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Isolation of Medicinally Important Compounds From Selected Mangrove Plant Leaves

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Abstract:- **This Paper examines the recent investigations on the biological activities of extracts and chemicals identified from mangroves. It describes how people have and are using mangroves on a traditional basis. It also describes the world's mangrove resources and products, in terms of their economical importance, medicinal values and other uses and functions. The economical uses of products from mangrove ecosystems are many and varied. Traditionally, the mangroves have been exploited for firewood and charcoal. Mangrove Ecosystems play an important role in preventing cyclones and tsunamis at estuaries from entering into interior land and in the economic development of local inhabitants. Mangrove plants have special adaptations such as stilt roots, viviparous germination, salt-excreting leaves, breathing roots, knee roots by which these plants survive in water logged anaerobic saline soils. The study of mangrove ecosystems in the deltaic region of Krishna river, particularly extracts and chemicals from mangroves are used mainly in folkloric medicine despite such enormous potential; remarkably few reports are available on these species regarding their biological activities and the active principles responsible for such activities. Though some chemical studies have been made on the mangrove plant leaves of this estuary,**

***Keywords*: Mangroves , Bioactive compounds, Gilakaladindi , Leaves, Solvent Extractions, Phytochemical Screening.**

I. INTRODUCTION

Mangrove plants are a group of plants that occur in the coastal intertidal zones of tropics and the subtropics.The mangrove community as a whole consists of salt tolerant plants of soft and swampy mud, mostly trees and shrubs, with broad, leathery, evergreen leaves. Mangrove plants provide valuable therapeutic agents, both in modern medicine and in traditional systems. For generations, the mangroves have proven its use worldwide. The mangrove plants are traditionally used for the treatment of rheumatism, painful arthritis, inflammation, asthma antioxidant, free radical scavenging, anti-inflammatory, diabetes and hepatoprotective actions and many more. Thus, it is possible that the mangroves contain a bioactive compound that may be of potential use in treating the viral and bacterial diseases of fish. An attempt has been made in this review to increase the awareness for the medicinal significance as well as conservation and utilization of these mangrove species as natural rich sources of novel bioactive agent.

Geographical Distribution ;The Krishna deltaic region is in tropical humid climate, with hot summers and moderate winters. The hottest months are April, May and June, when the average highest temperature is 33 ° C. The coldest month is January, when the highest temperature is 23 ° C. Maximum temperature varies from 23 ° C to 33 ° C and the minimum value ranges between 19 C to 23 ° C during a year. Machilipatnam gets annual rainfall due to the southwest monsoon. The average normal rainfall in the district is 110 cm.The other field stations viz. Gilakaladindi, Polatitippa and Pallethummalapalem of the region are the mangrove areas receiving sea water by tidal effect. Hence these field stations gain significance in the study of mangroves.

II. MATERIALS&METHODS

a). Study Area

Machilipatnam is between 16°10'N to 16.17°N latitudes and 81°09'E to 81.13°E longitudes on the southeast coast of India and in the east corner of Andhra Pradesh. Mangroves in this area lie between latitude 16° 0' - 16° 15'N latitude and 81° 10' - 81° 15' E longitude. Gilakaladindi is 7kms far from Machilipatnam by port road. The northern distributary of Krishna river drains in this area near Hamsaladeevi.

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b). Collection of Plant Material:

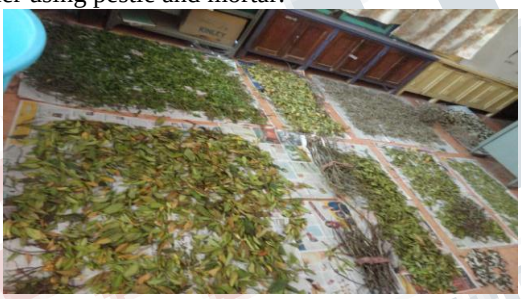
The leaves of different species were collected from the mangrove Vegetation of "Gilakaladindi" on May 10th, 2016 which extends from 25- 27 ' N and 55-65'.

Different Maangrove plant Species also have been collected from the adjacent regions of the study area.

Mangrove plant Collection at ''Gilakaladindi''

c). Drying of collected plant Leaves:

The leaves of the collected plants were separated and shade dried for 15 days and then pulverized into fine powder using pestle and mortar.



A Lyophilizer apparatus with dry vacuum pump is able to remove both non-condensable gases and water vapour. Column chromatography has be done for partial purification of crude extract and active fractions will be analyzed by GC-MS to identify the active molecule. In vivo studies will be carried out for the purified active molecule against male adult fish.

Extraction by Soxhlet extractor:

''Soxhlet extraction ''will be used to extract secondary metabolites with different solvents like petroleum, di-ethyl ether, acetone and water.Phytochemical screening has to be carried out to analyze the nature of active extracts.

Test organisms:

Recent studies revealed that, leaf extract which is tested for the antimicrobial activity using Aeromonas salmonicida, Streptococcus iniae, Pseudomonas fluorescens were used against the antibiotic resistant pathogens which are in turn applicable to commercial fishes/prawns.

Minimum inhibitory concentration (MIC) will be identified for active extracts. The literature revealed that the plant possesses antibacterial, anti fungal and anti viral activity. However, the chemical constituents present in these plant leaves which are responsible for these activities, need to be investigated. Mangrove plants have been found in vitro to have antimicrobial property as they are rich in a wide variety of secondary metabolites, such as tannins, terpenoids, alkaloids, and flavonoids.

III. RESULTS

The plant leaf material was subjected to an extraction process with different solvents like di ethyl ether, petroleum, Acetone and water. The crude extracts of these mangrove plant leaves show remarkable antibacterial activity with different zones of inhibition.

The sensitivity of di-ethyl ether to all of the mangrove extracts could be attributed due to the presence of common bioactive compounds that had inhibitory effects on various organisms. Some of the phytochemical compounds e.g. Glycoside, saponin, tannin, flavonoids, terpenoids, alkaloids have variously been reported to have anti bacterial activity.

Common uses of mangroves in medicine are reviewed by different scientists and a number of mangroves and associates contain poisonous substances, which also shows anti bacterial, anti fungal, anti viral activities. The screening of plant species for anti-microbial activity in the discovery of new sources of economically valuable materials and metabolites with new therapeutic agents is an important task. As a preliminary study, it has found that aqueous and acetone extracts of some mangrove species have antimicrobial activities. Therefore, it is possible to control infectious agents using natural products responsible for the inhibitory effect on

pathogenic microorganisms using mangrove plant leaf extracts.

Discussion :

However, the chemical constituents present in these plant leaves which are responsible for these activities, are to be investigated. Mangrove plants have been found in vitro to have antimicrobial property as they are rich in a wide variety of secondary metabolites, such as tannins, terpenoids, alkaloids, and flavonoids.The present review can prove the mangrove leaf extract has effective antibacterial and antiviral agents against fish pathogens.

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