



Pune District Education Association's
Annasaheb Magar Mahavidyalaya
Hadapsar, Pune- 411028

Affiliated to Savitribai Phule Pune University, Pune



Self Study Report: 2024 (4th Cycle)



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Research Paper

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Author Name: Prof. Kardile A.V.

1. Title of Paper: Green Synthesis of ZnO Nanoparticles Using Sugarcane Juice for LPG Sensing Application

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GREEN SYNTHESIS OF ZnO NANOPARTICLES USING SUGARCANE JUICE FOR LPG SENSING APPLICATIONS

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Abstract:

In the present work, we have successfully synthesized ZnO nanoparticles (NPs) by sugarcane stem using green synthesis method. Structural, morphological and optical characteristics of ZnO NPs are examined by X-ray diffraction (XRD), scanning electron microscopy (SEM), and ultraviolet-visible spectroscopy (UV-Vis). XRD reveals hexagonal wurtzite structure with average crystallite size of 30 nm. SEM images depict the uniformly distributed spherical nanoparticles. The optical measurements showed band gap is 3.15 eV. Synthesized ZnO NPs are investigated for its LPG gas sensing study together with operating temperature, response/recovery time and gas uptake capacity. The detail examination of LPG sensing study demonstrates the operating temperature 220°C with gas response of 91%, with fast response/recovery times 90/70 sec. respectively. In addition, the LPG gas uptake capacity remained sensible up to 9,000 ppm. Ultimately, we conclude that the green synthesis route, to fabricate sensor devices is encouraging as it is cost-effective, eco-friendly and simple.

Keywords: Green synthesis; ZnO; XRD; UV-Vis; SEM; Gas Sensor.

1. Introduction:

Nanomaterials display a wide range of unique physicochemical properties that are well-known to originate from the high surface area and nanoscale size of their constitutional components, called nanoparticles (NPs) [1]. NPs are a wide range of materials with dimensions below 100 nm, which can be used in various applications, such as medical, pharmaceutical, manufacturing and materials, environmental, electronics, energy collection, and mechanical industries, due to their multiple properties [2-5]. Wherein, metal oxide NPs have gained great attention among researchers for nano-device applications [6]. Among a large variety of metal oxides, zinc oxide (ZnO) NPs has superficially secured a special place in scientific and technological domains. ZnO is an n-type semiconductor having special features such as wide and direct band-gap (3.37 eV), large excitation binding energy (60 meV), high electron mobility, chemical/thermal stability, and good transparency. Hence it have various front-line applications in the field of solar cells, gas sensors, field emission devices, capacitors, coatings, sunscreen lotion, cosmetic and medicated creams [7-9].

Over the years, a wide number of physical, chemical and hybrid synthetic methods have been developed and employed to obtain ZnO NPs [10-15]. Usually, these preparation methods face several limitations, such as the high cost of equipment, usage/emission of highly toxic and hazardous materials, impurities, high temperature/pressure conditions, and additional use of capping agents, stabilizers [16]. To overcome these limitations, green chemistry procedures gaining importance as they are safe and eco-friendly methods, inexpensive, do not produce toxic by-products, and produce clean nanomaterials.

Hence the main emphasis of researchers is developing simple and green methods for synthesizing ZnO NPs [17]. According to the literature, several types of fruit and plants extracts has been used for the synthesis of ZnO NPs such as *Tabernaemontana divaricata*, *Citrus maxima* (Pomelo), *Aristolochia indica*, *Echinacea* spp., *Mentha longifolia*, *Salvadora oleoides*, *Bonellia ovalifoliolata*, *Limonia acidiflora*, *Cochlospermum religiosum*, and *Conyza canadensis* for various application including photo catalytic properties, antimicrobial activity, gas sensor etc., [18-29].

In the present work, we herein report, a simple, cost-effective and environment sustainable green approach for the synthesis of ZnO NPs using sugarcane stem extract for LPG sensing application. As synthesized, ZnO NPs are characterized for their structural, morphological and optical properties and further employed for detailed investigation of operating temperature, response/recovery time and uptake capacity for LPG gas sensing applications.

2. Experimental and Characterization Technique

2.1 Green synthesis of ZnO NPs using sugarcane stem

The schematic representation of the ZnO NPs by green synthesis using sugarcane stem is shown in Figure 1. Initially, fresh sugarcane stem is collected from agriculture field and cut into small pieces by sharp blade. Further it is washed with distilled water and dry in sunlight for two hour. Thereafter, 10 gm of dried sugarcane stem dipped in to 1M zinc acetate solution for specific period of 24 hrs to 48 hrs. Zinc acetate solution is absorbed by the sugarcane stem wherein complex reaction is occurred. Then

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— डॉ. नानासाहेब पवार

मराठी साहित्याचा विचार करता नव्वदोत्तरकाळ हा जागतिकीकरणाचा कालखंड आहे. अर्थव्यवस्थेत झालेल्या मूलगामी बदलांमुळे जीवनाच्या सर्वच क्षेत्रांत परिवर्तन घडून आलेले आहे. झालेले हे बदल फक्त जगाच्या भौतिक पातळीवरचे नाहीत तर मानवी नातेसंबंध, त्यांचे भावनिकत्व, भाषा, समाजातील मूल्यव्यवस्था इतक्या खोलवर हे बदल झालेले आहेत. हा काळ बाजारकेंद्री आहे. त्यामुळे माणसाचे ग्राहकात रूपांतर झालेले आहे. त्यांच्या माणूसपणापेक्षा त्याचे ग्राहकत्व महत्त्वाचे मानले जात आहे. जागतिकीकरणाच्या सांस्कृतिक आक्रमणाने पूर्वापार चालत आलेले आपले संचित नष्ट केले जात आहे. अमेरिकेचा साम्राज्यवाद, बहुराष्ट्रीय कंपन्यांचे वर्चस्व, वाढते संगणकीकरण आणि संपर्क माध्यमांचे अतिक्रमण, माहिती-तंत्रज्ञानाचा विस्फोट, धर्मांध ध्रुवीकरण, दहशतवाद, शेतकऱ्यांच्या आत्महत्या, वाढती आर्थिक विषमता आणि बेरोजगारी, लोकचळवळीचा होणारा न्हास, इंग्रजीचा जागतिक भाषा म्हणून झालेला उदय व जगभरातील नष्ट होत असलेल्या बोलीभाषा, पर्यावरणाचा विनाश या सान्यांमुळे नव्वदोत्तर कालखंड काळवंडून गेल्याचे दिसते.

तसे लक्षात घेतले तर मराठी साहित्याचा इतिहास सुमारे दीडशे वर्षांचा आहे. या प्रदीर्घ कालावधीत मराठी साहित्यप्रकारांमध्ये अनेक प्रवाह निर्माण झाले. आशय आणि रूपबंधदृष्ट्या मराठी कादंबरीत अनेक प्रयोगही झाले. गेल्या दीडशे वर्षांच्या काळात भारताच्या सामाजिक-सांस्कृतिक जीवनात फार स्थित्यंतरे झाली. या स्थित्यंतरांचा परिणाम जसा भारतीय समाजजीवनावर झाला, तसा कला, साहित्य आणि अभिरुचीवरही झाला. या स्थित्यंतरांमुळे एक नवे विचारविश्व भारतात निर्माण झाले, त्याचाही परिणाम साहित्यकृतींवर झाला. कादंबरी हा वाङ्मय प्रकारही त्या परिणामांपासून अलिप्त राहिला नाही.

| १२७ | अक्षर वाङ्मय | ऑक्टोबर-नोव्हेंबर-डिसेंबर २०२१ |

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२८. मातंग समुदायाची संघटनात्मक चळवळ

राहुल नरंगलकर

सा. प्राध्यापक, राज्यशास्त्र अण्णासाहेब नगर महाविद्यालय, हडपसर, पुणे.

महाराष्ट्रात अनुसूचित जाती संवर्गात असलेल्या ५९ जातींमध्ये संख्यात्मकदृष्ट्या महार/ नवबौद्ध, मातंग आणि चांभार या प्रमुख अग्रगण्य जाती आहेत. या जाती सवर्ण जातींकडून केल्या जाणाऱ्या शोषणात्याचाराच्या समान बळी असल्यातरी जातवर्णव्यवस्थेच्या विषमताजन्य मुख्य शोषकाच्या वाहक असल्याने त्या परस्पर व्यवहारात सामंजस्य प्रस्थापित करू शकल्या नाहीत. त्यामुळे त्या एकत्रितपणे व्यवस्था परिवर्तनाच्या चळवळीमध्ये सहभागी होताना दिसत नाहीत. स्वातंत्र्यपूर्वकाळात या प्रमुख जातींना एकत्रित करण्यासाठी महात्मा फुले, वि.रा. शिंदे आणि डॉ.बाबासाहेब आंबेडकर यांनी केलेल्या परिश्रमपूर्वक प्रयत्नांना व्यापक यश मिळू शकले नाही. स्वातंत्र्यपूर्व काळात ब्रिटीश राजवटीत आणि स्वातंत्र्योत्तर काळात संविधानिक तरतुदीच्या अनुषंगाने उपलब्ध झालेल्या सर्व प्रकारच्या संपी / सवलतींचा स्वजातीला अधिकाधिक लाभ मिळवून देण्याच्या अभिलासेपोटी या जाती सामुहिक एकजुटीऐवजी प्रस्थापित सवर्ण जातींच्या आधारेने स्वतंत्रपणे प्रवाहित झाल्या. 'अनुसूचित जाती' अशी राज्यव्यवस्थेने दिलेली नवी सामुहिक ओळख परिदृष्ट करणाऱ्याऐवजी इथल्या वर्णजात व्यवस्थेने दिलेली मूळ ओळख अधोरेखित करून (पुढे आणून) सामाजिक परिवर्तनाच्या चळवळीत सक्रीय झाल्या.

मातंगांचे प्रभाव क्षेत्र

मातंग जात समुदायाचे वास्तव्य महाराष्ट्रातील सर्व जिल्ह्यात आढळत असले तरी त्यांच्या लोकसंख्येचे सर्वाधिक केंद्रीकरण मात्र मराठवाडा, पश्चिम महाराष्ट्र आणि विदर्भातील वऱ्हाडात झालेले दिसून येते. पुणे आणि मुंबई शहर आणि उपनगरात वास्तव्यास असलेला मातंग समुदाया मुख्यतः मराठवाडा, पश्चिम महाराष्ट्र आणि विदर्भातून रोजगाराच्या शोधावै स्थलांतरीत झालेला असून खानदेशातील धुळे-नंदुरवार, कोकणातील सिंधुदुर्ग, रत्नगिरी व रायगड आणि विदर्भातील भंडारा, गोंदिया, चंद्रपूर व गडचिरोली या जिल्ह्यात मात्र हा समुदाय अल्पसंख्य असल्याचे दिसून येते.^१ काही ठराविक जिल्ह्यांमध्ये ही जात एकवटल्याने त्या जिल्ह्यातच या जातीचा संघटनात्मक वावर अधिक आढळतो.

मातंगांचे जात संघटन

कोणत्याही समुदायाला सामाजिक व राजकीय आत्मभान प्राप्त करून देण्याचे काम त्या समाजाला कार्यक्षेत्र बनवून कार्यरत झालेल्या सामाजिक संघटना करीत असल्याचे सर्वत्र आढळते. मातंग समाजातही अशा अनेक संघटना कार्यरत आहेत. या संघटना जिल्हा आणि उप-प्रदेशनिहाय विखुरलेल्या आणि त्या त्या जिल्ह्यात किंवा उप-प्रदेशात मर्यादित झालेल्या आहेत. ब्रिटिशांच्या सुधान्यावादी धोरणामुळे भारतात जातीधारित संघटनांच्या निर्मितीला सुरुवात झाली आणि ती मद्रास प्रांतात पेरियार यांच्या ब्राह्मणेतर आणि मुंबई प्रांतात महात्मा फुले यांच्या सत्यशोधक चळवळीमुळे गतीमान बनली. स्वातंत्र्यपूर्व कालखंडात ब्राह्मणेतर आणि अस्पृश्य जातींनी जाती परिषदांचे अथवा सभांचे आयोजन करून सामाजिक सुधारणा व शिक्षणाच्या प्रसाराचे कार्य हाती घेतले होते. प्रारंभीच्या काळात या जाती परिषदांच्या आयोजनात सत्यशोधक चळवळीतील कार्यकर्ते, त्या त्या जातीतील सधन वर्ग आणि सुशिक्षित उद्योगधंदेवाले यांचा पुढाकार असे.^२ अस्पृश्य जातींच्या जाती परिषदा/सभा महाराष्ट्राच्या विभिन्न भागात आयोजित करण्यात येऊ लागल्या. काही परिषदांमध्ये सर्व अस्पृश्य जाती (महार, मांग, चांभार, डोर आणि भंगी इत्यादी) सहभागी होत असत, तर काही परिषदा जातनिहाय आयोजित केल्या जात. मातंग आणि चांभार जातींच्या जाती परिषदा/सभा पुणे, मुंबई परिसरात, महार जाती परिषदा मात्र मुंबई, मध्य आणि वऱ्हाड प्रांतांत आयोजित केल्या जात होत्या. चांभारांच्या परिषदा संत रोहिदास, महारांच्या संत

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दिसते.

प्रस्तुत लेखात आपण शोधक्यात भाषा, भाषेचे मानवी जीवनातील स्थान, मानवी जीवनात भाषेचे उपयोजन आणि त्या उपयोजनाची अविष्कार रूपे या अंगाने आगदी शोधक्यात विचार करणार आहोत.शब्द मर्यादा असल्याने भाषा उपयोजन म्हणजे काय? त्याची अविष्काररूपे कोणती याची ओळख व्हावी तसेच त्या दृष्टीने विचार करताना दिशा दिग्दर्शन व्हावे हे उद्दिष्ट समोर ठेऊन या विषयाची जुजबी ओळख करून देण्याचा प्रयत्न केलेला आहे.

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भाषांतील भाषांतर, रुपांतर व अनुवादकोणासाठी व कशासाठी

डॉ. नानासाहेब पवार

मराठी विभाग,

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भाषांतर हा अनुवादाचा एक प्रकार आहे. त्यालाच रुपांतर, अनुवाद असे म्हटले जाते. मानवी समूहामध्ये संपर्क मध्यम म्हणून भाषा विकसित झालेली आहे. प्रत्येक व्यक्ती स्वभाषेत किंवा जन्मभाषेत आपला व्यवहार करित असते. पण स्वतःच्या भाषेखेरीज दुसऱ्या भाषेचा आपला केव्हा ना केव्हा संबंध येत असतो. त्या भाषेचे आवश्यक ते ज्ञान संपादन करून त्या भाषेद्वारा आपणांस व्यवहार करावा लागतो. पण एवढ्याने भागत नाही. कित्येकदा त्या दुसऱ्या भाषेतील आशय ती भाषा न जाणणार्या स्वभाषकांसाठी स्वभाषेत आणण्याची आवश्यकता निर्माण होतेय तर कधी स्वभाषेतील आशय परभाषेत पोहोचवावा लागतो. संभाषणाच्या पातळीवरही दुभाष्या म्हणून ज्याला काम करावे लागते त्याला हे आशयसंक्रमणाचे काम तेथल्या तेथे करावे लागते. प्रयत्न केल्यास आपल्याला दुसरी भाषा चांगली अवगत होते. तसेच तिच्यावर प्रभुत्वही मिळविता येते. परंतु अशी दुसरी भाषा न येणारी, पण संबंधित आशय कळण्याची गरज असलेली माणसे मोठव प्रमाणावर समाजात असतात हेही आपणाला विसरून चालणार नाही. तेव्हा जनसामान्यांच्या सोयीसाठी भाषांतर ही एक विशेष आणि आवश्यक गोष्ट म्हटली पाहिजे. कोणत्याही एक भाषेत जे नाही, ते दुसऱ्या भाषेतून आणून ती भाषा समृद्ध करायलाही भाषांतरामुळे मदत होत असते. भारतासारख्या बहुभाषिक देशांत भाषांतराची गरज, आवश्यकता तर पदोपदी जाणवते. प्राचीन, मध्ययुगीन काळात संस्कृतमधील आशय अन्य

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भारतीय भाषेतील अनुवादित कादंबऱ्यांचे समीक्षात्मक लेखन

प्रा. वंदना सोनावले

अण्णामाहेव मगर महाविद्यालय, हडपमर, पुणे.
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"भाषांतर म्हणजे एका भाषेतील मजकूर दुसऱ्या भाषेत त्याच्या शैली वैशिष्ट्यांसह उतरवण्याची कला. मूळ साहित्याचा वाचनाने मिळणारे ज्ञान आणि विचार, आनंद आणि अनुभव, दुसरी भाषा बोलणाऱ्या ना त्याच्या भाषेत उपलब्ध करून देण्याचा प्रयत्न करणे म्हणजे भाषांतर होय". अशी व्याख्या डॉ. कल्याण काळे यांनी केलेली आहे. अलिकडील काळात 'अनुवाद' हा शब्दच भाषांतर या अर्थाने रूढ झाला आहे. साहित्यकृतीतील एका भाषेतील आशय, भाव आणि शैली यांचे दुसऱ्या भाषेत अभिव्यक्त होणे म्हणजे भाषांतरकार मूळ कृतीतील जो अनुभव भावलेला असतो त्याची उत्कट प्रतिक्रिया साहित्यकृतीच्या भाषांतर प्रक्रियेत करत असतो, अनुवाद करताना अनुवादाचा अनुवादकाच्या देखील कम लागतो. मूळ भाषेत लेखकाने लिहिलेले समजून घेऊन समर्पकपणे अनुवाद करणे हे एक कौशल्यच असते. अनुवाद करताना अनुवादिन साहित्यकृतीतील शब्द, आशय, अभिव्यक्ती ही अनुवादकाचीच असते.

ज्या भाषेतील साहित्यकृतीचा अनुवाद करावयाचा ती भाषा आणि ज्या भाषेत अनुवाद करावयाचा त्या भाषेतील वाग्मयीन जडणघडण- भाषिक रचना याचे आकलन अनुवादकाला असणे गरजेचे असते. देशाच्या सीमा ओलांडून संवादाच्या माध्यमातून लोकांनी जवळ आले पाहिजे. यामाठी अनुवाद महत्त्वाची भूमिका बजावत आहे. सांस्कृतिक भाषिक समृद्धी अनुवादामुळे येत आहे. 'अनुवाद' ही संज्ञा 'भाषांतर' या अर्थाने वापरली तरी अनुवाद म्हणजे एका भाषेतील साहित्यकृतीचे दुसऱ्या भाषेत शब्दशः भाषांतर नाही तर अनुवाद हा अर्थ आणि आशय या दोन्हीचाही अभिव्यक्ती करणारा असतो. त्यामुळे अनुवाद कोणत्या साहित्यकृतीचा आहे, तो कोणासाठी केला आहे यावर अनुवादाचे महत्त्व ठरते. साहित्यकृतीच्या अनुवादामुळे जग जवळ आले आहे. कारण अनुवाद करताना त्या प्रदेशातील तेथील परिसरातील सांस्कृतिक, धार्मिक, राजकीय, सामाजिक व्यवस्थेची ओळख होते. विचारांची आणि संस्कृतीची देवाणघेवाण यामुळे जीवनातील सर्वच क्षेत्रात ज्ञानाचा - प्रसार होत असतो. निरनिराळ्या देशातील भाषा, तेथील संस्कृती, जीवन, साहित्य यांची ओळख अनुवादामुळेच होऊन मानवी जीवन, अनुभवाचे क्षेत्र व ज्ञानाच्या कक्षा विस्तारत चालल्या आहेत.


अनुवाद हा मूळ साहित्यकृतीशी प्रामाणिक राहून करताना दुसऱ्या वाजूने अनुवाद करणे म्हणजे दुसऱ्या भाषेतील संस्कृती आपल्या भाषेत आणताना तिच्या गुणविशेषांसह व मर्यादांसह आपल्या भाषेत आणणे. एकूणच अनुवाद ही संज्ञा सर्वसमावेशक ज्ञानी आहे आणि ती पुस्तके, एका वेगळ्या अपरिचित संस्कृती विश्वाचा परिचय करून देत असतात, अस्मिकडच्या काळात अनुवादाला फार महत्त्व आलेले आहे. आता अनुवादित कलाकृतींची आवर्जून दखल घेतली जाताना दिग्मत आहे. कथा, कादंबरी, कवितेसारख्या ललित साहित्यकृतीत आशयासह अभिव्यक्तीलाही महत्त्व असते. धेष्ट दर्जाच्या साहित्यकृतीत विशिष्ट जीवनानुभव व्यक्त होताना त्या अनुभवांना शब्दरूप देण्याचे सामर्थ्य भाषा करत असते. हीच ललित साहित्याची विशेष भाषा प्रभावी व परिणामकारक ठरते. अशा ललित साहित्याची भाषा यत्नाच वेळा आत्मपर, आत्मनिष्ठ व संवेदनशील असलेली दिसते.

कन्नड साहित्यकृती 'बेहदा' -

सलमामारख्या मुस्लीमा ,सलमामारख्या शिक्षिकेला करीमसारख्या भाषासांना अर्पण केलेल्या या साहित्यकृतीत दोन धर्मात वाढलेल्या पण प्रेम या एकमेव धर्माच्या हाकेला ओ देताना झालेली दोन जीवांची घातमेल या कादंबरीत थी वोल्वारू महंमद कुत्रि यांनी अतिशय मार्मिक व हळुवारपणे टिपणी आहेअतिशय सुद्ध करणारी, परंपरावाद्यांना विचार करायला लावणारी, संयमशील शैलीत मानवी संघर्शाची गुंतागुंत

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SELF- SOCIAL CONFLICT IN AMRUTA PRITAM'S LIFE

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ABSTRACT

Amruta Pritam is one of the most distinguished faces of Indian literature that had dexterity over both Punjabi and English languages. She had a bold and clear voice for all those thoughts that make us cry and sometimes provide us the greatest delight of life and sometimes notify us the utmost reality of life. She is the writer whose works has been translated in various languages and has won most prominent awards like Sahitya Academy, Janpith and various other awards from world. There are two most arresting conflicts of her life which changed her views of the world of metaphysics and that of reality her conflict about the existence of God and her battle in love.

Keywords- Environment, Society, Culture, Tradition,

Amruta Pritam was inspired by Sahir Ludhianvi whose image finds reflection in all her autobiographical work and she also accepts him as her model and follower. Her creativity shaped by Shahir Ludhianvi and he become the real source of all her achievements. She was a poet and writer and wrote most remarkable verses at the very early age of her life. Her literary sphere is extended from poetry to philosophy, culture to fashion, love to death, and reality to fiction, history to politics and, from inspiration to addiction. Her own autobiographies depict her own love and desires. Here she presents her conflict of selection and refusal of the ruthless realities of life which are very different from the world of books and imagination. Kagaj Te Canvas, Rasidi Ticket, and Life and Times are his most prominent autobiographies in which she tells not only her experiences of life but also her love triangle for Sahir Ludhianvi and her own husband, Imroz. Her novel Pinjar is a historical fiction which shows the story of an abducted Hindu girl Pooro who becomes the mashiha for all those abducted women during the partition of India in 1947 who are restored into their family during the discovery and exchange of lost and abducted persons after the partition. 'Ik Si Anita', 'Dilli Di Galiyan', 'Yatri', 'Doosari Manjil', Sunchre and 'KoreKagaz' are among her most popular pieces of an art. Her autobiographies are the reflections of her journey of life and thought process. Her experiences were very different from the written texts. She was married to Imroz at her early age who was also a poet. She loved to write poems from her early days.

The first conflict came in her life was about the existence of God and His role. It was the time of shaping of her youth and making of a poet. During this phase she had a conflict of her free will with the traditions of the family where she never finds relief. All that was going to ruin her own world of joy and liberty to think and practice was very close to her. It was

Author Name : Dr. Joshi R. P.

7. Title of Paper: Green Synthesis of ZnO Nanoparticles Using Sugarcane Juice for LPG Sensing A

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GREEN SYNTHESIS OF ZnO NANOPARTICLES USING SUGARCANE JUICE FOR LPG SENSING APPLICATIONS

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Ravindra U. Mene* PDEA's, Annasaheb Magar Mahavidyalaya, Hadapsar, Pune, 411028 (M.S.) India.

Abstract:

In the present work, we have successfully synthesized ZnO nanoparticles (NPs) by *sugarcane stem* using green synthesis method. Structural, morphological and optical characteristics of ZnO NPs are examined by X-ray diffraction (XRD), scanning electron microscopy (SEM), and ultraviolet-visible spectroscopy (UV-Vis). XRD reveals hexagonal wurtzite structure with average crystallite size of 30 nm. SEM images depict the uniformly distributed spherical nanoparticles. The optical measurements showed band gap is 3.15 eV. Synthesized ZnO NPs are investigated for its LPG gas sensing study together with operating temperature, response/recovery time and gas uptake capacity. The detail examination of LPG sensing study demonstrates the operating temperature 220°C with gas response of 91%, with fast response/recovery times 90/70 sec. respectively. In addition, the LPG gas uptake capacity remained sensible up to 9,000 ppm. Ultimately, we conclude that the green synthesis route, to fabricate sensor devices is encouraging as it is cost-effective, eco-friendly and simple.

Keywords: Green synthesis; ZnO; XRD; UV-Vis; SEM; Gas Sensor.

1. Introduction:

Nanomaterials display a wide range of unique physicochemical properties that are well-known to originate from the high surface area and nanoscale size of their constitutional components, called nanoparticles (NPs) [1]. NPs are a wide range of materials with dimensions below 100 nm, which can be used in various applications, such as medical, pharmaceutical, manufacturing and materials, environmental, electronics, energy collection, and mechanical industries, due to their multiple properties [2-5]. Wherein, metal oxide NPs have gained great attention among researchers for nano-device applications [6]. Among a large variety of metal oxides, zinc oxide (ZnO) NPs has superficially secured a special place in scientific and technological domains. ZnO is an n-type semiconductor having special features such as wide and direct band-gap (3.37 eV), large excitation binding energy (60 meV), high electron mobility, chemical/thermal stability, and good transparency. Hence it have various front-line applications in the field of solar cells, gas sensors, field emission devices, capacitors, coatings, sunscreen lotion, cosmetic and medicated creams [7-9].

Over the years, a wide number of physical, chemical and hybrid synthetic methods have been developed and employed to obtain ZnO NPs.[10-15]. Usually, these preparation methods face several limitations, such as the high cost of equipment, usage/emission of highly toxic and hazardous materials, impurities, high temperature/pressure conditions, and additional use of capping agents, stabilizers [16]. To overcome these limitations, green chemistry procedures gaining importance as they are safe and eco-friendly methods, inexpensive, do not produce toxic by-products, and produce clean nanomaterials.

Hence the main emphasis of researchers is developing simple and green methods for synthesizing ZnO NPs [17]. According to the literature, several types of fruit and plants extracts has been used for the synthesis of ZnO NPs such as *Tabernaemontana divaricata*, *Citrus maxima* (Pomelo), *Aristolochia indica*, *Echinacea spp.*, *Mentha longifolia*, *Salvadora oleoides*, *Boswellia ovalifoliolata*, *Limonia acidissima*, *Cochlospermum religiosum*, and *Conyza canadensis* for various application including photo catalytic properties, antimicrobial activity, gas sensor etc., [18-29].

In the present work, we herein report, a simple, cost-effective and environment sustainable green approach for the synthesis of ZnO NPs using *sugarcane stem* extract for LPG sensing application. As synthesized, ZnO NPs are characterized for their structural, morphological and optical properties and further employed for detailed investigation of operating temperature, response/recovery time and uptake capacity for LPG gas sensing applications.

2. Experimental and Characterization Technique

2.1 Green synthesis of ZnO NPs using sugarcane stem

The schematic representation of the ZnO NPs by green synthesis using *sugarcane stem* is shown in Figure 1. Initially, fresh *sugarcane stem* is collected from agriculture field and cut into small pieces by sharp blade. Further it is washed with distilled water and dry in sunlight for two hour. Thereafter, 10 gm of dried *sugarcane stem* dipped in to 1M zinc acetate solution for specific period of 24 hrs to 48 hrs. Zinc acetate solution is absorbed by the *sugarcane stem* wherein complex reaction is occurred. Then

Author Name: Dr. Deshmukh D. J.

8. Title of Paper: A Sweet Sour Indian Curry: Chetan Bhagat's Two States



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A SWEET SOUR INDIAN CURRY: CHETAN BHAGAT'S TWO STATES

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ABSTRACT:

This novel depicts how the cultural differences can create problem in the matrimonial alliances and still our society's concept about love marriages. It is really true the love marriages around the world are simple but as mentioned on the back cover of the novel the scenario is totally different when it comes to India. It deals with how multicultural ground realities affect 'Generation-y.' a journey of gaping and bridging between Tamilian (Ananya, the heroine of the fiction) and North Indian Delhi based Punjabi buoy, the hero complex love story.

Key words: Multiculturalism, Generation-Y, Society, Marriage, Love, Devotion

Chetan Bhagat is an Indian author, columnist and motivational speaker. He is the author of 5 bestselling novels-*Five points Someone* (2004), *One Night@the call center* (2005), *The 3 mistakes of my life* (2008), *2 States* (2009) and *Revolution 2020* (2011). All five books have remained bestsellers since their release and two have inspired Bollywood films. Bhagat's debut novel *Five Points Someone* was adapted into the 2008 blockbuster Bollywood movie. Three Idiots has established his fame as an author of international repute. Ranging from the romantic love story to a deplorable condition of the present educational system. He has started a crusade of eradicating the evils of society by his 'sugar coated novels'. He got the Indo-American society's the Society Young Achiever Award in 2004 and the Publisher's Recognition Award in 2005. The New York Times called Bhagat 'the biggest selling English language novelists in India's history'. The famous Time Magazine has counted him in the '100 Most Influential People in The World²' and fast company USA has listed him as one of the world's '100 most creative people in business'.

This novel shows how the cultural differences can make problem in the matrimonial alliances and still our society's concept about love marriages. It deals with how multicultural ground realities affect 'Generation-y.' Multiculturalism study of multiple cultures. So, here, we come across a journey of gaping and bridging between Tamilian (Ananya, the heroine of the fiction) and North Indian Delhi based Punjabi buoy, the hero of complex love story.

The most enchanting factor of the fiction is autobiographical element which is scripted from the real story of the author Chetan Bhagat and his wife Anusha who is from Delhi and Tamil Nadu. The another interesting factor is picaresque element as it moves in Delhi, Ahamadabad, Chennai and Goa. This book is remarkable in many sense. This book is remarkable in many sense. First of all its marriage proposal that itself one of a unique wedding among many love lines. "I, Krish, M. Bhagat, would like to propose to all of you

Author Name: Dr. Mane A. B.

9. Title of Paper: Impact of Recent Trends Banking Sector With Special Reference to Indian Scenario

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UGC Care Group I Journal

IMPACT OF RECENT TRENDS IN BANKING SECTOR WITH SPECIAL REFERENCE TO INDIAN SCENARIO

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Abstract:
The banking sector is undergoing of accepting digitization and cutting-edge technologies. To address the challenges posed by COVID-19, the industry has enthusiastically adopted digital technologies such as artificial intelligence and machine learning. RTGS, ECS, NEFT, ECS, ATM, EFT, Retail Banking, Debit and Credit Cards, and many more are examples of banking and financial sector innovations. With the rise of privatization, globalization, and liberalization in India, banks are focusing on R&D and implementing a variety of innovative ideas and technology.

Key Words: Impact, Banking, Trends, Indian, Digitalization, Scenario

Introduction:
The banking sector is undergoing of accepting digitization and cutting-edge technologies. To address the challenges posed by COVID-19, the industry has enthusiastically adopted digital technologies such as artificial intelligence and machine learning. RTGS, ECS, NEFT, ECS, ATM, EFT, Retail Banking, Debit and Credit Cards, and many more are examples of banking and financial sector innovations. With the rise of privatization, globalization, and liberalization in India, banks are focusing on R&D and implementing a variety of innovative ideas and technology.

A technological advancement Banks play a critical role in economic growth. In India's banking sector, the number of consumers is increasing. By offering banks with innovative services. Banks' improvements are primarily aimed at increasing financial inclusion and delivering stability to rural areas by encouraging credit development, bringing banking services closer to customers, and saving them important time.

Banks have a higher number of open positions than other government agencies. In addition, with this sector's rapid growth, job opportunities are expanding. Because of the large number of retirements scheduled in the next 4-5 years, recruitment will improve.

India's economic climate is undergoing ground-breaking reforms. The financial sector, of which the banking industry is the most important actor, has also gone through a transformation. Today's banking industry is stronger and better prepared to withstand competitive challenges. While internationally accepted prudential regulations have been established, the Indian banking industry is increasingly moving towards implementing best practices in accounting, corporate governance, and risk management, with increased disclosures and openness. Interest rates have been deregulated, and the rigor of directed lending is being loosened.

The banking business has undergone considerable transformations in the 50 years since 1969. Banks have abandoned their old functions in favor of innovating, enhancing, and launching new sorts of services to meet their customers' evolving needs. Massive branch expansion in rural and underdeveloped areas, mobilization of savings, and diversification of credit facilities to either neglected areas such as the small scale industrial sector, agricultural, and other preferred areas such as the export sector have resulted in the broadening and deepening of the financial infrastructure, transferring the fundamental character of class banking to mass banking.

Literature Review:
Avasthi and Sharma (2001) examined how technological advances are changing the face of the banking industry in their study. Banks' retail banking delivery channels have been transformed by technology. It has also had an impact on bank markets. The study also looked into the difficulties that the banking industry and its regulators face.
B. Janki (2002) investigated how technology affects employee productivity. There is no doubt that technology will be used by Indian banks, particularly public sector banks, to improve operational

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Author Name: Dr. Mane A. B.

10. Title of Paper: A study on Social Health and Financial Aspect of Auto Rickshaw Drivers in Belagavi City, Karnataka

Kalyan Bharati

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(UGC-CARE List Group I)

A STUDY ON SOCIAL, HEALTH AND FINANCIAL ASPECTS OF AUTO RICKSHAW DRIVERS IN BELAGAVI CITY, KARNATAKA

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Dr. Anant Bapurao Mane Head, Department of Economics Annasaheb Magar College, Hadapsar, Pune - 28 Mail Id: maheshgoudapatil@gmail.com ; mancab62@gmail.com

ABSTRACT

In India auto-rickshaws are main mode of public transport in urban and areas. Health has always been closely linked with occupation. Auto drivers are exposed to harmful environment like pollutant gases, continuous noise and whole-body vibration as well harmful lifestyle like irregularity of meals, bad posture while driving and stressful occupational conditions due to their working conditions. auto-rickshaws and their drivers face considerable criticism from the public, the media and policy makers. There is a contentious public debate about the perceived faults of auto-rickshaws and their drivers, and the policies to address these issues in Indian cities. Our objective is to provide balance and nuance to this debate, and to enable the perspective of drivers to be more effectively considered, along with that of auto-rickshaw users and the wider travelling public, in policy-making. This study was undertaken to assess the social health and economical condition of auto rickshaw drivers in belagavi.

KEY WORDS: Auto Rickshaw, Drivers, Health, Social, Financial,.

INTRODUCTION

Smart city Belagavi (previously known as Belgaum) have population of 4.88 Lakhs (according to 2011 census) and according to Belagavi statistical report 1988 auto rickshaw were registered as on 31-03-2018. The role of auto rickshaw drivers in the city is very significant in urban mobility. Health has been a major cause of concern in driving occupation especially among auto rickshaw drivers. Drivers spend a considerable amount of time in an environment full of pollutant gases, noisy, continuous cacophony and whole body vibration. Further harmful lifestyle are practised like irregularity of meals, no proper rest rooms, awful quality of sanitary toilets, bad posture while driving and stressful occupational conditions during their working hours. Such working parameters may be associated with various gastro intestinal disturbances, musculo- skeletal, cardio-vascular, respiratory, hearing and other problems which can hardly compromise with driving safety issues. Auto-rickshaws provide flexible, low-cost niche mobility in city. However, these vehicles and their drivers face criticism. Auto rickshaw impacts are at variance with public and policy-maker perceptions. Despite perceptions of over charging, drivers face significant economic hardship, Policy reform is needed particularly related to the permit system and fare setting.

OBJECTIVES:

- To analyze the social, health and financial conditions of auto drivers.
- To identify the level of satisfaction acquired by drivers by choosing this profession.
- To study the challenges faced by auto drivers in city.

LITERATURE REVIEW:

Lisa Elongo, 2018, Tamil Nadu a study conducted on socio-economic and health status of auto drivers of Tirupattur, vellore district, by this study they have analyzed and found out that public transport is less in tirupattur taluka. Hence it was the beneficial profession to men. But because of poor socio- economic and financial conditions auto drivers are dissatisfied and the level of stress among them is high due to the challenges faced by them.

Debashish Debbarma, 2017, Tripura a study conducted on health problems of the auto rickshaw drivers in Agartala city particularly Nagarjula nodc. According to him this profession is gradually deteriorating the health of auto rickshaw drivers, they are facing many hazardous problem like ENT

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Author Name: Dr. Shelke P.N.

11. Title of Paper: Green Synthesis of ZnO Nanoparticles Using Sugarcane Juice for LPG Sensing Application

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GREEN SYNTHESIS OF ZnO NANOPARTICLES USING SUGARCANE JUICE FOR LPG SENSING APPLICATIONS

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Ravindra U. Mene* PDEA's, Annasaheb Magar Mahavidyalaya, Hadapsar, Pune, 411028 (M.S.) India.

Abstract:

In the present work, we have successfully synthesized ZnO nanoparticles (NPs) by *sugarcane stem* using green synthesis method. Structural, morphological and optical characteristics of ZnO NPs are examined by X-ray diffraction (XRD), scanning electron microscopy (SEM), and ultraviolet-visible spectroscopy (UV-Vis). XRD reveals hexagonal wurtzite structure with average crystallite size of 30 nm. SEM images depict the uniformly distributed spherical nanoparticles. The optical measurements showed band gap is 3.15 eV. Synthesized ZnO NPs are investigated for its LPG gas sensing study together with operating temperature, response/recovery time and gas uptake capacity. The detail examination of LPG sensing study demonstrates the operating temperature 220°C with gas response of 91%, with fast response/recovery times 90/70 sec. respectively. In addition, the LPG gas uptake capacity remained sensible up to 9,000 ppm. Ultimately, we conclude that the green synthesis route, to fabricate sensor devices is encouraging as it is cost-effective, eco-friendly and simple.

Keywords: Green synthesis; ZnO; XRD; UV-Vis; SEM; Gas Sensor.

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Over the years, a wide number of physical, chemical and hybrid synthetic methods have been developed and employed to obtain ZnO NPs.[10-15]. Usually, these preparation methods face several limitations, such as the high cost of equipment, usage/emission of highly toxic and hazardous materials, impurities, high temperature/pressure conditions, and additional use of capping agents, stabilizers [16]. To overcome these limitations, green chemistry procedures gaining importance as they are safe and eco-friendly methods, inexpensive, do not produce toxic by-products, and produce clean nanomaterials.

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In the present work, we herein report, a simple, cost-effective and environment sustainable green approach for the synthesis of ZnO NPs using *sugarcane stem* extract for LPG sensing application. As synthesized, ZnO NPs are characterized for their structural, morphological and optical properties and further employed for detailed investigation of operating temperature, response/recovery time and uptake capacity for LPG gas sensing applications.

2. Experimental and Characterization Technique

2.1 Green synthesis of ZnO NPs using sugarcane stem

The schematic representation of the ZnO NPs by green synthesis using *sugarcane stem* is shown in Figure 1. Initially, fresh *sugarcane stem* is collected from agriculture field and cut into small pieces by sharp blade. Further it is washed with distilled water and dry in sunlight for two hour. Thereafter, 10 gm of dried *sugarcane stem* dipped in to 1M zinc acetate solution for specific period of 24 hrs to 48 hrs. Zinc acetate solution is absorbed by the *sugarcane stem* wherein complex reaction is occurred. Then

Author: Dr. Gandhile G. D.

12. Title of Paper: Impacts of Beach Tourism on Rural Development A Case Study Selected Beaches of Raigad District (Maharashtra)



SHODHSAMHITA
शोधसंहिता

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UGC CARE Group

“IMPACTS OF BEACH TOURISM ON RURAL DEVELOPMENT: A CASE STUDY SELECTED BEACHES OF RAIGAD DISTRICT” (MAHARASHTRA)

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Abstract

Tourism is the most useful human occupation that is helpful for the regional development. Tourism Industry in India is one of the most developing industries in the country and contributes substantially to foreign exchange earned. With the support of tourism development, it is possible to increase the income status of the rural folks who run their living mostly from farming and possible to increase the social life conditions. To reduce the unemployment in rural area, rural population can be integrated with the tourism activity. Perception of local people is very important to understand effects of tourism on local development. So here, Nagaon, Kashid and Diveagar beach tourist destinations (villages) have been selected for study purpose.

Keywords: Beach tourism, Local People, Rural development.

Introduction:-

According to the national tourism policy, tourism should be directly helpful to local people. It becomes essential to know the opinions of local people about the effect of tourism on overall development of villages near tourist destinations. The opinions of local people has been beneficial method to understand tourism impact on local population as well as it is an important tool for making policy for effective tourism development (Ap,1992). Several scholars like Potdar (2003), Ramotra and Potdar (2009), Konde (2015), Gadhe (2015), etc. have carried out perception-based study to identify effect of tourism on local people.

The Raigad district has an enormous potential for develop the tourism industry because of geographical features likes coastal location, creeks, tidal inlets and beaches, water bodies and waterfall as well as ancient forts and religious temples Pimple (2014). There are 24 Beaches like Alibag, Mandava, Kihim, Akshi-Nagaon Kashid, Murud, Diveagar, Shrivardhan, Harihareshwer etc are playing a vital role in Beach tourism.

Objective: -

Major objective of the study is to assess the Physical and Economic impacts of beach tourism activity on selected villages in Raigad district and suggest the appropriate planning for development of tourism in study region.

Study Region: -

Three beaches viz. Nagaon from Aibag tehsil, Kashid from Murud tehsil and Diveagar from shrivardhan tehsil have been selected for present study.

Methodology: -

The study has mainly based on first hand data. The enquiry about approach of local people regarding physical and economic influence of tourism on the sample villages has been completed by using set of structured questionnaire. About 95 local people from each village (i.e. Nagan, Kashid and Diveagar) were randomly selected for study. The answer of every question was ranked on five points “Likert scale” ranging from 1 to 5. The answers are ranked like 1 for strongly disagree, 2 for disagree, 3 for undecided, 4 for agree and 5 for strongly agree. Here, it must be noted that the further analysis is

२१. संसदीय राजकारणाच्या चक्रव्यूहात अडकलेली मातंग चळवळ

राहुल नरंगलकर

सा. प्राध्यापक, राज्यशास्र अग्न्यासहेब मगर महाविद्यालय, हडपसर, पुणे.

महाराष्ट्रात अनुसूचित जाती संवर्गात असलेल्या ५९ जातींमध्ये संख्यात्मकदृष्ट्या महार/ नवबौद्ध, मातंग आणि चांभार या प्रमुख अग्रगण्य जाती आहेत. या जाती संवर्ण जातींकडून केल्या जाणाऱ्या शोषणात्वाचाराच्या समान बळी असल्यातरी जातवर्णव्यवस्थेच्या विषमताकडून मुक्त चौकटीच्या बाह्य असल्याने त्या परस्पर व्यवहारात सामंजस्य प्रस्थापित करू शकल्या नाहीत. त्यामुळे त्या एकत्रितपणे व्यवस्था परिवर्तनाच्या चळवळीमध्ये किंवा संसदीय राजकारणात सहभागी होताना दिसत नाहीत. स्वातंत्र्यपूर्वकाळात या प्रमुख जातींना एकत्रित करण्यासाठी महात्मा फुले, वि.रा. शिंदे आणि डॉ.बाबासाहेब आंबेडकर यांनी केलेल्या परिश्रमपूर्वक प्रयत्नांना व्यापक यश मिळू शकले नाही. स्वातंत्र्यपूर्व काळात ब्रिटीश राजवटीत आणि स्वातंत्र्योत्तर काळात संविधानिक तरतुदीच्या अनुषंगाने उपलब्ध झालेल्या सर्व प्रकारच्या संधी / सवलतींचा स्वजातीला अधिकाधिक लाभ मिळवून देण्याच्या अभिलासेपोटी या जाती सामुहिक एकजुटीऐवजी प्रस्थापित संवर्ण जातींच्या आधारेने प्रवाहित झाल्या. 'अनुसूचित जाती' अशी राज्यव्यवस्थेने दिलेली नवी सामुहिक ओळख परिदृष्ट करण्याऐवजी इयल्या वर्णवात व्यवस्थेने दिलेली मूळ ओळख अपौरुहित करून (पुढे आपून) संसदीय राजकारणात सक्रिय झाल्या. डॉ. बाबासाहेब आंबेडकरांनी स्वतंत्र मजूर पक्ष, शेड्यूल्ड कास्ट फेडरेशन आणि भारतीय रिपब्लिकन पक्ष अशी दलित आणि दलितोत्तर शोषितांची व्यापक ओळख निर्माण करू शकणाऱ्या राजकीय व्यासपीठांची निर्मिती केली.^१ परंतु प्रत्यक्ष व्यवहारात अशी ओळख प्रस्थापित होऊ शकली नाही. डॉ.आंबेडकरांच्या पक्षात त्यांच्या चाराचार हक्क सांगणाऱ्या लढाकषित अनुवाकानी सर्व दलितांची सामुहिक ओळख दृढ होण्याच्या दृष्टीने आवश्यक असलेली नीती प्रामाणिकपणे अंगिकारली नाही. म्हणून संसदीय राजकारण आणि प्रशासनात प्रस्थापित असलेल्या धुरीण जातींना या सुद्धा-मुद्धा स्वरूपात प्रवाहित झालेल्या दलित जातींचा आपल्या सोयीप्रमाणे आणि प्रसंगानुसार वापर करून घेता आता. त्यामुळे कमकुवत आणि दुर्बल दलित जाती संसदीय राजकारणाच्या परिघात आत्मविश्वासाने वावरू शकल्या नाहीत. अनुसूचित जाती संवर्गात संख्यात्मकदृष्ट्या दुसऱ्या स्थानावर परंतु महार / नवबौद्ध आणि चांभार जातींच्या तुलनेत संसाधनाच्यादृष्टीने कमकुवत व दुर्बल असलेल्या मातंग जातीचा संसदीय राजकारणातील प्रारंभीपसूनचा वावर आश्रित स्वरूपाचा राहिल्याने तो कधीच दखलपात्र ठरू शकला नाही. मातंग जातीची सार्वजनिक जीवन व्यवहारातील भूमिका स्वहितऐवजी प्रस्थापित व्यवस्थेची निहा वाहणारी असल्याने तिला संसदीय राजकारणाचा चक्रव्यूह भेदता आलेला नाही.

काँग्रेस ते हिंदुत्ववादी पक्षापर्यंतचा मातंगांचा प्रवास

डॉ. बाबासाहेब आंबेडकरांनी १९२७ च्या प्रांतीय निवडणुकीत मुंबई प्रांतात अनुसूचित जातीसाठी राखीव असलेल्या पंधरा राखीव जागांपैकी कांही जागा मातंगांना देण्याचे आवाहन दिले होते.^२ त्यानुसार उमेदवारीसाठी अर्ज केलेल्या कृष्णाजी महादेव काळोखे या एकमेव मातंग उमेदवारास एका जागेवर स्वतंत्र मजूर पक्षाची उमेदवारी दिली गेली. या निवडणुकीत मातंग समुदाय प्रामाणिकपणे 'स्वयं' सोबत राहिला. या निवडणुकीत तिकीट नकारलेल्या अनेक महार पुढाऱ्यांनी बाबासाहेबाची संगत सोडली आणि ते काँग्रेसच्या कळपात सामील होऊन राष्ट्रीय हरिजनाचे मेळावे भरवू लागले.^३ रणछोआसारख्यांनी बाबासाहेबांविरुद्ध कडवट व भडक प्रचारासाठी पैसा पुरविला.^४ माटे-भोपटकरासोबत राहून सतत आंबेडकर विरोध चोरासणारे सकट-वायदंडे हे मातंग पुढारी या निवडणुकीत भोपटकरांच्या 'लोकशाही स्वराज्य' पक्षाने 'स्वयंप'शी हतमिळवणी केल्याने^५ आंबेडकरांच्या म्हणजेच 'स्वयंप'च्या विरोधात प्रचार करतांना आडळले नाहीत. पुणे, अहमदनगर आणि सोलापूर जिल्ह्यातील सीताराम बाबाजी लांडगे, सखाराम बाळाजी

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14. Title of Paper: Microgeomorphometric Analysis and Prioritization of Soil Erosion Vulnerable Sub-watersheds by Using Remote Sensing and GIS for Zuari River Basin, Goa, India

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Microgeomorphometric Analysis And Prioritization of Soil Erosion Vulnerable Sub-watersheds by Using Remote Sensing and GIS for Zuari River Basin, Goa, India

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Abstract Watershed prioritization for the identification of susceptible sub-basins for soil erosion in the Zuari river basin is carried out by using quantitative micro-geomorphometric analysis. The basin is divided into 10 sub-watersheds along with the stream order up to 7th order in Arc GIS software with the help of DEM data. Linear, areal, and relief parameters have been evaluated using Remote Sensing data and GIS techniques. Each parameter is examined independently as an indicator and appropriate rankings have been assigned by considering its role in soil erosion. Compound parameter values are calculated for all the sub-watersheds and the lowest compound value is allotted for the highest priority. Five priority levels are identified for the categorization of sub-watersheds, such as low, very low, moderate, high, and very high for conservation and planning of soil resource management. Three sub-watersheds scored very low compound value and hence are high priority basins which indicate the susceptible areas of intense soil erosion and need immediate action plans.

Keywords: Morphometric analysis, remote sensing and GIS, Zuari River, watershed prioritization

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1. Introduction

Sustainable development of natural resources is crucial to reduce the negative impacts of overutilization of resources on the environment and to ensure continued benefits for future generations. Human activities such as agriculture, deforestation, over-irrigation, mining, urbanization, and other construction projects have resulted in environmental degradation and resource depletion. Soil, like many other natural resources, is one of the most vital resources. Hence, conservation both in terms of quantity and quality based on scientific methods is a must. Soil erosion is a major problem related to land degradation in India. About 175 million ha of land in India, that is 53% of its total geographical area, is subjected to land degradation [1]. Therefore, appropriate planning and management of soil resources needs to be structured to avoid reckless utilisation of resources without proper vision.

A drainage basin is a fundamental natural unit taken

research paper, the study area; the Zuari river basin, is divided into 10 sub-watersheds (Figure 2) and prioritized to identify the zones of intense soil erosion. Prioritization of sub-watersheds is an important aspect of watershed management in the Western Ghats section due to heavy surface flow of water and the potential for high soil erosion. The prioritization becomes important when the whole area is not feasible for the execution of conservation measures at once due to limited financial and human resources [14]. It is beneficial in identifying sensitive areas and the intensity of environmental problems where conservation measures should be employed on a priority basis [15].

2. Study Area

The study area lies in the Tiswadi, Sanguem, Ponda, Quepem, Salcete, and Mormugao regions of Goa state and covers 998 km² of area (Figure 1). The average elevation of the study region is 500 meters from the mean sea level.

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15. Title of Paper: Green Synthesis of ZnO Nanoparticles Using Sugarcane Juice for LPG Sensing Application

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GREEN SYNTHESIS OF ZnO NANOPARTICLES USING SUGARCANE JUICE FOR LPG SENSING APPLICATIONS

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Abstract:

In the present work, we have successfully synthesized ZnO nanoparticles (NPs) by *sugarcane stem* using green synthesis method. Structural, morphological and optical characteristics of ZnO NPs are examined by X-ray diffraction (XRD), scanning electron microscopy (SEM), and ultraviolet-visible spectroscopy (UV-Vis). XRD reveals hexagonal wurtzite structure with average crystallite size of 30 nm. SEM images depict the uniformly distributed spherical nanoparticles. The optical measurements showed band gap is 3.15 eV. Synthesized ZnO NPs are investigated for its LPG gas sensing study together with operating temperature, response/recovery time and gas uptake capacity. The detail examination of LPG sensing study demonstrates the operating temperature 220°C with gas response of 91%, with fast response/recovery times 90/70 sec. respectively. In addition, the LPG gas uptake capacity remained sensible up to 9,000 ppm. Ultimately, we conclude that the green synthesis route, to fabricate sensor devices is encouraging as it is cost-effective, eco-friendly and simple.

Keywords: Green synthesis; ZnO; XRD; UV-Vis; SEM; Gas Sensor.

1. Introduction:

Nanomaterials display a wide range of unique physicochemical properties that are well-known to originate from the high surface area and nanoscale size of their constitutional components, called nanoparticles (NPs) [1]. NPs are a wide range of materials with dimensions below 100 nm, which can be used in various applications, such as medical, pharmaceutical, manufacturing and materials, environmental, electronics, energy collection, and mechanical industries, due to their multiple properties [2–5]. Wherein, metal oxide NPs have gained great attention among researchers for nano-device applications [6]. Among a large variety of metal oxides, zinc oxide (ZnO) NPs has superficially secured a special place in scientific and technological domains. ZnO is an n-type semiconductor having special features such as wide and direct band-gap (3.37 eV), large excitation binding energy (60 meV), high electron mobility, chemical/thermal stability, and good transparency. Hence it have various front-line applications in the field of solar cells, gas sensors, field emission devices, capacitors, coatings, sunscreen lotion, cosmetic and medicated creams [7-9].

Over the years, a wide number of physical, chemical and hybrid synthetic methods have been developed and employed to obtain ZnO NPs.[10-15]. Usually, these preparation methods face several limitations, such as the high cost of equipment, usage/emission of highly toxic and hazardous materials, impurities, high temperature/pressure conditions, and additional use of capping agents, stabilizers [16]. To overcome these limitations, green chemistry procedures gaining importance as they are safe and eco-friendly methods, inexpensive, do not produce toxic by-products, and produce clean nanomaterials.

Hence the main emphasis of researchers is developing simple and green methods for synthesizing ZnO NPs [17]. According to the literature, several types of fruit and plants extracts has been used for the synthesis of ZnO NPs such as *Tabernaemontana divaricata*, *Citrus maxima (Pomelo)*, *Aristolochia indica*, *Echinacea spp.*, *Mentha longifolia*, *Salvadora oleoides*, *Boswellia ovalifoliolata*, *Limonia acidissima*, *Cochlospermum religiosum*, and *Conyza canadensis* for various application including photo catalytic properties, antimicrobial activity, gas sensor etc., [18-29].

In the present work, we herein report, a simple, cost-effective and environment sustainable green approach for the synthesis of ZnO NPs using *sugarcane stem* extract for LPG sensing application. As synthesized, ZnO NPs are characterized for their structural, morphological and optical properties and further employed for detailed investigation of operating temperature, response/recovery time and uptake capacity for LPG gas sensing applications.

2. Experimental and Characterization Technique

2.1 Green synthesis of ZnO NPs using sugarcane stem

The schematic representation of the ZnO NPs by green synthesis using *sugarcane stem* is shown in Figure 1. Initially, fresh *sugarcane stem* is collected from agriculture field and cut into small pieces by sharp blade. Further it is washed with distilled water and dry in sunlight for two hour. Thereafter, 10 gm of dried *sugarcane stem* dipped in to 1M zinc acetate solution for specific period of 24 hrs to 48 hrs. Zinc acetate solution is absorbed by the *sugarcane stem* wherein complex reaction is occurred. Then

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16. Title of Paper: Observation of BITOT'S Spot and Sceral Melanixytosis in Preschool Children of Hilly Area

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OBSERVATION OF BITOT'S SPOTS AND SCLERAL MELANOCYTOSIS IN PRESCHOOL CHILDREN OF HILLY AREA.

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Abstract: A survey was carried out with the aim of observation of Bitot's spot and scleral melanocytosis among preschool children of rural area. Clinical examination of 437 preschool children was carried, WHO guidelines were followed. The data was collected and analyzed to find the prevalence of Vitamin A Deficiency (VAD). The present survey revealed the prevalence of Bitot's spots (4.5%) and scleral melanocytosis (5.75%) among the preschool children. These health issues might be due improper diet, lack of awareness about health, hygiene and hereditary disease etc. We brought parents attention on these health issues and created awareness about importance of vitamin A among them.

Keywords: Preschool children, Vitamin A deficiency, Bitot's spots, Scleral melanocytosis.

I. INTRODUCTION:

Most of the world's preschool children are suffering from vitamin A deficiency, it is highest prevalent in regions of South-East Asia and Africa (WHO, 2009). Deficiency of vitamin A is still a major nutritional issue among the lower income countries. The VAD causes xerophthalmia, night blindness and Bitot's spots to severe corneal xerosis or sometimes complete blindness (Zekariyas Sahile et.al. 2020). This dietary nutrient should be in adequate amount for normal vision and immunity. Vitamin A also boosts cellular growth, immunity and development (Amare Tariku et.al. 2016). VAD is prevalent in Africa where preschool suffering from night blindness but it is four times more prevalent in South East Asia (Zekariyas Sahile et.al. 2020). Scleral melanocytosis is hereditary hyperpigmentation commonly found in the sclera of Asian population. Scleral melanocytosis generally appear aa two-sided spots of black to grey pigmentation in sclerae. Histological examination of these spots shows dendritic melanocytes, it may be related benign condition which is commonly appear in Asian ancestries (Leung AKC. 1999). The scleral melanocytosis may be nevus of Ota which is a melanosis that involves the appearance of patchy gray, blue or black discoloration of sclera to hyperpigmentation of entire area between the outer and inner layer of cornea and sclera, retina and optic nerve (Bang P. 2015). Hence, there was an urgent need to carry out a survey of children in rural areas in Maharashtra regarding the same.

II. MATERIAL AND METHODS:

A survey was carried out in and around a 15 km hilly region (18°10'0"N 73°51'0"E) of Bhor Tehsil, M/S, India. The aim of survey was to check health related issues in preschool children of hilly area. In this survey, 437 preschool children of age group 4 to 7 years were examined. Especially eyes were examined to observe Bitot's spots and scleral melanocytosis. Sub-clinical examinations were carried out by trained surveyors (Plate-1). Photographs were taken by using Sony cyber-shot DSCW230 12 MP Digital Camera with 4x Optical Zoom. Guidelines provided by WHO were followed during the survey. Data was collected and analysed by using Microsoft Excel 2010.

III. RESULT AND DISCUSSION:

In this study, 437 preschool children of age group 4 to 7 years were examined. Clinical examination for Bitot's spots and scleral melanocytosis was carried out (Plate-1).

Author Name: Dr. Giramkar S. V.

17. Title of Paper: Case Study-Water Pollution in Sangli- Miraj Kupwad Municipal Corporation Area

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CASE STUDY-WATER POLLUTION IN SANGLI- MIRAJ- KUPWAD MUNICIPAL CORPORATION AREA

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ABSTRACT:

Sangli Miraj Kupwad Municipal Corporation is largest municipal corporation in South Maharashtra and serves a population of 0.65 million with Geographical Area 118.18 Sq.km and tropical climate. We can observe different types of pollution over this study area like water, air, soil, noise pollution as one of the growing cities surrounded with agricultural land. The major water bodies selected for study purpose were lake near RTO office, Bharat Nagar Talav, Miraj Odha, Ganesh talav, Kali Khan, Krishna River. The major causes of water pollution to these selected water bodies were identified. The pollution sources for these water bodies are sewage, agricultural runoff, solid waste disposal etc. The literature survey provided numerous evidences of health hazards of polluted water bodies on human. The Sewage treatment plant of 27MLD with primary and secondary treatment is proposed in the study area. As on today, the municipal corporation implementing sewage treatment plant in study area and implementation work of this plan is in progress.

Keywords: sewage treatment plant, primary treatment, secondary treatment.

INTRODUCTION:

Water is one of the vital components required for existence of any life form. Rapid increase in demand of water due to population growth, urbanization and changing lifestyle has created a considerable gap in demand and supply. This has posed serious challenges to water security (S. Gaikwad & N. Kamble 2016).

When toxic substances enter lakes, streams, rivers, oceans and other water bodies, they get dissolved or lie suspended in water. This result in pollution of water. Due to pollution the quality of the water deteriorates, affecting aquatic ecosystems. These pollutants can also seep down and affect the groundwater deposits (A. B. Sarwade et al., 2015)

The most polluting source of water is the city sewage and industrial waste, agricultural

runoff or the water from the fields that drains into river is another major water pollutant as it contains fertilizers and pesticides. Such water which ultimately ends up in our household is often highly contaminated and carries disease causing microbes (P. Pawar & S. Bhoosale, 2015)

In this research, we focused on water pollution of Sangli- Miraj- Kupwad Municipal corporation area and impact of water pollution on community and Agricultural industry

STUDY AREA:

Location selected for study is Sangli Miraj Kupwad municipal corporation (16°51'55.01"N, 74°36'46.00"E) Established on 9th February, 1998

Population 4,86,689 (as per 2001 Census) Geographical Area 118.18 Sq.km. This is the largest municipal corporation in South

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Author Name: Dr. Giramkar S. V.

18. Title of Paper: Observation of Climate Change and Skin Diseases Along With Vitamin A Deficiency and Scleral Melanocytosis Among Rural Preschool Children In Maval Tehsil, M/S, India

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OBSERVATION OF CLIMATE CHANGE AND SKIN DISEASES ALONG WITH VITAMIN A DEFICIENCY AND SCLERAL MELANOCYTOSIS AMONG RURAL PRESCHOOL CHILDREN IN MAVAL TEHSIL, M/S, INDIA.

Sharad Vitthal Giramkar

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ABSTRACT:

A health survey of preschool children was carried with the aim of climatic change and general health of preschool children in rural areas of Maval Tehsil. Clinical observation and examinations were carried out undertrained surveyors. During survey 629 preschool children were examined for various health issues in relation due to climate change. The survey revealed skin diseases (4.9%), Prevalence of Vitamin A deficiency (3.73%) with night blindness (1.33%), xerophthalmia (1.3%), Bitot's spots (3.8%) and conjunctival xerosis (2.3%). The other health issues observed were Scleral melanocytosis (2.7%).

Keywords: Climate change, Preschool children, Skin diseases, Vitamin-A deficiency, Bitot's spots, Scleral melanocytosis.

INTRODUCTION:

Climate change is the major issues in India. It frequently encounters skin diseases in preschool children in India. The children with age group of one to seven are suffering from skin diseases. The most common skin diseases were infections (Kabir Sardana et. al., 2019). The National Oral Health Survey indicates that about 60% of prevalence of dental issues was among children of 3 to 5 age in India [Patil Snehal et al., 2015] and about 28 to 30% of total patients having skin diseases were children of the pediatric age group [GM Sangameshwara et.al., 2015].

VAD is a major nutritional problem in lower income countries. Vitamin A deficiency is widely prevalent in Africa, about 2% of preschool age children were found to be suffering from night blindness. Deficiency of VAD causes xerophthalmia ranging from milder stages of night blindness and Bitot's spots to

severe corneal xerosis or sometimes complete blindness [Zekariyas Sahile et.al., 2020]. VAD is required in adequate amounts for normal vision and immunity and it also helps in cellular growth and development [Amare Tariku et.al. 2016]. In Urban Central India it was found that 6.5% of children were suffering from xerophthalmia [Dr. Sinha et al., 2011]. Appearance of patchy gray, bluish black discoloration in sclera of eye indicates the scleral melanocytosis [Bang P., 2015]. So, it was an urgent need to carry out a health survey of children in rural areas in Maharashtra.

MATERIALS AND METHODS:

A village survey was conducted from January 2019 to February 2020. Survey was carried out in and around a 18 km hilly region (18°48'40"N 73°28'55"E) of Maval Tehsil, M/S, India. The aim of survey was to assess health survey of preschool children of age group 3 to 7 years due

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COMPARATIVE STUDY ON DIFFERENT DRYING METHODS IN ROSE. HYBRID TEA, FLORIBUNDA & MINIATURE

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Abstract

Present investigation was undertaken to compare the six different methods of drying in rose flowers to determine the most suitable drying method and drying time concerning quality parameters like color, shape and texture. The rose varieties (Hybrid tea, Floribunda, and Miniature) chosen for the experiments were exposed to all the six methods of drying viz., Air drying, sand drying, borax drying, borax and sand drying, silica gel drying and hot air oven drying. With respect to drying methods air drying was least acceptable as far as color, shape and texture. Borax and sand drying yield deformed flowers, where as good results were obtained by the combination of borax and sand mixture. Silica gel was found the best desiccant and better quality products were acquired by hot air oven drying in lesser time.

Keywords: Drying methods: Flower quality: Rose flowers: Value added products.

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1. Introduction

Rose is one of nature's most excellent manifestations and is all around praised as "Crown of flowers". Rose flowers are different having wonderful shape, size, lovely tones and nice fragrance. Rose is the best cut flower and as such is in incredible interest in worldwide business sectors, but it is hard to support their excellence for significant period. However, those same can be dried and preserved with various dehydration techniques to extend their beauty and aesthetic significance (Saima *et al.*, 2020)¹. Dry flowers are the key components of floriculture business which is getting up quicker rate in the worldwide exchange (Gangadhar *et al.*, 2009)². Dried flowers are lifelong and can be used several times to meet the decorative demands, dry flowers provide an outstanding opportunity to Indian entrepreneurs as the country is bestowed with comprehensive variety of floral material, cheap labour and favorable climate (Gurumurti 1997)³. Dry flower industry has developed quickly with more than 60% portion of benefits belonging to the floriculture business ((Ranjan *et al.*, 2002)⁴. The business extended yearly turnover starting at 2003 was in excess of 150 crores, (Singh 2009)⁵. Potpourris are the significant portion

RESEARCH ARTICLE



Macromolecular Symposia

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One-Pot Synthesis of ZnO Nanorods for LPG Sensing Applications

Ravindra U. Mene,* Bhagyashri D. Shirapure, Vijaykiran N. Narwade, Kashinath A. Bogle, Megha P. Mahabole, Rajendra S. Khairnar, Ramakant P. Joshi, and Pandit N. Shelke

In the present work, the authors have successfully deposited uniformly upright standing ZnO nanorods on glass substrates by using simple one-pot chemical bath deposition method. XRD reveals the polycrystalline nature of ZnO thin films. SEM micrograph depicts the well resolved standing growth of ZnO nanorods on glass substrate with an average diameter of 200–300 nm. The optical measurements show that the band gap is 3.3 eV. The detail investigation of LPG sensing study demonstrates the lower operating temperature 190°C with gas response of 105%, with fast response/recovery times 80/70 s, respectively. In addition, the LPG gas uptake capacity remained sensible up to 10 000 ppm.

1. Introduction

Metal oxide nanostructures have gained great attention among researchers for nano-device applications.^[1] In sensor application, it is well-known that an anticipated gas sensor must to possess a combination of enhanced sensitivity, excellent selectivity, rapid response-recovery times, long-term stability, and low working temperature. These factors are mostly reliant on surface area to volume ratio, micro porosity, and nanostructures of sensing layer.^[2] Conferring to these factors, one-dimensional (1D) nanostructures are sensible and highly favorable to enhance the performance of a gas sensor.^[3] These 1D nanostructures have an extraordinarily high surface area and high density of active sites on the surface, which will grant more gas reaction with a sensing material.^[4] Metal oxide in nanorod (NR) structures is

area of interest due to its special characteristics and potential to be used in many electronic devices. The thin and vertical NR structure has shown less agglomeration due to its larger dimensions. Thus, more test gas is adsorbed and diffused quickly on the sensor surface, leads to contribute to the enhancement of the sensing performance.^[5] Among these, 1D ZnO nanostructures, such as nanorods, nanowires, nanobelts, and nanotubes have attracted a great research interest because of their scientific and technological applications.^[6] ZnO is an n-type semiconductor (e.g., 3.37 eV) with a large exciton binding energy of 60 meV at room temperature. Moreover, it has good

characteristics namely, chemical sensitivity to different adsorbed gases, and amenability to doping, high chemical stability, non-toxicity, low cost, easy fabrication of various nanostructures with a variety of methods.^[7,8] In different gases, LPG is one of the extensively used gases in day-to-day activities. There is a need to detect the leakage in its early stages before explosion and perform active suppression. In order to accomplish this, researcher paid more attention for the development of LPG sensor with low operating temperature.^[9]

Recently, Nkosi et al. successfully synthesized ZnO NR and flower like structures and implemented for LPG sensing at the operating temperature 200°C with gas response of 80%.^[10] Gonugade et al. reported maximum gas response of 20% upon exposure of 5200 ppm LPG concentration at 673 K for ZnO thin films.^[11] Dhingra et al. demonstrates the LPG sensing using ZnO worm like structures showed the 19% gas response at an operating temperature 200°C.^[12] Gurav et al. synthesized vertically aligned ZnO NRs it shows gas response of 49% at 573 K upon exposure to 5200 ppm of LPG.^[13] Shinde et al. reported Pd-sensitized ZnO nanobeads showed 63% LPG response at 275 °C.^[14] Moreover, some other reports demonstrated the evolution of ZnO morphologies towards LPG sensing at comparatively high operating temperature above 200°C.^[15–19] Therefore, our present investigation is aimed to develop a LPG sensor competent to quick and high gas response with low operating temperature based on ZnO NR synthesized using one-pot chemical bath deposition method. The synthesized ZnO NR is characterized for their structural, optical, and morphological analysis and further employed for detailed investigation of operating temperature, response/recovery time, and uptake capacity for LPG sensing applications.

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Fungal Diversity of Pokhar, Taluka-Purandar, District-Pune, India

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ABSTRACT

Pokhar is a small village from Purandar Taluka. The survey of the locality has been done and found some interesting fungi and lichens. In all total 13 species of fungi and lichens were reported from which 07 are non-lichenised fungi and 06 are lichenised fungi. The height indicator species like *Collema* has also found at low heights.

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Introduction

Pokhar village is in Purandar Taluka in Pune District of Maharashtra State, India. It comes under Pokhar Panchayath. It belongs to Desh or Paschim Maharashtra region. It belongs to Pune Division. It is located 29 KM towards South from District headquarters Pune. 15 KM from Purandar. 163 KM from State capital Mumbai. Pokhar Pin code is 412301 and postal head office is Sopannagar. From Pokhar village Kodit Bk. (4 KM), Supe Kh. (6 KM), Chambali (6 KM), Supe Kh. (7 KM), Hivare (7 KM) are the nearby Villages to Pokhar. Pokhar is surrounded by Haveli Taluka towards North, Bhor Taluka towards South, Pune Taluka towards North, Khandala Taluka towards South. Saswad, Pune, Pimpri-Chinchwad, Wai are the nearby Cities to Pokhar.

Pokhar village is the part of Desh or Western Maharashtra with Altitude 585 meters above Sea level. The normal humidity 20% and wind speed is 13.0 kph. The temperature range is 27°C to 42°C when clear weather is there. Pokhar Local Language is Marathi. Pokhar Village Total population is 254 and number of houses are 54. Female Population is 47.2%. Village literacy rate is 82.3% and the Female Literacy rate is 35.8%. There is no railway station near to Pokhar in less than 10 km. Daundaj Rail Way Station (near to Jejuri), Jejuri Rail Way Station (near to Jejuri) are the Rail way stations reachable from nearby towns. However Pune Rail Way Station is major railway station 28 KM near to Pokhar. Saswad, Jejuri are the nearby by towns to Pokhar having road connectivity to Pokhar.

Fungal Diversity of Pokhar

An extensive survey was done for studying the fungal diversity from Pokhar. During this survey surprisingly some rare members has been observed from the lichenised and non-lichenised groups of fungi. In the survey total 13 Fungi (Non-Lichenised and Lichenised) were found. From which total 07

forms were belongs to non-lichenised group and total 06 forms were from the lichenised group.

Interestingly two non-lichenised forms were found to be rare from this locality and 02 lichenised forms were also found to be rare in this locality. The forms like *Collema* are height indicator but surprisingly this was found at low height. As per species type the members which are found shows healthy climate and good rainfall also. Many lichens were found in association with other lichens ex. *Arthothelium* was found side by side with *Caloplaca* and *Parmelia*.

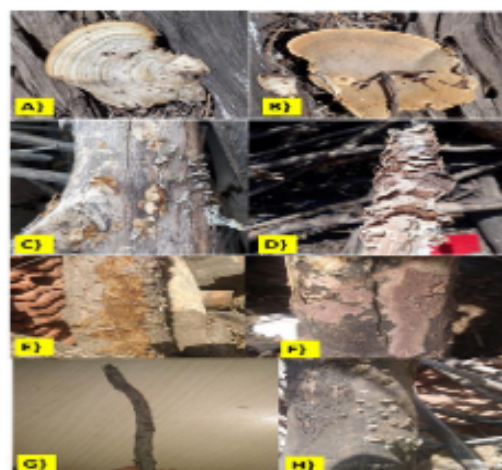


Figure 1. *Trametes* sp. (Fig. A & B), *Auricularia* sp. (Fig.C), *Stecocherinum* sp. (Fig. D), *Irpex* sp. (Fig. E), *Peniophora* (Fig. F), *Hypoxylon* sp. (Fig. G), *Schizophyllum* sp. (Fig. H),

Author Name: Prof. Dr. Shirurkar D. D.

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RESEARCH ARTICLES

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CHECKLIST OF CULTIVATED ANGIOSPERMIC PLANTS FROM ANNASAHEB MAGAR MAHAVIDYALAYA CAMPUS, PUNE, MAHARASHTRA, INDIA

Shirurkar D. D., Danai-Tambhale S. D. and Randive, K. R.

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ABSTRACT

Survey was conducted on cultivated angiospermic plants of Annasaheb Magar Mahavidyalaya campus. In all total 160 species representing 124 genera and 55 families were reported. From these 45 Dicots and 10 monocot families were reported. Apocynaceae, Euphorbiaceae and Caesalpinaceae from Dicots; Araceae from monocots were found to be dominant.

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INTRODUCTION

Annasaheb Magar Mahavidyalaya Hadapsar is one of the renowned educational institutions from Pune District Education Association's. It was established in the year 1971. Present survey was made to attempt checklist of cultivated angiospermic plant of the AMM campus. The survey of the AMM, based on the observations made in the years 2015 to 2018. The area of the premises is 05 acres. The main aim was conservation of the plant diversity. It also aims to enrich the plant diversity, aesthetic values and to popularise the botanical and common names of the plant among the students.

MATERIALS AND METHODS

The present checklist is based on the collection and observation of angiospermic plants during the year 2015 to 2018. The plants were propagated and cultivated by second year students of all faculties of the college.

Plant specimens were studied and identified in the botany laboratory with the help of standard taxonomic literature. All the families were identified & arranged according to Flora of Maharashtra State. (Singh et al. 2000)

RESULTS AND DISCUSSION

Check list of observed, identified plants and their families was given in Table no. 1. The graph reflects dominant plant families of the campus are Apocynaceae (11 species), Euphorbiaceae (10 species), Caesalpinaceae (07 species) from dicots and Araceae (11 species) from monocots were found to be dominant (Table 1, Fig. 1a and 1b). Survey of the campus represents the total 55 plant families. Among which 45 families belongs to Dicotyledones and 10 from Monocotyledons. 55 families represented by 124 genera and out of which 95 genera belong to Dicotyledones and 29 genera from monocotyledons (Table 2, Fig. 2a). In all College campus enriched with total number of 160 plant species. Among them 122 plant species reported from Dicotyledones and 38 plant species from monocotyledons

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An analytical study of Ahmednagar District Central Cooperative Bank Ltd, Ahmednagar.

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Abstract: -

The ADCC Bank has an important role for the economic development of Ahmednagar district. The main livelihood most of the people of Ahmednagar district is farming and agro based industries. The establishment of ADCC Bank is mainly for accepting and mobilising deposits and savings from the society and its provides loan and advances for agriculture and agro based industries through the credit co-operative societies.

Objectives of research: -

1. To study the wealth status of ADCC Bank.
2. To find out the actual financial position of ADCC Bank.

Research methodology: -

This research proposal shall be consider; as polite study to have ntional assessment of A.D.C.C. Bank. From this point of view, this project is undertaken as a model/ case study. The universe for this project shall be restricted to the district of the Ahmednagar.

Sources of data collection: -

The data collected for the study was secondary data in Nature

1. Annual Reports
2. News Papers
3. Internet
4. Research papers

Analysis of data: -

The researcher will use appropriate technique of the data analysis for the study. Simple average, ratio, percentage, trend analysis comparison and measurement tools etc... will be use to cover practical aspect of the study. For the purpose of analysis we study the ADCC Banks wealth status: entity, deposits, investment, loan and profit various loans in percentage as well as in rupees in the five year from 2010-2011 to 2014-2015. In accordance with the objectives of the study, the data collected from secondary sources were analyzed and interpreted.

RESEARCH ARTICLE



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One-Pot Synthesis of ZnO Nanorods for LPG Sensing Applications

Ravindra U. Mene,* Bhagyashri D. Shirapure, Vijaykiran N. Narwade, Kashinath A. Bogle, Megha P. Mahabole, Rajendra S. Khairnar, Ramakant P. Joshi, and Pandit N. Shelke

In the present work, the authors have successfully deposited uniformly upright standing ZnO nanorods on glass substrates by using simple one-pot chemical bath deposition method. XRD reveals the polycrystalline nature of ZnO thin films. SEM micrograph depicts the well resolved standing growth of ZnO nanorods on glass substrate with an average diameter of 200–300 nm. The optical measurements show that the band gap is 3.3 eV. The detail investigation of LPG sensing study demonstrates the lower operating temperature 190°C with gas response of 105%, with fast response/recovery times 80/70 s, respectively. In addition, the LPG gas uptake capacity remained sensible up to 10 000 ppm.

area of interest due to its special characteristics and potential to be used in many electronic devices. The thin and vertical NR structure has shown less agglomeration due to its larger dimensions. Thus, more test gas is adsorbed and diffused quickly on the sensor surface, leads to contribute to the enhancement of the sensing performance.^[5] Among these, 1D ZnO nanostructures, such as nanorods, nanowires, nanobelts, and nanotubes have attracted a great research interest because of their scientific and technological applications.^[6] ZnO is an n-type semiconductor (e.g., 3.37 eV) with a large exciton binding energy of 60 meV at room temperature. Moreover, it has good

1. Introduction

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Recently, Nkosi et al. successfully synthesized ZnO NR and flower like structures and implemented for LPG sensing at the operating temperature 200°C with gas response of 80%.^[10] Gonugade et al. reported maximum gas response of 20% upon exposure of 5200 ppm LPG concentration at 673 K for ZnO thin films.^[11] Dhingra et al. demonstrates the LPG sensing using ZnO worm like structures showed the 19% gas response at an operating temperature 200°C.^[12] Gurav et al. synthesized vertically aligned ZnO NRs it shows gas response of 49% at 573 K upon exposure to 5200 ppm of LPG.^[13] Shinde et al. reported Pd-sensitized ZnO nanobeads showed 63% LPG response at 275 °C.^[14] Moreover, some other reports demonstrated the evolution of ZnO morphologies towards LPG sensing at comparatively high operating temperature above 200°C.^[15–19] Therefore, our present investigation is aimed to develop a LPG sensor competent to quick and high gas response with low operating temperature based on ZnO NR synthesized using one-pot chemical bath deposition method. The synthesized ZnO NR is characterized for their structural, optical, and morphological analysis and further employed for detailed investigation of operating temperature, response/recovery time, and uptake capacity for LPG sensing applications.

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ARTICLE

Synthesis, antimicrobial and anti-tubercular activity study of N-(substituted-benzyl)-4-(trifluoromethyl)thiazole-2-sulfonamide and 2-(N-(substituted-benzyl)sulfamoyl)thiazole-4-carboxylic acid

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Abstract
A series of novel N-(substituted-benzyl)-4-(trifluoromethyl)thiazole-2-sulfonamide (4a-4i) and 2-(N-[2-chlorobenzyl]sulfamoyl)thiazole-4-carboxylic acid (7a-7i) derivatives were synthesized from readily available 4-(trifluoromethyl)thiazole-2-amine (1) and ethyl 2-aminothiazole-4-carboxylate (5), respectively. Eighteen novel thiazole-2-sulfonamide derivatives were synthesized. The targets were synthesized through a series of reactions involving diazotization and sulfonamide coupling reactions. All the synthesized compounds were characterized by ¹H NMR, ¹⁹F, ¹³C NMR, HRMS, and HPLC analytical techniques. All the synthetic derivatives were evaluated for their antimicrobial activity (minimum inhibitory concentration) against a series of strains of *Bacillus subtilis*, *Staphylococcus aureus*, and *Escherichia coli* for antibacterial activity and against the strains of *Candida albicans*, *Aspergillus flavus*, and *Aspergillus niger* for antifungal activity. Also synthetic derivatives were tested for their in vitro anti-tubercular (*Mycobacterium tuberculosis*: H37 Rv, MDR, and XDR strains) activities. Most of compounds showed moderate to good activity for antimicrobial and anti-tubercular strains. The compounds 4b (MIC = 12.5 µg/ml and 3.125 µM), 4c (MIC = 1.562 µM), 4d (MIC = 12.5 µg/ml), 7b (MIC = 12.5 µg/ml), 7c (MIC = 26 µg/ml and 1.562 µM), and 7i (MIC = 26 µg/ml and 6.25 µM) showed good antimicrobial and anti-tubercular activity in the range of (MIC = 12.5–26 µg/ml) and (MIC = 1.562–6.25 µM) against tested strains, while some derivatives show moderate inhibitions through the series.

KEYWORDS
anti-microbial, anti-tubercular, diazotization, thiazole-2-sulfonamide

1 | INTRODUCTION

The heterocyclic drug discoveries are a continuous process as there are many reasons for it like drug resistance, cost of drugs, treatment time, ineffectiveness of drugs, and many more. There is a constant need for the development of better and effective drugs.¹ Tuberculosis is an air borne contagious diseases caused by *Mycobacterium*

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Fungal Diversity of Pokhar, Taluka-Purandar, District-Pune, India

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An extensive survey was done for studying the fungal diversity from Pokhar. During this survey surprisingly some rare members has been observed from the lichenised and non-lichenised groups of fungi. In the survey total 13 Fungi (Non-Lichenised and Lichenised) were found. From which total 07

forms were belongs to non-lichenised group and total 06 forms were from the lichenised group.

Interestingly two non-lichenised forms were found to be rare from this locality and 02 lichenised forms were also found to be rare in this locality. The forms like *Collema* are height indicator but surprisingly this was found at low height. As per species type the members which are found shows healthy climate and good rainfall also. Many lichens were found in association with other lichens ex. *Arthothelium* was found side by side with *Caloplaca* and *Parmelia*.



Figure 1. *Trametes* sp. (Fig. A & B), *Auricularia* sp. (Fig.C), *Steccherinum* sp. (Fig. D), *Irpex* sp. (Fig. E), *Peniophora* (Fig. F), *Hypoxylon* sp. (Fig. G), *Schizophyllum* sp. (Fig. H),



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RESEARCH ARTICLE

EFFECT OF ASPERGILLUS INFESTATION ON NUTRITIONAL VALUE OF CHICKPEA SEEDS

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ABSTRACT

Chickpea seeds are rich source of proteins and consumed as food and fodder. Chickpea seeds are contaminated with various fungi during storage. Fungi are the widespread pathogen and the rate of seed deterioration is noteworthy for the food industry. Association of mycoflora during storage is a common problem and the most dominant genera were *Aspergillus*. *Aspergillus niger*, *A. flavus*, *A. quercinus*, *A. Oryzae*, and *A. nidulans* are major *Aspergillus* species recovered from selected chickpea varieties. Fungal infestation affects seedling growth as well as reduction in nutritive values was also observed during investigation. During investigation decrease in dry weight, protein, carbohydrate and starch content was recorded.

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INTRODUCTION

The chickpea (*Cicer arietinum*) is one of the most important pulses, commercially grown in tropical, sub-tropical, semi-arid and Mediterranean regions of the world (Kashiwagie *et al.*, 2015; Kandhare, 2015). It is an annual legume of the family Fabaceae, also known as gram. India is the world's leading producer of chickpeas (Taylor *et al.* 2016). It is one of the earliest cultivated crops that are consumed all over the world due to its high nutritional quality (Tripathi *et al.*, 2015). It is a source of protein, dietary fiber, resistant starch, polyunsaturated fatty acids, vitamins, and minerals, especially folate, calcium, magnesium, and potassium (Tripathi *et al.*, 2015). Infestation of various fungi like *Curvularia lunata*, *Helminthosporium sativum*, *Rhizopus nigricans*, *Alternaria alternata*, *Fusarium oxysporum*, *Macrophomina phaseolina*, *Penicillium italicum*, *Sclerotium rolfsii*, *Aspergillus flavus*, *A. niger*, *A. oryzae*, *Penicillium italicum*, *Penicillium notatum* and *Mucor* sp. were reported by many workers from chickpea during storage (Kiran Sing 2005, Kaur *et al.*, 2015; Muhammad *et al.*, 2015; Leo *et al.*, 2015; Kandhare, 2015; Zaidi and Pathak, 2015; Kushwaha, 2017; Arshad, 2019). Seed mycoflora affects seed texture, physiology and content. Seed mycoflora affect adversely to nutritive value of pulses.

Ability of various fungal species to utilize seed carbohydrates from different crops and varieties have been reported by various workers. Adisa (2006) found decrease in carbohydrate content in maize grains due to infestation of *A. clavatus*, *A. clavatus*, *A. nidulans* and *A. nidulans*. Embaby and Mona (2006) reported biochemical analysis of artificially infected of some legume seeds with mycotoxin produced isolate of *Aspergillus flavus* decreased the percentage of carbohydrate content compared with the healthy of legume seeds like bean, cowpea & lupin. Reduction in the carbohydrate content in seeds of cowpea (*Vigna sinensis*) infested with *Aspergillus* sp. recorded by Ushamsalini *et al.*, (1998) and Morkunas *et al.* (2005). Maheshwari and Mathur (1987) reported reduction in the reducing and non-reducing sugars in seeds of cowpea (*Vigna sinensis*) when infested with *Aspergillus nidulans* and *A. terreus* under different temperature and infection by *A. nidulans* was more deleterious than by *A. terreus*. According to Aziz and Makrouz (2004) *Aspergillus flavus* utilizes carbohydrate of seeds for its growth and aflatoxin production, then decrease lipids and carbohydrate contents of wheat and soybean seeds. Degradation of starch due to seed borne fungi in seeds is a serious fact. Breakdown and utilization of starch from the seed of green gram due to *Aspergillus* species have been reported by Vidyasekaran and Kandaswamy (1972). Similarly, association of *A. niger* and *A. flavus* in cowpea (Vijayakumari and Karan, 1981) caused reduction in starch content to the considerable level. Utilization of starch content of cereal seeds by the species of *Aspergillus* has been studied by Premilata and Sinha (1985) where they found that wheat seeds infested with *A. parasiticus* showed loss in starch content.

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RESEARCH ARTICLES

OPEN ACCESS

CHECKLIST OF CULTIVATED ANGIOSPERMIC PLANTS FROM ANNASAHEB MAGAR MAHAVIDYALAYA CAMPUS, PUNE, MAHARASHTRA, INDIA

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ABSTRACT

Survey was conducted on cultivated angiospermic plants of Annasaheb Magar Mahavidyalaya campus. In all total 160 species representing 124 genera and 55 families were reported. From these 45 Dicots and 10 monocot families were reported. Apocynaceae, Euphorbiaceae and Caesalpinaceae from Dicots; Araceae from monocots were found to be dominant.

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INTRODUCTION

Annasaheb Magar Mahavidyalaya Hadapsar is one of the renowned educational institutions from Pune District Education Association's. It was established in the year 1971. Present survey was made to attempt checklist of cultivated angiospermic plant of the AMM campus. The survey of the AMM, based on the observations made in the years 2015 to 2018. The area of the premises is 05 acres. The main aim was conservation of the plant diversity. It also aims to enrich the plant diversity, aesthetic values and to popularise the botanical and common names of the plant among the students.

MATERIALS AND METHODS

The present checklist is based on the collection and observation of angiospermic plants during the year 2015 to 2018. The plants were propagated and cultivated by second year students of all faculties of the college.

Plant specimens were studied and identified in the botany laboratory with the help of standard taxonomic literature. All the families were identified & arranged according to Flora of Maharashtra State. (Singh et al. 2000)

RESULTS AND DISCUSSION

Check list of observed, identified plants and their families was given in Table no. 1. The graph reflects dominant plant families of the campus are Apocynaceae (11 species), Euphorbiaceae (10 species), Caesalpinaceae (07 species) from dicots and Araceae (11 species) from monocots were found to be dominant (Table 1, Fig. 1a and 1b). Survey of the campus represents the total 55 plant families. Among which 45 families belongs to Dicotyledones and 10 from Monocotyledons. 55 families represented by 124 genera and out of which 95 genera belong to Dicotyledones and 29 genera from monocotyledons (Table 2, Fig. 2a). In all College campus enriched with total number of 160 plant species. Among them 122 plant species reported from Dicotyledones and 38 plant species from monocotyledons



One-Pot Synthesis of ZnO Nanorods for LPG Sensing Applications

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In the present work, the authors have successfully deposited uniformly upright standing ZnO nanorods on glass substrates by using simple one-pot chemical bath deposition method. XRD reveals the polycrystalline nature of ZnO thin films. SEM micrograph depicts the well resolved standing growth of ZnO nanorods on glass substrate with an average diameter of 200–300 nm. The optical measurements show that the band gap is 3.3 eV. The detail investigation of LPG sensing study demonstrates the lower operating temperature 190 °C with gas response of 105%, with fast response/recovery times 80/70 s, respectively. In addition, the LPG gas uptake capacity remained sensible up to 10 000 ppm.

1. Introduction

Metal oxide nanostructures have gained great attention among researchers for nano-device applications.^[1] In sensor application, it is well-known that an anticipated gas sensor must to possess a combination of enhanced sensitivity, excellent selectivity, rapid response-recovery times, long-term stability, and low working temperature. These factors are mostly reliant on surface area to volume ratio, micro porosity, and nanostructures of sensing layer.^[2] Conferring to these factors, one-dimensional (1D) nanostructures are sensible and highly favorable to enhance the performance of a gas sensor.^[3] These 1D nanostructures have an extraordinarily high surface area and high density of active sites on the surface, which will grant more gas reaction with a sensing material.^[4] Metal oxide in nanorod (NR) structures is

area of interest due to its special characteristics and potential to be used in many electronic devices. The thin and vertical NR structure has shown less agglomeration due to its larger dimensions. Thus, more test gas is adsorbed and diffused quickly on the sensor surface, leads to contribute to the enhancement of the sensing performance.^[5] Among these, 1D ZnO nanostructures, such as nanorods, nanowires, nanobelts, and nanotubes have attracted a great research interest because of their scientific and technological applications.^[6] ZnO is an n-type semiconductor (e.g., 3.37 eV) with a large exciton binding energy of 60 meV at room temperature. Moreover, it has good characteristics namely, chemical sensitivity to different adsorbed gases, and amenability to doping, high chemical stability, non-toxicity, low cost, easy fabrication of various nanostructures with a variety of methods.^[7,8] In different gases, LPG is one of the extensively used gases in day-to-day activities. There is a need to detect the leakage in its early stages before explosion and perform active suppression. In order to accomplish this, researcher paid more attention for the development of LPG sensor with low operating temperature.^[9]

Recently, Nkosi et al. successfully synthesized ZnO NR and flower like structures and implemented for LPG sensing at the operating temperature 200 °C with gas response of 80%.^[10] Gonugade et al. reported maximum gas response of 20% upon exposure of 5200 ppm LPG concentration at 673 K for ZnO thin films.^[11] Dhingra et al. demonstrates the LPG sensing using ZnO worm like structures showed the 19% gas response at an operating temperature 200 °C.^[12] Gurav et al. synthesized vertically aligned ZnO NRs it shows gas response of 49% at 573 K upon exposure to 5200 ppm of LPG.^[13] Shinde et al. reported Pd-sensitized ZnO nanobeads showed 63% LPG response at 275 °C.^[14] Moreover, some other reports demonstrated the evolution of ZnO morphologies towards LPG sensing at comparatively high operating temperature above 200 °C.^[15–19] Therefore, our present investigation is aimed to develop a LPG sensor competent to quick and high gas response with low operating temperature based on ZnO NR synthesized using one-pot chemical bath deposition method. The synthesized ZnO NR is characterized for their structural, optical, and morphological analysis and further employed for detailed investigation of operating temperature, response/recovery time, and uptake capacity for LPG sensing applications.

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Plants and Fungal Diversity from Pimpri Sandas, Pune District, Maharashtra

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ABSTRACT

Pimpri Sandas small village 1560.49 hectares in Haveli Tehsil. The survey of the locality has been done as a part of social activity and making general floristic awareness to the people from conservation point of view. In all total 18 plant species and 10 species of fungi and lichens were reported from which 08 are pure fungi and 02 are lichenised fungi. Basidiomycetous fungi and plants belongs to Fabaceae are found to be dominant in the locality. Some interesting saxicolous species like *Caloplaca* and *Rhizocarpon* are commonly found in this area.

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Introduction

Pimpri Sandas village is located in Haveli Tehsil of Pune district in Maharashtra, India. It is situated 30km away from sub-district headquarter Pune and 46km away from district headquarter Pune. As per 2009 stats, Pimpri Sandas is the gram panchayat of Pimpri Sandas village. The total geographical area of village is 1560.49 hectares. Pimpri Sandas has a total population of 3,392 peoples. There are about 645 houses in Pimpri Sandas village. Pune is nearest town to Pimpri Sandas which is approximately 30km away.

During the field survey of the plants from village Pimpri Sandas plants of the Family- Fabaceae were found to be dominant. The village is very much developed but the patches of the vegetation are conserved near the houses. Over all the region is dry and the members like *Acacia* are common.

Table No1. List of plants and family

Sr. No.	Name of the plant	Family
1	<i>Pongamia pinnata</i>	Fabaceae
2	<i>Ficus benghalensis</i>	Moraceae
3	<i>Ficus religiosa</i>	Moraceae
4	<i>Acacia khunara</i>	Fabaceae
5	<i>Cassia tora</i>	Fabaceae
6	<i>Zizyphus jujuba</i>	Rhamnaceae
7	<i>Azadirachta indica</i>	Meliaceae
8	<i>Melia azadirach</i>	Meliaceae
9	<i>Aternanthera sessilis</i>	Amaranthaceae
10	<i>Xanthium strumarium</i>	Asteraceae
11	<i>Sida cordifolia</i>	Malvaceae
12	<i>Sapathodia campanulata</i>	Bignoniaceae
13	<i>Combretum sp.</i>	Combretaceae
14	<i>Polygonum glabrum</i>	Polygonaceae
15	<i>Azalegia curasavica</i>	Apocynaceae
16	<i>Mangifera indica</i>	Anacardiaceae
17	<i>Polyalthia longifolia</i>	Annonaceae
18	<i>Albizia lebeck</i>	Fabaceae

Table No 2. Dominant Family of the area

Sr. No.	Name of the Family	No of Individuals
1	Fabaceae	04
2	Moraceae	02
3	Rhamnaceae	01
4	Meliaceae	01
5	Amaranthaceae	01
6	Asteraceae	01
7	Malvaceae	01
8	Bignoniaceae	01
9	Combretaceae	01
10	Polygonaceae	01
11	Apocynaceae	01
12	Anacardiaceae	01
13	Annonaceae	01

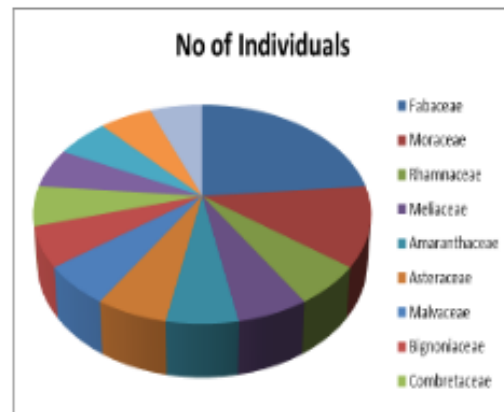


Figure No 1. Dominant Families of plants and their distribution

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Авторы заявляют, что у них нет конфликта интересов.

Investigating the effects of *Inonotus rickii* extracts on the muscle contraction intensity

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The aim of this study is to test the effect of aqueous, ethereal and alcoholic extracts of the fruit bodies of the wood-destroying fungus *Inonotus rickii* on locomotor activity resulting from contraction of both cross-striated and smooth muscles. The pharmacological activity of *I. rickii* raw materials was determined in vitro using the dose-response curve method (smooth muscles) and in experiments with oral intake of extracts (SNS-mediated effects on cross-lacing muscles). The aqueous extract of fungal material showed an increase in the motor activity of smooth muscles compared to standard caffeine, which indicates the ability of fungal extract to have a stimulating effect on the synapses. It was found that *I. rickii* extracts have an effect on smooth muscle contraction similar to the acetylcholine. It was shown that the greatest stimulating activity demonstrates an aqueous extract that may be a result of inhibitory effect of diethyl ether and ethanol on synapses. The described effects put on the agenda both the fractionation of active extracts and further experiments on the therapeutic applications of their described properties. As a field of possible application of this kind of substances can be considered the cardiovascular remodeling, the maintenance of smooth muscle tone during a number of surgical interventions, and the palliative cure of disseminated cancers.

KEYWORDS: acetylcholine; central nervous system; diazepam; caffeine; medicinal mushrooms; receptor agonists; stimulation of motor activity; *Inonotus*

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Smut fungi: a compendium of their diversity and distribution in India

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Abstract

A compendium of Indian smut fungi with respect to their diversity and distribution is provided in this paper. After compiling all the information available in online and offline resources, it was revealed that Indian smut fungi comprise 18 genera and 159 species belonging to five families. About 189 host plant species belonging to eight families are reportedly infected by smut fungi, *Poaceae* being the most infected. Similarly, *Ustilago* was reported with highest number of species (48) from India that accounts for 30.38 % of total number of species. *Ustilago* was followed by *Sporisorium* and *Anthracozytis*. Other genera recorded from India are *Ahmadiago*, *Bambusiomyces*, *Cintractia*, *Clinoconidium*, *Eriocaulago*, *Farysia*, *Franzpetrakia*, *Macalpinomyces*, *Melanopsichium*, *Melanotaenium*, *Moessziomyces*, *Pericladium*, *Stollia*, *Tolyposporium* and *Tranzscheliella*. Inaccessibility of literature on online platforms and ceased publications of many journals are the reasons for the dispersed literature of Indian smut fungi. This causes difficulties to researchers, especially young and emerging mycologists working on, or starting taxonomic work on smut fungi. The present paper provides a complete account of diversity and distribution of Indian smut fungi in a single-source document, for the benefit of national and international students and plant pathologists working on smut fungi.

Key words: *Basidiomycota*, checklist, diversity, India, smut fungi, *Ustilaginales*

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Indian Pucciniales: taxonomic outline with important descriptive notes

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Gautam AK, Avasthi S, Verma RK, Devadatha B, Jayawardena RS, Sushma, Ranadive KR, Kashyap PL, Bhadauria R, Prasher IB, Sharma VK, Niranjan M, Jeewon R 2021 – Indian Pucciniales: taxonomic outline with important descriptive notes. Mycosphere 12(1), 89–162, Doi 10.5943/mycosphe/12/1/12

Abstract

Rusts constitute a major group of the Kingdom Fungi and they are distributed all over the world on a wide range of wild and cultivated plants. It is the largest natural group of plant pathogens including 95% of the subphylum *Pucciniomycotina* and about 8% of all described Fungi. This article provides an overview and outline of rust fungi of India with important descriptive notes. After compilation of available literature on Indian rust fungi from various sources, it was observed that these fungi are distributed in 16 families, 69 genera and 640 species. They belong to *Coleosporiaceae*, *Crossosporaceae*, *Gymnosporangiaceae*, *Melampsoraceae*, *Milesinaceae*, *Ochropsoraceae*, *Phakopsoraceae*, *Phragmidiaceae*, *Pileolariaceae*, *Pucciniaceae*, *Pucciniastraceae*, *Raveneliaceae*, *Skierkaceae*, *Sphaerophragmiaceae*, *Tranzscheliaceae* and *Zaghouaniaceae*. There are still many rust fungi with uncertain taxonomic position, and they have been referred to *incertae sedis*. The placement of all fungal genera is provided at the class, order and family-level along with number of species in a genus. Notes for each rust family along with total Indian records and other taxonomic information on transferred genera and species are also presented. A phylogenetic analysis from a combined LSU and ITS dataset for 25 rust genera is presented to provide a better understanding of their phylogeny and evolution.

Key words – India – Phylogeny – *Pucciniomycotina* – rust fungi – Systematics

Introduction

Rust fungi (*Basidiomycota*, *Pucciniales*) are a highly diverse group of obligate biotrophic parasites, distributed in all geographical areas on a wide range of wild and cultivated plants ranging

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Discussion Concerning Key Terms in Systematic and Applied Mycology

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ABSTRACT: The recently introduced term “Funga” is discussed in relation to its use in systematic and applied mycology. Arguments for and against the use of this term are considered. The modern system of fungi and fungus-like organisms is analyzed in connection with the problems of terminology. Several terminologically problematic groups (e.g., DRIP, Opisthosporidia, slime mold lineages, Oomycota, and labyrinthulids) are also discussed. Two alternatives to use of the term Funga are comprehensively analyzed. At the same time, several Funga-derived terms are outlined. In order for a new term to become mainstream, it is necessary to use this term when creating a classical multivolume monograph elaboration of fungal taxa in various countries.

KEY WORDS: biodiversity, eukaryote supergroups, fauna, flora, funga, mycobiota, mycoflora, terminology

ABBREVIATIONS: DRIP, *Dermocystidium* + rosette agent + *Ichthyophonus* + *Psorospermium*; TSAR, telonemids + straminipiles + alveolates + rhizarians

I. INTRODUCTION

The present notice is intended to continue a discussion started on *IMA Fungus* pages with opening papers by Hawksworth¹ and Kuhar et al.,² who dedicated the proposal for wide use of the term “Funga.” They did this in order to substitute the term Mycobiota for Funga in fields where the term Flora (mycoflora) was previously used—that is, in a traditional field of biodiversity inventory and its biogeographic analysis as well as all of the applied fields. This problem is especially meaningful for fundamental works relevant in the long term, such as the creation of multivolume “Floras.”

A new direction set by Knudsen and Vesterholt,³ who introduced the term Funga, was enthusiastically followed by some authors.⁴ However, it is clear that the implementation of this proposal would face difficulties due to some avoidance of this term by authors for various reasons. Below, we will consider some possible reasons of this nature.

II. FUNGA: PRO ET CONTRA

The main arguments in favor of the term Funga are listed below:

- Fungi are traditionally considered as a separate kingdom of eukaryotes and require a separate general biological and related terminological approach.
- Fungi, plants, and animals are the most diverse groups of multicellular organisms and, if the terms Flora and Fauna traditionally correspond to species assemblages of the former, then fungal species assemblages require some equally short term that carries a conceptual significance.
- The term Mycobiota is not entirely successful for its composite characteristics, while “biota” is usually understood as the upper limit of the division in the synecological aspect but not in the

Role of extremozymes in bioremediation

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Abstract

The extremozymes are the enzymes from extremophilic microorganisms. The extremophilic organisms can survive under extreme conditions. These groups of microbes have ability to degrade xenobiotics like pesticides and remove heavy metals from different water environment. The wastewater released from various industries is much polluted and needs to be treated before disposal to the landfills or any other water bodies. Also, it is necessary that the waste water meets the environmental standards. The enzyme-based technology is gaining wide interest and enzymes from the extremophilic microorganisms have many advantages.

The review mentions the extremophilic microorganisms along with their classification and diversity of extremophiles in different regions of India. The role of extremozymes viz. cellulases, laccases, dioxygenases, monooxygenases, peroxidases, lipases, esterases, nitrilase in bioremediation and degradation of various compounds are mainly focused in the review. The molecular mechanisms of extremophiles for adaptation to extreme conditions and role of extremozymes in biomining are also described in the review. The extremozymes in biomining (bioleaching) will explore the availability of precious metals which will have industrial applications.

Keywords: Enzymes, Wastewater, Pollution, Environment, Biocatalysts, Landfills.

Introduction

Various pollutants are present in the industrial wastewaters due to which industries makes the wastewater contaminated. The industries like coal conversion, petroleum refining, resins and plastics, textiles, oil milling, tanning, mining, pulp and paper contribute to the pollution of industrial wastewater. These pollutants must be removed before the wastewater is discharged to the landfills or any other water bodies and also it is necessary to achieve the required environmental standards. The various physical and chemical techniques used to remove the pollutants from wastewater have disadvantages viz. high cost, formation of toxic by-products, removal efficiency is not good etc. Therefore, there is need for alternative approach to remove the pollutants from wastewater and therefore, enzyme-based approach is gaining popularity in this aspect. Since pollution

by organic compounds and heavy metals etc. is harmful to all the living beings and environment, research is therefore necessary in this aspect to study for minimization of pollution of water and also soil¹.

The bacteria and fungi along with their products like enzymes help in bioremediation². The enzymes are able to degrade variety of recalcitrant compounds under *in-vivo* conditions which involve the sorption and complexing of enzymes in soil. The main objective of the review paper here is to focus on the role of extremozymes from extremophilic microorganisms and their role in the bioremediation and biodegradation of various toxic compounds and pesticides.

Extremophilic microorganisms and their classification

The extremophiles are the microorganisms which live in the extreme environmental conditions. Based on their ability to adapt various environmental conditions, the extremophilic microorganisms are classified as acidophiles, alkaliphiles, endoliths, thermophile, hyperthermophiles, hypolith, metalotolerant, oligotrophs, piezophiles, psychrophiles, radioresistant, toxitolerant and xerophiles³. The diversity of extremophiles in different regions is shown in table 1. The classification of extremophiles is shown in figure 1.

Acidophiles are the microorganisms at pH below 3.0. Alkaliphiles are the microbes which live in the alkaline conditions (pH 9-11)⁴. Endoliths are the organisms which live inside the rock, coral and animal shell. Hyper thermophiles are the organisms that can grow at temperatures between 80-122 °C. The organisms which live beneath the rocks in cold deserts are known as hypolith. The organisms which can tolerate high levels of toxic metals are known as metallotolerant. The organism which grows in nutritionally limited environment is known as oligotroph. The organisms which tolerate high hydrostatic pressure are known as piezophiles.

The organisms which grow at temperatures of about -10 to 20°C are known as psychrophiles⁵. They are the cold environment loving microorganisms and found mostly in the Arctic and Antarctic oceans. The characteristic feature of the enzymes from psychrophiles is correlation of high catalytic activity and low thermal stability at moderate temperatures. The microorganisms which can tolerate high levels of ionizing radiation are known as radio resistant. The organisms which can tolerate high levels of toxic compounds are toxitolerant. The organisms which live in extreme dry environment are called as xerophiles.

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36. Title of Paper: Plants and Fungal Diversity from Pimpri Sandas, Pune district, Maharashtra

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Plants and Fungal Diversity from Pimpri Sandas, Pune District, Maharashtra

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ABSTRACT

Pimpri Sandas small village 1560.49 hectares in Haveli Tehsil. The survey of the locality has been done as a part of social activity and making general floristic awareness to the people from conservation point of view. In all total 18 plant species and 10 species of fungi and lichens were reported from which 08 are pure fungi and 02 are lichenised fungi. Basidiomycetous fungi and plants belongs to Fabaceae are found to be dominant in the locality. Some interesting saxicolous species like *Caloplaca* and *Rhizocarpon* are commonly found in this area.

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Introduction

Pimpri Sandas village is located in Haveli Tehsil of Pune district in Maharashtra, India. It is situated 30km away from sub-district headquarter Pune and 46km away from district headquarter Pune. As per 2009 stats, Pimpri Sandas is the gram panchayat of Pimpri Sandas village. The total geographical area of village is 1560.49 hectares. Pimpri Sandas has a total population of 3,392 peoples. There are about 645 houses in Pimpri Sandas village. Pune is nearest town to Pimpri Sandas which is approximately 30km away.

During the field survey of the plants from village Pimpri Sandas plants of the Family- Fabaceae were found to be dominant. The village is very much developed but the patches of the vegetation are conserved near the houses. Over all the region is dry and the members like *Acacia* are common.

Table No 2. Dominant Family of the area

Sr. No.	Name of the Family	No of Individuals
1	Fabaceae	04
2	Moraceae	02
3	Rhamnaceae	01
4	Meliaceae	01
5	Amaranthaceae	01
6	Asteraceae	01
7	Malvaceae	01
8	Bignoniaceae	01
9	Combretaceae	01
10	Polygonaceae	01
11	Apocynaceae	01
12	Anacardiaceae	01
13	Annonaceae	01

Table No1. List of plants and family

Sr. No.	Name of the plant	Family
1	<i>Pongamia pinnata</i>	Fabaceae
2	<i>Ficus benghalensis</i>	Moraceae
3	<i>Ficus religiosa</i>	Moraceae
4	<i>Acacia chinara</i>	Fabaceae
5	<i>Cassia tora</i>	Fabaceae
6	<i>Zizyphus jujuba</i>	Rhamnaceae
7	<i>Azadirachta indica</i>	Meliaceae
8	<i>Melia azadirach</i>	Meliaceae
9	<i>Alternanthera sesalis</i>	Amaranthaceae
10	<i>Xanthium strumarium</i>	Asteraceae
11	<i>Sida cordifolia</i>	Malvaceae
12	<i>Sapathodia campanulata</i>	Bignoniaceae
13	<i>Combretum sp.</i>	Combretaceae
14	<i>Polygonum glabrum</i>	Polygonaceae
15	<i>Asclepias curasavica</i>	Apocynaceae
16	<i>Mangifera indica</i>	Anacardiaceae
17	<i>Polyalthia longifolia</i>	Annonaceae
18	<i>Albizia lebbek</i>	Fabaceae

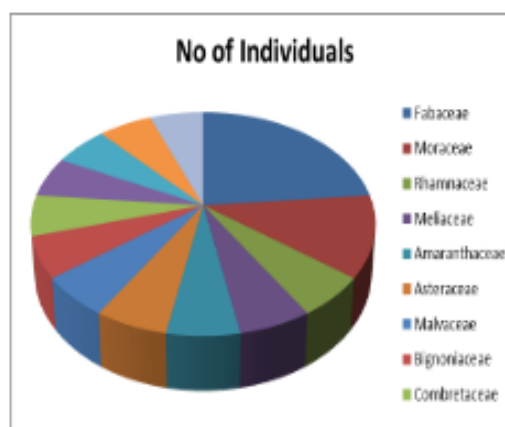


Figure No 1. Dominant Families of plants and their distribution

Author Name: Prof. Dr. Ranadive K. R.

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Current status of research on Rust fungi (*Pucciniales*) in India

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Abstract

Rust fungi show unique systematic characteristics among all fungal groups. A single species of rust fungi may produce up to five morphologically and cytologically distinct spore-producing structures thereby attracting the interest of mycologist for centuries. In India, the research on rust fungi started with the arrival of foreign visiting scientists or emigrant experts, mainly from Britain who collected fungi and sent specimens to European laboratories for identification. Later on, a number of mycologists from India and abroad studied Indian rust fungi and contributed a lot to knowledge of the rusts to the Indian Mycobiota. The establishment of Imperial Agricultural Research Institute (IARI) at Pusa (Bihar) in 1905 was the key achievement of pre-independent India which laid the foundation for many useful research on Indian rust fungi and in producing many renowned mycologists. This study presents the history of the study of rust fungi in India with complete information from various journals, books, websites and institutions involved. Detailed information of decadal publication records of rust fungi in India published in various journals have been included. Apart from the addition of a complete list of literature on Indian rust fungi, the future scope of research on rust fungi in India along with problems and challenges are also discussed. In a nutshell, this compendium will be quite useful for mycologists, especially beginners to find all available information on Indian rust fungi in one document.

Key words – fungi – history – Indian Mycology – mycological institutes – mycological websites and journals

Introduction

Fungi are valuable organisms which play an important ecological and economic role in decomposing, nutrients recycling and symbiotic association with higher plants. Endophytic as well as mycorrhizal fungi that help in growth and development inhabit almost every plant found on earth. Apart from beneficial aspects, fungi are among the major pathogens that cause many diseases

Author Name: Prof. Dr. Ranadive. K. R.

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RESEARCH ARTICLES

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CHECKLIST OF CULTIVATED ANGIOSPERMIC PLANTS FROM ANNASAHEB MAGAR MAHAVIDYALAYA CAMPUS, PUNE, MAHARASHTRA, INDIA

*Shirurkar D. D., Danai-Tambhale S. D. and **Ranadive, K. R.**

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ABSTRACT

Survey was conducted on cultivated angiospermic plants of Annasaheb Magar Mahavidyalaya campus. In all total 160 species representing 124 genera and 55 families were reported. From these 45 Dicots and 10 monocot families were reported. Apocynaceae, Euphorbiaceae and Caesalpinaceae from Dicots; Araceae from monocots were found to be dominant.

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INTRODUCTION

Annasaheb Magar Mahavidyalaya Hadapsar is one of the renowned educational institutions from Pune District Education Association's. It was established in the year 1971. Present survey was made to attempt checklist of cultivated angiospermic plant of the AMM campus. The survey of the AMM, based on the observations made in the years 2015 to 2018. The area of the premises is 05 acres. The main aim was conservation of the plant diversity. It also aims to enrich the plant diversity, aesthetic values and to popularise the botanical and common names of the plant among the students.

MATERIALS AND METHODS

The present checklist is based on the collection and observation of angiospermic plants during the year 2015 to 2018. The plants were propagated and cultivated by second year students of all faculties of the college.

Plant specimens were studied and identified in the botany laboratory with the help of standard taxonomic literature. All the families were identified & arranged according to Flora of Maharashtra State. (Singh et al. 2000)

RESULTS AND DISCUSSION

Check list of observed, identified plants and their families was given in Table no. 1. The graph reflects dominant plant families of the campus are Apocynaceae (11 species), Euphorbiaceae (10 species), Caesalpinaceae (07 species) from dicots and Araceae (11 species) from monocots were found to be dominant (Table 1, Fig. 1a and 1b). Survey of the campus represents the total 55 plant families. Among which 45 families belongs to Dicotyledons and 10 from Monocotyledons. 55 families represented by 124 genera and out of which 95 genera belong to Dicotyledons and 29 genera from monocotyledons (Table 2, Fig. 2a). In all College campus enriched with total number of 160 plant species. Among them 122 plant species reported from Dicotyledons and 38 plant species from monocotyledons

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Review Article

Coronavirus and Medical Ethics

Meghmala Waghmode¹, Neha Patil¹, Jaspal Kaur Oberoi^{2*} and Tooba Momin²

Abstract

Medical ethics has been followed in most of the nations from decades. But during COVID-19 pandemic situation, again every nation has to deal with the ethics related to categorize patients and health care distribution while maintaining community health. To solve the dilemma of consequentialist and non-consequentialist theories, major focus was driven on community health. But while looking at the rate of infected, cured and death, it's the alarming sign to India to strengthen the medical resources and follow the common good approach. Every Indian citizen's has the right to get proper treatment and funeral after death. Considering the problem associated with the spreading the virus through dead bodies, cremation was done by medical staff. Due to limited availability of medical staff and lack of electric furnace, many dead bodies were cremated after long time. Due to inadequate medical professionals and technical constraints, number of infectivity rate is increasing which is affecting economy, mental strength and social values. Hence, now we have to start thinking and working on strengthening of hospital, diagnostic labs and sophisticated cremation centers to avoid negligence and to follow ethics.

Keywords: Consequentialist; Triage Ethics; Corona; Medical Ethics; Covid-19

Introduction

COVID-19 outbreak due to the infection of the novel coronavirus, SARS-CoV-2 has attacked countless individuals in more than 173 countries and territories worldwide [1].

COVID-19 pandemic again raise the questions about the ethics related to medical profession. Concerns are associated with antibiotic stewardship, false lab report, ventilator availability, awareness program and cremation of

bodies. Prognostic theories suggested by French surgeon Dominique Jean Lorry, are suitable during this pandemic situation. These theories are

1. Death after treatment
2. Possibility of survival without treatment
3. Requisite of treatment for the survival.

Medical sorting protocols have been based on above categorical theories. Triage ethics deals with the prioritizing prospective

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Table No1. List of plants and family

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6	<i>Zizyphus jujuba</i>	Rhamnaceae
7	<i>Azadirachta indica</i>	Meliaceae
8	<i>Melia azadirach</i>	Meliaceae
9	<i>Alternanthera sessilis</i>	Amaranthaceae
10	<i>Xanthium strumarium</i>	Asteraceae
11	<i>Sida cordifolia</i>	Malvaceae
12	<i>Sapthodia campanulata</i>	Bignoniaceae
13	<i>Combretum sp.</i>	Combretaceae
14	<i>Polygonum glabrum</i>	Polygonaceae
15	<i>Aselepias curazavica</i>	Apocynaceae
16	<i>Mangifera indica</i>	Anacardiaceae
17	<i>Polyalthia longifolia</i>	Annonaceae
18	<i>Albizia lebbek</i>	Fabaceae

Table No 2. Dominant Family of the area

Sr. No.	Name of the Family	No of Individuals
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6	Asteraceae	01
7	Malvaceae	01
8	Bignoniaceae	01
9	Combretaceae	01
10	Polygonaceae	01
11	Apocynaceae	01
12	Anacardiaceae	01
13	Annonaceae	01

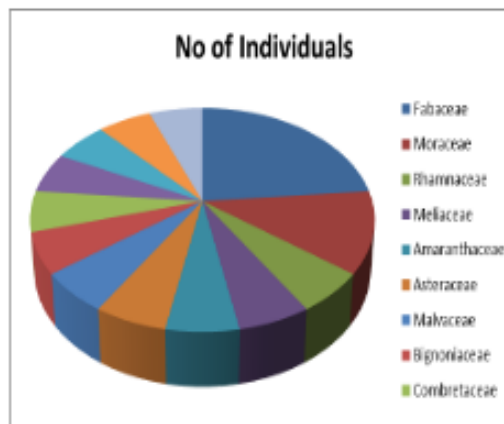


Figure No 1. Dominant Families of plants and their distribution

Role of extremozymes in bioremediation

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Abstract

The extremozymes are the enzymes from extremophilic microorganisms. The extremophilic organisms can survive under extreme conditions. These groups of microbes have ability to degrade xenobiotics like pesticides and remove heavy metals from different water environment. The wastewater released from various industries is much polluted and needs to be treated before disposal to the landfills or any other water bodies. Also, it is necessary that the waste water meets the environmental standards. The enzyme-based technology is gaining wide interest and enzymes from the extremophilic microorganisms have many advantages.

The review mentions the extremophilic microorganisms along with their classification and diversity of extremophiles in different regions of India. The role of extremozymes viz. cellulases, laccases, dioxigenases, monooxygenases, peroxidases, lipases, esterases, nitrilase in bioremediation and degradation of various compounds are mainly focused in the review. The molecular mechanisms of extremophiles for adaptation to extreme conditions and role of extremozymes in biomining are also described in the review. The extremozymes in biomining (bioleaching) will explore the availability of precious metals which will have industrial applications.

Keywords: Enzymes, Wastewater, Pollution, Environment, Biocatalysts, Landfills.

Introduction

Various pollutants are present in the industrial wastewaters due to which industries makes the wastewater contaminated. The industries like coal conversion, petroleum refining, resins and plastics, textiles, oil milling, tanning, mining, pulp and paper contribute to the pollution of industrial wastewater. These pollutants must be removed before the wastewater is discharged to the landfills or any other water bodies and also it is necessary to achieve the required environmental standards. The various physical and chemical techniques used to remove the pollutants from wastewater have disadvantages viz. high cost, formation of toxic by-products, removal efficiency is not good etc. Therefore, there is need for alternative approach to remove the pollutants from wastewater and therefore, enzyme-based approach is gaining popularity in this aspect. Since pollution

by organic compounds and heavy metals etc. is harmful to all the living beings and environment, research is therefore necessary in this aspect to study for minimization of pollution of water and also soil¹.

The bacteria and fungi along with their products like enzymes help in bioremediation². The enzymes are able to degrade variety of recalcitrant compounds under *in-vivo* conditions which involve the sorption and complexing of enzymes in soil. The main objective of the review paper here is to focus on the role of extremozymes from extremophilic microorganisms and their role in the bioremediation and biodegradation of various toxic compounds and pesticides.

Extremophilic microorganisms and their classification

The extremophiles are the microorganisms which live in the extreme environmental conditions. Based on their ability to adapt various environmental conditions, the extremophilic microorganisms are classified as acidophiles, alkaliphiles, endoliths, thermophile, hyperthermophiles, hypolith, metalotolerant, oligotrophs, piezophiles, psychrophiles, radioresistant, toxitolerant and xerophiles³. The diversity of extremophiles in different regions is shown in table 1. The classification of extremophiles is shown in figure 1.

Acidophiles are the microorganisms at pH below 3.0. Alkaliphiles are the microbes which live in the alkaline conditions (pH 9-11)⁴. Endoliths are the organisms which live inside the rock, coral and animal shell. Hyper thermophiles are the organisms that can grow at temperatures between 80-122 °C. The organisms which live beneath the rocks in cold deserts are known as hypolith. The organisms which can tolerate high levels of toxic metals are known as metallotolerant. The organism which grows in nutritionally limited environment is known as oligotroph. The organisms which tolerate high hydrostatic pressure are known as piezophiles.

The organisms which grow at temperatures of about -10 to 20°C are known as psychrophiles⁵. They are the cold environment loving microorganisms and found mostly in the Arctic and Antarctic oceans. The characteristic feature of the enzymes from psychrophiles is correlation of high catalytic activity and low thermal stability at moderate temperatures. The microorganisms which can tolerate high levels of ionizing radiation are known as radio resistant. The organisms which can tolerate high levels of toxic compounds are toxitolerant. The organisms which live in extreme dry environment are called as xerophiles.

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42. Title of Paper: Role of Immobilisation in Biodegradation of Surfactant Using Bacterial Whole Cell and Purified Enzyme for Water Treatment Planning



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Research Paper

Role of Immobilization in Biodegradation of Surfactant Using Bacterial Whole Cell and Purified Enzyme for Water Treatment Planning

Shubhangi R. Shinde*¹

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ABSTRACT

The widespread use of detergents increasing the global concern regarding its environmental pollution brought about by their active ingredients. Since detergents are pollutants, it is essential to degrade them by biological means. In the present study, we reported 16S rRNA gene sequencing-based *S. aureus* SS1 and *P. aeruginosa* SS2 able to degrade >90% of surfactant once immobilized in alginate and agar gel cubes evidenced by reduced total dissolved solids and chemical oxygen demand. Detergent free water received from *S. aureus*, and *P. aeruginosa* treatment also used to grow wheat seed and found to be promising for increasing vigour index.

Key words: Immobilization, Detergent, Degradation, Plant growth

The toxic nature of surfactants making them potent pollutants. The detergent containing wastewater is rich phosphorous and can impact severely on the environment [1]. Detergents now widely concentrated in soil and water hence directly affects ecosystem nearby. Detergents can lead to foaming, eutrophication, and able to alter the pH, temperature and surface tension, and their negative effects need to be managed by various means [2]. Detergents are reported to severely affect fish proteomics, especially of serum, liver and heart tissues. Hence the presence of detergents in the aquatic ecosystem needs to be tackled by scientific approach [3]. In a natural remedy agent like bacteria now extensively studied to degrade detergents under various model studies. The bacterial species like *Pseudomonas sp.*, *Micrococcus luteus* and *Citrobacter sp.* noted as detergent degrader once isolated from freshwater bodies [4]. Sodium dodecyl sulphate degrader identified as *Bacillus cereus* strain reported for surfactant removal from water bodies [5]. In the present study efficiency of immobilized detergent degrader, bacterial species/derived enzyme noted for detergent degradation. Further treated water checked for wheat plant growth to record the overall performance of bacterial species under investigation and to note the role of immobilization carried out by alginate and agar.

MATERIALS AND METHODS

In the present study, detergent degrader bacterial species present in the contaminated water sampled and analyzed for their enzyme activity and water treatment possibility.

Isolation of Bacterial species

The high concentration of detergent in water, creating an environment for the bacterial species to survive and able to degrade detergent. Hence attempt been made to sample water from Pune city and based on culturing to the basal medium broth added with 1% detergent, and isolates been enriched. The preparation kept static for 48 hours at 30°C during process. Upon incubation, 1 ml of sample inoculated on basal medium agar supplemented with 1% detergent and incubated at 30°C for 48 hours to record the bacterial growth.

Isolation of Bacterial species by 16S rRNA: The isolate obtained from the water able to grow in the presence of detergent further identified by 16S rRNA gene sequencing as per protocol reported by [6].

Immobilization of Bacterial cell and enzymes


As per 16S rRNA gene sequencing isolate SS1 identified as *Staphylococcus aureus* and SS2 as *Pseudomonas aeruginosa*. Both of the isolates able to express alkyl sulphatase enzyme capable of degrading alkyl sulphate (synthetic surfactant) majorly used in industry and categorized as a pollutant. In the study effect of immobilization on the degradation of 1% SDS by the enzyme/cells noted by MBAS assay. The detailed protocol has given below:

Immobilization with sodium alginate beads: In the preparation of 3% sodium alginate suspension weighed 0.9 g of sodium alginate dissolved in 30 ml boiling water and autoclaved at 121°C for 15 min. The cooled suspension then added with 47 µl cell suspension and kept stirring for 10 minutes. The mixture then transferred to a sterile syringe and added to chilled 0.2 M CaCl₂ solution from 5 cm height with constant stirring. Obtained beads then kept for curing at 4°C

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43. Title of Paper: Effect of Nicotine on Cytokine Production by Human Mononuclears: Perspective of COVID-19



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Effect of Nicotine on Cytokine Production by Human Mononuclears: Perspective of COVID-19

Waghmode Meghmala S.¹, Divekar Akshay B.², Dhasade Akshay Y.³,
Mulani Mansurali K.⁴, Patil Neha N.^{2*}

Abstract

Nicotine is present in the tobacco-containing products such as cigars, cigarettes, chewing tobacco, snus (an oral tobacco) and pipe tobacco. In Indian population, nicotine containing products are consumed by the 57% of population either in chewing form or smoking form. The correlation of nicotine and lung cancer in chronic smokers as well as nicotine consumption and COVID-19 incidence has to be justified. Hence current research was carried to study the effect of nicotine on cytokine production by peripheral blood mononuclear cells (PBMC's). MACSPlex Cytokine12 assay was used for the estimation of cytokine after treatment of PBMC's with the nicotine. Concentration of cytokines (IL 10, IL 12p70, IL 17, IFN α , IFN γ , GM CSF, IL 4, IL 5, IL 2 and IL 9) was found to be increased in the sample containing PBMC's treated with the 20 μ l of nicotine indicating that nicotine promotes PBMC's for the secretion of IL 10, IL 12p70, IL 17, IFN α , IFN γ , GM CSF, IL 4, IL 5, IL 2 and IL 9 but it impedes the production of IL 6 and TNF α the important pro-inflammatory cytokines. IL 6 and TNF α are the important pro-inflammatory cytokines in COVID-19 infection being responsible to switch the infection from mild to a fatal one. The impeding characteristics of nicotine can be proposed to have potential of pharmaceutical nicotine as a future treatment option in COVID-19. The detailed studies are needed for developing nicotine patches as a prospective cytokine release syndrome (CRS) therapy for COVID-19 to combat this dreadful pandemic.

Keywords: Cancer, COVID-19, cytokine, nicotine, immunity

INTRODUCTION

Consumption of nicotine containing products by small children and aged people is global concern due to its side effects on health. Higher nicotine content has been reported in smoking form of tobacco as compared to chewing form [1]. Absorption of nicotine occurs both through the buccal mucosa and the gastrointestinal tract in tobacco chewers whereas absorption of nicotine occurs primarily through the pulmonary vasculature in tobacco smokers.

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During chewing of tobacco, the nicotine in tobacco preparations remains in contact with oral mucosa for long period of time and absorbed by the tobacco chewer. Hence even though the content of nicotine is less than the smoke forms, it is responsible for carcinogenic effects. In saliva the tobacco-specific N-nitrosamines are extracted easily and there is increase in absorption in alkaline conditions in case of tobacco chewers as compared to smokers.

Pandemic situation posed due to SARS-CoV-2, leads to find the strategies to control cytokine release

Author Name: Dr. Shinde S. R.

44. Title of Paper: Effect of Phosphate Solubilisation on Biodegradation Efficiency of Organophosphorus Pesticide

Effect of Phosphate Solubilization on Biodegradation Efficiency of Organophosphorus Pesticide (Dimethoate)

Shinde S. R. and Bhailume M. V.

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Biobleaching of electronic waste

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ABSTRACT: Increase in advanced electronic technology leads to environmental issues related with its disposal. Electronic waste i.e., video card and random access memory were used for studying extraction of precious metals using *Paenibacillus* sp. Metal contaminated soil was used for the isolation of exopolysaccharide producing strains. The isolate was identified as *Paenibacillus* sp. based on morphological, biochemical tests and 16S rRNA sequencing. Metal content analysis of soil and e-waste was carried out using X-ray Fluorescence spectroscopy. The vanadium element was more in the soil sample which was 0.487 mg/g and in electronic waste sample copper content was more which was 250 mg/g. *Paenibacillus* sp. produced capsule which was observed under bright, dark field and phase contrast microscope. Scanning electron microscopy was done for the study of morphological changes of exopolysaccharide producing *Paenibacillus* sp. in chitin broth and on chitin agar medium with and without e-waste. The Fourier Transform Infrared Spectroscopy analysis of exopolysaccharide produced by *Paenibacillus* sp. grown on chitin agar and chitin agar with e-waste showed presence of different functional groups. The one step and two step biobleaching experiments were carried out for testing efficacy of biomass on metal leaching. *Paenibacillus* sp. showed its potential for the extraction of precious metals viz., gold, silver and copper from electronic waste. *Paenibacillus* sp. recovered gold (0.001%), cadmium (45%), copper (50%), iron (46%), manganese (88%), palladium (56.9%) and zinc (87.12%) by two step fermentation. The study is useful for the biobleaching of precious metals from electronic waste.

Keywords: Exopolysaccharides, Microbial extraction, *Paenibacillus*, Bioflocculation, Eco-friendly.

INTRODUCTION

Advancement in technology leads to progressive use of electrical and electronic equipment which leads to generation of electronic waste (e-waste). Around 50 million tons of e-waste generates worldwide. The disposal of e-waste is a major challenge as it contains many toxic elements viz., lead, mercury, arsenic, cadmium, selenium,

chromium, etc. Management of e-waste has now become a serious concern in developed as well as developing countries. Precious metal content, energy requirement and pollution control measures enable to recycle the waste rather than using it for landfilling purposes. For the recovery of metals there are number of processes viz., mechanical separation, pyrometallurgical, hydrometallurgical and bio-hydrometallurgical. These processes have

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Review Article

Coronavirus and Medical Ethics

Meghmala Waghmode¹, Neha Patil², Jaspal Kaur Oberoi³ and Tooba Momin²

Abstract

Medical ethics has been followed in most of the nations from decades. But during COVID-19 pandemic situation, again every nation has to deal with the ethics related to categorize patients and health care distribution while maintaining community health. To solve the dilemma of consequentialist and non-consequentialist theories, major focus was driven on community health. But while looking at the rate of infected, cured and death, it's the alarming sign to India to strengthen the medical resources and follow the common good approach. Every Indian citizen's has the right to get proper treatment and funeral after death. Considering the problem associated with the spreading the virus through dead bodies, cremation was done by medical staff. Due to limited availability of medical staff and lack of electric furnace, many dead bodies were cremated after long time. Due to inadequate medical professionals and technical constraints, number of infectivity rate is increasing which is affecting economy, mental strength and social values. Hence, now we have to start thinking and working on strengthening of hospital, diagnostic labs and sophisticated cremation centers to avoid negligence and to follow ethics.

Keywords: Consequentialist; Triage Ethics; Corona; Medical Ethics; Covid-19

Introduction

COVID-19 outbreak due to the infection of the novel coronavirus, SARS-CoV-2 has attacked countless individuals in more than 173 countries and territories worldwide [1].

COVID-19 pandemic again raise the questions about the ethics related to medical profession. Concerns are associated with antibiotic stewardship, false lab report, ventilator availability, awareness program and cremation of

bodies. Prognostic theories suggested by French surgeon Dominique Jean Lorry, are suitable during this pandemic situation. These theories are

1. Death after treatment
2. Possibility of survival without treatment
3. Requisite of treatment for the survival.

Medical sorting protocols have been based on above categorical theories. Triage ethics deals with the prioritizing prospective

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47. Title of Paper: Isolation of Sodium Dodecyl Sulphate Degradator from the Contaminated Water Sample and its Bioassay



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Research Paper

Isolation of Sodium Dodecyl Sulphate Degradator from the Contaminated Water Sample and its Bioassay

Shubhangi R. Shinde*¹

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ABSTRACT

Detergents one of the most commonly used chemicals in the household, pharmaceuticals, cosmetics, and in agriculture- finding its success in many ways. However, with increasing use, it is increasingly concentrating in the environment and now grouped in significant pollutant. Hence it is essential to degrade the accumulated detergent by biological means. In this study, detergent contaminated water sample found to be positive for bacterial species able to degrade sodium dodecyl sulphate (SDS). We identified those species as *Staphylococcus aureus* SS1 and *Pseudomonas aeruginosa* SS2 and appeared to be efficient degrader of SDS within ten days at high concentration (about 1% of total volume). As per Fourier Transform InfraRed spectroscopy and Thin Layer Chromatography, SDS is degraded to dodecanoyl by these bacterial species and exhibit exceptional capabilities to become resistant and further breaks SDS, and hence those are considered as a source for biotechnological tools to bring about cheap bioremediation for industrial applications in coming time.

Key words: Detergent, Degradation, Sodium dodecyl sulphate, Bacteria

Surfactants represent their uniqueness of amphiphilic nature. This property makes them capable- interface between water and oil, air and water and thereby lowers the surface tension. Once present in aqueous solution, surfactants represent its anionic, non-ionic, cationic or amphoteric classes [1]. The surfactants being anionic represent low price and widely used in pharmaceuticals, cosmetics, agriculture, household properties. Since they are now increasing in use resultant getting accumulated in aquatic and terrestrial environments, becoming toxic to the living organisms [2]. The real problem of surfactants is its large quantity accumulating in sewage treatment plants, which influences physiological and biological processes in water purification [3]. Detergents can very easily interact with intracellular components of living organisms by bringing about electrostatic or hydrophobic interactions, making them toxic [4]. Even though we know detergents are toxic, still they prominently used in increasing water solubility, and for bioavailability of xenobiotics. In this content, SDS is widely used in soil bioremediation [5-6].

Numerous reports are mentioning the bacterial role in degrading surfactants, for example, *Klebsiella oxytoca* [7]; *Pseudomonas strains* [8-10]. These microorganisms are prominently isolated from the detergent contaminated environment and reported to be a potential source for them. In the present study, we have sampled the detergent contaminated water, assuming that microorganisms inhabiting this water should contain features to degrade detergents. Further, we reported the potential degradation of SDS and bio-

products formed from them.

MATERIALS AND METHODS

Sampling of bacterial species

Since the detergent stands one of the pollutants, its degrader biological species isolation (Bacteria) carried out from the contaminated water source, Pune India. The water sample immediately processed for bacterial species isolation.

Enrichment

Collected 5 ml of water sample inoculated to sterile 50 ml basal medium broth containing 1% detergent mainly in 250 ml Erlenmeyer flask. For 1% detergent, different makes of it utilized namely (brand name) Sodium dodecyl sulphate, Wheel, Rin, Nirma and Ghadi. Once the inoculation made, flask kept static for 48 hours for the enrichment of culture in the presence of detergent while maintained at 30°C.

Isolation of Detergent degrader

The sample from enrichment broth inoculated on the sterile basal plates supplemented with given detergent in 1% concentration. After that by 48hrs of inoculation, plates were flooded with Lugol's iodine solution, and colonies were recorded for the formed zone of degradation around the colonies.

Morphological and biochemical analysis


Selected isolates then Gram-stained, and biochemically tested with Gelatin hydrolysis, Catalase test, Oxidase test, Methyl red, Voges Proskauer's test, Urease test, Nitrate

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48. Title of Paper: Effect of Nicotine on Cytokine Production by Human Mononuclears: Perspective of COVID-19



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Effect of Nicotine on Cytokine Production by Human Mononuclears: Perspective of COVID-19

Waghmode Meghmala S.¹, Divekar Akshay B.², Dhasade Akshay Y.³,
Mulani Mansurali K.⁴, Patil Neha N.^{1*}

Abstract

Nicotine is present in the tobacco-containing products such as cigars, cigarettes, chewing tobacco, snus (an oral tobacco) and pipe tobacco. In Indian population, nicotine containing products are consumed by the 57% of population either in chewing form or smoking form. The correlation of nicotine and lung cancer in chronic smokers as well as nicotine consumption and COVID-19 incidence has to be justified. Hence current research was carried to study the effect of nicotine on cytokine production by peripheral blood mononuclear cells (PBMC's). MACSPlex Cytokine12 assay was used for the estimation of cytokines after treatment of PBMC's with the nicotine. Concentration of cytokines (IL 10, IL 12p70, IL 17, IFN α , IFN γ , GM-CSF, IL 4, IL 5, IL 2 and IL 9) was found to be increased in the sample containing PBMC's treated with the 20 μ l of nicotine indicating that nicotine promotes PBMC's for the secretion of IL 10, IL 12p70, IL 17, IFN α , IFN γ , GM-CSF, IL 4, IL 5, IL 2 and IL 9 but it impedes the production of IL 6 and TNF α the important pro-inflammatory cytokines. IL 6 and TNF α are the important pro-inflammatory cytokines in COVID-19 infection being responsible to switch the infection from mild to a fatal one. The impeding characteristics of nicotine can be proposed to have potential of pharmaceutical nicotine as a future treatment option in COVID-19. The detailed studies are needed for developing nicotine patches as a prospective cytokine release syndrome (CRS) therapy for COVID-19 to combat this dreadful pandemic.

Keywords: Cancer, COVID-19, cytokine, nicotine, immunity

INTRODUCTION

Consumption of nicotine containing products by small children and aged people is global concern due to its side effects on health. Higher nicotine content has been reported in smoking form of tobacco as compared to chewing form [1]. Absorption of nicotine occurs both through the buccal mucosa and the gastrointestinal tract in tobacco chewers whereas absorption of nicotine occurs primarily through the pulmonary vasculature in tobacco smokers.

During chewing of tobacco, the nicotine in tobacco preparations remains in contact with oral mucosa for long period of time and absorbed by the tobacco chewer. Hence even though the content of nicotine is less than the smoke forms, it is responsible for carcinogenic effects. In saliva the tobacco-specific N-nitrosamines are extracted easily and there is increase in absorption in alkaline conditions in case of tobacco chewers as compared to smokers.

Pandemic situation posed due to SARS-CoV-2, leads to find the strategies to control cytokine release

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49. Title of the Paper: Studies on Cytokine Production in Gutkha & Panmasala Chewers

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Original Article

Studies on Cytokine Production in Gutkha and Panmasala Chewers

Abstract

Introduction: Panmasala is one of the products which have been favored by the people of all ages in Indian. It contains areca nut, lime, flavoring agents and catechu. It holds a prominent place in Indian market. It has been reported to affect human health by causing oral cancer and dysfunctioning of vital organs. **Materials and methods:** Current research was carried on testing the effect of saliva of panmasala enters on cytokine production by peripheral blood mononuclear cells (PBMC's). Panmasala (Vimal) and Gutkha (RMD) were used for the study of cytokine modulation. MACSPlex Cytokine12 assay was used for the estimation of cytokine after treatment of PBMC's with the saliva of panmasala enter. **Results:** Concentration of cytokines (IL 10, IL 12, L 17, IFN α , IFN γ , TNF α , GM CSF, IL 4, IL 6, IL 5, IL 2 and IL 9) was found to be increased in the sample containing PBMC's treated with the saliva of panmasala. **Conclusion:** Based on the findings supported with the statistical analysis, it can be concluded that panmasala and gutkha have negative impact on immune function. There is a strong need to generate social awareness about health hazards of pan masala and gutkha.

Keywords: Cytokines, gutkha, immunity, oral cancer, panmasala

Introduction

In India panmasala, betel quid and gutkha are favorite products in rural as well as urban areas.^[1] Panmasala is dehydrated product made using catechu, areca nut, slaked lime (calcium oxide and calcium hydroxide), cardamom, artificial perfuming, and flavoring substances.^[2] Chewing of betel quid or its variants such as pan masala, gutkha (mitha pan) kiwam and zarda, leads to oral submucous fibrosis (OSMF) which resulted in difficulty in mouth opening.^[3] OSMF is the previous stage of oral cancer. Oral cancer is the eleventh most widespread cancer worldwide^[4] (WHO 2005). According to the study undertaken in the Department of Oral Pathology, Patna Dental College and Hospital, Patna, where total 50 cases of the patient diagnosed with the OSMF were evaluated to find out the relation between OSMF and chewing habit of areca nut or its products. Based on the histopathological examination of biopsy tissue from oral mucosa, researchers concluded that incidence of OSMF in gutkha chewers is far faster and more rigorous as compared in areca nut products chewers.^[5]

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Research has been carried out on the studies of malignant transformation of OSMF into oral squamous cell carcinoma (OSCC).^[6] A significant finding has been recorded about the correlation between areca and gutkha chewing with the prevalence of OSCC where males are more susceptible.^[6]

Oral cancer is often preceded by the disorder known as Oral Potentially Malignant Disorders (OPMDs). The multistep neoplasia "OSCC" has scores of genetic and epigenetic changes allied to cancerous transformation. They are "OPMDs found out to be erythroplakia, oral leukoplakia, and skin rash triggered by the immune system (lichen planus). Studies have been carried out on proinflammatory cytokines in saliva as prospective biomarkers of OPMDs and OSCC.^[6-9] Tumor necrosis factor (TNF)- α is a cytokine with diverse effects. The important components in malignant transformation process^[10] are inflammation, angiogenesis, programmed cell death, and proliferation. The TNF-TNF receptor system plays a significant role in these malignant transformation process.^[10] The TNF- α has been found to damage DNA of cells. This results in malignant transformation due to induction of reactive oxygen species.^[11] Moreover, TNF family members contribute to immune

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Role of microorganisms in Vedic astrology: Mini review

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Abstract

Vedic astrology which is one of the most important study in India. Since ancient times, in India rituals were suggested as per the planets and other cosmic influences. Planets have the influence at cell level, eukaryotic, prokaryotic as well as viruses. Beside the concept of nakshatra tree, in this paper emphasis is given on the role of microorganisms in astrology. As a part of ritual, we are using the microbial products or processes. Microorganisms are also mentioned in Vedas. Biomineralization derived crystals has been suggested for healing practices. Meteorite-microbial interaction has also been reported which suggests extra-terrestrial existence of microorganisms.

Keywords: Microorganisms, astrology, biomineralization, crystals, meteorites

Introduction

Microorganisms are tiny living things that proved their terrestrial as well as extra-terrestrial life. Meteorites which has origin in outer space, has also been reported to have presence of Actinobacteria *Rubrobacter radiotolerans*, Proteobacteria and Bacteroidetes, iron/sulfur cycling organisms *Geobacter* spp. and *Desulfovibrio* spp (Tait *et al.*, 2017) ^[1]. Microbial fingerprint on extraterrestrial material, meteorites suggests the possibility of interaction of microorganisms with meteorites (from asteroids, Moon, or Mars) and subsequent mineralization (Milojevic *et al.*, 2019) ^[2].

Since ancient times, India has some traditional astrological remedies which uses fermented foods and microbial products or processes (biomineralization). This review is based on the interconnection of microbiology and astrology. There are main 7 planets viz., Sun, Moon, Mars, Mercury, Jupiter, Venus, Saturn and 2 shadow planets viz., Rahu and Ketu. Reference of microorganisms in Vedas is as "adrishta krimi" (Jakhmola, 2010) ^[3] where positive and negative aspects of them are available. As per the available report, not only human being but also small creatures like bacteria, virus are under the influence of planets and shows behavior accordingly. Planets also influences the growth of the cell. Considering the microorganisms, bacterial growth curve always has variations due to Kuja dosha (Planet: Mars) (Vegaraju *et al.*, 2020) ^[4]. Eclipses particularly solar eclipses has massive effect on the growth of bacteria and viruses (Vegaraju *et al.*, 2019) ^[5].

In this paper, more emphasis is given on Indian Vedic rituals for planets and associated microorganisms, by which we can put some light on microorganism's involvement for human wellbeing. Microorganisms are ubiquitous in nature. Microorganisms play both the beneficial as well as malefic role as that of planets. Some microorganisms play the role as probiotic i.e. microorganisms for life. These probiotics are especially present in fermented foods like pickle, curd, idli etc. As per the planets nature, tree and food has been suggested.

In India, there is concept to worship Nakshatra Tree (Āradhya Vruksha) for each group of people born under specific constellation. There are main Nakshatras which show astronomical signatures and have profound effect on human's nature (Table 1). Worshipping Nakshatra concept is like connecting the human inner environment with the nature by which Chakras (energy centers of body) can be activated (Gupta *et al.*, 2016) ^[6]. Microbiologists are doing the research on activities or contents in Āradhya Vruksha aided by microorganisms' involvement (Gupta *et al.*, 2016; Kakaḍe and Chaphalkar, 2017) ^[6-7]. Consumption of fermented foods like pickles, vinegars, and dry wines has been suggested to reduce the malefic effect of Saturn (<https://kripahu.org>).

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51. Title of Paper: Bioleaching of Electronic Waste

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Bioleaching of electronic waste

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ABSTRACT: Increase in advanced electronic technology leads to environmental issues related with its disposal. Electronic waste i.e., video card and random access memory were used for studying extraction of precious metals using *Paenibacillus* sp. Metal contaminated soil was used for the isolation of exopolysaccharide producing strains. The isolate was identified as *Paenibacillus* sp. based on morphological, biochemical tests and 16S rRNA sequencing. Metal content analysis of soil and e-waste was carried out using X-ray Fluorescence spectroscopy. The vanadium element was more in the soil sample which was 0.487 mg/g and in electronic waste sample copper content was more which was 250 mg/g. *Paenibacillus* sp. produced capsule which was observed under bright, dark field and phase contrast microscope. Scanning electron microscopy was done for the study of morphological changes of exopolysaccharide producing *Paenibacillus* sp. in chitin broth and on chitin agar medium with and without e-waste. The Fourier Transform Infrared Spectroscopy analysis of exopolysaccharide produced by *Paenibacillus* sp. grown on chitin agar and chitin agar with e-waste showed presence of different functional groups. The one step and two step bioleaching experiments were carried out for testing efficacy of biomass on metal leaching. *Paenibacillus* sp. showed its potential for the extraction of precious metals viz., gold, silver and copper from electronic waste. *Paenibacillus* sp. recovered gold (0.001%), cadmium (45%), copper (50%), iron (46%), manganese (88%), palladium (56.9%) and zinc (87.12%) by two step fermentation. The study is useful for the bioleaching of precious metals from electronic waste.

Keywords: Exopolysaccharides, Microbial extraction, *Paenibacillus*, Bioflocculation, Eco-friendly.

INTRODUCTION

Advancement in technology leads to progressive use of electrical and electronic equipment which leads to generation of electronic waste (e-waste). Around 50 million tons of e-waste generates worldwide. The disposal of e-waste is a major challenge as it contains many toxic elements viz., lead, mercury, arsenic, cadmium, selenium,

chromium, etc. Management of e-waste has now become a serious concern in developed as well as developing countries. Precious metal content, energy requirement and pollution control measures enable to recycle the waste rather than using it for landfilling purposes. For the recovery of metals there are number of processes viz., mechanical separation, pyrometallurgical, hydrometallurgical and bio-hydrometallurgical. These processes have

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52. Title of Paper: Effect of Phosphate Solubilisation on Biodegradation Efficiency of Organophosphorus Pesticide

Effect of Phosphate Solubilization on Biodegradation Efficiency of Organophosphorus Pesticide (Dimethoate)

Shinde S. R. and Bhailume M. V.

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53. Title of the Paper: Studies on Cytokine Production in Gutkha & Panmasala Chewers

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Original Article

Studies on Cytokine Production in Gutkha and Panmasala Chewers

Abstract

Introduction: Panmasala is one of the products which have been favored by the people of all ages in Indian. It contains areca nut, lime, flavoring agents and catechu. It holds a prominent place in Indian market. It has been reported to affect human health by causing oral cancer and dysfunctioning of vital organs. **Materials and methods:** Current research was carried on testing the effect of saliva of panmasala eaters on cytokine production by peripheral blood mononuclear cells (PBMC's). Panmasala (Vimal) and Gutkha (RMD) were used for the study of cytokine modulation. MACSPlex Cytokine12 assay was used for the estimation of cytokine after treatment of PBMC's with the saliva of panmasala eater. **Results:** Concentration of cytokines (IL 10, IL 12, L 17, IFN α , IFN γ , TNF α , GM CSF, IL 4, IL 6, IL 5, IL 2 and IL 9) was found to be increased in the sample containing PBMC's treated with the saliva of panmasala. **Conclusion:** Based on the findings supported with the statistical analysis, it can be concluded that panmasala and gutkha have negative impact on immune function. There is a strong need to generate social awareness about health hazards of pan masala and gutkha.

Keywords: Cytokines, gutkha, immunity, oral cancer, panmasala

Introduction

In India panmasala, betel quid and gutkha are favorite products in rural as well as urban areas.^[1] Panmasala is dehydrated product made using catechu, areca nut, slaked lime (calcium oxide and calcium hydroxide), cardamom, artificial perfuming, and flavoring substances.^[2] Chewing of betel quid or its variants such as pan masala, gutkha (mitha pan) kiwam and zarda, leads to oral submucous fibrosis (OSMF) which resulted in difficulty in mouth opening.^[3] OSMF is the previous stage of oral cancer. Oral cancer is the eleventh most widespread cancer worldwide^[4] (WHO 2005). According to the study undertaken in the Department of Oral Pathology, Patna Dental College and Hospital, Patna, where total 50 cases of the patient diagnosed with the OSMF were evaluated to find out the relation between OSMF and chewing habit of areca nut or its products. Based on the histopathological examination of biopsy tissue from oral mucosa, researchers concluded that incidence of OSMF in gutkha chewers is far faster and more rigorous as compared in areca nut products chewers.^[5]

Research has been carried out on the studies of malignant transformation of OSMF into oral squamous cell carcinoma (OSCC).^[6] A significant finding has been recorded about the correlation between areca and gutkha chewing with the prevalence of OSCC where males are more susceptible.^[7]

Oral cancer is often preceded by the disorder known as Oral Potentially Malignant Disorders (OPMDs). The multistep neoplasia "OSCC"⁸ has scores of genetic and epigenetic changes allied to cancerous transformation. They are "OPMDs found out to be erythroplakia, oral leukoplakia, and skin rash triggered by the immune system (lichen planus). Studies have been carried out on proinflammatory cytokines in saliva as prospective biomarkers of OPMDs and OSCC.⁹⁻¹¹ Tumor necrosis factor (TNF)- α is a cytokine with diverse effects. The important components in malignant transformation process^[10] are inflammation, angiogenesis, programmed cell death, and proliferation. The TNF-TNF receptor system plays a significant role in these malignant transformation process.^[10] The TNF- α has been found to damage DNA of cells. This results in malignant transformation due to induction of reactive oxygen species.^[11] Moreover, TNF family members contribute to immune

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विविध क्षेत्रातील उद्योजगता

प्रा. ससाणे अशोक नामदेव
अर्थशास्त्र विभाग,
अनंतराव पवार महाविद्यालय,
पिरंगुट ता. मुळशी,
जि. पुणे ४१२११५

प्रस्तावना :-

भारतासारख्या विकसनशील देशामध्ये मिश्र अर्थव्यवस्था आहे. उद्योजक वेगवेगळ्या क्षेत्रांमध्ये उत्पादन करून देशाच्या आर्थिक विकासाला हातभार लावतात. त्याचप्रमाणे वेगवेगळ्या क्षेत्रांमध्ये उत्पादन करून देशाला स्वावलंबी बनवतात. उद्योग वाढल्यामुळे बेकारी, नवीन रोजगार संधी, गुंतवणूक प्रेरणा व आर्थिक विकास यामध्ये मोठ्या प्रमाणावर बदल होतात. त्यातून आर्थिक विकास साध्य होतो. नवनीत उद्योग सुरु झाल्यामुळे विविध प्रकारच्या वस्तुचे उत्पादन बाजारपेठामध्ये येऊ लागल्याने ग्राहकांना नाविन्यपूर्ण वस्तु छरेदी करता येतात. बाजारपेठांचा विस्तार वाढतो. लोकांच्या राहणीमाणात वाढ होते. औद्योगिकरण वाढल्याने जनतेमध्ये उद्योजकीय प्रवृत्ती वाढीस लागते.

भारतासारख्या विरतीर्ण देशामध्ये आज बेरोजगारांची प्रचंड संख्या आहे. यामध्ये दिवसेंदिवस वाढ होत असताना रिता, सार्व प्रशिक्षित व सुशिक्षित तरुणांना रोजगार मिळणे शक्य नाही. यासाठी आजच्या तरुणांनी महाविद्यालयीन शिक्षण किंवा व्यवसायीक कोर्स पूर्ण केल्यानंतर नोकरीच्या मागे न धावता नवीन उद्योग सुरु करून उद्योजक होणे हा एक चांगला बहुमोल असा पर्याय होऊ शकतो. आपल्या परीसरत नेमक्या कोणत्या व्यापारी संधी उपलब्ध आहेत. याचा नेमकेपणा ओळखून छोटेहमोठे व्यवसाय सुरु करणे आवश्यक आहे. नवीन व्यवसाय सुरु करून स्वतःचे करीअर स्वतः घडवू शकतो. स्वतःची बेकारी कमी करून इतरांनाही आपण रोजगार उपलब्ध करून देऊ शकतो. सध्या भारतात मोठ्या प्रमाणात बेकारी वाढत चालली आहे. यावर सर्वात उत्तम पर्याय म्हणजे भारतासारख्या जास्त मनुष्यबळ असलेल्या देशामध्ये उद्योजक बनणे हा जीवनातील स्वतः निवडलेल्या एक चांगला पर्याय असून नव्या युगातील नवीन भारत घडवण्यासाठी उद्योजकता हा एक चांगला बहुमुल्य असा पर्याय असून त्यावर भर देणे नवीन भारत घडवणे होय.

उद्योजकतेची उद्दिष्टे :

- १) स्वयंम रोजगार भर देऊन उद्योग वाढवणे
- २) उपलब्ध भांडवलाची योग्य गुंतवणूक करून पुरेसा वापर करणे.
- ३) उद्योजकता प्रवृत्तीमध्ये वाढ करणे.
- ४) सामाजिक व आर्थिक विकासावर भर देणे.
- ५) व्यक्तीमत्त्व विकसाला वाच देणे.

55. Title of Paper: Studies on Different Methods in Ornamental Flowers Concerning Quality Dry Flower Products



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Research Article

STUDIES ON DIFFERENT DRYING METHODS IN ORNAMENTAL FLOWERS CONCERNING QUALITY DRY FLOWER PRODUCTS

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Abstract: In the modern era of eco-awareness, dried flowers and dried botanicals have attained substantial growth in horticulture commercial enterprise. Future possibilities of the dry flower industry are relied upon to contribute a ton to the country's economy in contrast to fresh flowers and other live plants. Apart from flower structure and season of gather, the nature of dry flowers inconceivably depends on the method of drying. Hence, the current investigation was undertaken with the objective to determine the appropriate methods of drying in ornamental flowers with respect to quality dry flower products. The ornamental flowers chosen for the examination was exposed to all the drying methods employed in study viz., Air drying, Silica gel drying, Borax drying and Hot air oven drying. Total 25 flower samples were dried and drying time required for each sample was recorded.

Keywords: Dry flowers, Drying methods, Ornamental flowers, Value addition

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Introduction

The interest for ornamental flowers is truly expanding in the global and homegrown market with the improvement in way of life and personal satisfaction. Flowers are magnificent creation of nature considered as an image of adoration, excellence and a worldview of life in sight of their innumerable tones. Govt of India has categorized floriculture as a dawn industry and concurred it 100% export status, owing to consistent expansion in demand of flowers floriculture has become one of the significant commercial trades in agriculture [1]. The fresh flowers, however wonderful in their magnificence, are costly, brief and delicate to temperature and are accessible just during a specific season [2]. Their freshness and excellence are lost because of different biochemical changes and microbial activities, thus can be retained only for few days, even by utilizing the best methods of postharvest technology [3]. The shelf life of flowers could be drawn out only to an extent of 40% even when the best flower additives or chemicals were utilized [4]. To conquer this problem the same flowers and foliages can be dried to prolong their beauty and freshness which hold both economic and aesthetic importance [5]. Thus, dried flowers come as a brilliant option in contrast to fresh flowers and foliage for interior design as well as for a variety of other aesthetic and commercial uses.

Dried flowers are lifelong and can be used number of times to meet the decorative demands, dry flowers provide an outstanding opportunity to Indian entrepreneurs as the country is bestowed with comprehensive variety of floral material, cheap labour and favorable climate [6]. Dry flowers and foliages are attractive and possess number of abilities including ornamental, durable, lifelong and year-round availability [7]. The dried flowers and plant parts are natural, inexpensive and have everlasting value with year around availability [8].

Dry flower industry has developed quickly with more than 60% portion of benefits belonging to the floriculture business [4]. The business extended yearly turnover

The USA is a biggest consumer of dried and artificial flowers assessed at (US \$2.4 million) yearly followed by Germany and UK [11]. Dried flowers can be formed by different drying methods and can be productively utilized in preparation of various decorative and aesthetic products. However, apart from flower structure and time of collect, the quality of dry flowers incredibly relies upon the method of drying. Hence, the current investigation was undertaken to determine the suitable drying methods in ornamental flowers concerning quality dry flower products.

Materials and Methods

Present investigation was conducted at the research laboratory of Department of Botany, Prof Ramkrishna More Arts, Commerce & Science College, Akurdi, Pune, Maharashtra. The distinct drying methods including Air drying, Silica gel drying, Borax drying and Hot air oven drying was employed to drying of 25 ornamental flowers. Flowers under test were already authenticated by referring literature for the identification. Flowers at the peak blooming season were selected and harvested with proper care along with their beauty, mostly flowers with bright color and slightly at immature stage were harvested. Five flower replicates were used for each treatment and the suitable methods of drying was determined along with approximate drying time taken to dry by the ornamental flowers [Table-1].

Drying Methods

Air Drying

Plant material as displayed in [Table-1] was selected and used for the formation of dry flowers via air drying. In this method the floral material was tied with a rope and was kept in hanging position in clean, dark and well-ventilated area and were observed periodically [12].

Silica gel Drying

56. Title of Paper: Utilization of Naturally Occurring Pigment Lycopene as a Photosensitizer for ZnO based Dye-Sensitized Solar Cell



Utilization of Naturally Occurring Pigment Lycopene as a Photosensitizer for ZnO based Dye-Sensitized Solar Cells

Kisan Mahadeo Gadave,^{1,*} Pankaj K. Bhujbal,² Dnyaneshwar Rambhau Shinde,¹ Habib M. Pathan² and Suresh Pandurang Rasale¹

Abstract

In this study, we present lycopene-sensitized ZnO (Zinc Oxide) as a photoanode for dye-sensitized solar cells (DSSCs). To obtain ZnO nanopowder, initially zinc peroxide is synthesized and then thermally decomposed. The bandgap of 3.25 eV was estimated by Tauc's formula using the diffused reflectance spectra. Column chromatography was used to isolate lycopene (dye) molecules from a mixture of carotenoids and lycopene. The ZnO films were deposited on the conducting side of Indium-doped Tin Oxide (ITO) glass by the doctor blade method. The dye adsorption time on ZnO film was optimized. These DSSCs show better performance for dye loading times of 24 hours. A photoconversion efficiency of about 0.39% with 281 mV open-circuit voltage (Voc), 176 Acm⁻² photo-current density (Jsc), and a 47% fill factor (FF) has been achieved for a novel lycopene-sensitized ZnO photoanode-based DSSC.

Keywords: Zinc oxide; Lycopene; DSSCs; Carotenoids; Sensitizer.

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Article type: Research article.

1. Introduction

In 1991, a breakthrough in organic photovoltaics was achieved by Graetzel *et al.*^[1] by implementing mesoporous TiO₂ (Titanium oxide) for dye-sensitized solar cells (DSSCs). In DSSCs, dye absorbs light photons and with the help of wide band gap semi-conducting material converts photons to electricity. A review of the literature indicates that various synthetic, organic, and natural dyes were used by researchers^[2-15] as sensitizers in DSSCs. Zhou *et al.*^[16] studied 20 natural dyes for sensitization of TiO₂ based solar cells. And it was observed that mangosteen pericarp extract showed the best conversion efficiency amongst all dyes used. These are the pigments that can be found in different plant parts such as roots, leaves, fruits, and flowers. The natural dyes are biodegradable, non-toxic, and environmentally suitable as compared with the synthetic metal complex-based dyes. Wang *et al.*^[17] studied natural dyes such as chlorophyll and carotenoids as sensitizers. Natural dyes such as betalains,^[18,19] anthocyanins,^[20,21] and carotenes^[22] have been used as sensitizers. Similar to TiO₂, ZnO can be used in the

construction of photoanode in DSSCs. ZnO have certain advantages over TiO₂ such as; (i) wide direct band gap of 3.37 eV, (ii) excitation binding energy of ZnO (60 meV)^[23-25] is higher than TiO₂ (4 meV) and (iii) electron mobility of ZnO (200 cm³V⁻¹s⁻¹) also higher compared with TiO₂ (30 cm³V⁻¹s⁻¹).^[26-27]

The DSSC consists of a thick film of ZnO nanoparticles that accepts electrons from the excited dye since it provides a large surface area for the adsorption of light-harvesting molecules.^[28] Due to the same reason, ZnO finds potential application in photocatalysis,^[29] sensors,^[30] light-emitting diodes,^[31] solar cells,^[32] etc. Keis *et al.*^[33,34] reported photoconversion efficiency of 5% for porous ZnO sensitized with metal complex-based dye. Law *et al.*^[35] used ZnO nanowires for DSSCs and achieved a conversion efficiency of 0.5%. Yafeng *et al.*^[36] showed that the dye-sensitized ZnO nanowire can be used in DSSCs to improve light to energy conversion efficiency. Win *et al.*^[37] had reported the characterization of nano-sized ZnO electrodes with curcumin-derived natural dye extract for DSSCs application. Thambidurai *et al.*^[34-40] reported flowers like ZnO nanorods for DSSCs. Hosni *et al.*^[41] reported a power conversion efficiency of 4.66% for nanorods and 4.21% for nano-spheres of ZnO sensitized D149 dye.

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57. Title of Paper: Physicochemical properties of blended raw honey samples collected from three different locations of Kannad taluka of Aurangabad district (MS), India

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ORIGINAL ARTICLE

Oral Intake of Polyphenols of *Chromolaena odorata*: A Perspective in Peptic Ulcer, Thrombocytopenia, and Heparin-induced Bleeding Diathesis in Rodent Model

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ABSTRACT

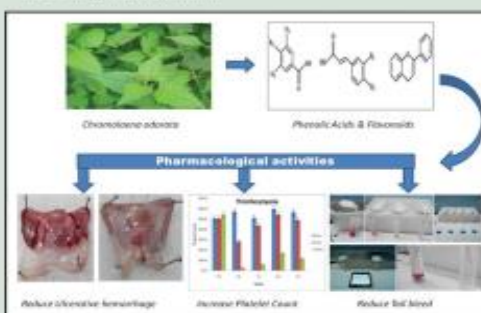
Objective: Bleeding disorder is of two types: external bleeding due to trauma, surgery, and internal bleeding which happens mainly due to ulcers and thrombocytopenia or use of excessive anticoagulants. Proven hemostatic activity of *Chromolaena odorata* (L) in bleeding and wound healing had encouraged to evaluate the efficacy of aqueous extract and spray-dried powder (SDP) on ulcers, thrombocytopenia, and heparin-induced bleeding diathesis. **Materials and Methods:** Internal bleeding in the form of lesions in empty stomach was induced by absolute ethanol. Busulfan is administered through intraperitoneal injection to produce thrombocytopenia in Wistar rats and heparin at 1000 IU/ml was injected intravenously to mice, and after 30 min, tail was truncated to qualitatively and quantitatively differentiate the bleeding diathesis in treated versus nontreated controls. **Results:** A significant reduction in the lesions was observed in treated rats as compared to disease control rats which was evident from ulcer index and histopathology data. Considerable protection and production of platelets were observed in the thrombocytopenia model which was drastically reduced in the Busulfan administered disease control. Both aqueous extract and SDP were successful in preventing blood loss in heparin-induced tail-bleeding model. **Conclusion:** The presence of polyphenols attributes to the crucial role of *C. odorata* in arresting internal bleeding from stomach ulcer, protecting the thrombocytes from destroying, and minimizing the bleeding diathesis in mice.

Key words: *Chromolaena odorata*, gastric ulcer, heparin, tail-bleeding assay, thrombocytopenia

SUMMARY

Chromolaena odorata or Siam weed in spite of its traditional medicinal use, it never acquired the status of a medicinal herb. A significant reduction in the ulcers was observed in treated rats as compared to disease control rats which was evident from ulcer index and histopathology data. Considerable protection and production of platelets were observed in the thrombocytopenia model which was drastically reduced in the busulfan-administered disease control. Both aqueous extract and spray-dried powder (SDP) were successful in preventing blood loss in

heparin-induced mouse tail-bleeding model. The presence of considerable amount of flavonoids and phenols in the plant extract plays a key role in the pharmacological activities.



Abbreviations Used: SDP: Spray-dried powder, μ L: Microliter, ml: Milliliter, nm: Nanometer, μ g: Microgram, NAD: No abnormality detected, SD: Standard deviation.

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INTRODUCTION

Blood is one of the principal components of a body that maintains its homeostasis which many a times gets affected by factors such as disease, toxins, and drugs that may cause coagulation disorders also known as blood-clotting defects. Normally, when a person bleeds, the body starts a cascade of processes to clot the blood to prevent excessive bleeding. However, the body sometimes fails to clot the blood due to failure related to clotting factors or protein defects in the plasma. Bleeding disorders can be classified into two types which are external bleeding due to trauma, surgery,^[1] etc., and internal bleeding which happens mainly due to ulcers, thrombocytopenia, or use of excessive anticoagulants. It is believed by the National Health Service, UK, that in stomach ulcers, internal bleeding is the most common complication. It can occur when an ulcer develops at the site of a blood vessel.

Due to over intake of spicy food, alcohol, meat, fish, gastric surgery, and infection by *Helicobacter pylori*, serious injury in the stomach is seen that causes gastric ulcer.^[2]

Ethanol is proved to cause mucosal stasis, leading to hemorrhage and necrosis by triggering radical reactions such as lipid peroxidation.^[3,4]

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Role of microorganisms in Vedic astrology: Mini review

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Abstract

Vedic astrology which is one of the most important study in India. Since ancient times, in India rituals were suggested as per the planets and other cosmic influences. Planets have the influence at cell level, eukaryotic, prokaryotic as well as viruses. Beside the concept of nakshatra tree, in this paper emphasis is given on the role of microorganisms in astrology. As a part of ritual, we are using the microbial products or processes. Microorganisms are also mentioned in Vedas. Biomineralization derived crystals has been suggested for healing practices. Meteorite-microbial interaction has also been reported which suggests extra-terrestrial existence of microorganisms.

Keywords: Microorganisms, astrology, biomineralization, crystals, meteorites

Introduction

Microorganisms are tiny living things that proved their terrestrial as well as extra-terrestrial life. Meteorites which has origin in outer space, has also been reported to have presence of Actinobacteria *Rubrobacter radiotolerans*, Proteobacteria and Bacteroidetes, iron/sulfur cycling organisms *Geobacter* spp. and *Desulfovibrio* spp (Tait *et al.*, 2017) ^[1]. Microbial fingerprint on extraterrestrial material, meteorites suggests the possibility of interaction of microorganisms with meteorites (from asteroids, Moon, or Mars) and subsequent mineralization (Milojevic *et al.*, 2019) ^[2].

Since ancient times, India has some traditional astrological remedies which uses fermented foods and microbial products or processes (biomineralization). This review is based on the interconnection of microbiology and astrology. There are main 7 planets viz., Sun, Moon, Mars, Mercury, Jupiter, Venus, Saturn and 2 shadow planets viz., Rahu and Ketu. Reference of microorganisms in Vedas is as "adrishta krims" (Jakhmola, 2010) ^[3] where positive and negative aspects of them are available. As per the available report, not only human being but also small creatures like bacteria, virus are under the influence of planets and shows behavior accordingly. Planets also influences the growth of the cell. Considering the microorganisms, bacterial growth curve always has variations due to Kuja dosha (Planet: Mars) (Vegaraju *et al.*, 2020) ^[4]. Eclipses particularly solar eclipses has massive effect on the growth of bacteria and viruses (Vegaraju *et al.*, 2019) ^[5].

In this paper, more emphasis is given on Indian Vedic rituals for planets and associated microorganisms, by which we can put some light on microorganism's involvement for human wellbeing. Microorganisms are ubiquitous in nature. Microorganisms play both the beneficial as well as malefic role as that of planets. Some microorganisms play the role as probiotic i.e. microorganisms for life. These probiotics are especially present in fermented foods like pickle, curd, idli etc. As per the planets nature, tree and food has been suggested.

In India, there is concept to worship Nakshatra Tree (Āradhya Vruksha) for each group of people born under specific constellation. There are main Nakshatras which show astronomical signatures and have profound effect on human's nature (Table 1). Worshipping Nakshatra concept is like connecting the human inner environment with the nature by which Chakras (energy centers of body) can be activated (Gupta *et al.*, 2016) ^[6]. Microbiologists are doing the research on activities or contents in Āradhya Vruksha aided by microorganisms' involvement (Gupta *et al.*, 2016; Kakade and Chaphalkar, 2017) ^[6, 7]. Consumption of fermented foods like pickles, vinegars, and dry wines has been suggested to reduce the malefic effect of Saturn (<https://kripalu.org>).