

ABSTRACT

Patchouli (*Pogostemon cablin* Benth.) is an essential oil-producing crop with high economic value; however, its productivity in Aceh has declined due to land limitations and suboptimal environmental conditions, particularly light intensity. This study aimed to analyze the morphological and physiological responses of several patchouli accessions under shaded and non-shaded conditions to support the development of adaptive cultivation practices. The theoretical framework was based on plant morphology and physiology, the role of light intensity in photosynthesis, and genetic variability among accessions as a source of environmental adaptability. The research was conducted at the Experimental Field of the Faculty of Agriculture, Universitas Malikussaleh, using a Split Plot Design with two shading levels (no shading and 55% shading) as main plots and three patchouli accessions (LS 02, TM 03, and AU 01) as subplots. Data were collected through observations of morphological and physiological parameters, including plant height, number of leaves, fresh and dry biomass, root length and volume, chlorophyll content, and stomatal characteristics. The data were statistically analyzed using F-test followed by Duncan Multiple Range Test (DMRT) at a 5% significance level. The results showed that 55% shading significantly enhanced vegetative growth, chlorophyll content, and biomass accumulation. Significant interactions between shading and accession were observed for several parameters, particularly plant height, early leaf number, root length, and stomatal traits. Overall, accession LS 02 grown under 55% shading exhibited the best growth performance. This study concludes that appropriate shading combined with suitable accession selection plays an important role in improving growth performance and environmental adaptability of patchouli plants.

Keywords: light intensity, plant adaptation, vegetative growth