Table 1 *Morphology and rhizogenesis in leaf-derived calli from wild species and hybrids of Arachis*

Wild species	Origin of calli	Nature of calli	Rhizogenesis
Parent			
Arachis villosulicarpa Hoehne ($2n = 20$)	Laminar and midrib	White to yellow and soft	Profuse rooting with rootlets
A. diogoi Hoehne ($2n = 20$)	No callusing	—	—
A. duranensis nom. nud ($2n = 20$)	Laminar	White friable	Thick root formation with branches
A. marginata Gard ($2n = 40$)	Laminar	Dark brownish	–do–
A. monticola Krap & Rig. ($2n = 40$)	Laminar and midrib	Dark brownish	–do–
A. hagenbeckii Harms ($2n = 40$)	Midrib	White and soft	–do–
A. glabrata Benth ($2n = 40$)	Laminar and midrib	Light yellowish and soft	–do–
Hybrid			
A. hypogaea L. × *A. villosa* Benth ($2n = 30$)	Laminar	Light brownish	Thick root formation without rootlets
A. hypogaea L. × *A. villosa* Benth ($2n = 60$)	Cut ends of the lamina	White and soft	No rooting

sponse or interaction effect of genotypes of diploid cells to high concentration of casein hydrolysate and coconut water. However, polyploid species did not show rooting even after several subcultures in similar treatments; only profuse callusing was noticed. But in the case of triploid hybrid ($2n = 30$) of *A. hypogaea* × *A. villosa* Benth, short and thick root formation was noticed. Subculturing of the callus tissues in a medium without casein hydrolysate and 2,4-D stimulated faster growth of calli from the polyploid species. But none of the species of *Arachis* except *A. villosulicarpa* Hoehne exhibited differentiation of shoot buds. In *A. villosulicarpa* Hoehne, successful shoot induction was noticed even without the addition of cytokinins[6].

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INFLUENCE OF *GLOMUS FASCICULATUM* ON DAMPING-OFF OF TOMATO

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THE vesicular-arbuscular (VA) mycorrhizal fungi are known to interact with root infecting soil-borne plant pathogenic micro-organisms[1]. Colonization by *Fusarium oxysporum* f. sp. *lycopersici* decreased more in mycorrhizal tomato plants than in non-mycorrhizal plants[2]. The effect of VA mycorrhiza, *Glomus fasciculatum*, on damping-off of tomato (*Lycopersicon esculentum* Mill.) caused by *Pythium aphanidermatum* (Edson) Fitzp. studies reported in this paper.

The experiment was conducted in pot culture, under green house conditions. Tomato var Pusa Ruby seedlings were raised in steam-sterilized soil and 22-day old seedlings were transplanted into 20 × 18 cm size earthen pots, each containing 2 kg of red soil mixed with 1 % (w/w) compost. The plants received the following inoculation treatments: (1) uninoculated control, (2) mycorrhiza (M) only, (3) pythium (P) only, (4) both (M) and (P) at the time of transplanting, (5) M at transplanting and P two weeks after transplanting and (6) P at transplanting and M two weeks after transplanting. There were four pots under each treatment and two seedlings were planted in each pot. The mycorrhizal inoculum consisted of a mixture of root pieces and soil from a pot culture of guinea grass

Table 1 *Effect of Glomus fasciculatum on damping-off of tomato caused by pythium aphanidermatum.*

Treatment *	Disease index **	Plant height (cm)	Shoot dry wt (g)	Root dry wt (g)	Mycorrhizal spore count/ 50 ml soil
Control (C)	0	29.3[b]	2.7[b]	0.4[b]	50
Mycorrhiza (M)	0	27.3[b]	2.5[b]	0.6[c]	400
Pythium (P)	4	10.6[a]	0.8[a]	0.1[a]	40
M(T) + P(T)	1	23.8[b]	2.2[b]	0.3[b]	380
M(T) + P(2W)	0	28.8[b]	2.8[b]	0.7[c]	450
p(T) + M(2W)	4	10.3[a]	0.6[a]	0.1[a]	30

* (T) = Inoculated at the time of transplanting; 2W = inoculated two weeks after transplanting.
** 0 = No disease; 1 = slightly stunted growth; 4 = plants either dead or very stunted.
Values superscribed with identical letter do not differ significantly at $P = 0.05$.

Figure 1. Influence of mycorrhiza on damping-off of tomato: P = Pythium only inoculated at transplanting, M + P = Both pythium and mycorrhiza inoculated at transplanting, four pots in each treatment.

(*Panicum maximum*) which was infected with *G. fasciculatum* and grown for 4 months (spore density 460/50 ml). Pythium inoculum was prepared by aseptically growing *P. aphanidermatum* on 100 g autoclave sterilized sorghum seeds for 15 days in 500 ml glucose bottles and suspending the fungal growth in 250 ml sterile water at the end of incubation. For inoculation 10 ml of pythium or 100 g of mycorrhiza inoculum was applied per pot. The observations were recorded after 30 days of transplanting. The experiment was twice repeated.

The results presented in table 1 and figure 1 indicate a beneficial influece of mycorrhizal inoculation on control of damping-off of tomato caused by *P. aphanidermatum*. Mycorrhiza fungal inoculation either simultaneously or 2 weeks prior to pythium inoculation reduced damping-off in tomato and significantly increased plant height, shoot and root weights over pythium only inoculation as well as over plants inoculated with pythium 2 weeks prior to mycorrhizal inoculation. The results suggested that mycorrhizal fungus could colonize and protect such tomato plants from damping-off which were not already infected with pythium. Mycorrhiza alone inoculation of tomato significantly increased the root weight but not shoot weight and plant height over control plants. Understanding the exact disease control mechanism involved in the tripartite interaction of mycorrhiza, tomato and pythium is needed for greater exploitation of the beneficial effects[1].

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EFFECT OF GASEOUS POLLUTANTS ON AMMONIUM OXIDATION IN BACTERIAL CULTURES AND SULPHUR OXIDATION IN SOIL

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NITRIFICATION and sulphur oxidation in soils are mediated essentially by autotrophic bacteria and, to a minor extent, by heterotrophs. Heterotrophic nitrifiers are more tolerant than autotrophic nitrifiers to adverse