TO EXAMINE THE FUNGAL COLONIES ISOLATED FROM THE DIFFERENT MEDIA AND FUNGAL SPECIES ISOLATED FROM THE DIFFERENT ECOLOGICAL NICHES OF AMARANTHUS VIRIDIS AND HIBISCUS CANNABINUS FROM FIELD AND MARKET.

Dr. A. Pramila

HOD, Associate Professor in Botany, Andhra Mahila Sabha,
Arts and Science College for Women, O.U.Campus, Hyderabad
Email: pramila21ams@gmail.com.

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Abstract: Soil being a complex ecosystem composed of multiple, minute habitats and harbours of almost all taxonomic groups of fungi. Along with Bacteria, Actinomycetes and Algae, fungi are the primary decomposers, agents of biochemical transformations and recyclers of stored energy and nutrients of the organic matter. The intrusive apical growth habit of the fungi allows them to access efficiently to organic substrates, hence they play a major role as recyclers of biosphere. Even though chemical composition of the soil influences its fertility, it is greatly influenced by the qualitative and quantitative nature of microbes inhabiting it. Microbial ecology is an emerging discipline as an integral branch of Microbiology, soil science and Biochemistry. The microorganisms are known to colonize diversified habitats helping in recycling of elements, organic matter and also help in the plant growth and productivity. The substances like Soil, Rhizosphere, Rhizoplane and Phylloplane are considered as important ecological niches for millions of microorganisms. The study on Microbial ecology of leafy vegetables in particular *Amaranthus viridis*, *Hibiscus cannabinus*, both are common leafy vegetables which are rich in Iron, macro and micro nutrients. They are grown widely by the farmers and in kitchen gardens. *Hibiscus cannabinus* belongs to Malvaceae family. In India the family Malvaceae is represented by 22 genera and 110 species.In India the family Amaranthaceae is represented by 17 genera and 50 species occurring mostly in the warmer parts. The number of mycoflora of Amaranthus and Hibiscus from field and market samples showed that the number of fungal colonies were higher in the Vegetable Agar Medium (VAM) compared to the Potato Sucrose Agar Medium (PSA). A total of 56 species harboured in the Non-Rhizosphere soil, 66 fungal species were isolated from the Rhizosphere soil, 59 fungal species were isolated from Rhizoplane and 43 fungal species were isolated from Phylloplane.

Keywords: Non-Rhizosphere, Phylloplane, Rhizosphere, Rhizoplane.

Introduction: The microorganisms are known to colonize diversified habitats helping in recycling of elements, organic matter and also help in the plant growth and productivity.Soil being a complex ecosystem composed of multiple, minute habitats and harbours of almost all taxonomic groups of fungi. The microorganisms which live in the soil are of an excellent source of new genetic material for molecular biologists. Along with Bacteria, Actinomycetes and Algae, fungi are the primary decomposers, agents of biochemical transformations and recyclers of stored energy and nutrients of the organic matter. The intrusive apical growth habit of the fungi allows them to access efficiently to organic substrates, hence they play a major role as recyclers of biosphere. Even though chemical composition of the soil influences its fertility, it is greatly influenced by the qualitative and quantitative nature of microbes inhabiting it.

Microbial ecology is an emerging discipline as an integral branch of Microbiology, soil science and Biochemistry. The substances like Soil, Rhizosphere, Rhizoplane and Phylloplane are considered as important ecological niches for millions of microorganisms. The aerial and subterranean portions of the plants are known to be congenial sites for the colonization of the microbes. The microbes are known to colonize diverse habitats and substrates including plants. The study on Microbial ecology of leafy vegetables in particular *Amaranthus viridis*, *Hibiscus cannabinus*, both are common leafy vegetables which are rich in Iron, macro and micro nutrients. They are grown widely by the farmers and in kitchen gardens. *Hibiscus cannabinus* belongs to Malvaceae family. In India the family Malvaceae is represented by 22 genera and 110 species.In India the family Amaranthaceae is represented by 17 genera and 50 species occurring mostly in the warmer parts.

The Present Study is Aimed At :

- Fungal colonies isolated from the different Media
- Fungal species isolated from the different Ecological niches

The study of Microbial ecology of these plants are important as large number of microbes are associated with Soil, Rizosphere, Rhizoplane and Phylloplane and also helping the soil fertility, transformation of elements, plant nutrition's and plant growth.

Therefore an attempt is made in understanding mycobial ecology of Soil, Rizosphere, Rhizoplane and Phylloplane of *Amaranthus viridis* and *Hibiscus cannabinus*. Sampling was made at an interval of 20 days from seed to seed and the samples were subjected to mycobial analysis. Fungi were isolated using VAM and PSA. The quantitative and qualitative nature of the microbes in the Soil are subjected to constant state of flux by edaphic, biotic and environmental conditions. Number of these microbes are very important as they are involved in recycling of organic wastes, Carbon, Nitrogen and Phosphorous cycles, Mineralization etc. They are also source of antibiotic, organic and production which are of immense value in human welfare.

The ecological study of soil and microbes attained importance as number of Algae, Fungi, Actinomycetes are rich source of antibiotics and other important organic by - products. Various aspects of soil fungi, microhabitat, dynamic equilibria, decomposition of organic matter, fungal physiology, antagoinism were found. The extensive studies on Soil, rhizophere, rhizoplane and phylloplane of different plants revealed diversified mycoflora differing from plant to plant and region to region. New fungal species were identified at regular intervals.

Methodology: *Amaranthus viridis* and *Hibiscus cannabinus* is a leafy vegetable which is rich in biotin, Iron and other macro and micronutrients. It is widely grown by the farmers and also in kitchen gardens in warmer climates. For the present study the plants of *Amaranthus* and *Hibiscus* were raised in the field and compared with the market samples to study the ecology and population dynamics of Fungi. The plant samples were collected at 20 days intervals and were subjected to mycobial analysis. The Fungi were isolated using vegetables Agar Medium (VAM), potato Sucrose Agar Medium (PSA)

Isolation of Mycoflora:

A) Fungi were isolated by dilution plate method of Waksman (1952) as described by Johnson and Curl (1972) was used.

B) Isolation and Estimation of Non- Rhizosphere soil, Rhizosphere, Rhizoplane and Phylloplane Fungi were studied.

Results: The study of quantitative and qualitative estimations of mycoflora from different media and ecological niches viz., Soil, Rhizosphere, Rhizoplane and Phylloplane.

Table 1 NUMBER OF FUNGAL COLONIES ISOLATED FROM THE DIFFERENT MEDIUM

A Amaranthus viridis (Field Samples)

Medium	20th day	40th day	60th day	80th day	100th day	120th day
VAM	5	4	6	8	10	7
PSA	2	4	4	4	5	4

B Amaranthus viridis (Marked Samples)

Medium	20th day	40th day	60th day	80th day	100th day	120th day
VAM	6	3	5	2	8	5
PSA	2	1	2	3	3	1

Table 2 NUMBER OF FUNGAL COLONIES ISOLATED FROM THE DIFFERENT MEDIUM

A Hibiscus cannabinus (Field Samples)

Medium	20th day	40th day	60th day	80th day	100th day	120th day
VAM	8	4	5	6	7	8
PSA	2	2	4	5	2	5

B Hibiscus cannabinus (Market)

Medium	20th day	40th day	60th day	80th day	100th day	120th day
VAM	5	3	4	2	5	2
PSA	1	2	2	1	3	3

Table 1 (A and B) and 2 (A and B) shows the number of mycoflora from the *Amaranthus viridis* and *Hibiscus cannabinus* from Field and Market samples. The data clearly shows that the number of fungal colonies were higher in the Vegetable Agar Medium compared to the Potato Sucrose Agar Medium. This clearly indicates the higher number of microorganisms harboured in the VAM rather than PSA.

Table 3 shows the fungal species were isolated from different ecological niches of *Amaranthus viridis* and *Hibiscus cannabinus* from field and market. A total of 56 species harboured in the Non-Rhisosphere soil. The 66 fungal species were isolated from Rhizosphere soil. A total of 59 fungal species were isolated from Rhizoplane and a total of 43 fungal species were isolated from Phylloplane. The data clearly indicates the importance of nutritional levels in various leafy vegetables that are available for the fungal species harbouring in the ecological niches of these plants.

Table 3 List of Fungal species isolated from the different ecological niches of Amaranthus viridis & Hibiscus cannabinus from field & market samples

S.No	SPECIES	NRS	RS	RP	PP
1	Absidia glauca	+	+	+	
2	Acrophialophora nainiana	+		+	
3	Alternaria alternate	+	+		
4	Alternaria sp				+
5	Ascomycetes sp	+	+		
6	Aspergillus candidus	+		+	
7	Aspergillus chevalieria		+	+	
8	Aspergillus flavus		+		+
9	Aspergillus funiculosos	+	+	+	+
10	Aspergillus fumigatus		+	+	+
11	Aspergillus luchuensis				+
12	Aspergillus nidulans	+			+
13	Aspergillus niger			+	+
14	Aspergillus orchraceous		+		
15	Aspergillus sp		+	+	+
16	Aspergillus Sulphureus			+	
17	Aspergillus sydowi	+		+	
18	Aspergillus terreus		+		
19	Aspergillus versicolor	+			
20	Aspergillus violacco foscos	+			+
21	Bispora Sp.		+	+	
22	Cephalosporium aceremonium	+	+		
23	Cercospora sp		+		+
24	Chaetomium aureum	+		+	
25	Chaetomium globosum		+	+	
26	Chaetomium funicola	+	+		
27	Chaetomium sp	+	+		+
28	Circinella sp	+			
29	Cladosporium herbarum		+		+
30	Cladosporium oxysporum	+	+	+	
31	Collectotrichum fatcutum	+	+	+	+
32	Curvularia borreriae	+	+		
33	Curvularia lunate	+	+	+	+
34	Curvularia pallescens		+	+	+
35	Curuularia sp	+	+		+
36	Doratomyces sp	+	+		+
37	Dreschlera australinsis		+	+	
38	Dreschslera rostrata	+	+	+	+
39	Dreschslera sp		+	+	+
40	Fosarium dimerum		+	+	+
41	Fusarium jaraniscum	+	+		+
42	Fusarium oxysporom	+	+	+	+
43	Fusarium solani		+	+	
44	Fusarium sp	+	+	+	
45	Helminthosporum	+		+	
46	Heterosporium	+		+	
47	Humicola	+	+		+
48	Humicola sp	+	+	+	
49	Hyalopos	+	+	+	
50	Isoaclya		+	+	+
51	Memnoniella echinulata		+	+	
52	Mesobotrys simplea		+	+	
53	Monosporium sp	+	+		

54	Mucor				+
55	Mucor flavos	+	+	+	
56	Mucar globossos	+	+	+	
57	Neocosmospora vasinfecta	+			
58	Paecilomyces austriacus	+			
59	Paecilomyces fosisporus	+	+		
60	Paecilomyces varioti	+		+	+
61	Paecilomyces viridae	+			
62	Pencillium atropurpurea	+	+		
63	Pencillium citreo-virde		+	+	
64	Pencillium fumigatus		+	+	+
65	Pencillium funculosum		+	+	
66	Pencillium notatum	+	+	+	+
67	Pencillium sp	+	+	+	
68	Penicillium varians	+	+	+	+
69	Penicillium victoriae	+			
70	Periconia atrapurpurea			+	
71	Phoma feckelli		+	+	+
72	Phoma glomerata		+		
73	Phoma humicola		+	+	
74	Phoma sp	+			+
75	Phycomyces sp	+	+		
76	Pithymyces flavos	+	+	+	
77	Pyrenochaeta sp		+	+	
78	Pyronema sp		+	+	
79	Rhizoctonia		+	+	+
80	Scoupulariopis alba		+	+	+
81	Scolecobasidium constrictum	+	+	+	+
82	Scopolariosis sp	+			+
83	Spicaria elegans			+	
84	Stachbotrya atra		+		
85	Syncephalastrum racemosm	+			+
86	Syncephalastrum sp	+		+	
87	Thiclavia sp	+	+	+	+
88	Torula alli			+	+
89	Torula sp			+	+
90	Torula terrestis	+			+
91	Trichoderma sp	+		+	
92	Trichurus spiralis	+			
93	Unidentified			+	
94	Verticilliasrum sp	+			
95	Zygorhyncus		+		+
96	Zygorhyncus sp		+	+	+
	STERILE MYCELIA				
1	While sterile	+	+		
2	Black sterile		+	+	+
3.	Green sterile		+	+	

NRS – Non Rhizosphere Soil, RS-Rhizosphere Soil, RP-Rhizoplane, PP-Phylloplane

Conclusion: The study on the results of fungal colonies from different media showed higher number of fungal colonies in Vegetable Agar Medium both in field and market samples indicating harbouring of more number of microbes in VAM though sucrose increases the sporulation in many fungi

The results of mycobial numbers indicate that the Fungi were relatively high in the field samples of both *Amaranthus viridis* and *Hibiscus cannabinus* compared with that of the market samples. This shows that the field samples are free from the spraying of the chemicals but whereas the market samples were

treated with some chemicals. This evidence clearly shows that the crop plants or leafy vegetables are inhabited with several fungal species in the soil. The study clearly shows that the organic nutrition available would generally been utilized by various microorganisms which are inhabited in the soil. The above data clearly indicates the importance of nutrition levels in various leafy vegetables that are available for the fungal species harbouring in the different ecological niches of these plants.

In the present study also the concentration of Rhizosphere and Rhizoplane mycoflora is higher than the Non-Rhizosphere mycoflora in the field samples of Amaranthus and Hibiscus. However the market samples of Amaranthus and Hibiscus does not show much significant differences of Non-Rhizosphere, Rhizosphere, Rhizoplane and Phylloplane.

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