COMPARATIVE STUDY AND CONSERVATION OF RHIZOPHORA SPECIES.

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ABSTRACT:
This research paper presents the comparative study between the three Rhizophora species i.e. R. apiculata, R. mucronata, Avicennia officinalis respectively. Mangroves, being one of the primary features of coastal areas have been of great interest for scientists and of astonishment for layman. This paper, examines the biological activities of extracts, physiological properties and histological history of each of the species, Along with the detailed morphological comparison among the species, the paper attempts to emphasize and create awareness of the potential mangroves and on its much needed conservation, for the welfare of mankind and ecosystem.

INTRODUCTION

mangrove ecosystem. The mangroves from a unique and dominant ecosystem and are comprised to inertidal marine trees, predominantly bordering margins of tropical western coastlines. This ecosystem is formed as a result of very special association of flora and fauna which proliferate in coastal areas. These mangroves generally known as Rhizophora species have variations on the basis of characters, functions and chemical constituents These mangrove species also have medicinal properties still unknown to the majority of population. The photochemical analytes constituting the leaves, stem of mangroves may play an upcoming role in fighting various diseases. The tribal population in some areas uses Avicennia to get rid of ulcers. The decoction of leaves of R. mucronata gives relief from throat cancer. The most important of all the findings, was the presence of inhibitory enzymes in the Rhizophora species. The cholinesterase-inhibiting enzymes may help in fighting th odds of Alzheimer's disease. A neurodegenerative disease, caused by the lack of Acetylcholine, can be fought by the reduction in formation of Cholinesterase (a neurotransmitter used to destroy the Acetylcholine); these enzymes inhibit the formation of Cholinesterase and the best part is that: these enzymes are present in certain concentration in each of the above mentioned species. R. mucronate polysaccharide (RMP) protected MT-4 cells from the HIV - induced cytopathogenicity and blocked the expression of HIV antigens. (Marippan et. al., 1999), Many mangroves plants have been studies to trace the bioactive activity (K. Kathiresan, et. al., (1999), Sdoodee, et. al., (2005) Nopara et. al., (1999) Lakshmanan, K. K. (1989).

MATERIALS AND METHODS :

The comparative study on these species were carried out by collecting data samples at the end of July,2008. The samples were collected from a tidal region, here these marine trees were half submerged in brackish, muddy waters. The soil must have had alkaline conditions and high saline content to encourage the upsurge of such trees. The comparison between these species was held by holding them as a subject under the categories such as ph, moisture content, T.L.C, solubility, wet tests were carried out to study the morphological history and structure of stem, leaves and pneumatophores, roots etc.

RESULTS AND DISCUSSION :

After conducting a comprehensive study on the three species, the data was interpreted and compared.Tests conducted were Wet tests, Dry tests, Water solubility, pH, Alcohol solubility, Moisture content, Cold extraction, Powder study, Thin Layer Chromatography (TLC). The fresh samples of the bark of each species was subjected to the wet tests in which thin sections of leaves, stems, was observed in great detail under the microscope. In this case of dry tests, the samples were dried and then powdered. Then this powdered sample was subjected to water solubility, alcohol solubility, pH, moisture content, thin Layer Chromatography, etc. From the Water solubility test, the outcome turned out to be that of huge difference in each of the values R. apiculata showed high with 1.2 and following to that were R. mucronata and Avicennia officinalis with the values of 0.7 and 0.63. The same pattern was observed in the case of the alcohol solubility. Taking into consideration, the pH values; the R. apiculata has acidic nature with value as 6 and R. mucronata and Avicennia reveals their basic nature with the values such as 7.8 and 10.5. The gradation observed in the moisture content value was quite less, with each of he values differing up to two decimal places. Pursuing with the tests, next was Cold Extraction, which is recommended for the detection of the thermo-labile compounds such as alkalids. The test showed repercussions that were prominent with R. apiculata, showing high values of 0.82, following trail were Avicennia and R. mucronata with the values of 0.04 and 0.02. These results ensured the comspicuous presence of alkaloids, flavonoids in R. apiculata at high percentage, compared to others. The most imperative test TLC was performed on the samples. The Rf values, which are paramount importance to identify the metabolites present in the samples were obtained. The yellow mark indicated the presence of Indole-3-derivatives yellow green streak of the mobile

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Table 1 : The data obtained from the various tests conducted on the Rhizophora species.

Sr. No.	Properties	R. apiculata	R. mucronata	Avicennia officialis
1	Water Solubility	1.2	0.63	0.71
2	Alcohol Solubility	1.3	0.88	0.77
3	Moisture content	0.07	0.02	0.04
4	pH value	6	7.8	10.5
5	Cold extraction	0.82	0.56	0.61
6	T.L.C.:- Rf value			
	yellow	0.6428	0.6029	0.5555
	green	0.8571	0.6617	0.6349

phase showed the presence of glycosides of Quentin. Myrecetin, fluteolinetc. The highest percentage of alkaloids were stated in terms of the Rf value by R. apiculata with the values of 0.6428 (yellow) and 0.8571(green). The powder study that was performed on these powdered samples led to the revelation of presence of calcium oxalate crystals in the R. apiculata and the stone crystals in the R. mucronata. The R. apiculata shows the presence of five long chains of the aliphatic alcohols, 11 long chains of carvixylic acids, three steroids, 2, 6-dimethoxy p-benzoquinone, catechol-like tennins, teraxeryl compounds etc, The R, mucronata showed the presence of leucoanthocyanins, sterols, flavonoids and triterpenes. The Avicenalis officinalis exhibits the presence of cytotoxic activity, c-iridoid glucoside, 7-o-trans cinnamoyl-4-epilogenin, geniposidic acid, 2-cinnamoyl mussaenoside, lupeol, butelinic acid triterpenoids Triterpenoids from the Stem bark of Avicennia officinalis.. These species have a thick waxy coating on the leaves which makes stem
impervious to water. The pungent odour of these species which is due to the anaerobic respiration in those marshy areas.

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