

## ABSTRACT

**Nasfa Alifia Sofika. 24020121140159. The Effect of Light Intensity on the Growth and Stomata Density of Taiwanese *Phalaenopsis* orchid seedlings. Department of Biology, Faculty of Science and Mathematics, Diponegoro University, Semarang under the guidance of Endang Saptiningsih and Nintya Setiari.**

*Light intensity plays an important role in plant growth, affecting photosynthesis, chlorophyll formation, stomata, and the development of vegetative organs such as leaves and roots. Differences in light intensity during the seedling phase cause differences in plant growth and physiological responses. This study aims to determine the optimal light intensity range for the growth of Taiwanese hybrid *Phalaenopsis* orchids. The study was conducted for 0-12 weeks after acclimatization using an experimental method in a greenhouse with a completely randomized design (CRD) with a single factor, namely light intensity consisting of: high light intensity (I high), medium light intensity (I medium), low light intensity (I low). The parameters observed included the number and total leaf area, the number and area of new leaves, the number and total root length, photosynthetic pigment content, stomatal density, percentage of stomatal opening and closing, 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 0.05. The results showed that the high I treatment resulted in the highest values of chlorophyll a, carotenoids, stomatal density, stomatal opening percentage, total root length growth, total root number, and root fresh weight. The medium I treatment resulted in the highest increase in chlorophyll b, stomatal opening percentage, total leaf area and number growth, new leaf area and number, and leaf fresh weight. Furthermore, the low I treatment resulted in the highest stomatal closing percentage. The optimal light intensity for the growth of Taiwanese *Phalaenopsis* hybrid seedlings was 229–1461 lux.*

**Keywords:** *light intensity, *Phalaenopsis* hybrid, seedlings, growth*