

Mycoflora Associated with five commonly used Medicinal Plants of Karaikal (U.T. of Puducherry)

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Abstract: Medicinal plants are the precious wealth for healthy and happy society; all the plants in natural ecosystem appear to be symbiotic with fungal endophytes. This highly diverse group of fungi can have profound impacts on plant communities through increasing fitness by conferring stress tolerance or decreasing fitness by altering resource allocation. Thus the present work has been carried out to explore their activities against some of the ethno medicinally important plants in Karaikal. In view of importance of these fungi (as potential bio control agents, source of bioactive compounds and in plant protection) it was considered worthwhile to study fungal associates of some of ethno medicinal plants. Five medicinal plants belonging to different families have observed, fungi have been isolated from the different parts of the medicinal plants.

I. INTRODUCTION

Karaikal town belongs to the U.T. of Puducherry, it lies in Cauvery delta .It is located between 10⁰, 51', and 11⁰ north latitude and 79⁰43' and 79⁰52' east longitude .The boundaries of this district are the Bay of Bengal on the east and is embedded in the Nagapattinum and Tiruvarur district of Tamilnadu on the other three sides. Medicinal plants traditionally occupied an important position in rural and tribal lives of India and are considered as one of the most important source of medicine since the dawn of human civilization. Medicinal plants constitute the basis of the population of India and are a great source of income for rural population .There is corresponding evidence in the literature that suggests a correlation between plant bioactivity and the traditional medicinal use [9].Fungi living together or inside the tissue of plants can produce bioactive compounds [15]. It is reasonable to consider that the healing processes of plants are aided by the compounds produced by one or more fungi within the plant [14, 16].The well-known anticancer agent Paelitaxal was originally discovered from the bark of yew tree (*Taxus brevifolia*) [19] but later it was observed that an endophyte living in the bark was producing the same compound [13]. Medicinal plants contain a wide variety of free radicals scavenging molecules, such as phenolic compounds [18]. phenolic acids, flavonoids ,quinines ,coumarins, lignans and amines vitamins and other endogenous metabolites [3].Medicinal plants and their endophytes are important resource for discovery of natural products. Some of the endophytes found to produce metabolites possessing strong antioxidant activities The world of fungi provides a fascinating and almost endless source of biological diversity which is a rich source for exploitation .Till now only a few publications have been reported the isolation of endophytes fungi of ethno pharmaceutically important [2].Traditional medicines are the basic and alternative remedies to treat various human as well as animal ailments. Endophytic fungal symbionts can have profound effects on plant ecology, fitness and evolution. Diverse group of this organism are able to produce number of bioactive agents [9]. They are known to be a rich source of novel antimicrobial substance [10]. The endophytes associated plants produces some metabolites that induce resistance and believed to be associated with the production of pharmaceutical products [20]. Medicinal plants are gaining global attention owing to the fact that the herbal drugs are cost effective, easily available and with negligible side effects. Plant based natural constituents can be derived from any part of plant like bark, leaves, flowers, fruits, roots, seeds etc .The compounds derived from medicinal plants form the ingredients of analgesic ,antibiotics ,laxatives ulcer treatment etc. In recent years, the quest for the isolation of new compounds from medicinal plants has become a fascinating area of research. Plants with ethno pharmaceutical importance is being exploited because of their healing properties [11].However large scale harvesting of

medicinal plants has already become a major threat to biodiversity. As an alternative, microbes which live in such plants may offer tremendous potential sources of therapeutic compounds.

II. MATERIAL & METHODS

Collection of plant material:

For screening of mycoflora of ethno medicinal plant parts, leaves, stem, bark, flower, fruits were collected and brought to the laboratory. The collected plant material used for the isolation was first surface sterilized. The plant material was first cleaned by washing several times under running tap water and then cut into small segments. Surface sterilization was performed by sequentially rinsing the plant material with 70% ethanol for 30 seconds, then with 0.01% mercuric chloride for 5 minutes followed by 0.5 % sodium hypochlorite for 2-3 minutes and finally with sterile distilled water for 2-3 times. Plant material was then dried in between folds of sterile filter papers.

Isolation of fungal associates:

The laboratory processing for fungal isolation were done by different standard scientific methods, scrap mount, hand out section preparation and isolation was done by using Standard moist blotter method and by Agar plate methods, suspension made by washing leaf technique [1,4]. One ml. of serially diluted suspension was poured in three Petri plates containing PDA supplemented with chloramphenicol and incubated at 25 °C for 7 days. The fungi occurring on all the samples were identified preliminarily on the basis of sporulation character like sexual and asexual sporulation with the help of binocular microscope. The identification and further confirmation of fungi was made by preparing slides of the fungal growth and observing them under compound microscope. The identification was made with the help of manuals [2,5,6,8,12,17]. Pure culture was made and maintained on PDA slants and accessioned accordingly depending upon the plant and plant parts from which they have been isolated. Finally all the purified fungal isolates were stored at 4°C for further use.

III. RESULTS & DISCUSSION

The plants that have been chosen for investigation are species known to have been traditionally used as medicinal plants. There has been very little work investigating the endophytes of these traditionally used medicinal plants. The investigation of fungal flora of five important medicinal plants (Table –I) have been carried out, and results reveals that variation in distribution of fungal flora were not restricted to single species, genera and family, the same endophyte was isolated from different hosts, no species specificity was observed among these. Medicinal plants have been recognized as the repository of fungal endophytes with novel metabolites of pharmaceutical importance [15].

TABLE I :

S.NO.	HOST PLANT	FAMILY	LOCAL NAME	COMMON NAME	FUNGI
	<i>Aloe vera</i>	Liaceae	Amari,alunku	Aloe	<i>Alternaria alternate</i> <i>Alternaria tenuissima</i> <i>Aspergillus flavus</i> <i>Aspergillus niger</i> <i>Aspergillus verocosa</i> <i>Curvularia lunata</i> <i>Fusarium roseum</i>
	<i>Acorus calamus L.</i>	Aracaceae	Vashambu	Bach	<i>Aspergillus fumigates</i> <i>Aspergillus niger</i> <i>Aspergillus oryzae</i> , <i>Aspergillus versicolor</i> <i>Cephalosporium sp.</i>

					<i>Curvularia prasadii</i> <i>Fusarium oxysporum</i> <i>Fusarium solani</i> <i>Fusarium moniliforme</i> <i>Penicillium citrium</i> <i>Penicillium purpurogenum</i> <i>Rhizopus oryzae</i> <i>Trichoderma viridae</i>
	<i>Adhatoda vasica</i> NEES.	Acanthaceae	Adhatodai	Vasak	<i>Aspergillus fumigates</i> <i>Aspergillus glaucus</i> <i>Aspergillus oryzae</i> <i>Aspergillus niger</i> <i>Emericella nidulans</i> <i>Fusarium solani</i> <i>Fusarium oxysporum</i> <i>Fusarium moniliformae</i> <i>Gliocladium catenulatum</i> <i>Penicillium chrysogenum</i> <i>Penicillium citrinum</i> <i>Phomasp.</i> <i>Rhizoctonia solani</i> <i>Rhizopus nigricans</i> <i>Rhizopus oryzae</i> <i>Trichoderma harzianum</i>
	<i>Andrographis peniculata</i> (BURM.F.)WALLICH EX.NEES	Acanthaceae	Anariyam	kalmegh	<i>Alternaria tenuissima</i> <i>Aspergillus flavus</i> <i>Cuvularia boeijidin</i> <i>Fusarium oxysporum</i> <i>Mucor hemalis</i>
	<i>Boeraavia diffusa</i> L.	Nyctagenaceae	Caranai	punarnava	<i>Aspergillus fumigates</i> <i>Colletotrichum capsici</i> <i>Curvularia lunata</i> <i>Rhizopus solonifer</i>

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