

Nano aquaria for table-top to diminish tautness

Aquarium-keeping is one of the world's most popular hobbies. It continues to grow in popularity, especially those harbouring marine organisms¹. Technological advancements in marine aquarium-keeping guarantee an abundant supply of ornamentals, propelling the global industry towards economical sustainability in coastal and island regions. Recent developments in aquarium trade allow for the replication of controlled marine environments, to engage the hobbyists to evince interest in invertebrates like ornamental shrimps and anemones². This economically viable sector requires ecological sustainability, where the low-volume trading part has to earn a high-volume benefits. The sector safeguards the coastal and island communities by providing long-term livelihood. Also, the health of the reef ecosystem can be conserved, since the trade and aquarists depend on captive-raised organisms³.

In this technology-driven society, researchers disseminate scientific facts informally through leisure activities for easy understanding. The innate tendency to focus on the life cycle and other processes of psychological activities increases the sense of responsibility in humans for the sustainable use of ocean resources. The conservation strategies help the aquarists to stock and repopulate small reef organisms and display them on the tabletop through nano aquaria, thus solving the problem of space, cost and maintenance. On the other hand, the nano aquaria focus on small critters taking centre stage. However, the limitation in space restricts the selection of marine life suitable for a nano tank. It also

reduces the number of organisms needed to replicate the reef system. The marine ornamentals sector can meet its demand through nano aquaria, which can be stocked with relatively small-sized and low-quantity captive-bred or cultured organisms, making it a real green choice in terms of maintenance with limited water, filtration, electricity, etc. as well as in the stocking of small organisms⁴. An array of cultured organisms for nano tanks support the marketability of captive-bred animals and the sustainability of the aquarium trade. The compact dimensions of nano aquaria can be integrated anywhere as they are not bulky and require less space.

Against this backdrop, a nano tank technology has been developed. It is an integrated system equipped with the required accessories for a specific habitat. Nano tanks are suitable for ornamental shrimps, where culture technology has been developed for production and can satisfy the demand. Larger displays require more variety and number of ornamental organisms, whereas those filling nano tanks could be single species as well and less in number. Future technology will focus on culture potential species, which could be expensive. Small-sized and reasonably priced captive-bred organisms will form a wide array of specimens for nano tanks. Thus nano tanks support the marketability and demand for bred and cultured marine organisms and contribute to the sustainability of the marine aquarium trade.

This new concept of nano tanks in India, initiated by the ICAR-National Bureau of Fish Genetic Resources (NBFG), Lucknow, provides an aesthetic view of a mini reef system and is designed to accommodate captive-bred marine ornamentals, particularly shrimps. The small tank can house organisms with its specific requirements, thus space saving and being cost-efficient. A moulded aquarium of tank size 17.5 × 10 × 12.5 cm can easily accommodate the hatchery-propagated *Thor hainanensis* (Figure 1) or *Ancyllocaris brevicarpalis* (peacock shrimp)⁵ along with an anemone (*Heteractis magnifica*). Experiments done using this mini aquarium set-up equipped with synthetic salt showed that the shrimps survived without water exchange for more

than three months when a drop of commercially available beneficial bacteria (super battle bacteria, 8000) was added on alternate days with the pellet feed.

Fish/shrimp display is an interactive service by creating positive stimuli for the physical and psychological benefits to humans, as it is linked with therapeutic benefits. The passive nature of viewing them provides an optimistic effect on a person's well-being and mental health. Placing a nano tank on the working table improves creativity and evokes an indirect therapy of healing, by invoking physical or mental response as it provides an oasis of placidity and relaxation from today's fast-paced life. Watching fish/shrimp is an effective eye exercise, with the movement of the eyeball and eye muscles, that provides a natural relaxation among people working all day long, with digital systems.

Promoting nano aquaria minimizes the number and size of organisms required to develop a biotope. Further, breeding and culturing safeguard the wild resources from depletion and overexploitation, thus conserving the ecosystem and also providing a new window of livelihood opportunities for humans.



Figure 1. Nano aquarium with *Thor hainanensis*.

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