

ABSTRACT

Fina Zanjabila, 24020122130114. Growth Response and Anatomy of *Dendrobium nindii* W.Hill Orchid to Organic and Inorganic Fertilizer Application. Under the guidance of Endang Saptiningsih and Muhammad Luqman Hakim

Dendrobium nindii W.Hill is an orchid species with unique morphology and attractive flower colors. However, its growth is relatively slow, requiring adequate nutrient availability to support optimal development. This study aimed to analyze the effects of fertilizer application on the vegetative growth, morphology, physiology, and leaf anatomical structure of *Dendrobium nindii* W.Hill during the seedling-to-juvenile stage. The experiment was conducted using a Completely Randomized Design (CRD) on two-month-old ex vitro orchids grown in a greenhouse. Four treatments were applied: control (without fertilizer), organic fertilizer (liquid organic fertilizer), inorganic fertilizer (Gaviota), and alternating organic–inorganic fertilizer application. Observations were conducted for 20 weeks after acclimatization. Fertilizers were applied once a week by spraying onto the plant crown and growing medium. The observed parameters included vegetative growth, photosynthetic pigment content, and leaf anatomical characteristics. The results showed that the inorganic fertilizer treatment produced the highest values for total leaf area (111.25 cm²), new leaf area (71.05 cm²), fresh leaf weight, chlorophyll a (260.71 µg g⁻¹), mesophyll thickness (1115.62 µm), and number of roots (36 roots). Meanwhile, the alternating organic–inorganic fertilizer treatment resulted in the highest number of leaves (8.50 leaves), stomatal density (33.35 stomata mm⁻²), number of pseudobulbs (4.25 pseudobulbs), and root length (205.43 cm). In general, both the inorganic fertilizer and alternating organic–inorganic fertilizer treatments promoted better growth responses than the organic fertilizer and control treatments.

Keywords: *Dendrobium nindii*, vegetative growth, leaf anatomy, organic fertilizer, inorganic fertilizer