Effects of carbon source and potatoo homogenate on in vitro growth and development of Sabah's endangered orchid : Phalaenopsis gigantean

Abstract

This study was carried out to determine the effects of three types of sugars as the carbon source and potato homogenate on in vitro growth and development of Phalaenopsis gigantea. The stage 3 protocorms derived from in vitro germination were used as explants. They were cultured on XER medium added with combinations of 0.11 moles fructose, sucrose or glucose and 0, 10, 15, 20 or 25% (v/v) potato homogenate (PH). After 150 days of culture, protocorms cultured on media containing either sugar or PH alone grew very well. Protocorms cultured on medium with fructose showed a higher growth index value (537.4 ± 21.7) than those on media with glucose (495.0 ± 10.0) or sucrose (493.3 ± 32.5). In the presence of any concentration of PH without sugar, the growth index obtained was between 466.6 ± 29.5 to 494.4 ± 29.5. In contrast, on media containing both sugar and PH, the growth index values were much lower (310.0 ± 7.1 to 397.0 ± 14.4) and protocorms became stunted and pale during the culture period. Initiation of shoots was observed after 30 days on all tested media. Protocorms produced the first leaf following 60 days of culture on media containing either PH or sugar only, whereas protocorms cultured on media containing combinations of sugar and PH showed the first leaf after 90 days. In general, media containing only sugar without any PH enhanced significantly both leaf size and root length of P. gigantea seedlings.decreased. Medium supplemented with 2% (w/v) sucrose was the best compared to the other treatments and sugar at a concentration of 4% (w/v) induced the formation of large size seedlings.