

STUDIES ON PHYLLOSPHERE MYCOFLORA OF CERTAIN MEDICINAL PLANTS OF NANDURBAR DISTRICT

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Abstract

Medicinal plants are attracting to each and every person seeking health, without side effects. Ethnomedicines are the upcoming formulas of alternative drugs resources to Allopathic medicines. As the awareness about medicinal plants are increasing day –by- day. The diseases of medicinal plants are becoming the important factor for commercialization of medicinal plants. The medicinal plants suffer from various kinds of plants pathogens including fungi. The phyllosphere mycoflora must be studied to save the quality of drugs and active principles of particular medicinal plants.

In the present study 11 types of medicinal plants from Nandurbar district are selected to detect the phyllosphere mycoflora associated with respective plants .This study will be helpful to create awareness about the various types of the plants as habitat for fungal microorganisms.

Key words:- Medicinal plants, Phyllosphere, Nandurbar district.

Introduction

Plants are not only providing food, Oxygen to all mankind but they are also working as a Habitat for microorganisms. The study of such microbial ecology is very important factors of all kinds of plants. Medicinal plants are valuable drug containing plants with various types of active ingredients. Such ingredients are contaminated due to presence of various types of microhabitat of microorganisms. Common diseases on the plants were leaf spots, leaf blight and leaf rust causes effect on medicinal value of the plants parts. (S. P. Chavan and S. L. Kporekar, 2011) There are two million kinds of living organisms of which fungi constitute a hundred thousand species from this we can conclude that fungus is omnipresent (Mehrotra R. S Aneja K .R, 2008). Fungal pathogens above ground portion of the plants show the Numerical dominance on leaves, but it also effect other

parts of phyllosphere. Such as caulosphere (stem), Anthosphere (flowers) and Carposphere (fruit). This types of fungal colonies are depend upon the availability of carbon –Nitrogen containing Nutrients on leaves and other parts of phyllosphere. All pathogens which occurs on medicinal plants seriously damages the secretory tissues and stomata, causing a decrease in amount of essential oil contained in infected plants and modifying the composition of the plants volatile fraction. (D'aulerio, A . Z, Zambonellia , A, 1995) .

So phyloplane is both scientifically and economically important habitat to study fungi as microbial ecology. Phyllosphere fungi include endophytes and epiphytes that colonize the interior or surface of leaves respectively (Pertini 1991).

The highest species richness as well as frequency of colonization of endophytic fungi was found in the leaf segments, rather than the stem and bark segment of the host plant species (N.S Raviraja Dr. et al. 2005) . Many of the plant materials are used in traditional medicines are readily available in rural areas at relatively cheaper than modern medicine (Mann et.al) so far the purpose of study of phyllosphere mycoflora Nandurbar district is selected as it represent one of the tribal districts in India with rich source of Ethnomedcinal plants .

Methodology :-:

Isolation of fungi from leaf spot disease:- The leaves with presence of characteristic leaf spot disease symptoms were collected from standing phyllosphere and brought to laboratory for isolation of pathogen. After washing diseased leafs with running tap water then with the help of sterilized zone of laminar air flow isolation was done. Sterilized scissor was used to make pieces of diseased leaf portion in a sterilized zone of laminar air and merge into 0.1 aqueous mercuric chloride solutions for 30 second. Meanwhile 3-4 times washing of pieces with sterile distilled water is done .Afterwards 3-5 pieces was kept on solidified PDA maintaining some distance from each other with the help of sterilized forceps. Plates were kept into BOD incubator at 28⁰Cfor 4 days. (Junaid et. al. 2014)

Purification of culture:-Growing hyphal tips were transferred into PDA slant and pure cultures were maintained at 50 ⁰C in Refrigerator. Sub culturing of isolated pathogen done after 15 days successive time period. For the study of appeared fungal morphology in relation to its comparative study of identification of fungal species, characteristic features of the fungal hyphae, conidiophores and spores formation, slides from the selected fungal culture prepared and observed under the phase contrast microscope.

Pathogenecity test of each fungus:-preparation of spore suspension is important phase for confirmation of pathogenecity test followed by artificial inoculation of plants. PDA media pour petri plates were used for preparation of culture of inoculums. The plates were kept and incubated for 4 days in BOD incubator at 28₋⁰C. After preparation of the culture of the test fungi, spore suspension in sterile distilled water was formed and sprayed on healthy wild standing species leaves covered with poly –propylene bags to develop favourable conditions for diseases. 20-25 days after artificial inoculation the disease symptoms were developed. The infected leaves were collected and re-isolation of pathogen done and compared with previous pathogen with its characteristic features conforming its pathogenecity test.

Table: Phyllosphere mycoflora of medicinal plants:-

Sr. no.	Botanical name/ family	Common Name	Locality	Phyllosphere mycoflora
1.	<i>Abrus precatorius</i> L (Fabaceae)	Gunjja / Ratti	Kothali	<i>Acrosporium</i> sp. <i>Ravenelia ornate</i> <i>Ravenelia sessilis</i>
2.	<i>Abutilon indicum</i> (L) Sweet (Malvaceae)	Petari /Kanghi	Kokani hill	<i>Cercospora avicennace</i> <i>C. malaveciarum</i> <i>Leveillula taurica</i> <i>Puccinia abutili</i> <i>P. heterospora</i> <i>Synchytrium varanansense</i>
3.	<i>Acalypha indica</i> L. (Euphorbia ceae)	Khokali	Loy	<i>Alternaria tenuis</i> <i>Cercospora acalypha</i> <i>C. acalyphae</i> <i>C. gangetica</i> <i>C. profusa</i> <i>Colletotrichum dematium</i> <i>Microtechium rodium</i> <i>Phyllosticta briosiana</i>
4.	<i>Boerhavia diffusa</i> (Nyctaginaceae)	Punar-nava	Prakasha	<i>Cercospora boerhaavicola</i> <i>C. dillusa</i> <i>C. fufurella</i> <i>Colletotrichum boerhaaviae</i> <i>C. capsici</i> <i>Leptosarullina argentinensis</i> <i>Albugo platensis</i>
5.	<i>Catharanthus roses</i> (Apocynaceae)	sadaphuli	Khodai mata	<i>Alternaria longipes</i> <i>Colletotrichum capsici</i> <i>Colletotrichum gloeosporioides</i> <i>Leveillula tourica</i> <i>Myrothecium</i>

6.	<i>Desmodium gangetium</i> (Papilionaceae)	Lepadi / Cholbo	Ranala	<i>Aecidium callianthum</i> <i>A.alternata</i> <i>C.bagdorensis</i> <i>C.desmodi</i> <i>Colliototrichum capsesi</i> <i>Periconia parasitica</i> <i>Phakopsora mangalorica</i> <i>Phyllacora desmodi</i>
7.	<i>Euphorbia hirta</i> (Euphorbiaceae)	Mothi dudhi	Prakasha	<i>A.alternata</i> <i>A.longicema</i> <i>A.tenuissima</i> <i>C.euphorbia</i> <i>C.petila</i> <i>Drechsleria euphorbi</i> <i>Leptosphaeria Australia</i> <i>Melampsora euphorbia</i> <i>Periconia byssoides</i> <i>Pestalotia sp.</i>
8.	<i>Gloriosa superba</i> (Liliaceae)	Kallavi	Dhanora	<i>C.gloriosae</i>
9.	<i>Oxalis corniculata</i> (Oxalidaceae)	Ambuti	Koriat naka	<i>Colliototrichum punctiformae</i> <i>Drechsleria tetramera</i> <i>Lavellua taurica</i> <i>Cercospora sp.</i>
10.	<i>Tinospora cordifolia</i> (Menispermaceae)	Gulwel	Nandar-kheda	<i>Phyllosticta tinospora</i> <i>Hymenularia indica</i>

Result and discussions:-

Diverse mycoflora communities inhabit the phyllosphere i.e total above ground portions of medicinal plants and we can divide it into caulosphere (stems), Phylloplane (leaves) , anthosphere (flowers) and carposphere (fruits) present study show that mycoflora found dominated on leaf portion of respected medicinal plants i.e numerical dominance of leaves as there is availability of Carbon -Nitrogen containing Nutrients on large scale of leaves . So it works as one of the dominant factor for epiphytic colonization on plants. Phyllosphere fungi include endophytes and epiphytes that colonize the interior or surface of leaves respectively.

Diverse mycoflora present on phyllosphere out of which some are fungi associated with particular plant but they does not show pathogenicity with that particular plants like *Fusarium* and *Phyllachora* present on *Boerhavia* but they does not show pathogenicity. *Cladosporium* and *Colletotrichum* are present on *Abrus precatorius* but does not show pathogenicity it means they are only associated fungi present on but does not show pathogenicity it means they are only associated fungi present on phyllosphere. Some fungi causes leaf spot diseases, some are causing powder mildew ,some are responsible for leaf ball and some are causing Rust i.e. there is diversity of fungi

causing different types of diseases ,some beautiful patchwork of mycoflora is present on the phyllosphere.

Present study about mycoflora of phyllosphere help to know about diverse fungal communities present on it. So it is important for developing new ways and methods to control spread of fungi above ground portions of medicinal plants. We can also develop many strategies based upon studies to avoid contamination of fungi with medicinal active principles of particular plant showing medicinal value.

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