

ABSTRACT

Soybeans are a type of leguminous plant that serves as a valuable source of vegetable protein and contributes to overall health. The seeds of soybeans contain approximately 40% - 45% protein, 18% fat, 24% - 36% carbohydrates, 8% water, as well as amino acids and other essential nutrients that are beneficial to humans. In Indonesia, there is a high demand for soybeans, but production is insufficient, leading to a heavy reliance on imports. To address this shortage, efforts can be made to enhance soybean production by improving existing varieties or developing superior ones through plant breeding. Furthermore, mutation breeding using colchicine mutagen can be employed in this process. The objective of this study is to assess the impact of administering colchicine mutagen on the morphological changes in the growth and yield of M.1.1.3 soybean line. The research was conducted in Pulo Rungkom Village, Dewantara District, North Aceh Regency, with an altitude of 8 meters above sea level. Data analysis was performed using a t-test on four colchicine concentrations: 0% (K_0 = Control), 0.01% concentration (K_1), 0.02% concentration (K_2), and 0.04% concentration (K_3). Each experimental plot was planted with 150 soybean plants. The results unequivocally demonstrate that the treatment of colchicine mutagen at 0.01% (K_1) significantly increased the length of stomata while concurrently inhibiting plant height and stem diameter. Furthermore, the treatment of colchicine mutagen at 0.02% (K_2) exhibited a substantial impact on increasing stomatal width, while significantly impeding plant height, number of productive branches, stem diameter, flowering age, harvesting age, number of pods per plant, 100 seed weight per plant, and dry seed weight per plant. The application of colchicine mutagen at the 0.04% level (K_3) unequivocally led to the failure of soybean plant seed growth.

Keywords: Morphological character, Mutation, M.1.1.3 line, Stomata