ABSTRACT

Jasmine Metanoia. 24020121130113. The Effect of Light Intensities on The Growth and Stomata Anatomy of *Dendrobium nindii* W. Hill Orchid Seedlings. Department of Biology, Faculty of Science and Mathematics, Diponegoro University, Semarang, under the guidance of Dr. Dra. Endang Saptiningsih, M.Si. and Dr. Nintya Setiari, S.Si., M.Si.

The Dendrobium nindii orchid is a unique orchid because it has spiral-shaped flower petals and a distinctive labellum, which makes this orchid much sought after by consumers. The weakness of Dendrobium nindii in the seedling phase is that it is susceptible to light intensity that is too high or too low, so it is necessary to know the appropriate light intensity range. This study aims to determine the effect of light intensity and its appropriate range to produce the highest seedling growth in Dendrobium nindii. The study was conducted over 12 weeks using 9-week-old Dendrobium nindii orchids. The experimental method was used in a greenhouse located in Sekebrok Hamlet, Beji Village, East Ungaran. The research used a Completely Randomized Design (CRD) with 1 factor, namely light intensity consisting of high light intensity (I high), medium light intensity (I medium), and low light intensity (I low). The parameters observed included the content of chlorophyll a, chlorophyll b, carotenoid pigments, stomatal density, percentage of stomatal opening, percentage of stomatal closing, total leaf number, number of new leaves, total leaf area, new leaf area, total pseudobulb number, total pseudobulb length, total root number, total root length, and fresh weight. Quantitative data were analyzed using One Way ANOVA. Significant differences were further tested using the LSD Test at a significance level of 5%. The results showed that I high treatment caused the highest increase in carotenoid pigment content, percentage of stomatal opening, total leaf area, new leaf area, total pseudobulb length, total root length, total root number, and fresh weight. Meanwhile, the I medium treatment showed higher values in total leaf number, total root length, total root number, and stomatal density. In Dendrobium nindii seedling phase, high light intensity treatment (around 450 – 3.001 lux) was the optimal intensity and caused the highest increase in carotenoid pigment content, percentage of stomatal opening, total leaf area, new leaf area, total pseudobulb length, total root length, total number of roots, and fresh weight.

Keywords: *Dendrobium nindii, seedling phase, light intensity, growth*