumbil S K, Anilkumar M. Metagenomic insights into plant growth promoting genes inherent in bacterial endophytes of *Emilia sonchifolia* (Linn.) DC. Plant Science Today. 2021;8(sp1): 6–16. <https://doi.org/10.14719/pst.1357>

Abstract

Studies on the genome of endophytes reveal the metabolic potential of endophytic microbiome including both culturable and unculturable fractions. The metagenome analysis through the Illumina HiSeq platform gives access to the genetic data encrypted for the molecular machinery, which takes part in plant growth promotion activity of the endophyte in various aspects including production of plant growth hormones and enhancing nutrient availability for the host plant. The present work was undertaken to identify the genes involved in plant growth promotion activities from the endophytes of *Emilia sonchifolia* (Linn.) DC. through metagenome analysis. Metagenomic studies include the analysis of functional annotations which aid in the detection of biocatalysts taking part in the metabolic pathway of host plants. The annotations of expressed genes in different databases like NCBI Nr, KEGG, eggNOG and CAZy resulted in enlisting the vast array of information on the genetic diversity of the endophytic microbiome. The metagenome analysis of endophytic bacteria from the medicinal plant *E. sonchifolia* unveiled characteristic functional genes involved in plant growth promotion such as nitrogen metabolism (*nif*) and siderophore production (enterobactin category), *ipdC* and *tnaA* (IAA producing), ACC deaminase coding genes (regulation of elevated ethylene levels in host tissues), Mo-Nitrogenase, nitrous-oxide reductase (*nosZ*), nitrate reductase (*narG*, *napA*), nitrite reductase (*nirD*) (nutrient assimilation and absorption) enterobactin siderophore synthetase components F and D and acid phosphatase genes. This clearly explains the effective plant-microbe relationship and the role of bacterial endophytic microbes in regulating the growth of host plants.

Keywords

Functional annotation, Gene prediction, Metagenome analysis, Nutrient uptake, Siderophores

Introduction

Endophytes are non-pathogenic microbiome occupying internally in plant tissues and occupy in many plants. Many researchers screened the endophytic microbes associated with medicinal plants for analysing the active and passive role of these microorganisms in the synthesis of host-derived bioactive compounds (1, 2). Its multilevel interactions like plant-microbe, microbe-microbe, and microbe-environment enhanced the complexity of endophytic microbiome analysis (3). The identification of closely related endophytic microbes and their functional genes becomes difficult because of their genome plasticity (4).

Recent developments in molecular biology and metagenome analy-

Empire Drink and Beverage Culture : TEA

- Dr. Sebastian Joseph

Associate Professor and Research Guide, PG
Dept. of History, UC College, Aluva,
Ernakulam, Kerala.

- Jijo Jayaraj

Assistant Professor on Contract, PG
Department of History, Pavanatma College,
Murickassery, Idukki, Kerala.

Summary :

The tea History is one of the most memorable in the history of the world. The production and marketing of tea led to the imperialism. Many regions in Asia and Africa were colonized after the tea trade. Here is a look at the history of how tea was traded, marketed and how the plant tea became a tool of the empire around the world is inquired by the article.

Keywords : Tea, Medicine, Beverage, Tea culture, Tea Imperialism, Empire, Great Britain

Introduction :

Tea as everyone knows is a global beverage now. Tea has got a unique history which has caused deep historical changes all around the world. There is no other drink that has changed the history of the world. The origin of the plant Tea is in China and the Chinese were the first to show the world the use of the tea. Thus the drink called tea came before the world and it was used as a medicine. But the tea trade was not first started by the Chinese but by the Portuguese. The tea business was then run by the East India Company. The drink quickly became popular throughout Europe as tea became popular. Tea shops have sprung up all over the Europe and tea has become part of a culture. As the famous Post Modern historian Habermas said, tea culture and the tea shops become a public space in Europe. The educated middleclass of Europe used to come to the tea

shops and discussed and decided on things in general and political matters so that the tea shops in Europe as a public space.

But the turning point in history with regard to tea came with the passing of the Charter Act of 1833. With the Charter Act China stopped the monopoly trade with East India Company. This later became a milestone in the history of the world. The tea plant became a cause for imperialistic trade. After the industrial revolution there were many wealthy families in Europe. It was an opportunity for them to invest in many colonies and make profit. The charter Act gave every citizen the right to invest in any British colony. In this way tea production began around the world and thus colonized the world. This imperialism spread in India as well as in other parts of the world. Alfred Crosby calls this imperialization through a plant as 'plant imperialism'.

Origin of Tea - The History :

The tea, camellia has been known to man for a long time. It has been cultivated by the Chinese people for more than two thousand years. It has been cultivated by the Chinese people not on large plantations, but in thousands of small plots. Thus the Chinese were well familiar with the tea plant and its value. The origin of the word 'tea' goes to China. The Chinese call it as 'kia'. As far as it is known, it was during the course of the 6th Century AD that the name evolved to 'cha'. When it arrived

Spoken Histories on Periyar : River, Life World and Memories

Thara V M.

A History Student, Savitribai Phule
Pune University,
Pune.

- Dr. Sebastian Joseph

Associate Professor and Research Guide,
PG Dept. of History, UC College, Aluva,
Ernakulam, Kerala.

Summary :

Rivers as they flow through time, leave behind many tales imprinting in the minds of people many memories that outlive time, these memories may be autobiographical or collective in terms of their association with the river. When people encounter with a river in their day to day life, it becomes so much a part of their life that they take it for granted. The river takes shape to form an indispensable slice of an individual's existence and the individual being unaware of it. They would feel for the river only when their access to it seems to be disturbed due to many reasons which can be natural as well as manmade, with the latter weighing heavily. Periyar, a perennial river that is often known as the life line of Kerala when taken into the above mentioned context talks about many memories through the people who experienced and felt the river.

Keywords : Periyar, River, Memories, Life world

Introduction :

The testimonies of people in the late fifties and early eighties and who lived on the banks of the river in and around Aluva (inclusive of Manappuram, Kottarakadav, Kunjunnikkara, Uliyanoor, Elookkara, Veliyathunadu, Kacherikadav and Desam); gave mixed emotions of enthusiasm when talking about the good old days of the river, their proud in being an accompanist of the river in its zenith, the

adventure they had when the river was furious and more feelings erupted endlessly. Memories when taken, recorded, analysed and interpreted in a systematic way through conducting interviews or conversations with those people (individually or collectively) who were not part of that highly lime lighted 'histories', but was part in making their own in turn helps in culling out those histories that formerly escaped notice and were overlooked in historical narratives.

By involving in a casual conversation with these people actually lends a heap of varied experiences, opinions and observations through which they lived, which consecutively aids in the reconstruction of those chapters of history that have been torn out and considered nugatory as a source in retrospection. Memories may not be factual but it can be relied in underpinning and scooping out the actual and unheard voices of the ordinary people whose spoken expressions to a degree are considered to be fictitious accounts of the past by historians, who regard written documents as immutable and hence objective. This paper through hermeneutic analysis tries to glean out the embedded history in the interviews to bring out the relationship that Periyar and the interviewees had.

Sites of River, Manappuram and the Nurtured Life World :

Periyar, as a river has got varied adjectives and meanings in accordance with the memories of people about the river. The river was different

Temples in the Social Formation of A Settlement - Case Study

- Dr. Sebastian Joseph & - Nisha Ann Jacob

Abstract :

In this paper the role of temples as centre of redistribution and resource in the making of the settlement of Kottayam has been traced. Social economic and cultural history of the temples determined the relations of production. The paper made an enquiry into the role of temple as centre of redistribution and resources in the social transformation of a settlement. The multi-dimensional perspectives of temples, land holding rights and the management of agriculture shows the mode of production. Majority of the land were owned by the Brahmins and temples as is consolidated from settlement records. Specialised working classes mobilised and redistributed resources. Exchange centres promoted trade. Increase in the number of angadis showed the surplus in production. Temple centred economy did contribute to the making of Kottayam. The transition from agricultural mode of production to feudal mode of production can be traced. The trade and the exchange has not been dealt in detail. Temples and Kavu played an important role in the making of the settlement of Kottayam.

City morphology in Asian countries is believed to have been influenced by its ceremonial character, the centre being marked by a monumental building, either religious or political. Religion does not mean the mere existence of beliefs in the other world or cult practices. It is that point of development in which a formalised system and practice plays

an important part in the process of transformation of landscape. Through institutional means, it enables a certain politico-religious elite to command priority and exercise authority. Temple acts as an institutional focus. Temple was invariably a royal project, both for legitimation of political authority and as an institution of integration, mobilisation, and redistribution of resources. The pattern of social dominances reflected in the architectural components of the temple complex, establish it as a centre of politico-cultural regions. The growth of angadis and the transport of goods across various production regions was an inevitable accompaniment of the nature of production. The growth of temples further developed this process as the temples were major consumers not only of local products but goods brought through overseas trade networks. The development of temples in various production centres, not only helped in the redistribution of commodities, but also provided vital linkages in the relationship of the production centres with the trade process.

Brahmins flowed to Kerala after AD 438 which led to a process of Brahminization. Their social formation was hierarchical in nature with caste laws for governing different communities in a hierarchical order. In the caste society Brahmins were at the top and all others are at a lower social order. In Brahminization their hierarchical nature was imposed on Kerala society. Local chieftains were promoted to Kshtriya status by the Brahmin priests. Syrian Christians and Muslims played the role of

Pandemics and the Colonial State in India : Politics of Contagionism

- Lijo Sebastian

Assistant Professor,
Department of History, Baselius College,
Kottayam, Kerala.

- Dr. Sebastian Joseph

Associate Professor and Research Guide,
PG Dept. of History, UC College, Aluva,
Ernakulam, Kerala.

Abstract :

Occurrence and spread of epidemics in India like cholera, small pox, influenza and plague have been a much-debated medical historical issue. The native understanding of these epidemics in the pre-colonial times is after that comes outside the preview of modern medicine due to the unsophisticated and refined treatment codes and strategies it offered for the cure. Colonial administration of India, well aware of the deadly implications of the epidemics followed a political policy rather than a medical one in the containment of epidemics. Pre supposed on the unhygienic culture of the people in the tropics, colonial government stressed on the concept of sanitation neglecting the need for effective vaccination. This had contributed to sever casualties and sometimes instances of selective vaccination for the supporting classes of the colonial administration demonstrated imperial agendas. Significantly, the knowledge about Indian climatic conditions too have helped the colonial scientists in locating the temporal spatial dimensions of epidemics.

Key Words : Pandemics, Colonial Medical Policy, Containment, Surveillance, Morbidity, Contagionism

Deadly scourges ravaged the Indian sub-continent in the past two centuries more than any other parts of the world. Out of the total

estimated pandemic death of 70 million lives globally between 1817 and 1920, the most rampant phase of epidemics, about 40 million to the death toll was the contribution of the sub-continent. Our eventful textbooks and regional and national writings filled with anti-colonial struggles, socio-religious reforms, battles, partition and nation building hardly speak anything about the human tussle with pandemics that took away the lives of millions. Even in the popular memories, an abode of genres that hardly found space in grand narratives, pandemics are used to remain conspicuously in off the field dugout. Apart from colonial medico-administrative reports epidemics confined their presence to certain literary references and unnoticed tombstones alone. The historical amnesia of the people about lives taking contagions make contemporary techno-medical terminologies alien to them and the memory loss barred from making a sense about the surveillance and regulatory strategies of the governments to control their body and movements. Thoughts about the pandemics are usually tended to restrict in the medicinal curing of the diseases and mortality levels, role of certain more important factors like geography, community perception about disease and collective mentalities of the age were often neglected in

Evolution of Film as a Source of History

- Dr. Sebastian Joseph

Associate Professor and Research Guide,
PG Dept. of History, UC College, Aluva,
Ernakulam, Kerala.

- Radhika Lal

Assistant Professor,
Dep. Of History, SSV College,
Valayamchirangara.

Summary :

From the outset, historians have a deep scepticism towards the notion that films can be considered as historical evidences. The time has come to seriously contest this approach of the historians towards films. Historians generally considered early historical films as breaches. If they ever associated with films, it was as if they were masters of historical facts. They immensely trusted at the immortality of raw historical facts.

Keywords : Historical writing, Postmodern, Evidence, Historical Films

Introduction :

The traditional paradigm of history writing is often associated with the legacy of the Greco-Roman school at a time when the discipline was engaged in history writing based on hearsay accounts from those who witnessed great events, especially wars. Political history was the main focus in their writings and other aspects though mentioned at some points, were subordinated to political events. When Herodotus stressed on truthful enquiry, Polybius looked at the utilitarian purposes and Cicero stood for literary and rhetorical genres. In the Hellenistic period, the notion of history as a factual account and a literary genre (or a mode of writing) prevailed. The word 'historia', both in Latin and Greek, refer to 'a literary genre with its rules and styles, canons of greatness

and social utility'. In the Roman Age, there was a shift in function of history from pure enquiry to a higher level of philosophy. Dionysius of Halicarnassus asserted that 'history is philosophy from examples.' In the period of the Roman Empire, the emphasis again shifted to literary truth and factual information. Also history began to be seen as an account of the past.

The Church and the Jewish historiography stressed on moral values than literary truth. In the period of later Roman Empire, facts began to acquire prominence than fiction. The Greco-Roman philosophy's metaphysical doctrine of substance was challenged by the Christians doctrine of creation, which stressed that only God is eternal and everything else has been created by God. Historical process came to be the working out of God's purposes. Christian philosophy was also, universal, providential, apocalyptic and periodized. The Greeks saw history as story whereas the Latin Christians stressed on literary truthfulness. The Christian historiographers saw history as a collective past of the selected people, who were not non-Christians. The rhetoric nature of history was strengthened.

In the European Middle Ages, 'historia' referred to 'narrative works of art, saints' lives, part of the Bible, the literal sense of scriptural texts, liturgical offices, epic poems, other texts and objects.' Though 'truth' was the prime factor, 'truth' itself had diverse meanings.

EP92E-PTE2 NSS1



നേരമേ
സാഹിത്യ
അക്കാദമി

സാഹിത്യ ലോകം

വാല്യം 50 | ലക്കം 1 • 2021 ജനുവരി-ഫെബ്രുവരി

കവിതയെന്ന കാരുണ്യധാര

പ്രകൃതിയെയും സർവ്വചരാചരങ്ങളെയും ഉൾക്കൊള്ളുന്ന വിശാലമാനവികതയും നിരുപാധികമായ സ്നേഹത്തിന്റെ കാല്പനികസൗന്ദര്യവും സവിശേഷമാക്കിയ സുഗതകുമാരിയുടെ കാവ്യലോകത്തെക്കുറിച്ച്



രാധ ദേവദാസി അഭിസാരിക പ്രണയം

ഈ രാധയുള്ളിൽ പ്രതിഷ്ഠിതമാകയാൽ
തീരാത്ത തേടലാകുന്നു ജന്മം.

-ഒരു വൃന്ദാവനരംഗം

കൃഷ്ണനും രാധയും അവരുടെ അലയൊടുങ്ങാത്ത സാഗരതുല്യമായ പ്രണയവും സുഗതകുമാരിയുടെ കവിതകളിൽ ആവർത്തിച്ചു വരുന്നുണ്ട്. സുഗതകുമാരിയുടെ കവിതകളെക്കുറിച്ചുള്ള സാമാന്യമായ അഭിപ്രായമാണിത്. എന്നാൽ എന്തുകൊണ്ട് രാധയെന്ന ഗോപിക, അല്ലെങ്കിൽ മറ്റൊരു ഗോപിക, അതുമല്ലെങ്കിൽ ദേവദാസിയൊക്കെ ആ കവിതകൾക്കു ജീവനായി നിലനിൽക്കുന്നു എന്ന ചോദ്യം പ്രണയമെന്ന സത്താപരമായ സാംസ്കാരിക നിർമ്മിതിയെക്കുറിച്ചുള്ള ഉത്തരങ്ങൾ മനസ്സിൽ നിർമ്മിക്കുന്നു. കാമാഭിലാഷങ്ങൾ, അനുരാഗം, വിവാഹം എന്നിവയ്ക്കു ബദലെന്നപോലെ പ്രണയമെന്ന ആദർശമായി നിലനിൽക്കുന്ന പൗരാണികസ്ത്രീസത്തയാണ് രാധ. വിവാഹമെന്ന സ്ഥാപനത്തിനു വെളിയിൽ സ്വതന്ത്രമായ കാമനാവ്യവഹാരത്തിന്റെ സാധ്യതകളാണ് രാധാ-കൃഷ്ണദ്വന്ദ്വവും ദേവദാസിപ്രണയവും അവതരിപ്പിച്ചത്. സംഗീതവും നൃത്തവും സ്വാതന്ത്ര്യവും സമർപ്പണവുംകൊണ്ട് അനുഭൂതിപരമായ സ്വച്ഛന്ദോഷ്യമായി രാധയും കൃഷ്ണനും ദ്വാപരയുഗത്തിന്റെ കാലാതിർത്തികളെ കടന്ന് ഇന്ത്യൻമനസ്സിൽ പ്രതിഷ്ഠ നേടി. സർഗ്ഗാത്മകമായ പ്രണയത്തിന്റെ ഉന്മ

AWARENESS ON ABUSE AGAINST WOMEN – A SURVEY

By

***Anjali Sukumar Varma, & **Neelima Ranjith**

**Post-graduate Student, Research & Post Graduate Department of Psychology, Union Christian College, Aluva, Kerala, India.*

***Assistant Professor, Research & Post Graduate Department of Psychology, Union Christian College, Aluva, Kerala, India.*

Abstract

The study aims to explore the awareness on four types of abuse, Physical, Sexual, Verbal and Economic, among people between the ages 20-60 years, with diverse educational qualifications, and Socio-economic status. Abuse involves interactions in cruel, violent, demeaning, or invasive manner. Survey method was adopted, with 823 participants. Analysis included estimating the frequency and percentage of people having high, moderate and low awareness across the different dimensions of abuse. 65.5%, 65.5%, 52.6%, 67.6% of participants had awareness on physical, sexual, verbal and economic abuse respectively. The awareness on the four types of abuse is considerably low among those having low educational qualification, and those belonging to a rural background. Higher level of awareness was also seen in people from upper class and middle class, compared to people from lower class. There was higher percentage of people having low awareness on economic abuse (2.2%), when compared to those in other types of abuse. The percentage of people having awareness was the least for verbal abuse (52%), compared to physical (64%), and sexual (65.5%) forms of abuse.

Keywords: *awareness, physical abuse, sexual abuse, verbal/emotional abuse, economic/financial abuse.*

Introduction

Various types of abuse exist ranging from very subtle to extreme by value of impact over mental health, with the most common forms against women being physical and sexual. Most prevalent form in India is domestic violence including dowry demands,

which has become a public health concern. Four types of violence against women in domestic relationships are recognized under the Protection of Women from Domestic Violence Act (PWDVA), 2005: Physical, sexual abuse, emotional or verbal abuse, and economic violence. This categorization

Body image perception and self-esteem Among classical dancers

Sreelakshmi K S* & Dr.Vidhya Ravindranadan**

M.Sc.Psychology, Assistant Professor of Psychology

Union Christian College, Aluva, Kerala

Abstract

Body image is defined as a person's emotional attitudes, beliefs, and perceptions about their own body and self-esteem is a person's overall subjective feeling of personal worth. The objective of the study was to understand if there is any significant difference between classical dancers and non-dancers in terms of body image perception and self-esteem. Participants (N=160) were chosen at random from several dance schools and regular colleges in Kerala, including 80 classical dancers (40 males and 40 females) and 80 non-dancers (40 males and 40 females) in the age group 18-22 years. The MBSRQ-AS and Rosenberg's self-esteem questionnaires were used to collect data via Google form. The data were analyzed using one-way ANOVA. From the results it was found that there is significant difference in over-weight preoccupation between female classical dancers and non-dancers. There was no significant difference in the other dimensions of body image perception like appearance evaluation, appearance orientation, over weight pre occupation, body area satisfaction and self-esteem among male and female classical dancers and non-dancers.

Keywords : Body image perception, self-esteem, classical dancer, non-dancer.

“The moment you change your perception is the moment you rewrite the chemistry of your body”.
(Lipton B.)

Body image is a human picture that is made up in one's mind, which includes the concerns about individual perception of own body. Body image can also be viewed as an individual's, subjective sense of satisfaction or dissatisfaction with one's body or physical appearance (Melan, Haugland and Bredablik, 2006).

A person's view of his or her body image may be either pleased or unhappy. The happiness or disappointment with one's body can lead to a shift in one's self-confidence. A positive attitude toward oneself will boost one's self-esteem, while a negative attitude or excessive self-consciousness will lower one's self-esteem. Therefore, the perception of one's body and one's self-esteem are related. Dancers are a group that is more concerned with body image, which has a direct or indirect impact on their self-esteem.

Body image can be explained by the Developmental Theory of Embodiment put forth by Piran and Tell (2012). The theory explains the influence of external experience on bodily experiences. When a positive environment is maintained, the individual has a proper physical and mental balance thereby he/she will have a positive body image. The present study deals with dancers and non-dancers in the aspects of their body image.

When a dancer is getting a positive response from society it automatically enhances his/her self-perception and thereby will get an increase in self-esteem and well-being. Instead, if a person is getting negative feedback from society as he /she is a dancer, the person will get into a conflict with his appearance and inner-self. The person will have a negative body perception and this will indirectly reduce his self-esteem. The body image is having

WOMEN EDUCATION AND EMPOWERMENT: REVISITING THE 'MISNOMER' WITH SPECIAL REFERENCE TO KERALA

Dr. Twincy Varghese

Assistant Professor

Department of History Union Christian College, Aluva, Kerala, India Pin: 683 102

ABSTRACT

The paper makes a brief enquiry into the reality of social position of Kerala women. It looks into how colonial education successfully created colonial patriarchy in the state and produced women community with a strong patriarchal zeal. Paper argues for a psychological revamping of the society demolishing all the colonial vestiges. A reform at family level and in education is essential to create a new society eliminating all gender disparities. Education should move on from its colonial motive of providing employment to creating better human beings.

Key words

Colonial Education, Colonial Patriarchy, Inside/Outside Space, Mobility, Psychological Revamping, Women Empowerment, Transformation, Egalitarian Society

WOMEN EDUCATION AND EMPOWERMENT: REVISITING THE 'MISNOMER' WITH SPECIAL REFERENCE TO KERALA

Paucity of women's writing and women's history reflects the patriarchal position taken by Indian society in ancient as well as in the current period. Irrespective of their uncompromising efforts behind the curtain Indian women remained invisible throughout the past. Studies on women and their role in the process of social cultural and political life has been either neglected or underrated. Traditional histories always portrayed men and masculinity as the key factors in making of history. Political history of nations with an enthusiastic recreation of battles fought by the custom-made male figures in myths and traditions made it a tough task for

Psychological Well-being and Life Satisfaction of Teachers Working Abroad

Shreya Mary Jose

*Postgraduate Student, Department of Psychology,
Union Christian College, Kerala, India*

Dr. Vidhya Ravindranadan

*Asst. Professor of Psychology, Department of Psychology,
Union Christian College, Kerala, India*

ABSTRACT

Teachers play a vital role in the progress of a society. Their perceived state of psychological well-being and life satisfaction can influence the quality of work. The present study attempted to compare the psychological wellbeing and life satisfaction of teachers and non-teacher working abroad. The participants of the study consisted of 60 individuals, among them 30 are teachers and 30 are non-teachers within the age range of 40 years to 60 years. The psychological well-being scale and the life satisfaction scale were used for data collection. The collected data was analyzed using statistical techniques like t-test and Pearson coefficient of correlation. The results show that sense of mastery, personal growth, purpose in life, and psychological wellbeing is significantly higher for the teachers' groups compared to the non-teachers group. It was also found that there were no significant differences between the two groups in terms of autonomy, positive relations with others, self-acceptance, and overall life satisfaction. Also, significant positive correlation was found between psychological wellbeing and life satisfaction.

Keywords: Psychological well-being, Life satisfaction, Personal growth

Working Memory and Dyscalculia: A Scientific Review

Anu Joy Singh

Research Scholar, Department of Psychology, Union Christian College, Aluva, Kerala.

Dr. Vidhya Ravindranadan

Assistant Professor, Department of Psychology, Union Christian College, Aluva, Kerala.

ABSTRACT

Mathematics plays an important part in our lives; Children who exhibit mathematical difficulty in early years are more likely to encounter future career problems and even more problems with their day to day living. Compared to research on language difficulties, this field is in its formative years, but knowledge is growing and there is a great deal of pertinent information available now that can inform us as to how can we adapt to address the difficulties and disabilities in learning mathematics. The purpose of the present study is a detailed representation of a review of studies related to Dyscalculia with a focus on studies conducted to find out the underlying working memory components that are critical for learning Maths skills. The study includes the literature reviews related to Dyscalculia and different components of working memory such as verbal component, Visuospatial component, and central executive. Review studies present the functional role of each working memory component and its deficit in causing Dyscalculia. In India, compared to other areas of learning disability, studies conducted in Dyscalculia and its cognitive components are very limited. Results from these reviews revealed that Dyscalculia children have been generally observed with a cognitive deficit in the working memory component and of the subcomponents of working memory, the Visuospatial component tends to play a major role in causing the deficit. This review study helps us to realize the role and importance of identification of working memory cognitive components and with the proper understanding of these deficits, intervention and remedial measures can be developed to help Dyscalculia children.

Key Words: Cognitive Components, Working memory and Dyscalculia

Introduction

Learning difficulties will occur because of advanced interaction of things that will reside in the child's constitution, temperament, and intellectual abilities or within the background and quality of child's schooling or within the family connected factors that affect interactions and emotional wellbeing of the child. The term includes such conditions as sensory activity handicaps, brain injury, least brain pathology, dyslexia, and

SEMI PARAMETRIC ESTIMATION OF TOTAL TIME ON TEST TRANSFORM FOR LOMAX DISTRIBUTION

SOWBHAGYA S PRABHU¹ & DR. E. S. JEEVANAND²

¹Research Scholar, Department of Statistics, Nirmala College, Muvatupuzha, India

²Assistant Professor, Department of Mathematics, Union Christian College, Aluva,
India

Abstract

Epstein and Sobel introduced the Total Time On Test(TTT) concept. The scaled total time on test transform and its empirical counterpart, the TTT-plot have proven to be very useful in different applications in reliability. This paper presents semi parametric estimation of TTT transform for the Lomax distribution using complete and censored samples. Based on a Monte Carlo simulation study, comparisons are made between the proposed estimators.

Keywords: Lomax distribution, Monte Carlo simulation, Semi parametric estimation, Total Time On Test.

Author for correspondence E-mail: sowbhagyasprabhu@gmail.com

1 Introduction

Two approaches to looking at ordered data, one from economics and the other from reliability theory, have led to the Lorenz curve and the scaled Time to Test Transform curve. Some relationships between the two approaches have been investigated by Chandra and Singpurwalla (1981) and Pham and Turkkan (1994). The concept of time to test transform (TTT) and TTT-plot in the reliability was introduced by Barlow and Campo (1975). Since then it has proved to be very useful in model identification, characterization of distribution and the estimation and testing of various

International Journal of Statistics and Applied Mathematics

ISSN: 2456-1452
 Maths 2021; 6(2): 27-30
 © 2021 Stats & Maths
www.mathsjournal.com
 Received: 10-01-2021
 Accepted: 12-02-2021

Neethu Jacob
 Department of Statistics,
 Nirmala College, Muvattupuzha,
 Kerala, India

ES Jeevanand
 Department of Mathematics,
 Union Christian College, Aluva,
 Kerala, India

Bayesian estimation of stress strength reliability $P[X>Y]$ of Lomax and exponential distribution based on right censored sample

Neethu Jacob and ES Jeevanand

DOI: <https://doi.org/10.22271/math.2021.v6.i2a.660>

Abstract

The present paper is concerned with the estimation of stress strength reliability $R=P[X>Y]$ when X and Y are the random variables following Lomax and Exponential Distribution based on right censored sample. The main aim of this article is to estimate the Maximum Likelihood estimates of R and Bayesian Estimates of R under Squared Error Loss function, Linex Loss function and Entropy Loss function. Finally the performance of the estimators are evaluated by simulation study.

Keywords: lomax distribution, exponential distribution, maximum likelihood estimation, bayesian estimation, squared error loss function, linex loss function, entropy loss function

1. Introduction

In the literature the problem of estimating the stress strength reliability $R= P[X>Y]$ has been considered as both distribution free and parametric frame works. In stress strength reliability analysis the strength X and the stress Y are considered as random variables. The system fails if at any time the applied stress is exceeds its strength. In stress strength model if the system functions only if its inherent random strength is greater than the random stress applied to it. The stress strength reliability have wide applications in Quality control, Engineering Statistics, Medical Statistics, Bio statistics etc. The stress strength model was introduced by Birnbaum (1956) ^[1] and developed by Birnbaum and McCarty (1958) ^[2]. The term stress strength reliability was first introduced by Church and Harris (1970) ^[3]. The different stress strength models was studied by Kelly *et al.* (1976) ^[12], Owen *et al.* (1977) ^[17], Tong (1977) ^[18], Jeevan and (1997,1998 and 2016) ^[8, 9, 11], Kundu and Gupta (2005,2006), Jeevanand *et al.* (2008) ^[11], Dhanya and Jeevanand (2011, 2012, 2014, 2015 and 2018) ^[4-7], Neethu and Jeevanand (2021) ^[15-16] etc.

Let X be the strength of the random variable following Lomax distribution with parameters $L(\alpha,1)$, where α is the shape parameter and Y be the stress of the random variable following exponential distribution with parameter $\text{Exp}(\theta)$ and corresponding probability density functions are given below.

$$f(x, \alpha, 1) = \frac{\alpha}{(1+x)^{\alpha+1}} ; x > 0, \alpha > 0 \tag{1.1}$$

$$f(y, \theta) = \theta e^{-\theta y} ; y > 0, \theta > 0 \tag{1.2}$$

The stress strength reliability is defined as

$$\begin{aligned} R=P[X>Y] &= \int_0^\infty \int_0^x \frac{\alpha}{(1+x)^{\alpha+1}} \theta e^{-\theta y} dx dy; 0 < x, y < \infty \\ &= 1 - [E_\alpha(\theta)e^\theta], 0 < R < 1 \end{aligned} \tag{1.3}$$

Corresponding Author:
Neethu Jacob
 Department of Statistics,
 Nirmala College, Muvattupuzha,
 Kerala, India



A comparative study of mechanical, dynamic mechanical and thermal properties of rice husk ash, modified rice husk ash and nano silica filled epoxy composites

E.P. Ayswarya^{a,b,*}, Ajalesh B. Nair^c, Eby Thomas Thachil^b

^a Department of Chemistry, Federal Institute of Science and Technology, Angamaly-683577, Kerala, India

^b Department of Polymer Science and Rubber Technology, Cochin University of Science and Technology, Kochi-682 022, Kerala, India

^c Department of Chemistry, Union Christian College, Aluva-683102, Kerala, India

ARTICLE INFO

Article history:

Received 12 April 2021

Received in revised form 31 May 2021

Accepted 4 June 2021

Available online 19 June 2021

Keywords:

Epoxy

Rice husk ash

Nanosilica

Tensile properties

ABSTRACT

This paper reveals the study on the reinforcement effect of rice husk ash (RHA), modified rice husk ash (MRHA) and nanosilica (NS) on epoxy resin such as mechanical, dynamic mechanical and thermal properties of composites. Epoxy- rice husk ash/ modified rice husk ash/ nanosilica composites with concentrations of 0–2.5 phr of filler particles were prepared by mechanical stirring for 45 min followed by sonication for another 30 min. Mechanical thermal and dynamic mechanical properties of epoxy – rice husk ash/ modified rice husk ash/ nanosilica composites were studied. NS filled epoxy composites exhibit 20% improvement in tensile strength over pure epoxy resin. Modulus of the composites increases with filler addition. NS filled epoxy composites show 45% improvement in flexural strength when compared to pure epoxy resin. With the addition of 1.5 phr of NS to epoxy, the impact strength shows an improvement of 86% over the matrix material. TGA studies reveal that epoxy -NS composites have excellent thermal stability. These results prove that NS act as reinforcing material in epoxy-based composites.

© 2021 Elsevier Ltd. All rights reserved.

Selection and peer-review under responsibility of the International Conference on Sustainable materials, Manufacturing and Renewable Technologies 2021.

1. Introduction

Epoxy is one of the most widely used polymers with excellent performance characteristics, including superior mechanical and electrical properties, good corrosion resistance, strong adhesion and low shrinkage upon cure [1]. Inorganic fillers in epoxy resins have been extensively studied as an approach to improve thermal and mechanical properties of epoxy resins. The intrinsic properties of each component like the shape of fillers, the nature of the interface, and so forth largely affect the properties of composite [2].

It is well known that the load applied on the composites is mainly transferred to the fillers via the interface. Therefore, for superior properties, strong interfaces between components are needed. Other important factors affecting composite properties are the content and size of filler particles [3]. To enhance the properties, smaller size and larger amount of fillers are required. It has been already reported that the increase of specific surface area and

content of fillers enhance the mechanical and impact properties of composite [4]. RHA contains about 90% of silica [5]. So, it can be used as a source for the production of nanosilica. Nanosilica can be prepared from RHA as reported by many researchers [6]. They report that the obtained nanosilica with a dimension of 5–10 nm is in the form of agglomerates and has a high specific surface area due to the non-isothermal decomposition of RHA in air.

The final objective of this work was to prepare nanosilica (NS) from RHA and develop epoxy based RHA/ MRHA/NS filled composites taking epoxy as matrix and RHA, MRHA and NS as fillers.

2. Experimental

Epoxy resin, Araldite GY 250 based on diglycidyl ether of bisphenol A (epoxy equivalent 187 g/eq) was purchased from Emax Glass Fibre and Accessories (P) Ltd Chennai. Triethylene tetramine hardener with the commercial name HY 951 was also purchased from Glass Fibre and Accessories (P) Ltd Chennai. The density and specific gravity of the resin and composites were determined according to ASTM D 792–08. Tensile properties were

* Corresponding author.

E-mail address: ayswaryaep@fisat.ac.in (E.P. Ayswarya).



HYDROTHERMAL SYNTHESIS OF NANO-TiO₂ PHOTOCATALYST AND ITS CHARACTERIZATION

¹Vidya Francis, ²Ayswarya E P, ³Ajalesh B Nair, ⁴Eby Thomas Thachil
¹Assistant Professor, ²Assistant Professor, ³Assistant Professor, ⁴Professor
¹Department of Chemistry, Carmel College, Mala, Thrissur, Kerala

Abstract: Nanoanatase having photocatalytic activity was successfully prepared by hydrothermal method under controlled conditions using Titanium-iso-propoxide. It is one of the most commonly used semiconductor oxide for environmental photocatalysis, being of low toxicity, insoluble in water and stable to photo and chemical corrosion over a wide range of pH. Their properties, which are determined by the preparation method, are very crucial in photocatalysis. The advantages of the hydrothermal method are that it is an easy method to obtain nanotube morphology, variation in the synthesis method can be implemented to enhance the properties of TiO₂ nanotubes, and it is a feasible method for different applications. A systematic characterization was done using XRD, BET, FTIR and SEM techniques. When compared to commercial form, nanostructures have several advantages like large surface area, controlled morphology, size, porosity to obtain desired surface chemistry.

Index Terms: TiO₂, Hydrothermal, anatase, photocatalyst

1. INTRODUCTION

Studies on the photochemical activity of pigments in commercial polyolefins have been mainly concerned with white pigments. Titanium dioxide (TiO₂) is the most widely studied of these, since it is technically outstanding in many respects (King, 1968). Anatase, brookite and rutile are the three crystalline forms of titania. Among these crystalline forms anatase-TiO₂ deserves more attention by virtue of its use as pigment (J.G. Balfour, 1994) and gas sensors (Y.C. Yeh et al, 1989), catalysts (C.G. Bond et al, 1991; P.S. Awati et al, 2003) and photocatalysts (Hagfeldt et al, 1995; Y.H. Hsien et al, 2001; C. Lizama et al, 2002) in applications related to pollution control and in photovoltaics (N. Serpane et al, 2000). The catalytic and other properties of these materials strongly depend on the crystallinity, surface morphology, the particle sizes and preparation methods. TiO₂ nanoparticles have real advantages in relation to photocatalytic activity. Different preparation processes for them have been reported, such as sol-gel process (G. Colon et al, 2002), hydrolysis of inorganic salts (Y. Zhang et al, 2001), ultrasonic technique and hydrothermal process (X.M. Wu et al, 2001; E. Vigil et al, 2001; H. Zhang et al, 2001; X. Ju et al, 2002).

This study describes a rapid hydrothermal synthesis method to produce phase pure, monodisperse anatase particles with small grain size and high specific surface area at low temperature. Hydrothermal processing of either amorphous titania or a titanium containing precursor has been shown to be an ideal method for producing ultrafine (grain size < 10nm) anatase crystallites with high specific surface areas and high crystallinity, a property that is essential for photocatalytic reactions (J. Ovenstone et al, 2001).

II. MATERIALS AND METHODS

Materials

Titanium-iso-propoxide, [Ti(OPrⁱ)₄] purchased from Alpha was used as titanium source for TiO₂ photocatalyst preparation. Ti(OPrⁱ)₄ was used without further purification. Glacial acetic acid (C₂H₄O₂, 99.5%) was used as a solvent. Distilled water was used for the hydrolysis of Ti(OPrⁱ)₄.

Preparation of nano-TiO₂ photocatalyst by hydrothermal method

The most popular technique to hydrolytically prepare nanocrystalline titania is hydrothermal processing, i.e., crystallization at elevated temperature and pressure in the presence of water (A. Rabenau et al, 1985). Hydrothermal crystallization is carried out in a sealed autoclave. A heating mantle or oven is used to raise the temperature above the standard boiling point of the solvent, at which point the evaporating solvent begins to generate a pressure inside the sealed vessel exclusively due to the refluxing solvent. Hydrothermal reaction times are often as short as 2 h and are rarely longer than 1-2 days. The following procedure was employed in this case.

ISSN: 2349 - 0217

CARMEL BLAZE

A JOURNAL OF MULTIDISCIPLINARY RESEARCH



CARMEL COLLEGE

MALA - 680732

Volume 13

Issue 1

July 2021

12. Molecular Docking Studies of Azidonucleoside Analogues on Hiv1 Reverse Transcriptase Proteins.....198
Shima Mathew, Adithya Ratheesh, Stephania Mendez & Sheneya Festus
13. Comparison of Phytochemical Constituents and Anti-oxidant Activity of *Evolvulus Alsinoides* and *Evolvulus Nummularius*.....215
Suresh V Nampoothiri, Saranya C T, Brighty T Stephen
14. ശൈലീദർശനം - കഥാഭാഷയുടെ പരിപ്രകാശ്യത്തിൽ.....233
ശയാ. ബിന്ദുസുഖി ഡോമിനിക്
15. इतिहास में वर्तमान में त्वील होने दृष्टतनाक यथार्थ का कथा-मंदरुभ.....246
Dr. P. Geetha

Locard's exchange principle: In search of hidden evidence in forensic science

Abhiramy Sudheesh¹ and Ajalesh B Nair^{2*}

¹Department of Forensic Science, Aditya College, Andhra Pradesh, Surapalem-533 291

²Post Graduate and Research Department of Chemistry, Union Christian College, Aluva-683 102, Kerala, India
*E-mail: ajaleshnair@uccollege.edu.in

Abstract

A French criminologist by name Dr. Edmond Locard (1877-1966) was the pioneering scientists in the field. The principle which he evolved is known as 'Locard's Exchange Principle'. It states that "Whenever two objects come into contact with each other, traces of each are exchanged. To put it briefly, "Every contact leaves a Trace". It suggests that criminals can't leave the scene of the crime without leaving some trace of evidence which is useful in identifying the criminal.



EDMOND LOCARD(1877-1966)

Keyword:Forensic science, Trace evidence, Locard's principle, Chemical analysis

Introduction

Forensic Science is getting more important in our everyday life. It is an evolving science with new technique of analysis, new interpretations to evidence gathered. Considering the evolving nature of the science and frequent use of the scientific techniques, it is very important that not only legal professionals and scientists but even ordinary people should have some understanding of the application of Forensic Scientific methods. Keeping this purpose in mind a brief outline of the Forensic scientific investigation is given in this article.

Trace evidence

DR. Edmond Locard has brought out the importance of trace evidence in criminal investigations. In the early 20th century. The Locard Principle brought out vast changes in the field of Forensic Science and also in the crime investigations. Now a day the role of this principle is increasing because the crime and criminals are growing day by day. Trace evidence is created when objects make contact. The materials is often transferred by heat or induced by contact friction. The physical contact between a victim and a suspect can result in the transfer of trace material. The trace material left by the suspect or the criminal may include fiber, illicit drug, soil, glass etc.. Trace evidence can be used to link people or objects to place, other people or other object serves as a starting point. It may also

provide a lead for a new line of investigation. The investigator as to find out the trace evidence and reconstruct the events of the crime. Fig 1 shows some of the trace evidence from the crime scene [1-2].



Fig. 1. Some of the trace evidence from the crime scene

Important developments in microscopy, chemical analysis and database technology and led to significant progress in trace evidence. Every item that can be touched or transported has the potential to become trace evidence; For example, The Automotive paint may be to extend of 45,000 varieties as the FBI found out. This makes it necessary for the investigator to study and identify the details of the trace evidence found at the place of crime.

Analysis of trace evidence

The discipline of Forensic science is the analysis of the trace evidence that cannot be seen by aided eyes. A few

ISSN: 2349 - 0217

CARMEL BLAZE

A JOURNAL OF MULTIDISCIPLINARY RESEARCH



CARMEL COLLEGE

MALA - 680732

Volume 13

Issue 1

July 2021

Exploiting the Extracts of Moringa Oleifera Plant for the Green Synthesis and Characterization of ZnO Nanoparticles

Aparna M Roy, Arjun Dileep, Ashkar Ali B, *Neethumol Varghese

¹Department of Chemistry, Union Christian College, Aluva, Kerala, India

Email: neethumolvarghese@uccollege.edu.in

Abstract

Nanoparticles has established to be an advanced field of science where extensive research is carried out to implement the technology. The nanotechnology has a great future due to its efficiency and environment friendly property. Metal nanoparticles have been intensively studied within the past decade. Nanosized materials have been an important subject in basic and applied sciences. Zinc oxide nanoparticles have received considerable attention due to their unique antibacterial, antifungal, and UV filtering properties, high catalytic and photochemical activity. In the present work synthesis of Zinc oxide nanoparticles was carried out using green methodology employing the flower and leaf extracts of Moringa Oleifera as reducing/capping agent. The characterization of zinc oxide nanoparticles was done using XRD, FTIR and UV-visible spectroscopy. Antibacterial activity of ZnO nanoparticles were studied against *Staphylococcus aureus* and *Escherichia coli*.

Keywords: Nanoparticles, zinc oxide, green methodology, antibacterial activity

Introduction

Green synthesis of metal and metal oxide nanoparticles has been a highly attractive area. The plant extract has high efficiency as stabilizing and reducing agent for the synthesis of controlled materials. The plant mediated green synthesis of NP's are been increased due to its eco-friendly nature. This have gained increased consideration as it is simple, efficient, cost-effective method for the nanoparticle production is mainly concerned with replacing chemical products and improving or developing process and technologies to reduce or even to eliminate substances that are harmful to health and environment. It promotes the reactions without hazardous solvent and reducing agents.

Zinc oxide is of great economic and industrial interest due a wide range of properties that allows its application in many different areas, such as the rubber industry, biomedical field and metal surface treatment (Gujel et al., 2017 [1]; Kathalewar et al. [2], 2013; Pasquet et al. [3], 2014; Xie et al. [4], 2011; Zhang et al., 2013 [5]).

Synthesis of zinc oxide nanoparticles can be obtained using chemical, physical or biological methods. The interest in synthesizing ZnO NPs via biological methods has increased

considerably in the last decade. The development of this new approach and the significant interest in it is mainly related to the absence of toxic chemicals or high amount of energy applied to the biological synthesis, which makes the process more cost-effective and eco-friendly (Khalid et al., 2017 [6]; Kharissova et al., 2013 [7]; Krol et al., 2017 [8]; Makarov et al., 2014 [9]; Naveed et al., 2017 [10]). Many reports in the literature indicate that the biological synthesis of metallic and metal oxides nanoparticles is more environmentally friendly than the conventional chemical or physical methods used nowadays. Therefore, these biological methods have become more known as green synthesis and it goes in agreement with the twelve principles of the green chemistry. (Anastas and Warner, 1998 [11], Anastas and Eghbali, 2010 [12]).

Plants are the most common biological substrate used for the green synthesis of nanoparticles with metallic ions (Iravani, 2011) [13]. This might be related to the fact that vegetal substrates are believed to be more cost-effective, easy to process and less toxic than microorganisms. Also, there is no exposure to health risks or concerns about safety issues related to hazardous microorganisms during the process when using plant-based substrates. In addition, plant extracts can be obtained in a straight forward manner by exposing the plant to a solvent, which is usually distilled water or ethanol (Ahmed et al., 2016)

[14]. Different parts of the plant have been applied to this purpose such as leaves, roots, seeds and fruits (Fazlzadeh et al., 2017 [15]; Matinise et al., 2017 [16]; Nava et al., 2017a [17]; Sangeetha et al., 2011 [18]). It is known that the plants have high concentrations of active compounds like methylxanthines, phenolic acids, flavonoids and saponins (Alemimi et al., 2017 [19]; Guldiken et al., 2018 [20]; Maisuthisakul et al., 2008 [21]; Xu et al., 2017 [22]). These compounds are more known as antioxidants as they can neutralize reactive oxygen species (ROS) and free radicals and chelate metals (Flora, 2009) [23]. Hence, it is concluded that the antioxidants present in the plants are responsible for the green synthesis of metal or metal oxides nanoparticles due to their capability to bioreduce or chelate metal ions and to act as stabilizers of the produced nanoparticles (Ahmed et al., 2017 [24]; Anjum et al., 2015 [25]). Despite the knowledge of the phytochemical properties of the antioxidants, plant extracts are constituted of an enormous variety of these active compounds in different concentrations (Oz and Kafkas, 2017 [26]; Saxena et al., 2013 [27]; Sharma et al., 2017 [28]). This feature poses a problem to analytically determine the exact amount of all molecules that are extracted from the plant. Consequently, the definition of a precise mechanism route of the biosynthesis of metal and metal oxide nanoparticles using vegetal substrates is still a challenge to be surpassed. Regarding the green synthesis of ZnONPs, published research suggest in

ISSN: 2349 - 0217

CARMEL BLAZE

A JOURNAL OF MULTIDISCIPLINARY RESEARCH



CARMEL COLLEGE

MALA - 680732

Volume 13

Issue 1

July 2021

An Assessment of Water Quality in River Periyar, Kerala

*Diya Sabu, Ahsana C.S, Aiswarya T.R, Devika K.M, Akhil Yohannan, Dinesh Sankar, Minu Joys**

*Post Graduate and Research Department of Chemistry, Union Christian College, Aluva
Email: minujoys85@gmail.com*

Abstract:

Periyar river is the main drinking water resource of Cochin corporation, Aluva and Paravur towns. River Periyar of Eloor-Edayar industrial stretch has been a subject of pollution study for many years. Water samples have been collected from a part of Periyar River along different points and analyzed for various water quality parameters. Effects of industrial wastes and municipal sewage on river water quality have been investigated. This study involves determination of physical, biological and chemical parameters of surface water at different points.

Keywords: Periyar River, Chloride, DO, Bacteriological

Introduction

Water is the basic necessity for the functioning of all life forms that exist on earth. It is safe to say that water is the reason behind earth being the only planet to support life. This universal solvent is one of the major resources we have on this planet. It is impossible for life to function without water. After all, it makes for almost 70% of the earth. Water is not only

required for our survival but for a healthy and happy life as well.

Water pollution occurs when harmful substances often chemicals or microorganisms contaminate a stream, river, lake, ocean, aquifer, or other body of water, degrading water quality and rendering it toxic to humans or the environment. The main water pollutants include bacteria, viruses, parasites, fertilizers, pesticides, pharmaceutical products, nitrates, phosphates, plastics, faecal waste and even radioactive substances.

Rivers play a significant role as they serve not only the purpose of water supply for domestic, industrial, agricultural and power generation but also utilized for the disposal of sewage and industrial waste and therefore put under tremendous pressure. In the last few decades, pressure has been increasing and greater emphasis is laid on the deterioration of the quality of Indian Rivers. Most of the rivers have been unmindfully used for the disposal of domestic and industrial effluents far beyond their assimilative capacities and have been rendered grossly polluted [1]. Despite its importance, water is the most poorly managed resource in the world. The quality of water is getting vastly deteriorated mainly due to unscientific waste disposal; improper water management and carelessness towards the environment and this had led to the scarcity of potable water affecting human health [2]. People who live near the river area use the water

from the river for domestic purposes. Unfortunately, there is no frequent and up to date monitoring and information providing facility on the quality of the industrial effluent discharged into the river and the quality of the water in the river for human use. Such information is important for the authorities to take proper action in preventing pollution of the environment for the good health of the population. Before water can be described as potable, it has to comply with certain physical, chemical and microbiological standards to ensure that the water is palatable and safe for drinking and other domestic purposes [3]. The objective of the present study was to assess the extent of various pollutants received by Periyar river lets in the Northern regions of Ernakulam district, as affected by industrial, domestic sewage and solid wastes discharged therein.

The use of Water quality index was initially proposed by Horton (1965) and Brown et al (1970)[4]. Since then, many different methods for the calculation of WQI's have been developed. Several authors have proposed the use of a WQI as a means to derive numerical expression for the general quality of the surface water (Brown et al., 1970; Otto, 1978; Miller et al., 1986; Bordalo et al., 2001; Cude, 2001; Hallock, 2002)[5,6,7,8 and 9]. WQI is considered better for transformation of information to general audiences (Stambuck-Giljanovic, 1999)[10] when their specific characteristic

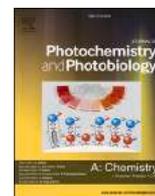
limitations are taken into consideration (Otto, 1978; Flores, 2002; Hallock, 2002; Pesce and Wunderlin, 2002)[5,11,9 and 12]. WQI's can be very useful tool for management in decision and policy-making.

Aim and Objectives

1. To measure physical parameter such as:
 - ❖ Taste
 - ❖ Odour
 - ❖ Colour
 - ❖ Temperature
2. To estimate chemical parameters such as:
 - ❖ (i)pH
 - ❖ (ii) E-Coli content
 - ❖ (iii) Chloride content
 - ❖ (iv) Free CO₂
 - ❖ (v) Alkalinity
 - ❖ (vi) Hardness
 - ❖ (vii) Dissolved Oxygen
 - ❖ (viii) Turbidity

Materials And Method

Water samples were collected from the selected areas of River Periyar in Ernakulam district, during the month of April 2021. The water samples were collected in high grade plastic bottles of one liter capacity. Before collection, the plastic bottles were rinsed once with distilled water and then



Anthracene based photo-tunable polymers with excimer emission

Sajith Menon^{a,*}, Aravind Krishnan^b, Smitha Roy^c

^a Department of Chemistry, Maharaja's College, Ernakulam, Kerala, India

^b Department of Chemistry, Saint Berchmans College, Changanassery, Kerala, India

^c Department of Chemistry, Union Christian College, Aluva, Kerala, India

ARTICLE INFO

Keywords:

Photo-responsive
ATRP
Block copolymers
Micelles
Self-assembly

ABSTRACT

The aggregation properties of a diblock and a triblock copolymer in the aqueous phase has been investigated by photophysical and microscopy methods. Both copolymers possess photoresponsive hydrophobic poly(9-anthrylmethyl methacrylate) (PAN) block and hydrophilic polyethylene oxide (PEO) block whereas the triblock copolymer have an additional polystyrene (PSt) block at the middle. The amphiphilic copolymers, PAN-*b*-PEO and PAN-*b*-PSt-*b*-PEO, were synthesized by atom transfer radical polymerization (ATRP) method. Self-assembly of these individual copolymers in water leads to the formation of uniform spherical supramolecular assemblies. The morphology of the resultant spheres was disturbed by the illumination of the turbid aqueous solutions with 360 nm UV light accomplished by the photosolvolytic of the anthracenylmethyl ester. This irreversible photodissociation virtually transforms the amphiphilic diblock copolymer to a double hydrophilic block copolymer whereas the triblock copolymer because of its central PSt block was transformed into a bolaamphiphile. Complete micellar dissociation obtained in the case of diblock was not observed in the case of vesicular aggregates of the triblock copolymer. We also found that compared to the completely dissolved state, aggregation resulted in the pronounced excimer emission of the anthracene copolymers.

1. Introduction

An amphiphilic compound contains a polar or ionic gathering associated with a long hydrocarbon tail. When an amphiphile is dissolved in water over a critical concentration, it self-gathers into an aggregate of 50–100 atoms called a "micelle". Such frameworks assume a significant job in nature—for instance, in photosynthesis and numerous different procedures in living cells. For applied science such frameworks are critical too; they are found, for instance, in paints, cleansers, and pharmaceuticals. [1–5] Aggregates formed from field-responsive materials that change their physicochemical properties in responsive to an external stimuli such as pH, temperature, redox, light *etc.* have been proposed to find a wide assortment of utilizations in the fields of regenerative medicine, information storage, molecular switches and self-cleaning surfaces. [6–16] Among all the accessible stimuli, light is considered to be the best option particularly because of its ready availability and inexpensiveness. It is a neat and clean external stimulus and can be remotely applied for a brief timeframe with high spatial and

transient exactness [17–22].

Owing to high thermodynamic and kinetic stability, amphiphilic block copolymer (BCP) aggregates has attracted considerable attention. [23–27] The ability of well-defined BCPs to self-assemble into nanostructures have pulled in a lot of enthusiasm for potential applications in the targeted delivery and controlled release of active agents. Colloidal properties arises from their micellization in a block selective solvent [28–30]. The capacity to control the self-assembly of BCPs in aqueous media gives flexibility and versatility to tune the development of different micellar nanostructures, including micelles, vesicles, cylinders, and different nanostructures. In light of the improvement of nanomedicine, BCPs have been proposed for light controlled medication conveyance. These nanostructures have been utilized as drug bearers that can flow in the blood, collect at tumor locales, and be taken up by malignant growth cells and furthermore improve therapeutic safety and minimize side effects through the upgraded penetrability and retention effect [31–34].

Photoresponsive groups incorporated into BCPs can optically shift

Abbreviations: PAN, poly(9-anthrylmethyl methacrylate) 2; PSt, polystyrene 3; PEO, polyethylene oxide 4; THF, tetrahydrofuran 5; DSC, differential scanning calorimetry 6; T_g , glass-transition temperature 7; DLS, dynamic light scattering 8; PDI, polydispersity index 9; AFM, atomic force microscopy 10; TEM, transmission electron microscopy.

* Corresponding author.

E-mail address: sajith@maharajas.ac.in (S. Menon).

<https://doi.org/10.1016/j.jphotochem.2020.112990>

Received 8 August 2020; Received in revised form 6 October 2020; Accepted 17 October 2020

Available online 23 October 2020

1010-6030/© 2020 Elsevier B.V. All rights reserved.



Electron transfer study on newly synthesized Ti(IV)/Zr(IV) complexes of amide and oxime functionality: A pulse radiolytic and theoretical revelation

Raji Thomas^{a,*}, Densely Jose^b, Nelson Joseph P^c, R T Pardasani^d & T Mukherjee^e

^aDepartment of Chemistry, School of Science and Humanities, Sreenidhi Institute of Science & Technology, Hyderabad 501 301, India

^bDepartment of Chemistry, Mar Athanasius College, Kothamangalam, Kerala, India

^cDepartment of Chemistry, Union Christian college, Aluva, Kerala, India

^dDepartment of Chemistry, Central University of Rajasthan, Bandar Sindri, Rajasthan, India

^eChemistry Division, Bhabha Atomic Research Centre, Mumbai 400 085, India

*E-mail: rajithomas28@yahoo.com

Received 20 August 2020; revised and accepted 09 February 2021

Complexes of the general formula $\text{Cp}_2\text{Ti(IV)L}$, $\text{Cp}_2\text{Zr(IV)L}$, $\text{Cp}_2\text{Ti(IV)L}^1$ and $\text{Cp}_2\text{Zr(IV)L}^1$ have been synthesized with N,N' -bis(2-pyridyl)pyridine-2,6-dicarboxamide (H_2L) and 9,10-phenanthrenequinone dioxime (H_2L^1). The complexes have been characterized by different spectral techniques and their reduction reactions have been carried out with hydrated electron as reducing radical, mechanism which has been explored pulse radiolytically. Theoretical calculations have been performed to understand the effect of chelation and electron transfer processes in complexes.

Keywords: Ti(IV)/Zr(IV) complex, Oxime complex, amide complex, hydrated electron, Pulse radiolysis

Amides and oximes are the two important precursors in the field of coordination chemistry and both react with many transition metals. The structural analyses of these complexes have been reviewed by many researchers^{1, 2}. In the case of amide ligands special attention has been focused on pyridine carboxamide ligands due to their efficiency for the formation of transannular bonding. These are biologically potent ligands and their several biological significance have been reviewed³.

Titanium complexes are active catalysts for α -olefin polymerization and for the ring-opening polymerization of cyclic esters^{4, 5}. For a long time, not much has been published on the complexation of Ti and Zr halides with the oxime and amide ligands. Electron transfer and coordination chemistry overlap in many important areas of biological and structural interest because biological activities of metal complexes may be related to the redox behaviours⁶. The pulse radiolysis technique provides a means for producing low concentrations of powerful reducing and oxidizing agents on the microsecond timescale. This rapid time resolution facilitates the detection of reactive transients. Since first characterization of iminoxyl radical by Thomas in 1964, a number of

studies have been reported for electron transfer behaviour of oximes⁷. There are many reports on the synthesis of transition metal complexes^{8, 9}. But pulse radiolysis studies on Ti(IV) and Zr(IV) complexes of oximes and amides are virtually non-existent. In recent years, increasing effort has been devoted to the study of effect of chelation and electron transfer in complexes by quantum chemical methods, and in this respect, DFT has emerged as a useful methodology to support and/or predict experimental data¹⁰. Herein we report the synthesis, characterization, and redox behaviour of Ti(IV) and Zr(IV) complexes of N,N' -bis(2-pyridyl)pyridine-2,6-dicarboxamide (H_2L) and 9,10-phenanthrenequinone dioxime (H_2L^1).

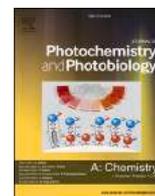
Materials and Methods

All the chemicals have been purchased from Merck and Aldrich and used without further purification. All the reactions were carried out under dry conditions. Solvents were dried by standard methods¹¹. IR spectra were recorded in KBr pellets on a Shimadzu spectrometer in the range 4000-400 cm^{-1} . The ¹H (CDCl₃, DMSO, 300 MHz) and ¹³C (CDCl₃, DMSO, 75.5 MHz) NMR spectra of complexes have been obtained on a JEOL AL-300FTNMR spectrometer



Contents lists available at ScienceDirect

Journal of Photochemistry & Photobiology, A: Chemistry

journal homepage: www.elsevier.com/locate/jphotochem

UV-responsive glycosomes as frameworks for FRET: The quest for bio-inspired energy transfer systems

Sajith Menon^{a,*}, Aravind Krishnan^b, T.E. Jose^b, Smitha Roy^c

^a Department of Chemistry, Maharaja's College, Ernakulam, Kerala, India

^b Department of Chemistry, Saint Berchmans College, Changanassery, Kerala, India

^c Department of Chemistry, Union Christian College, Aluva, Kerala, India

ARTICLE INFO

Keywords:

Glycosomes
FRET
Photoreponsive
ATRP
Block copolymer

ABSTRACT

Biological supramolecular assemblies have fascinated humans for centuries. The ability to mimic such natural architectures have been a long-standing goal for humans. Despite intensive research in the field of molecular assemblies, the ability to control morphology, utilizing two most basic segments of life viz. light and water is still a zone of immense challenge. Here we report the synthesis and aggregation studies of a pair of photoresponsive glycopolymers. These block copolymers which are assigned as PDACS-*b*-PBG was integrated utilizing controlled/living radical polymerization and comprises of a lyophobic stilbene block and a lyophilic glucose part. Our comprehensive morphological and photophysical examinations in aqueous phase uncovered that these glycopolymers form vesicular and cylindrical assemblies, which gets disassembled under UV light stimulus due to structural conversion from the *trans* to the *cis* form of the hydrophobic section. We further demonstrate that these vesicular nanocapsules have the capacity of confining hydrophobic guests and for certain fluorescent dyes these nanocages can act as scaffolds for FRET as affirmed by UV-vis and fluorescence spectroscopy. This feature can be additionally stretched out to switch the fluorescence of the captured coumarin dye through their control discharge.

1. Introduction

Block copolymers have attained considerable attention owing to their ability to self-organize in the nano-scale dimensions. Knowledge about the nature and structure of block copolymers has permitted the improvement of these macromolecules for almost every application possible [1]. For developments in nanobiotechnology and nanomedicine, advanced gadgets and materials fit for controlling the capacity, movement, or portability of biomacromolecules, for example, DNA, proteins, organelles, and cells are crucial [2,3]. Amphiphilic block copolymers (ABCs) that spontaneously self-assemble in an aqueous environment into micellar nanoparticles with a hydrophobic fragment and hydrophilic section can have useful applications as nanocarriers especially in the field of chemotherapy [4–7]

Polymeric nanocapsules are hollow particles containing a center space encompassed by a polymer shell. They are immensely explored

core-shell frameworks ready to safeguard, transport and stabilize numerous substances, capturing them in the central part of a clear-cut shell [8]. The utility of nanocapsules is characterized by the possibility of caging their freight material for an extended time or controlling its discharge in a focused way [9–11]. Nanocapsules resulting from ABCs can display vivid architectures with tunable affinity, specific interaction, and responsive performance emerging from well-defined polymer chains [12–16]. Synthetic molecular containers usable in aqueous media have been extensively studied because of their intriguing characters such as selective molecular binding, stabilization of reactive species, and modulation of chemical reactions in their cavities [17–20]. Combining well-defined nanoscopic objects with therapeutics have important implications because the therapeutic drug can be trapped with high efficiency thereby attaining control over the conditions and places of drug discharge. Nanomedicine is a quickly developing field, for which polymer building blocks are proving valuable for the development of

Abbreviations: FRET, fluorescence resonance energy transfer; ATRP, atom transfer radical polymerization; PBG, poly(vinyl benzoyl-D-glucosyl-*b*-D-glucopyranoside); PDACS, dialkoxycyano stilbene polymethacrylate; DLS, dynamic light scattering; AFM, atomic force microscopy; TEM, transmission electron microscopy; C7D, Coumarin 7 dye.

* Corresponding author.

E-mail address: sajith@maharajas.ac.in (S. Menon).

<https://doi.org/10.1016/j.jphotochem.2020.112927>

Received 8 August 2020; Received in revised form 11 September 2020; Accepted 17 September 2020

Available online 21 September 2020

1010-6030/© 2020 Elsevier B.V. All rights reserved.

**കേരളക്രൈസ്തവർക്കിടയിലെ മതകോളനീകരണശ്രമങ്ങളും
ഉദയാപേരൂർ സുന്നഹദോസിന്റെ കാനോനുകളും**
(Religious Colonization of St. Thomas Christians in Kerala based on the study of 'The Acts
and Decrees of the Synod of Diamper')

ഷിമി പോൾ ബേബി
അസി.പ്രൊഫസർ, മലയാളവിഭാഗം
യൂണിയൻ ക്രിസ്ത്യൻ കോളേജ്, ആലുവ

Abstract

The Synod of Diamper is one of the most significant milestones in the history of St. Thomas Christians in Kerala. The Synod was convened in the church of Diamper Kochi, Kerala on 20 to 26 June 1599, under the leadership of Portugal Archbishop Alexis De Menezes. The doctrines and decrees enforced at the imply that Latinization of St. Thomas Christians was the main motto of synod. The Christianity that the Portuguse missionaries found in Kerala was lacking in well -defined dogmas and practices that ensured Christian exclusiveness. They believes that 'purifying and regulating' St. Thomas Christians in Kerala only through the western Christianity practices. It was the background of Synod of Diamper. The doctrines and decrees of synod obviously tries to hoax Kerala Christians to Romanize through various methods like expulsions from parish, ex-communication etc. The Kerala Christians who were living here in co- existence with different cultures were forced to change to one culture. Many of the socio- cultural customs of Kerala Christians were abolished. This was an attempt to change the socio- cultural life of the Kerala Christians in accordance with to the western Christianity. More than that it was the way to colonize and boost their trading. This article aims the religious colonization at the constant surveillance and the exertion of the Power by the Institutionalized Western agencies towards Kerala Christians based on the study of the Acts and Decrees of the Synod of Diamper.

താക്കോൽ വാക്കുകൾ: കോളനീകരണം, മതകോളനീകരണം, അധികാരം, കേരളക്രൈസ്തവർ, ഉദയാപേരൂർ സുന്നഹദോസിന്റെ കാനോനുകൾ.

Perceptions about the Mechanical and Morphological Performance of Nano Chitosan/Ctbn/Dgeba Ternary Nanocomposites

Neethumol Varghese¹, Minu Joys², Ajalesh B. Nair³

^{1,2,3}Department of Chemistry, Union Christian College, Aluva-683 102, Kerala, India

ABSTRACT

Although the fracture and deformation behaviour of the binary epoxy nanocomposites have been intensively studied over the past decade, less attention has been paid to the ternary nanocomposites and their interactions with the resin. The present chapter unveils the incorporation of both functionalized elastomers and the nano fillers into epoxy matrix with the aim of obtaining improved material with toughness higher than neat resin and elastomer toughened resin without compromising the other desired mechanical properties. Elastomer toughened blends of Diglycidyl ether of bisphenol – A (DGEBA) resin and carboxyl terminated butadiene acrylonitrile (CTBN) was selected as a matrix for the present study. TETA(HY951) was used as the curing agent for CTBN/DGEBA blends. Through optimization 10wt% CTBN/DGEBA, which showed greater improvement in mechanical and morphological characterisation was selected as the base matrix system. Furthermore, nano chitosan of different compositions were incorporated into the 10wt% CTBN/DGEBA system to fabricate multiphase ternary nanocomposites. The mechanical and morphological properties were investigated for the ternary nanocomposites. To understand the dispersion of nano filler into CTBN toughened DGEBA resin, morphological characterization using SEM and TEM were carried out for the samples.

Keywords: epoxy matrix, chitosan, functionalized elastomers, ternary nanocomposites

INTRODUCTION

Epoxy polymers are widely used as the matrices of fibre-reinforced composite materials and as adhesives. When cured, epoxy polymers are amorphous and highly-cross linked thermosetting polymers. This microstructure results in many useful properties for structural and engineering applications, such as a high modulus and tensile strength, low creep and good performance at elevated temperatures. However, the structure of such epoxy polymers also leads to a highly undesirable property in that they are relatively brittle materials, with poor resistance to crack initiation and growth. So, toughening of brittle epoxy thermosets has been intensively studied in the past few decades since the lack of toughness is one of the major reasons limiting their more widespread engineering applications (Hsieh, Kinloch, Masania, & Taylor, 2010) [1].

One of the most successful strategies of improving the fracture toughness of epoxy is to introduce a second phase into the epoxy matrix. The multiphase morphology increases the fracture toughness, with the ability to initiate various toughening mechanisms during crack growth (Bashar, Sundararaj, & Mertiny, 2011) [2].

One of the successful methods used to toughen DGEBA resin is the incorporation of the functionalized elastomers into the brittle epoxy matrix. The compatibility between liquid elastomer and resin must be matched carefully in order to achieve phase separation during cure and simultaneously provide adequate interfacial adhesion (Pascault, 1995) [3].

The phase-separated elastomer particles are presumed to act as stress concentrators initiating energy absorbing “toughening” processes. According to the literature, the most common micromechanical processes responsible for the increase in fracture toughness are localized shear yielding of the epoxy matrix, plastic void growth in the matrix, which is initiated by cavitation or debonding of the elastomer particles and bridging behind the crack tip (Yi, Wiedmaier, & Schmauder, 2015) [4].

The early advances of McGarry and the re-searchers at B.F. Goordrich were the compatibility matching that has been achieved by varying molecular architectures and reactive end groups of liquid elastomers, such as butadiene acrylonitrile copolymers containing carboxyl (CTBN), amine (ATBN), or epoxy (ETBN) reactive end groups. Other elastomeric



Room temperature ammonia sensing of α -MoO₃ nanorods grown on glass substrates

Tijin Thomas^a, Nagabandi Jayababu^c, Julakanti Shruthi^d, Alex Mathew^b,
Andrea Cerdán-Pasarán^a, Javier Alejandro Hernández-Magallanes^a, K.C. Sanal^{a,*}, Reshmi R^{b,*}

^a Universidad Autónoma de Nuevo León, UANL, Facultad de Ciencias Químicas, Av. Universidad, Cd. Universitaria, 66455, San Nicolás de los Garza, Nuevo León, México

^b Optoelectronic and Nanomaterials Research Laboratory, Department of Physics, Union Christian College, Aluva, Kerala, 683102, India

^c Department of Electronic Engineering, Institute for Wearable Convergence Electronics, Kyung Hee University, 1732, Deogyong-daero, Giheung-gu, Yongin 17104, Republic of Korea

^d Thin Films and Nano Materials Research Laboratory, Department of Physics, Osmania University, Hyderabad, Telangana State, 500007, India

ARTICLE INFO

Keywords:

Molybdenum trioxide nanorods
Vacuum thermal evaporation
Ammonia gas sensors

ABSTRACT

We report the fabrication of ammonia gas sensors operating at room temperature using aligned one-dimensional orthorhombic molybdenum trioxide (α -MoO₃) nanorods. α -MoO₃ nanorods were fabricated on glass substrates by thermal evaporation under vacuum condition and subsequent annealing at ambient air. The selectivity of fabricated sensors was performed with different test gases viz. ammonia, xylene, acetone, toluene, isopropanol, 2-methoxyethanol, n-butanol, methanol, and ethanol. Highest sensitivity for ammonia gas at room temperature (28 °C, 35% relative humidity) for a concentration of 100 ppm, was achieved. The sensors annealed at 400 °C showed response to lower concentrations of ammonia (1 ppm) with high repeatability. The sensing response dropped only less than 1% after one year of stable performance. The change in morphology and the structural modifications of α -MoO₃ nanorods with annealing had improved the sensing response.

1. Introduction

Ammonia (NH₃) gas is one of the commonly used coolants in chemical, automobile, textile, and fertilizer industries [1]. It also finds applications in the advanced selective catalytic reductive type automobile exhaust systems [2]. The leakage and miscarriage of ammonia gas cause serious environmental, and health problems for even lower concentrations. The proper monitoring of ammonia gas concentration is crucial for a healthy environment as 16–28% of its concentration in the atmosphere considered as fatal [3,4]. Hence, the development of efficient gas sensors capable of detecting NH₃ in lower concentration (<100 ppm) at room temperature has academic and industrial significance. The ammonia gas sensing were generally carried out using various methods including gas chromatography [5], optical spectroscopy [6], electrochemical method [7] and using semiconductors [8]. Among these, transition metal oxide semiconductor gas sensors were recognized more efficient and cheap compared to others because of their advanced sensing response towards various gases [9–11]. Sensors made of one dimensional (1-D) transition metal oxides are more efficient because of

their ease of fabrication, high stability, quick response, and recovery, compared to other existing sensors. Molybdenum trioxide [12], tungsten oxide [13], tin oxide [9], indium oxide [14] titanium dioxide [15], copper oxide [16], zinc oxide [3], and zinc oxide-nickel oxide [17] were identified as good candidates for the sensing application. Among these, a highly stable orthorhombic 1-D molybdenum trioxide (α -MoO₃) is known for its distinctive gas sensing performance due to its unique layered structure, the variable valence of molybdenum, and availability of plenty of active sites to trap targeted molecules during gas sensing [18].

Several groups have investigated the 1-D α -MoO₃ nanostructures for gas sensing applications [19,20]. L. Chen *et al.* [21] synthesized α -MoO₃ nanorods by ultrasonic synthesis and performed NO₂ gas sensing characterization at a working temperature of 290 °C and studied the effect of chlorination in sensing response. Yang *et al.* [22] synthesized α -MoO₃ nanoribbons by hydrothermal method for hydrogen sensing with higher concentrations (1000 ppm) at room temperature and reported a good response time of 14 s. Yang *et al.* [18] synthesized α -MoO₃ nanobelts by hydrothermal method for the sensing of the Tri-methyl Amine (TMA) at

* Corresponding authors.

E-mail addresses: sanal.kozhiparambilch@uanl.edu.mx (K.C. Sanal), rreshmi@gmail.com (R. R).

<https://doi.org/10.1016/j.tsf.2021.138575>

Received 1 August 2020; Received in revised form 6 February 2021; Accepted 6 February 2021

Available online 9 February 2021

0040-6090/© 2021 Elsevier B.V. All rights reserved.



Effects of reduced graphene oxide on nonlinear absorption and optical limiting properties of spin coated aluminium doped zinc oxide thin films

V G Sreeja^{a,c}, P Hajara^b, R Reshmi^a, E I Anila^{a,d,*}

^a Optoelectronic and Nanomaterials' Research Laboratory, Department of Physics, Union Christian College, Aluva-683 102, Kerala, India

^b Centre for advanced materials, Department of Physics, Cochin University of Science and Technology, Kochi-682022, India

^c Department of Physics, St.Teresa's College (Autonomous), Ernakulam, Kochi-682011, India

^d Department of Physics and Electronics, CHRIST (Deemed to be University), Bengaluru-560029, India

ARTICLE INFO

Keywords:

Reduced graphene oxide
Aluminum doped zinc oxide
Open aperture z-scan technique
Nonlinear absorption
Two photon absorption
Optical limiter

ABSTRACT

In this work, we investigate the nonlinear absorption and optical limiting properties of reduced graphene oxide (rGO) incorporated aluminum doped zinc oxide (AZO) composite thin films by open aperture z-scan technique using Q-switched Nd:YAG laser at 532 nm. The structural and spectral properties were also systematically analyzed. The composite thin films were synthesized by spin coating technique with online infrared curing facility. Studies on nonlinear optical responses of the investigated samples proved a substantial enhancement in the nonlinear absorption coefficient of AZO:rGO composites compared to AZO thin film. The nonlinear absorption is attributed to the two photon absorption with reverse saturable absorption. The strong nonlinear absorption and nonlinear scattering effects result in the optical limiting property of the composite material. The AZO:rGO thin film exhibits lower optical limiting threshold value (32 MW/cm²) as compared to AZO (59 MW/cm²). Hence it is an excellent optical limiter which explores applications in the field of optoelectronics as protecting material for sensitive photonic devices.

1. Introduction

Graphene is an atom thick, sp² hybridized carbon atom that could revolutionize the world due to its distinctive, unusual properties which are highly promising for various technological applications in different fields of science and technology [1,2]. Owing to the unique Dirac cone-shaped electronic band structure, it shows many noteworthy properties such as the quantum Hall effect [3], superb electrical and thermal conductivity [4], high carrier mobility [5], large surface area [6] and good optical transparency [7]. These properties make it an ideal material suitable for microelectronic, photonic and optoelectronic devices [8] like photo detectors [9], electro-optic modulators [10], plasmonic optical switching devices [11] and ultrafast lasers [12]. Studies have shown that graphene based materials exhibit excellent nonlinear optical properties [13,14]. The nonlinear optical (NLO) properties with ultrafast optical response, four-wave mixing and wideband spectral range saturable absorption (SA) [15] have been found in graphene and its derivatives because of the large absorption and dispersion properties. NLO effects have also been observed; including two-photon absorption (TPA) [16], reverse saturable absorption (RSA) [17] and optical limiting

(OL) [18] which makes it suitable for the application to ultrafast mode locked lasers [12].

Zinc oxide (ZnO) is a wide band gap semiconductor having large excitonic binding energy [19]. Recent studies showed that ZnO thin films exhibit strong second and third order nonlinear optical features [20,21] which make them promising material for the applications such as integrated nonlinear optical devices [22], nonlinear propagation in fibers [23], self-focusing [24], fast optical switching [25], optical limiting in semiconductors and damage in optical materials [26]. Due to its unique electronic, optical and piezoelectric properties [27,28], it has attained broad range of technological applications in various fields like solar cells [29], photodetectors [30], light emitting diodes [31], gas sensors [32] and nanoscale lasers [33]. Doping with suitable elements with ZnO alters the properties such as its band gap, crystalline size, optical and electrical characteristics. Considering the remarkable properties of ZnO and graphene, their nanocomposite can facilitate versatile properties which exceeds far beyond those of the individual members.

Few investigations reported that graphene- ZnO nanocomposite with tunable band gap is a good candidate for the fabrication of

* Corresponding author.

E-mail address: anilaei@gmail.com (E.I. Anila).

തുടങ്ങിയ ബോധപൂർവ്വമായ ഭാഷാപ്രയോഗം വെള്ളവംശീയതയെ തിരേയും സവർണ്ണമേധാവിത്വത്തിനുമെതിരെയുള്ള ഹിന്ദി ഹോപിന്റെ പ്രതിരോധമാണ്.

യുവതലമുറയുടെ കേവല വിനോദോപാധിയ്ക്കപ്പുറമായ് ഇത്തരത്തിൽ കാമ്പുള്ള ചിന്തകൾക്കും പഠനങ്ങൾക്കുമുള്ള വേദിയാണ് റാപ്പുകൾ. നിലനിൽക്കുന്ന ജ്ഞാനപദ്ധതികളുടെ പ്രായോഗികസിദ്ധാന്തങ്ങൾ ഉപയോഗിച്ച് റാപ്പിന്റെ രൂപത്തെയും പ്രയോഗത്തെയും കൃത്യമായി വിലയിരുത്താൻ കഴിയും. ഭാഷാശാസ്ത്രപരമായ പുതിയ പഠനമേഖലകളിലേക്ക് വെളിച്ചം വീശാനും ഇത്തരം റാപ്പ് ഗാനങ്ങൾ സഹായിക്കുന്നു എന്നതാണ് യാഥാർത്ഥ്യം.

സഹായകഗ്രന്ഥങ്ങൾ:

ഗിരീഷ് പി.എം, 2012, അറിവും ഭാഷയും ധൈര്യം ധൈര്യം ധൈര്യം ധൈര്യം ധൈര്യം, ആമുഖം, തിരുവനന്തപുരം, കേരള ഭാഷ ഇൻസ്റ്റിറ്റ്യൂട്ട്.

ജോർജ് എം.പി. (ഡോ.) 2013, പാശ്ചാത്യസംഗീത പ്രവേശിക, കോട്ടയം, ഡി.സി. ബുക്ക്സ്.

Keyes, C, 2004, Rap music and street consciousness, South Oak street, Champion, University of illinois press.

Lommel, C, 2001, The History of rap music, United States, Chelsa House Publications.

Priya, Parmar, 2005, Cultural studies and Rap: The poetry of an Urban lyricist, Taboo, Spring - Summer.

Samy Alim, H, 2006, Roc the mic right: The language of hip hop culture, Routledge Tayler & Francis group, Newyork and London.

URL:

- <https://youtu.be/OPzY3ekolrA>
- <https://youtu.be/J6VeU04NZr4>
- <https://youtu.be/yuJxPXogFlg>
- <https://youtu.be/yuHX1XogFlg>
- <https://youtu.be/d4d4cgW1faU>

സിബിൾ സണ്ണി

ഗവേഷകൻ

ഗവ. കോളേജ് കട്ടപ്പന

&

ഡോ. ബെന്നിച്ചൻ സ്കറിയ

അസോസിയേറ്റ് പ്രൊഫസർ & റിസേർച്ച് ഗൈഡ്

ഗവ. കോളേജ് കട്ടപ്പന

മിത്ത്: സാമൂഹികധർമ്മവും അന്തർവൈജ്ഞാനിക പഠനവഴികളും

ഡോ. എം. ഐ. പുനൂസ്

പ്രബന്ധസംഗ്രഹം

ജന സംസ്കാര പഠനത്തിൽ ഏറെ പ്രസക്തിയും പ്രാധാന്യവുമുള്ള വൈജ്ഞാനിക വിഷയമാണ് മിത്തുകൾ. ഒരു ജനസമൂഹത്തിന്റെ ആചാരാനുഷ്ഠാനങ്ങളും വിശ്വാസവും വിനോദവുമൊക്കെയുൾക്കൊള്ളുന്ന സർവ്വതലസ്പർശിയായ സംസ്കാര പഠനവിഷയമെന്ന നിലയിലാണ് മിത്തുകൾ ചരിത്രത്തിലും നാടോടിവിജ്ഞാനീയത്തിലും സവിശേഷപ്രാധാന്യം നേടുന്നത്. സമൂഹ മനസ്സിന്റെ പ്രതീകാത്മകവിഷ്കാരങ്ങളെന്ന നിലയിൽ സമൂഹത്തിന്റെ ഘടനയും സ്വഭാവവും ലോകബോധവുമാണ് മിത്തുകൾ പലനിലകളിൽ പ്രകാശിപ്പിക്കുന്നത്. കൃത്യമായ ഒരു നിർവ്വചനപരിധിയിലൊതുക്കി നിർത്താനാവാത്ത നിലയിലുള്ള വ്യവഹാരവൈവിധ്യമാണ് മിത്തുകളുടെ സവിശേഷത. ദിവ്യചരിത്രമായും (Sacred History) പ്രാകൃതശാസ്ത്രമായും (Primitive Science) സമഷ്ട്യബോധത്തിന്റെ ഭ്രമകല്പനകളായുമൊക്കെ വിലയിരുത്തപ്പെടുന്ന മിത്തുകളുടെ അന്തർവൈജ്ഞാനിക സ്വഭാവവും പര്യന്തപഠനമേഖലകളുമാണ് ഈ പ്രബന്ധം ചർച്ച ചെയ്യുന്നത്. സാഹിത്യം, ചരിത്രം, മതം, സംഗീതം, ശാസ്ത്രം തുടങ്ങിയ സാമൂഹികവിജ്ഞാന വിഷയങ്ങളിൽ മിത്തുകളുടെ വ്യവഹാരസാധ്യതകളും പ്രസക്തിയുമാണ് പ്രധാനമായും വിശകലന വിധേയമാക്കിയിരിക്കുന്നത്.

താക്കോൽ വാക്കുകൾ: പുരാവൃത്തം (Myth), ദിവ്യചരിത്രം (Sacred History), മിത്തീം (Mytheme), പ്രാകൃതശാസ്ത്രം (Primitive Science), സമാന്തരചരിത്രം (Para History), ആദിപ്രരൂപം (Archetype), ക്രിയാചിഹ്നം (Act Symbol), മാതൃപ്രരൂപം (Mother Archetype)

12

1 ആഗസ്റ്റ് 2021

വില ₹ 25

വിജ്ഞാനകൈരളി

കേരള ഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട് പ്രസിദ്ധീകരണം



പാറശാല പൊന്നക്കാൾ:
സംഗീതവും ജീവിതവും



പി.കെ. സാരിയർ :
കേരളം-ലോകത്തിനു
സംഭാവന ചെയ്ത
വിശ്വപൗരൻ

ഓണത്തിന്റെ ഗോത്രമുഖങ്ങൾ
മാവേലിപുരാവൃത്തങ്ങൾ



ISSN 2349 1051



എമിലി സോള

എമിലി സോള: നിലയ്ക്കാത്ത പ്രകമ്പനങ്ങൾ

ഡോ. എം.ഐ. പുനൗസ്

നാച്ചറലിസ്റ്റ് പ്രസ്ഥാനത്തിലൂടെ ഹ്രസ്വസാഹിത്യത്തിൽ പ്രകമ്പനം സൃഷ്ടിച്ച എഴുത്തുകാരനാണ് എമിലി സോള. സോളയുടെ കൃതികളധികവും ഹ്രസ്വവിപ്ലവത്തിന്റെ ചരിത്രപശ്ചാത്തലത്തിലെഴുതപ്പെട്ടവയാണ്. ഇവ സൃഷ്ടിച്ച പ്രകമ്പനങ്ങൾ ഇന്നും ലോകസാഹിത്യത്തിൽ അവസാനിച്ചിട്ടില്ലെന്നു പറയാം. ദാർശനികവും മനശ്ശാസ്ത്രപരവും രാഷ്ട്രീയവുമായ നിലപാടുകൾക്കൊണ്ട് ദേശഭാഷാന്തരങ്ങളെ അതിജീവിച്ച് ഇന്നും സംവിദിക്കപ്പെടുന്നുവെന്നതു തന്നെയാണ് സോളയുടെ പ്രസക്തി. മനുഷ്യപ്രകൃ

തിയുടെ സൂക്ഷ്മഭാവങ്ങൾ ഒപ്പിയെടുക്കുന്നതിൽ പ്രകടിപ്പിച്ച അനന്യസാധാരണമായ പ്രതിഭാസുരശമാണ് എമിലി സോളയെ വ്യത്യസ്തനാക്കുന്നത്.

1840-ൽ പാരിസിലാണ് സോളയുടെ ജനനം. പിതാവ് ഫ്രാങ്കോയിസ് സോള ഒരു ഇറ്റാലിയൻ സിവിൽ എഞ്ചിനീയറായിരുന്നു. സോളയ്ക്ക് ഏഴു വയസ്സുള്ളപ്പോൾ അദ്ദേഹം അന്തരിച്ചു. പിന്നീട്, ഹ്രസ്വകാരിയായ മാതാവ് എമിലി ഔറേലിയുടെ സംരക്ഷണയിൽ എയ്ത്സിയൻ പ്രവിശ്യയിലാണ് സോള തന്റെ കട്ടിക്കാലം ചെലവിട്ടത്. വളരെ ദരിദ്രമായ സാഹചര്യങ്ങളിലൂടെയാണ് എമിലി സോളയുടെ ബാല്യകാലം കഴിഞ്ഞത്. 18-ാം വയസ്സിൽ പാരിസിൽ തിരിച്ചെത്തിയ സോള ഇരുപത്തിയഞ്ച് വയസ്സാകുമ്പോഴേക്കും പത്രപ്രവർത്തനമേഖലയിൽ സ്വന്തമായി ഒരിടം കണ്ടെത്തിക്കഴിഞ്ഞിരുന്നു.

എഴുത്തിലും ജീവിതത്തിലും വികസ്മയമായ വൈകാരികാവസ്ഥകളെ നേരിട്ടു എഴുത്തുകാരനായിരുന്നു എമിലി സോള. കടുത്ത ദാരിദ്ര്യത്തിലും ഏകാന്തതയിലും കഴിച്ചുകൂട്ടിയ ബാല്യകാലം ജീവിതത്തിന്റെ ഭിന്നാവസ്ഥകളെ അനുഭവിച്ചറിയാൻ അദ്ദേഹത്തിന് അവസരം നൽകി. വിശ്രുത കലാകാരൻ പോൾ സെസൻനുമായുണ്ടായിരുന്ന ഗാവസൗഹൃദമാണ് അദ്ദേഹത്തിന്റെ സാഹിത്യ ജീവിതത്തിലെ നിർണായക വഴിത്തിരിവായത്.

1867-ൽ എഴുതിയ 'തെരേസ് റാക്വിൻ' (Therese Raquin) ആണ് സാഹിത്യകാരൻ എന്ന നിലയിൽ എമിലി സോളയ്ക്ക് അംഗീകാരം നേടിക്കൊടുത്ത ആദ്യകൃതി. 1868-നും 1893-നുമിടയിലുള്ള കാൽനൂറ്റാണ്ടുകാലത്തിനിടയിലാണ് റുഗോൺ-മക്വാർട്ട് പരമ്പരയിലുൾപ്പെട്ട ശ്രദ്ധേയമായ നോവലുകൾ സോള രചിച്ചത്. പത്തൊമ്പതാം നൂറ്റാണ്ടിലെ ഹ്രസ്വസാമൂഹിക ജീവിതവും രാഷ്ട്രീയാധികാര വ്യവസ്ഥിതികളുമൊക്കെ വിഷയമാക്കുന്ന നിലയിലുള്ള ഇരുപത് നോവലുകളുടെ സുദീർഘമായ പരമ്പരയായിരുന്നു അത്. ഭിന്ന സാമ്പത്തിക സാമൂഹിക നിലകളിലുള്ള റുഗോൺ-മക്വാർട്ട് കുടുംബബന്ധങ്ങളുടെ ആന്തരബന്ധം ഈ നോവലുകളിലെല്ലാമുണ്ട്. പ്രകൃതത്തിലും പെരുമാറ്റത്തിലും പാടേ വിഭിന്നരായ കഥാപാത്രങ്ങളും ഭിന്നസ്ഥലകാലങ്ങളുമാണ് ഈ വംശവൃക്ഷകഥാപരമ്പരയിൽ കടന്നുവരുന്നത്. ലെ-അസമൊയർ (1877), നാന (1880), ചെർമിനൽ (1885), ദി എർത്ത് (1887) എന്നിവ ഈ നോവൽ പരമ്പരയിലെ ശ്രദ്ധേയമായ കൃതികളാണ്.

ഇത് കൂടാതെ മറ്റു പതിനൊന്നു നോവലുകളും അഞ്ചു കഥാസമാഹാരങ്ങളും ഒട്ടേറെ നാടകങ്ങളും നിരൂപണ പഠനങ്ങളും എമിലി സോളയുടെ സാഹിത്യജീവിതത്തെ ധന്യമാക്കുന്നുണ്ട്. സാഹിത്യത്തിന്റെ വ്യത്യസ്ത ആഖ്യാനവഴികളിലൂടെ സഞ്ചരിച്ചിട്ടുണ്ടെങ്കിലും നാച്ചറലിസ്റ്റ് സരണിയിലെ വിശ്വവിഖ്യാതനായ നോവലിസ്റ്റ് എന്ന നിലയിലാണ് എമിലി സോള ഖ്യാതി നേടുന്നത്.

അഴിമതിയും ജീർണതയും നിറഞ്ഞ ഹൃദയൽ അധികാരലടനയോടുള്ള കലഹം സോളയുടെ

Myth: Social Ethos and Interdisciplinary Methods of Study

Dr. M. I. Punnoose

The study of myths has much relevance and importance in mass cultural studies. They are crucial topics in history and folkloristics as they function as a set of beliefs, customs, practices and entertainments underlying a society. Myths are symbolic representations of the different aspects of the nature, perspectives and structure of a society. The discursive diversity of myths constrains an absolute definition. This research paper discusses the interdisciplinary nature and related areas of myths which are often considered part of Sacred History, Primitive Science and the hallucinations of the Collective Consciousness of a community. It takes into consideration the possibilities and relevance of myths in the social science disciplines including literature, history, religion, music and science.

Dr. M.I Punnoose
Associate Professor
UC College Aluwa
Kerala
India
Pin: 683102

മിത്ത്: സാമൂഹികധർമ്മവും അന്തർവൈജ്ഞാനിക പഠനവഴികളും

ഡോ. എം. ഐ. ഐ പുനൂസ്

പ്രബന്ധസംഗ്രഹം

ജനസംസ്കാരപഠനത്തിൽ ഏറെ പ്രസക്തിയും പ്രാധാന്യവുമുള്ള വൈജ്ഞാനിക വിഷയമാണ് മിത്തുകൾ. ഒരു ജനസമൂഹത്തിന്റെ ആചാരാനുഷ്ഠാനങ്ങളും വിശ്വാസവും വിനോദവുമൊക്കെയുൾക്കൊള്ളുന്ന സർവ്വതലസ്പർശിയായ സംസ്കാരപഠനവിഷയമെന്ന നിലയിലാണ് മിത്തുകൾ ചരിത്രത്തിലും നാടോടിവിജ്ഞാനീയത്തിലും സവിശേഷപ്രാധാന്യം നേടുന്നത്. സമൂഹമനസ്സിന്റെ പ്രതീകാത്മകവിഷ്കാരങ്ങളെന്ന നിലയിൽ സമൂഹത്തിന്റെ ഘടനയും സ്വഭാവവും ലോകബോധവുമാണ് മിത്തുകൾ പലനിലകളിൽ പ്രകാശിപ്പിക്കുന്നത്. കൃത്യമായ ഒരു നിർവ്വചനപരിധിയിലൊതുക്കി നിർത്താനാവാത്ത നിലയിലുള്ള വ്യവഹാരവൈവിധ്യമാണ് മിത്തുകളുടെ സവിശേഷത. ദിവ്യചരിത്രമായും (Sacred History) പ്രാകൃതശാസ്ത്രമായും (Primitive Science) സമഷ്ട്യബോധത്തിന്റെ ഭ്രമകല്പനകളായുമൊക്കെ വിലയിരുത്തപ്പെടുന്ന മിത്തുകളുടെ അന്തർവൈജ്ഞാനിക സ്വഭാവവും പര്യന്തപഠനമേഖലകളുമാണ് ഈ പ്രബന്ധം ചർച്ച ചെയ്യുന്നത്. സാഹിത്യം, ചരിത്രം, മതം, സംഗീതം, ശാസ്ത്രം തുടങ്ങിയ സാമൂഹികവിജ്ഞാന വിഷയങ്ങളിൽ മിത്തുകളുടെ വ്യവഹാരസാധ്യതകളും പ്രസക്തിയുമാണ് പ്രധാനമായും വിശകലന വിധേയമാക്കിയിരിക്കുന്നത്.

താക്കോൽ വാക്കുകൾ: പുരാവൃത്തം (Myth), ദിവ്യചരിത്രം (Sacred History), മിത്തീം (Mytheme), പ്രാകൃതശാസ്ത്രം (Primitive Science), സമാന്തരചരിത്രം (Para History), ആദിപ്രരൂപം (Archetype), ക്രിയാചിഹ്നം (Act Symbol), മാതൃപ്രരൂപം (Mother Archetype)



Investigation of photoluminescence emission from β -Ga₂O₃: Ce thin films deposited by spray pyrolysis technique



Rakhy Raphael^a, E.I. Anila^{a,b,*}

^a Optoelectronic and Nanomaterials' Research Laboratory, Department of Physics, Union Christian College, Aluva 683102, Kerala, India

^b Christ (Deemed to be University), Bengaluru 560029, Karnataka, India

ARTICLE INFO

Article history:

Received 16 January 2021

Received in revised form 9 March 2021

Accepted 17 March 2021

Available online 22 March 2021

Keywords:

Phosphors

Thin films

Amorphous materials

Optical materials

Quenching

Dexter theory

ABSTRACT

Ce doped Ga₂O₃ thin films for different doping concentrations (3 at%, 4 at%, 5 at%, 6 at%, 7 at%, and 8 at%) were deposited by spray pyrolysis method. X-ray diffraction analysis confirmed the crystalline structure as that of monoclinic β -Ga₂O₃. The effect of doping on the band gap of the material was studied by UV-Visible spectroscopic method and the thickness of the film and refractive index were measured by ellipsometric technique. The photoluminescence excitation and emission spectra were recorded for pure and doped samples and the energy band scheme with possible radiative and nonradiative transitions were elucidated. Concentration quenching effect was observed, and the underlying mechanism responsible for quenching effect was studied based on Dexter theory.

© 2021 Elsevier B.V. All rights reserved.

1. Introduction

In the past decade, luminescent materials have been widely used in diverse applications like display devices, light sources, radiation converters, fluorescent pigments, forensic applications etc. [1–3]. Synthesis of phosphors emitting primary colours help to reinforce the technology of lighting and display devices [4,5]. The white-light LEDs, recent technology for domestic and industrial applications, make use of blue, violet and UV LEDs in combination with phosphor coatings. In this context, the new phosphors are being developed, expecting better color rendition, cost reduction, stability and efficiency improvement. Identifying the host lattice and activator ion is the most crucial part, in formation of highly efficient phosphor materials. Previous research works report trivalent rare earth ions as an important class of activators which can convert ultraviolet (UV) to visible light due to their distinctive $4f \rightarrow 4f$ or $4f \rightarrow 5d$ transitions [6,7].

Ga₂O₃ is a wide band gap semiconducting oxide, well known for its novel luminescence properties. Being a chemically and thermally stable material, Ga₂O₃ can replace sulfide-based phosphors in emissive displays like thin film electroluminescence (TFEL) devices. Highly efficient and durable TFEL devices have been successfully demonstrated

with Ga₂O₃: Mn, Ga₂O₃: Cr, Ga₂O₃: Eu active layers [4,5]. Recently this material is gaining considerable research interest and it is expected that Ga₂O₃ may find many commercial applications shortly, because of its unique properties. Hao et al. observed red, green and blue-green luminescence of Eu³⁺, Tb³⁺ and Tm³⁺ doped Ga₂O₃ thin films, deposited by spray pyrolysis technique [7]. Li et al. has reported cerium doped gallium oxide thin films and deep ultraviolet photo detectors fabricated by pulsed laser deposition technique [8]. Near Infrared persistence luminescence is observed from Er³⁺ doped Ga₂O₃ thin film, which is specifically useful for optical communication systems [9]. Villora et al. introduced Ga₂O₃ phosphors for white LED and LDs and next generation power devices [4]. Fabrication of Ga₂O₃ based phosphors with tunable emission color that span the entire visible spectra region is particularly desirable.

In general, Ga₂O₃ exists in five polymorph phases α , β , γ , ϵ and δ . The monoclinic β -Ga₂O₃, the most stable one among the phases, has extensive applications such as UV detectors, transparent conducting films, light-emitting diodes, magnetic memory, gas sensors, catalysts and dielectrics [10–12]. The band gap of β -Ga₂O₃ ranges from 4.5 eV to 5 eV. The Monoclinic β -Ga₂O₃ has lattice parameters $a = 12.23 \text{ \AA}$, $b = 3.04 \text{ \AA}$, $c = 5.08 \text{ \AA}$ and $\alpha = 103.7^\circ$ and it belongs to the space group C2/m with four Ga₂O₃ molecules per unit cell [10].

Although there are several reports on the luminescence of Ga₂O₃ bulk and nanocrystalline powder samples, its thin films are less explored. The film properties such as composition, texture, the thickness should be carefully modified to obtain the maximum light

* Corresponding author at: Optoelectronic and Nanomaterials' Research Laboratory, Department of Physics, Union Christian College, Aluva 683102, Kerala, India.
E-mail address: anilaei@gmail.com (E.I. Anila).



The Acts and Decrees of the Synod of Diamper and the Machinations of Religious Colonization

മതകോളനീകരണവും ഉദയംപേരൂർ സൂനഹദോസിന്റെ കാനോനുകളും

Shimi Paul Baby ^{a, *}



^a Department of Malayalam, Union Christian College, Aluva-683102, Kerala, India.

*Corresponding author Email: shimipaul2@gmail.com

DOI: <https://doi.org/10.54392/ijmrd2147>

Received: 09-11-2021; Revised: 21-12-2021; Accepted: 25-12-2021; Published 27-12-2021

Abstract: The Synod of Diamper is, arguably, amongst the most significant milestones in the history of St. Thomas Christians in Kerala. This Synod was convened in the church at Udayamperoor, Kochi, Kerala, from June 20 to June 26, 1599. As is documented, it was Archbishop Alexis De Menezes of Goa who convoked this Synod. 200 decrees were passed during the nine sessions which were held during the Synod; these decrees, *in toto*, became a turning point in the history of Christianity in Kerala. Primarily, the Synod of Diamper was a religious/theological one. However, its subsequent decisive role in the history and culture of Kerala also gave the Synod a social face. A close scrutiny of the canons [canon] reveals that these decrees were formulated with a consideration of only Christian practices that were prevalent and familiar in the West [Occident]. In a grimly ironic sense, the canons overtly attempts a coax-hoax, whereby the Christians of Kerala would be coerced to follow the rules of the occidental version of Christianity; and this disciplining would be aided by various methods including expulsions from parish, ex-communication, etc. One big fallout of this scenario was that the Christians of Kerala, who till then had a variegated co- existence with different cultures, were forced to take up an exclusive and singular notion of Christian culture. Through these canons, many of the existing socio- cultural customs of the Christians of Kerala were abolished; an attempt to sculpt the socio-cultural life of this native populace and bring it in accordance with the image of the Christian that the West upheld. This article aims to reveal the methodology through which the Institutionalized Western Theological-agencies, by means of constant surveillance and an enforced seclusion-exclusion axis, exerted power on regional and native Christian group.

Keywords: Colonialism, Religious Colonization, Synod of Diamper, Postcolonialism, Orientalism, Kerala Christians, Surveillance

Subject Specialization: Malayalam

About the Author



Dr. Shimi Paul Baby, working as an Assistant Professor in the Department of Malayalam, Union Christian College, Aluva, Ernakulam, a district of Kerala. She had published 14 research papers, authored and edited books in Malayalam Language and Literature.

ആമുഖം

പോർച്ചുഗീസ് അധിനിവേശശക്തികൾ കേരളക്രൈസ്തവരെ മതപരമായി കോളനീവൽക്കരിക്കുവാൻ നടത്തിയ സമ്മേളനമാണ് ഉദയംപേരൂർ സൂനഹദോസ്. എറണാകുളം ജില്ലയിലെ ഉദയംപേരൂർ എന്ന സ്ഥലത്ത് മർത്തമറിയം പള്ളിയിൽ വെച്ച് 1599-ൽ നടത്തിയ ക്രൈസ്തവമതസമ്മേളനമാണ് ഉദയംപേരൂർ സൂനഹദോസ്



Pokkali Cultivation in An Environmental History Perspective

- *Dr. Sebastian Joseph*

Associate Professor and Research Guide,
PG Dept. of History, UC College, Aluva,
Ernakulam, Kerala

- *Jiya Tharian*

Research Scholar, Department of History,
U.C.College, Aluva,
Ernakulam.

Summary :

Vypeen, the island in the Cochin backwaters have an environmental history to convey. This environmental history is unique to a greater extent due to the specific characteristics of the islands ecosystem and agrarian methods practised by the people of Vypeen are under threat due to the causative forces of urbanisation and integration of the island with the capitalist forces of production and appropriation. This paper tries to address these issues in an environmental history perspective as a suitable hypothetical assertion in analysing the history of Vypeen.

Keywords : Pokkali, Cherai, Shrimp culture, Socio Economic system

Introduction :

The island of Vypeen, 13 miles long by one broad, on the north side of Cochin, was thrown up by the sea not long ago. It is known in the localities *Puthu-vaipu*, and people there commence an era from the date of its formation in A.D. 1341. Vypeen has a size of 87.85 Sq. k.m. The Island is demarcated by a sea coast of 26 Kilometres on the West and backwaters extending around 30 Kilometres on the East. The ecology of Vypeen is unique. Vypeen has the natural advantage, as the whole area is connected with waterways large and small

which in turn, are connected with the sea. With paddy fields coconut gardens, marshy, lands and waste lands, water in most parts of the island is extremely saline. Another ecological peculiarity of Vypeen is its Mangroves which are vital for the environmental safety of the region. These ecological peculiarities facilitate a diversified development of the agricultural sector. The existing mangrove vegetation is highly fragmented, being restricted largely to the bunds of the shrimp farms, or edges of the coconut homesteads, and dense and extensive mangrove forests are lacking in Vypeen.

Evolution of Rights on Wetlands :

The history of rights on the wetlands adjoining Cochin estuary dates back to the evolution of organised brackish water wetland agriculture, locally called "pokkalikrishi". Pokkali agriculture in the low-lying belts of Cochin estuary was an occupation that was generally undertaken by the upper classes of the society. Two types of land tenure systems were reported in the low-lying fields around Cochin estuary. The first category was *Pandaravaka* (State property). The second category was the *Puravaka* (private property) of Jennies and in Vypeen island large area of land was controlled by the Paliath Achan & other *Nayars*.

Approved by UGC
Journal No. : 63580
Regd. No. 21747

Indexed by : IJIF, I2OR, SJIF
I2OR Impact Factor : 6.650
ISSN 2277-2014

Research Discourse

An International Peer-reviewed Refereed Research Journal

Vol.XI

No.1

JANUARY- MARCH 2021



Editor in Chief

Dr. Anish Kumar Verma

Associate Editors

Dr. Rakesh Kumar Maurya

Dr. Purusottam Lal Vijay

Romee Maurya

Ashok Ram

Published by :

South Asia Research & Development Institute

B. 28/70, Manas Mandir, Durgakund, Varanasi-221005, U.P. (INDIA)

Website : www.researchdiscourse.org

E-mail : researchdiscourse2012@gmail.com

Mobile : 09453025847, 8840080928

The Untold History of a Havoc : Flood in Munnar 1924

Dr. Jijo Jayaraj*

*Assistant Professor on Contract, P.G. Dept. of History, Pavanatma College, Marickassery, Idukki, Kerala.

Dr. Sebastian Joseph**

**Assistant Professor, P.G. Dept. and Research Centre in History, UC College, Aluva

Abstract : Munnar the plantation town in South India was affected by the flood of 1924. All the developments started by the colonial enterprise there were lost. Men and property was affected. There is a story behind this that no one has or has not told. A few plantation records and official records describe the flood of Munnar. All the records created by the planters represent it as a natural calamity that happened in Munnar like every other places in the then Travancore. The flood has caused severe damages on the men and materials of this region. It was not flood but landslide that perished many human lives. Munnar is located in the Southern Western Ghats of present day Kerala. It was ecologically sensitive area and it was there the European planters started large scale plantations especially the monoculture plantations of tea, coffee, cinchona, sisal etc., at the expense of the broad leaved evergreen forest.

Keywords : Munnar, Havoc, Flood, Colonialism, Plantation, Landscape, Degradation etc.

Introduction : Munnar is one of the busiest plantation spots in South India. It is located at the southern slopes of the Western Ghats and has been the abode of flora, fauna and adivasis population including the Muthuvan. Munnar attracted the foreign investment due to its geographical location and climate. The industry had begun in the early nineteenth century and Munnar witnessed large scale transformation both in geology and demography. Munnar got public attention with the reports submitted by the British travellers. But the turning point in the history of Munnar was the flood of 1924. It is also known as flood of 99, because it happened in the 1099 in Malayalam Era. Although it can be said that flood it was actually a misnomer because what destroyed Munnar was the landslips and landslide. The water damage was limited to the town of Munnar and all other places were damaged or washed away by landslides. It was the rain that sowed misery in Munnar as elsewhere in Travancore. It had afflicted serious damages on the men and property. The most modern technologies of the age like Munnar ropeway, light rail known as Kundala Valley Tramline, Hydro Electric Project etc., were irreparably damaged. The native labourers worked in the plantation estates suffered a lot. There is no accurate data even this day regarding the loss of lives in the estates. Both European Bungalows and coolie lines went underground or washed away in the rushing water. This article is an attempt to narrate the history of the havocs that occurred in Munnar in 1924.

Beginning of the Flood in Munnar : The flood of the 16th July 1924 was a milestone in the history of Munnar hills. There was heavy rain across the high range in the whole month. Plantation came to full swing during 1920s. European life on the hills was flourishing. The monsoon started in July in a normal way. The company had made all the pre-rain preparations as part of the plantation industry. Shading of the tea plants, repairs and maintenance of the roads and bridges were carried out. Rainfall in the first 12 days of July 1924 was very normal. It rained a lot as part of the monsoon but only a very low wind blew. A total of 195 inches measured in July. The rain started on 14 July 1929 morning. The rain was so strong and one of the witness sub divisional officer wrote to the government regarding the effect of the rainfall. Many lives lost in the heavy rain and land slips. Many trees had fallen down. Many lives including coolies and managers lost in the cyclone, factories and other buildings were damaged and the coolie's lines were carried away in the flood. The cyclone affected the Munnar-Top station Light Railway. The railway was completely damaged. Once again the General Manager H.L. Pinches, made efforts to develop the Kannan Devan Hills from the devastations of the flood. Gundumalai was the only estate that did not suffer so much as other places because of its location in a higher elevation.

Destruction of Munnar Town : A huge land-slip took place above the bridge, on the right side of the river above the Guderale road. This blocked the water flow and it banked up all that day and night. On Friday the 18th the Munnar old bridge which crossed to the town just below Hill's Bungalow the water was very nearly over the top of the bridge and logs were being pushed under to keep the bridge from being damaged. In about 5.30 p.m. the water began to come back and rise fast, and it was noticed that an old building then occupied by Marikar was

A Study of Gujarati Trading Community in Relation with the Emergence of Alappuzha Port

- *Mary Varghese*

Research Scholar, U.C. College, Aluwey, Kerala.

- *Sebastian Joseph*

Assistant Professor, U.C. College, Aluwey, Kerala.

Abstract :

The present study trying to trace a comprehensive history of Alappuzha port and this work centers on two set of questions in the first place detailed answers are sought to the question of how Alappuzha port was emerged and developed, politically and socio-economically. Port Alappuzha a planned construction of Travancore government in 1762 for the involment of maritime trading activities was a great challenge to the foreign trading companies which tries to monopolize the entire overseas trade and transports and this kind of trading activities were very rare in Indian subcontinent in 1700s. Another objective of this paper is to trace the history of Gujarati community in Alappuzha in the larger social context of Kerala in relation to the emergence of Alappuzha port and the past and present situation of Gujaratis their social and cultural life focusing on the identification of this community as a dying one. Gujaratis were the one among the trading group settled in Alappuzha, who were conservatives and rigidly followed traditions and social orders. What binds the community together is a common passion for business and money making. They were sharpened through centuries of maritime trade and commerce and has an inherent ability to do business, was attracted Travancore government and they invited gujaratis to settle in alappuzha for counter European merchants.

KEY WORDS : Alappuzha port, Gujarati trading community , maritime history

Introduction :

In Kerala history maritime trade played an integral part of its economic activities. Maritime commerce is known to have been carried on

for ages between the Malabar Coast and Persian Gulf.¹ Port acted as the doors for the micro economic units of Kerala to interact with the wider world outside. These were also the main doors through which the outside world enters in to the nook and corner of Kerala. The location of ports and the rhythms of trade are largely determined by the physical factors of geography, geology and climate, specially the monsoon winds dictated the economic life of the region by subjecting its ports 'The period of activity' and 'month of isolation' bringing ships from Africa, Arabia, and Persia etc. In short Movement of the commodities, ideas, and people through this port shaped a lot of the culture of the people inhabiting the region. Travancore had from very ancient time's maritime trade relations with the western and Middle East and Far Eastern countries.⁴ The anonymous writer of Periplus of Erythrean Sea describes the commercial activity at the ports of Muziris [Cranganore], Nelcynda [Niranam], Bacre [Purakad], and Balita [Varkala] where coir, topaz, precious metals etc... were exchanged for large quantities of pepper, ginger, ivory, peacocks, apes, piece goods and other indigenous products. Pepper was specifically mentioned as a produce of Cottanara [Kuttanad]

Content :

Emergence of Alappuzha port we could understand only with study of the socio economic background of Travancore. Travancore [anglicized version of the name Thiruvithamcode] was pushed by the ambitious and state building Rajas Marthanda Varma 1729-1758, and Rama Varma

Life Satisfaction of Mothers of Differently abled Persons with Online Vocational Training in Covid 19 Pandemic

*Fr. Dr. Shony Mathew, P.J. & **Dr. Vidhya Ravindranadan

*Fr. Dr. Shony Mathew, P.J.
Cottolongo Vocational Rehabilitation Research Centre
Vadakkumpara P.O. Wandoor, Malappuram, Kerala

**Dr. Vidhya Ravindranadan
Asst. Professor, Research Dept. of Psychology
Union Christian College, Aluva,
Ernakulum, Kerala

Abstract

The present study is undertaken to examine the life satisfaction of mothers of differently abled persons with vocational training in Malappuram and Ernakulum district of Kerala during the Covid 19 pandemic period. For this purpose, the life satisfaction scale was used. The participants for the present study consisted of 60 mothers of differently abled persons (30 with vocational training and 30 without vocational training) from Malappuram and Ernakulum district in Kerala. The major findings of the study is that the mothers of differently abled adults who received online vocational training during Covid 19 experienced greater degree of life satisfaction than their counterparts whose children did not receive any vocational training.

Key terms: Life Satisfaction, Differently abled, Vocational Training, Covid-19 pandemic

Tracing The Life and Culture : Muthuvans of Kannan Devan Hills On The Eve of Europeanisation

Dr. Sebastian Joseph • Dr. Jijo Jayaraj

Summary

The Muthuvans lived in the interior forest of these regions from prehistoric period onwards. In the early days they kept aloof from the mainstream population and had followed peculiar life world practices. The historical records about the adivasis were constructed as a part of the official discourses by the imperial government. This article attempts to articulate the social and cultural structures underpinned in the life world of the Muthuvans who were the original inhabitants of the forest of Kannan Devan Hills in the erstwhile Travancore state on the eve of the opening of plantations by the European planters.

Keywords

Muthuvan-tribe-adivasi-colonialism-modernity-kani (Head man)-kudi (settlement)-culture-matrilineal-settlement-tradition

Introduction and Scope

The Kannan Devan Hills today known as Munnar the confluence of the three rivers has been the abode of a number of adivasis. The place now famous for tea plantation industry was once a semi tropical evergreen forest with large number of diverse flora and fauna. The adivasis like Muthuvan, Mannan, Urali, Paliyar, Pulayar etc., lived in the forest for many generations with least environmental impact on the ecosystem. Most of the tribal settlement has unique beliefs, traditions, language and culture.



സമ്പർക്കവിലക്കിലായ വിജ്ഞാനശാഖ: ചരിത്രത്തിന്റെ ഭൂത/വർത്തമാന കാലം

ഡോ. സെബാസ്റ്റ്യൻ ജോസഫ്

ഭൂതകാലവുമായി ബന്ധപ്പെട്ടത് എന്ന സാമാന്യ ധാരണയ്ക്ക് പുറത്താണ് ചരിത്രത്തെ മിക്കപ്പോഴും പരിഗണിക്കുന്നത്. അതുകൊണ്ടുതന്നെ വർത്തമാനകാലത്തെ പ്രയോജനവാദ ചിന്താഗതിയെ സംബന്ധിച്ചിടത്തോളം പ്രത്യേകിച്ച് ഒരു പ്രസക്തി യുമില്ലാത്ത ഭൂതകാലത്തെക്കുറിച്ചുമാത്രം ചിന്തിച്ചിരിക്കുന്ന ആളുകളാണ് ചരിത്രകാരന്മാരും ചരിത്രാധ്യാപകരും. ഏതാണ്ട് ഇതിന് സമാനമായ ഒരു മനോഭാവം, അതായത് അയഥാർഥ്യമായ പണ്ടുണ്ടോ നടന്നെന്ന് പറയുന്നവയുടെ ഊഹവും അത്തരം ഊഹങ്ങൾക്ക് മേലുള്ള വ്യാഖ്യാനവും ഒക്കെയാണ് ചരിത്രമെന്നും അതുകൊണ്ടുതന്നെ വലിയ പ്രയോ

ഗികതയൊന്നുമില്ലാത്ത എഴുത്തിനും തോന്നലുകൾക്കും മേൽ സൃഷ്ടിക്കുന്ന അറിവാണിതെന്നുള്ള ധാരണയാണ് പൊതുജനങ്ങൾക്കിടയിലും. മറ്റൊരാൾക്ക് ചരിത്രപഠനമെന്ന വിജ്ഞാനശാഖയെപ്പറ്റി അത്രയൊന്നും നിപുണതയില്ലാത്ത ചരിത്രകാരന്മാരും ചരിത്രാധ്യാപകരും തങ്ങളുടെ മുടന്തൻ വാദങ്ങളുടെ മറുപടിയുമായി വരുന്നതോടെ കാര്യങ്ങൾ കൂടുതൽ മോശമാവുന്നു. ശ്രേഷ്ഠമായ റാങ്കേയൻ പാരമ്പര്യവും പോസിറ്റിവിസ്റ്റ് വസ്തുനിഷ്ഠതയും തങ്ങളുടെ പഠനശാഖയുടെ ശാസ്ത്രീയതാ അവകാശവാദങ്ങളും പ്രൊഫഷണൽ സ്വഭാവവും മറ്റുള്ളവരെ ബോധ്യപ്പെടുത്താൻ ഇവർ അത്യധ്വാനം ചെയ്യുന്നു.



ഇർഫാൻ ഹബീബ്

തൊണ്ണൂറിലെത്തിയ ചരിത്ര ശൗര്യം

ഡോ. സെബാസ്റ്റ്യൻ ജോസഫ്
ലിജോ സെബാസ്റ്റ്യൻ

കഴിഞ്ഞ ഏഴ് പതിറ്റാണ്ട് കാലമായി ഇന്ത്യൻ ഡയെഷണൽ രംഗത്തെ അവഗണിക്കാനാവാത്ത ഇടപെടൽ ശേഷി പ്രകടിപ്പിക്കുന്ന ചരിത്രകാരനും സാമൂഹിക ശാസ്ത്രജ്ഞനുമായ പ്രൊഫ. ഇർഫാൻ ഹബീബിന് തൊണ്ണൂറ് വയസ് തികഞ്ഞിരിക്കുന്നു. ചരിത്രകാരൻ, അധ്യാപകൻ, മാർക്സിസ്റ്റ് ചിന്തകൻ, സാമൂഹിക വിമർശകൻ, സംഘാടകൻ എന്നിങ്ങനെ ഇടപെട്ട മേഖലകളിൽ ഒക്കെയും തനതായ വ്യക്തിമുദ്ര പതിപ്പിച്ചയാളാണ് അദ്ദേഹം. ഇർഫാൻ ഹബീബ് എന്ന ചരിത്രകാരന് തൊണ്ണൂറ് വയസ് തികയുന്നു എന്നുള്ളതല്ല പ്രാധാന്യം,

തൊണ്ണൂറു വർഷത്തെ ഈ ലോകജീവിതത്തിൽ ഇർഫാൻ ഹബീബ് എത്ര ചരിത്രം രചിച്ചുവെന്നുള്ളതിലാണ് പ്രാധാന്യം. ചരിത്ര രചനയെയോ ചരിത്രാധ്യാപനത്തെയോ മഹനീയമാക്കുക എന്നതു മാത്രമായിരുന്നില്ല ഈ 'ഇർഫാൻ തൊണ്ണൂറി'ന്റെ പ്രസക്തി. ഇതു രണ്ടുമായിരിക്കെത്തന്നെ ഭരണകൂടങ്ങളുടെ വർഗീയ രാഷ്ട്രീയ നീക്കങ്ങളെ ചരിത്രപരമായി എതിർക്കുന്ന എതിർപക്ഷത്തിന്റെ ചരിത്രകാരനായിരുന്നു ഇർഫാൻ എല്ലാ കാലത്തും. അദ്ദേഹത്തിന്റെ രാഷ്ട്രീയം നിരന്തരമായ ചരിത്രസ്രോതസ്സുകളുടെ ശാസ്ത്രീയ വിമർശപഠനങ്ങളിലടി

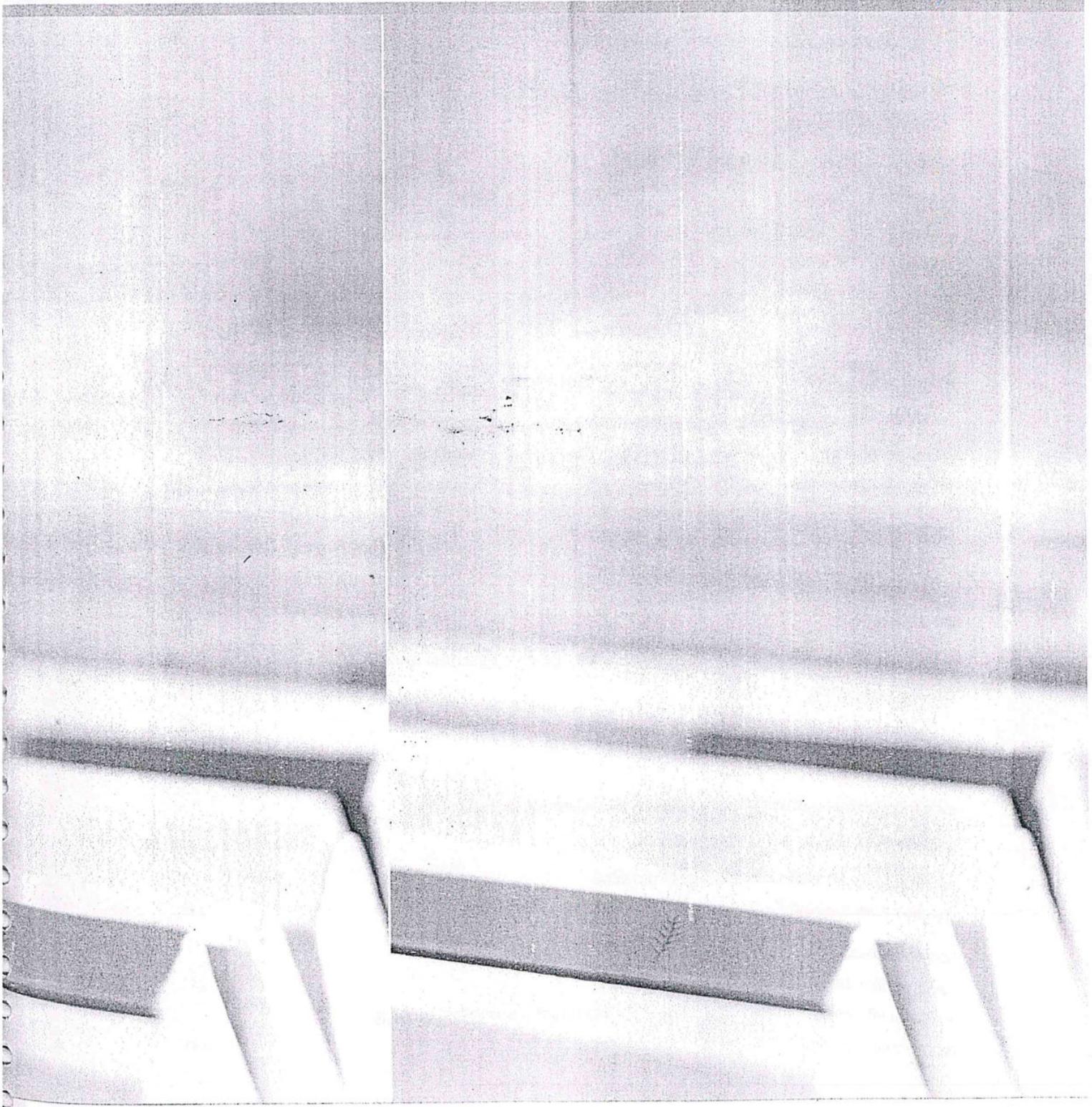


VOL. I, No.7
 2022 January-June
 1197 ധനു-ഇടവം



CHENGAZHI

Included in UGC-CARE list
 A peer reviewed research journal



ഉള്ളടക്കം

കവിതയിലെ സങ്കല്പനവും വിചേദവും അമീന എം.എൻ.	9
'മനുഷ്യസന്നിധിയിൽ' ഒരു മനുഷ്യർ ഹരികുമാർ എസ്.	24
കവിതയുടെ ജൈവലോകം : ഭാവന,ദർശനം,ആഖ്യാനം ബിന്ദു ടി.വി.	29
പ്രാചീനഇന്ത്യയിലെ ഭക്ഷണസമ്പ്രദായങ്ങൾ എൻ. രജനി; ഉണ്ണികൃഷ്ണൻ കിഴക്കേ വള്ളപ്പിൽ	38
സെന്റ് തോമസ് ചരിതം:പുരാവൃത്തങ്ങളുടെ പുനർവായന എം.ഐ. പുനന്തസ്	44
'എന്റെ കഥ'-പെൺ പിഴകളുടെ അരന്തറ്റാണ് വി. ലിസി മാത്യു	52
മരക്കാപ്പ്—അറിവിന്റെ കടപ്പുറം റീജ വി.	63
മ്ലാവേലിവായനയും മ്ലാവേലിച്ചിത്രകലയും സജിത ജി	70
ഭിന്നശേഷി വ്യവഹാരങ്ങൾ: സാമൂഹിക ബലതന്ത്രങ്ങളും സാംസ്കാരിക പ്രയോഗങ്ങളും സ്റ്റാലിൻ ദാസ് പടിഞ്ഞാറെ പുരക്കൽ	76
ചങ്ങാത്തവും പെണ്ണെഴുത്തും സൈബർ പെൺകൂട്ടങ്ങളുടെ രചനകളിലൂടെ ഒരന്വേഷണം ജിസ ജോസ്	85
ഇന്റർനെറ്റ് മീമുകളും മലയാളി സമൂഹവും സംഗീത് മാത്യു	93
മലയാളിയുടെ സംസ്കാരശീലത്തിലെ ആൺനോട്ടം അനു ജെയിംസ്	102
മലയാളത്തിലെ കാവ്യഭാഷ: നിയോക്ലാസ്സിക്കൽ ഘട്ടം മുതൽ പുതുകവിത വരെ ബിൻസ് എം. മാത്യു	108
സുഗതകുമാരികവിതയിലെ ജൈവവിന്യസനങ്ങൾ ബ്രിൻസി മാത്യു	116
ഉടൽവിനിമയവും പ്രണയനിലകളും—മാധവിക്കുട്ടിക്കവിതകളുടെ വായന ഷീബാദിവാകരൻ	121
ചികിത്സയുടെ നൈതികത മലയാളസിനിമയിൽ സുഷമകുമാരി കെ.എസ്.	130
'കടൽത്തീരത്തി'ലെ ബലിച്ഛോറ് ജിഷ എലിസബേത്ത് വർഗീസ്	137
പാട്ടിലെ ജീവിതവും ജീവിതത്തിലെ പാട്ടും —വയനാടൻ പുലയരുടെ കളപെട്ട് സിനുമോൾ തോമസ്	141

സെന്റ് തോമസ് ചരിതം: പുരാവൃത്തങ്ങളുടെ പുനർവായന

എം.ഐ. പുനന്തസ്

പ്രൊഫസർ, മലയാളവിഭാഗം, യു.സി.കോളജ്, ആലുവ

സെന്റ് തോമസിന്റെ കേരളസന്ദർശനദൗത്യം ചരിത്രത്തിൽ ഇന്നും തീർപ്പാകാത്ത വിവാദാസ്പദ ചരിത്രവിഷയമാണ്. ഐതിഹ്യപാഠങ്ങളിലെ ചരിത്രപരാമർശങ്ങളെ ഒന്നാം നൂറ്റാണ്ടിന്റെ സാമൂഹികചരിത്രവുമായി ചേർത്തുവായിച്ചുകൊണ്ട് നടന്നിട്ടുള്ള അനുകൂലവും പ്രതികൂലവുമായ ചരിത്രനിലപാടുകളെ പുനർവായനയ്ക്ക് വിധേയപ്പെടുത്തുന്ന പുരാവൃത്തവിശകലനപഠനമാണിത്. മധ്യനൂറ്റാണ്ടുകളിൽ പാരമ്പര്യനസ്ത്രാണി സമൂഹം നേരിട്ടിരിക്കാനിടയുള്ള അസ്തിത്വവ്യഥകളെയും ആത്മസംഘർഷങ്ങളെയും മറികടക്കുന്നതിന് ക്രൈസ്തവ സമഷ്ട്യബോധം സൃഷ്ടിച്ചവയാണ് ഇന്ന് പ്രചാരത്തിലുള്ള സെന്റ് തോമസ് പുരാവൃത്തങ്ങളെന്ന നിഗമനമാണ് ഈ പ്രബന്ധം മുന്നോട്ടു വെയ്ക്കുന്നത്. പൂർവ്വചരിത്രസ്മരണകളിലെ സെന്റ് തോമസെന്ന ഗണനായകനെ രക്ഷകനായ ഒരു പിതൃപ്രരൂപമെന്ന നിലയിൽ ഈ വാങ്മയാഖ്യാനങ്ങൾ പുരാവൃത്തവൽകരിച്ചിരിക്കുന്നതിന്റെ സാഹചര്യങ്ങളും സാംഗത്യവും ചർച്ച ചെയ്യുന്നു.

താക്കോൽ വാക്കുകൾ: ആത്മീയസ്വത്വം (Religious Identity), ആദിപ്രരൂപം (Archetype), ഈഗോപ്രതിരോധം (Ego Defense), ഘടനാപഠനം (Structural Study), ദിവൈത്യതിഹൃത്തങ്ങൾ (Sacred Myths), പുരാവൃത്തപഠനം (Mythical Study), സമഷ്ട്യബോധം (Collective unconscious)

കേരളചരിത്രത്തിൽ പെരുമാൾക്കഥപോലെ പുരാവൃത്ത പരിവേഷമുള്ള മറ്റൊരാഖ്യാനമാണ് സെന്റ് തോമസ് ഇതിഹാസം. ചരിത്രസാധ്യതകളുടെ ബലിഷ്ഠമായ അടിത്തറമേൽ ഭാവനയും വിശ്വാസവും കൊണ്ട് പടുത്തുയർത്തിയ കമനീയ വാങ്മയ ശില്പങ്ങളാണവ. വസ്തുനിഷ്ഠമായ ചരിത്രോപാദാനങ്ങളുടെ അഭാവമാണ് ഈ ഇതിഹാസത്തിന്റെ ചരിത്രപരത കൂടുതൽ സങ്കീർണ്ണമാക്കുന്നത്. എ.ഡി. ആദ്യനൂറ്റാണ്ടിലെ സെന്റ് തോമസിന്റെ ഭാരതപ്രവേശനത്തെ സംബന്ധിച്ച പുരാവൃത്തസാക്ഷ്യങ്ങളെ ചരിത്രമായും ഭാവനാസൃഷ്ടിയായും സമർത്ഥിക്കുന്ന രണ്ടു പ്രബല ചിന്താപക്ഷങ്ങൾ നിലവിലുണ്ട്. സെന്റ് തോമസിന്റെ പ്രേഷിതദൗത്യം ഒരു ഭാവനാസൃഷ്ടി മാത്രമാണെന്ന ചരിത്രനിലപാടുകൾ വളരെ പ്രബലമാണ്. മിൽനി റേ, പീറ്റേഴ്സ്, ഡാൽമൻ, ലാറ്റുററ്റ്, ഫാ.ജെയിംസ് ഹൗ, ടി.കെ.ജോസഫ്, എം.ജി.എസ്. നാരായണൻ, കെ.ശിവശങ്കരൻ നായർ,