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Research Notes

OCCURRENCE OF VESICULAR-ARBUSCULAR MYCORRHIZA IN CERTAIN CROP PLANTS OF KERALA

Vesicular–arbuscular mycorrhiza plays an important role in the growth and development of many crop plants of economic importance (Gerdemann, 1975; Mosse and Hayman, 1971). The work done so far in India and abroad indicates that this association can increase the uptake of P and minor elements such as Zn and Cu by different crops besides enhancing nodulation and nitrogen fixation by rhizobia in several grain and fodder legumes (Krishna *et al.*, 1982; Manjunath and Bagyaraj, 1984 and Sivaprasad *et al.*, 1984).

In the present study, a preliminary survey was conducted at the Coliege of Agriculture, Vellayani, Trivandrum to identify the crop plants which are having the natural association of vesicular–arbuscular mycorrhiza. In all, 46 crops including 11 cultivars of banana and cassava were examined for the presence of VAM infection by the standard staining technique of Phillips and Hayman (1970). The resufts are expressed in terms of percentage of mycorrhizal infection out of 100 bits of root samples examined for each crop (Table 1).

The survey revealed the natural presence of VA mycorrhiza in most of the crop plants examined. However, there was significant difference in the percentage infection by vesicular-arbuscular mycorrhiza (Table 1). Crops like rice (upland)' coconut, cashew, mango and cassava varieties such as *Pannivella*, M_4 and *Kondachukappan* showed hundred per cent infection by VAM. The incidence of mycorrhiza was also significantly higher in rubber, cocoa, pepper, citrus, pineapple, greengram, centrosema, amaranthus, brinjal, chillies, cassava varieties such as *Mankozhunthan* and *Adukkumuttan* and in banana varieties such as *Palayamkodan, Monthan* and *Red banana.* Crops like nutmeg, clove, groundnut, tomato, clusterbean, subabul, siratro and paragrass showed moderate infection. The percentage of mycorrhizal infection was comparatively low in seasmum, betelvine, redgram, guineagrass, Hybrid Napier, Setaria, lawngrass, jack tree and in banana varieties like *Nendran, Robusta*, and *Rasthali*. However, in arecanut and bhindi, no VA mycorrhizal infection was observed during the present investigation.

The above study has, thus indicated a natural occurrence of VAM infection in a number of crop plants cultivated in Kerala, eventhough the survey was restricted to a single locality. There was also significant differences in the percentage of infection by VAM, Such differences are reported earlier by Mosse and Hayman (1971) and Bagyaraj (1984). The complete absence of VAM in the case of arecanut and bhindi observed during the investigation has to be further confirmed by conducting more survey for these crops 3t other locations in the state.

The natural incidence of VAM in a large number of crop plants commonly cultivated in the state is important because it will enable these plants to increase the uptake of P from the generally P deficient and P fixing soils ocurring in the state and also from the rock phosphate which can be used as a cheap substitute for superphosphate.

Table 1

Percentage occurrence of mycorrhiza in different crop plants **

Name of crop		Family	% occurrence*
Common name	Botanical name		of mycorrhiza
Amaranthus	*Amaranthus viridis* L	Amaranthaceae	97.7 (81.15)
Cashew	*Anacardium occidentale* L.	Anacardiaceae	100.0 (90.00)
Pineapple	*Ananas comosus* (L) Merr.	Bromeliaceae	80.7 (63.93)
Rubber	*Hevea brasiliensis* M, Agr.	Euphorbiaceae	98.8 (83.85)
Cassava varieties			
1 Pannivella	*Manihot esculenta* Crantz	,,	100.0 (90.0)
2 M4	,,	,,	100.0 (90.0)
3 Kondachukappan	,,	,,	93.3 (75.0)
4 Mankozhunthan	,,	,,	83.7 (66.15)
5 Adukkumuttan	,,	,	93.3 (75.0)
Rice (upland)	*Oryza sativa* L.	Graminaceae	100.0 (90.0)
Paragrass	*Brachiaria mutica* L.	,,	53.3 (46.92)
Lawn grass	*Cynodon dactylon* (L.) Pers	,,	43.2 (41.07)
Guinea grass	*Panicum maximum* L.	,,	36.4 (37.14)
Dinanath grass	*Pennisetum pedicellatum* L.	,,	36.1 (36.93)
Congo Signal grass	*Brachiaria ruziziensis* L.	,,	31.6 (34.22)
Hybrid Napier	*Pennisetum purpureum* L.	,,	26.5 (30.49)
Setaria	*Setaria viridis* L.	,,	25.0 (30.0)
Greengram	*Phaseolus aureus* Roxb.	Leguminoceae	91.2 (72.78)
Redgram	*Cajanus cajan* (L.) Mill sp	,,	22.2 (28.08)
Groundnut	*Arachis hypogaea* L.	,,	56.8 (48.93)
Cluster bean	*Cyamopsis tetragonolobus* (L.) Taub.	,,	67.2 (55.08)
Stylosanthes	*Stylosanthes gracilis* L.	,,	98.9 (83.85)
Centrosema	*Centrosema pubescense* L,	,,	90.8 (72.29)
Subabul	*Leucaena leucocephala* L	,,	60.1 (50.85)
Siratro	*Macroptilium artopurpureum* L.	,,	60.1 (50.85)
Bhindi	*Abelmoschus esculentus* L.	Malvaceae	0 (0)
Mango	*Mangifera indica* L.	Mangiferae	100.0 (90.0)
Jack tree	*Artocarpus heterophyllus* Lamk	Moraceae	16.3 (23.85)

* Mean of 3 replications C.D.(0.05) = 17.01

** Values in parenthesis are transformed values

Table 1 (continued)

Banana varieties			
1 Palayamkodan	*Musa paradisiaca* L.	Musaceae	98.9 (83.85)
2 Monthan	,,	,,	95.5 (77.17)
3 Red banana	,,	,,	83.7 (66.15)
4 Nendran	,,	,,	39.7 (39.06)
5 Robusta	,,	,,	31.6 (34.22)
6 Rasthali	,,	,,	23.2 (28.78)
Nutmeg	*Myristica fragrans* L.	Myristicaceae	66.7 (54.78)
Clove	*Eugenia caryophyllus* L.	Myrtaceae	66,7 (54.78)
Coconut	*Cocos nucifera* L.	Palmae	100.0 (90. 0)
Arecanut	*Areca catechu* L.	,,	0 (0)
Sesamum	*Sesamum indicum* L.	Pedaliaceae	46,5 (42.99)
Pepper	*Piper nigrum* L.	Piperaceae	93.3 (75.0)
Betelvine	*Piper betle* L.	,,	6.7 (15.0)
Citrus	*Citrus aurantifolia* Swingle	Rutaceae	88.4 (70 08)
Brinjal	*Solanum melongena* L.	Solanaceae	97.7 (61.15)
Chillies	*Capsicum annum* L	,,	88.4 (70.08)
Tomato	*Lycopersicon esculentum* Mill.	,,	77.8 (61.92)
Cocoa	*Theobromacacao* L.	Sterculiaceae	91,2 (72.78)

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