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साहित्य, कला आणि लोकसंस्कृतीवर वाढिलेले वैचारिक

सिक्का

MAH MAR 34737/13/1/2009-TC

लोककला विशेषांक

वर्ष ११ वे, अंक-२ रा व ३रा, जुलै-डिसेंबर २०२० (जोडअंक)

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डॉ. फुला बागुल
डॉ. अनिल गर्जे
डॉ. संजय भालेराव

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डॉ. वंदना महाजन
डॉ. प्रकाश खत्री

डॉ. ममता इंगोले
डॉ. वापन जाधव
डॉ. यशवंत सोनुने
डॉ. रामचंद्र झाडे

मूल्य : १७५ रुपये

या अंकातील लेखकांच्या मताशी संपादक सहमत असतीलच असे नाही. या निमतकारितास महाराष्ट्र राज्य साहित्य आणि संस्कृती मंडळकडून अनुदान प्राप्त झाले आहे. परंतु या निमतकारितात प्रसिद्ध झालेली मते मंडळास मान्य असतीलच असे नाही.

पता : संपादक, तिकण, 'शिवाय', श्रीराम कॉलनी, हिवरखेडा रोड,
कन्नड, जि. औरंगाबाद - ४३११०३, मोबा. ९४०४०००३९८

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निकषण

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समकालीन कथा व व्यावहारिक मराठी विशेषांक

वर्ष - ११ वे, अंक पहिला
(एप्रिल-मे-जून २०२०)

संपादक

डॉ. शिवाजी हुसे

अतिथी संपादक

डॉ. राजेंद्र थोरात डॉ. राहुल पाटील

संपादक मंडळ

डॉ. सर्वेशचंद्र जिणे
डॉ. फुला बागुल
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डॉ. संजय भालेराव

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डॉ. प्रकाश खेत्री

डॉ. ममता इंगोले
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डॉ. यशवंत सोनुने
डॉ. रामचंद्र झाडे

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डॉ. सदीप सांगळे

मूल्य : १५० रुपये

या अंकातील लेखकांच्या मराठी संपादक सहमत असतीलच असे नाही. या नियतकालिकास महाराष्ट्र राज्य साहित्य आणि संस्कृती मंडळाद्वारे अनुदान प्राप्त झाले आहे. परंतु या नियतकालिकात प्रसिद्ध झालेली मते मंडळास मान्य असतीलच असे नाही.

पत्ता : संपादक, निमण, 'शिवाय', श्रीराम कॉलनी, विठारखेडा रोड, कन्नड,
जि. औरंगाबाद - ४३११०३, मोबा. ९४०४०००३९८

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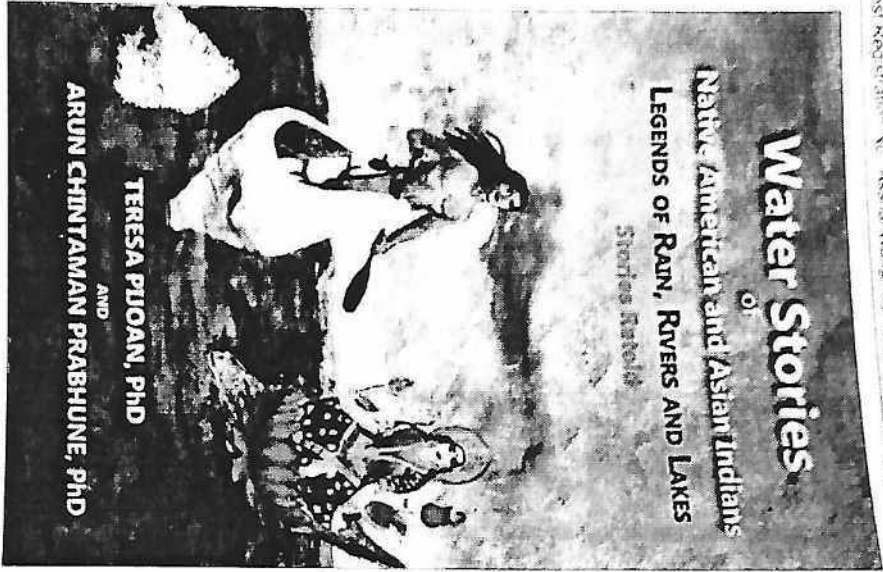
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अमेरिकन लोककथा टॅम्बा 'प्योवॉन, पीओव. डी. आणि भारतीय लोककथा अणु प्रभुणे, पीओव. डी. यांनी एकत्र काम करून मिळू केवळला कथासंग्रह हा जलतत्वाच्या तौलनिक पुराणकथा, लोककथा व उल्लेखांचा अमूल्य अमेरिकन तुकटांचा प्रकाशित झाला आहे. हा कथासंग्रह भारतीय निजामू वाचकांना अतिशयच प्रसन्न करणारा ठरेल.

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डॉ. नानासाहेब सुर्वेदशी, 'प्रणव' स्वकर्म नगर, थोडगा रोड, अहमदाबाद, जि. तांदूर-४९३५९५

'अहमदाबाद' हे मासिक कर्मचारी मिळू करताना डॉ. वि. ४६९/४, सावित्री रोड, पिंजळ रोड, पुणे-४११०३० येथे प्रकाशक यांच्या कार्यालयात आहे. संपादन: डॉ. वि. ४६९/४, सावित्री रोड, पिंजळ रोड, पुणे-४११०३० येथे प्रकाशक यांच्या कार्यालयात आहे.

डा. अणु प्रभुणे

तांदूर



भारतीय भाषेतील अनुवादित कादंबऱ्यांचे समीक्षात्मक लेखन

प्रा. वंदना सोनवले

अण्णासाहेब मगर महाविद्यालय, हडपसर, पुणे.

दूरध्वनी : ८३०८९७६९९३ / ९०२२८२७३०

"भाषांतर म्हणजे एका भाषेतील मजकूर दुसऱ्या भाषेत त्याच्या शैली वैशिष्ट्यांसह उतरवण्याची कला. मूळ संहितेच्या 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 अनुवादित साहित्यकृतीतील शब्द, आशय, अभिव्यक्ती ही अनुवादकाचीच असते.

ज्या भाषेतील साहित्यकृतीचा अनुवाद करायचा ती भाषा आणि ज्या भाषेत अनुवाद करायचा त्या भाषेतील वांगमयीन जडणघडण- भाषिक रचना याचे आकलन अनुवादकाला असणे गरजेचे असते. देशाच्या सीमा ओलांडून संवादाच्या माध्यमातून लोकांनी जवळ आले पाहिजे. यासाठी अनुवाद महत्त्वाची भूमिका बजावत आहे. सांस्कृतिक भाषिक समृद्धी अनुवादासुळे 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 अनुवादासुळे 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 अनुवादासुळेच होऊन मानवी जीवन, अनुभवाचे क्षेत्र व ज्ञानाच्या कक्षा विस्तारत चालल्या आहेत.

अनुवाद हा मूळ साहित्यकृतीशी प्रामाणिक राहून करताना दुसऱ्या वाजून अनुवाद करणे म्हणजे दुसऱ्या भाषेतील संस्कृती आपल्या भाषेत आणताना तिच्या गुणविशेषांसह व मर्यादांसह आपल्या भाषेत आणणे. एकूणच अनुवाद ही संज्ञा सर्वसमावेशक झाली आहे आणि ती पुस्तके एका वेगळ्या अपरिचित संस्कृती विश्वाचा परिचय करून देत असतात. अलिकडीच्या काळात अनुवादाला फार महत्त्व आलेले आहे. आता अनुवादित कलाकृतींची आवर्जून दखल घेतली जाताना दिसत आहे. कथा, कादंबरी, कवितेसारख्या ललित साहित्यकृतीत आशयासह अभिव्यक्तीलाही महत्त्व असते. श्रेष्ठ 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 बऱ्याच वेळा आत्मपर, आत्मनिष्ठ व संवेदनशील असलेली दिसते.

कन्नड साहित्यकृती 'जेहाद' -

सलमासारख्या मुलीला ,सलमासारख्या शिक्षिकेला करीमसारख्या माणसांना अर्पण केलेल्या या साहित्यकृतीत दोन धर्मात वाढलेल्या पण प्रेम या एकमेव धर्माच्या हाकेला ओ देताना झालेली दोन जीवांची घालमेल या कादंबरीत श्री बळुवारू महंमद कुत्रि यांनी अनिश्चय मार्मिक व हळुवारपणे टिपली आहेअनिश्चय . सुन्न करणारी, परंपरावाद्यांना विचार करायला लावणारी, संयमशील शैलीत मानवी संबंधांची गुंतागुंत

Impact of COVID-19 Pandemic on Indian Economy

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Abstract:- The outbreak of the Covid-19 pandemic is a shock to the Indian economy. The economy was already in a uncertainty state before Covid-19 struck. With the extended country-wide lockdown, global economic downturn and related interruption of demand and supply chains, the economy is likely to face a delayed period of slowdown. In this paper we describe the Covid-19 impact on Indian economy, evaluate the impact of the shock on various segments of the economy.

Keywords:- Covid-19, pandemic, economic downturn, manufacturing, Aviation Industry, Export, Import, financial institutions and E-Commerce.

Introduction:-

The World Health Organization (WHO) has declared that the new corona virus outbreak is a public health emergency of international concern, officials announced on Thursday, 30th January, 2020. WHO proposed calling the disease "2019-nCoV acute respiratory disease". The 2019 novel corona virus (2019- NCV) originating in Wuhan, China, has spread to 24 more countries alarming public health authorities across the world. More than 4,900 people have died and over 132,000 have been infected globally, according to the WHO on 13 march,2020.

Objectives:-

1. To understand and study the impact of covid-19 on Indian economy.
2. To know the impact of covid-19 on different sectors.
3. To know the challenges for different sectors in Indian economy

Research Methodology:-

Research can be defined as a systematic search for information on a particular topic. Research is an academic activity and such the term should be used in a technical sense. A design a specification of method and procedures for acquiring the information needed, structurally to solve the problems.

GST and Tourism Sector in India

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Abstract:

India is one of the hot tourist destinations in the world. It is so due to variety of tourist attractions and delicious food. Due to this, domestic as well as international inbound tourists' movement is worth mentioning. However, it also can be mentioned that, India is not trying hard to attract and excel the tourists, to its potential. Indian tourism sector is one of the industries, where, multiple taxes are livid. The sector was expecting some relief in the new tax regime of Goods and Services Tax (GST). But, apparently, it can be perceived that, instead of providing relief, it has made worst. However academicians do believe that, inflation in the price of tourism, would be a temporary phenomena, in the longer run, the prices would go down, and GST would be beneficial to the sector. Present article, is a attempt to put forth, both the perceptions with facts and figures.

Keywords: GST, Tourism Sector, Tourist, Hospitality Industry.

Introduction:

Indian Tourism sector is one of the great contributors to the economy. Tourism in India is very much useful due to various reasons such as employment creation, great contributor to national income, bringing in the foreign exchange etc. Moreover, its multiplier impact gives impetus to overall economy. Hence, ideally, Indian policy makers should make all sorts of efforts to boost this sector, by providing conducive environment in terms of infrastructure such as good roads, friendly taxation policy, safety and security of tourists in general and foreign female tourists in particular. However, in reality, it can be seen that, various taxes are imposed on this sector at various stages. It creates hurdles in growth of this sector. In order to get relief, especially in taxation, the entire industry was expecting lower slabs of Goods and Services Tax (GST). But in reality GST has been levied in the bracket of 5% to 28%. Majority stake holders of the industry are unhappy about it and fear that, such rate may halt the growth of the sector. An academician echoes in other way and positively say that, negative impact of such rate would be in the shorter run, but the scenario may change in the longer run.

Objectives:

- To study, an overview of Indian Tourist Sector.
- To study the GST provisions in relation to tourism sector.
- To study the positive and negative impact of GST on tourism sector.

Research Methodology:

Since, the present paper is a descriptive one, secondary data has been used. Various national English news papers such as – The Hindu, The Times of India, and various websites providing details about GST and Tourism, has been used for this purpose.

Problems and Prospects of Tourism Industry in India

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Abstract: India is a land of rich history, cultural and geographical diversity. Being the home of one of the Seven Wonders of the World. India also has huge plethora of flora and fauna spread across its national territories. Such appealing features about the Indian culture and its diversity make India one of the best international tourist destinations. India presents heritage and cultural tourism along with medical, business and sports tourism. Tourism is expanding the fastest and is the most rewarding industry of the modern world. International tourism constitutes the invisible export trade. No wonder then that some more enterprising countries have turned this flourishing industry into a means of spinning money. In recent years, India too has woken up to this great reality and concerted efforts are being made to develop and promote this foreign exchange earning industry in a big way. India, with her rich cultural heritage, ancient monuments, world famous temples, architectural masterpieces, wild animal sanctuaries and scenic spots, holds a great attraction for the tourists on the move. This paper tries to know the problems and prospects of tourism industry in India and government initiative for the development of tourism industry.

Key words: Tourism, problems, prospects, foreign exchange and Tourist.

Introduction:

Tourism industry is the largest service industry prevailing in the Indian economy and contributes as high as 6.4% to the national GDP. Apart from this, the industry plays a huge role in the employment of the people of India and contributes almost 8.1% to the total employment in India. Revenue generated from the industry we see that the country generated as high as 200 billion US dollars in 2008 from the industry, which is expected to increase to 375.5 billion US dollars by the end of year 2018. This expectation would result in a growth of almost 9.5% annually for the industry. According to World Travel and Tourism Council, India will be the one of the most hot-spot for tourism from the year 2009 to 2018, having the highest 10-year growth potential. *Tourism revenue is expected to surge by almost 42% by the*



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OVERVIEW OF DIGITAL BANKING, ITS SERVICES, ADVANTAGES AND DISADVANTAGES IN INDIA

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Abstract:

The world has changed and continues to change rapidly. The convergence of telecom, media and computing has changed the way we work, play and live. Everything is moving faster - trends, novelties, news, products, markets, etc. The digital and physical worlds are starting to come together. Digital experience is far more personalised so Banking Sector become a Digital. Digital banking is part of online banking services are delivered over the internet. The use of computer and other fast developing information machines in banks are known as technology in banking these technologies helps to interpret this mass information into a meaningful analysis. E-banking is a most important invention in Banking Sectors with the introduction of computers in Indian banks and with the advent of ATM's.

Digital banking involves web-based services and transactions. With the increased convenience of anytime, anywhere banking, the number of customers has increased for banks. Human error in calculations and recordkeeping is reduced, if not eliminated. With records of every transaction being maintained electronically, it is possible to generate reports and analyze data at any point, and for different purposes. This paper presents an overview of Digital banking, Concept Its Features and Its Services in India.

Keywords: *Digital Banking, E-Banking, ATM, Credit Card, Tele Banking, Net Banking, Core Banking, UPI, IMPS, BHIM Mobile APP.*

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**OPPORTUNITIES AND CHALLENGES OF INTEGRATING ICT IN
HIGHER EDUCATION: A CASE STUDY**

PROF. SHITAL GAIKWAD

DR. SAVITA KULKARNI

DR. SAVITA KULKARNIDepartment of Geography
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&**PROF. SHITAL GAIKWAD**Lecturer, Dept. of Geography
Annasaheb Magar College Hadapsar**Abstract :**

The Role of higher education in the economic development is inevitable. India has heritage of old tradition of higher education institution. There are many changes in the higher education system and methods also. Many challenges are faced by high education from pre independence and till today. The pandemic of COVID19 led educational institutional to close and compel to change in social interaction, organization, and the education sector. In the situation distance learning or Integration of ICT in education becomes demanding. The situation granted opportunities to education methods and systems to shift from traditional to online. As well as there are many challenges for teachers and students while adopting the system. This paper deals mainly with the study of opinion of the students and teachers about the challenges faced by them while adopting the ICT in education. As well as it narrated the opportunities received to education by this situation. The data collected by the non professional course students and teachers in the colleges of Pune city.

Key words : Higher Education, ICT, Online Teaching, Traditional Method of Teaching,

Introduction :

Higher education institutions provide efficient manpower, increase efficiency as well as extend the field of knowledge, skill and technological advancement. Education plays a strategic role in helping achieve more than one goal of Human resource development. India has old tradition of higher education system which generated knowledge and learning right from the beginning of Indian civilization. The higher education learning centers were encouraged and Nalanda, Takshila, Ujjain, Vikramshila and Vallabhi came into existence. India became a renowned centre for higher studies by attracting scholars from all parts of India and from several foreign countries. Higher education since the British rule has made steady advances in the country. Thus during the British Rule India could claim its position as one of the leading countries providing quality higher education to its people as well as to students and scholars coming from countries all over the world. In the beginning of the 50's which marked a good

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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 rational 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.



“A Study of impact of Covid 19-corona virus on Indian Economy and possible remedies.”

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“ABSTRACT”

“All the transactions in the world economy are stopped due to corona virus. The borders of all the countries are closed down. It is a situation like a world war, the borders are not sealed or closed. But today situation is very different. The India is also suffering from this epidemic corona virus. All the border of the country is also sealed. The whole transactions are closed down. Production, trading, building, construction, financial, travelling, tourism, transport, agricultural, services and small and medium enterprises are all stopped. One cannot imagine like this situation in the country. The Mumbai, people say never stopped in this situation. The only one solution for this situation is stay at home. But staying at home cannot solve the financial and other needs of the human being. Therefore, under this paper, the researcher finds out the impact of covid 19 virus on economy and possible remedies.”

Introduction-

The whole world is suffering from corona virus. All the transactions in the world economy are stopped. The borders of all the countries are closed down. It is a situation like a world war. But in the world war, the borders are not sealed or closed. But today situation is very different. The India is also suffering from this epidemic corona virus. All the border of the country is also sealed. The whole transactions are closed down. Production, trading, building, construction, financial, travelling, tourism, transport, agricultural, services and small and medium enterprises are all stopped. One cannot imagine like this situation in the country. The Mumbai, people say never stopped in this situation. The only one solution for this situation is stay at home. But staying at home cannot solve the financial and other needs of the human being. According to **Du and Bradstreet**, Covid 19 no doubt disrupted human lives and global supply chain but the pandemic is a severe demand shock which has offset the green shoots of recovery of the Indian economy, that was visible towards the end of 2019 and early 2020. The revised Gross domestic product (GDP) estimates for India downwards by 0.2 percentage points for the fiscal year 2020 to 4.8. Per cent and by 0.5. Per cent for the fiscal year 2021 to 6 per cent. Further, it is stated that the extent of the actual impact will depend upon the severity and duration of the outbreak. According to **KPMG**, the lockdown in India will have a sizable impact on the economy mainly on consumption which is the biggest component of GDP. There fore it is very essential to study the impact of the corona virus on various sectors of the economy.

Objectives-

- a) To study the impact of the virus on various sector of the economy.
- b) To know the impact on live human being in India.
- c) To find some solutions to overcome the impact.

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 exaction 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

Journal Name



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Sunlight mediated degradation of spentwash using hydrothermally synthesized orthorhombic shaped Cu-TiO₂ nanoparticles.

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Degradation of spentwash waste is very essential but challenging task for indian suagrane distillery industry because of its awfully acidic pH, intense brown colour with strong unpleasant odour. Prior to discharge in environment, its degradation using efficient and cost effective method is important. Photocatalytic degradation route could be simple, cost effective alternative to the conventional degradation processes. Cu-doped TiO₂ was synthesized using a facile sol gel assisted hydrothermal method at various temperatures like 120°C, 150°C and 180°C. Cu-TiO₂ with dpoing concentration of 0.5 to 5% were synthesized using hydrothermal method. Physico-chemical properties of synthesized Cu-TiO₂ were investigated by using various characterization techniques. UV-visible analysis shows red shift in absorption wavelenth in case of Cu-TiO₂ as compared with bare TiO₂. Structural and morphological analysis confirms formation of anatase TiO₂ with nano-orthorhomb like morphology. Photocatalytic performance of TiO₂ and Cu doped TiO₂ samples was evaluated for degradation of spentwash colour under natural solar light irradiation. Among all Cu-TiO₂ samples, 1% Cu-TiO₂ synthesized at 150°C exhibited maximum degradation efficiency with nearly 59% degradation of spent wash in 5 hr. The molecular weight of colour compounds after degradation was monitored by Gel Permeation Chromatography (GPC). The GPC fractions shows low, medium, high molecular weight coloured compounds with the strong hypsochromic shift. Identification of compounds in each GPC fractions was studied by LC-MS Q-TOF.

1. Introduction

Contemporary problem for the environment is the emergence of innumerable types of effluents as a result of rapid growth in indirect realization. Disposal of such industrial effluent to soil and water bodies can have profound impact on the ecology and environment, as they contain many potentially hazardous materials. Most of the industries release highly coloured water, which cause colour contamination problem in natural water bodies. The colour recalcitrant's in these waste water effluent remain unaffected even if sample is treated in treatment plants. These recalcitrant interfere biodegradation process as well hence remains persistent in soil and water for longer time. Molasses can be defined as final effluent obtained in the preparation of sugar after repeated crystallization. It is the residual syrup from which no crystalline sucrose can be obtained by simple means.

The dark brown colour of molasses is attributing to the presence of non-sugar and sugar colorants from sugarcane plants generated during manufacturing process. These colorants get concentrated into molasses after sugar crystallization and subsequently get transferred further to the spent slurry during molasses fermentation by using yeast after suitable dilution. In the distillery, ethanol or spirit is manufactured by fermentation process along with distillation. During this an average of 12 to 15 litre of coloured effluent per litre of ethanol produced. The unwanted bottom part of distillation is called stillage or spent wash or alcohol distillery waste contains a considerable amount of toxic organic load and many recalcitrant compounds harmful to the environment.^{1,2,3} Apart from colour, the discharged distillery effluent also has high amount of total dissolved solids with acidic pH and other contaminants in form of complex polymer containing heterocyclic nitrogenous compounds of aldehyde-amine, ketone, ester, metabolites, lipids, proteins,⁴ various heavy metals,⁵ phenolic compounds, plant derived resins and fatty acids. Melanoidin, a dark brown coloured natural condensation product of sugars and amino acids produced by non-enzymatic browning reaction called Maillard

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ARTICLE

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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.

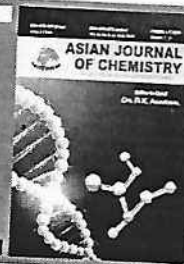
KEYWORDS

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*



CuSCN Catalyzed Conjugate Addition of Grignard Reagents to Substituted Coumarins with Dilithium Tetrachloromanganate

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The regioselective 1,4-addition of CuSCN catalyzed Grignard reagents to the substituted coumarins are reported. The Li_2MnCl_4 reagent is used to transmetallate magnesium by manganese. It adds regioselectively to coumarins and forms 1,4-addition products with higher yield under the atmosphere of nitrogen gas and at a lower temperature.

Keywords: Coumarin, Grignard reagent, Dilithium tetrachloromanganate, Conjugate addition, Transmetalation.

INTRODUCTION

The conjugate addition of organometallic reagents like organomagnesium and organolithium reagents to the α,β -unsaturated compounds in presence of copper(I) catalyst is one of the most important synthetic strategies for the formation of carbon-carbon bonds [1]. The utilization of Grignard reagents in organic chemistry, which are one of the most extensively used method, of organometallic compounds in the asymmetric conjugate addition has acquired much less assistance [2]. Even though exhaustive research over the past two decades, only limited selectivity in the conjugate addition of Grignard reagents were reported in contrast to dialkyl zinc reagents [3]. This is the most probable method because of the greater reactivity of organomagnesium reagents, which give rise to 1,2 and 1,4-additions without catalyst. Furthermore, the existence of various copper complexes in solution, for example, cuprate chemistry additionally, complicating the access to powerful enantiopure catalysis. Nowadays, there are few reports of high enantioselective compounds up to 99% ee which can be accomplished in the conjugate addition of organomagnesium reagents to the α,β -unsaturated carbonyl compounds by using catalytic quantity of asymmetric ferrocenyl diphosphine compounds and Cu(I) complexes [4]. The asymmetric conjugate addition reaction in presence of copper(I) complexes with Grignard reagents shows important process for the generation of chiral

centers and has uses in synthesis [5-10]. The less reactive coumarin compounds were required to generate a new catalytic methodologies. The investigation begins with copper-catalyzed conjugate addition reaction of dialkylzinc compounds to coumarin employs phosphoramidate ligands [11,12]. This catalytic method does not demonstrate to be more reactive and does not get in any output. When researchers turned their focus to asymmetric conjugate addition reaction with the highly reactive organomagnesium reagents, for instance, Josiphos ligand to the desired 1,4-addition product with 82% ee was achieved with full conversion [13]. However, the protocols that allow the insertion of alkyl groups at the newly generated asymmetric center in the structurally different 3,4-dihydropyran-2-ones. While conveying this challenge, chemist visualize the probability of applying 2H-pyran-2-ones [14] in conjunction with organometallic reagents to approach optically active dihydropyran-2-ones across the Cu(I) catalyzed conjugate addition reaction [15]. 2H-Pyran-2-ones present electron-deficient diene group are common substrate for [4+2] and [2+2] cyclo-addition reaction to generate bicyclic organic compounds [16]. However, in asymmetric conjugate addition reaction, the extra conjugation lowers the reactivity as compared with acyclic α,β -unsaturated esters [17]. According to our best of knowledge, asymmetric 1,4-addition of Grignard reagents to 2H-pyran-2-ones remain difficult to achieve. Such a kind of reaction could give an efficient, direct and resourceful method for the

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Review on Perimidines: A synthetic Pathways Approach

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Abstract

Perimidines are available in an assortment of drugs and general use industrial structures and perimidines are also significant primary theme because of their extraordinary method of physiological activity. Thus the underlying significance of perimidine moiety has evoked a lot of interest in the field of natural blend and compound science to build up some better than ever amalgamation of this atomic skeleton. In this review, we have depicted a modern outline on the new advances in the different manufactured approaches of perimidine. The review covers the essential applied and down to earth synergist blend like, green methodologies, metal catalysed responses, microwave illumination, grinding and so forth which are critical for developing perimidine skeleton. This review will fulfill the assumptions for peruses who are keen on the advancement of the field and searching for an update. It will animate analysts to grow new and innovative manufactured admittance to this heterocyclic framework, which will be instrumental in the headway of perimidine science. This review provides an overview of various synthetic methodologies for the synthesis of a wide range of perimidine derivatives with applications in material chemistry, drug discovery, polymer chemistry, photo sensors, dye chemistry, and other fields.



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Introduction

Perimidine is synthesized by inserting a one-carbon unit between the nitrogen and closing the ring of 1,8-naphthalenediamine. Heteroaromatic structure displaying the distinct properties of compounds with abundance and deficit of electrons at the same time. Perimidine is one such framework, and its amphoteric

chemical properties make it a fascinating research topic. Perimidine derivatives are explored in terms of polymer chemistry, drug discovery, photo sensors, dye industries, and catalytic action in organic synthesis.¹ Perimidines and the pyrimidine fused with naphtha framework is a relatively recent and rapidly expanding field of pure and applied chemistry.

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RESEARCH ARTICLE

EFFECT OF ASPERGILLUS INFESTATION ON NUTRITIONAL VALUE OF CHICKPEA SEEDS

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Chickpea, Fungi,
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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 growths 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 (Kashiwagiet 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 (Tripathiet al., 2015). It is a source of protein, dietary fiber, resistant starch, polyunsaturated fatty acids, vitamins, and minerals, especially folate, calcium, magnesium, and potassium (Tripathiet 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 Ushamalini 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 Mahrous (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 Premrata and Sinha (1985) where they found that wheat

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Potential of *Cinnamon cassia* Oil for Safety of Grains Contaminated with Aflatoxin Induced by *Aspergillus flavus*

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ABSTRACT

Fungal infestation is one of the common and serious problems faced during grain storage. *Aspergillus flavus* is one of the major storage fungi producing aflatoxins, which is highly toxic, carcinogenic and shows ill-effects on human and animal health. Inhibitory effect of *Cinnamon cassia* oil against the mycelial growth and aflatoxins production by *A. flavus* has been studied in this investigation. *A. flavus* was found dominant fungi during maize grain storage. *Cinnamon cassia* oil showed significant antifungal activity against *A. flavus* when evaluated by agar well diffusion method. Monitoring of aflatoxin levels in grains is a management methodology and it can be applied during storage. Aflatoxins were assessed qualitatively and quantitatively by adopting TLC and HPLC methods in *Cinnamon cassia* oil treated and non-treated grains. Cinnamon oil is a natural essential oil that does not show ill effects to human and animal health. Aflatoxin production was considerably declined by application of *Cinnamon cassia* oil during storage. *Cinnamon cassia* oil has fungi toxic potential against *Aspergillus flavus*. It may be used as fungicidal agrochemical during seed storage.

Keywords: Aflatoxin, *Aspergillus flavus*, *Cinnamon cassia* oil, fungi toxic potential.

INTRODUCTION:

Stored grains deterioration is a prolonged problem in India. Fungi are prominent destroyer during storage and by producing mycotoxins nutritive value of grains becomes decreased. Dominance of *Aspergillus* species in maize seeds was also reported by Reddy and Reddy (1989), Nishant and Mall (2008), Saleem M. K. *et al.* (2012) and Saleem M. J. *et al.* (2012); Shirurkar and Wahegaonkar (2013). *A. flavus* have been the most prevalent fungal species in samples of maize grains reported by Fandohan *et al.* (2003), Bhutta *et al.* (2004) and Aksun (2006); Shirurkar and Wahegaonkar (2013).

About 300 fungal metabolites are reported to be toxic to man and animals (Galvano *et al.*, 2001). Among them aflatoxins were very common mycotoxin produced by *Aspergillus flavus*, which is one of the common storage fungi. Reported toxic effects are carcinogenicity, genotoxicity, teratogenicity, nephrotoxicity, hepatotoxicity, reproductive disorders and immuno-suppression (Diener *et al.* 1987, Lacey, 1988; Desjardins *et al.* 2000). Fungal invasion in grains results into decline of the power of germination, molding visible



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*.

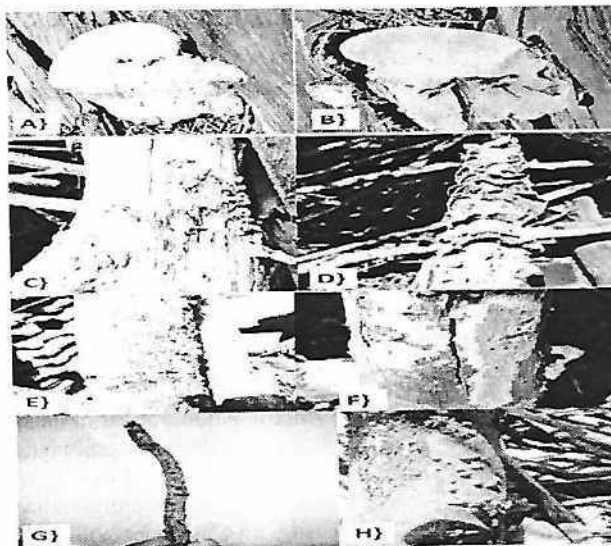


Figure 1. *Trametes* sp. (Fig. A & B), *Auricularia* sp. (Fig.C), *Steccherinum* sp. (Fig. D), *Irpex* sp. (Fig. E), *Peniophora* (Fig. F), *Hypoxylon* sp. (Fig. G), *Schizophyllum* sp. (Fig. H),

The list of actually seen fungi and lichens is as follows.

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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 chinura</i>	Fabaceae
5	<i>Cassia tava</i>	Fabaceae
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>Sapathodia canyamitata</i>	Bignoniaceae
13	<i>Combretum sp.</i>	Combretaceae
14	<i>Polygonum glabrum</i>	Polygonaceae
15	<i>Asclepias curusavica</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
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

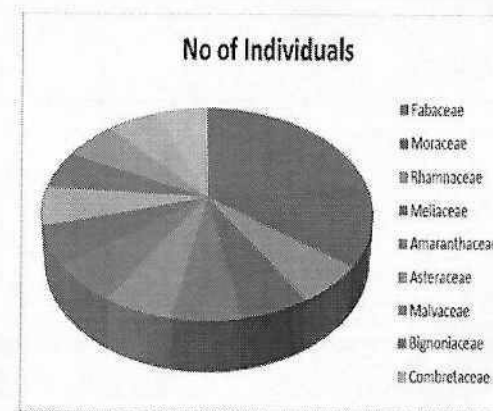


Figure No 1. Dominant Families of plants and their distribution.

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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.

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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 (Table 2, Fig. 2a).

Оценка влияния экстрактов *Inonotus rickii* на интенсивность мышечного сокращения

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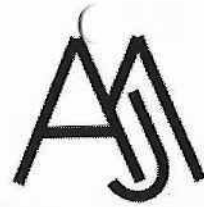
Целью настоящего исследования является тестирование воздействия водного, эфирного и спиртового экстрактов плодовых тел дереворазрушающего гриба *Inonotus rickii* на двигательную активность животных, являющуюся результатом сокращения как поперечноисчерченной, так и гладкой мускулатуры. Фармакологическая активность сырья *I. rickii* была определена *in vitro* с использованием метода кривой «доза-ответ» (гладкая мускулатура), так и в экспериментах с пероральным приемом экстрактов (эффекты на поперечноисчерченную мускулатуру, опосредованные ЦНС). Водный экстракт грибного материала показал увеличение двигательной активности гладкой мускулатуры по сравнению со стандартным кофеином, что говорит о способности грибного экстракта оказывать стимулирующее действие на синапсы. Было выяснено, что экстракты *I. rickii* оказывают влияние на сокращение гладкой мускулатуры наподобие нейромедиатора ацетилхолина. При этом было показано, что наибольшую стимулирующую активность проявляет водный экстракт, что может быть связано с тормозным действием диэтилового эфира и этанола на холинэргические рецепторы. Описанные эффекты ставят на повестку дня как фракционирование активных экстрактов, так и дальнейшие эксперименты по терапевтическим приложениям описанных эффектов. Область возможного приложения такого рода вещества – кардиоваскулярное ремоделирование, поддержание тонуса гладкой мускулатуры при ряде оперативных вмешательств, а также паллиативная терапия злокачественных новообразований.

КЛЮЧЕВЫЕ СЛОВА: ацетилхолин; агонисты рецепторов; диазепам; кофеин; лекарственные грибы; стимуляция двигательной активности; ЦНС; *Inonotus*

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СОКРАЩЕНИЯ:

ЦНС – центральная нервная система;
КОН – гидроксид калия.



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

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*, *Moesziomyces*, *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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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*, *Milesiaceae*, *Ochropsoraceae*, *Phakosporaceae*, *Phragmidaceae*, *Pileolariaceae*, *Pucciniaceae*, *Pucciniastraceae*, *Raveneltaceae*, *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

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



PREVALENCE OF VITAMIN A DEFICIENCY, SCLERAL MELANOCYTOSIS, TOOTH DECAY AND SKIN INFECTION AMONG RURAL PRESCHOOL CHILDREN IN MULSHI TEHSIL, M/S, INDIA

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AUTHOR'S CONTRIBUTION

The sole author designed, analysed, interpreted and prepared the manuscript.

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Original Research Article

ABSTRACT

In present study, a village survey was carried out in rural areas of Mulshi Tehsil with the aim of assessing health related problems among the rural preschool children. Clinical examinations were carried out on 527 preschool children for various health issues. Their data was collected and analyzed to find the prevalence of Vitamin A Deficiency (VAD) and other common health issues like tooth decay, skin diseases, etc. These health issues might be due to illiteracy about hygiene, sanitation, exposure to humid atmosphere due to heavy rainfall in the study area, consumption of unfiltered borewell water for drinking, etc. The high humidity and improper sanitation leads to growth of harmful bacteria, viruses, fungi and/or other microbes. The present survey revealed 12.3% prevalence of VAD which includes 2% Night blindness, 2.5% xerophthalmia, 4% Bitot spots and 3.8% conjunctival xerosis among these preschool children. The other health issues observed among were 4.5% scleral melanocytosis, 2.7% tooth decay and 5.3% skin diseases.

Keywords: Preschool children; vitamin a deficiency; bitot spots; scleral melanocytosis; tooth decay; skin diseases.

1. INTRODUCTION

About 1/3rd of the world's preschool children are estimated to be vitamin A deficient with highest prevalence (44-50%) being reported in regions of South-East Asia and Africa [1]. Vitamin A Deficiency is still a major nutritional concern among the lower-income countries. This deficiency leads to xerophthalmia ranging from milder stages of night blindness and Bitot's spots to severe corneal xerosis or sometimes complete blindness [2]. This nutrient is required in adequate amounts for normal vision and immunity. Vitamin A also helps in cellular growth

and development [3]. VAD is widely prevalent in Africa, around 2% of preschool age children were found to be suffering from night blindness which is four times higher than proportion of South East Asia (0.5%) [2]. In Urban Central India it was found that 6.5% of children were suffering from xerophthalmia [4]. The National Oral Health Survey indicates that 51.9% of prevalence of dental issues was among children of 3 to 5 age in India [5] and 30% of total patients having skin diseases were children of the pediatric age group [6]. Hence, there was an urgent need to carry out a survey of children in rural areas in Maharashtra regarding the same.

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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 as 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).

Coronavirus and Medical Ethics

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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 Larry, 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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Review Paper:

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, monoxygenases, 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 soil⁹¹.

The bacteria and fungi along with their products like enzymes help in bioremediation⁹⁶. 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, toxitolterant and xerophiles¹⁵. 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)²⁶. 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 psychrophiles²⁶. 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 toxitolterant. The organisms which live in extreme dry environment are called as xerophiles.

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

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Mulani Mansurali K.⁴, Patil Neha N.^{5*}

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.

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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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.^[3]

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Research has been carried out on the studies of malignant transformation of OSMF into oral squamous cell carcinoma (OSCC).^[5] 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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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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BIOINSPIRED SYNTHESIS OF TiO₂ NANOPARTICLES AND ITS EFFECT ON SORGHUM BICOLOR

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Abstract

Biosynthesis of nanoparticles provides great advantages such as low cost, biocompatibility, non-toxicity and easiest experimental protocol. Titanium dioxide is being one of the fascinating and technologically important materials in almost all the field of nanotechnology. Titanium dioxide nanoparticles are widely used because of its thermodynamic stability, anticorrosion, high photocatalytic activity, wide band gap, high transmittance in visible and infrared spectral range. In the present study, Titanium dioxide nanoparticles were synthesized from titanium isopropoxide as a precursor using *Bacillus subtilis* and the pure α -amylase enzyme. TiO₂ nanoparticles were characterized by Fourier-transform infrared spectroscopy (FTIR), UV-Visible spectroscopy, X-ray diffraction (XRD) analysis and scanning electron microscopy (SEM). The TiO₂ nanoparticles were found to be spherical, ellipsoidal and irregular in shape. Individual nanoparticles as well --as a few aggregates are found having the size of 5-20 nm. The XRD shows the crystallographic plane of anatase structure of TiO₂ nanoparticles. The synthesized TiO₂ nanoparticles also induced vigour index, antidiabetic and antioxidant property of Sorghum bicolor. TiO₂ treatments have potential to enhance the growth cycle, food chain and economics of Sorghum bicolor.

Keywords: TiO₂ nanoparticles, *Bacillus subtilis*, α -amylase, Sorghum bicolor, Antidiabetic, Antioxidant

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1. INTRODUCTION

Nanotechnology is a promising field, which covers a wide range of processes, material and applications. The main focus of this new field is the synthesis, characterization, fabrication and modification of material at nanoscale level (Handford and Cambell, 2014). Nanoparticles are non porous solid, atomic or molecular aggregates with dimension between 1 and 100 nm that can eventually modify their physico-chemical properties compared with the complex material. Nanoparticles can be made from a variety of complex materials and they can act depending on chemical composition, size or shape of the particles (Gupta and Tripathi, 2011). Nanoparticles are broadly classified into two groups of organic and inorganic nanoparticles. Organic nanoparticles include carbon nanoparticles the inorganic nanoparticles include magnetic nanoparticles, noble metal nanoparticles (Gold and Silver), semiconductor nanoparticles (TiO₂, ZnO) and

metal-based materials (Al₂O₃, BaTiO₂ and ZrO₂) (Lide 1991). Smaller particle size enables the development of smaller sensors, which can be utilized more easily into remote locations. Biological synthesis of nanoparticles has grown markedly to create novel materials that are eco-friendly, cost effective and stable with great importance in wider application in the areas of electronics, medicine, food and agriculture (Gupta and Tripathi, 2011). Although nanoparticles can be synthesized through an array of conventional methods, the biological route of synthesis is advantageous as it provides rapid synthesis, controlled toxicity, control of size characteristics, low cost and eco-friendly approach (Waghmode *et al.*, 2019). Nanoparticles are extensively used for the removal of biological and chemical contaminants from the environment (Nia *et al.*, 2015). Nanoparticles are synthesized by different methods like physical, chemical,



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

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

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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 tackle 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.

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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 for 1h in the refrigerator. Beads then washed with sterile distilled water and kept preserving in 0.9% NaCl solution at 4°C.

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

Shinde S. R. and Bhailume M. V.

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Biodegradation of Caffeine

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Abstract: Caffeine is a purine alkaloid which is naturally present in different varieties of plants, tea leaves, cocoa beans etc. It act as stimulant to central nervous system and has various negative withdrawal effect on health. Caffeine can be treated chemically as well as biologically. Biodegradation by bacteria is considered to be the most efficient technique in degrading caffeine within environment. In the present study, four isolates capable of utilizing caffeine as a sole source of carbon were isolated from garden soil. The bacteria were characterized by conventional morphological and biochemical test. To identify the intermediates and degradation end products, thin layer chromatography was performed in which Isolate 1 and Isolate 3 degrades caffeine and coffee respectively to form theobromine as the end product. Isolate 2 and Isolate 4 degrades caffeine and coffee respectively to form theophylline as the end product. Infrared spectroscopy of medium containing caffeine and coffee treated by four isolates shows the presence of functional group such as alcohol, amines and amides

Keywords: Caffeine, Biodegradation, Thin Layer Chromatography, Infrared Spectroscopy

1. Introduction

Caffeine is a methyl xanthine molecule which is the most widely consumed psychoactive substance in the world, most commonly from the beverages coffee, tea and soda. The English word caffeine comes from the French (Spanish and Portuguese) word for coffee: café. Because of its stimulatory nature, it was used as a cardiostimulant till the end of 19th century (Wijhe, 2002). In the first half of the 20th century; it was used as a stimulant of respiration and circulation in Dutch medicine. The Islamic physician was the first to exploit the medicinal use of coffee well before second millennium A.D, the first documented use as a beverage was by the Sufis of Yemen. With caffeine being increasingly used as a stimulant, it was prohibited from being used as it was thought that caffeine used was a cause for vices and is seditious. Coffee was introduced to England around 1650's and in Holland a decade later. The Dutch introduced the coffee plant to the island of Java in 1688. The Island's association with coffee production led to the use of "Java" as a nickname for high quality coffee.

Caffeine is found in about a hundred species of plants, but the most highly cultivated sources are the coffee beans. (*Coffea arabica* or *Coffea canephora*, variety robusta), the leaves and leaf-buds of tea (*Thea sinensis* or *Camellia sinensis*), cola nuts (*Cola acuminata*) and cacao beans (*Theobroma cacao*)^[1].

Coffee and tea plants are the major sources of natural caffeine and related compounds such as theophylline and theobromine are produced by a large number of plant species belonging to numerous genera, families, and orders. It is believed that methylxanthine producing plants accumulate these substances as part of a chemical defense system against pests and herbivores^[1].

A very large proportion of the non-alcoholic beverages used in social settings contain caffeine. The most important beverages and foods containing caffeine are coffee, tea, guarana, mate, cola nuts, cola drinks, cocoa, chocolate. The amount of caffeine found in these products varies, but is generally high. Based on dry weight, the highest amounts are found in guarana (4-7%). Tea leaves contain

approximately 3-5% caffeine, coffee beans 1.1-2.2% (Saldana et.al 2000), cola nuts 1.5%, and cocoa beans 0.03% (Bogo and Mantle, 2000; Kretschmar and Baumann, 1999). Cocoa beans in addition contain about 1.8-2.5% theobromine. Caffeine also occurs in certain soft drinks, and so called "smart" drinks, as well as in medicinal drugs. In these cases, however, purified or synthesized caffeine has often been added to the products. Caffeine is responsible for the stimulant action of coffee (Europaisches, 1978). It stimulates the central nervous system, increases the contraction power of the heart, widens the vessels of heart, kidney and the skin and exhibits broncholytic and diuretic action. (Europaisches, 1978)^[1].

In mammals, ingested caffeine is rapidly absorbed, metabolized, and excreted in the urine as methyl xanthine derivative. Apart from being a stimulant to the central nervous system, if consumed in excess it causes mutation; it is teratogenic, causes inhibition of DNA repair, inhibition of cyclic AMP phosphodiesterase activity and inhibits seed germination (Friedman and Waller, 1983 a and b). It is the major cause of cancer, heart diseases, and complications in pregnant woman and aging (Green and Suls, 1996; Infante et. al., 1993; Srisuphan and Bracken, 1986; Dlugosz et. al., 1996; Fenster et.al., 1991)^[1].

The stimulant effect of caffeine is thought to be due to an increase in adrenaline release, which may stimulate the sympathetic nervous system, but the mechanism is not completely understood (Clarkson, 1993). Caffeine enhances Acetylcholine release in the hippocampus in vivo by a selective interaction with adenosine A1 receptors. Carter, et al, 1995).

It is known that caffeine is responsible for many effects on the human body. Details of the mechanism of caffeine at cellular and organ level can give an insight into how this molecule affects different functions in the body and the reasons for adverse effects on the body.

Caffeine is 1,3,7-trimethylxanthine, meaning it is a xanthine molecule with methyl groups replacing all of the three hydrogen's bound to nitrogen's in the xanthine ring. The molecular weight of caffeine is 194.2 and structurally it is

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Quantitative Analysis of Caffeine by Percent Degradation Assay and Iodometric Titration

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Abstract: Caffeine, a methyl xanthine molecule which is the most widely consumed psychoactive substance in the world over, most commonly from the beverages coffee, tea and soda. Caffeine is naturally present in different varieties of plants, tea leaves, cocoa beans etc. It acts as stimulant to central nervous system and has various negative withdrawal effects on health. Caffeine can be treated chemically as well as biologically. Biodegradation by bacteria is considered to be the most efficient technique in degrading caffeine within environment. In the present study, four isolates capable of utilizing caffeine as a sole source of carbon were isolated from garden soil. The bacteria were characterized by conventional morphological and biochemical test. To quantify the amount of biodegradation, percent degradation assay was performed in which Isolate 1 and Isolate 4 shows maximum degradation of caffeine. Isolate-1 shows 98, Isolate- 2 shows 88.63, Isolate-3 shows 95.45 and Isolate-4 shows 95.45 after 48 hours of incubation. Iodometric back titration was performed to measure the remaining concentration of caffeine in broth.

Keywords: Caffeine, Biodegradation, Percent degradation assay, Iodometric back titration

1. Introduction

Caffeine is a methyl xanthine molecule which is the most widely consumed psychoactive substance in the world, most commonly from the beverages coffee, tea and soda. The English word caffeine comes from the French (Spanish and Portuguese) word for coffee: café. Because of its stimulatory nature, it was used as a cardiotonic till the end of 19th century (wijhe, 2002). In the first half of the 20th century; it was used as a stimulant of respiration and circulation in Dutch medicine. The Islamic physician was the first to exploit the medicinal use of coffee well before second millennium A.D, the first documented use as a beverage was by the Sufis of Yemen. With caffeine being increasingly used as a stimulant, it was prohibited from being used as it was thought that caffeine used was a cause for wices and is seditious. Coffee was introduced to England around 1650's and in Holland a decade later. The Dutch introduced the coffee plant to the island of Java in 1688. The Island's association with coffee production led to the use of "Java" as a nickname for high quality coffee^{[1][2]}.

Caffeine is found in about a hundred species of plants, but the most highly cultivated sources are the coffee beans. (*Coffea arabica* or, *Coffea canephora*, variety robusta), the leaves and leaf-buds of tea (*Thea sinensis* or *Camellia sinensis*), cola nuts (*Cola acuminata*) and cacao beans (*Theobroma cacao*)^{[1][2]}.

Coffee and tea plants are the major sources of natural caffeine and related compounds such as theophylline and theobromine are produced by a large number of plant species belonging to numerous genera, families, and orders. It is believed that methylxanthine producing plants accumulate these substances as part of a chemical defense system against pests and herbivores^{[1][2]}.

A very large proportion of the non-alcoholic beverages used in social settings contain caffeine. The most important beverages and foods containing caffeine are coffee, tea,

guarana, mate, cola nuts, cola drinks, cocoa, chocolate. The amount of caffeine found in these products varies, but is generally high. Based on dry weight, the highest amounts are found in guarana (4-7%). Tea leaves contain approximately 3-5% caffeine, coffee beans 1.1-2.2% (Saldana et.al 2000), cola nuts 1.5%, and cocoa beans 0.03% (Bogo and Mantle, 2000; Kretschmar and Baumann, 1999). Cocoa beans in addition contain about 1.8-2.5% theobromine. Caffeine also occurs in certain soft drinks, and so called "smart" drinks, as well as in medicinal drugs. In these cases, however, purified or synthesized caffeine has often been added to the products. Caffeine is responsible for the stimulant action of coffee (Europaisches, 1978). It stimulates the central nervous system, increases the contraction power of the heart, widens the vessels of heart, kidney and the skin and exhibits broncholytical and diuretical action. (Europaisches, 1978)^[1].

In mammals, ingested caffeine is rapidly absorbed, metabolized, and excreted in the urine as methyl xanthine derivative. Apart from being a stimulant to the central nervous system, if consumed in excess it causes mutation; it is teratogenic, causes inhibition of DNA repair, inhibition of cyclic AMP phosphodiesterase activity and inhibits seed germination (Friedman and Waller, 1983 a and b). It is the major cause of cancer, heart diseases, and complications in pregnant woman and aging (Green and Suls, 1996; Infante et. al., 1993; Srisuphan and Bracken, 1986, Dlugosz et.al., 1996; Fenster et.al., 1991)^{[1][2]}.

The stimulant effect of caffeine is thought to be due to an increase in adrenaline release, which may stimulate the sympathetic nervous system, but the mechanism is not completely understood (Clarkson, 1993). Caffeine enhances Acetylcholine release in the hippocampus in vivo by a selective interaction with adenosine A1 receptors. Carter, et al, 1995).

It is known that caffeine is responsible for many effects on the human body. Details of the mechanism of caffeine at cellular and organ level can give an insight into how this

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