

PROCEEDINGS OF THE
NATIONAL SEMINAR

SPECIES THE PASSION - 8



Department of Botany
St. Thomas College (Autonomous) Thrissur

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Proceedings of the National Seminar
“Species The Passion - 8”

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Research and Postgraduate Department of Botany
St. Thomas College (Autonomous), Thrissur

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FOREWORD

The Research and Postgraduate Department of Botany has organized a National Seminar “Species The Passion - 8” on the 3rd of February 2023 at Menachery Hall, St. Thomas College (Autonomous), Thrissur. “Species The Passion”, an annual event that has been organized for the last eight years, is an academic platform for researchers in the discipline of taxonomy, for presenting new species discoveries and the history behind those discoveries. Creating and disseminating knowledge on different new species to the scientific community is the aim of this programme. It also helps to know the importance of conserving biodiversity as the species discovery stories convinces us the specific role of those species in nature. This seminar series with invited lectures from distinguished researchers and the new findings along with their presentations are helpful to assimilate the knowledge in biological science to the existing and future generations.

I have great pleasure in presenting the proceedings of “Species The Passion - 8” to the scientific community. The seminar proceedings compile the invited lectures and original articles of paper presentations. I acknowledge St. Thomas College (Autonomous), Thrissur for supporting with infrastructure facilities and Kerala State Council for Science, Technology and Environment (KSCSTE) for the financial support for the conduction of this seminar. I appreciate all the authors for sharing their original research articles and I also express my sincere gratitude to all well-wishers who made the effort to make this event a great success. I hope everyone will make use of this opportunity to grow with science.

Dr. Anto P. V.

(Assistant Professor)

Convenor & Editor-in-Chief

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LICHENS OF KERALA: DIVERSITY, MONITORING AND CONSERVATION

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Abstract

The present paper deals with the diversity of lichens of Kerala with emphasis on their pollution monitoring and conservational aspects.

Introduction

Lichens are a unique group of non-vascular cryptogams composed of a photobiont and a mycobiont associated in a symbiotic manner. They are the dominant life forms on earth, which constitute over as much as 8% of earth's surface (Ahmadjian, 1995). Lichens are distributed from poles to poles and from below low tide level on sea shore rocks and to the highest mountains and thus exhibit one of the widest distributions among other plant groups (Lindsay, 1977) and thus exhibit one of the widest latitudinal and altitudinal distributions of any organism in the world. These little plants are the most successful symbiotic organisms on earth and can grow on anything and anywhere. Morphologically the thallus of lichens shows variation in its structure like crustose, squamulose, foliose and fruticose forms. According to the type of substratum they are classified as corticolous (on bark of trees), saxicolous (on rocks), terricolous (on soil) and folicolous (on leaf surfaces). Lichens are the pioneers in habitat colonizer on barren rocks in plant succession and they help in weathering of soil, mineral cycling, have a role in carbon sequestration and also have an important role in food chain and food web.

It is estimated that global number of currently recognized lichens are about 20000 including orphaned species (Feurer and Hawksworth, 2006). There are several groups remain unsettled, numerous groups have unresolved taxonomic problems and lichen especially crustose forms still remain unexplored in several parts of the world, especially in tropics and it has been estimated that 50% tropical lichens were unknown. However, the database shows about 18882 species including about 1560 lichenicolous fungi (Lawrey and Diederich, 2003). India having variety of phytogeographical regions and is rich with megacentres and microcentres of

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CHARACTERIZATION AND SCREENING OF PLANT GROWTH-PROMOTING BACTERIA FROM COW DUNG

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ABSTRACT

Dung, the excrement from herbivorous ruminant animals, is a constantly available and cheapest bioresource on Earth. Cow dung contains faeces and urine in 3:1 ratio, along with the undigested residue of consumed food material. It retains a broad range of gut microbes as well as different metabolic products of the cows, thereby, attracting its own microflora offering a range of agriculturally favourable qualities to the dung. The application of cow dung for enhancing plant growth and development is a living tradition in India. On this account, cow dung microflora can be efficiently exploited for its plant growth-promoting traits. Therefore, the present work attempted at isolating, screening, and identifying plant growth-promoting bacteria (PGPB) from cow dung. Four morphologically distinct pure colonies were isolated on nutrient agar media and one colony was able to grow in Ashby mannitol agar (exhibiting nitrogen-fixing activity). Molecular characterization revealed the bacteria belong to the genus *Pseudomonas*, *Bacillus*, *Acinetobacter*, *Azotobacter*, and *Alcaligenes*. These isolates were found to have both gram-positive and gram-negative bacteria with plant growth-promoting qualities like nitrogen fixation, phosphate solubilisation, and IAA production, along with biocontrol activities like pectinase and chitinase biosynthesis. Thus, these PGPB isolated from cow dung can be exploited as potential bio-inoculants for promoting plant growth and development.

Keywords: Plant growth-promoting Bacteria (PGPB), Cow dung, Sustainable agriculture Biofertilizers, Biocontrol.

INTRODUCTION

Cow dung is the excrement of cattle, a herbivore ruminant animal species. It is a constantly available and cheapest bioresource that possesses multifaceted applications such as biogas production, as a pest repellent, bio-fertilizer, and bio-pesticides (Dhama *et al.*, 2005). The use of cow dung as an organic manure to enhance plant growth