

# Fungal Flora of Some Medicinal Plants

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**Abstract:** Medicinal plants traditionally occupied an important role in rural lives of India and are considered as one of the most important source of medicine since the dawn of human civilization. The healing properties of medicinal plants are usually linked with the presence of secondary metabolites and this differs from one plant to another. Medicinal plants are associated with a broad variety of microbial contaminants mainly Bacteria and Fungi. 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. Sample of some medicinally important plants were collected and isolation of fungi have been carried out in the laboratory. The identification of fungi has been done on the basis of their morphological characters.

**Keywords:** medicinal plants, fungal pathogens endophytes

## 1. Introduction

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 (10). 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 (16,17,18). The well known anticancer agent Paeitaxal was originally discovered from the bark of yew tree (*Taxus brevifolia*) (20,21) but later it was observed that an endophyte living in the bark was producing the same compound (14). Medicinal plants contain a wide variety of free radicals scavenging molecules, such as phenolic compounds (19) e.g. phenolic acids, flavonoids, quinines, coumris, lignans and amines vitamins and other endogenous metabolites (4,10). 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 (2,3). 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 (8). They are known to be a rich source of novel antimicrobial substance (11, 13). The endophytes associated plants produces some metabolites that induce resistance and believed to be associated with the production of pharmaceutical products (22). 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 are being exploited because of their healing properties, (12). 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.

## 2. Material and 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 (1,5). 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. 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 identified stored for further use (5, 6, 7, 9, and 18).

### 3. Results and Discussion

Biodiversity is essential asset of each ecosystem. Fascinating and beautiful fungi are vital components of nearly all ecosystems and impact human health and our economy in various ways. Fungi play a significant role in the daily life of human beings besides their utilization in industry, agriculture, medicine, food industry, textile, bioremediation and many other ways fungal biodiversity has become an integral part of human welfare. In present study different species of fungi were isolated from

different medicinal plants. *Aspergillus*, *Curvularia*, *Penicillium*, *Alternaria*, *Fusarium* are some of common and abundant fungi in all most all medicinal plants. The actual diversity may depend on the methods used for gathering and handling plant parts. 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 nine important medicinal plants 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 endophytes 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 pharmaceuticals importance (17).

Table I

|   | Host  | Family      | Tamil name    | Hindi name  | Fungi   |
|---|---|-------------|---------------|-------------|---|
| 1 | <i>Catharanthus roseus(L.)G.DON</i>         | Apocynaceae | nityakalyani  | sadabhar    | <i>Aspergillus flavus</i><br><i>Chaetomium sp</i><br><i>Pestotia sp.</i><br><i>Rhizopus solonifer</i>   |
| 2 | <i>Datura stramoniumL.</i>                  | Solanaceae  | cakamuli      | datura      | <i>Aspergillus niger</i><br><i>A. flavus</i><br><i>Fusarium sp.</i><br><i>Curvularia lunata</i><br><i>Curvularia cragrodis</i><br><i>Pennicillium citrinum</i>  |
| 3 | <i>Eclipta alba Hassk</i>                   | Asteraceae  | kaikeshi      | bhringraj   | <i>Aspergillus niger</i><br><i>Cladosporium oxysporum</i><br><i>Fusarium moniliformae</i><br><i>Phoma sp.</i>   |
| 4 | <i>Occimum basclicum L.</i>                 | Lamiaceae   | tulasi        | Holy basil  | <i>Aspergillus niger</i><br><i>Chaetomium sp.</i><br><i>Dreshlera sp.</i><br><i>Helminthosporium</i><br><i>Rhizopus sp.</i>   |
| 5 | <i>Rauwolfia serpentine(L)BENTH.EX.KURZ</i> | Apocynaceae | serpagandhi   | serpagandha | <i>Alternaria tenuis</i><br><i>Aspergillus niger</i><br><i>Aspergillus terrus</i><br><i>Chaetomium erraticum</i><br><i>Curvularia brachyspora</i><br><i>Curvularia lunata</i><br><i>Dreschlara sp.</i><br><i>Fusarium oxysporum</i><br><i>Helminthosporium sp.</i><br><i>Pennicillium globalarum</i><br><i>Rhizopus sp.</i> |
| 6 | <i>Solanum melongena L.</i>                 | Solanaceae  |               | eggplant    | <i>A.flavus</i><br><i>Alternaria alternate</i><br><i>Aspergillus niger</i><br><i>Cercospora sp.</i><br><i>Curvularia lunata</i><br><i>Curvularia sp.</i><br><i>Fusariumsp.</i><br><i>Pennicillium notatum</i><br><i>Rhizopus rotifer</i>  |
| 7 | <i>Solanum nigrum L.</i>                    | Solanaceae  | cidirutakkali | makoi       | <i>Aspergillus niger</i><br><i>Aspergillus flavus</i><br><i>Aspergillus terreus</i><br><i>Alternaria tennussima</i><br><i>Fusarium moniliformae</i>   |

|   |  |                       |                     |                 |  |
|---|--|-----------------------|---------------------|-----------------|--|
|   |  |                       |                     |                 | <i>Phomopsis</i> sp.   |
| 8 | <i>Tinospora cordifolia</i> (Willd)HOOK.F.&THOMS | <i>Menispermaceae</i> | <i>cinndilakodi</i> | <i>giloe</i>    | <i>Aspergillus niger</i><br><i>Aspergillus</i> sp.<br><i>Fusarium oxysporum</i><br><i>Pestotia</i> sp.<br><i>Trichoderma glaucum</i>   |
| 9 | <i>Vitex negundo</i> L.                          | <i>Verbenaceae</i>    | <i>cintuvaram</i>   | <i>nirgundi</i> | <i>Aspergillus fumigates</i> ,<br><i>A.niger</i><br><i>A.glaucs</i><br><i>A.ustus</i> ,<br><i>A.oryzae</i><br><i>Cephalosporium</i> sp.<br><i>Cunninghamella elegans</i><br><i>Curvularia prasadii</i><br><i>Emericella nidulans</i><br><i>Fusarium oxysporum</i> ,<br><i>Gliocladium catenulatum</i><br><i>Penicillium chrysogenum</i><br><i>P. restrictum</i><br><i>Rhizopus nigricans</i><br><i>Trematostroma</i> sp.<br><i>Trichoderma viridae</i> |

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