

Establishment of *Gracilaria edulis* propagules by raft culture method in Puttalam Lagoon, Sri Lanka

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Gracilaria edulis is the principal source of agar which has a high demand in foreign markets. The resource depletion has been observed since 1998 due to natural phenomena but regeneration was evident recently. Although the natural stocks are underutilized at the moment, there is a high potential for cultivation of *G. edulis* in Sri Lanka. Present study was carried out from October to November 2016, with the aim of determining the optimal depth and weight of *G. edulis* propagules needed for commercial culture and the effects of water quality on growth in Puttalam Lagoon during the study period. The two factors randomized complete block design method was used to design the trial. The weight and depth had two levels as 50 g, 100 g and 15 cm, 25 cm from the surface respectively. Two floating rafts with PVC pipes (1.8 x 1.6 m) were constructed with 08 parallel lines and they were fixed in the lagoon beneath 15 and 25 cm depth from the surface and propagules were collected from the natural seaweed beds in Puttalam Lagoon. The wet weight of each propagule, water quality parameters and water flow were measured biweekly. Subsequently daily growth rate (DGR) and flow rate were calculated. The highest DGR of 4.32 ± 0.581 %/day was recorded at the depth of 15 cm and 50 g propagules at the end of 60 days of culture period. The DGR for 100 g of propagules at the same depth was 3.59 ± 0.24 %/day. The DGR at the depth of 25 cm for 50 and 100 g of propagules were 3.98 ± 0.246 %/day and 3.34 ± 0.14 %/day respectively. High fluctuation of DGR had occurred due to fragmentation of algae with heavy wave actions during the Northeast monsoon period. The results revealed that DGR is significantly affected by nitrate, ionized ammonia and water flow ($p < 0.05$) but nitrite, pH, phosphate and salinity were not significantly affected on DGR ($p > 0.05$). In summary, the optimum growth of *G. edulis* could be obtained by using floating raft at 15 cm depth with 50 g propagules during Northeast monsoon period in the Puttalam Lagoon.

Keywords: daily growth rate, floating raft method, *Gracilaria edulis*

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