limited availability of the seed.

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AN ABNORMAL *LYCOPODIUM PHLEGMARIUM* L.

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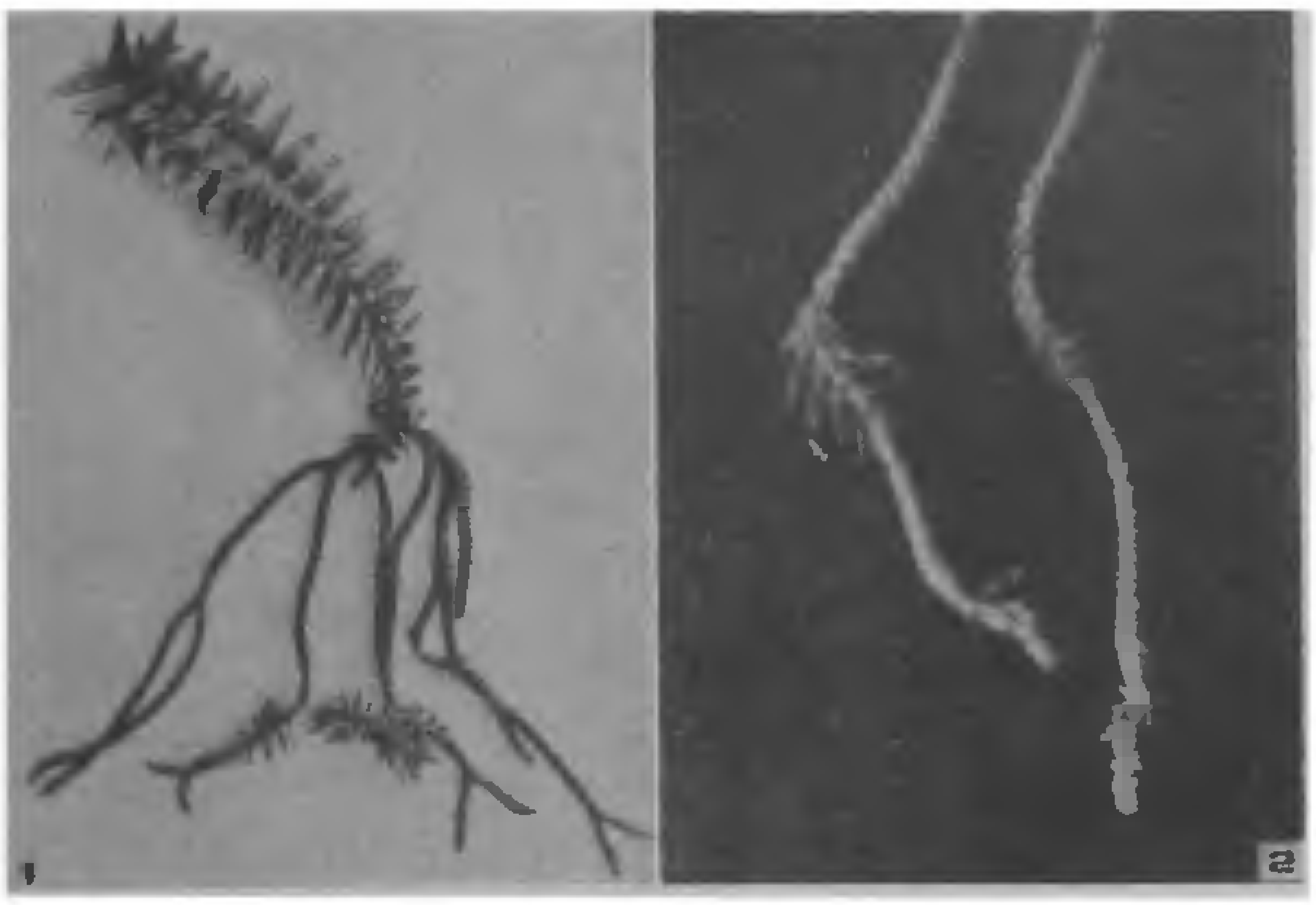
Lycopodium phlegmarium L. is one of the tropical epiphytic species and grows hanging from the tree trunks. In this species the sporophylls are smaller than the foliage leaves and are compactly arranged to form distinct strobili which are dichotomously branched at the terminal ends of the stem and its branches. Plants were collected from Kodaikanal (Tamil Nadu) and planted in the green house of this Department.

It was interesting to observe that the plant instead of producing the normal strobilus developed alternate fertile and sterile zones in the strobilus region. In the sterile region leaves were morphologically similar to the normal leaves except for their smaller size. Two to three sterile zones were recorded in each branches of the strobili. It was also noted that all the strobili produced by this plant showed this nature of fertile and sterile zones.

In the simple and primitive species of *Lycopodium* all of which belong to the subgenus *Urostachya*, every leaf on the plant is a sporophyll or at least potentially so. But in the species of subgenus *Rhopalostachya* and in some species belonging to *Urostachya* (*L. phlegmarium*) the leaves near the apices of the branch bear sporangia and are arranged in a compact manner to form distinct strobili. This rare nature of strobilus of *L. phlegmarium* clearly implies that there occurred a gradual transformation of the sterile vegetative leaf into fertile sporophyll by the simultaneous alterations in the structure and size and also its progressive shift towards the distal end of the stem. Hence it is probable that *L. phlegmarium* is one of the connecting links between the *Urostachya* and *Rhopalostachya*.



Figures 1–2. 1. Single strobilus showing fertile and sterile zone. **2.** Portion of the strobilus with sterile and fertile zone.

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PREVALENCE OF ENDOMYCORRHIZAL FUNGUS *GLOMUS FASCICULATUM* IN RELATION TO PHOSPHORUS CONTENT OF SOIL

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Endomycorrhizal fungi have earlier been shown to increase the ability of roots to absorb more nutrients than non-mycorrhizal plants [1–5]. The present study was carried out to obtain information on the prevalence and infection of *Glomus fasciculatum* (Thaxter sensu Gerdemann) in different maize soils with varying phosphorus content.

Fields which were mainly planted with maize for the last five years were selected. Soil samples were collected before planting maize and 30 and 60 days after sowing maize. Five plants were selected randomly from each site along with the rhizosphere soil. The number of

Table 1. *Prevalence of Glomus fasciculatum and root infection of maize plants in different soil types with varying phosphorus content*

Soil type	pH	Soil phosphorus content (kg/ha)†	No. of chlamydospores recovered from 100 g soil sample			Root length infection (%)*		Total root infection (%)*	
			Days			after plantings			
			0	30	60	30	60	30	60
Silt loam	6·4	11	78·3	109·9	138·3	17·71	20·86	40·00	40·00
Silt loam	6·2	16	78·3	196·6	237·6	4·85	11·14	14·28	31·42
Loam	6·7	47	66·6	86·6	86·6	21·42	22·57	42·85	48·57
Loam	5·7	60	50·2	58·3	81·6	15·14	07·14	31·42	22·85
Loam	6·3	103	21·6	46·6	64·9	7·71	10·28	20·00	25·71
Sandy loam	2·8	112	35·7	23·2	16·6	10·57	6·85	25·71	17·14

†Low phosphate soil – less than 12 kg P/ha; Medium phosphate soil – 12–40 kg P/ha; High phosphate soil – More than 40 kg P/ha

*Mean of 75 samples

chlamydospores from soil was estimated[6]. Roots were stained with acid—fuchsin in lactophenol. Root infection was estimated from 75 segments of 1.0 cm length randomly selected from plants, 30 and 60 days after planting. The proportion of the length of each root segment which contained vesicles, arbuscules or hyphae, was estimated[7,8].

The number of chlamydospores recovered before planting maize was larger from silt soils with low phosphorus content (11 and 16 kg/ha) than from other soils (table 1). High soil phosphorus content decreased the recovery of chlamydospores. The recovery of chlamydospores increased 30 days after planting maize in two silt loam soils (*P* content 11 and 16 kg/ha) and three loam soils (*P* content 47, 60 and 103 kg/ha). However, in sandy loam soil which contained high *P*, the recovery of chlamydospores was poor. Sixty days after planting the recovery of chlamydospores was increased in all the soils except in sandy loam soil. The infection of maize roots with *G. fasciculatum* was relatively high in low phosphate soils (table 1). Low phosphorus content in soil increases the amount of carbohydrates in roots, resulting in greater infection of roots, when compared with plants grown in soils containing high phosphorus content[9]. Phosphorus stress in soil could also change the root exudate pattern with an increased amounts of amino-acid content and this in turn could stimulate chlamydospore germination and infection of roots. The differences in recovery of chlamydospores from different soil types could be attributed to the intensity of root infection associated with soil phosphorus status and root growth[10]. High phosphorus application reduced the recovery of chlamydospores from soil[3].

21 September 1985

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