Effect of yeast extract and coconut water on protocorm proliferation and growth development of Dimorphorchis rossii

Abstract

Dimorphorchis rossii is an epiphyte orchid that endemic to Borneo, specifically Sabah. Forest clearance and fires on its natural habitat and illegal collection by local people contributed to the extinction of this orchid. In attempt to preserve this exquisite orchid, an efficient propagation protocol was established by means of plant tissue culture. The main objective of this study was to determine the effect of coconut water (CW) and yeast extract (YE) on protocorm proliferation and growth development. The protocorms used in this study were obtained from in vitro seed germination of Dimorphorchis rossii. Protocorms were cultured on Murashige and Skoog basal medium treated with 10%, 15% and 20% (v/v) CW or 0.1%, 0.2% and 0.3% (w/v) YE and grown under 16 hour light at 25±2°C for 130 days of culture. The pH of the media adjusted to 5.7. Maximum protocorm proliferation (41.67±0.51%) was observed on 0.2% (w/v) YE, and followed by 0.3% (w/v) YE (31.25±0.48%) after 130 days of culture. New protocorms produced in both complex additives are 1.94±0.35 and 1.50±0.02, respectively. However, 0.1% (w/v) YE recorded the highest average number of new protocorms (3.00±0.08). Meanwhile, protocorms grown on medium containing 10% (v/v) CW promoted the best complex additive for protocorms developed to seedlings with 78.33±0.42% and 66.67±0.48% of the explants produced leaf and root respectively. This medium also recorded the highest length of leaf (3.43±0.46mm) among other treatments. Maximum number of leaf (6.28±0.90) and length of root (3.71±0.42) were obtained on medium treated with 15% (v/v) CW. As can be seen in the pattern of the protocorm proliferation and growth development, it can be concluded that YE is preferred most for protocorm proliferation, while CW is for protocorm growth development to seedlings.