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DYNAMICS OF VESCICULAR ARBUSCULAR MYCORRHIZAE IN ASSOCIATION WITH *ALBIZZIA LEBBECK.*

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Association of VAM fungi with *Albizzia lebbeck* under different edaphic conditions of Godavari belt was assessed. In all 13 species representing 6 genera could be recorded. *Glomus mosseae* and *Sclerocystis pakistanika* were most predominant. *Albizzia lebbeck* was found to be VAM dependent as there was considerable increase in growth rate, biomass production, chlorophyll content and phosphorus content in plants grown in normal soil than in sterilized soil. The degree of VAM infection varied with the place as well as time of sampling.

Key Words: VAM fungi, *Albizzia lebbeck*, agroforestry, phosphorus.

The premier role of mycorrhizae in plant nutrition and stress tolerance has been proved beyond doubt. Further, critical review of literature on the association of VAM fungi reveals meagre information on this tree species. Therefore, the present investigations, have been taken up.

Soil samples from root zone of *Albizzia lebbeck* upto the depth of 10 cm from different places of Godavari belt were collected. Tertiary root-lets were collected together with adhering soils in polyethylene bags. The roots were washed thoroughly and immediately fixed in FAA. As the roots were pigmented bleaching was carried out as suggested by Miller *et al.* (1986). The roots were cleared in 10% KOH and then stained with 0.08% tryphan blue (Phillips and Haymann, 1970). The stained roots were observed under microscope. The presence of mycorrhizal fungus was confirmed by observing vescicles and arbuscules. The percentage of infection was calculated by the formula given by Giovannetti and Mosse (1980). Resting chlamydospores, azygospores and soilborne vescicles were extracted by wet sieving and decanting method (Pacioni, 1992). The resting spores were identified by the key provided by Schenck and Perez (1987).

Table 1 reveals the variation in the degree of root infection and density of VAM fungal spores with the soil sample. In general root infection was more during winter than in summer which may be attributed to increased dependency of plants on mycorrhizal association. Similar to present observations, several workers have demonstrated that increased light intensity and longer day lengths generally increase the percentage of root colonization Rachel *et al.* (1993). Heavy root infection was observed in samples collected from Bheemadevarapally. While samples collected from Ramnagar have shown very low root infection. This variation in infection among samples of difference in the edaphic conditions including the soil fertility. Inspite of this variation, a correlation was observed in degree of infection during winter and summer months. Koske (1981) also feels that distribution of VAM fungi is related to soil environmental conditions. A strong negative correlation between mycorrhizae formation and soil depth, moisture and pH was reported by Al-Agely and Reeves (1995). Haymann (1975) reported that high levels of phosphorus and nitrogen reduce root colonization.

Contrary to the root infection, VAM fungal spore population in soil was more during summer than in winter. On the other hand, Mago and Mukerji (1994) have observed more fungal spore density in summer than in winter. The fungal spore population was highest in the rhizosphere soils of *Albizzia lebbeck* collected from Eturnagaram and least in soils collected from Mulkanoor. Further soils of Ramnagar, Hasanparthy, Kemmala, Rampoor, Warangal, Jakaram, Tadwai and Elkathurty were considered to be rich in VAM fungi. Such variation in the spore population may be attributed to physico-chemical characteristics of the soil. The present observations are in agreement with those of Khan (1971), Maninder *et al.* (1977) who also reported variation in VAM colonization.

Blaszkowski (1993) while investigating the plant

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Table 1. Root infection and spore population in different localities in two seasons (Summer and winter)

Localities	VAM infection (%)		Spores/100 gr soil	
	Winter	Summer	Winter	Summer
Bahupet	38	32	82	112
Bheemadevarapally	54	42	53	88
Elkathurty	36	33	58	96
Eturanagaram	50	39	112	143
Hasanparthy	39	35	70	98
Huzurabad	44	40	63	78
Jakaram	48	31	98	128
Kommala	37	33	80	106
Mulkanoor	40	38	48	56
Narsampet	46	40	61	96
Ramnnagar	31	26	78	104
Rampoor	34	29	87	114
Rathnagiri	33	28	73	92
Tadwai	43	36	103	133
Warangal	49	38	78	118

communities of Poland, observed significant correlation between spore density and soil pH. Critical perusal of Table 1 reveals no correlation between degree of root infection and VAM spore population as reported by Kehri *et al.* (1987).

Altogether 13 VAM fungal species could be recorded in the rhizosphere soil of *A. lebbeck*. They include two species of *Acaulospora (A. foveata* and *Acaulospora* sp.), five species of *Glomus (G. fasciculatum, G. multicaule, G. aggregatum, G. mosseae* and *G. geosperum)*, three species of *Sclerocystis (S. spinuosa, S. pakistanika, S. microcarpus)*, two species of *Scutellospora (S. nigra* and *Scutellospora* sp.*)* and a species of *Gigaspora. G. mosseae* and *S. pakistanika* were most predominant VAM fungi in the root region of *A. lebbeck*. However, Mosse (1992) feels that the specificity in VAM fungi may be determined more by interactions between strains and soil than between the fungus and the host plant.

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