

Identification of suitable hardening medium for micro-propagated *Lagenandra thwaitesii* species in the Tilapia based aquaponic system

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Lagenandra thwaitesii consider as a threatened endemic ornamental aquatic plant in family Araceae. Micro-propagation is a tool for large scale multiplication of these plants. High mortality experienced in transferring of micro-propagated plantlets from the laboratory to the environment is a major limitation in the production of *L. thwaitesii* at commercial scale. Aquaponic system is used for growing of various plants as a new approach to harden micro-propagated aquatic plantlets. This study focused on examining an effective hardening medium for *L. thwaitesii* in an aquaponic system. Six weeks aged uniform samples of in-vitro rooted *L. thwaitesii* plantlets were hardened by 3 different media; coconut husk, clay bricks shards and river gravels. Tilapia fish waste was used as the fertilizer from the aquaponic system, while trickling down to each section with different hardening media. The performance of plantlets in each media were measured using survival and growth parameters (number of leaves, length of roots, shoots and leaves, width of leaves, wet weight of plantlets) during five weeks of hardening period. The collected data were subjected to multivariate analysis at $P < 0.05$ level. According to the results, characteristics of hardening media significantly affect on growth performance of *L. thwaitesii*. Highest average leaf length (24.18 ± 0.582), leaf width (10.58 ± 0.250), root length (87.05 ± 5.15) and wet weight (0.83 ± 0.05) were recorded in clay brick shard medium, while maximum average number of leaves (4.05 ± 0.189) was recorded from gravel medium. The 100% survival rate was obtained in all the hardening media. Bricks play a vital role in cation exchange, which enhances the nutrients availability for plants by increasing the growth rate of plants. Hence, clay bricks shards medium was considered as the best substrate for hardening of *L. thwaitesii* in the Tilapia based aquaponic system. This novel trend in integrated aquaculture system is useful to overcome the practical problems in micro-propagation of *L. thwaitesii* plants, as a valuable asset for ornamental aquatic plant industry.

Keywords: Acclimatization, *Lagenandra thwaitesii*, Aquatic plants, Micro-propagation, Ornamental Aquaculture, Hardening Media