

# **Influence of Nutrient Combinations and Growing Systems on Root Growth and Symbiotic Association of *Piriformospora indica* (PGPRE) in *Dendrobium* cv. Earsakul**

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## **ABSTRACT**

*Dendrobium* is an important orchid for cut flower and potted plant production. The present experiment was designed to work out a suitable treatment combination and growing system for better root growth of *Dendrobium*. The treatments were replicated thrice in Completely Randomized Design. Experimental results clearly indicated that, among plant growth promoters, the treatment NPK + GR + OM + VW + PGPRE + Bone meal (T<sub>6</sub>) recorded higher number of roots (91.00, 79.72), root volume (16.34 m<sup>3</sup>, 14.19 m<sup>3</sup>) in six month and three year old plants. Significantly longer roots (34.01 cm) and higher root colonization (66.63 per cent) was resulted in POP + OM + VW + PGPRE + Bone meal + GR (T<sub>4</sub>) in six month old plants. Among three growing systems, top ventilated polyhouse (S<sub>2</sub>) recorded significantly higher number of roots (89.00, 94.75), longer roots (31.44 cm, 43.33 cm), root volume (17.14 m<sup>3</sup>, 19.16 m<sup>3</sup>) and root colonization (63.34, 41.30 per cent). In interaction, the combination of POP + OM + VW + PGPRE + Bone meal + GR (T<sub>4</sub>) and top ventilated polyhouse (S<sub>2</sub>) had maximum influence on root parameters. In anatomical studies, after inoculation, in *Dendrobium* cv. Earsakul roots, hyphae of the *Piriformospora indica* fungus entered into the tissue of the root through the root tip. In the cortical cells of the roots, development of intracellular hyphal coils and round bodies could be observed. Hyphae multiplied within the cortical tissues and never traversed through endodermis.

**Key words :** Anatomical studies, *Dendrobium* cv. Earsakul, Inorganic nutrients, Organic, *Piriformospora indica* (PGPRE), Root growth, Three growing systems.