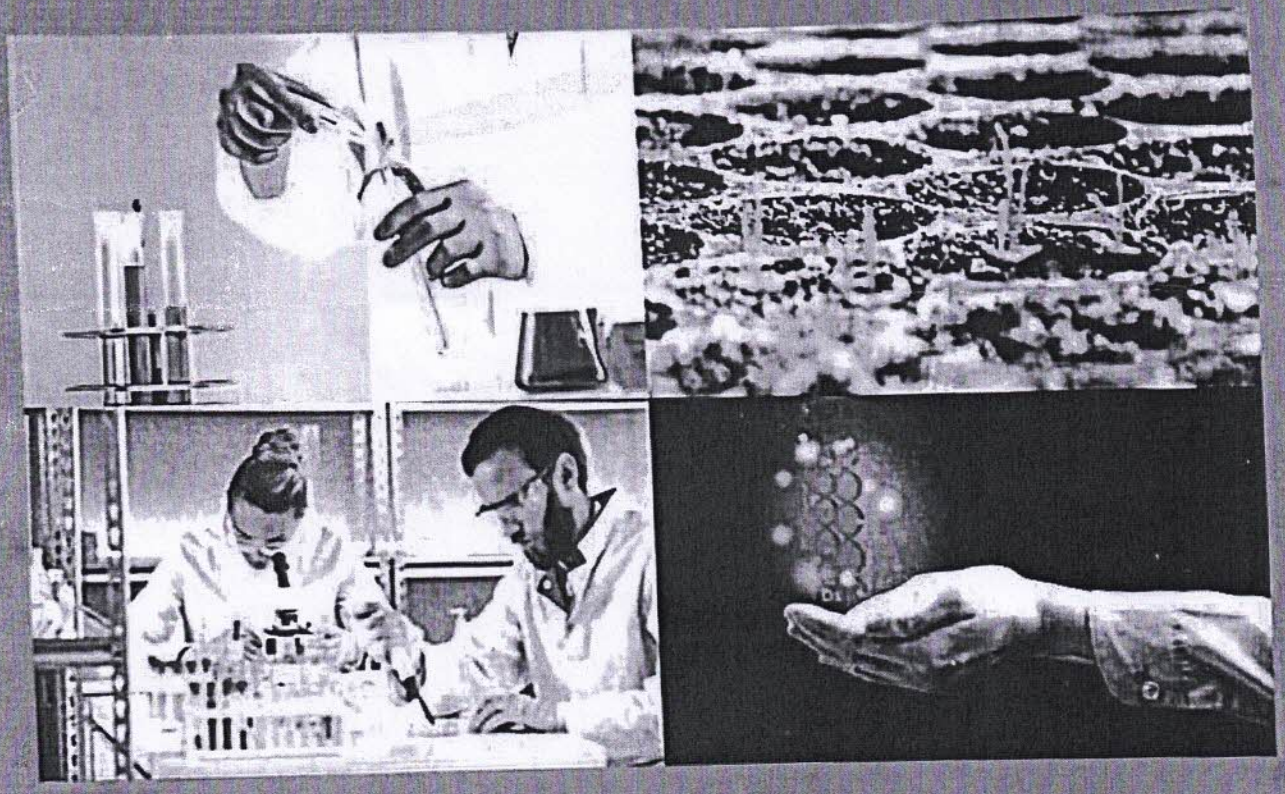
Advanced Research in

Physical And Biological Sciences



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Assessment of Water and Sludge Pollution Potential Inkunnam Area (Perambalur Dt., Tamil Nadu)

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Abstract

Water is an essential natural element for all kinds of biota. Without water, oxidation, reduction reactions are impossible for the living beings. The quality of water is ... the physico-chemical parameters which are directly influencing the ... species. In this study, water and sludge.

Thalassas: An International Journal of Marine Sciences
https://doi.org/10.1007/s41208-022-00498-2

Age and Growth Studies in Indian Oil Sardine (*Sardinella longiceps*) using Hard Part Microstructure, a Tool for Biological and Ecological Understanding

E. M. Abdussamad[1] · P. Rohit[1] · S. Ghosh[1] · K. G. Mini[1] · P. Shameer[1] · N. V. Dipti[1] · T. B. Retheesh[1] · A. M. Abbas[1] · A. R. Akhil[1] · I. Shihab[1] · A. Gopalakrishnan[1]

Received: 22 April 2022 / Revised: 17 September 2022 / Accepted: 16 October 2022

Abstract
Age and growth characteristics of the Indian oil sardine (*Sardinella longiceps*) was studied by interpreting microstructures on hard parts. Microstructures were validated to the time scales by observing their frequency of formation on hard parts of the fishes reared in confinement. Among the hard parts, sagittal otolith alone was found suitable for ageing the species as frequency of microstructure formation on them followed definite time scale. The estimates of age at length data and growth parameters from otolith analysis indicated faster growth in the species than the earlier estimates by other methods. Despite an expected sexual divergence in their growth, results show identical growth in both sexes. It further highlighted the prevalence of very distinct temporal growth variation driven by habitat environment indicating significance of hard part studies on ecological understanding of fishes. It also aided in tracing the precise time of birth with high precision, identifying the cohorts that supported the fishery and possible inter-regional migration of the species. The data generated from hard part ageing would aid in better eco-biological understanding of species, precise stock assessment outputs and fishery forecasting.

Keywords Ageing · Hard parts · Sagittal otoliths · Microstructures · Ecology · Stock assessment · Forecasting

Introduction

Indian oil sardine (IOS), *Sardinella longiceps* is the most dominant resource of the Indian coast, in terms of distributional range, abundance and contribution to the marine fish production. They support more than 10% of annual marine fish landings of India (Rohit et al. 2018). Several studies and reports are available on their fishery, biology, stock status and measures proposed during time to time for sustaining stock and fishery. Being one of the most decisive basic inputs, precise estimates of age/age parameter is a paramount requirement for assessing stock health (Bellido et al. 2000) and to decide on adequate measures for resource sustainability and fishery (Carbonara and Follesa 2019). Traditionally, growth and demography of fished populations in tropical waters were estimated following length-based methods (Bensam 1964; Banerji 1968; Sam Bennet 1965; Antony Raja 1969, 1970; Palomares et al. 1987; Kurup et al. 1989; Annigeri et al. 1992; Yohannan et al. 1998; Bellido et al. 2000; Cubillos et al. 2001; Rohit and Bhat 2003; Ganga and Pillai 2006; Abdussamad et al. 2010; Jayabalan et al. 2014; Nair et al. 2016; Al-Anbouri et al. 2011; Rohit et al. 2018). However, the available estimates of population parameter by this method varied widely and lacked any proper scientific interpretations for it. Among the alternate techniques, interpretation of microstructures on hard parts are considered more accurate and reliable for estimating age and growth in fishes (Morales-Nin and Pertierra 1990). Despite suitability of this technique, only limited studies are available on ageing *Sardinella* species using hard parts for stock assessment (Dayaratne and Gjosaeter 1986). Earlier studies using hard part of sardines in India were limited to description of the rings on their otoliths (Nair 1949) and scales (Balan 1959, 1964). Recently, the age of *S. longiceps* from Oman waters (Al-Anbouri et al. 2011) and *Sardinella sindensis* from Persian Gulf (Dehghani et al. 2015) were studied using otolith microstructures. Other studies in sardine include ageing of *Sardinella brasiliensis* using growth increments in otoliths (Saccardo et al. 1988) and scales (Fontelles Filho et al. 2005).

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Evaluation of Nicotine levels in Smokers Blood and Urine samples

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Abstract- Smoking is the most prevalent form of tobacco consumption. More than 0.4 lakhs chemicals have been identified in tobacco products. Nicotine is abundantly found in the tobacco products. They get evaporated on burning and are catabolized from the body fluids (blood) and excreted in the urine. It is an addictive in low amounts and was found toxic in high doses. Assessment of nicotine in smokers' blood and urine samples are very limited. Blood and urine samples were collected from smokers (n=15) and non-smokers (n=15) from two age groups; group I (< 35yrs) and group II (>35yrs). For the evaluation of nicotine in human plasma and urine, HPLC considered as a reliable and highly sensitive method. Nicotine content in the human plasma and urine are fractionized by dichloromethane method. Blood plasma nicotine levels were found as 798.67 ± 210.89 ng/mL among the smokers and 30.69 ± 5.99 ng/mL in non-smoker groups. The average reported urine nicotine level was found as 403.42±115.42 ng/mL among the smokers and 15.21±1.34 ng/mL in non- smokers. Our study results revealed the presence of high concentrations of nicotine levels in smokers than non-smoker. Our results concluded that age variations showed no much impact on the nicotine levels in blood plasma and urine.

Keywords: Nicotine, Human plasma, urine, HPLC

I. INTRODUCTION

Tobacco is consumed by humans both as non-smoking and smoking varieties. Chewing (Pan, and Gutta) are the major non-smoking form whereas Cigartee, Chutaa, Hooka and Bidi are the smoking forms used in India. [1],[2] Nearly 4000 chemicals are reported in tobacco smoke, so finally it is considered as heterogeneous gas mixture with various particulate molecules, tar, uncondensed vapours, nicotine, polyaromatic hydrocarbons, heavy metals and CO. [3-9]

Nicotiana tubacum plant leaves are used for the tobacco preparation, which contains the natural tertiary alkaloid called as "Nicotine" which has 2 hrs half-life and its primary metabolite cotinine's half-life is 20hrs. During smoking, various biochemical compounds are entered into the human blood [10] and the major nicotine detoxifying organ is human liver. Nicotine is catabolized into cotinine due to the presence of cytosolic aldehyde oxidase and cytochrome P4502A6 hepatic enzymes. [11]

Assessment of Nicotine in smokers (cigarette, bidi, hooka) blood and urine samples is very limited. [12] For both passive and direct smokers, Nicotine levels can be assessed in human blood and urine by using instrumentations such as HPLC, UV-visible spectrophotometer and GC/MS. [13-14] The present study is aimed to evaluate the nicotine levels in blood plasma and urine samples collected from smokers and non-smokers by HPLC analysis.

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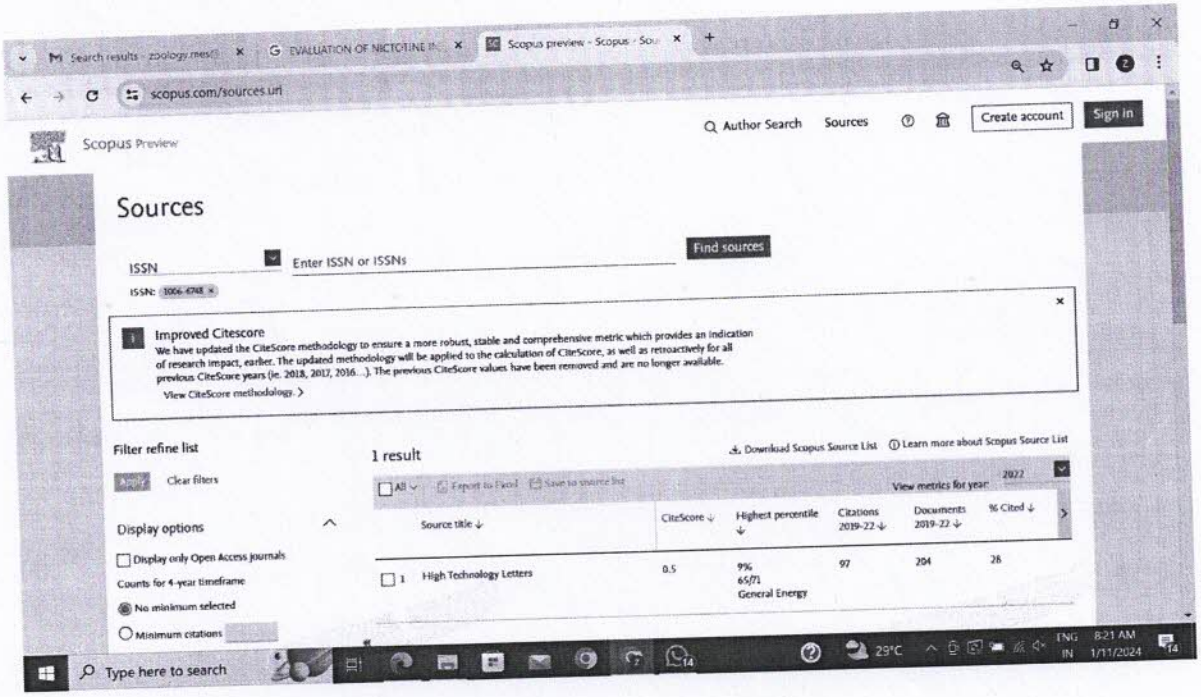

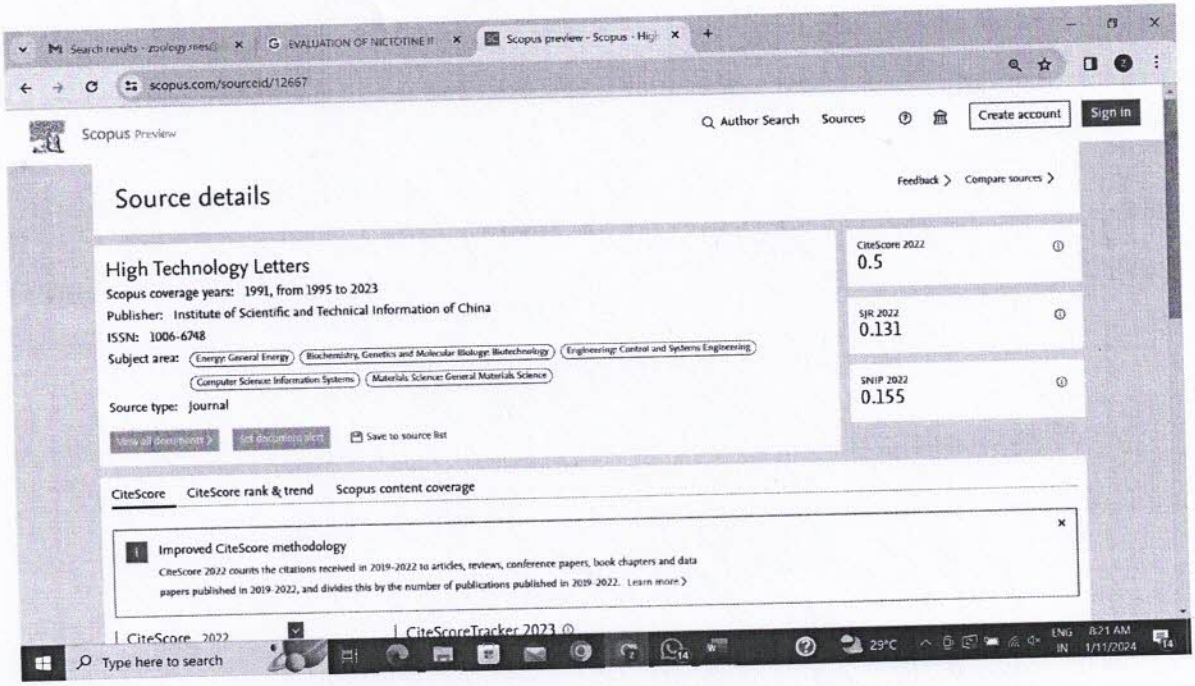

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3.2 Number of research papers per teachers in the Journals notified on UGC website during the year

Title of paper	Name of the author/s	Department of	Name of journal	Year of	ISSN number	Link to the recognition in UGC enlistment of the	
yth or Real: A Critical Reading on the Inclusivity of Gender in Media	Anupama Murali and Thah	English	Inclusivity through a tra	2022			
dvertisement and Society: A Qualitative Analysis of Societal and Cultural Stere	Anupama Murali	English	Journal of The Oriental	2022	0030-5324		UGC Care list no: 135
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urney of the Underprivilleged, Analysing the Power Hierarchy in independen	Anupama Murali	English	Smart Moves Journal IJ	2022	2582-4406		
pact of Colonialism, partition, and the rise of new movements in post Indep	Thahsin Z. Hussain	English	Smart Moves Journal IJ	2022	2582-4407		
ecentered Culture and Dislocated Identity in Nadeem Aslam's Maps for Lost L	Reshmi Ravindran P	English	International Journal of	2023	2456-7620	https://dx.doi.org/10.22161/ijels.81.2	

INCLUSIVITY THROUGH A TRANSDISCIPLINARY PRISM

VOLUME- 1

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Dr. Neha Kumari

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CHAPTER II

Myth or Real: A Critical Reading on the Inclusivity of Gender in Media

Anupama Murali[1] and Thahisn Z. Husain[2]

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Abstract

Is the term Gender really open to all on the social media as we believe? It seems all inclusive but one eventually realise that it is a deceptive one. The internet psyche has been conditioned in such a way that the inclusion is strictly confined to those who express and exhibit oneself adhering to unwritten parameters. For example there is no room for dissent when it comes to accepting the standards of beauty constricting the concept of beauty to "white, fair and lean". A majority of the internet population is still biased on what it reads and sees. Gender is in itself is a huge umbrella term which includes all sorts of human beings, but the media is hesitant towards assimilating the greater idea of Gender and narrow it down to a fewer privileged classes, men with power, white woman

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Oriental Institute

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Editor
Sweta Prajapati

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ADVERTISEMENTS AND SOCIETY: A QUALITATIVE ANALYSIS OF SOCIAL AND CULTURAL STEREOTYPING AS REFLECTED IN INDIAN ADVERTISING SCENARIO

*ANUPAMA MURALI

Abstract

Stereotypes are the belief that different roles, qualities, and positions are assigned to different groups of people based on their race, religion, sexual orientation, or gender. Stereotyping in advertising can provide an audience, an orientation with which they can identify, however, stereotypical images tend to be overly simplified representations of any group in society, which can lead to misinformation. Stereotypes are so ingrained in the society and it is quite surprising how one internalize the concepts from their childhood onwards. The society is structured on certain value system, morality, culture and tradition. The values and presence of patriarchy is felt not merely in social practices but even in the daily lives of men and women and shared even by the women. Gender stereotyping as well as other stereotypes based on social groups -- vary across cultural groups. The system has assigned various roles to men and women. Males belonging to the dominant gender get greater privileges and assertive roles, while females' position is reduced to meek tender and the one to be ruled by the dominant gender. The concept of a patriarchal society itself asserts the dominance of men in the society. Cultural stereotypes are used frequently in advertising. The viewer assigns mental ideologies based on their membership in a social group. Stereotyping is by definition neither negative nor positive. Due to this, we see many different outcomes; cultural stereotyping can be beneficial for the advertiser as well as the viewer in cases,where specific demographics are being targeted. While referring to different races, cultures, nationalities or ethnic groups, advertisers should consider the possible offence, the portrayal can create. Stereotypes are known to many members of a social group, hence, they can inform a group's behavior and policies in a much more powerful way than the unique beliefs of a single individual could. This makes it all the more difficult for the members of the target group to escape their influence. Stereotypes not only describe members of a social group but explain why they are,how they are. Stereotypes often invoke the existence of deep underlying properties that may account for the homogeneity of the group. The paper intends to study on the impact of social and cultural stereotyping in advertising in the Indian scenario. The study focuses on both print and video advertisements released in India and how these influenced the society and the norms it follows.

Keywords: Stereotyping, culture, gender, patriarchy, society.

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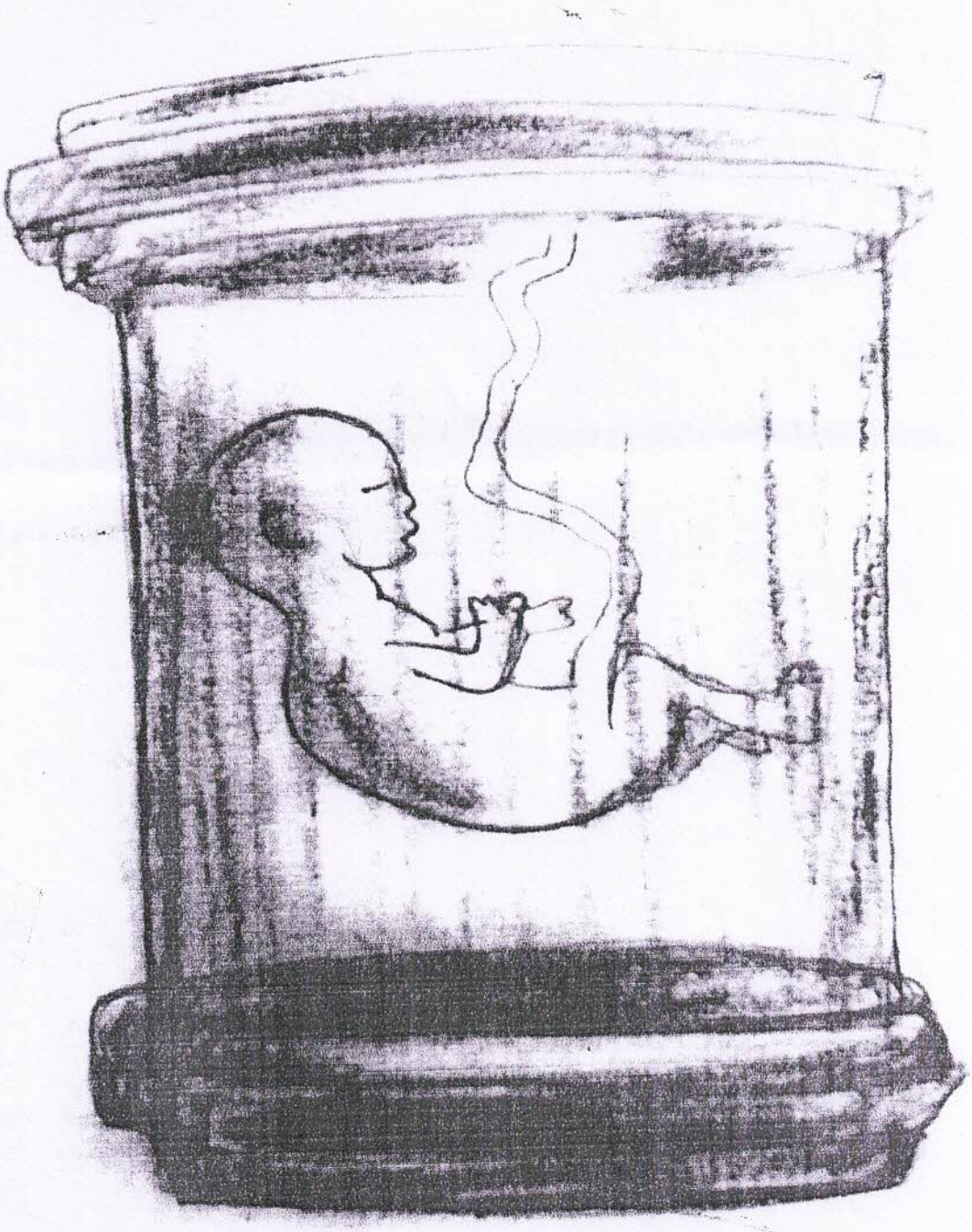
INSIGHT : AN INTERNATIONAL MULTILINGUAL JOURNAL FOR ARTS AND HUMANITIES



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VOLUME 2 – ISSUE 8 (2) October 2022

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INSIGHT: An International Multilingual Journal for Arts and Humanities
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Special Issue: Science Fiction

Life Transitions in Age Old: A Study on Old Age Trauma and Technological Solutions Based on Malayalam Feature Films *Android Kunjappan version 2.5* and *Home*

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Abstract Trauma is regarded generally as a significant disrupting event that profoundly alters one's perception of the external world and the functioning of one's emotions. Through an analysis of trauma's psychological, rhetorical, and cultural significance, trauma studies examine the impact of trauma on literature and society. An artist's narration of trauma shows how trauma disrupts attachments between self and others through challenging fundamental assumptions about moral laws and social relationships which are themselves linked to specific environments. In the current paper, the subject of vulnerability and resilience is discussed among people who have faced trauma in the past and the pursuit of happiness in a hostile environment, which is characterized by the dynamic interaction of positive systems that support a favourable psychological environment and how this favourable psychological ecosystem is created by science and technology. The chapter explores older adults ability to change and adapt according to technological innovations happens from time and time and application of the same as an option to deal with trauma through the analysis of Malayalam sci-fi film *Android Kunjappan version 2.5* and family drama *Home*.

Key words: trauma, traumatic experience, science, technology, old age

Literary trauma theory asserts that trauma creates a speechless fright that divides or destroys identity. This serves as the basis for a larger argument that suggests identity is formed by the intergenerational transmission of trauma. People who experience trauma react emotionally to overwhelming events that disrupt their sense of self and their standards of evaluating the world.

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Journey of the Underprivileged, Analysing the Power Hierarchy in Independent India With Reference To Mulk Raj Anand's *Coolie* and Aravind Adiga's *The White Tiger*

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Abstract

After colonialism ended, the ideologies underlying the colonizer-colonized relationship did not vanish. It crept into autonomous countries like India in novel ways, taking on many forms like the caste system, social inequity, capitalism, etc. The privileged elite have marginalised the people of the underclass and have ignored their existence. Binaries of oppressor/oppressed, abuse of authority, and exploitation were produced as a result of the chaotic battle for existence and power. Even when the caste system was abolished, which arbitrarily divided India's population and impeded social mobility by shackling each member to a certain way of life, inequality did not decrease. In addition, it promoted the British ideology of widening the gap between the rich and the poor .The paper attempts to read the social and cultural inequality that exists in the post independent India.Mulk Raj Anand's *Coolie* and Aravind Adiga's *The white Tiger* are analysed to understand how the hierarchy of power plays a decisive role in the progression of life of underprivileged people.This paper explores the capitalist Indian society that is firmly rooted in power hierarchy and the socioeconomic gaps that have caused a widening of the social divide by traversing the lives of the characters in both novels.

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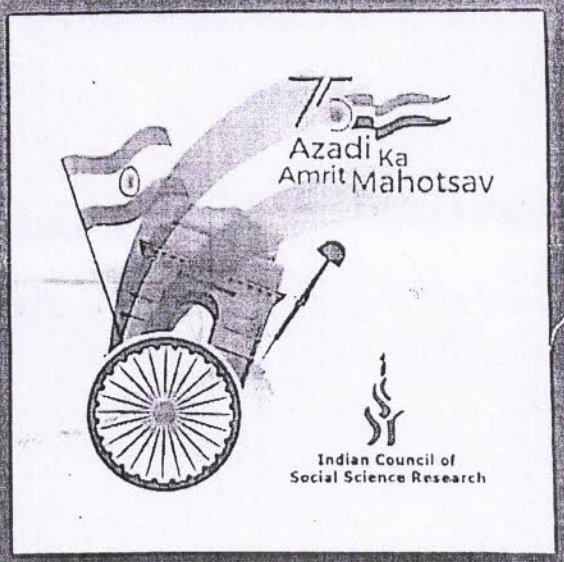

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Contents

Impact of colonialism, partition, and the rise of new movements in post Independent India with reference to JhumpaLahiri's The *Lowland* and Kiran Desai's *The Inheritance of Loss*

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Abstract

Post independent India witnessed umpteen issues like trauma of partition, evil facets of casteism, poverty and so on. With a story spanning generations, continents and political upheaval, *The Lowland* by JhumpaLahiri is epic in scope. Though nearly inseparable early in life, brothers feel a rift deepening between them as one's politics become increasingly radicalized in response to their homeland's unrest. Broader strife in India continues to be mirrored by familial divisions and tragedies throughout the novel—moments that, in turn, often fuel further unrest. The narrative focuses on the perspective and the response of two members from the same family towards the changed socio political scenario. By exploring the ways in which political and personal violence feed each other, Lahiri suggests the ultimate inseparability of the two; the personal is always political, and vice versa. The character in *The Inheritance of Loss* by Kiran Desai is an illegal alien residing in the United States, trying to make a new life for himself, and contrasts this with the experiences of an anglicised Indian girl living with her grandfather in India. The novel shows both internal conflicts within India and tensions between the past and present. Desai writes of rejection and yet awe of the English way of life, opportunities to gain money in America, and the squalor of living in India.

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Decentered Culture and Dislocated Identity in Nadeem Aslam's *Maps for Lost Lovers*

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Abstract— In the age of global modernity where human life is increasingly shaped by the change in cultural pattern, the concept of shared culture is often debated and discussed. Modern life marked by geographical dislocations and displacement is no longer centered on the notion of purity of culture. The present paper analyses the effect of cultural decentralization affected by dislocation in Nadeem Aslam's Maps for Lost Lovers. The reading focuses in analyzing the novel, based on the effect of shared experiences in shaping and establishing their life ranging from intercultural interactions, transnational patterns, and connected life styles. The paper also traces how the decentered culture results in dislocated identity formation.

Keywords— acculturation , assimilation, cultural trauma, displacement, hybridity.

I. INTRODUCTION

Cultural effects in midst of dislocations welcome new cultural formations through acceptance and assimilation. The society that progress under displaced settings are tamed to adapt and assimilate where new cultural forming is generated out of hybrid representations. The novels of British Pakistani writer Nadeem Aslam presents the nuanced representations of cultural, social and political instabilities in which immigrant community particularly the grass root sections are immersed into . His works projects the complexities of nationalism, tradition, community, culture and religion through various perspectives. His *Maps for lost lovers* is about the life of conservative Pakistani immigrant family living in an isolated place for immigrants named Dash E Tanhai. The narration reveals how the characters are assimilating themselves to the foreign culture from which they cannot escape. Many readings are done in Nadeem Aslam's works which focused on identity crisis out of cultural mixedness. In this context, the present reading initiate a new perspective focusing on how the characters frame a new life out of the dislocations in which they are immersed in. The paper analyzes the effect of cross cultural encounters in the identity establishments resulting from different cultural representations. Built around a culturally hybrid world, the novel presents the space of decentered world marked by polarization, hybridity, assimilations and at times rejections

II. THIRD SPACE AND CULTURAL RECONSTRUCTION IN MAPS FOR LOST LOVERS

Maps for Lost Lovers by Nadeem Aslam, centers around the life experiences of Shamas and his wife Kaukab living in Dash E Tanhai, a place where a group immigrants are living together. Being migrated from Pakistan during the time of partition, the characters frame a new life in the midst of cultural dislocation and de representation. Set in UK town named Dash E Tanhai inherited by Pakistani immigrants, the novel highlights the effect of mixed cultural representations in ordinary lives. . Dash E Tanhai, the land of solitude can be read as a space of cultural reconstruction. According to Baba, hybridity is the 'third space' which enables other positions to emerge '(Bhaba ,Third Space 211). The shared life resulting from cultural encounters develops a new space that breaks the fixity of cultures, where fluidity of cultural establishments is prompted. The Geographical locations of immigrants are also affected by their cultural impacts. The processes of re-naming places reflect the transitional

space, but a continuous space that connects them to the old and new. In this space of perfect assimilation, their exist no conflict of culture and tradition. The novel projects the reality of fluidity of culture in a space where the very concept of being pure is nullified. The state of living establishments in the sphere of global modernity has to be judged not on the notion of purity but on the frame of fluidity. The characters come out successful in their living state while they develop a strategy to adapt and accept where past is not absolutely denied. The third space created never displaces the characters from their root establishments but replace them to the new establishment where an accepted acculturated space is framed.

IV. CONCLUSION

The reading in the context of mixed life representations traced how the characters struggle to come out of their mixed identities engraved upon them out of the residue of being immigrant. All the characters are the products of struggled psyche created out of their unsecured state which haunts them in the first phase of their path towards hybridity. While the first generation immigrants , Kaukab and Shamas who are the victims of double displacement finds their new space as absolutely strange, the new generation embodied through Stella and Surayya are towards their path for acceptance. The set of traditional value inscribed as culture in the characters banes on them with the responsibility of holding and preserving it. These responsibilities as protectors and preserves of culture stigmatize their position as alien,where they identify themselves as strange, alien or foreign. Though caught in a strange space created out of their cultural and psychological residue, the characters willfully initiate an effort towards assimilation and acceptance triggered by the need for survival. These paths towards assimilation and acceptance lead them to the hybrid state, where total rejection of new is abandoned.

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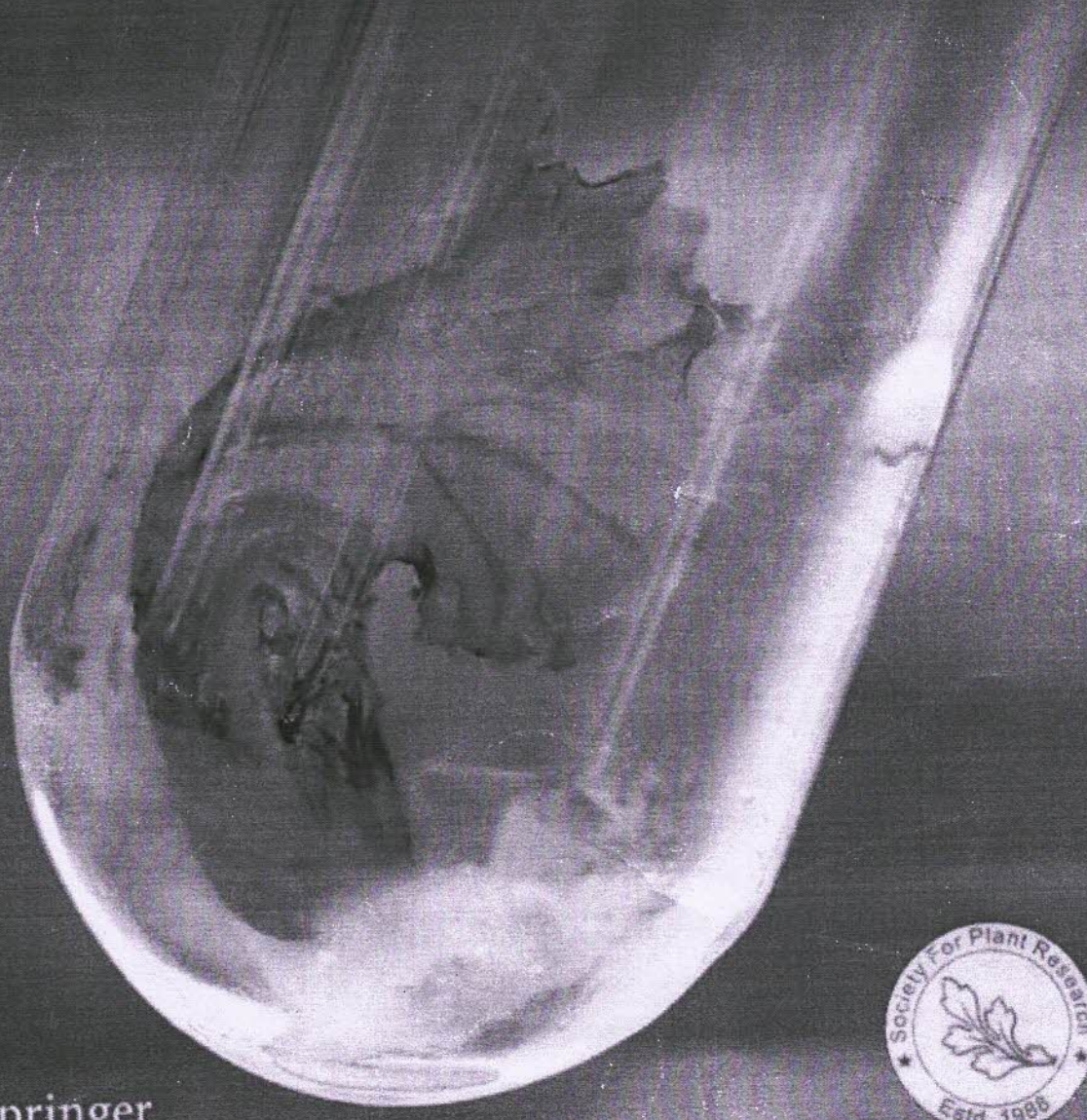

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Calcium-alginate coated synthetic seed production, storage and assessment of genetic stability in *Alpinia galanga* (L.) Willd

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Abstract
An efficient encapsulation method was developed for artificial seed production in *Alpinia galanga*. Shoot buds obtained from in vitro proliferated plantlets on Murashige and Skoog (MS) medium containing 2.5 mg/l 6-benzyladenine (BA) was used for encapsulation. Calcium-alginate matrix composed of 3% sodium (Na) alginate and 100 mM calcium chloride ($CaCl_2.2H_2O$) was optimum for uniform, firm synseed preparation. Highest germination and plantlet conversion (87%) was obtained on MS medium containing 2.0 mg/l BA and 0.5 mg/l α-naphthalene acetic acid (NAA) under light/dark (16/8 h) photoperiod. Synseeds stored at 4 °C exhibited 85% and 23% germination after 30 days and 120 days respectively. In vitro grown plantlets were hardened successfully to field condition with 76% survival rate. 8 random amplified polymorphic DNA (RAPD) markers were used to check the genetic stability of regenerated plants. A monomorphic banding profile confirmed the genetic similarity of plants obtained from synseeds.

Keywords *Alpinia galanga* · Synthetic seed · Calcium-alginate · RAPD

Introduction

Alpinia galanga (L.) Willd is an important medicinal plant belongs to the family Zingiberaceae. *Alpinia* comprises of more than 250 species distributed worldwide (Smith 1990). It has been widely cultivated in China, India, Srilanka, Malaysia and Thailand (Trakranrungsie et al. 2008). *A. galanga* used as medicine for diabetis mellitus (Jaju et al. 2009), stomach health (Oonmetta-aree et al. 2006), heart disease, bronchitis, renal calculus and rheumatism (Rao et al. 2010). Rhizomes of *A. galanga* are richest in carbohydrate and lowest in fat, and it is also used for flavouring food (Indrayan et al. 2009). Extracts of *A. galanga* rhizomes have been shown to have various properties such as anticancer (Panich et al. 2010), hepatoprotective (Jantan et al. 2005), antiplasmidal (Latha et al. 2009), antibacterial (Hsu et al. 2010), anti-amoebic (Sawangjaroen et al. 2006), apoptosis (Banjerdpongchai et al. 2011) and anti-acetyl cholin esterase (Vinutha et al. 2007) activities. Rhizomes are used as vegetative propagule for commercial cultivation. But, they are very slow to grow, and very susceptible to various environmental stresses. So, alternative propagation methods are required for the large scale production of *A. galanga*. Synseed production techniques can be used as a non-conventional method for rapid propagation and conservation of this valuable medicinal plant. Synthetic seed is an encapsulated single seed used for storage, transport, sowing, and that would eventually regenerate into a complete plantlet (Murashige 1978; Standardi and Piccioni 1998; Asmah et al. 2011).

Artificial seed technology has been widely used in various medicinal plants (Gantait et al. 2015; Sharma et al. 2019), ornamental plants (Ekinci et al. 2019; Maqsood et al. 2021), crop plant species (Micheli and Standardi 2016; Ahmad and Shahzad 2019) and endangered species (Fonseka et al. 2019; Priyadarshini et al. 2020; Negahdar et al. 2021). This technology has also been developed in different plants of Zingeberaceae, including *Curcuma amada* (Soundar et al. 2016) and *Zingiber officinale* (Sharma et al. 1994; Sundararaj et al.

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PGRs and photoperiod on synthetic seed germination

Regrowth of encapsulated shoot buds was significantly affected by plant growth regulators (PGRs) and light/dark photoperiod. A maximum germination response (87%) was recorded on MS medium fortified with 2.0 mg/l BA and 0.5 mg/l NAA in 16/8 light/dark (Fig. 1c, d). Large number of multiple shoots (6 shoots per synthetic seeds) were also observed in same condition (Table 1). Synthetic seeds cultured on a medium containing 2.0 mg/l BA alone or combined with 0.5 mg/l IBA in an incubation of 8/16 h light/dark (50, 69%) or complete darkness (49, 56%) limited the synseed germination. Increasing or decreasing the concentration of PGRs reduces the germination percentage and the number of shoots from a single synseeds. Similar studies of BA and NAA for plantlet conversion of synthetic seeds and multiple shoot formation was also investigated in *Balanites aegyptiaca* (Varshney and Anis 2014). In addition, 16/8 light and dark conditions attributed the regrowth of synthetic seeds (Saha et al. 2014; Javed et al. 2017).

Storage of synthetic seed

Production of viable encapsulated seeds after storage is an important aspect of synseed technology. In this study, encapsulated shoot buds were kept at two different temperatures (4 °C and 25 °C) and different time durations (30, 60, 90 and 120 days). Synseeds kept at 4 °C for 30 days recorded a maximum germination (85%) and 90 days of storage showed 51% germination (Fig. 1e, f; Table 2). While, storage at 25 °C for 30 days resulted a sprouting percentage of 62%. Storage of encapsulated shoot buds up to 120 days at 4 °C noted only 23% of germination. Longer duration of storage at 25 °C also indicated a significant reduction in regrowth and plantlet conversion (11%). Similar results have also been reported in other Zingeberaceae species. In *C. amada*, calcium alginate coated synseeds kept at 4 °C showed higher plantlet production. This report also suggests that synseed storage at low temperature (4 °C) and short duration more efficient than the higher temperature (25 °C) and longer duration (SoundarRaju et al. 2016). In *Z. officinale*, Sundararaj et al (2010) reported that short term storage of synseeds at 25 °C exhibited lower percentage of plantlet conversion.

Table 2 Effect of storage temperature and duration on synthetic seed germination of *A. galanga*

Storage temperature	Storage duration (days)	Plantlet conversion %	No. of shoots/bead
4 °C	30	85 ± 2.08^{a}	5 ± 2.08^{a}
	60	73 ± 3.51^{b}	4 ± 1.52^{ab}
	90	51 ± 3.60^{d}	4 ± 2.08^{ab}
	120	23 ± 2.64^{f}	2 ± 0.57^{ab}
25 °C	30	62 ± 3.05^{c}	4 ± 1.52^{ab}
	60	35 ± 3.60^{e}	3 ± 1.52^{ab}
	90	23 ± 2.64^{f}	3 ± 0.57^{ab}
	120	11 ± 1.73^{g}	1 ± 0.00^{b}

Values are expressed as the mean ± SE, taking twelve explants in each experiment with three replications. Within each group, values with different letters indicate significant difference at $P \geq 0.05$ using Duncan's multiple range test (DMRT)

Table 1 Effect of plant growth regulators and light and dark photoperiod on germination of synthetic seeds of *A. galanga*

PGRs			Plantlet conversion (%)			No. of shoots/synseed		
BA	NAA	IBA	16 h light/8 h dark	8 h light/16 h dark	24 h dark	16 h light/8 h dark	8 h light/16 h dark	24 h dark
0.5			34 ± 6.35^{g}	27 ± 3.5^{g}	19 ± 2.4^{g}	1 ± 0.33^{fg}	1 ± 0.00^{f}	1 ± 0.52^{e}
1.0			45 ± 2.72^{f}	32 ± 0.88^{g}	27 ± 3.28^{cde}	3 ± 0.57^{cd}	2 ± 0.33^{cdef}	1 ± 0.33^{de}
2.0			80 ± 2.9^{ab}	50 ± 6.42^{de}	49 ± 3.78^{a}	5 ± 1.15^{ab}	4 ± 0.33^{ab}	3 ± 0.57^{bcd}
3.0			76 ± 3.75^{bc}	44 ± 2.0^{ef}	34 ± 0.57^{bc}	3 ± 0.33^{bc}	2 ± 0.88^{cdef}	1 ± 0.33^{cde}
2.0	0.25		67 ± 4.33^{cd}	64 ± 2.6^{bc}	39 ± 2.08^{b}	4 ± 0.33^{abc}	2 ± 0.57^{def}	2 ± 0.33^{cde}
	0.50		87 ± 3.51^{a}	77 ± 6.69^{a}	56 ± 3.92^{a}	6 ± 0.57^{a}	5 ± 0.33^{a}	5 ± 1.15^{a}
	0.75		74 ± 2.84^{bc}	59 ± 2.33^{bcd}	38 ± 3.84^{b}	5 ± 0.33^{a}	4 ± 0.57^{abc}	4 ± 0.33^{bc}
	1.00		47 ± 1.85^{f}	36 ± 2.02^{fg}	23 ± 1.52^{de}	4 ± 0.66^{abc}	3 ± 1.45^{bcd}	3 ± 0.88^{abc}
2.0		0.25	62 ± 1.15^{de}	57 ± 3.46^{cd}	33 ± 1.73^{bc}	3 ± 0.33^{bc}	2 ± 0.33^{cdef}	2 ± 0.0^{cde}
		0.50	77 ± 1.85^{abc}	69 ± 0.57^{ab}	56 ± 1.15^{a}	4 ± 0.33^{abc}	3 ± 0.0^{bcde}	3 ± 0.57^{bcd}
		0.75	58 ± 1.52^{de}	54 ± 2.6^{cd}	50 ± 3.46^{a}	2 ± 0.33^{cde}	2 ± 0.33^{cdef}	2 ± 0.57^{cde}
		1.00	52 ± 1.45^{ef}	34 ± 0.33^{fg}	31 ± 1.73^{bcd}	1 ± 0.33^{e}	1 ± 0.33^{ef}	1 ± 0.33^{cde}

Values are expressed as the mean ± SE, taking twelve explants in each experiment with three replications. Within each group, values with different letters indicate significant difference at $P \geq 0.05$ using Duncan's multiple range test (DMRT)

RAPD analysis

Genetic fidelity of plant derived from synthetic seeds must be assessed for the success of the protocol. RAPD analysis has successful applications in detecting somaclonal variability as simple, faster and more cost effective method (Haque and Ghosh 2014). We noted that 76% plantlet derived from synthetic seeds was survived after 30 days of acclimatization (Fig. 1G). To check genetic stability, DNA of synseed derived *A. galanga* plants were compared with the DNA of mother plant grown in ex vitro condition. Out of 12 random primers used for RAPD analysis, 8 primers (OPD20, OPD16, OPD02, OPC08, OPC05, OPC11, OPE18 and OPF12) showed clear and scorable amplified products (Table 3). These primers yielded a total of 24 bands and an average of 3.0 bands per primer. Monomorphic band produced by each primer varied from 1 (OPE18) to 5 (OPC05) and DNA fragment size ranged between 100 to 1500 bp. The genetic similarities between the synseed plants and control plants were confirmed by the amplification profile (Fig. 3). Similar records of genetic uniformity of synthetic seed derived plants were also detected through RAPD markers by different workers (Banerjee et al. 2012; Khan et al. 2018; Saha et al. 2014).

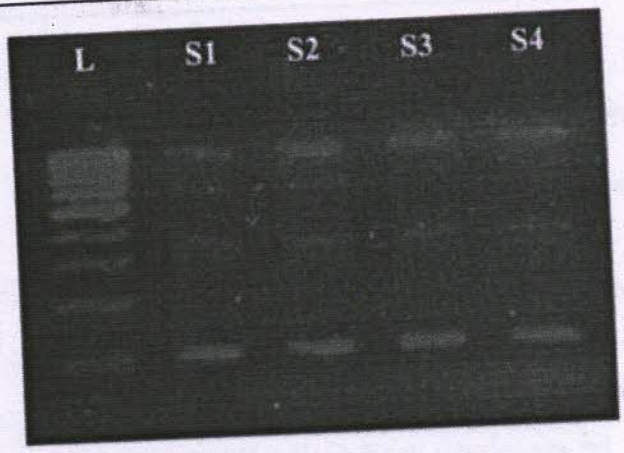

Fig. 3 RAPD amplification profile using OPC05 primer. **L** Ladder. **S1** Mother plant. **S2** In vitro raised plantlets. **S3, S4** synthetic seeds derived plants

Conclusion

In summary, a simple and reproducible protocol for synseed production was established using shoot buds of *A.galanga* under laboratory condition. MS medium containing 2.0 mg/l BA and 0.5 mg/l NAA under 16/8 h light/dark photoperiod was optimum for plantlet regeneration. Our study also shows that encapsulated shoot buds can be kept at low temperature (4 °C) for 30 to 90 days. Identical banding patterns in RAPD analysis confirms the genetic stability of recovered *A.galanga* shoots. In vitro conservation, gene transformation and germplasm exchange are some important applications of this technique.

Table 3 RAPD amplification profile of *A. galanga*

Primer	Sequence	No. of scorable bands per primer
OPD20	ACCCGGTCAC	2
OPD16	AGGGCGTAAG	4
OPD02	GGACCCAACC	3
OPC08	TGGACCGGTG	3
OPC05	GATGACCGCC	5
OPC11	AAAGCTGCGG	4
OPE18	GGACTGCAGA	1
OPF12	ACGGTACCAG	2

Declarations

Conflict of interest The authors declare that there is no conflict of interest to publish this manuscript.

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Research Article

Phytosynthesis and Characterization of *Curcuma amada* Mediated Silver Nanoparticles

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ABSTRACT

Silver nanoparticles are the glorious metallic material due to their wide applications in the pharmaceutical and industrial sectors. In this study, *Curcuma amada* rhizome are used for the silver nanoparticle synthesis. *C. amada* mediated $AgNO_3$ nanoparticles are synthesized by and characterization studies (UV, FTIR, XRD, DLS, SEM and TEM). In UV spectra, three peaks observed at 413, 418 and 995nm confirmed the presence of silver particles in the green synthesized Ag nanoparticles. FTIR spectra exhibited various functional groups (N-H stretching vibrations, alkane, amide stretching, carboxylic acid, stretching and rocking C-C bonds, NH_2 stretch and S-S stretch) of the nanoparticles. green synthesized Ag NPs electron microscopic analysis revealed agglomerated irregular shape with homogenously. The crystal plane lattice of the nanoparticles is revealed by XRD. Agglomerated irregular structures of silver nanoparticles with average particle size 32-55nm. Our study concluded that *Curcuma amada* mediated silver nanoparticles exhibited the nanoparticles properties.

Keywords: *Curcuma amada*, Ag nanoparticles, UV, SEM.

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INTRODUCTION

Nanoparticles are the excellent materials with enhanced properties widely utilized for the various industrial, agrochemical, mechanical, pharmaceutical and cosmetic sectors. Due to their diverse application and demand, nanoparticles productions has been increased to threefold within the last decade.[1-3] Chemically synthesised nanoparticles utilization leads to the environmental contamination due to the high redox activities with the non-targeted species.[4] To overcome this issue, the researchers showed much attention towards either microbe mediated or phytomediated nanoparticle synthesis.

The perennial herb, *Curcuma amada* (Roxb.) belongs to the family Zingiberaceae which is commonly known as mango ginger. It is a well-known plant for their intense aroma with camphoraceous smell and edible rhizome. It has numerous pharmacological and therapeutic applications. In Siddha, the plant extracts are used to treat hypercholesterolemia, dermal infections, anti-inflammatory, anti-venom for snake and insect bites.[5,6] Sathak *et al.*[7] explained the importance of phytocompound for the synthesis of metallic nanoparticles from bulk particles and their wide applications.

Silver nanoparticles are synthesised from different plants such as roots, leaf and seeds.[8-10] Ethnobotanical value rich plants such as *Jatropha curcas, Cassia auriculata, Chrysanthemum morifolium, Mimusops elengi, Morinda citrifolia* and *Cinnamon zeylanicum*[8-12] are used as an alternative

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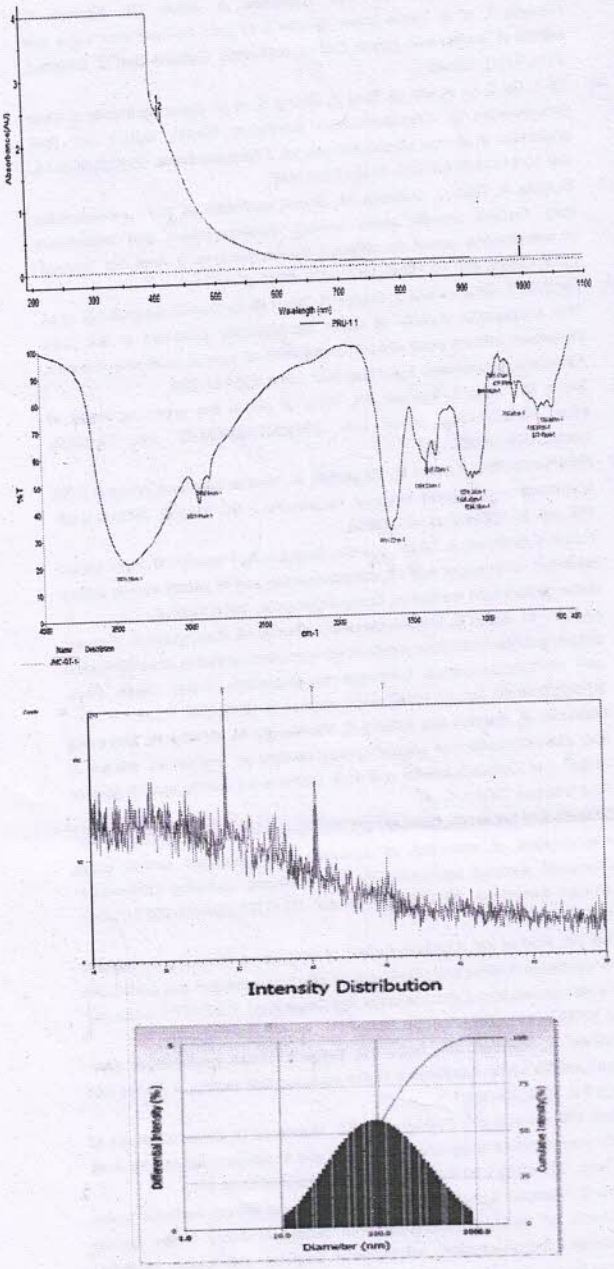

Figure 1: *Curcuma amada* mediated AgNPs characterization analysis.

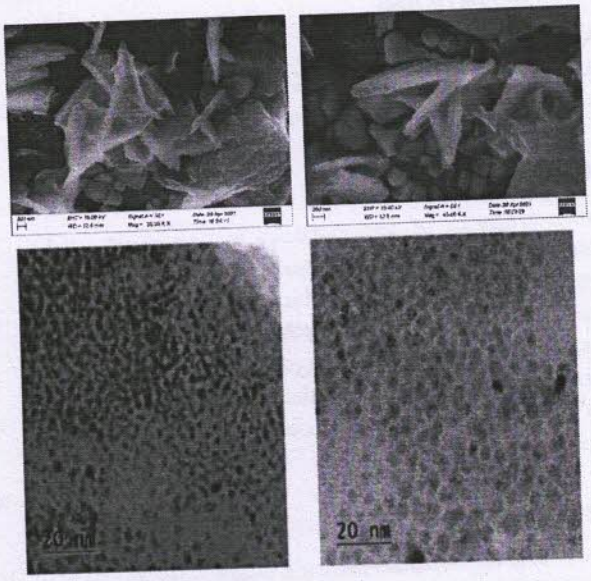

Figure 2: SEM and TEM image of biosynthesized AgNPs using *Curcuma amada* rhizome extract.

represented the cubic face centered silver crystal. Morphology of the nanoparticles are confirmed by SEM and TEM analysis. The green synthesized Ag NPs electron microscopic analysis (Figure 2) revealed agglomerated irregular shape with well dispersed homogeneity. The agglomerated compound diameter is ranging between 32-55nm. The tested particle size distribution is analyzed by DLS whereas the average diameter of the particles is measured as 152.3nm (D10: 25.2nm, D50: 92.3nm). Similar results are evidenced by Suman *et al.*,[8] Gavhane *et al.*[30] and Reddy *et al.*[31]

CONCLUSION

Curcuma amada mediated silver nanoparticles are synthesized by plasmon excitation (downstream) process. Brownish red colour supernatant are collected and subjected to various characterization studies. UV analysis of *C. amada* mediated Ag NPs exhibited three peaks at 413, 418 and 995nm confirmed the presence of silver. Various functional groups such as amide, alkane, carboxyl, carbonyl is identified. XRD and DLS analysis revealed face centered agglomerated irregular shaped particles with the size ranging between 32-55nm with 152.3nm diameter.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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Biotechnology and Crop Improvement

Tissue Culture and Transgenic Approaches

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Contents

8

Somatic Embryogenesis and Transformation Studies in Ginger

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medicine, ginger is used for the treatment of diarrhea, blurred vision, vomiting, lightheadedness, decrease in blood pressure, high blood pressure and dyspepsia (Ravindran and Babu 2005).

8.3 Somatic Embryogenesis

Somatic embryogenesis is an important plant regeneration method that resembles zygotic embryogenesis. At the same time, somatic embryogenesis enables non-zygotic plant cells to form embryos and a whole plant (Rose et al. 2010). Standardization of a somatic embryogenesis protocol facilitates the commercial production of plants (Loyola-Vargas and Vazquez-Flota, 2006). It is also considered to be a highly desirable plant regeneration system for genetic transformation, with few or no somaclonal variations and higher genetic uniformity (Gaj 2001; Zhao et al. 2012).

8.3.1 Somatic Embryogenesis in Ginger Family

A somatic embryogenesis protocol has been successfully established in many species of the Zingiberaceae family (Table 8.1). Different tissues such as leaf sheath, leaf base, young inflorescence, shoot buds and the inner core region of the rhizome have been used to produce somatic embryos in different species of Zingiberaceae. Growth regulators also play an important role in induction of embryogenic tissues. Murashige and Skoog (MS) medium (Murashige and Skoog 1962) supplemented with auxin 2,4-dichlorophenoxyacetic acid (2,4-D) is found to be the most successful growth regulator in somatic embryo induction. Auxin in combination with cytokinin exhibits better results in the majority of species. Most studies on somatic embryogenesis of the Zingiberaceae species have reported indirect somatic embryogenesis (Rahman et al. 2004; Manohari et al. 2008; Wong et al. 2013; Zuraida et al. 2014). Direct somatic embryogenesis has been reported in *Curcuma longa* and *Curcuma amada* (Raju et al. 2015; Shajahan et al. 2016).

8.4 *Agrobacterium*-mediated Transformation

A. tumefaciens-mediated genetic transformation is the most widely used transformation technique in dicotyledonous plants. Earlier, transformation of monocots was considered a difficult technique, because they are not natural hosts for *Agrobacterium* (Wu et al. 2014). However, *Agrobacterium*-mediated transformation systems have been successfully developed in agronomically important monocot crops, including rice (Raineri et al. 1990; Ozawa 2009), wheat (Cheng et al. 1997; Wu et al. 2003), barley (Shrawat et al. 2006), maize (Ishida et al. 1996), sugarcane (Arencibia et al. 1998) and turmeric (He and Gang 2013) using the optimized transformation system. An efficient plant regeneration system, the *Agrobacterium* strain, binary vector, phenolic substances and selection markers are important factors influencing the monocot transformation (Cheng et al. 2004).

8.5 *Agrobacterium*-mediated Transformation via Somatic Embryogenesis in Ginger

The number of somatic embryogenesis and transformation protocols reported for ginger is still considered low. So far, only indirect somatic embryogenesis and plant regeneration have been described in ginger using young leaf segments (Kackar et al. 1993) and shoot tips (Guo and Zhang 2005). Kackar et al. (1993) obtained embryogenic culture from leaf explants of ginger on MS medium containing 2.7 μM dicamba alone. But, Guo and Zhang (2005) reported the induction of embryogenic calli from ginger shoot tip explant on MS medium containing 1.0 mg/l 2,4-D and 0.2 mg/1 kinetin. Later, Lincy et al. (2009) reported indirect somatic embryogenesis in ginger using *in planta* leaf explant cultured on MS medium supplemented with 2,4-D and 6-benzylaminopurine (BAP). They also described the induction of direct somatic embryos from the ginger *in planta* leaf explant by using thidiazuron alone or in combination with indole, 3-butyric acid. However, no plantlet regeneration was observed for direct somatic embryos in ginger.

A transformation protocol in ginger was attempted previously using young bud derived callus as explant (Suma et al. 2008). *A. tumefaciens* EHA 105 containing binary vector p35SGUS INT was used for the transformation. A vector having hygromycin phosphotransferase (*hpt*II) and gusA genes driven by the cauliflower mosaic virus (CaMV) 35S promoter was successfully introduced into the ginger genome.

Later, in ginger, leaf sheath explants were infected with *Agrobacterium* strains (EHA105 and LBA4404) binary vector harboring pGFPGUS*Plus* containing *hpt*II selection marker and *gus* reporter gene (Mehaboob et al. 2019). The transformation and embryo regeneration protocol is described in the following (Figure 8.1).

8.5.1 *Agrobacterium*-mediated Genetic Transformation

Bacterial strains were cultured on LB medium (Table 8.2) in an orbital shaker (28 °C, 180 rpm) overnight. After centrifugation of the culture at 10,000 rpm for 5 min, the resultant pellet was suspended in liquid MS medium (basal) containing acetosyringone. Then, 1–2-cm long leaf sheath explants obtained from 6–8-week-old *in vitro* grown plantlets were infected with bacterial culture with gentle shaking (20 min, 80 rpm). Explants were then blotted dry on filter paper for 5 min and placed on co-cultivation medium (MSC) (Table 8.2) in the dark (25 °C, 2 days). Infected explants were subcultured at regular intervals of 3 to 4 days. To remove excess growth of bacteria, transformants were washed with distilled water, blot dried on sterile paper and transferred to resting medium (MSR) (Table 8.2) containing antibiotics. After 4–6 days in dark conditions, the cultures were placed on selection medium (MSS) (Table 8.2) for 4 weeks.

8.5.2 Selection and Somatic Embryo Regeneration

Hyg-resistant embryogenic callus developed from leaf explant was selected and shifted onto MSM medium (Table 8.2) containing BAP alone. Somatic embryos were produced after regular subculturing on the same medium. Fully grown somatic

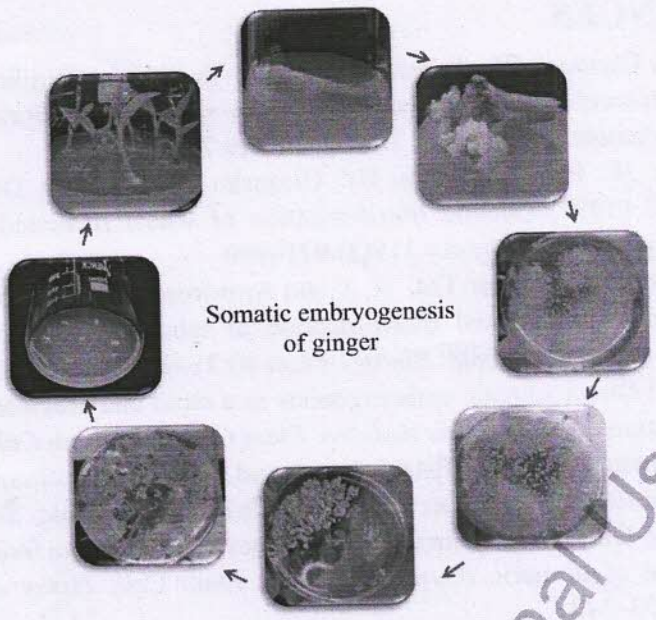

FIGURE 8.2 Developmental stages of somatic embryogenesis in ginger.

embryos were placed on regeneration medium (MSR2) (Table 8.2) for regeneration (Figure 8.2). Different factors improving transformation efficiency were examined in our study. Bacterial cell density of 0.6 OD_{600}, 150 μM acetosyringone and a period of 2 days were optimum for co-cultivation of bacterial culture and leaf explants. High transformants were obtained using the selection regime of 40 mg/l hygromycin. Transient expression of *gus* gene and *hpt*II gene were confirmed by histochemical β-glucuronidase (GUS) assay and polymerase chain reaction (PCR) analysis.

8.6 Conclusion

Agrobacterium-mediated transformation via somatic embryos has become one of the most important biotechnological tools for genetic improvement of monocot species. Plant regeneration methods through somatic embryogenesis have been achieved in several species of the Zingiberaceae family. This chapter describes the *Agrobacterium*-mediated transformation protocol for ginger by infecting the leaf explant. The effects of *Agrobacterium* strains, bacterial cell density, doses of acetosyringone, co-cultivation period and hygromycin are important determinants for the efficient transformation of somatic embryos. This transformation system helps with a quick expression of marker and reporter genes in transformed ginger plants.

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3.3.2 Number of research papers per teachers in the Journals notified on UGC website during the year						
Title of paper	**Name of the author/s**	**Department of the teacher**	**Name of journal**	**Year of publication**	**ISSN number**	**Link to the recognition in UGC enlistment of the Journal**
Utility and Challenges in the Adoption of IFRS: An Overview in the Indian Context	Dr. Siji Verghese.V	Commerce	International Journal of Creative Research Thoughts	2022	2320-2882	
Analysis of Motivational Factors for Developing Women Entrepreneurs in Kerala	Raheena K M	Commerce	Journal of the Asiatic Society of Mumbai	2022	0972-0766	
Stress among bank officers in the context of Canara -Syndicate merger	Fathima A V	Commerce	Journal of Data Acquisition and Processing. Vol.38Issue	2023		https://sjcjycl.cn/article/view-2023/02_1926.php

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UTILITY AND CHALLENGES IN THE ADOPTION OF IFRS: AN OVERVIEW IN THE INDIAN CONTEXT

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Abstract: *International Financial Reporting Standards (IFRS Standards) is a single set of accounting standards, developed and maintained by the International Accounting Standards Board (the Board) with the intention of those standards being capable of being applied on a globally consistent basis with the ability to compare the financial performance of publicly listed companies on a like-for-like basis with their international peers. The paper tries to understand the procedure by which the IFRS has been adopted by companies in India. And also tried to examine the utility of Indian companies by adopting IFRS. The paper also reveals the challenges raised by the adoption of IFRS . The paper concludes by calling the lawmakers to do the necessary amendments in the existing Companies Act 1956 and also emphasises the need for training the professionals for facilitating the easy adoption of IFRS in India.*

Key Words: IFRS, Adoption and Implementation

1. Introduction

International Financial Reporting Standards (IFRS Standards) is a single set of accounting standards, developed and maintained by the International Accounting Standards Board (the Board) with the intention of those standards being capable of being applied on a globally consistent basis—by developed, emerging and developing economies—thus providing investors and other users of financial statements with the ability to compare the financial performance of publicly listed companies on a like-for-like basis with their international peers.

IFRS began as an attempt to harmonize accounting across the European Union but the value of harmonization quickly made the concept attractive around the world. However, it has been debated whether or not de facto harmonization has occurred. Standards that were issued by IASC (the predecessor of IASB) are still within use today and go by the name International Accounting Standards (IAS), while standards issued by IASB are called IFRS. IAS were issued between 1973 and 2001 by the Board of the International Accounting Standards Committee (IASC). On 1 April 2001, the new International Accounting Standards Board (IASB) took over from the IASC the responsibility for setting International Accounting Standards. During its first meeting the new Board adopted existing IAS and Standing Interpretations Committee standards (SICs). The IASB has continued to develop standards calling the new standards "International Financial Reporting Standards".

IFRS Standards are now mandated for use by more than 100 countries, including the European Union and by more than two-thirds of the G20. The G20 and other international organisations have consistently supported the work of the Board and its mission of global accounting standards.

IFRS Standards are developed by the Board, the standard-setting body of the IFRS Foundation—a public-interest organisation with award-winning levels of transparency and stakeholder participation. Its 150 London-based staff are from almost 30 different countries. The Board's 12 members are appointed and overseen by 22 Trustees from around the world, who are in turn accountable to a Monitoring Board of public authorities.

International Financial Reporting Standards (IFRS) are designed as a common global language for business affairs so that company accounts are understandable and comparable across international boundaries. They are a consequence of growing international shareholding and trade and are particularly important for companies that have dealings in several countries. They are progressively replacing the many different national accounting standards. They are the rules to be followed by accountants to maintain books of accounts which are comparable, understandable, reliable and relevant as per the users internal or external.

2. Review of Literature

As mentioned earlier, the available literature on IFRS and its implementation covers the data from European Union. Few studies have been carried out analysing the data from other countries. Zhou et al (2009) in one such study of Chinese firms' data concluded that the firms adopting IFRS are less likely to smooth earnings in the post IFRS adoption period. Their findings also pointed out the need for a stricter enforcement mechanism of financial reporting standards in emerging markets.

Working on the data of European firms, Armstrong et al (2010) found out a positive reaction to IFRS adoption events for firms with high quality pre adoption information, consistent with investors expecting net convergence benefits from IFRS adoption.

In his study of 1084 European Union firms during the period of (1995-2006), Siqi Li (2010) concluded that on average, the IFRS mandate significantly reduces the cost of equity for mandatory adopters. He also suggested in his research that this reduction is present only in countries with strong legal enforcement and that increased disclosures and enhanced information comparability are two mechanisms behind the cost of equity reduction.

Cai & Wong (2010) in their study of global capital markets summarized that the capital markets of the countries that have adopted IFRS have higher degree of integration among them after their IFRS adoption as compared to the period before the adoption.

Paananen & Lin (2009) gave a contrary view to prior research that IFRS adoption ensures better quality of accounting information. Their analysis of German companies reporting showed that accounting information quality has worsened with the adoption of IFRS over time. They also suggested that this development is less likely to be driven by new adopters of IFRS but is driven by the changes of standards.

Iatridis (2010) concluded, on the basis of data of firms listed on London stock exchange, that the IFRS implementation has favorably affected the financial performance (measured by profitability and growth potential) of firms. The study also demonstrated that following the fair value orientation of IFRS, the transition to IFRS appears to introduce volatility in Income statement figures.

Lantto & Sahlstrom (2009) in their study of key financial ratios of companies of Finland found that the adoption of IFRS changes the magnitude of the key accounting ratios. The study also showed that the adoption of Fair Value Accounting rules and stricter requirements on certain Accounting issues are the reasons for the changes observed in Accounting Figures and financial ratios.

Chand & White (2007) in their paper on convergence of Domestic Accounting Standards and IFRS, demonstrated that the influence of Multinational Enterprises and large international accounting firms can lead to transfer of economic resources in their favour, wherein the public interests are usually ignored.

The study carried out by Callao et al (2007) on financial data of Spanish firms revealed that local comparability is adversely affected if both IFRS and local Accounting Standards are applied in the same country at the same time. The study, therefore calls for an urgent convergence of local Accounting Standards with that of IFRS. Barth et al (2008) in their study of financial data of firms from 21 countries examined whether application of IAS/IFRS is associated with higher accounting quality.

3. Statement of the problem

As evident from the literature review, good number of studies carried out in different countries have highlighted the benefits of having single set of financial reporting standards across the globe. Few of the studies have also brought out the procedural aspects of implementation of IFRS. Some of the studies have given a contradictory view wherein the articles talk about the difficulties and complications faced in implementing IFRS.

4.The objectives of the study

The objectives of the study can be listed down as below:

4.1. To discuss the IFRS adoption procedure in India;
4.2. To discuss the utility for India in adopting IFRS;
4.3. To discuss the problems faced by the stakeholders in the process of adoption of IFRS in India; and
4.4. To discuss the ways through which these problems can be addressed.

5. IFRS Adoption Procedure in India

In 1949, Indian government to streamline accounting practices in the country established Institute of Chartered Accountants of India by passing ICAI Act, 1949. Accounting Standard Board was constituted by ICAI in 1977 with a view to harmonize the diverse accounting policies and practices in India. The other objectives of the Board are: (i) conceive of and suggest new areas in which Accounting Standards are needed, (ii) formulation of Accounting Standards, (iii) examine how far IAS and IFRS can be adapted while formulating the accounting standards and to adapt the same and (iv) review the existing Accounting Standards and revise them regularly as and when necessary, among others. In 2006, a task force was set up by ICAI. The objective of the task force was to lay down a road map for convergence of IFRS in India.

Based on the recommendation made by the Task Force and on the basis of outcome of discussions and public opinions on IFRS adoption procedure, a 3 step process was laid down by the Accounting Professionals in India. This three steps IFRS adoption procedure can be summarized as follows:

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Journal of Data Acquisition and Processing

STRESS AMONG BANK OFFICERS IN THE CONTEXT OF CANARA - SYNDICATE MERGER

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Abstract

Restructuring like mergers provide synergies and competitive advantages, but there are several emotional, physical and survival issues related with employees. The main intention behind this study was to understand the stress arose among the officers of acquired bank due to Syndicate bank and Canara Bank merger .133 officers of Canara Bank who were the employees of Syndicate Bank from Kozhikode region in Kerala were taken as sample. Paired sample t test, ANOVA, Chi square test and Percentage analysis were applied in the analysis and interpretation of the data. The results revealed that there is significant difference between before and after Canara - Syndicate merger regarding all other factors of occupational stress except transfer and there exist occupational stress with regard to some factors among the bank officers after merger.

Key words: Stress, merger, bank officers

JEL Codes: G21, M12 and O11

Introduction

Merger and acquisition in the banking sector of India brought out a range of restructuring in the financial sector as well as in the economy. Even though merger and acquisitions provide synergies and competitive advantages, there are several emotional, physical and survival issues related with employees. In the ordinary conditions itself work pressures, tight schedules, late ending meetings, uncooperative colleagues, critical superiors, hopeless assistants and lots of other frustrating factors may create several issues to the officers in the modern era (R.Dhanaraj, 2012)). Organisational changes may also add to these stressful situations.

In August 2016, SBI approved the merger of its operations with five of its associate banks, namely State Bank of Bikaner and Jaipur, State Bank of Hyderabad, State Bank of Patiala, State Bank of Travancore, besides State Bank of Mysore and in April 2017, State Bank of India merged with Bharatiya Mahila Bank to ensure greater banking outreach. A mega-

merger of 10 Public Sector Undertaking (PSU) banks in India into four was occurred with effect from 1st April 2020. Canara and Syndicate banks merger was one among them.

Literature review

1. Manisha(2018) conversed about the motives financial implications, trend, issues and concerns of mergers and acquisitions in Indian banking sector. The data was accumulated from prowess – a database for Indian Corporate Sector built by the CMIE (Centre for Monitoring Indian Economy) and different official websites of the related banks. Ratio analysis, pre and post merger means, paired t-test etc. were exercised as tools of data analysis .Sample banks were IBO, PNB, HDFC, ICICI, BOB and OBC. Pre to post-merger scrutiny has been done and established that there was a positive change in the performance of all the sample merged banks in terms of stability, monetary and economical aspects. The study identified the merger and acquisition activities in Indian banking revolution as inevitable.
2. Deepika Agarwal(2018) evaluated the job stress of staffs in public and private sector banks in the Jaipur District of Rajasthanby considering Punjab National Bank and ICICI bank. 550 employees from 130 branches (60 branches from PNB and 70 from ICICI) were chosen as sample by applying convenience sampling method. One set of Questionnaire was given to them for primary data and 440 utilizable questionnaires were received. Chi-square test, ANOVA, factor analysis, t-test, Arithmetic Mean, Standard Deviation and Linear Regression were employed to analyse the data. 47.3% respondents experienced moderate level of stress and 48.2 % agreed that they had moderate level of impact of job stress.
3. Anant Lakshendra (2017) scrutinized the impact of employees' length of service on role stress by comparing public and private sector banks in Western Uttar Pradesh. Banks, their branches and the employees of the banks were chosen by using convenience sampling method. State Bank of India, Punjab National Bank, Bank of Baroda, Oriental Bank of Commerce and Canara Bank from Public sector banks and Private sector banks such as HDFC Bank, ICICI Bank, Kotak Mahindra Bank, Axis Bank and Yes Bank were selected as sample banks for the study. 68 branches of Public banks contributing 304 respondents and 52 branches of Private sector banks contributing 270 respondents from Western Uttar Pradesh were finally decided as sample size. Organizational role stress (ORS) Scale originated by Prof. Pareek utilized to measure organizational role stress. Data analysis was done by using the statistical techniques like percentage, average, multiple regression analysis, ANOVA etc. Study revealed that there is no significant effect of length of service with banking sector and demographic variables on organizational role stress of employees. The study provided further scope in conducting studies by taking organizational role stress as independent variable and job satisfaction with organizational commitment and emotional intelligence etc. as dependent variables.
4. R.Dhanaraj (2012) examined the influence of organizational variables such as conflict, blocked career, alienation, work overload, and adverse work environment etc. on job stress with special reference to public sector bank employees in Chennai. 700 employees from nationalised banks in Chennai city were selected as sample by

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An Analysis of the Motivational Factors for Developing Women Entrepreneurs in Kerala

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ABSTRACT

Entrepreneurship was traditionally considered as men's matter; rather women are gradually entering into entrepreneurship. Entrepreneurial motivations are different from women to women based on their personality and environment. The purpose of this study is to analyse the factors of motivation and necessities of women to be an entrepreneur. The study aims to explore the entrepreneurial motivations of women entrepreneurs.

KEYWORDS:

Women Entrepreneurs, Motivating factors.

INTRODUCTION

Development of women as an entrepreneur will not only provide economic freedom but also gives her the freedom to make decisions. This will enhance her mental ability and uplift social status significantly. Along with generating income for herself, a woman entrepreneur builds a source of income for many other women by providing employment opportunities. This will have a multiplier effect on the generation of income and poverty alleviation. While entering into the entrepreneurial career women have different motives. Some of them are based on their inborn attitudes and talents while some other factors emerged from their life situations.

SIGNIFICANCE OF THE STUDY

Women entrepreneurs are entering into the field of business with a lot of motives. These factors encourage them to undertake the risk of starting an enterprise and running it with confidence. Understanding of these motives helps to support the women entrepreneurs' development.

STATEMENT OF THE PROBLEM

By recognizing the importance of women entrepreneurs in the industrial growth of Kerala, the State has initiated several programmes which aims at scaling up the growth of women-owned enterprises through comprehensive support measures. Despite of all these initiatives the number of women entering into this career is comparatively low. Inorder to understand the problems faced by women entrepreneurs and for attracting more women into this vibrant sector an awareness about the motivational factors that attract women into this career is essential. In this context, the researcher conducts a study, "From Home Makers to Entrepreneurs"- An Exploratory Analysis of the Motivating Factors of Women Entrepreneurs in Kerala.

OBJECTIVES:

Major objectives of this study are-

with other jobs, self prestige and independence etc. The main reason of the variation in overall motivational behaviour of women entrepreneurs is the variation in the independent variables like Innovative, Social Status, opportunity, tradition and dissatisfaction with other jobs, self prestige and independence, Risk-taker and Enforced factors. Proper awareness about the opportunities prevailing in the state for the development of women entrepreneur should provided to the women. This will enhance their motivation and more women are attracted to this field. This will definitely contribute to the industrial output and overall development of the state.

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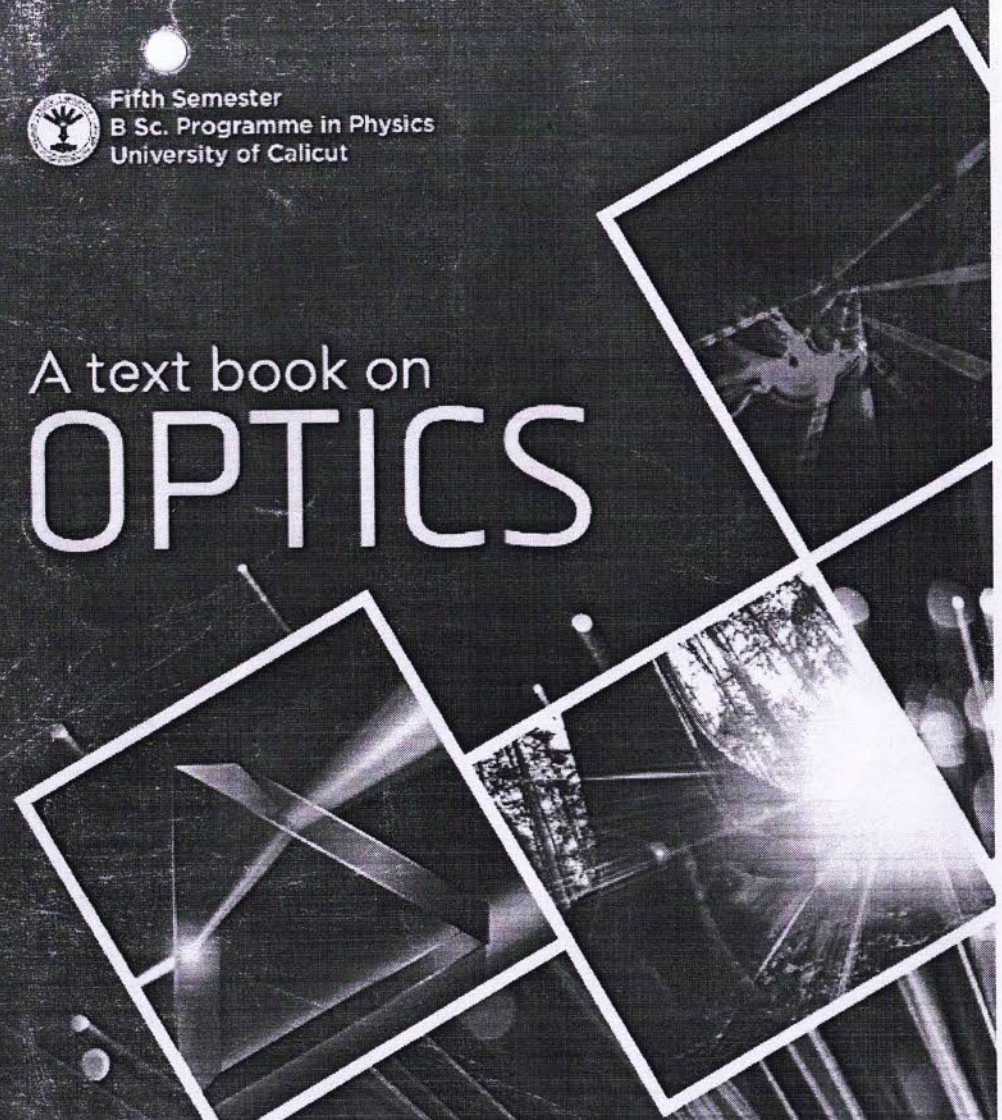

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subject of optics has rapidly been expanding ever sinc
lasers and has given rise to an essentially new field
optics. It has been our endeavour to cover all the m
above in accordance with the syllabus of the Universit
no claim to its comprehensiveness as certain topics
and a few others could not be accommodated in the boo

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straight lines and plane geometry. Wave optics deals
of light and is used to describe wave properties of ligh
diffraction and polarization. These are discussed i
chapters. Chapter 3 deals with the fascinating dom
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illustrated in detail. Two broad classes of interferen
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presented with much elucidation and concludes with g
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examples through simplified mathematical approac

3.3.2- Research Publications/ Projects

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Details of Research Publications/Projects 2022-23

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1	Dr. Mujeeb Rahman A	Scope of Implementing Direct Benefit Transfer in Lieu of Food Subsidy: An Empirical Study in Kerala	Shodhaprabha (UGC Care Journal) Vol.47, Issue 1, No: 19, 2022
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SCOPE OF IMPLEMENTING DIRECT BENEFIT TRANSFER IN LIEU OF FOOD SUBSIDY: AN EMPERICAL STUDY IN KERALA

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Abstract

Government of India implemented Direct Benefit Transfer scheme to reach the benefits to people effectively by eliminating middlemen and curbing leakages. Studies pointed out that current system of PDS delivery are not free from corruption and wastage. So that researchers argue that it is better to substitute direct cash transfer in place of food subsidy. The present paper is an attempt to highlight the preferences of cash transfer verses food subsidy of PDS beneficiaries. Purposive sampling is used to collect data to fulfil the objectives of the study. This study brings perspective of PDS beneficiaries towards cash transfer in lieu of food subsidy by discussing the pros and cons of the new delivery mechanism.

Key words: Direct Benefit Transfer, Food subsidy, Curbing leakages

INTRODUCTION

PDS is India's largest welfare programme which provides subsidized food to the poor households. Previous studies have found that the PDS is inefficient and expensive to support the needy people. The inefficient and corrupt nature of PDS prompted the government to think about an alternative mechanism to deliver the food grains. Scholars identified issues and mismanaging of PDS and suggested PDS should be replaced by cash transfer.

In 2013, the Government of India introduced the Direct Benefits Transfer (DBT) to facilitate the delivery system of benefits under various welfare schemes. According to this system benefits are transferred in to a digital platform where the cash subsidy goes directly into the Aadhaar-linked bank account of identified beneficiary. This system helps implementing agencies and beneficiaries to

track down the flow of funds for diverse schemes through a single interface, enabling both transparency and efficiency. This paper investigates the possibility of substituting the existing system of subsidized Public Distribution System (PDS) with ICT-enabled Direct Benefit Transfer (DBT). The study is an enquiry to understand whether respondents prefer subsidised food grains to cash transfer.

REVIEW OF LITERATURE

A review of the available materials shows that only a scant attention has been given to the study of Direct Benefit Transfer in food subsidies in India.The Indian Council for Research on International Economic Relations (ICRIER) had published two working papers which navigated the scope of Cash transfer in lieu of PDS. The first paper (2015) by Gulati and Saini, studied the leakages from the PDS in different states of India and found that a cash transfer is one of the perfect solutions to tackle the faulty nature of the PDS. Saini et al (2017) suggested that cash transfer scheme should be implemented through a gradual process. The study claims that cash transfer scheme should be combined with other schemes and advised to increase the financial inclusion for the success of the programme. In an experimental study conducted by Gangopadhyay, Lensink and Yadav (2015) reveal that Cash transfer scheme is better than PDS because it opens up opportunities for beneficiaries to purchase according to their demands.

Khera (2011) examines the question of cash and kind payments to the PDS beneficiaries wherein the respondents were asked if they preferred food supplements over an equivalent cash transfer. The study found that most people prefer food articles to cash transfer and only a small section opined they would consider cash transfers as the superior method of ensuring food security. The study found that people prefer PDS because of the poor banking infrastructure and lack of financial literacy

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Economics of Seized Vehicles in Kerala: A Cost Benefit Analysis

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Confiscation of the vehicle is generating a positive influence on law enforcement by lowering the crashes and related issues. The vehicles involved in offending law are confiscating by the police department and these vehicles are dumped into vehicle dumping yard or public places that may treat as a dumping yard. In Kerala, almost all police stations are flooded with confiscated vehicles. However, the police can auction such a vehicle after a fixed period. Police try to conduct auctions for the disposal of piled stock of vehicles but very little vehicles disposed of through public auctions. Sometimes a vehicle needs to attend many auctions and at last, sold at scrap price. The researcher wants to conduct a socio-economic analysis of seized vehicles and check whether there is a chance for changing the piled stock of junk vehicles to a means for making monetary benefit. However, no detailed scientific study of economic analysis was conducted in this field in Kerala. Vehicle confiscation or seizure is an efficient tool against vehicle-related crimes. The government can make use of vehicle seizure as a means for law enforcement and at the same time earn revenue from it employing vehicle auction. The cost-benefit analysis proved that the financial cost of vehicle seizing is cost to the rather than benefit while the social benefit of vehicle seizing is very high. So the government can go forward with vehicle seizing for ensuring law enforcement and at the same time the disposal of seized vehicle should be done with less time and thus ensure benefits to the government.

Keywords: Vehicle confiscation, financial cost benefit, social cost benefit, and fair value of seized vehicle

Introduction:

Confiscation of the vehicle is generating a positive influence on law enforcement by lowering the crashes and related issues. The vehicles involved in offending law are confiscating by the police department and these vehicles are dumped into vehicle dumping yard or public places that may treat as a dumping yard. In Kerala, almost all police stations are flooded with confiscated vehicles. However, the police can auction such a vehicle after a fixed period.

In the case of vehicles involved in sand mining, the district collector has the right to fix the penalty. As the penalty will be a huge amount, most of the owners left their vehicle on the sides of public roads. We can see vehicles at the

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MANAGEMENT OF CONFISCATED VEHICLES AND ITS DISPOSAL: A GLOBAL PERSPECTIVE

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ABSTRACT
The piled stock of junk vehicles are becoming a treat to many economies as it is connected with rules and regulations, court procedures, maintenance etc. This paper attempts to do a review analysis of different studies on confiscated vehicles. Many studies proved that vehicle confiscation is effective while working to reduce recidivism or criminal attempts. Confiscation of vehicle is effective in reducing the chance of making an income through illegal measures.
Key words: sustainable transportation, confiscation of vehicles, End of life vehicles.

Introduction
Vehicles under the custody of police are a problem that does not end up with a single solution as the court procedure needs much time to tackle. Lack of dumping or storage facility forces them to leave the vehicles exposes to all weather conditions. Once a vehicle is seized, it must be treated well, stored in good condition, proper maintenance should be ensured Tahir (2015). The confiscated or seized vehicles are facing a big challenge as it depends on rules and regulations, inadequate storage facilities, frequent check-ups for maintenance works, setting up of a limited time frame to settle the issue by courts (Neendur Asha 2022). This paper attempts to do a review analysis of different studies on confiscated vehicles.
Many studies proved that vehicle confiscation is effective while working to reduce recidivism or criminal attempts. The vehicle seizure reduces the chance of getting profit from the criminal offence. It may curb all chance to finance further crime. The society may get a strong message that crimes not benefiting. The public may get utility by demonstrating such actions. While on the other hand their lack measures to keep these vehicles without reducing its economic utility, Tahir (2015).

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The national audit department of Malaysia had pointed out many problems in the issue of seized vehicles . they are the inadequate management of seized vehicles, delay in official procedures, lack of maintenance records and registers, inadequate storage facility all promote the fast decay of vehicles under custody. Long and slow legal actions and court procedures are acting as a major reason for the existing stock of seized vehicles. (Tahir (2015). The Organisation for Economic Co-operation and Development (OECD) (2018) had put forward a suggestion to avoid the wastages of resources that allowing the owner to retain them during the time of legal procedures and guaranteeing payment of the value of these vehicles after settling the legal formalities. The history of asset forfeiture is more related to British common law.(Neendur Asha,(2022)

Hedman (2010) finds that the Britian had first to enact their Navigation Act in 1660 for confiscate vessels and vehicles that stand against rules and navigation act. Britian tried to hold these vessels and vehicles with their language. Krane (2010) had expressed the opinion that a state can reduce the illegal actions and even earn a reasonable income and profit from confiscation. (Worrall, 2001) also expressed the same view that the proceeds of crime or any type of profit earned from crime or illegal actions shall be confiscated by the government to give the society a message that crimes do not earn profits. Hedman (2010) had also opined that the confiscation of assets is good measure to curb all forms of evil actions and at the same time the government can earn more income without introducing fiscal measures. Paying incentives to the officials for confiscating an asset that contains a huge value may work in a positive way in controlling crimes (Neendur Asha 2022). Many countries provide lessons and training to drivers and owners of vehicles to inculcate a decent transportation culture especially among the young generations. The renovation of transportation infrastructure is of high demand for having development.

The government can go for confiscation of assets if the owner of the assets is performing actins against state interest for against humanity. (Kar & Datta, 2009) had stated the law in England on asset forfeiture to control illegal actions. This kind of confiscation is conducted in early times purely based on religious beliefs and was called 'deodand',later in 1846 the 'deodand' system was abolished in England as it was purely based on religious grounds. The Royal British crown tried to limit the transfer of proceeds of crime as heredity and it was taken by the state. (Kar & Datta, 2009) had pointed out the reasons for high rate of fatality on roads as over speed, inadeguate road infrastructure, poor knowledge in transportation and poor law enforcement etc. (Levi & Osofsky, 1995).The forfeiture of vehicles is a good measure to control crimes as it give a message to all that crimes may not give profits.

(Neendur Asha,(2022) states the need for the proper maintains of confiscated property as in some cases it had to be return to its owner after closing the court procedures or it can be used for social reuse purposes. The maintains of confiscated vehicle involve high cost as it require skilled labouers and proper storage facilities. There is a chance to reuse these confiscated vehicles. Caggiano and De Rosa (2015) had stated that there is a scope for the study of post seizure mechanism and the government can sanction the reuse of confiscated vehicles for social purposes through proper channels. The forfeiture of assets can be used to pay compensation to the victims of crime and also to fight against crime.(Neendur Asha 2022).

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RESEARCH

Lattice dynamics, core–shell electron structure and Judd – Ofelt analysis on europium-doped Gd_2O_3 micro phosphors

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Abstract
Various concentrations of europium-doped gadolinium oxide powders are synthesized by a high-temperature solid-state reaction method. Raman spectra of the compounds exhibited the vibrations and symmetry of monoclinic single-phase crystal formation, with the predominant monoclinic phase of Gd_2O_3 which is consistent with the XRD findings reported earlier. The core level electron emission spectra revealed the formation of highly valence-stable compound systems with shell structures corresponding to Eu^{3+} and Gd^{3+} electronic states. In-depth analysis of photoluminescence spectra with multiple emissions in the yellow–red region corresponding to transitions of $^5D_0$–$^7F_2$, $^5D_0$–$^7F_1$, and $^5D_0$–$^7F_0$ which arise due to europium substitution brought out interesting findings of colourinescence parameters. Investigations of Judd–Ofelt parameters, mean lifetimes, radiative transition rates, and CIE coordinates revealed the compatibility of the prepared samples as the good orange-red emitter.

Keywords Gd_2O_3 · Phosphorescence · XPS · Judd – Ofelt analysis

Introduction

Phosphors, the converted white light-emitting diodes (WLEDs) have been widely used in the field of backlit lamps and lighting, due to their eco-compactness, excellent stability in both chemical and physical properties, moderate lifetime, and better efficiency [1–4]. The contemporary trend in manufacturing WLEDs is combining commercial yellow phosphor with blue LED chips [4–6]. But in this method, the deficiency of the RED component will cause a poor colour rendering index (CRI) and therefore, the research for efficient RED phosphors that can be excited by near UV regions was fuelled in recent years. Recent research entrènched that rare earth compounds are crucial materials that exhibit phosphorescence and to obtain phosphorescence, exact doping of ions is the most imperative part of it [7, 8]. Among lanthanide ions (Ln^{3+}), europium (Eu^{3+}) is the significant component that acts as an activator for optical gain and also an intensifier of colour emissions[9–12]. Eu^{3+}-doped phosphors provide orange-red emission due to the intra-configurational $^5D_0$ to ^7F_J (J = 0, 1, 2, 3, 4) transitions of Eu^{3+} ions [13–17]. Alongside, Eu^{3+} has acquired a special interest due to the fact that it can emit red fluorescence with high luminescence efficiency under UV excitation; the colour purity of Eu containing red phosphors tends to be better too [18, 19]. Relative emission intensities of various f-f transitions of the Eu^{3+} can be tailored by providing adequate crystal field atmospheres by ligands surrounding them [20]. Owing to these attractive properties, Eu^{3+} is a promising luminescence activator in red laser device applications[21]. The emission emerging from the $^5D_0$–$^7F_2$ transition depends on the strength of the ligand field and can be estimated by using the luminescence intensity ratio of electric and magnetic dipole transitions[22]. Generally, Eu^{3+}-doped material exhibits red luminescent; however, it can be tuned to orange or red–orange bands based on the crystal field atmosphere set up around the Eu^{3+} activator by the use of a suitable host material with a specific lattice structure[23]. Here we chose Gd_2O_3 as our host material which can exhibit cubic and monoclinic structures[24]. Gd_2O_3 is considered a promising host material for luminescence enhancements due to its high melting point and

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large energy band gap[25]. A great deal of interest in gadolinium oxide exists because of its physicochemical properties, such as the crystallographic stability up to temperatures of 2325 °C, high mechanical strength, excellent thermal conductivity, and wide band optical gap [25]. We have previously reported the successful synthesis of single-phase monoclinic Gd_2O_3:Eu^{3+} at various doping concentrations by the high-temperature solid solutions reaction method[26]. We reported the structural profile, surface properties, and effect of doping on the optical properties of Gd_2O_3. However, the detailed investigation of the compounds by means of the lattice dynamics, the core-level electron structure, and the possible electronic state of ions in the compounds was not reported, especially the correlation of surface chemical state versus the transitions of Eu^{3+} between 570 and 710 nm region. Herein, we report the micro-Raman spectra and core-level X-ray photoelectron emission spectra of the same compound systems reported earlier[26]. Furthermore, the in-depth analysis of luminescence properties and spectral features such as Judd ofelt parameters, CIE coordinates mean lifetimes, and emission barycentres are reported here with the help of LUMPAC software. Extended investigations in $^5D_0$-^7F_J (J = 0,1,2,3,4) transitions of the spectra are expected to bring out very significant results that could reveal the compatibility of this rare earth oxide system as an effective orange-red emitter.

Experimental procedure

Single-phase monoclinic solid solutions of Eu-doped Gd_2O_3 powder samples were synthesized by high-temperature solid-state reaction technique as reported previously[26]. The Raman spectra were recorded by **JASCO Spectrometer B005161822** with a source LASER wavelength of **784.62 nm**. X-ray photoelectron emission spectra were obtained by Prevac XPS equipment equipped with an MX650 monochromator. LUMPAC [27] and JOES [28] software calculated optical parameters from photoluminescence data. Judd–Ofelt parameters, emission barycentres, intensity ratios, radiative transition rates, and CIE diagram and coordinates were found from LUMPAC software. LUMPAC offers features important to the study of the luminescence of compounds containing lanthanide ions[27] and is designed in a simple and viable procedure, from calculating the ground state geometry of systems with hundreds of atoms at a low computational cost to calculating the most important luminescent properties, which provides greater insight into the luminescent process and enables us to explain the experimental observations. The experimental mean lifetime for all four doping concentrations was tabulated by JOES software.

Results and discussions

Lattice dynamics: micro Raman spectra

The micro-Raman spectrum recorded at room temperature is presented in Fig. 1. The monoclinic structure of prepared Gd_2O_3 samples belongs to the Centro symmetric space group C^3_{2h} (C2/m) [29]. The Raman bands are located in the region between 50 and 600 cm^{-1}, and a number of 16 distinct bands are recorded for monoclinic Gd_2O_3 structure with reference to the previous reports[29]. C Le Luyer et al. [30] have brought out the significant Raman peaks of Gd_2O_3 with their intensity features and reported 21 active modes. But in the present study, all these Raman activities were not detected, this might be due to the synthesis methods adopted by the previous investigators which are mainly by wet chemical reaction methods. In wet chemical reaction methods, the probable presence of chemical reagents and impurities is higher and that will result in the production of Raman active modes. However, solid-state reactions at very high temperatures without the presence of reagents are mostly chemically pure and produce the most active significant vibrations. We have obtained the most relevant 11 Raman active phonons which are the most prominent Raman modes for Gd_2O_3 ceramics. Here, the peak at 176 cm^{-1} shows maximum intensity which belongs to Ag symmetric mode. Other peaks seen in the spectrum 93, 112, 212, 265, 298, 387, 413, 440, 481, and 581 cm^{-1} belong to the modes Bg, Bg, Ag, Ag, Bg, Bg, Bg, Ag, Ag, and Ag respectively. As per our previous investigation, all

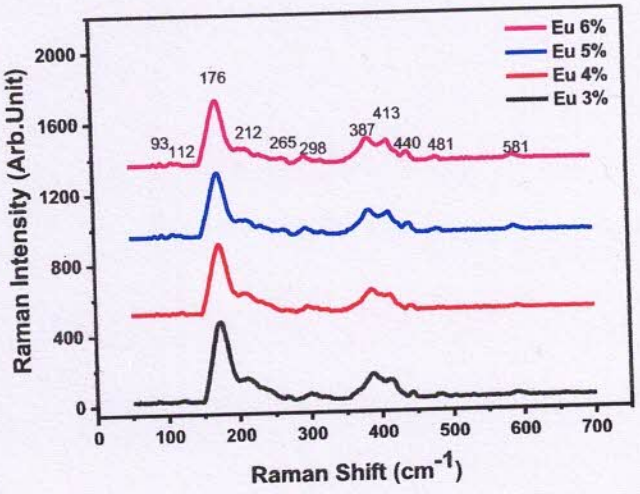

Fig. 1 Raman spectra of the samples for different dopant concentrations

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ORIGINAL ARTICLE

Enhancement of Corrosion Resistance of Epoxy Resin with Polyaniline–Silica Gel Hybrid

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Abstract
The present study focuses on the protection of aluminium against corrosion using epoxy resin composites. The work involves chemical oxidative polymerisation of polyaniline (PANI) doped with organic acid and in situ preparation of its hybrid with silica gel (SiG) in epoxy matrix. The fillers were characterised using FTIR spectroscopy, thermogravimetric analysis, scanning electron microscopy and X-ray diffraction spectrometry. The electrochemical reversibility and stability of PANI and PANI–SiG hybrid were investigated using cyclic voltammetry. The corrosion resistance of aluminium sheet coated with the PANI-based epoxy composites was evaluated in 3.5% NaCl solution by Tafel extrapolation measurements. The corrosion parameters obtained from Tafel plots showed that the introduction of PANI considerably improved anticorrosive property of epoxy resin. There was an increase in corrosion potential from − 0.732 V to − 0.623 V and − 0.588 V and a decrease in corrosion current from 11.800 µA to 1.973 µA. The PANI–SiG hybrid further reduced the corrosion current to 0.212 µA. The penetration rates decreased from 0.064 mm/yr to 0.006 mm/yr and 0.001 mm/yr for Aluminium coated with PANI and PANI–SiG composites, respectively. The corrosion protection efficiency of the coating containing PANI–SiG hybrid was found to have a sevenfold improvement, i.e. from 13.8% of the neat resin to 98.2%.

Keywords PANI–SiG hybrid · Epoxy resin composite coating · Electrochemical reversibility · Tafel extrapolation measurements

Introduction

Metals and alloys are being widely used in different applications because of their exceptional properties (Lu et al. 2016; Tran et al. 2015; Behzadnasab et al. 2011). Owing to their greater tendency to return back to its native low energy state, metals are getting corroded, which result in a heavy economic lose (Li et al. 2015). Numerous approaches such as retarding or stopping the movement of electrons or providing a barrier to diffusion of oxygen and ions, etc. have been explored to tackle this problem. This is accomplished to some extent with the help of protective inorganic or organic coatings (Kalendová et al. 2008; Beck 1988; Liang et al. 2015).

Conjugated polymers are of considerable interest for protection against corrosion. Research on the use of conducting polymers as protective coatings is progressing (Bierwagen 1998; Zarras et al 2003a; MacDiarmid 1985; Abbas 2018; Ansari and Keivani 2006). The expediency of the conjugated polymers is that their properties can be tailored for specific applications by altering the reaction methods and conditions. This can be made use of in anti-corrosive coatings.

Among the conjugated polymers, polyaniline is found to be one of the most promising as it has exceptional environmental and thermal stability (Ansari and Keivani 2006; Chen et al. 2012; Cao et al. 2014; Ghorbani et al. 2011; Ghorbani and Eisazadeh 2012), tuneable electrical conductivity (Luk et al. 2014; Cui et al. 2015), excellent redox properties (He et al. 2012; Sivakkumar et al. 2007; Xu et al. 2010) and non-toxic nature (Spinks et al. 2002; Zarras et al. 2003b; Chen et al. 2016). PANI has been extensively used in anticorrosive coatings due to its activity against aqueous corrosion (Wei et al. 1995a; Kohl et al. 2017). Reliant to the degree

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