


RESEARCH PUBLICATION BY THE STUDENTS

The college actively promotes scientific temper by urging students to publish their dissertation findings. Recently, an MSc student from the PG Department of General Biotechnology successfully communicated a research paper to a peer-reviewed journal, marking a significant milestone in fostering a culture of academic inquiry and dissemination of knowledge. This initiative not only enhances the student's academic profile but also contributes to the wider scientific community, reinforcing the college's commitment to nurturing research-oriented minds

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The screenshot displays the homepage of the International Journal of Recent Scientific Research. The header includes the journal's name, ISSN 0976-3031, and a navigation menu with options like HOME, ABOUT US, AIM & SCOPE, CURRENT ISSUE, SPECIAL ISSUE, BOOKS & THESIS, EDITORIAL BOARD, and ARCHIVE. A search bar is also present. The main content area features a 'COMING ISSUE' section for February 2023, listing three articles with their titles, authors, and subjects. The first article is 'Study of hematological and coagulation profile in patients of malaria' by Nimit Patel et al. The second is 'The "nightmare omicron variants" are not as bad as they sound' by Raghavendra Rao M.V. et al. The third is 'An evaluation of ICT competencies of IT professionals in providing digital library services of d. y. patilpratilishthan's colleges' by Rohan Raju Pawar et al. To the right, there is an 'IMPACT FACTOR' section with a 'CERTIFICATE OF INDEXING/INDE' and a 'SUBMIT YOUR ARTICLE' button. Below that is a 'PUBLISH YOUR ARTICLE' button and an 'ANNOUNCEMENT' section with the text 'Index Copernicus IC Value'.


Dr. NAVEEN MOHAN
PRINCIPAL
GEMS ARTS AND SCIENCE COLLEGE
KADUNGAPURAM (PO), RAMAPURAM
MALAPPURAM DT., KERALA-679 321



Bio-augmentation - Effective Method of Treating Plastic Waste - A field Study

Naveen Mohan and R. Usha*

Department of Microbiology, Karpagam Academy of Higher Education,
Coimbatore 641021, Tamil Nadu, India.

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Polythene waste is a serious threat to our environment. There are many methods available for its degradation. The present study shows light for eco friendly approach for mitigating the ecological problem of the century. By using bio-augmentation, microorganisms having specific metabolic capabilities are introduced into the contaminated site for enhancing the degradation of plastic waste. The field trials for a period of 3 months shows clearly that the LDPE sheets are better degraded with augmented microorganism (1.6%,4%,5.2%,8%,8.8%) than non bio augmented soil (4%,1.6%,2.8%3.6%4%). The ecological importance of this study is that we will be able to tackle plastic waste by adding bio-augmented strains in to an area or dumpyard filled in with plastic waste.

Keywords: Bio augmentation, Actinomycetes, Plastic waste and Degradation.

The term "Plastic" is derived from the Greek word "plastikos" which means "able to be molded in to different shapes"¹ and is given to any synthetic or semi- synthetic organic polymers with high molecular mass that are mouldable. Plastic are man-made long chain polymeric molecules² mainly synthetically derived from petrochemicals. Plastic materials such as polyethylene, polypropylene, polyvinyl chloride and polyethylene tetra phthalate have wide applications in industries and human life.

Civilization, urbanization and industrialization paved the way for the mass dumping of plastic waste in to the environment . "Beat plastic pollution" is the theme for World Environment Day 2018, and is a call for everyone combat the eco-nightmare. Nearly one third of the plastic packaging we use escapes collection systems, which means it ends up as solid wastes causing irreparable damage to our environment.

There are different methods of disposal of plastics such as incineration, recycling and landfills³. Biodegradation is the recent trend in this field giving a helping hand to the nature⁴.

The microbial species which are associated with degrading plastic materials were identified as Bacteria (*Psuedomonas*, *Streptococcus*, *Micrococcus* and *Moraxella*) Fungi (*Aspergillus*) and Actinomycetes⁵.

Bio-augmentation is the addition of pre-grown microbial cultures to enhance microbial population at a site to improve contaminant clean up and reduce clean up time and cost. The success of bio-augmentation depends on both biotic and abiotic factors. The most important is a strain selection⁶. The organism for bio augmentation should be able to survive and multiply in soil as well as to compete with indigenous microorganisms for nutrients and oxygen. Moreover, after being introduced in the soil, they should not lose their degradative capacity.

Attempt has been made in this paper to find a lucrative bioremediation method to study the biodegradation of LDPE using augmented

* To whom all correspondence should be addressed.
E-mail: ushaanbu09@gmail.com

Biochemical Characterization and Biological Evaluation of Royal Jelly from *Apis cerana*

Ajitha Nath K.G.R^{1*}, Adithya Krishna S.B¹, Smrithi S¹, Jayakumaran Nair A¹, Sugunan V.S²

¹Department of Biotechnology, University of Kerala, Karyavattom, Thiruvananthapuram, Kerala, India

²Department of Zoology, University College, Thiruvananthapuram, Kerala, India

***Corresponding author:** Ajitha Nath K.G.R, Department of Biotechnology, University of Kerala, Karyavattom, Thiruvananthapuram, Kerala, India, Tel: +91 7510804497, E-mail: kgr.ajithanath@gmail.com

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Abstract

Royal Jelly (RJ) is an extremely nutritious functional food produced by nurse honey bees from their hypo-pharyngeal gland. It plays a critical role in the determination of honey bee caste and the development of queen bee. RJ is also considered as a 'nutraceutical' often used as a substance that supports health. The present study analyzes the biochemical components of Royal Jelly from Indian honey bee, *A. cerana*. RJ showed an acidic pH 3.6. Royal Jelly has a higher moisture content of 67% and ash content of 1.06%. RJ has the lipid and the carbohydrate content of 4.6 mg/mL and 11.4 mg/ml respectively. This highlights the properties of RJ in various fields of medicine, food and cosmetic industries. Antimicrobial activities were also evaluated and were found to be effective against *Bacillus subtilis* and *Rhizopus stolonifer*. It also showed high antioxidant potential which shows its ability to scavenge free radicals thus protects the cells from unwanted stresses. This paper reports for the first time the biochemical characterization of Royal Jelly from Indian honey bee, *A. cerana*.

Keywords: Royal Jelly; Functional food; Antimicrobial activity; Phenolic compounds; Flavonoids contents; Antioxidant activity

Introduction

Royal Jelly (RJ) is a thick milky white secretion produced from the hypo-pharyngeal glands of nurse honey bees of 6-12 days old worker bees. It plays an important role in the caste determination and the development of the queen bee. The larvae destined to be queen bees are continuously fed with RJ but the larvae destined to be worker bees fed with a mixture of honey, RJ and pollen [1]. RJ has been discovered to have anti-ageing, antibacterial, anti-oxidant, anti-tumor, anti-fatigue, anti-inflammatory, vasodilative, hypotensive, disinfectant, anti-hypercholesterolemia, anti-diabetic properties [2,3], anti-mutagenic and anti-histopathology effects [4]. These effects are attributed to the bioactive components present in the RJ. It includes water (60-70%), protein (12-18%), sugars (8-11%), lipids (3-8%) and vitamins, salt and free amino acids. There are differences in composition of RJ according to seasonal and geographical conditions, species of honeybees [5], physiological and metabolic changes of both nurse bees and larvae [6], time of harvest of RJ [7]. The objective of the study is to analyze the biochemical characterization and biological properties of RJ from Indian honeybee, *A. cerana*. This is the first report showing the biological characterization of RJ from Indian honey bee, *A. cerana*.

Materials and Methods

Sample Collection

RJ was collected in January from the queen cells at the Apiary of Meenachil Bee Garden, Pala, Kottayam, Kerala, India. The queen cells containing the RJ was removed from the frame and immediately placed in -20 °C wrapped with aluminum foil. The samples were thick milky in appearance, slightly yellow in color (Figure 1) with a pungent odour. Before use, the stored samples were allowed to equilibrate at room temperature and stirred to produce a homogenous mixture.

Biochemical analysis of Royal Jelly

An investigation on the biochemical composition of RJ was carried out as follows. International Honey Commission (IHC) by Sabatini, *et al.* developed an international standard for RJ [8].

Determination of pH [9]: pH of RJ was determined by using a pH meter.

Determination of moisture content [9]: RJ (5.0 g) was placed in a hot air oven for eight hours at 105 °C in pre-weighed crucibles.



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Sebrin J Islam

1) Biological Sciences and Technology Division, North-East Institute of Science and Technology, Council of Scientific and Industrial Research, Jorhat, Assam, India

2) Academy of Scientific and Innovative Research (AcSIR), CSIR- North East Institute of Science and Technology Campus, Jorhat, Assam, India

Prasenjit Manna

1) Biological Sciences and Technology Division, North-East Institute of Science and Technology, Council of Scientific and Industrial Research, Jorhat, Assam, India

2) Academy of Scientific and Innovative Research (AcSIR), CSIR- North East Institute of Science and Technology Campus, Jorhat, Assam, India

Balagopalan Unni

Director Research, Assam Down Town University, Guwahati, Assam, India

Jatin Kailta

1) Academy of Scientific and Innovative Research (AcSIR), CSIR- North East Institute of Science and Technology Campus, Jorhat, Assam, India

2) Research Planning and Business Development Division CSIR-North East Institute of Science and Technology, Jorhat, Assam, India

Correspondence

Sebrin J Islam

1) Academy of Scientific and Innovative Research (AcSIR), CSIR- North East Institute of Science and Technology Campus, Jorhat, Assam, India

2) Research Planning and Business Development Division CSIR-North East Institute of Science and Technology, Jorhat, Assam, India

Higher concentrations of heavy metals impair antioxidant defense mechanism and growth response of muga silkworm, *Antheraea assamensis* (Lepidoptera: Saturniidae)

Sebrin J Islam, Prasenjit Manna, Balagopalan Unni and Jatin Kailta

Abstract

Oxidative stress leads to imbalance between the production of free radicals and antioxidant defense mechanism. Muga silkworm being reared outdoor is subjected to heavy metal pollution. The present study focuses on the potential capacity of larvae in terms of growth and antioxidant enzyme activity fed with heavy metals (Cd, Pb, Mn & Zn) stressed leaves *in vitro* condition. Heavy metal accumulation in pupa was correlated with body weight and instar duration and its effect on silk thread was studied. The body weight and instar duration was significantly varied in high dose of Cd and Pb, indicating that metal pollution prevented silkworm from achieving better growth. Effect of heavy metal on the antioxidant enzyme activity (Glutathione-S-transferase, superoxide dismutase, catalase) showed significant difference than control. Groups were compared by One-way ANOVA using Student Neumann Keul test. Present study suggests that activity of antioxidant enzymes in the larvae varies with respect to time and concentration of heavy metal ions.

Keywords: *Antheraea assamensis*, antioxidant enzymes, heavy metals, oxidative stress

1. Introduction

The safe clearance of industrial effluents is becoming a serious concern worldwide. Increase in industrialization and inputs of chemicals in agro-ecosystem leads to the accumulation of toxic metals in the air, soil and water bodies. Anthropogenic activities such as metalliferous mining, smelting, application of chemical fertilizers and natural activities had resulted in the significant accumulations of variety of heavy metals in terrestrial ecosystems [27]. Being non-biodegradable in nature, metals persist in the nature for long time and causes deleterious effects to both human health and environment. Heavy metals has relatively high density and toxic at low quantity, e.g., arsenic (As), lead (Pb), mercury (Hg), cadmium (Cd), chromium (Cr), thalium (TI). Some trace elements are also considered as zinc (Zn), copper (Cu), selenium (Se). They are present mostly in soil and aquatic ecosystems rather than atmosphere. The toxicity of heavy metals is dependent on dose, route of exposure, chemical species, age, gender, genetics and nutritional status of exposed individuals [35]. They are important constituents of several key enzymes and various oxidation reduction reactions. Their negative effects includes increase of reactive oxygen species (ROS) for eg. superoxide anions, hydrogen peroxide and hydroxyl radicals [24]. Among heavy metals pollutants, cadmium (Cd) and lead (Pb) are not able to participate in metabolic reactions in herbivores [40]. Cd is absorbed by host plants and accumulated in phytophagous insects through the food chain inducing irreversible damages, ultimately leading to cell death. It is a cumulative toxicant and is of concern of phytophagous insects as its concentration tends to increase with age [36]. Deleterious effects of Cd are associated with alterations in the redox status of the cell. Scientific studies revealed the cytogenic, mutagenic and carcinogenic effects of cadmium on organisms including invertebrates [45]. It interferes with the antioxidative defense system, thereby resulting in the formation of free radicals and consequently lipid peroxidation. Cd accumulates in the animal tissues and disturb their physiological functions due to its non-degradable nature. Toxicological profile of Pb comprises generation of oxidative stress, ionic mechanism and apoptosis [16]. Exposure to lead causes many side effects depending on the level and duration. Zn is an essential element and play a vital function in protein, lipid and carbohydrate metabolism, however at higher concentrations it can induce a broad range of physiological,

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Effect of feed supplementation with biosynthesized silver nanoparticles using leaf extract of *Morus indica* L. V1 on *Bombyx mori* L. (Lepidoptera: Bombycidae)

Sudip Some¹, Onur Bulut^{2,3,4}, Kinkar Biswas⁵, Anoop Kumar⁶, Anupam Roy⁷, Ipsita Kumar Sen⁸, Amitava Mandal⁹, Octavio L. Franco^{10,11}, İkbâl Agah İnce¹², Kartik Neog¹³, Sandip Das¹, Sayantan Pradhan¹, Subhadeep Dutta¹, Debjoy Bhattacharjya¹⁴, Soumen Saha¹⁴, Pradeep K. Das Mohapatra¹⁵, Anil Bhuimali¹⁶, B. G. Unni¹⁷, Ahmet Kati^{12,18}, Amit Kumar Mandal¹, M. Deniz Yilmaz^{4,19} & Ismail Ocsoy²⁰

Herein, we report the synthesis of silver nanoparticles (AgNPs) by a green route using the aqueous leaf extract of *Morus indica* L. V1. The synthesized AgNPs exhibited maximum UV-Vis absorbance at 460 nm due to surface plasmon resonance. The average diameter (~54 nm) of AgNPs was measured from HR-TEM analysis. EDX spectra also supported the formation of AgNPs, and negative zeta potential value (−14 mV) suggested its stability. Moreover, a shift in the carbonyl stretching (from 1639 cm^{−1} to 1630 cm^{−1}) was noted in the FT-IR spectra of leaf extract after AgNPs synthesis which confirm the role of natural products present in leaves for the conversion of silver ions to AgNPs. The four bright circular rings (111), (200), (220) and (311) observed in the selected area electron diffraction pattern are the characteristic reflections of face centered cubic crystalline silver. LC-MS/MS study revealed the presence

¹Chemical Biology Laboratory, Department of Sericulture, Raiganj University, Uttar Dinajpur, 733134, West Bengal, India. ²Department of Molecular Biology and Genetics, Faculty of Agriculture and Natural Sciences, Konya Food and Agriculture University, 42080, Konya, Turkey. ³Department of Biological Sciences, Middle East Technical University, 06800, Ankara, Turkey. ⁴Research and Development Center for Diagnostic Kits (KIT-ARGEM), Konya Food and Agriculture University, 42080, Konya, Turkey. ⁵Laboratory of Organic Synthesis, Department of Chemistry, Raiganj University, Raiganj-733134, Uttar Dinajpur, West Bengal, India. ⁶ANMOL Laboratory, Department of Biotechnology, North Bengal University, Raja Ram Mohanpur, Siliguri, Darjeeling, 734013, India. ⁷Laboratory of Food Chemistry and Technology, Department of Chemical Engineering, Birla Institute of Technology, Mesra, Ranchi, 835215, India. ⁸Department of Science and Humanities, Sidhu Kanhu Birsa Polytechnic, Keshiary, 721133, West Bengal, India. ⁹Molecular Complexity Laboratory, Department of Chemistry, Raiganj University, Raiganj, 733 134, Uttar Dinajpur, West Bengal, India. ¹⁰S-INOVA Biotech, Post-Graduate Program in Biotechnology, Catholic University Dom Bosco, Campo Grande, Mato Grosso Do Sul, Brazil. ¹¹Center of Proteomic and Biochemical Analysis, Post Graduate Program in Genomic Sciences and Biotechnology, Catholic University of Brasilia, Brasilia, Brazil. ¹²Department of Medical Microbiology, School of Medicine, Acibadem Mehmet Ali Aydınlar University, 34752, Ataşehir, Istanbul, Turkey. ¹³Biotechnology Division, Central Muga Eri Research & Training Institute (CMER&TI), Central Silk Board, Ministry of Textiles: Govt. of India, Lahdoigarh-785700, Jorhat, Assam, India. ¹⁴Cytogenetics & Plant Biotechnology Research Unit, Department of Sericulture, Raiganj University, Uttar Dinajpur, 733134, India. ¹⁵Department of Microbiology, Raiganj University, Uttar Dinajpur, 733134, West Bengal, India. ¹⁶Hon'ble Vice-Chancellor, Raiganj University, Uttar Dinajpur, 733134, West Bengal, India. ¹⁷Director Research, Assam Down town University, Sankar Madhav Path, Gandhi Nagar, Panikhaiti, Guwahati, 781026, Assam, India. ¹⁸Department of Biotechnology, Institution of Health Science, University of Health Science, Istanbul, 34668, Uskudar, Istanbul, Turkey. ¹⁹Department of Bioengineering, Faculty of Engineering and Architecture, Konya Food and Agriculture University, 42080, Konya, Turkey. ²⁰Department of Analytical Chemistry, Faculty of Pharmacy, Erciyes University, Kayseri, 38039, Turkey. Correspondence and requests for materials should be addressed to A.K.M. (email: amitmandal08@gmail.com) or M.D.Y. (email: deniz.yilmaz@gidatarim.edu.tr) or I.O. (email: ismailocsoy66@gmail.com)



Circulatory heavy metals (cadmium, lead, mercury, and chromium) inversely correlate with plasma GST activity and GSH level in COPD patients and impair NOX4/Nrf2/GCLC/GST signaling pathway in cultured monocytes

Kabita Gogoi^{a,b}, Prasenjit Manna^{a,b}, Tapan Dey^a, Jatin Kalita^{b,c,*}, Bala Gopalan Unni^d, Dibyajyoti Ozah^e, Pranab Kumar Baruah^e

^a Biological Sciences and Technology Division, CSIR-North East Institute of Science and Technology, Jorhat 785006, Assam, India

^b Academy of Scientific and Innovative Research, CSIR-North East Institute of Science and Technology Campus, Jorhat 785006, Assam, India

^c Research Planning and Business Development Division, CSIR-North East Institute of Science and Technology, Jorhat 785006, Assam, India

^d Research Cell, Assam Downtown University, Guwahati 781026, Assam, India

^e Clinical Centre, CSIR-North East Institute of Science and Technology, Jorhat, Assam, India

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ABSTRACT

This study aims to examine the hypothesis that circulatory heavy metals may be associated with lung function decline and lower plasma GST activity and GSH level in COPD patients via activating monocytes mediated by impairing the NOX4/Nrf2/GCLC/GST signaling pathway. Results showed that the blood levels of heavy metals (cadmium, lead, mercury, and chromium) were significantly higher in COPD patients of coal mine site compared to the healthy controls. The levels of heavy metals in COPD patients were significantly and negatively correlated with lung function, GST activity, and GSH level. Using flowcytometry, fluorescence spectroscopy, and immunoblotting studies we have further demonstrated that treatment with individual heavy metals dose-dependently increased the NOX4 protein expression, intracellular ROS production, and decreased the Nrf2, GCLC, and GST protein expression, GST activity, and GSH level in THP-1 monocytes. None of the treatment caused any change in cell viability compared to control. In conclusion, this study suggests that circulatory heavy metals in COPD patients of coal mine site weakened the lung function, decreased the plasma GST activity and GSH level via impairing the NOX4/Nrf2/GCLC/GST signaling pathway in monocytes, which may cause monocyte activation and initiate the COPD pathophysiology.

1. Introduction

Occupational exposure to heavy metals, toxic gases, dust, or fumes are associated with the development of chronic obstructive pulmonary disease (COPD), a major cause of morbidity and mortality worldwide (Boschetto et al., 2006; Kraim-Leleu et al., 2016; Rokadia and Agarwal, 2013). Several epidemiological studies have shown the association of heavy metal exposure with lower pulmonary function, a hallmark for developing COPD (Heo et al., 2017; Little et al., 2017; Oh et al., 2014). There has been an increased exposure of heavy metals to the environment due to various anthropogenic factors, such as coal mining, smelting, and industrial effluents. Upon metabolism within the body, heavy metals, particularly lead, mercury, and cadmium, produce a large

amount of reactive oxygen species (ROS) and cause oxidative impairment in various organs (Agrawal et al., 2014; Almeida Lopes et al., 2017; Patra et al., 2011; Rehman et al., 2018).

Glutathione-s-transferase (GST) is a super family of enzymes comprising alpha, mu, pi, theta, kappa, zeta, sigma, omega, and delta sub units that are involved in the detoxification mechanism via conversion of many endogenous and exogenous electrophilic compounds to less reactive metabolites (Nebert and Vasiliou, 2004). A series of earlier studies including our previous report demonstrated that genetic polymorphism of GST (GSTM1, GSTT1, and GSTP1) is a critical risk factor for the development of COPD among various populations (Dey et al., 2014; Ishii et al., 1999; Lakhdar et al., 2011; Rodriguez et al., 2005; Shukla et al., 2011). The total antioxidant capacity was reported to be

* Corresponding author at: Research Planning and Business Development Division, CSIR-North East Institute of Science & Technology, Jorhat 785006, Assam, India.

E-mail address: kalitajk74@gmail.com (J. Kalita).

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Utilization of Resources as a Component of Integrated Nutrient Management Strategy in Tropical Tuber Crops

K. Susan John, P.S. Anju, S. Chithra, S.U. Shanida Beegum,
I.P. Anjana Devi, M.N. Sheela and G. Suja

ICAR- Central Tuber Crops Research Institute, Thiruvananthapuram, Kerala

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Abstract

Tropical tuber crops like cassava, sweet potato and elephant foot yam have served as major/subsidiary food for a major section of the global human population since time immemorial. Because of the higher biological efficiency, manifested in terms of high tuber yields, response of these crops to application of fertilizers and manures is high. Though tuber crops are grown on marginal soils, our experience has shown that the farmers' income can be enhanced substantially through proper utilization of different natural as well as applied resources under integrated nutrient management (INM) practice. Natural resources managed in this strategy include soil, planting material and crop residues; whereas applied resources involve organic manures, chemical fertilizers and biofertilizers. This paper describes a detailed account of the ways in which these resources have been managed efficiently leading to the higher benefit : cost ratio. The low input management technology developed at the ICAR-CTCRI, Thiruvananthapuram by combining the natural as well as applied resources like nutrient use efficient (NUE) planting material; cost-effective organic manure source like green manuring *in situ* with cowpea; soil test based application of fertilizers including major, secondary and micro nutrients; and use of effective biofertilizers not only effected up to 55% saving in the fertilizer inputs but also raised the farm income with benefit : cost (B:C) ratio up to 4.4:1.

Key words: Nutrient use efficiency (NUE), planting material, sustainability, carbon sequestration, customized fertilizers, *thippi*, soil quality, crop residues

Introduction

As per Cambridge dictionary, resource is a useful or valuable possession or quality of a country, organization, or person. Air, water, food, plants, animals, minerals, metals and everything else that exists in nature and has utility to mankind is a 'resource'. There are three types of economic resources which are also referred to as factors of production; these are land (including all natural resources), labour (including all human resources), and capital (including all economic resources). In crop production, natural resources namely, soil, planting material or residue of the crop influence the crop yields and sustain soil health. Soil resource, in addition to supplying nutrients for plant growth, provides beneficial microbes which help in cycling nutrients to plant-assimilable forms. Usually the applied resources are chemical fertilizers, organic manures and bio-fertilizers. Effective utilization of all these resources leads to the enhanced productivity.

Sustained research efforts were made at ICAR-CTCRI for enhancing income of the farmers growing tropical food crops like cassava, sweet potato and elephant foot yam through judicious use of natural resources like soil (nutrients, microbes), planting material (crop/

variety), crop residues (leaves, stem, solid waste from cassava starch factory) and applied resources like chemical fertilizers, organic manures and bio-fertilizers. This article presents, collates and discusses the work done at ICAR-CTCRI which led to the development of integrated plant nutrition supply system for these crops.

Soil as a Natural Resource for Tropical Tuber Crops

Soil is a prime source of nutrients for plant growth. Tropical tuber crops are mainly grown in Ultisols (laterites), Alfisols (red soils) and Entisols (coastal sandy loam). Laterites are poor in organic matter, and low in available nitrogen (N), available phosphorus (P) and available potassium (K) with pH range of 4.0-5.5. Red soils are loamy in texture; low in organic matter, available N and available P; and medium in available K with pH varying from 5.0 to 7.0. Sandy loam soils are low in organic matter and plant nutrients. Hence, in general tuber crops growing soils are poor in native fertility, low in cation exchange capacity (CEC) and high in P fixing capacity. As regards to the fertility status, tuber crops growing soils of Kerala are acidic with medium soil organic carbon (SOC); high in available P; low to medium in available K; low in calcium (Ca) and magnesium (Mg) content; sufficient in a available sulphur (S), iron (Fe), copper (Cu), manganese (Mn) and zinc (Zn); and very

Association of X-ray Repair Cross-Complementing Group 1 Arg399Gln Polymorphisms with the Susceptibility to Develop Oral Squamous Cell Carcinoma in Tamol Chewer's Population in Assam, India

Lhakit Lepcha, Manash Pratim Sarma¹, Amal Chandra Kataki², Bala Gopalan Unni¹

Departments of Medical Laboratory Technology, ¹Department of Biotechnology, Assam Downtown University, Guwahati, Assam, India, ²Department of Gynecologic Oncology, Dr B. Borooah Cancer Institute, Guwahati, Assam, India

Abstract

Background: Various environmental factors have been reported to play key role in the development of oral squamous cell carcinoma (OSCC). A lesser known risk factor of oral cancer in India is the uncontrolled use of areca nut chewing. In North-East India, Areca nut, locally called as "Tamol" in Assam, is raw betel nut, lime and betel leaf without tobacco, which are more effective as compared to dried which can be the important contributing factor for OSCC. **Objectives:** The aim of the study was to detect the association between XRCC1 polymorphisms and increased risk of OSCC in tamol chewers population in Assam, India. **Methods:** 50 OSCC patients, 50 tamol chewers and 50 controls were enrolled in the study. XRCC1 Arg399Gln polymorphisms were determined by using polymerase chain reaction restriction fragment length polymorphism (PCR-RFLP). **Results:** There was a significant association for XRCC1 codon 399 (Arg/Gln+Gln/Gln) ($p < 0.05$; OR=1.909, CI=0.8622- 4.227) with the wild type in cancer sample as compared with control sample. Similarly, the positive association for 399G/G ($p < 0.05$; OR =2.842, CI = 0.919-8.79) genotypes with oral carcinoma and control sample. In case of tamol chewers, the AA genotype was found to be associated with 2-fold (OR- 2.25, CI= 0.709-7.14) increase risk of developing oral cancer while GA+AA genotype was associated with one and half fold (OR-1.62, CI=0.7354- 3.568) risk of developing oral cancer. **Conclusions:** Based on these results, the XRCC1399G>A genotype could be used as a useful molecular biomarker to predict genetic susceptibility in tamol chewers population and its susceptibility to develop OSCC.

Keywords: Oral squamous cell carcinoma, polymerase chain reaction–restriction fragment length polymorphism, Tamol, X-ray repair cross-complementing group

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INTRODUCTION

Oral cancer is currently the 6th most common malignancy in the world.^[1] The worldwide oral cancer incidence is around 500,000 new cases every year, accounting for approximately 3% of all malignancy, creating a world health problem significantly.^[2] In India, it is the most common malignancy among men and one of the five most common malignancies among women.^[3] Etiology of oral squamous cell carcinoma (OSCCs) comprises risk factors such as exposure to tobacco product, alcohol, infection, dietary factors, and chemical irritants. A lesser known risk factor of oral cancer in India can also be attributed

to uncontrolled chewing of areca nut.^[4] In Northeast India, locally called as "Tamol" in Assam, "Kwai" in Meghalaya, and "Kuba" in Mizoram, is a raw betel nut chewed in combination with betel leaf and lime and often without tobacco. It has a high content of chemicals such as alkaloids, polyphenol, and tannins

Address for correspondence: Miss. Lhakit Lepcha, Department of Medical Laboratory Technology, Assam Downtown University, Panikhaiti - 781 026, Assam, India. E-mail: lakilepcha@gmail.com

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Protein Profile of Human Saliva as a Predictive and Prognostic Tool for OSCC in Tamol Chewer's Population in Assam

Lhakit lepcha^{1*}, Manash P Sarma², Amal C Katak³, Wankupar Wankhar¹, B G Unni²

Abstract

Objective: To identify potential proteomic salivary biomarker in tamol chewers and comparing it to healthy and Oral squamous cell carcinoma cases. **Methods:** A total of fifty unstimulated saliva samples were collected from the healthy volunteers, tamol chewers (without tobacco), and OSCC patients referred to North-East cancer Hospital, Jorabat, Assam, India. The 2-D gel analysis and western blotting were performed to analyze protein profiling. **Results:** The identified proteins were serum albumin, HSP (Heat shock protein) 27, gamma actin, SCC (Squamous cell carcinoma) 1, and Annexin A4. All the proteins were associated with OSCC development when their values were compared with those of normal healthy subjects. HSP27 was subjected to further validation using western blotting methods. An increase of 18.39% (Serum Albumin), 15.04% (gamma actin), 14.01% (SSC 1), and 20.22% (ANX4) were observed in Tamol chewers when compared with healthy control subjects. **Conclusion:** Our results revealed that the identified salivary proteins have a positive association with OSCC development. Profiling of these saliva proteomes especially HSP (Heat shock protein) 27 as a potential biomarker for OSCC detection in the high-risk population is recommended.

Keywords: OSCC- Oral squamous cell carcinoma- ANXA4 - Annexin A4- HSP-Heat shock protein- SCC

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Introduction

Oral cancer, histologically about 90% in the form of oral squamous cell carcinoma (OSCC), is a high-effect and common form of disease-related with the oral cavity (Gupta et al., 2013; Mascitti et al., 2018). Many environmental and genetic factors are often associated with the development of this disorder but the major regional predisposing risk factor for OSCC is chewing of betel quid and "paan" in India (Garg et al., 2014; Lepcha et al., 2021). World Health Organization and International Agency for cancer research classified areca nut as a group-I human carcinogen with enough verification of increased risk of precancerous oral lesion and cancer of the oral cavity (Hernandez et al., 2017). In Northeast India, a variety of raw areca nut is used in combination lime paste and piece of betel leaf without tobacco locally termed as tamol in Assam. Frequent and regular scratches of betel nut and betel leaf form ulcers in the oral cavity (Kumar et al., 2021). Comprises strong chemical compound in slaked lime which further forms scars or ulcers by burns the soft tissue in the oral cavity. Which can further be a main contributing factor for developing oral cancer (Phukan et al., 2001; Borkotoky et al., 2020).

OSCC diagnosis depends on a thorough oral cavity examination, for possible signs and symptoms of the

disease, followed by tissue biopsy. Besides diagnosis based on tissue, and body fluids like saliva and blood are the extensively studied samples that may comprise consistent biomarkers for cancer analysis. The saliva sample is an enlightening body fluid containing a range of analytes such as protein (Singh et al., 2020; Roi et al., 2020), mRNA (Oh et al., 2020), antioxidant profile (Lepcha et al., 2019), and DNA (Lepcha et al., 2021; Borkotoky et al., 2020) which can be used as diagnostic and prognostic markers for clinical and therapeutic applications. Several studies have investigated the use of salivary proteins as a potential diagnostic marker for oral cancer. The identification of proteins is either cleaved by gel electrophoresis or enzymatic digestion by the procedure to produce peptides (Hu et al., 2008; Ploypetch et al., 2020). Approximately, 3000 proteins have been identified in saliva by using various procedures (Hu et al., 2008; Jarai et al., 2012; Ploypetch et al., 2020). Similarly, various potential biomarkers identified from the saliva of OSCC such as cytokeratin 19 fragment (Cyfra21-1) (Rathore et al., 2020), albumin (Nguyen et al., 2020), telomerase (Sannam et al., 2016), transferrin (Nguyen et al., 2020), glutathione (Singh et al., 2020) were identified.

Thus, analyzing salivary protein profiles as potential biomarkers or molecular targets for early detection for OSCCs in tamol chewers and a feasible target to screen

¹Department of Pathology, Assam Downtown University, India. ²Assam Down Town University Panikhaiti, Assam, India. ³Director Dr. Bhubaneswar Borooh Cancer Institute Guwahati, Assam, India. *For Correspondence: lakilepcha@gmail.com

Pharmacological potentials of *Dalbergia Sissoo*-A mini review

RanjushaVP¹

¹PG Department of General Biotechnology, GEMS Arts and Science College, Malappuram, 679321, Kerala, India

Abstract

The Fabaceae family tree *Dalbergia sissoo*, widely known as Indian rose wood, rightfully belongs to. High pharmacological potential for treating a wide range of ailments can be found in all parts of this plant. The pharmacological effects among many solvent extracts and related components of *Dalbergia sissoo* are addressed in the current review. Anti-diabetic, antioxidant, neuroprotective, inflammatory, antinociceptive, antibacterial, antidiarrheal, antiviral, anticholerae, mitigation of DNA damage, anti-analgesic, anti-pyretic, antihelmintic, gastroprotective, and anti-ulcer qualities are all present in *Dalbergia sissoo*. The majority of studies show that *Dalbergia sissoo* bark and leaf alcohol extracts have been shown to be effective against a variety of diseases. This review recommended using an alcoholic *Dalbergia sissoo* extract to isolate active compounds and conduct subsequent clinical studies.

Key words: *Dalbergia sissoo*, alcoholic extract, pharmacological properties, *Fabaceae*.

Introduction:

Nearly 80% of the world's inhabitants use medicinal plants to treat common illnesses, and the vast majority of modern therapeutics have their ancestors within these same plants. Owing to this, the pharmacological traits and characteristics of *Dalbergia sissoo* and its various solvent extracts are explored in the current review. Secondary metabolites are the primary active components of medicinal plants that are used to treat a variety of conditions. The foundational pillars of plants are their secondary metabolites, which also include alkaloids, terpenoids, flavonoids, phenolics, and tannins. (Prof. Dr. Ali Esmail -2017). It is a huge tree that may achieve a height of 25 metres and has niches all over the world, including India. This plant has historically been used as a folk remedy for fever, inflammation, piles, blood purification, skin irritations, ulcers, and leprosy.

Secondary metabolites are primarily found in plants, introduced a variety of applications for use in several industries, including the pharmaceutical, agricultural, flavor, fragrance, color, food, and bio pesticide sectors. etc (Phool Chandra *et al* 2013). India is home to 25 of the 300 species in the genus. Pharmaceuticals make up a large portion of compounds generated from plants. (Sudhakar *et al* -2013). The plant is found in forests and in the natural world, particularly in tropical and subtropical temperatures. In India, Pakistan, Persia, Malaysia, Thailand, Ethiopia, Nigeria, Kenya, USA, Indonesia, Tanzania, and Iraq, *Dalbergia Sissoo* is a common plant etc (Lal *et al*-2012). *Dalbergia sissoo* oil used for Skin disorders, infected ulcer; heart wood used for fever, anti-helmintic, anti-leprotic, cooling, barks extract used for piles, anti-inflammatory, sciatica, blood purifier; arial part used for spasmolytic, aphrodisiac, and expectorant (Mamtha *et al*- 2014).



Figure(1) Indian Rose wood

Methodology: Scopus, Web of Science, Google Scholar, Science Direct, Elsevier, and PubMed were used to search databases to find and assemble relevant literature (from 2000 to 2023). The papers were chosen using the keywords "*Dalbergia sissoo*, anti-oxidant, inflammatory, medicinal effects, phytochemical components, malignancy".

Pharmacological activities of *Dalbergia sissoo*

Anti-Diabetic activity: The anti-diabetic activity of leaves was studied using various extracts at a concentration of 300 mg/kg and solvents such as ethyl acetate, ethanol, n-butanol, and petroleum ether. According to the study's findings, ethanolic extracts have higher anti-diabetic activity when compared to Glibenclamide, a standard medication. (Sangram *et al* 2009). Anti-diabetic activity of bark was studied by using ethanolic extract. The dosage of plat sample about 250-500mg/kg. Barks (Shukla *et al*-2000).



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Research Article

STUDIES ON LIPASE FROM *MONOMORIUM* SPECIES: *IN SILICO* AND *IN VITRO* APPROACHES

Ramisha Khathoon M.C., Nayana P.* and Balagopalan Unni

PG Department of General Biotechnology, GEMS Arts and Science College, Affiliated to University of Calicut, Ramapuram 679321, Malappuram, Kerala, India

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ABSTRACT

Ants, a worldwide species with lots of variations have a metabolic byproduct lipase (triacylglycerol acyl hydrolase), an enzyme that hydrolyzes acyl ester bonds that can be used for various purposes. The protein sequence of *Monomorium pharaonis* lipase 3, which is closely related to the sample used for *in vitro* experiments, was used in the current work to conduct *in silico* analysis. ProtParam predicted the molecular weight of lipase to be 46.42 kDa and the protein to be hydrophilic in nature. CFSSP was used for the prediction of secondary structure and SWISS-MODEL used for homology modelling. The Mol Probit score was 2.10 with three possible active sites predicted by the FT Site tool. The optimal temperature and pH of lipase from *Monomorium pharaonis* were determined to be 37°C and 4, respectively, using BRENDA. The specimen employed for *in vitro* research was molecular characterized and the ant species was identified to be *Monomorium sahlbergi*, which was further verified by phylogenetic analysis using Mega 6.06. The enzyme activity was found to be 0.05±0.01 U/ml/min, and the optimum temperature and pH were found to be 37°C and pH4, respectively. As the highly related species *Monomorium pharaonis* and *Monomorium sahlbergi* display a lipase with almost identical physicochemical characteristics and a comparable optimal range. In order to expand the work's potential applications and usage of lipase for other studies, it is required to look at additional parallels.

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INTRODUCTION

Nutritional availability from dietary lipids are achieved through lipid processing, transference and absorption by lipase, otherwise called triacylglycerol acyl hydrolase (E.C. 3.1.1.3), an enzyme that act at oil and water interface for hydrolysing acyl ester bonds from acylglycerols and also acquits in esterification and trans-esterification reactions (Willerding *et al.*, 2011).

Based on their specificity and source, lipases are categorized, providing information on the availability, functioning, and wider applications of lipase. They were primarily divided into three groups: (i) substrate-specific, (ii) regioselective, and (iii) enantioselective (Sarmah *et al.*, 2017). The primary lipase catalytic processes are hydrolysis and synthesis, with synthesis further subdivided into aminolysis, esterification, trans-esterification (Sarmah *et al.*, 2017). Various types of lipases are used for different raw materials. Lipase used industrially can be in the form of immobilized (Avramiuc, 2012), recombinant or phospholipids (Borrelli and Trono, 2015) and have a wide range of applications. Production of Biodiesel by trans-

esterification of fats and oils using lipase enzyme result in much more advantages (Lukovic *et al.*, 2011) and studies for its advancement is under process (Gog *et al.*, 2012; Ghaly *et al.*, 2010; Amoah *et al.*, 2016; Li *et al.*, 2015). It is employed in baking (Barros *et al.*, 2010), manufacturing drinks (Sarmah *et al.*, 2017), dairy products (Salihu and Alam, 2012), and medical diagnostics (Sikora *et al.*, 2014). The regiospecific nature of lipase is exploited in the food sector to produce fatty acids in food items whereas emulsifier and mayonnaise preparation uses phospholipases (Ray A, 2012). Other applications for lipase in the food business include the creation of edible lubricants, boosting loaf volume, enhancing texture and softness and extending shelf life (Moayedallaie *et al.*, 2010). Lipase is used in the dairy sector to create wines, dairy products, vitamins, emulsifiers, ice creams, and flavored products (Patel *et al.*, 2015). Lipase is employed in the treatment of wastewater to handle food waste (Meng *et al.*, 2015), dairy waste (Adulkar and Rathod, 2015), grease from wool (Saravanan *et al.*, 2014) and manure (Rodrigues *et al.*, 2014). In the pharmaceutical and medical fields, lipase is utilized as a tumour necrosis factor (Ye *et al.*, 2011) and

*Corresponding author: **Nayana P**

Department of General Biotechnology, GEMS Arts and Science College, Affiliated to University of Calicut, Ramapuram 679321, Malappuram, Kerala, India

A STUDY OF NETWORK SECURITY WITH INTRUSION PREVENTION SYSTEM IN DIFFERENT ENVIRONMENT

P. K. Anoo Babu, N. Thangarasu*

Abstract

The global use of the internet has increased significantly in recent years. Attacks on computer security are on the rise at the same time as new developing tactics and technologies. The connected devices in the networks were experiencing security problems brought on by malicious content or other hacker activities. The two systems utilised for the detection and prevention of these malicious softwares are the intrusion detection system (IDS) and intrusion prevention system (IPS), respectively. This essay examines the security principles and methods that are employed in intrusion prevention systems to stop assaults caused by malicious software. Additionally, it describes how various platforms' Intrusion Prevention Systems operate.

Keywords: Intrusion detection System, Intrusion Pretension System, Internet of Things, Hybrid Computing, MANET, Two-level classification, Security, Machine Learning

I. INTRODUCTION

The ability to use the internet has emerged as a necessary component of society. The security of every computer network is compromised. The ability to use the internet has emerged as a necessary component of society. The security of every computer network is compromised. Every computer network system on the planet is insecure and vulnerable to attack from any direction. We have two systems for the detection and prevention of these compute network challenges. both an intrusion detection system and an intrusion prevention system to stop malicious stuff from entering the network. In this study, we discussed the security-

related technologies used in intrusion prevention systems.

II. LITERATURE STUDIES

The intrusion prevention system is used to stop attacks in computer networks that have been flagged by intrusion detection systems. To stop malicious content from entering the network, intrusion prevention systems use a variety of different tactics and precautions. The measures and technologies utilised in intrusion prevention systems in various environments will be detailed in the information that follows.

1. Android Platform

Android platform security concerns related to wireless assaults cannot be disregarded. Only relatively straightforward attack scenarios can be prevented using the conventional intrusion

The most frequent assaults on the Android platform are wireless cracking and phishing. In this area, a novel intrusion prevention system was developed that uses TcpDump and VPNService as data sources to collect traffic. Real-time intrusion is carried out by the single-step attack rule in conjunction with the attack chain signature database and the signature database. In order to determine the detection, penetration intent and output alerts are combined with these detections [1].

2. Cloud Computing

Traditional intrusion detection and prevention systems (IDPS) are mainly ineffective to implement in a cloud computing environment. The open and distributed architecture of cloud computing and services makes them an appealing target for possible cyberattacks by outsiders. IDPS and alarm management were both built using thorough taxonomy methodologies. The primary characteristics of

¹Department of Computer Science

²Department of Computer Applications

Karpagam Academy of Higher Education, Coimbatore, Tamil Nadu, India

*Corresponding Author



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स्त्री विमर्श –मृदुला गर्ग के समकालीन उपन्यासों के परिप्रेक्ष्य में – वीणा सी वसन्त

सारांश

मेरे शोध पत्र का उद्देश्य मृदुला गर्ग के समकालीन उपन्यासों में स्त्री विमर्श को अभिव्यक्त करना है। मृदुला गर्ग बेहद बोल्ड व अंतर्मुखी व्यक्तित्व की लेखिका है। उनके उपन्यास कठगुलाब, चित्तकोबरा और उसके हिस्से की धूप आदि उनके सशक्त औपन्यासिक कृतियाँ हैं जहाँ नारी को उनके प्रति होनेवाली अत्याचारों का सामना करनेवाली, पुरुष के समान अतृप्त वासना रखनेवाली और नारी के आत्मसार्थकता की तलाश को दर्शाया गया है। नारी के बहादुरी और शक्ति का प्रत्यक्ष प्रमाण इसमें मिलता है।

वास्तविकता यह है कि स्त्री पैदा नहीं होती, उसे स्त्री बना दी जाती है।

प्रस्तावना

समकालीन शब्द असमंजस में डालनेवाले शब्द हैं। हर समय की रचना समकालीन होता है। इस दुनिया में जो घट चुकी है या लिख चुका है वह कभी भी पुराना नहीं है, बल्की समय की माँग है। भारत नदियों से सम्पन्न है। एक नदी धीमी गति से बहती है, कई जगहों पर तेज़ धारा में प्रवाहित भी होती है और कुछ स्थानों में वह अलग रास्ता भी बना लेती है। स्त्री और प्रकृति में बहुत सारी समानताएँ हैं। स्त्री स्वाभाविक होती है, कई हालातों में वह आपे से बाहर भी हो जाती है, और समय आने पर वह लीक से हटकर अपनी एक अलग अस्मिता की खोज में निकल पड़ती है। “कठगुलाब” एक सशक्त औपन्यासिक कृति है, जहाँ नारी को आत्मविश्वास, मेहनतकश और आत्मनिर्भर बनने में सफल किया है। कठगुलाब में चित्रित स्मिता लगनशील,