

## IMPROVEMENT IN THE MEDICINAL PLANTS THROUGH VAM FUNGI

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During survey of Amarkantak, Pachmarhi and Jabalpur forests in Madhya Pradesh, roots of twenty one plant species belonging to different angiospermic families along with rhizospheric soils were collected. Microscopic investigations of collected roots and soils revealed presence of profuse mycelium, arbuscles, vesicles and spores of VAM fungi in roots, in all the plants studied. Colonization of VAM fungi varied in different plant roots and spores count ranged between 200 to 8900 spores/100 gm of soil. Higher spore count supported good growth. All the four VAM genera viz., *Glomus* sp., *Acaulospora* sp., *Sclerocystis* sp. and *Gigaspora* sp. were recorded.

**Keywords:** Angiospermic families; VAM fungi.

### Introduction

Mycorrhizal association has been reported almost in all angiospermic plants<sup>1,2</sup>. The distribution of Mycorrhizae and their influence on plant growth is well established<sup>3,4</sup>. Successful field trails with various economic crops after inoculation with V.A.M. fungi have been reported by Howeler *et al*<sup>5</sup>, and Lioi *et al*<sup>6</sup>. However, little information is available on VAM association with medicinal plants.

### Materials and Methods

Twenty one medicinally important plant sps were selected for the present study. The sampling was done from Pachmarhi, Amarkantak, and Jabalpur forest. The plants were carefully excavated along with association soil. The rhizospheric soils were collected in separate bags along with the plant roots. Later roots were stained by a modified technique of Phillips and Hayman<sup>7</sup>. The infection percentage was calculated through the formula of Read *et al*<sup>8</sup>. VAM fungal spores/100 gm in rhizospheric soil of each plant were counted through the wet sieving and decanting method.

### Results and Discussion

Results of percentage of VAM colonized root

and spore number per 100 grams of rhizospheric soil of each plant are presented in Table 1. Almost all the plant roots examined exhibited profuse mycelial association while vesicles were observed in the cortical region. The mycelia extended beyond the root system and their presence was seen in intercellular spaces of cortical region as well. The following 12 plants showed colonization upto 40%: *Cissampelos pareira*, *Triumfetta pilossa*, *Pterocarpus marsupium*, *Bulophia orekis*, *Helictres isora*, *Centellaasiatica latifolia*, *Calotropis porcera*, *Mucuna pruneus*, *Thallictrum foliolsum*, *Pimpinella wallichiana*, *Eclipta alba*, *Zanthium strumarium*; whereas *Elephantopus alsinoides*, *Andrographis paniculata*, *Chlorophytum tuberosum*, *Jasminum roxburghianum*, *Hemidesmus indicum* showed 40 to 100% VAM colonization. Spores of red brown, yellowish brown, light yellow brown, dark brown, black, light brown and deep honey colour with variable shapes like spherical, spherical ovoid, pear and subglobose were observed.

The colonization appeared to have started from the second set of lateral roots to the tip of root system. In the present study the plants like *Andrographis paniculata*,



Table 1

Name of the plant	Percentage Infection root system	Spores/100 gms soil	Place from where collected	Name of the Mycorrhizae sps.
1. <i>Triumfetta pilossa</i>	50%	1200	Pachmarhi	<i>Gigaspora calospora</i>
2. <i>Hemidesmus indicus</i>	20%	1800	Pachmarhi	<i>Gigaspora calospora</i>
3. <i>Eclipta alba</i>	40%	200	Jabalpur	<i>Glomus macrocarpus</i> <i>Sclerocystis sp.</i>
4. <i>Discorea floribunda</i>	50%	1200	Pachmarhi	<i>Glomus mosseae</i>
5. <i>Elaeodendron glaucum</i>	40%	900	Pachmarhi	<i>Glomus sp.</i> <i>Sclerocystis sp.</i>
6. <i>Murraya paniculata</i>	40%	600	Pachmarhi	<i>Gigaspora calospora</i>
7. <i>Xanthium strumarium</i>	30%	1800	Jabalpur	<i>Glomus sp.</i> <i>Gigaspora calospora</i>
8. <i>Pterocarpus marsuptum</i>	20%	800	Pachmarhi	<i>Gigaspora calospora</i>
9. <i>Calotropis procera</i>	10%	500	Jabalpur	<i>Gigaspora calospora</i>
10. <i>Thallictrum foliolosum</i>	30%	3900	Pachmarhi	<i>Glomus macrocarpus</i>
11. <i>Eulophia orekis</i>	10%	3600	Pachmarhi	<i>Glomus sp.</i>
12. <i>Euphorbia nerifolia</i>	70%	3900	Pachmarhi	<i>Glomus macrocarpus</i>
13. <i>Andnographis peniculata</i>	70%	1200	Pachmarhi	<i>Glomus sp.</i> <i>Gigaspora calospora</i>
14. <i>Pimpinella wallichianum</i>	30%	1300	Pachmarhi	<i>Gigaspora calospora</i>
15. <i>Asparagus racemosus</i>	10%	500	Pachmarhi	<i>Gigaspora calospora</i>
16. <i>Helictres isora</i>	10%	600	Pachmarhi	<i>Gigaspora calospora</i>
17. <i>Cissampelos pareira</i>	20%	1100	Amarkantak	<i>Glomus mosseae</i>
18. <i>Centella asiatica</i> var. <i>latifolia</i>	20%	3800	Pachmarhi	<i>Glomus mosseae</i> <i>Glomus macrocarpus</i>
19. <i>Mucuna pruricus</i>	10%	200	Pachmarhi	<i>Acaulospora sp.</i>
20. <i>Chlorophytum tuberosum</i>	100%	800	Pachmarhi	<i>Gigaspora calospora</i>
21. <i>Jasminum roxburghinum</i>	90%	1200	Pachmarhi	<i>Glomus sp.</i>

*Hemidesmus indicum*, *Centella asiatica latifellia* and *Eclipta alba* were found with mycorrhizal association. Mohan Kumar & Mahadevan<sup>9</sup> reported that medicinal plants inhibited mycorrhizal association, however, in the present study such restrictions among medicinal plants were not observed. They further stated that VAM inhibition is due to chemical substance (s) in the the plants but this was not found during the studies. None of the plants studied were without Mycorrhiza. Contrary to it all the plants studied were infected by VAM to a varying degree. Tentative identification revealed the presence of most of the VAM genera like *Glomus* sps. *Gigaspora* sps. *Sclerocystis* sp. and *Acaulospora* sps.

The Above results clearly show that Madhya Pradesh forests soils are rich in VAM fungi and which helps in the establishment of natural forests in the area. These results could lead to the silvicultural development of medicinal plants in the eroded and denuded forests.

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