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Sea moss as an alternative gelling agent to develop a cost-effective *in vitro* culture medium for the propagation of *Phalaenopsis* cv. Pink lip

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Genus *Phalaenopsis* is an ornamental orchid with the greatest commercial importance in the world floriculture industry. The propagation of *Phalaenopsis* is difficult by conventional breeding due to delayed flowering and uneven characteristics of flowers. Therefore, conventional *Phalaenopsis* cultivation is ineffective for large-scale production. At present, the tissue culture technique is extensively used for the mass propagation of *Phalaenopsis.* Tissue-cultured plants are more expensive than traditionally propagated plants due to the high cost of the chemicals used for the preparation of tissue culture media. Agar is widely used as a gelling agent and the most expensive ingredient in the preparation of tissue culture media. Developing a cost-effective *in-vitro* culture media using low-cost components is one strategy to reduce the production costs of tissue-cultured plants. The use of alternative gelling agents to replace the agar can highly contribute to reducing the cost of *in-vitro* culture media in tissue culture than other components. The main component of sea moss is carrageenan, a gelatinous substance used to thicken or as a solidifying agent. The ability of carrageenan-based hydrogels to produce thermos-reversible gels and viscous solutions makes them a desirable option for extensive use as a gelling agent. The objective of the present research was to assess the performance of sea moss as an alternative gelling agent to determine the effectiveness for *in vitro* propagation of Protocrom-like bodies (PLBs) of *Phalaenopsis* cv. Pink lip. Growth performance of PLBs of *Phalaenopsis* cv. Pink lip was used to assess the effect of sea moss as an alternative gelling agent. PLBs (0.020g) were transferred to ½ MS medium containing agar as a gelling agent, and ½ MS medium containing sea moss as a gelling agent. Cultures were maintained for four months and the growth performance of PLBs was evaluated, with fresh weight as a parameter at 30 days intervals. There was no significant difference observed in the mean fresh weight of PLBs throughout the four-month period, incubation in ½ MS medium containing agar, and medium containing sea moss as an alternative gelling agent. Moreover, there was no significant difference between the contamination percentages of the agar-containing medium and sea moss-containing medium. According to the cost calculation, the cost reduction resulting in the medium with sea moss as an alternative gelling agent was 79.81% compared to the conventional agar as the gelling agent. In conclusion, the application of sea moss as a gelling agent in tissue culture media can be utilized to achieve the optimum benefits for in vitro propagation of PLBs of *Phalaenopsis* cv. Pink lip. Based on the findings, sea moss can be recommended as a cost-effective alternative gelling agent for the propagation of *Phalaenopsis* cv. Pink lip using protocorm-like bodies.

Keywords: Alternative gelling agent; Cost effective medium; *Phalaenopsis*; Protocorm Like Bodies (PLB); Sea moss

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