

OCCURRENCE OF ECTO AND ENDOMYCORRHIZAE IN *GALPHIMIA GRACILIS* BARTL.

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Galphimia gracilis Bartl. (Malpighiaceae) is a shrub or a small tree upto 10' in height with yellow flowers. It is a native of Mexico which has since been introduced in Pakistan. During an excavation of root systems of some leguminous herbs growing under the canopy of *Galphimia gracilis* plants forming a hedge near the faculty of Pharmacy, University of Karachi, ectomycorrhizal associations on the roots of *Galphimia gracilis* were observed. Ectomycorrhizae had a smooth surface and lacked root hairs. The ectomycorrhiza showed budding of mycorrhiza from tips of old mycorrhiza (Fig.1A). For anatomical studies, ectomycorrhizae were removed from the roots with the help of a sharp scalpel, washed thoroughly with water and fixed in formalin - acetic acid- alcohol in the ratio of 5:5:90 and embedded in paraffin wax (mp 56°C). Transverse sections 10-12 μm thick were cut with a rotary microtome. Paraffin was removed with xylol and slides stained with safranin and fast green (Johansen, 1940). For electronmicroscopy ectomycorrhizae were cut in small segments, washed with water, fixed in F.A.A. and embedded in methacrylate following Baird *et al.*, (1985). Transverse sections 0.5 μm thick cut on Jeol Ultramicrotome were transferred to a glass slide, stained with Toluidine blue and mounted in canada balsam. Transverse section of an ectomycorrhiza can be differentiated into fungal mantle (m), cortex (c) and stele (s). (Fig.1B). The cortical cells are filled with non-septate fungal hyphae (Fig.1C,D). For examination of the endomycorrhizae, young roots of *Galphimia gracilis* were gently washed under slow tap water and cut into 1 cm segments, fixed in formalin- acetic acid-alcohol, cleared in Potassium hydroxide (10% at 90°C) and stained with 0.5 % trypan blue in lactophenol as described by Philips & Hayman (1970). Vesicles were observed in the root segments where a single vesicle growing at the tip of a hypha is shown (Fig.1E). Another vesicle containing a number of rounded structures was observed (Fig.1F), the nature of which needs determination. Such structures have also been reported by Saif & Iffat (1976) in the roots of *Conyza canadensis*. Discovery of ectendomycorrhizae on the roots of *Galphimia gracilis* support Hayman (1978) that mycorrhizae occur in almost all tropical plants.

On the basis of the literature consulted and personal discussions with Dr. A. G. Khan, University of Campbelltown Australia, ectendomycorrhizae observed on the roots of *Galphimia gracilis* appears to be a new report.

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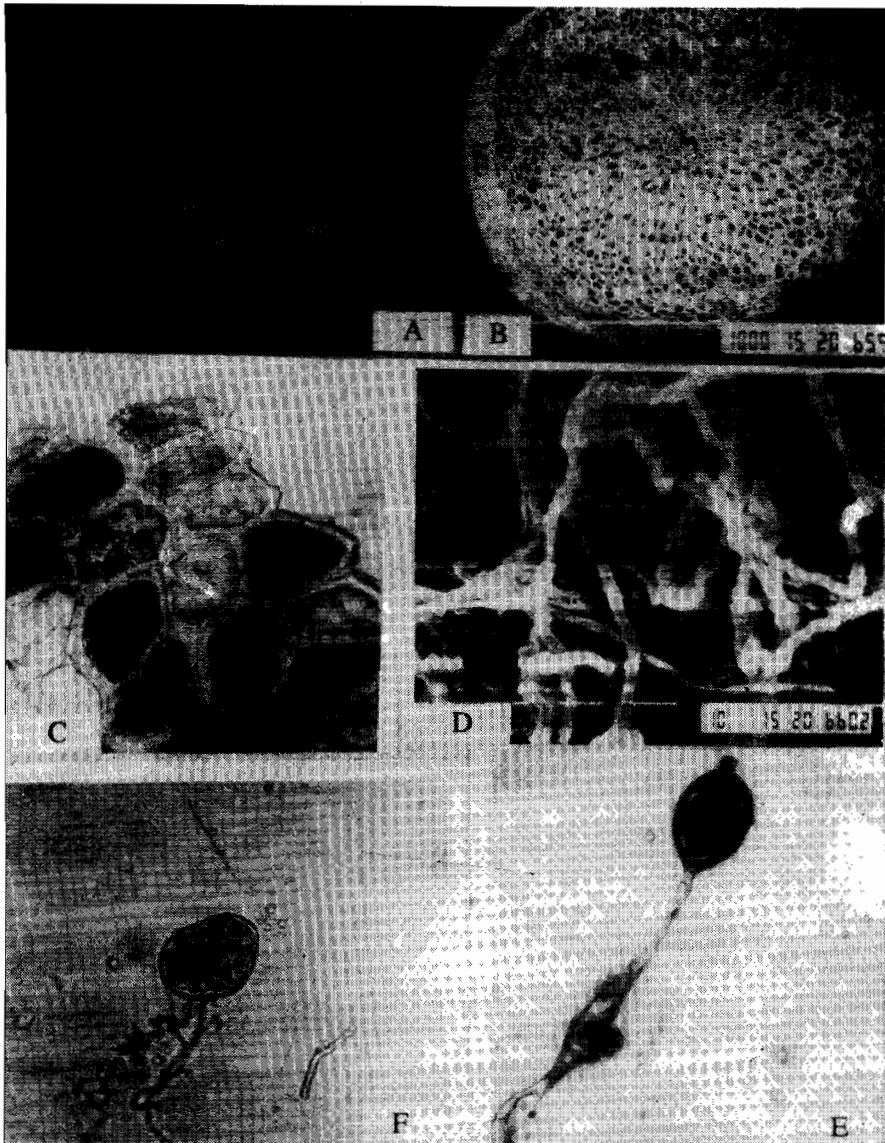


Fig. 1. Ectomycorrhizae on the roots of *Galphimia gracilis*.

- A) Budding of mycorrhiza from tips of old mycorrhiza. (arrow).
 B) Scanning Electron micrograph of ectomycorrhiza showing fungal mantle (m), cortex (c) and stele (s). X 75.
 C) A portion of the transverse section of ectomycorrhiza showing cortical cells filled with hyphae. X 200.
 D) Scanning Electron micrograph showing non-septate fungus. X 1000.
 E) Vesicle growing at the hyphal tip. X 200.
 F) Vesicle showing a large number of rounded structures inside. X 200.

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