



Cardio-protective effects of *terminalia catappa* leaves and *terminalia chebula* fruit extract in doxorubicin-induced cardiomyopathy in rats

Ramasamy Manikandan, Balamuralikrishnan Balasubramanian, Panneerselvam Punniyakotti, Arumugam Vijaya Anand, Arun Meyyazhagan, Shanmugam Velayuthaprabhu, Rengasamy Lakshminarayanan Rengarajan, Utthapon Issara & Wen-Chao Liu

To cite this article: Ramasamy Manikandan, Balamuralikrishnan Balasubramanian, Panneerselvam Punniyakotti, Arumugam Vijaya Anand, Arun Meyyazhagan, Shanmugam Velayuthaprabhu, Rengasamy Lakshminarayanan Rengarajan, Utthapon Issara & Wen-Chao Liu (2022): Cardio-protective effects of *terminalia catappa* leaves and *terminalia chebula* fruit extract in doxorubicin-induced cardiomyopathy in rats, *Biomarkers*, DOI: [10.1080/1354750X.2022.2064550](https://doi.org/10.1080/1354750X.2022.2064550)

To link to this article: <https://doi.org/10.1080/1354750X.2022.2064550>



Published online: 02 May 2022.



Submit your article to this journal [↗](#)



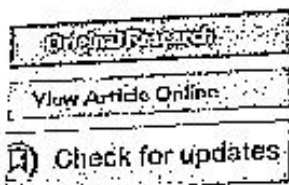
Article views: 26



View related articles [↗](#)



View Crossmark data [↗](#)



Effects of *Euphorbia thymifolia* and *Euphorbia hirta* leaf extracts on membrane-bound, mitochondrial enzymes and lipid profile of carbon tetrachloride-induced hepatotoxicity in rats

received 23 January 2022
revised 10 February 2022
accepted 17 February 2022
available online 29 March 2022

Gurupalraj Durai Muthu Mani¹, Balasubramanian Balamuralikrishnan^{2,*},
Ramdasamy Manikandan³, Palanisamy Sampathkumar⁴,
Meeyazhagan Arun⁵, Rengasamy R Lakshminarayanan⁶, Wen-Chao Liu⁷,
Arumugam Vijaya Anand^{8,*}

lited by Onur Bender

KEYWORDS:

hepatoprotective activity
membrane-bound
mitochondrial enzymes
lipid profiles

J. Pure Appl. Nat. Prod. 2022, 16(1):7
doi:10.53365/jnpnp.146770
SN: 2583-1194
Copyright © 2022 Visper Publishing House

¹Department of Biochemistry, SRM Arts and Science College, Chennai, Tamil Nadu, India
²Department of Food Science and Biotechnology, College of Life Science, Sejong University, Seoul, South Korea
³Department of Biochemistry, Sri Mata Indira Gandhi College, Trichy, Tamil Nadu, India
⁴Department of Chemistry and Biosciences, SASTRA University, Kumbakonam, Tamil Nadu, India
⁵Department of Life Science, CHRIST (Deemed to be University), Bengaluru, Karnataka 560076, India
⁶Department of Animal Sciences, Bharathidasan University, Tiruchirappalli, Tamil Nadu, India
⁷Department of Animal Science, College of Coastal Agricultural Sciences, Guangdong Ocean University, Zhanjiang 524088, P. R. China
⁸Department of Human Genetics and Molecular Biology, Bharathiar University, Coimbatore, Tamil Nadu, India

ABSTRACT: The present investigation was aimed to identify the potentiality of *Euphorbia thymifolia* Linn. and *Euphorbia hirta* Linn. leaf extract on the toxin-induced (carbon tetrachloride - CCl₄) Albino Wistar rats. The animals were grouped into 7 categories including control (basal diet, G1), CCl₄-induced (1.5 mL/kg, b.w., i.p.) (G2), G1 administered with 300 mg/kg b.w., extract of *E. thymifolia* (G3) and *E. hirta* (G4), G2 administered with 300 mg/kg b.w., extract of *E. thymifolia* (G5), *E. hirta* (G6), and standard drug (silymarin 25 mg/kg b.w.; G7) for 21-days trial period with each group contains 6 rats. The samples were collected and the following parameters including mitochondrial enzymes, different ATPase and lipid profiles were analyzed. The membrane-bound enzymes, the mitochondrial enzymes levels and the lipid profiles were reduced in the toxin-induced rats but the levels of enzymes were restored, significantly increased and lipid profiles are returned to the normal in the treatment of both extracts.

INTRODUCTION

The liver is one of the most important organs and mainly involves the metabolism of biomolecules, protein synthesis, production of various biochemical compounds, detoxification and regulating homeostasis in the body (Rose, 2001; Udomsinprasert & Jitikon, 2019). In addition, it is also involved in the bile secretion and the storage of minerals as well as vitamins (Ahsan et al., 2009; Tavakoli et al., 2019). The liver has been exposed to substances from exogenous origin like environmental toxins, drugs and alcohol, which

may lead to complications in the liver, generally presenting as a distinct pattern of diseases such as cirrhosis, hepatitis, haemochromatosis, cholestatic, coronavirus (Dinesh et al., 2014; Li & Fan, 2020). In the case of disturbed liver functions due to toxins, may alter the chemical composition of the liver and its subcellular organelles (Figure 1). The modification in the structure of the liver and its function may result in jaundice, increased bleeding, portal hypertension and causes multiple metabolic changes which may affect the functions of the other organs (Ibrahim et al., 2008).

Corresponding authors.

Email addresses: geneciv@rediffmail.com (Balasubramanian Balamuralikrishnan); avahgm@buc.edu.in (Arumugam Vijaya Anand)

This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).





search articles

Nano phytoremediation for textile dye degradation using abutilon indicum silver nanoparticles: photo catalytic activities

Varalakshmi B¹, Jannathul Firdous^{2*}, Karpagam T¹, ShaamugaPriya A¹, Suganya V¹, Anitha P¹, Gomathi S¹, Manikandaa R¹, Abarna T¹, Abirami N¹, Jeyarani³

¹ Sri Sathya Sai Institute of Higher Learning, Bangalore, India.
² Cluster for Integrative Physiology and Molecular Medicine, Royal College of Medicine Perak, University Kuala Lumpur, Jalan Greentown, Ipoh, Perak, Malaysia.
³ Sri Indira Ganesan Institute of Medical Science, Madurai Main Road, Manikarayan, Tiruchirappalli, India.

STRACT

Synthetic dyes are colouring agents mainly used in textile industries which generate a huge amount of wastewater in the process of dyeing. Several dyes used in textile industry usually have a synthetic origin and complex aromatic molecular structures which make them more stable and difficult to be biodegraded and thus polluting the environment. To overcome the deleterious effects of such dyes, it is necessary to decolorize them. In the present study, fabric azo dyes were decolorized by silver nano particles isolated from plant Abutilon indicum. Production and characterization of silver nanoparticles synthesized from Abutilon indicum was analysed by UV-visible spectroscopy and Fourier transform infra-red spectroscopy. Photo catalytic degradation using Abutilon indicum synthesized silver nanoparticles showed significant dye degrading efficiency against dye. At the end of 24 hours, nanoparticles of Abutilon indicum showed 17.41% of degradation, followed by increased degradation of about 72% at the end of 7th day of incubation. Results confirmed the complex, toxic azo dyes were degraded into simple, non-toxic compounds. In conclusion, Abutilon indicum synthesized silver nanoparticles can exhibit excellent photo catalytic activity against dye molecules and can be used in water purification systems and dye effluent treatment.

Keywords: Abutilon indicum, azo dye, photo catalytic degradation, phytochemicals, silver nanoparticles, Received - 20/09/2021, Reviewed - 02/10/2021, Revised/ Accepted- 07/12/2021

Correspondence: Jannathul Firdous, ✉ jannathul.firdous@unipkl.edu.my

Faculty of Medicine, Royal College of Medicine Perak, University Kuala Lumpur, Jalan Greentown, Ipoh, Perak, Malaysia.

INTRODUCTION

Dyes are versatile chemicals which are consumed by a number of chemical industries like textile, printing, paper, food and cosmetics industries.^[1] This azo dye comprise of one or more azo groups (-N=N-) with benzene, naphthalene, and aromatic heterocyclic aromatic rings.^[2] Anthraquinone dyes and phthalocyanine dyes are azo dye on the basis of containing chromophoric groups. Anionic and non-anionic dyes are classified based on their behavior in aqueous solution. Disperse dye and reactive dye are based on their application method and used for polyester and cotton fabrics respectively.^[3] This synthetic dyes produced can have detrimental effects when it is discharged into the environment without any treatment.^[4] Almost 700,000 tons of different synthetic dyes are synthesized annually and they are non-biodegradable with resistant to degradation by heat, light, or water.^[5] Effects of such dyes when discharged into the water bodies causes an increase in BOD and COD levels, depletion of aquatic biota,^[6] generation of carcinogenic compounds,^[7] toxicity, mutagenicity and

carcinogenicity^[8].

The treatment of such industrial effluents should be necessary prior to their discharged into the environment. The conventional chemical processes are effective but produces toxic intermediate products^[9] and the physical processes are less efficient with high operational cost.^[10] Biological processes have received more interest by today because of their cost effectiveness, lower sludge production and environmentally friendly. Microbial systems (bacterial and fungal species either as pure or mixed cultures) with efficient decolorization or degradation of colorants were well documented.^[11] Plants can uptake contaminants persisting in environment and such phytoremediation is used for effective elimination of wastes including azo dyes and colorants. The use of plant extracts for the synthesis of nanoparticles known as green synthesis of nanoparticles and this emerging research contributes for Nano phytoremediation. Even plants not aid in remediation may remediate various contaminants by altering their physiology and biochemistry with the

Electroorganic Synthesis and Characterization of 4-Ethoxy Acetanilide using Platinum and Graphite as Anodes

S. Antonysakthi^{1*}, M. S. Selvakumar², P. L. Prabha³

¹Department of Chemistry, St. Joseph's College (Affiliated to Bharathidasan University), Tiruchirapalli-620 002, Tamilnadu, India

²Department of Chemistry, St. Xavier's College (Affiliated to Manonmaniam Sundaranar University), Palayamkottai, Tiruchiveli, 627 007, Tamilnadu, India

³Department of Chemistry, Shrimati Indira Gandhi College (Affiliated to Bharathidasan University), Tiruchirapalli-620 002, Tamilnadu, India

Received 12 November 2021, accepted in final revised form 3 February 2022

Abstract

Alkoxy group substituted compounds of acetanilide are found to have pharmacological and industrial importance. Synthesis of alkoxy substituted acetanilides via conventional thermal methods involves multi-step processes, formation of side products, and the poor yield of desired products. But, the vast literature studies reveal that electroorganic synthesis of alkoxy substituted acetanilide derivatives would be effectively carried out through electrochemical oxidation methods. The direct substitution of the ethoxy (alkoxy) group onto the aromatic ring, an electrophilic substitution, has not been attempted so far. This concept is taken as a preparatory attempt to find an alternative method to the tedious chemical route and to invent a direct method of introducing the ethoxy groups into the aromatic ring in a single step. A polarization study on acetanilide with ethanol as an electrolyte is carried out on platinum and graphite anodes to find out the oxidation potentials. Electrochemical ethoxylation of acetanilide at the platinum electrode is done by the Potentiostatic method using the oxidation potentials. The products are separated using preparative TLC and purified with suitable solvents. The products are characterized by UV, IR, NMR, and Mass spectra.

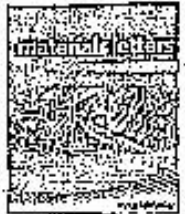
Keywords: Anodic ethoxylation; 4-Ethoxy acetanilide; Electroorganic synthesis.

© 2022 JSR Publications. ISSN: 2070-0237 (Print); 2070-0245 (Online). All rights reserved.
doi: <http://dx.doi.org/10.3329/jsr.v14i2.54735> J. Sci. Res. 14 (2), 583-591 (2022)

1. Introduction

The electrochemical methoxylation and ethoxylation of aromatic compounds can be used to synthesize polymers and plasticizers, valuable lubricating oils, emulsifying agents, perfumes, pharmacological drugs, inhibitors of the oxidation of petroleum products, and biologically active preparations [1]. Electrochemical ethoxylation of mono- and di-substituted aromatic compounds on platinum and graphite anodes are found to yield ethoxy substituted aromatic compounds of industrial and pharmaceutical importance [2].

* Corresponding author: santonysakthi@gmail.com



Synthesis and antimicrobial activity of aluminium oxide nanoparticles using *Lyngbya majuscula* extract

P. Manogar^{a,*}, Jobu Esther Morvinyabesh^a, Ponnusamy Ramesh^b,
 Jayasekar Dayana Jeyaleela^c, Venkatesan Amalan^d, Jamaan S Ajarem^e, Ahmed A Allam^f,
 Seong Khim^g, Natesan Vijayakumar^{d1,*}

^a Research Department of Botany, Nehru Memorial College (Autonomous) Puthanampatti, Affiliated to Bharathidasan University, Tiruchirappalli, Tamil Nadu 620002, India

^b Research Department of Physics, Nehru Memorial College (Autonomous) Puthanampatti, Affiliated to Bharathidasan University, Puthanampatti, Tamil Nadu 620002, India

^c Department of Chemistry, Shri Matai Indira Gandhi College, Affiliated to Bharathidasan University, Tiruchirappalli, Tamil Nadu 620002, India

^d Department of Biochemistry and Biotechnology, Faculty of Science, Annamalai University, Annamalainagar, Tamil Nadu 608002, India

^e Department of Zoology, College of Science, King Saud University, Riyadh, Saudi Arabia

^f Department of Zoology, Faculty of Science, Beni-Suef University, Beni-Suef, Egypt

^g Faculty of Earth & Environmental Sciences, College of Natural Sciences, Seoul National University, Seoul 08526, Republic of Korea

KEYWORDS

Aluminum oxide nanoparticles

ABSTRACT

Today, the synthesis of green metal nanoparticles is a potential approach in material science and nanotechnology. Aluminum nanoparticles (Al₂O₃NPs) were produced in a high-efficiency, cost-effective, green, and easy method using *Lyngbya majuscula* algae extract. The aluminum oxide nanoparticles were evaluated using X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FT-IR), and scanning electron microscopy (SEM). This study also determines the antibacterial activity and minimum inhibitory concentration (MIC) of Al₂O₃ nanoparticles against pathogens such as *Streptococcus aureus*, *Bacillus subtilis*, *Klebsiella pneumoniae*, *Salmonella paratyphi*, *Candida albicans*, and *Aspergillus flavus*. The average crystallite size of Al₂O₃ nanoparticles was determined to be 226 nm and 382 nm in UV, 28 nm in XRD, and peaks at 407 and 428 in the FT-IR spectra, which were attributed to aluminum oxide stretching. *Klebsiella pneumoniae* and *Candida albicans* displayed a peak zone of inhibition (22 mm) in the antimicrobial experiment at a dose of 100 mg/ml of Al₂O₃ nanoparticles. Finally, aluminum oxide is a powerful antibacterial agent that may be used to treat a wide range of human illnesses.

1. Introduction

Aluminum oxide nanoparticles are useful in the ceramic industry they may be utilized as an abrasive, as an absorbent in heterogeneous catalysis, as a biomaterial, and as reinforcements in metal composites. In recent years, there has been a fast increase in number of microorganisms that are resistant to commonly used antibiotics. The contact surface area will grow by 10⁹ times if the particle size is reduced from ~10 μm to 10 nm. Due to their high surface area to volume ratio and unique chemical and physical characteristics, nanomaterials have emerged as potential antibacterial agents in various applications [1]. Over a wide temperature range, alumina nanoparticles are dynamically stable particles. They have a corundum-like

structure, with oxygen atoms packed hexagonally close together and aluminum ions covering two-thirds of the lattice's octahedral spaces [2]. Nanoparticles also have stronger catalytic capabilities and have a variety of medicinal uses, including drug delivery systems and bio-imaging sensors. Because of their great solubility and therapeutic qualities, nanoparticles are utilized in various sectors. Green synthesis of nanoparticles was done utilizing plants, bacteria, fungus, and algae as an environmentally friendly and cost-effective alternative to physical and chemical approaches [3]. They're also utilized to make medications that are safe, effective, and, most critically, cheap and non-toxic [4]. In recent years, scientists have focused on the use of diverse plant systems as renewable and sustainable resources for the manufacture of metal nanoparticles [5]. Nanoparticles have been shown to exhibit

Corresponding authors.

E-mail addresses: man071985@gmail.com (P. Manogar), nvkbiochem@yahoo.co.in (N. Vijayakumar).

doi:10.1016/j.matlet.2021.131569

Received 2021; Received in revised form 10 December 2021; Accepted 20 December 2021

15 June 2021

© 2021 Elsevier B.V. All rights reserved.

Comparison of Anti-Inflammatory Activities of Biogenic *Gymnema Sylvestre*- and *Panicum sumatrense*-Mediated Titanium Dioxide Nanoparticles

Moses Stella Bharathy, Gnanasekar Dayana Jeyaleela, Joseph Devaraj, Rosaline Vimala, Aranganathan Agila, Sagaya Adalajaraj Margal Sheela
Department of Chemistry, Holy Cross College (Autonomous), Affiliated to Bharathidasan University, Tiruchirappalli, Tamil Nadu, India

Abstract

Background: Studying the anti-inflammatory effect of the wound-healing property in immune responsive compounds such as interleukins and cytokines plays a vital role in targeting various inflammatory diseases such as asthma, rheumatoid arthritis, tuberculosis, and periodontitis. The goal of the present work is to compare the anti-inflammatory activity of *Gymnema sylvestre* (GS)- and *Panicum sumatrense* (PS)-mediated titanium dioxide (TiO₂) nanoparticles (NPs) by *in vitro* studies. **Methods:** *G. sylvestre*- and *P. sumatrense*-mediated TiO₂ NPs were synthesized by Greener method. The synthesized TiO₂ NPs were spectroscopically characterized such as Ultraviolet-visible, Fourier transform infrared spectroscopy, X-ray diffraction, scanning electron microscope (SEM), and Energy Dispersive X-Ray Analysis (EDAX). **Results:** The *in vitro* anti-inflammatory activities of GS-TiO₂ and PS-TiO₂ NPs were carried out by albumin denaturation assay. **Conclusion:** The overall study concludes that *G. sylvestre*-mediated TiO₂ nanoparticle can have a scope in alternative treatment/medy for inflammation diseases.

Keywords: Anti-inflammatory activities of *Gymnema sylvestre*-titanium dioxide and *Panicum sumatrense*-titanium dioxide, green synthesis of titanium dioxide, *Gymnema sylvestre*-titanium dioxide, *Panicum sumatrense*-titanium dioxide

INTRODUCTION


Nanotechnology/nanoscience comprises a synthesis and application of nano-sized particles with an average size of 1–100 nm and is widely applied in the field of energy, chemical, health care, and cosmetics. In scientific research, the most fastest-growing field is nanotechnology which was first proposed by the scientist Richard Feynman in the year 1959. Among the metal oxide nanoparticles (CuO, ZnO, CeO₂, SnO₂, etc.), titanium dioxide (TiO₂) nanoparticles possess high stability, insoluble in water, and exhibit unique magnetic, thermal, optical, and electrical properties. Numerous metal oxide nanoparticles were reported through chemical, physical, and greener methods. Among all, a chemical reduction method is regularly practiced in large-scale productions. Chemical and

physical methods need toxic chemicals and also require high temperature and pressure which can pollute the environment and also it limits the mass production of NPs, respectively.^[1-3] Greener reducing method is an eco-friendly alternative method in which the reducing agents are derived from natural resources

Address for correspondence: Dr. Moses Stella Bharathy,
Department of Chemistry, Holy Cross College (Autonomous), Affiliated to
Bharathidasan University, Tiruchirappalli - 620 002, Tamil Nadu, India.
E-mail: stellabharathy@hccolchey.ac.in
ORCID: <https://orcid.org/0003-0888-4501>

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 license, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WJNRP@wvdknow_reprints@wvdknow.com

Access Online	
Quick Response Code:	Website: www.wjnrj.org
	DOI: 10.4103/wjnrj.001164.21

Title: Bharathy Stella Bharathy, M. Dayana Jeyaleela, G. Rosaline Vimala, D. Agila A., Margal Sheela S.A., Comparison of anti-inflammatory activities of biogenic <i>Gymnema sylvestre</i> - and <i>Panicum sumatrense</i> -mediated titanium dioxide nanoparticles. <i>Global Biotechnol Res J</i> 2021;5:105-11	
Submitted: 03-Aug-2021	Accepted: 12-Aug-2021
Revised: 16-Oct-2021	Published: 04-Dec-2021



VIER

Materials Today: Proceedings

Journal homepage: www.elsevier.com/locate/matpr



Synthesis, characterization and thermoelectric properties of Ca substituted nanostructured SrMnO₃ by sol-gel hydrothermal method

S. BethMary^{a,*}, K. Nalini^b, K. Rajalakshmi^c

^a Dept of Physics, M.A.M. School of Engineering, Affiliated to Anna University, Tiruchirappalli, India

^b Dept of Physics, K. Ramakrishnan College of Technology (Autonomous), Affiliated to Anna University, Tiruchirappalli, India

^c Dept of Chemistry, Shrimati Indira Gandhi College, Tiruchirappalli, India

C L E I N F O

Article history:
Received xxxxx

Keywords:
Perovskite
sol-gel method
thermoelectric
power

A B S T R A C T

Perovskite manganites are pure and stable at elevated temperatures due to its thermal and chemical stability. Pure and Ca substituted SrMnO₃ nanoparticles have been prepared by sol-gel hydrothermal method. Structural, micro structural, elemental, functional, optical electrical and thermoelectric properties have been investigated by XRD, Raman, SEM with EDAX, FTIR, UV-Vis Spectroscopy and Physical properties respectively. Powder X-ray Diffraction studies reveals the formation of the single phase without secondary phases. Poly vinyl pyrrolidone as a capping agent decreases the grain size of the nanoparticles with different nanostructures. Electrical conductivity increases but thermal conductivity is strongly reduced due to grain size reduction. Thermoelectric properties are evaluated from ambient to 300 K. Ca²⁺ substituted at A-site of SrMnO₃ nanoparticles leads to oxygen deficient calcium manganese oxide nanoparticles. The major charge carriers are an electron that reveals that pure and Ca substituted SrMnO₃ nanoparticles are n-type promising thermoelectric oxides with high thermoelectric power.

Copyright © 2022 Elsevier Ltd. All rights reserved.

Selection and peer-review under responsibility of the scientific committee of the International Conference on Innovation and Application in Science and Technology.

1. Introduction

Thermoelectric materials have widely studied owing to their conversion of irrecoverable heat energy and refrigeration without emission of global warming gases. Perovskite oxides are complex materials where the oxygen ions can occupy the adjacent sites, and the transition metal ions can occupy the B-site. These oxides have received significant attention due to their applications in sensors, cathodes, catalysts, solid oxide fuel cells and thermoelectric energy storage applications [1-4]. Various materials like Skutterudites, half-Heusler, chalcogenides, and oxides are various groups of thermoelectrics. Since the discovery of cobalt oxide Na_xCoO₂ by Teresaki et al. with significant thermoelectric properties, similar oxides have been identified by researchers [5,6]. Oxide materials are more efficient than thermoelectric materials due to low cost, eco-friendly, stabilized temperatures in terms of chemical composition and conductivity. The figure of merit (ZT) determines the efficiency of a thermoelectric material [7].

$$ZT = \frac{\sigma S^2}{\kappa} T \tag{1}$$

where σ is electrical conductivity, S is Seebeck coefficient value, κ is thermal conductivity and T is absolute temperature. A promising thermoelectric material should possess increased electrical conductivity, reduced thermal conductivity and a large Seebeck coefficient value. Methods are used to attain these conditions like synthesis methods, nanostructuring, doping, and so on. The properties of thermoelectric energy are influenced by synthesis techniques with varying parameters.

Various methods have been employed to synthesize the nanostructured perovskites like solid state reaction, PVD, CVD, spray pyrolysis, sol-gel, co-precipitation and hydrothermal method [8-11,12]. A sol-gel hydrothermal method is well known for its homogeneous, controlled grain size, high surface area, and low temperatures on a large scale. Optimizing annealing, surfactant addition, experimental duration, and nanoparticle doping can produce controlled grain size with porous structure [12-14]. Adding dopants and modifying band structures improves electrical conductivity while nanostructuring reduces thermal conductivity. It is not easy to do substantial reduction in thermal conductivity (κ) alone

*Corresponding author.
E-mail address: bethmary2@gmail.com (S. BethMary).

https://doi.org/10.1016/j.matpr.2022.01.273
Copyright © 2022 Elsevier Ltd. All rights reserved.
This article is peer-reviewed under responsibility of the scientific committee of the International Conference on Innovation and Application in Science and Technology.

COVID-19 IMPACT ON SUSTAINABLE DEVELOPMENT AND LIVELIHOOD

Dr. J. Bhuvan

Assistant Professor of Chemistry, Shri Mata Indra Gandhi College, Thuchitroppoli

Introduction

The COVID-19 pandemic may affect the world severely in terms of quality of life, political, environmental, and economic sustainable development, and the global economy. Its impact is assessed by the number of research studies on it. There is a high rate of uncertainty related to COVID-19, whose pandemic impacts economic performance, sustainability criteria, and development processes. The effect of coronavirus on health and economic crises. Analysis of its growth in countries, clearly shows that its development leads to crises. Declining GDP rates damage health, education, and industrial progress globally. The COVID-19 vulnerability affects socio-economic circumstances because of declining global GDP, declining capital flows, fewer investment opportunities, and decreased trading. Not limited to economic loss, this pandemic impacts social parameters like the changes in sustainable psychological development. Globally, the rate of poverty is increasing.

Several research studies have highlighted the severe impact of the COVID-19 pandemic. It is worth noting that the 2013 SARS outbreak experienced in Hong Kong damaged mental health (Fernandes, 2020), but, specific to COVID-19, there are diverse effects on mental health following the imposition of preventive measures. Social distancing, self-isolation, limited meetings, and lack of interaction directly decelerate the economy and mental health. Many countries face declining projected global trade and export volumes. In the view of Allcott et al. (2020), psychological sustainability involves the merger of political perspectives, human development, and economic aspects, and COVID-19 has had an impact on all three. Fetzer et al. (2020) discuss the pandemic's impact on the global economy as self-isolation results in loss of business revenue. Restrictions on consumers being able to purchase ultimately result in an economic downturn. Apart from this, stresses are being constantly imposed on people worldwide that negatively affect their minds and decrease economic activity (Iacus et al., 2020). COVID-19's considerable impact has emotionally traumatized individuals; the handling of the situation has reduced their level of comfort, socially, economically, and environmentally, according to Cartwright et al. (2020).

As per the study conducted by Cartwright et al. (2020) observed that COVID-19 affects the quality of life as overall economic, ecological, and equity conditions have changed. According to Bastola et al. (2020), psychological and sustainability factors contribute to well-being and allow psychological development. Recycling, dismantling, and demolishing factors are affected by sustainability.

Impact of Coronavirus Disease on Sustainable Development

Impact of Coronavirus Disease on Economic Conditions

The interdependency of overall prosperity and integrity of health emphasizes human dependence on the state of the economy. Econometric analysis of the world's economic growth rate shows that the current pandemic has led to widespread health crises and economic damage. The economic situation depends on the GDP rate helping to affect economic recovery measures. Global economic crises due to COVID-19 reveal economic decline. Moreover, the report by Allcott et al. (2020) highlights the declining economy related to fluctuations in GDP rates. In the current scenario, the GDP rate has shrunk by approximately 4.2%, the first time for a pandemic (Fetzer et al., 2020). Another report estimated that a difference of 7% is projected in the coming period if the same conditions continue (IMF Blog, 2020). Additionally, there

OPEN ACCESS

Volume: 10

Special Issue: 1

Month: January

Year: 2022

P-ISSN: 2320-2645

E-ISSN: 2582-3531

Impact Factor: 4.110

Received: 09.10.2021

Accepted: 12.12.2021

Published: 20.01.2022

Citation:

Delicea Jasmine, J.
"The Serfdom of
Women Portrayed by
Margaret Atwood in
The Handmaid's Tale."
*Shantax International
Journal of English*,
vol. 10, no. S1, 2022,
pp. 34-35.

DOI:

<https://doi.org/10.34293/english.v10iS1-Jan2022.4725>

The Serfdom of Women Portrayed by Margaret Atwood in The Handmaid's Tale

J. Delicea Jasmine

Assistant Professor, Department of English,
Shrimati Indira Gandhi College Tiruchirappalli, Tamil Nadu

Abstract

The aim of this paper *The Handmaid's Tale* is to scrutinize issues. As there is plenty of traditional feminist critique of male power structures in Atwood's works, *The Handmaid's Tale* argues the power structure of Gilead also analyses the feminine roles that support and allow the suppression of other women. Placing the novel in the contexts of Atwood's career, feminism, and dystopian literature, provides a fuller understanding of how the novel functions as an expression of the divergence of women. Margaret Atwood focuses on the problems such as gender equality and the dangers of a hierarchical-structured system for women's oppression. Her focal point is to mention the subservience of women in a male-dominated society and women's enslavement in a consumer society in which women's body is handled as object, an instrument and also as adorable item. Margaret Atwood is one of the foremost vivid writers in current Canadian literature. She has vigorously contributed to Canadian politics and its cause. Her works are mostly associated with social and political issues. She contemplates the relation between men and ladies and human basic rights, the topic of gender is the author's major concern. She depicts the ladies in her novels that always search for their identity which is lost within the male-controlled societies. Oppression of ladies is another theme for her novels and it may be seen evidently in her writings. She encounters the lower position of girls in society. Atwood's images of gender, the mistreatment and coercion of ladies, predominantly women's bodies. She signifies the misery of her female characters limited in their feminine roles in her novels. Moreover, femininity is the main fear for examining *The Handmaid's Tale*. In Gilead society, women are depressed about their freedom and ordered to serve the state in numerous ways and functions.

Margaret Atwood is one of the foremost brilliant writers in contemporary Canadian literature. Her works are mostly associated with social and political issues Margaret Atwood's formation of an imagined society during which women under a futuristic oppressive government reduces their female subjects to mere disenfranchised, and childbearing machines. The Republic of Gilead may be a strictly hierarchical society, with a large difference between the genders. Society is extremely explained within the novel *The Handmaid's Tale*. It shows women of all ranking, their rights and the way they were forced to measure outlives of slavery within the male-dominated society. Even women in positions of power, like Aunt Lydia, are only allowed cattle prods, never guns. The Commander's Wife, once a robust supporter of far right-wing preaches religious ideas about how women should stay within the home, now finds herself unhappily trapped within the world she advocated for.

PG & Research Department of English, Voorhees College, Vellore

An Inquist Study on Sufferings of Dalit in Bama's Karukku

Mary Portia, P.D

Assistant Professor, Department of English
Shrimati Indira Gandhi College, Tiruchirapalli, Tamil Nadu

The Study focuses on the Gender discrimination in Bama's Karukku. Bama could be a notable Woman novelist, story writer, essayist, and social activist of Madras, who not only refine the society on Caste discrimination but she has also narrated her own life history through this novel Karukku. Her writing mainly focusses on social and gender equality, education etc. She also focuses on the iniquity against the ladies within her society and fights for the emancipation for both men and ladies in her community.

Bama was born in 1958 as Faustina Mary Fatima Rani at Puthupatti, Virudhunagar district in Madras. She was born in a very Roman Catholic family to Soosairaj and Sebasthiamma. She studied in her village Puthupatti. After her graduation she became a nun and served in convent in various places in and around India for seven years. She isn't contentment with the nunnery life due to caste discrimination within the church and convent. Finally, she left the convent and began writing. Karukku was first published in 1972. After the publication of this autobiography, Bama was prevented from her village people for the portrayal of their real condition and poor light, they instructed her to not enter the village for about seven months. However, Karukku was significantly acclaimed and won the Crossword Book Award in 2000. Bama followed it with Sangati, Vanmam, and Kusumbukaran.

Karukku means sharp blade leaf of the tree it incises the skin when not handled carefully. Bama draws attention to the symbol, and refers to the words from The Holy Bible from Hebrews "For the word of God lives and active, sharper than any two-edged sword, sharp to soul and spirit, of joints and marrow, and discerning the thought and intention of the heart" (Hebrews 4:12). Bama narrates her sufferings which made her life bleed like wounds made by Karukku leaves. She wrote her autobiography as a way of healing her wounds: It impact among the people many folks start to read her novel and fight for his or her self-respect.

Bama starts the novel with the outline about her village. She loved the village for its beauty. The village is extremely small but had numerous communities' lives there. The village is surrounded by mountains. The mountains encircle the village, making it a border.

OPEN ACCESS
Volume: 10
Special Issue: 1
Month: January
Year: 2022
ISSN: 2320-2645
E-ISSN: 2582-3531
Impact Factor: 4.110
Received: 02.10.2021
Accepted: 19.11.2021
Published: 20.01.2022
Citation:
Mary Portia, P.D
"An Inquist Study on Sufferings of Dalit in Bama's Karukku."
Shantax International Journal of English, Vol. 10, no. S1, 2022, pp. 41-46.
DOI:
https://doi.org/10.34293/english.1010S1-Jan2022.4728



INTERNATIONAL JOURNAL OF CURRENT SCIENCE (IJCSPUB)

An International Open Access, Peer-reviewed, Refereed Journal

Observations On The Paper Entitled

"Integral Solutions of Ternary Quadratic Equation $x^2 + y^2 = z^2 - 4$ "

S.Vidhyalakshmi¹, M.A.Gopalan²

¹Assistant Professor, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Trichy-620 002, Tamil Nadu, India.

²Professor, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Trichy-620 002, Tamil Nadu, India.

Abstract

This paper illustrates the process of obtaining different sets of non-zero distinct integer solutions to the non-homogeneous ternary quadratic Diophantine equation given by $x^2 + y^2 = z^2 - 4$.

Keywords: non-homogeneous quadratic, ternary quadratic, integer solutions

Introduction

It is known that Diophantine equations with multidegree and multiple variables are rich in variety.

While searching for the collection of second degree equations with three unknowns, the authors came across the paper [1] entitled "Integral Solutions of Ternary Quadratic Equation $x^2 + y^2 = z^2 - 4$ "

to the above paper, the authors have presented only a few choices of integer solutions. However, there are many more sets of integer solutions to the considered equation which is the main thrust of this paper.

Method of analysis

The non-homogeneous ternary quadratic Diophantine equation under consideration is:

$$x^2 + y^2 = z^2 - 4 \tag{1}$$

The process of obtaining different sets of integer solutions to (1) is illustrated below:

Illustration 1:

The substitution of the linear transformations

$$z = u + v, x = u - v, y = 2Y, u \neq v \neq 0 \tag{2}$$



Homogeneous Quadratic Equation With Three Unknowns $z^2 = 6x^2 - 2y^2$

S. Vidhyalakshmi¹, M.A. Gopalan²

¹Assistant Professor, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Trichy-620 002, Tamil Nadu, India.

²Professor, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Trichy-620 002, Tamil Nadu, India.

ABSTRACT

In this paper, different sets of non-zero distinct integer solutions to the homogeneous quadratic equation with three unknowns given by $z^2 = 6x^2 - 2y^2$ are obtained. A few interesting relations among the solutions are presented. The formulae for generating sequence of integer solutions to the equation in title based on its given solution are exhibited.

Keywords: Homogeneous quadratic, Quadratic with three unknowns, Integer solutions, generation formula

INTRODUCTION

Ternary quadratic equations are rich in variety [1- 4, 17-20]. For an extensive review of sizable literature and various problems, one may refer [5-16]. In this communication, we consider yet another interesting homogeneous ternary quadratic equation $z^2 = 6x^2 - 2y^2$ and obtain infinitely many non-trivial integral solutions. A few interesting relations among the solutions are presented. The formulae for generating sequence of integer solutions to the equation in title based on its given solution are exhibited.

METHOD OF ANALYSIS

The homogeneous quadratic equation with three unknowns to be solved is

$$z^2 = 6x^2 - 2y^2 \tag{1}$$

Different sets of solutions in integers to (1) through various ways are illustrated below:

Way 1:

Introduction of the linear transformations

$$x = 2(u + v), y = 2u + 6v, z = 4w \tag{2}$$

In (1) leads to

$$u^2 - 3v^2 = w^2 \tag{3}$$

which is satisfied by

$$\left. \begin{aligned} v &= 2rs \\ w &= 3r^2 - s^2 \\ u &= 3r^2 + s^2 \end{aligned} \right\} \tag{4}$$

Substituting the above values of u, v, w in (2), the non-zero distinct integral values of x, y and z are given by



Remarks on the paper entitled "On Interesting Integer Triple"

S. Vidhyalakshmi¹, M. A. Gopalan²

¹Assistant Professor, Department of Mathematics, Shrinani Indira Gandhi College, Affiliated to Bharathidasan University, Trichy-620 002, Tamil Nadu, India

²Professor, Department of Mathematics, Shrinani Indira Gandhi College, Affiliated to Bharathidasan University, Trichy-620 002, Tamil Nadu, India

ABSTRACT

The process of obtaining different choices to integer triples (a, b, c) , such that, in each triple, each of the following expressions $a + b, a + c, b + c, 2(a + b + c)$ represents a nasty number, is illustrated.

INTRODUCTION

While searching for integer triples with different characterizations, the authors came across the paper [1] entitled "On Interesting Integer Triple" in which two sets of integer solutions have been presented through employing the well known one and four parametric solutions of the space Pythagorean equation: $x^2 + y^2 + z^2 = w^2$. In this communication, other choices to integer triples for the problem under consideration have been presented.

Method of analysis

Let a, b, c be three non-zero distinct integers such that

$$\left. \begin{aligned} a + b &= 6t^2, \\ a + c &= 6u^2 \\ b + c &= 6v^2 \\ 2(a + b + c) &= 6w^2 \end{aligned} \right\} \quad (1)$$

Eliminating a, b, c among the equations (1), the resulting equation is

$$t^2 + u^2 + v^2 = w^2 \quad (2)$$

After performing some algebra in the first three equations of (1), it is observed that

$$\left. \begin{aligned} a &= 3(t^2 + u^2 - v^2) \\ b &= 3(t^2 + v^2 - u^2) \\ c &= 3(u^2 + v^2 - t^2) \end{aligned} \right\} \quad (3)$$

Substituting the values of u, v, t obtained from (2) in (3), the corresponding values

a, b, c are obtained. Note that they satisfy the fourth equation of (1).

Now, different ways of solving (2) are illustrated below:



ON THE HOMOGENEOUS CONE $z^2 = 74x^2 + y^2$

S. VIDHYALAKSHMI¹, K.HEMA², M.A. GOPALAN³

¹ Assistant Professor, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Trichy-620 002, Tamil Nadu, India.
email: vidhyasige@gmail.com.

² M.Phil Scholar, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Trichy- 620 002, Tamil Nadu, India.
email: hema.krishnan1998@gmail.com

³ Professor, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Trichy-620 002, Tamil Nadu, India.
email: mayilgopalan@gmail.com

Abstract

The homogeneous ternary quadratic equation given by $z^2 = 74x^2 + y^2$ is analysed for its non-zero distinct integer solutions through different methods. A few interesting properties between the solutions are presented. Also, formulae for generating sequence of integer solutions based on the given solution are presented.

Keywords: Ternary quadratic, Integer solutions, Homogeneous cone.

Introduction:

It is well known that the quadratic Diophantine equations with three unknowns (homogeneous or non-homogeneous) are rich in variety [1, 2]. In particular, the ternary quadratic Diophantine equations of the form $z^2 = Dx^2 + y^2$ are analysed for values of $D=29,41,43,47, 53, 55, 61, 63, 67$ in [3-11]. In this communication, yet another interesting homogeneous ternary quadratic Diophantine equation given by $z^2 = 74x^2 + y^2$ is analysed for its non-zero distinct integer solutions through different methods. A few interesting properties between the solutions are presented. Also, formulae for generating sequence of integer solutions based on the given solution are presented.

METHODS OF ANALYSIS

The ternary quadratic equation to be solved for its integer solutions is $z^2 = 74x^2 + y^2$

INTEGRAL SOLUTION OF THE HOMOGENEOUS TERNARY CUBIC EQUATION

$$x^3 + y^3 = 52(x+y)z^2$$

DR. V. PRABA, DR. S. MALLIKA

*Pg and Research Department of Mathematics
Srimathi Indira Gandhi College, Trichirappalli, 2
prabavenkatrangan23@gmail.com, msmallika65@gmail.com*

RECEIVED : 04 September, 2021

The cubic homogeneous ternary equation $x^3 + y^3 = 52(x+y)z^2$ is analyzed for its non-zero integral solutions. A few interesting relations between the solutions and special numbers are exhibited.

Key-Words: Homogeneous, ternary, Diophantine equation, integral solution.

Notations: $P_n = n(n+1)$

$$S_n = 6n(n-1) + 1$$

$$t_{m,n} = \pi \left[1 + \frac{(n-1)(m-2)}{2} \right]$$

INTRODUCTION

Integral solutions for the homogeneous or non-homogeneous Diophantine equation is an interesting concept as it can be seen from [1-4]. In [5-13], a few special cases of cubic Diophantine equation with three and four unknowns are studied. This communication concerns with another interesting homogeneous cubic equation with three unknowns given by $x^3 + y^3 = 52(x+y)z^2$ for its integral solutions. A few interesting relations between the solutions are presented.

METHOD OF ANALYSIS

The cubic Diophantine equation with three unknowns to be solved for getting non-zero integral solution is,

$$x^3 + y^3 = 52(x+y)z^2 \quad \dots(1)$$

on substituting the linear transformations

$$x = u + v, y = u - v \quad \dots(2)$$



EQUIVALENCE COLOURING OF GRAPHS

V. Praba¹ & V. Swaminathan²

¹Assistant Professor, Department of Mathematics, Shrimati Indira Gandhi College, Tiruchirappalli, Tamil Nadu, India

²Ramanujan Research Center, Department of Mathematics, Saraswathi Narayanan College, Madurai, Tamil Nadu, India

ABSTRACT

Let $G = (V, E)$ be a simple and undirected graph. A proper colouring of the vertices of $V(G)$ is an assignment of colours to the vertices of G such that adjacent vertices receive different colours. A proper colouring of G induces a partition of $V(G)$ into independent sets. The minimum cardinality of a proper colour partition of G is called the chromatic number of G and is denoted by $\chi(G)$. If in a proper colour partition of G , the union of any two-colour classes induces an acyclic subgraph, then the colouring is called acyclic colouring of G . $\{[4], [5], [6]\}$. If instead, the union of any two colour classes in a proper colour partition induces a disjoint collection of stars, the resulting proper colour partition is called a star partition. $\{[6]\}$. A subset S of $V(G)$ is called an equivalence set if the subgraph induced by S is component wise complete. In this paper, a study of proper colour partition in which the union of any two colour classes induces an equivalence set is initiated.

KEYWORDS: Equivalence Coloring

AMS Subject Classification: 05C69, 05C15

Article History

Received: 29 Oct 2021 | Revised: 04 Oct 2021 | Accepted: 07 Oct 2021



Research Article

ON FINDING INTEGER SOLUTIONS TO THE TERNARY QUADRATIC DIOPHANTINE EQUATION $2(x^2 + y^2) - 3xy = 43z^2$

Vidhyalakshmi S., Umamaheswari N., Revathi M and Gopalan M.A

Department of Mathematics, SIGC, Affiliated to Bharathidasan University, Trichy, Tamilnadu, India

KEYWORDS

ABSTRACT

History:

The homogeneous ternary quadratic equation given by $2(x^2 + y^2) - 3xy = 43z^2$ is analysed for its non-zero distinct integer solutions through different methods. Also, formulae for generating sequence of integer solutions based on the given solution are presented.

Index:

quadratic, Homogeneous quadratic, solutions

Copyright © 2021 Vidhyalakshmi S et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Ternary quadratic equations are rich in variety [1-4, 17-19]. An extensive review of sizable literature and various methods, one may refer [5-16]. In this communication, yet another interesting homogeneous ternary quadratic Diophantine equation given by $2(x^2 + y^2) - 3xy = 43z^2$ is analysed for its non-zero distinct integer solutions through different methods. Also, formulae for generating sequence of integer solutions based on the given solution are presented.

Method of analysis

The ternary quadratic Diophantine equation to be solved for its non-zero distinct integral solution is

$$2(x^2 + y^2) - 3xy = 43z^2 \tag{1}$$

Introduction of the linear transformations

$$x + y, y = u - v, u \neq v \neq 0 \tag{2}$$

leads to

$$4v^2 = 43z^2 \tag{3}$$

The above equation is solved for u, v and z through different methods and using (2), the values of x and y satisfying (1), are obtained which are illustrated below:

Assume

$$z = a^2 + 7b^2 \tag{4}$$

Write 43 as

$$43 = (6 + i\sqrt{7})(6 - i\sqrt{7}) \tag{5}$$

Using (4) and (5) in (3) and employing the method of factorization, define

$$(u + i\sqrt{7}v) = (6 + i\sqrt{7})(a + i\sqrt{7}b)^2$$

Equating the real and imaginary parts, we get

$$u = 6a^2 - 14ab - 42b^2$$

$$v = a^2 + 12ab - 7b^2$$

In view of (2), one obtains

$$\left. \begin{aligned} x &= 7a^2 - 2ab - 49b^2 \\ y &= 5a^2 - 26ab - 35b^2 \end{aligned} \right\} \tag{6}$$

Thus (4) and (6) represent the integer solution to (1).

Way 2:

One can write 43 as

$$43 = \frac{(25 + 13\sqrt{7})(25 - 13\sqrt{7})}{4^2} \tag{7}$$

Using (4) and (7) in (3) and applying the method of factorization, define

Corresponding author: Vidhyalakshmi S. Department of Mathematics, SIGC, Affiliated to Bharathidasan University, Trichy, Tamilnadu, India

Stochastic Modeling for Using A Cross Cultural Analysis of Salivary Cortisol in Breast Cancer Survivors

Dr. N. Unamaheswari¹ and Ms. E. Thatchayeni²

¹ Assistant professor, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Trichy, Tamilnadu, India.

² M.Phil. Scholar, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Trichy, Tamilnadu, India.

ABSTRACT

Examined whether Chinese and white women with and without a history of breast cancer exhibit differences in physiological and psychological stress profiles. Diurnal and reactive salivary cortisol profiles and physiological stress patterns of 41 breast cancer survivors and 58 healthy women were assessed. Breast cancer survivor displayed a blunted acute cortisol response but there was no main effect of ethnocultural membership using the sharp large deviation for the energy of α -Brownian motion.

Keywords: Acute cortisol, breast cancer, cultural orientation, diurnal cortisol, physiological stress, reactivity, salivary cortisol.

2010 Mathematics Subject Classification: 60G20, 60J05, 60G05.

Date of Submission: 06-02-2022

Date of acceptance: 19-02-2022

I. INTRODUCTION

Stress is a Universal experience, the product of an interaction between an individual and the environment, namely the individual's appraisal of the environment and coping capability[8]. Thus, stress can be viewed as positive, negative or neutral and beneficial toward prompting one's survival[9]. In response to a stressor, the hypothalamic-pituitary-adrenal (HPA) axis is activated to prepare the organism to deal with environmental challenges[10], which initiates the production of glucocorticoids such as cortisol. Cortisol is a hormone that regulates bodily functions, such as homeostasis and immune response, and is commonly measured via plasma, serum, urine or saliva[6].

Cortisol has a relatively stable diurnal pattern in healthy individuals. It reaches its peak approximately 30 to 60 min after waking, thereafter steadily declining throughout the day. Cortisol secretion and basal levels can be affected by numerous factors, such as hormonal status [5], age and sex, circadian rhythm and illnesses such as cancer.

We consider the following α -Brownian bridge:

$$dX_t = -\frac{\alpha}{T-t} X_t dt + dW_t, X_0 = 0$$

Where W is a standard Brownian motion, $t \in [0, T]$, $T \in (0, \infty)$, and the constant $\alpha > 1/2$. Let P_{α} denote the probability distribution of the solution $\{X_t, t \in [0, T]\}$. The α -Brownian bridge is first used to study the arbitrage profit associated with a given future contract in the absence of transaction costs by [4].

α -Brownian bridge is a time inhomogeneous diffusion process which has been studied by [1, 11]. They studied the central limit theorem and the large deviation for parameter estimators and hypothesis testing problem of α -Brownian bridge, while the large deviation is not so helpful in some statistics problems since it only gives a logarithmic equivalent for the deviation probability, overcome this difficulty by the sharp large deviation principle for the empirical mean. Recently, the sharp large deviation principle is widely used in the study of Gaussian quadratic forms in [2], [3].

we consider, the sharp large deviation principle (SLDP) of energy S_{α} , where

$$S_{\alpha} = \int_0^t \frac{X_s^2}{(s-T)^2} ds \quad (1)$$

Our main results are the following.

ON THE BI-QUADRATIC DIOPHANTINE EQUATION WITH FOUR UNKNOWNNS

$$xy(x+y) = 3zw^3$$

E. PREMALATHA, J. SHANTHI AND M.A. GOPALAN

ABSTRACT

The non homogeneous biquadratic equation with 4 unknown given by $xy(x+y) = 3zw^3$ is analyzed for its patterns of non-zero distinct integral solutions. A few interesting relations between the solutions and special polygonal numbers are exhibited.

Keywords: Bi-quadratic equation with 4 unknowns, non homogeneous biquadratic, Integer solutions, Special polygonal numbers, Centered polygonal number

Mathematics Subject Classification 2010: 11D25

INTRODUCTION

Quadratic Diophantine equations, homogeneous and non-homogeneous, have aroused the interest of numerous Mathematicians since antiquity as can be seen from [1-7]. In the context one may refer [8-24] for varieties of problems on the Diophantine equations with two, three and four variables. This communication concerns with the problem of determining non-zero integral solutions of yet another biquadratic equation in 4 unknowns represented by $xy(x+y) = 3zw^3$. A few interesting relations between the solutions and special polygonal numbers are presented.

NOTATIONS USED

Regular Polygonal Number of rank n with sides m : $t_{m,n} = n[1 + \frac{(n-1)(m-2)}{2}]$

Pyramidal Number of rank n with sides m : $p_n^m = \frac{1}{6}[n(n+1)][(m-2)n + (5-m)]$

Centered Polygonal Number of rank n with sides m : $Ct_{m,n} = \frac{1}{2}[mn(n+1)] + 1$

Pronic Number of rank n : $pr_n = n(n+1)$

Star Number of rank n : $S_n = 6n(n-1) + 1$

Pentatopc Number of rank n : $pt_n = \frac{n(n+1)(n+2)(n+3)}{24}$

METHOD OF ANALYSIS

The Diophantine equation representing the biquadratic equation with four unknowns under consideration is

$$xy(x+y) = 3zw^3 \tag{1}$$

On substitution of the transformations

$$x = u + v, y = u - v, z = 2u \tag{2}$$

(3)

(1) leads to

$$u^2 - v^2 = 3w^3$$

Present below different methods of solving (3) and thus obtain different patterns of integer solutions to (1).

PATTERN -1

Write (3) as the system of double equations as shown in Table 1 below:

ON THE HOMOGENEOUS CONE $z^2 = 14x^2 + y^2$

J. SHANTHI, T. MAHALAKSHMI, S. VIDHYALAKSHMI AND M.A. GOPALAN

ABSTRACT

Homogeneous ternary quadratic equation given by $z^2 = 14x^2 + y^2$ is analysed for its non-zero distinct integer solutions through different methods. A few interesting properties between the solutions are presented. Also, formulae for generating sequence of integer solutions based on the given solution are presented.

Keywords: Ternary quadratic, Integer solutions, Homogeneous cone.

INTRODUCTION

$$= n \left[1 + \frac{(n-1)(m-2)}{2} \right]$$

INTRODUCTION

It is well known that the quadratic Diophantine equations with three unknowns (homogeneous or non-homogeneous) are rich in variety [1, 2]. In particular, the ternary quadratic Diophantine equations of the form $z^2 = Dx^2 + y^2$ are analysed for values of $D=29, 41, 43, 47, 53, 55, 61, 63, 67$ in [3-11]. In this communication, the homogeneous ternary quadratic diophantine equation given by $z^2 = 14x^2 + y^2$ is analysed for non-zero distinct integer solutions through different methods. A few interesting properties between the solutions are presented. Also, formulas for generating sequence of integer solutions based on the given solution are presented.

METHODS OF ANALYSIS

The ternary quadratic equation to be solved for its integer solutions is

$$z^2 = 14x^2 + y^2 \quad (1)$$

present below different methods of solving (1):

METHOD: 1

It is written in the form of ratio as

$$\frac{z}{z-y} = \frac{x}{\beta}, \beta \neq 0 \quad (2)$$

This is equivalent to the system of double equations

$$z - \beta y - \beta z = 0$$

$$\alpha y - \alpha z = 0$$

Using the method of cross-multiplication to the above system of equations,

$$z(\alpha, \beta) = 2\alpha\beta$$

$$y(\alpha, \beta) = 14\alpha^2 - \beta^2$$

$$x(\alpha, \beta) = 14\alpha^2 + \beta^2$$

which satisfy (1)

REFERENCES

$$(\alpha, 1) - t_{55, \alpha} \equiv 1 \pmod{13}$$

$$z(\alpha, \beta) + y(\alpha, \beta) - 14x(\alpha, 1) + \alpha = t_{55, \alpha}$$

Received: 23-10-2021
Accepted: 28-11-2021

ISSN: 2587-019X

On The Transcendental Equation $\sqrt[3]{y^2 + x^2} = z^6$

¹Assistant Professor, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Tamil Nadu, India
²Professor, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Tamil Nadu, India
 Corresponding Author: MA Gopalan

Abstract: Transcendental equation with three unknowns involving surds is represented by the Diophantine equation $\sqrt[3]{y^2 + x^2} = z^6$ is considered for its patterns of non-zero distinct integer solutions. A few properties between the solutions and special figurate numbers are presented.

Keywords: Transcendental equation, surd equation integral solutions

$t_{3,s} = \frac{s(s+1)}{2}$	$CT_{12,s} = 6s(s+1) + 1$
$P_3^s = \frac{s(s+1)(s+2)}{6}$	$CT_{14,s} = 7s(s+1) + 1$
$P_4^s = \frac{s(s+1)(2s+1)}{6}$	$CT_{16,s} = 8s(s+1) + 1$
$P_5^s = \frac{s(s+1)(2s+1)}{6}$	$CT_{18,s} = 9s(s+1) + 1$
$P_6^s = \frac{s^2(s+1)}{2}$	$CT_{20,s} = 10s(s+1) + 1$
$ST_s = 6s(s-1) + 1$	$ct_{4,s} = s^2 + (s-1)^2$
$P_7^s = s(s+1)$	

Diophantine equations have an unlimited field of research by reason of their variety. Most of the Diophantine problems are solved by integral solutions [1,2]. In [3-18], the integral solutions of transcendental equations involving surds are analysed for their integer solutions. This communication analyses a transcendental equation with three unknowns given by $\sqrt[3]{y^2 + x^2} = z^6$. Infinitely many non-zero integer triples (x, y, z) satisfying the above equation are obtained. A few properties between solutions and special figurate numbers are presented.

1. The transcendental equation involving surds to be solved is

$$\sqrt[3]{y^2 + x^2} = z^6 \tag{1}$$

2. The transformation of the transformations

$$x = n(n^2 + n^2), y = n(n^2 + n^2) \tag{2}$$



OBSERVATION ON THE INTEGER SOLUTION OF THE POSITIVE PELL EQUATION

$$y^2 = 15x^2 + 21$$

Dr. N. UMAMAHESHWARI¹, V. BAHAVATHI², B. LOGANAYAKI³, J. SASIKALA⁴

¹ Assistant Professor, Department of Mathematics, SIGC, Affiliated to Bharathidasan university, Trichy, Tamilnadu, India.

² Assistant Professor, Department of Mathematics, SIGC, Affiliated to Bharathidasan university, Trichy, Tamilnadu, India.

³ M.Phil Research Scholar, Department of Mathematics, SIGC, Affiliated to Bharathidasan university, Trichy, Tamilnadu, India.

⁴ M.Phil Research Scholar, Department of Mathematics, SIGC, Affiliated to Bharathidasan university, Trichy, Tamilnadu, India.

Abstract :

The binary quadratic equation $y^2 = 15x^2 + 21$ is considered and a few interesting properties among its solutions are presented. Employing the integral solutions of the equation under consideration, a remarkable observations are illustrated.

Keywords: Binary quadratic, Hyperbola, Integral solutions, Pell equation.

Introduction:

A non-homogeneous binary quadratic equation of the form $y^2 - Dx^2 = 1$, where D is a given positive non square integer, requiring integer solutions for x & y is called Pellian equation (also known as Pell-Fermat equation). In cartesian co-ordinates, the equation has the form of a hyperbola. The Pellian equation has infinitely many distinct integer solutions as long as D is not a perfect square



Homogeneous Quadratic with Five Unknowns

$$10w^2 - x^2 - y^2 + z^2 = t^2$$

S.Vidhyalakshmi¹, M.A.Gopalan²

¹Assistant Professor, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Trichy-620 002, Tamil Nadu, India.

²Professor, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Trichy-620 002, Tamil Nadu, India.

Abstract:

The homogeneous quadratic diophantine equation with five unknowns given by $10w^2 - x^2 - y^2 + z^2 = t^2$ is analyzed for determining its non-zero distinct integer solutions employing linear transformations.

Keywords: homogeneous quadratic, quadratic with five unknowns, integer solutions

Introduction:

The theory of diophantine equations offers a rich variety of fascinating problems. In particular, homogeneous or non-homogeneous quadratic diophantine equations with two or more variables have been of interest to mathematicians since antiquity [1-4]. In this context, one may refer [5-11] for different sets of quadratic diophantine equations with four unknowns. In [12], the quadratic diophantine equation with five unknowns given by $4w^2 - x^2 - y^2 + z^2 = 16t^2$ is analysed for obtaining its non-zero distinct integer solutions.

This motivated me for finding integer solutions to other choices of quadratic equations with five unknowns. This paper deals with the problem of determining non-zero distinct integer solutions to the quadratic Diophantine equation with five unknowns given by $10w^2 - x^2 - y^2 + z^2 = t^2$.

Method of analysis:

Second degree diophantine equation with five unknowns to be solved is

$$10w^2 - x^2 - y^2 + z^2 = t^2 \tag{1}$$

Process of obtaining different sets of integer solutions to (1) are presented below:

Substitution of the linear transformations

$$x = w + 2(u + v), y = w - 2(u + v), z = 2(u + v), t = 2(u - v) \tag{2}$$

leads to the Pythagorean equation

ON THE HOMOGENEOUS CONE $z^2 = (10k^2 - 10k + 14)x^2 + y^2$

S. VIDHYALAKSHMI¹, K.HEMA², M.A. GOPALAN³

¹ Assistant Professor, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Trichy-620 002, Tamil Nadu, India.
email: vidhyasigc@gmail.com.

² M.Phil Scholar, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Trichy- 620 002, Tamil Nadu, India.
email : hemakrishnan1998@gmail.com

³ Professor, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Trichy-620 002, Tamil Nadu, India.
email: mavilgopalan@gmail.com

Abstract:

The homogeneous ternary quadratic equation given by $z^2 = (10k^2 - 10k + 14)x^2 + y^2$ is analysed for its non-zero distinct integer solutions through different methods. A few interesting properties between the solutions are presented. Also, formulae for generating sequence of integer solutions based on the given solution are presented.

Keywords: Ternary quadratic, Integer solutions, Homogeneous cone.

Introduction:

It is well known that the quadratic Diophantine equations with three unknowns (homogeneous or non-homogeneous) are rich in variety [1, 2]. In particular, the ternary quadratic Diophantine equations of the form $z^2 = Dx^2 + y^2$ are analysed for values of $D = 29, 41, 43, 47, 53, 55, 61, 63, 67$ in [3-11]. In [12], the homogeneous cone represented by the ternary quadratic equation $z^2 = 74x^2 + y^2$ has been studied. This result motivated us for determining integer solutions to the homogeneous cone $z^2 = Dx^2 + y^2$ when D takes even values. In this communication, yet another interesting homogeneous ternary quadratic Diophantine equation given by $z^2 = (10k^2 - 10k + 14)x^2 + y^2$ is analysed for its non-zero distinct integer solutions through different methods. A few interesting properties between the solutions are presented. Also, formulas for generating sequence of integer solutions based on a given solution are presented.

METHODS OF ANALYSIS

The ternary quadratic equation to be solved for its integer solutions is

$$z^2 = (10k^2 - 10k + 14)x^2 + y^2 \quad (1)$$

We present below different methods of solving (1):

OBSERVATION ON THE PAPER ENTITLED INTEGRAL SOLUTION OF THE HOMOGENEOUS TERNARY CUBIC EQUATION $x^3 + y^3 = 52(x+y)z^2$

S. Vidhyalakshmi¹, J. Shanthi², K. Hema³, M.A. Gopalan⁴

^{1,2} Assistant Professor, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Trichy-620 002, Tamil Nadu, India.

³ M.Phil Scholar, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Trichy- 620 002, Tamil Nadu, India.

⁴ Professor, Department of Mathematics, Shrimati Indira Gandhi College, Affiliated to Bharathidasan University, Trichy-620 002, Tamil Nadu, India.

ABSTRACT

This paper concerns with the problem of obtaining non zero distinct integer solutions to the homogeneous ternary cubic equation $x^3 + y^3 = 52(x+y)z^2$. Also, formulae for generating sequence of integer solutions based on the given solution are presented.

KEYWORDS: Ternary cubic, Integer solutions, Homogeneous cubic, Generation of solutions.

INTRODUCTION

The study of Diophantine equations in multidegree with multivariables offers a rich variety of interesting and fascinating problems. One may refer [5-22] for cubic equation with three variables. It is observed that in [22] the authors have presented some solutions of integer solutions to the ternary cubic equation $x^3 + y^3 = 52(x+y)z^2$. It is noted that the above equation has some non-zero distinct integer solutions.

In this paper, the other choices of non-zero distinct integer solutions to the above ternary cubic equation are obtained. Also, formulae for generating sequence of integer solutions based on the given solution are presented.

METHODS OF ANALYSIS

The homogeneous ternary cubic equation under consideration is

$$x^3 + y^3 = 52(x+y)z^2 \tag{1}$$

It is observed that (1) is satisfied by the triples

$$(16, 12, \pm 2), (6, -2, \pm 1), (16, 4, \pm 2), (48, 36, \pm 6).$$

We have other sets of nonzero distinct integer solutions to (1) which are illustrated below.

Let us consider the linear transformations

$$x = u + v, y = u - v \tag{2}$$

ss-EXCELLENCE IN GRAPHS

V. Praba and V. Swaminathan*

Department of Mathematics,
Shrimati Indira Gandhi College,
Tiruchirappalli - 620002, Tamil Nadu, INDIA

E-mail : prabasigc@yahoo.co.in

*Ramanujan Research Center in Mathematics,
Saraswathi Narayanan College, Madurai - 625022, Tamil Nadu, INDIA

E-mail : swaminathan.sulanesri@gmail.com

(Received: Aug. 25, 2020 Accepted: Oct. 15, 2021 Published: Dec. 30, 2021)

Abstract: Let G be a simple graph with vertex set $V(G)$ and edge set $E(G)$. A subset S of $V(G)$ is called a semi-strong set abbreviated as ss -set if $|N[v] \cap S| \leq 1$ for all v in $V(G)$. This concept was introduced by E. Sampathkumar in the paper titled Semi-strong chromatic number of a graph. Any ss -set has hereditary property. That is, a subset of an ss -set is an ss -set. So, an ss -set is maximal iff for any $u \in (V-S)$, there exists $v \in V(G)$, $v \neq u$ such that v is adjacent with u and a vertex of S . Excellence is studied with respect to several parameters like domination. A vertex u is α -good with respect to the parameter α if u belongs to a minimum (maximum) α -set of G . A graph G is α -excellent if every vertex of G is α -good. A graph G is ss -excellent if every vertex of G is ss -good. ss -excellence and ss -just excellence are studied in this paper.

Keywords and Phrases: Semi-strong set, semi-strong partition, excellent, just-excellent.

2020 Mathematics Subject Classification: 05C69.

1. Introduction

As a generalization of strong set introduced by Claude Berge [2]. E. Sampathkumar defined semi-strong sets in a graph. In a simple graph G , a subset S



Performance Evaluation of Nifty Financial Services Companies

Dr. J. Francis Mary¹, K. Radha²

¹Professor, Dept. of Management Studies, Shrimathi Indira Gandhi College, Affiliated to Bharathidasan University, Trichy, India.
²Ph.D Research scholar in Management, Shrimathi Indira Gandhi College, Affiliated to Bharathidasan University, Trichy, India.

ABSTRACT

The two sides of investment is -- Risk and Return. This paper attempt to analyze the performance of Nifty Financial service companies. The performance evaluation of Nifty Financial Service is carried out through relative performance index, risk-return analysis, Treynor's ratio, Sharpe's ratio, Jensen's measure. The data used are monthly high of NAVs. The source of data is website of National Stock Exchange (NSE). NSE has been a driving force of capital market in India. It plays a critical role with regulators, government and market participants in development of capital markets. 2019 marks NSE's Silver Jubilee in their career. Study period is 2014-15 to 2018-19. This study focus with a sample of 5 schemes for computing relative performance index.

Keywords: Nifty Financial Service, Systematic Risk, Sharpe's Value, Treynor's Value, Portfolio

INTRODUCTION

In today's environment, most of the people are earning and spending. They have more interest on investment. But they don't have adequate education regarding investment. Investment is a wide spread practice and many have made their fortunes in the process. There are many sources of investment. Some are Bonds, Mutual funds, National Pension Scheme, Public Provident Fund, Bank Fixed Deposit, etc. This study focus to build a portfolio containing equity stocks and analyse their risk and return which will further analyze the portfolio's performance in terms of risk-return relationship. Further we have used measures like Treynor's measure, Sharpe's Measure, Jensen's Alpha and CAPM.

SIR JOHN TEMPLETON says 'This time it's different' are the four most dangerous words in investment. The market moves in cycles, and understanding how the trends change is something Templeton knew all about. He reached billionaire status as a mutual fund investor by looking at how stocks had performed in the past, rather than relying on future speculation. So it is important to analyze the market before building a portfolio. Based on market performance, one portfolio has been built sector wise for this analysis.

REVIEW OF LITERATURE:

1. Arna Suryani, Eva Heriyanti (2015) In this article they had made a portfolio performance analysis for LQ45. The purpose of this research is to analyze the consistency of Sharpe index, Treynor Index and Jensen Index as measurement of risk adjusted performance.
2. Chakramon (2004) studies the performance of Thai equity funds. He finds that equity funds, on average, do not provide positive and significant abnormal returns from the market, though they provide higher sharpen's measure.
3. Kosowski, Timmermann, Wermers and White (2006) conducts first comprehensive examination of mutual examination of mutual fund performance (alpha) that explicitly controls for luck without imposing an ex-ante parametric distribution from which fund returns assumed are to be drawn. Specifically, they apply bootstrap approach to analyze the significance of the alpha of extreme funds, that is, funds with



In vitro study of antioxidant, antidiabetic and antiuro lithiatic activity of synthesized silver nanoparticles using stem bark extracts of *Hybanthus enneaspermus*

Sachithra, Assistant professor^a, S. Bhuvaneshwari, Assistant professor^{a, *},
 S. Sathya Kumar, Assistant professor^a, R. Dineshkumar^b, K. Chithradevi^c,
 Devi ferhana noor^a, R. Madhumitha^a, M. Kaviraj^d

^aDepartment of Chemistry and Biosciences, SASTRA Deemed University, Srinivasa Ramanujan Centre, Kumbakonam, Tamil Nadu, India.
^bDepartment of Microbiology, Maragani Academy of Higher Education, Polathal Main Road, Eelamari, Coimbatore, 641021, Tamil Nadu, India.
^cDepartment of Microbiology, Sri Sarada Indira Gandhi College, Tiruchirappalli, Tamil Nadu, India.
^dDepartment of Science and Technology, Department of Civil Engineering, School of Building and Environment, Research Scholar, Chennai, Tamil Nadu, India.

KEYWORDS

Antioxidant
 Antidiabetic
 Antiuro lithiatic
 Synthesized silver nanoparticles
 Stem bark extracts
Hybanthus enneaspermus

ABSTRACT

Diabetes mellitus is an endocrine disorder that affects 83% of the people because of higher sugar level in blood. Due to this metabolic disorder and improper function of organs especially kidney results in urinary tract infection causing struvite urinary stone. So, in the present study was carried out to study the green synthesized silver nanoparticles using *Hybanthus enneaspermus* stem bark extracts on antioxidant, antidiabetic and antiuro lithiatic activity under *in vitro* conditions. By the treatment of aqueous solution of 5 mM silver nitrate (AgNO₃) with stem bark extracts, silver nanoparticles could be quickly synthesized within 1 h. These silver nanoparticles were characterized using UV-Visible spectroscopy, Fourier Transform Infrared Spectroscopy (FT-IR), Transmission Electron Microscope (TEM), X-ray diffraction (XRD) and Dynamic Light Scattering (DLS) for further confirmation. TEM analysis found that the silver nanoparticles are spherical in shape. X-ray diffraction confirmed that silver nanostructure exhibit a face centered cubic crystal structure. DLS showed that the nanoparticles size is 614.2 nm. By increasing the concentration of silver nanoparticles, weight of the formed crystals reduced from 0.94 g to 0.13 g in struvite crystals and analysed by FTIR analyses. This multidisciplinary approach showed a better percentage of inhibition such as antioxidant, antidiabetic and antiuro lithiatic activity of silver nanoparticles.

INTRODUCTION

Diabetes mellitus is a universal endocrine metabolic disorder that affects people in both developed and developing countries. Due to insulin secretion and action, leads to the metabolic changes of carbohydrates, proteins, fats and lipids. Diabetes is well characterized by hyperglycaemic conditions (high blood sugar level) due to pancreas not producing abundant insulin or cells losing their ability to respond to insulin production (West, 2000). Genetic factors and lifestyle may be the cause of diabetes (Riserus et al., 2015). In India, 5% of the people suffered from diabetes and international diabetes federation's projects updated that the number of

*Corresponding author. Department of Chemistry & Biosciences, Srinivasa Ramanujan Centre, SASTRA Deemed to be University, Kumbakonam, 612001, Tamil Nadu, India.
 E-mail address: shb2010@sastra.ac.in (S. Bhuvaneshwari).

0169-8455/2021/102219-10
 © 2021 Elsevier B.V. Received in revised form 22 October 2021; Accepted 9 November 2021
 Available online 12 November 2021



Effect of Substrate Temperature on Structural, Electrical and Optical Properties of Sprayed Tin Selenide Thin Films Applicable for Photovoltaic Measurements

Anitha Ezhil Mangaiyar Karasi,^{1,2,3} R. Sambasivam,¹ S. Seshadri,¹ and Amalraj³

¹PG & Research Department of Physics, Uraviti Dharmalakshmi College, Tiruchy (Affiliated to Bharathidasan University), India

²Department of Physics, Shrimati Indira Gandhi College, Tiruchy (Affiliated to Bharathidasan University), India

³Research Department of Physics, VHSVN College, Virudhunagar, India

Thin films of Tin selenide (SnSe) have been prepared on glass substrates at different temperatures in the range of 250 °C–375 °C in steps of 25 °C for optimization were discussed. The deposited tin selenide thin films were characterized using X-ray diffraction analysis (XRD), Elemental dispersive X-ray analysis (EDAX), Scanning electron microscopy (SEM), Optical absorption, Photoluminescence (PL), Raman spectroscopy and electrical measurements. From XRD analysis a single-phase tin selenide thin film having orthorhombic crystalline structure with crystallite size of 17 nm to 62 nm were investigated. The surface morphology spectrum revealed the presence of uniformly distributed spherical grains of SnSe thin films without pores and voids. Optical absorption spectrum revealed a direct band gap of 1.15 eV and having very high absorption coefficient (10^4 cm^{-1}) was calculated. The Raman scattering analysis confirmed the presence of B_{2g} and A_g vibrational modes of SnSe thin films. PL studies revealed a strong luminescence peak near-band-edge (NBE) emission at 785 nm due to recombination of bound excitons. Photocurrent characteristics of SnSe thin films were due to the existence of continuous distribution of localized states in the band gap data. Thus tin selenide thin films were used as an absorber layer in the photovoltaic application.

© 2022 The Electrochemical Society ("ECS"). Published on behalf of ECS by IOP Publishing Limited. DOI: 10.1149/2162-3777/202208024032

Manuscript submitted August 28, 2021; revised manuscript received January 12, 2022; Published February 9, 2022.

In this scenario, tin-based binary semiconductors such as SnS are expected to play a crucial role in replacing toxicating compounds and scarce elements based CIGS absorbers in photovoltaic devices. They are relatively earth abundant, non-toxic, and easy controllability of stoichiometric. Moreover, the annual production of tin, sulphur, and selenium is large (low-price) as compared to other elements. These materials exhibit favourable properties such as high chemical stability, suitable band gap (1.0 eV to 1.5 eV) and absorption coefficient ($\sim 10^4 \text{ cm}^{-1}$) with P-type conductivity. On the other hand, the solar cells fabricated from SnSe thin films exhibited efficiencies ($\leq 1\%$ by non-vacuum methods and $>5\%$ by vacuum methods) than CIGS and CZTS solar cells.

In recent years, semiconducting compounds play a vital role for various applications due to their potential application in the solar energy conversion, sensors, laser materials, thin films polarizer and thermoelectric cooling materials.^{1–3} Tin selenide (SnSe) is a IV–VI binary semiconductor that crystallizes in orthorhombic crystallographic structure whose atomic arrangement within the crystal resembles general NaCl structure.⁴ The existence of the tightly bound layers of tin and selenium atoms stacked along the crystallographic c-axis and anisotropic character, thus tin based chalcogenide semiconductors are attractive layered compounds which can be used as cathode materials in lithium ion batteries⁵ and decreasing the corrosion.⁶ It is a narrow band semiconductor with high thermal stability, p-type conductivity and their band gap lies between 1.0 eV and 2.0 eV and absorbs light energy from the high energy end of the solar spectrum.⁷ SnSe has numerous applications in many switching devices, in holographic recording systems or as a photoconductive material to improve light diffusivity.^{8–13} Owing to this, SnSe has been studied in the form of both single crystal and thin films. Researchers investigated a number of methods to prepare SnSe thin films viz. epitaxial laser ablation method,¹⁴ atomic layer deposition,¹⁵ closed space vapor transport,¹⁶ chemical bath deposition,¹⁷ vacuum deposition,¹⁸ etc. Among these techniques spray pyrolysis is a low cost technique for the preparation of semiconductor thin films. It has capability to produce large area, high quality thin films of uniform thickness, low temperature growth, enable

morphological and film thickness controlled by electrical parameters.

In the present work, SnSe thin films were grown on glass substrates, held at different substrate temperatures (T_s), by the spray pyrolysis technique. We study the effect on the structural, morphological, optical and electrical properties of SnSe thin films sprayed at different substrate temperature ranging from 250 °C to 375 °C.

Experimental

Tin selenide (SnSe) thin films were deposited onto glass substrates at different substrate temperatures using the spray pyrolysis unit.¹⁴ It consists of a spray nozzle, a furnace for heating the substrate, and a mechanical system for rotor, thermocouple included temperature controller and air compressor. A hot plate (base plate) made up of iron disc is used to measure the temperature in which a maximum temperature of 450 °C can be achieved with the help of chromel–alumel thermocouple. Substrate temperature (T_s) was maintained with the help of a feedback circuit which controls the heater supply. Temperature of the substrate can be varied from room temperature to 450 °C using this coating unit. During the spray, temperature of the substrate was kept constant with an accuracy of ± 2 °C. The nozzle is made up of borosil glass and consists of solution tube which is surrounded by a glass bulb. Due to air pressure of the carrier gas, a vacuum is created at the tip of the nozzle to suck the solution from the tube after which the spray starts. Spray head and hot plate with substrates were kept inside a chamber provided with an exhaust fan for removing gaseous by-products and vapours of the solvent. Pressure of the carrier gas (air) used for spraying the precursor solution was adjusted manually from an air compressor unit. With the help of indigenously developed dispensing unit, the spray rate of the solution can be precisely controlled. Spray rate is an important parameter in controlling different properties of the films which can be controlled with an automated spray pyrolysis unit. In the spray mechanism, the nature of the substrate surface is very important in order to get uniform spray at the entire surface. The basic principle involved in chemical spray pyrolysis was that when a droplet of the spray solution reaches the substrate owing to the pyrolytic decomposition of the solution, well adherent films are deposited. Substrate cleaning plays a dominant role since the contaminated surface provides nucleation sites facilitating in non uniformity growth of thin films.



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

EFFECTS OF TRAINING AND DEVELOPMENT ON EMPLOYEE PERFORMANCE ON GLOSIL INTERNATIONAL PRIVATE LIMITED, COIMBATORE, TAMILNADU.

Dr. K. Sheela Bai, Head, PG and Research department of Social Work, Ms. K. Tamil Selvi, MPhil Scholar, PG and Research department of Social Work, Shrimati Indira Gandhi College, Truchirappalli, India.)

ABSTRACT

Training and development lead to improve success and or more encouraging attitude toward profit direction, improve the job information and skill at all level of the association, improve the morale of the workers and help the workers classify with executive goal. according to Garry Dressler, training is the procedure of educating new recruits the essential skills they require to execute their jobs. Fukunimulongo 2016 too said that on the job the stage a big role in improving the worker presentation and output. the respondents (73%) of the two under the quarterly training program is organized in the company. To study on socio-geography-based ground of the respondent. To recognize the availability of training and development programme. To investigation the level surface of be acquainted with on training and proceed performance among the employees. To estimate the effects of training and development on their concert to gather in response on tools of training and development show to induce the respondents.

Keywords: Training and development, Performance.

INTRODUCTION

Training and development refer to educational activities within a company created to enhance knowledge and skills of employees while providing information and instruction on how to better perform specific tasks. Training is a short-term reactive process meant for operatives and process while development designed continuous pro-active process meant for executives. In training employees' aim is to develop functional skills and in development, it is to develop a total personality. It leads to improved success and or more encouraging attitude toward profit direction, improve the job information and skill at all level of the association, improve the morale of the workers and helps the workers classify with executive goal. Training and development is the permanent development if civilizing skills, fast information, descriptive concept and training approach through prepared and designed learning by which the efficiency and presentation of the



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJERT)
An International Open Access, Peer-reviewed, Refereed Journal

A STUDY ON WORKING WOMEN'S PARENTAL INVESTMENT TOWARDS CHILD REARING

(Dr. K. Shenbaham., Head, PG and Research department of Social Work, Ms. J. Rathipriya, MPhil Scholar, PG and Research department of Social Work, Shrimati Indira Gandhi College, Truchirappalli, Tamilnadu, India.)

ABSTRACT

Parenting or child rearing is the process of promoting and supporting the physical, emotional, social, and intellectual development of a child from infancy to adulthood. In many cases, orphaned or abandoned children receive parental care from non-parent or non-blood. "A study on work family balance and challenges faced by working women", here the author has described the work-life balance and the challenge a woman faces in her every day schedule how she keeps a BAL. To study on demographic details of the respondents. To study about the physical and psychological problem of respondents. To analyse the causes of poor parental investment among the respondents. To know the problems of on child rearing and how they overcome among the respondents. To enhancing your child's self-esteem. Catch kids being upright. The parent must set bounds and be reliable with your chastisement they should be spent time for your children. The parent must be a good role model Give more reputation to communication. Be flexible and eager to adjust parenting elegance

Key Words: Parenting, Child Care, Working Women, Parental Investment.

INTRODUCTION

PARENTING:

Parenting or child rearing is the procedure of sanctioning and subsidiary the corporeal, expressive, emotional, and intelligent expansion of child from beginning to parenthood in numerous cases, orphaned or uncontrolled children obtain maternal care from non-parent or non-blood.

Socio- Economic Status of Rural Women

Dr. K. Kavitha Maheswari ¹ & N. Shanthini ²

1. Assistant Professor, Department of Social Work, Shrimati Indira Gandhi College, Tiruchirappalli-2,
Tamil Nadu

2. M.Phil., Scholar Department of Social Work, Shrimati Indira Gandhi College, Tiruchirappalli-2, Tamil Nadu

Abstract

Women are considered the main strength and unity force of the family. Despite their great responsibility to family and society, they also face many obstacles that weaken their potential. They collected only a small part of the opportunities for improvement, and they often stay away from education, better jobs, private actions in the political system, and better healthcare and decision-making. This study is concerned with the socio-economic conditions of rural women. The researcher adopted the descriptive research design concerned with describing the various characteristics of the study population pertaining to their socio-economic status. The universe of this study constituted of rural married women of Punjai Sangenthi village Lalgudi Block, Tiruchirappalli. There were around 700 married women in the village formed the universe of this study. The data of the population were collected from the village administrative office. The findings related to the rural women's socio-economic independence, educational attainment, decision making capacity and political participation were discussed in the full paper.

Keywords: Rural women, Social condition, Economic status, Problems and Empowerment.

Job satisfaction among women teachers

Dr.K.Kavitha Maheswari¹ & C.Narmadha²

1. Assistant Professor, P.G & Research Department of Social Work, Shrimati Indira Gandhi College, Tiruchirappalli-2, Tamil Nadu, kavitha_maheswari@yahoo.co.in. Mobile No,9003590082.

2. M.Phil., Scholar P.G & Research Department of Social Work, Shrimati Indira Gandhi College, Tiruchirappalli-2, Tamil Nadu

Introduction

Job satisfaction is a motivating factor and an integration factor for the efficient performance of workers. It is equally a energy and morale booster. Job satisfaction refers to the positive attitude of the employee towards his job. It is related to the degree to which the employee's personal needs are fulfilled satisfactorily in the job situation. Thus, job satisfaction is the favorableness with which employees view their work and his working environment. Thus, job satisfaction is an expected outcome of positive job performance and involvement. High job satisfaction contributes positively to organizational commitment, job involvement, better physical and mental health and quality of work life and personal life to the employees.

Achanta & Reddy(2014) conducted a research on the level of satisfaction among primary school teachers. The result revealed that male teachers gained high mean score job satisfaction than that of female teachers.

Jahirul Hoque et al., (2012) stated that the determinants of job satisfaction such as job status, salary fringe benefits, job security, promotional opportunities, working environment, job autonomy, recognition for good work, co-workers, and supervising have been assigned by both the level of executives, junior and top level as the major determinants of their respective job satisfaction. It is also revealed that each of their determinants has significant positive relation with the overall job satisfaction of the executives. Therefore, increase in values/standard of each of these determinants would definitely increase the level of job satisfaction of the selected executives.

Mehra (2012); and Zill (2012) conducted a survey regarding the teachers' job satisfaction to know whether the teacher's perception is affected by the type of organization. The result observed that there is a significant difference in the level of satisfaction of government and private school teachers.

Iqbal and Akhtar(2012) conducted their study to compare the level of satisfaction between male and female teachers in the public school secondary teachers employed in Pakistan and Lahore district. T test can be used to compare the satisfaction. The result showed that female teachers are satisfied when compared to the male teachers.

Aims of the study

- To assess the level of job satisfaction among the women teachers.
- To study the influence of selected variables on one another.



INTERNATIONAL JOURNAL OF RESEARCH AND ANALYTICAL REVIEWS (IJRAR) | IJRAR.ORG
An International Open Access, Peer-reviewed, Refereed Journal

A study on Stress Management and coping mechanism among married nurses

1. Dr. E. Deepa Assistant Professor., PG & Research Department of Social Work

Shrimati Indira Gandhi College., Trichy-2

2. V. Janani shree., Research Scholar., PG & Research Department of Social Work
Shrimati Indira Gandhi College., Trichy-2

The American Medical attendants Affiliation (ANA) states nursing ,s the assurance, advancement , and optimization of health and capacities, avoidance of illness and injury, alleviation of suffering through the conclusion and treatment of human reaction , and backing within the care of people , families, communities , and populations .1. Nursing is the security, advancement, and optimization of wellbeing and capacities, avoidance of ailment and harm, easing of enduring through the conclusion and treatment of human reaction, and backing within the care of people, families, communities, and populations.

Risk Factors for Stress in Nurses

Word related security and wellbeing analysts and specialists concur that medical caretakers are intensely uncovered to a horde of "psychosocial stressors" in their every day work. The term "psychosocial stressors" alludes to unpleasant working conditions and/or work characteristics that relate to how errands are designed. Psychosocial stressors can moreover allude to administration fashion, viewpoints of interpersonal connections, and work parts. Cases of these stressors incorporate overwhelming workload, clashing work requests, long working hours, and move work. Nurses appear to be overexposed to a run of psychosocial stressors, counting the following:

Adolescent adjustment among school students

Dr.K.Kavitha Maheswari¹ & A.Sajitha²

1. Assistant Professor, P.G & Research Department of Social Work, Shrimati Indira Gandhi College, Tiruchirappalli-2, Tamil Nadu, kavitha_maheswari@yahoo.co.in. Mobile No.9003590082.

2. M.Phil., Scholar P.G & Research Department of Social Work, Shrimati Indira Gandhi College, Tiruchirappalli-2, Tamil Nadu

Abstract

Adolescence is a period of change in everyone's life. The stress associated with dynamism and development during this period is dealt by the adolescents in two ways, those are either change the behavior in a positive way, which is a process called adjustment, or in a negative way, which ends up to maladaptive behavior. Descriptive research design has been used in this study; descriptive research is concerned with describing the socio demographic characteristics along with the adolescent's adjustment. The universe of this study constituted the school students of private Higher Secondary School in Dindigul. The data were collected from the students from two grades such as 8th and 9th. Socio-demographic details of respondents were collected by using a self prepared questionnaire. Along with the self prepared questionnaire standardized Reddy's adolescent adjustment inventory (1964) was used to measure the adjustment among the adolescent school students. The findings of the study revealed that more than 1/4th of the respondents perceived low level of adjustment which is due to their low level of maturity to handle the life situations. Only 21.6% of the respondents have high level of adjustment and having less adjustment oriented problems.

Key words: Adolescents, school students, adjustment, gender, type of family, mode of study and problems.



INTERNATIONAL JOURNAL OF RESEARCH AND ANALYTICAL REVIEWS (IJRAR) | IJRAR.ORG

An International Open Access, Peer-reviewed, Refereed Journal

Work life balance among women teachers

Dr.K.Kavitha Maheswari¹ & V.Ramalakshmi²

¹Assistant Professor, P.G & Research Department of Social Work, Shrinall Indira Gandhi College, Tiruchirappalli-2, Tamil Nadu,

²Ph.D., Scholar P.G & Research Department of Social Work, Shrinati Indira Gandhi College, Tiruchirappalli-2, Tamil Nadu

Abstract

Women are the centre of any development process especially in the development of a nation. They control most of the non-monetary economy and take an important part in the money economy. A working woman has a more interesting life than one who does not work. It is a very powerful task to balance the professional responsibilities in one hand and the family commitments on the other hand. The researcher used descriptive research design for this study and it describes the variables of the selected population with special reference to their work life balance and how socio-demographic variables influence work life balance of the respondents. The findings of the study revealed that more than half of the respondents perceived low level of work life balance, low level of work interference with personal life, personal life interference with work and low work and work enhancement. The statistical analysis revealed that the demographic variables have no significant effect over work life balance of the respondents.

Keywords: working women, work, personal life and work life balance.

Introduction

Women are the centre of any development process especially in the development of a nation. They control most of the non-monetary economy and take an important part in the money economy. A working woman has a more interesting life than one who does not work. It is a very powerful task to balance the professional responsibilities in one hand and the family commitments on the other hand. Kakkar et al. (2016) in their study on work life balance in the Indian service sector from a gender perspective revealed that women who work and shine both the spheres are celebrated than men. Murthy.M and Shastri. S (2015) observed various issues in work life balance include parenting issues, marital issues, role conflict and role guilt. Parenting issues are spending less time with children and not able to give quality time and care to the spouse when it comes to marital issues. The tendency of doubt about how good they are in the roles and responsibilities they perform at home as mother, as daughter in law and wife. The implementation of work life improvement programs has both individual and organizational benefits. Effective work life programs facilitate a symbiotic relationship mutually between the employees and the employers. It will improve the performance of the employees as well as to enable them better to balance the demand on their time and more content Purohit.M. and Kishorika and Supriya (2010) focused both the work based factors like flexible working time, option



**INTERNATIONAL JOURNAL OF RESEARCH AND
ANALYTICAL REVIEWS (IJRAR) | IJAR.ORG**
An International Open Access, Peer-reviewed, Refereed Journal

**SOCIO-ECONOMIC AND LIFE STYLE OF
MIGRANT LABOURS**

Dr. K. Shentabham, Head, Department of Social Work, Ms. R. Samundeeswari, MPhil Research Scholar,
Department of Social Work, Sri Mata Indira Gandhi College, Tiruchirappalli, Tamilnadu, India)

ABSTRACT

Migrant labour, casual and unskilled workers who move about systematically from one region to another offering their services on a temporary, usually seasonal, basis. Migrant labour in various forms is found in South Africa, the Middle East, western Europe, North America, and India. In Europe and the Middle East, migrant labour usually has been hired for urban rather than agricultural employment and involves longer periods of residence. In North America, migrant labour tends to be hired for farm work, primarily at harvest time. The demand for agricultural migrant labour is from the seasonal nature of harvesting. In the Northern Hemisphere, migrant labour moves seasonally from south to north following the harvest, while this pattern is reversed in the Southern Hemisphere. Most of these agricultural workers move in established patterns within these general directions, and their work typically involves tasks that are manual, repetitive, and easily learned. As a result, migrant workers can have difficulty accessing local health and social services and can be deprived of rights either because of their illegal status or because they lack easy recourse to the law. The nomadic nature of migrant workers makes the regulation of their working and living conditions difficult and necessitates union and government labour standards that apply to regular work settings.

Keywords: Labour, Migrant workers, Bonded Labour.

INTRODUCTION

A "migrant worker" is the person who either migrates within their home country or outside it to pursue work such as seasonal work, usually do not have an intention to stay permanently in the country or region in which they work. Migrant workers who work outside their home country may also be called foreign workers or expatriates, especially when they are sent for or invited to work in the host country before leaving their home country. The International Labour Organization estimated in 2014 there were 232 million international migrants worldwide who were outside their home country for at least 12 months and approximately half of them were estimated to be economically active (i.e. being employed or seeking employment). Some countries have millions of migrant workers. Some migrant workers may be illegal migrants. Since the 1960s, farmers in Ontario and other provinces have been meeting some of their seasonal