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### Response of chili (*Capsicum annuum* L.) varieties for low nitrogen levels supplemented under *in vitro* condition

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Crops cultivated in sandy regosols in the Kalpitiya region are managed by frequent application of N fertilizer and heavy irrigation that leads to contaminating the groundwater table. One of the long-term sustainable strategies is the cultivation of the varieties with a higher response to the low nitrogen levels. Thus, four chili varieties (Kodian hot, Rajini, Super 874 F1, Gandhi F1) were tested against different N levels under *in vitro* conditions. Considering the concentration of  $\text{NH}_4\text{NO}_3$  in the half-strength Murashige and Skoog medium *i.e.* 875.0 mg/L as the control, 656.3, 437.5 and 218.75 mg/L  $\text{NH}_4\text{NO}_3$  were tested in a two-factor factorial Completely Randomized Design using thirty germinated seedlings per treatment. The leaf and root numbers and the shoot and root lengths were recorded after 30 days of subculturing into the treatments. The major factors, N levels ( $p < 0.0001$ ) and varieties ( $p < 0.0001$ ), significantly affected the growth performance of the seedlings whereas an interaction effect was not observed among them. Chili varieties showed a significant difference for all the parameters except for the root length. Super 874 F1 performed better for all the parameters except for the number of leaves that were comparable in all four varieties. It also showed the lowest sensitivity to the N supplement showing a comparable performance for the root parameters and for the leaf number, where the shoot length was comparable in the first two N levels *i.e.* 875.0 and 656.3 mg/L. The number of leaves of the variety Kodian Hot did not vary among the N levels, whereas the number of roots was significantly lowered at the lowest level of N ( $p < 0.05$ ). Rajini and Gandhi F1 varieties showed a higher sensitivity for the tested N levels by showing significant reduction for all the parameters in the media supplemented with 437.5 and 218.75 mg/L  $\text{NH}_4\text{NO}_3$ . Therefore, Super 874 F1 that showed a lower sensitivity to the N supplement was the best among others and was selected to evaluate the yield performance under field conditions.

**Keywords:** Half-strength MS medium, *in vitro* screening, nitrogen, variety performance

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