

## **Growth comparison of three commercially important *Aponogeton* species propagated from seeds.**

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### **Abstract**

*Aponogeton* species are commercially important as they fetch high values in the export market related to the aquarium trade. Since the collection of the plants from the wild for export purposes, has been banned, they are cultured in nurseries for this purpose. However plant culturists believe that these plants can only be propagated through rhizome propagation and collection of rhizomes for propagation in nurseries continue up to date. The present study investigates the possibility of seed propagation of *Aponogeton* species and compares the rate of growth between the 3 commercially important species.

Seeds of the three *Aponogeton* species, *A. natans*, *A. rigidifolius*, *A. crispus* were collected from the wild, and propagated in glass tanks, using river sand as the substrate. A commercial liquid fertilizer and compost were used as treatments with no fertilizer in the control. Growth was monitored weekly together with nitrate and phosphate concentrations for 6 months. *Aponogeton* rhizomes collected from the wild were grown under the same conditions for comparison. Results were analysed using ANOVA to find any variation between species, treatments or propagation method.

The results of this study has shown that they can be easily propagated through seeds. But the time taken for plants to reach the export size is longer than those propagated from rhizomes. It has also shown that *Aponogeton rigidifolius* which is an endemic species shows even slow growth compared to the others. However the quality of plants produced through seed propagation is better for export. Therefore it is recommended that seed propagation of these plants be popularized so that they can be conserved in their natural habitats.

## **Growth comparison of three commercially important *Aponogeton* species propagated from seeds.**

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### **Introduction**

*Aponogetons* are important aquatic plants in the export trade related to the aquarium industry. Formerly they were collected from their natural habitats for export. Since these plants are categorized as threatened according to the IUCN red lists, regulations were imposed banning wild collection only propagated plants are permitted to be exported.

Of the commercially important species, two species of *Aponogeton* have a bulbous rhizome while the other has a runner type of rhizome. They are flowering plants and produce 20-90 seeds per inflorescence which are found above the water surface. This inflorescence is used as a vegetable while the rhizomes are important in the ayurvedic medicine preparations. The common belief among the exporters and aquatic plant culturists is that *Aponogeton* species can only be propagated through rhizomes.

Presently they collect the rhizome from the wild and these are planted in the nurseries. When the vegetative parts are 10 – 25cm in length these are harvested for export. But this practice still causes damage to their natural existence as whole plants have to be removed to collect rhizomes. Therefore this study was carried out to investigate the possibility of propagating *Aponogeton* species through seeds for the export market.

### **Methodology.**

*Aponogeton* seeds were collected from the natural habitats from *Aponogeton natans*, *Aponogeton crispus* and *Aponogeton rigidifolius* which are the 3 commercially important species. They were propagated in glass aquarium tanks 90x35x30cm tanks using river sand as substrate and a water depth of 20 cm was used. Two types of manure, a commercial liquid and compost were used with 3 replicates for each treatment for all 3 species. Only river sand without any manure was used in the control. 30 plants were planted in each tank and their growth was monitored weekly by measuring the length of vegetative parts, number of leaves in the plant and the size of rhizome for a period of 6 months. There after the growth of the rhizome was monitored monthly.

Thirty numbers of *Aponogeton* rhizomes from each species were cultured under the same conditions to compare the plant growth from seeds and from rhizomes.

The nitrate and phosphate concentrations were monitored weekly during the study period.



## Results

All 3 species showed 100% seed germination when ripe seeds were used for propagation. There was a significant difference between the plants propagated from seeds and plants propagated from rhizomes in growth of vegetative parts. In plants propagated from rhizomes the leaf length which is the size measurement for plant export, reached the export size within 3-6 weeks of culture. The seed propagated plants reached this size in 12-15 weeks. There was no significant difference between the two types of manure used and between the control as reported before.

A significant difference was also observed between the 3 species in growth. The *Aponogeton rigidifolius* took longer time to grow to market size than the other 2 species. The growth of the rhizome was very slow in all 3 species. *Aponogeton natans* and *Aponogeton crispus* had a rhizome of  $0.7 \pm 0.024\text{cm}$  and  $0.6 \pm 0.038\text{cm}$  respectively at the end of the 6 month period while it reached  $0.8 \pm 0.018$  and  $0.9 \pm 0.022\text{cm}$  respectively in 12 months. The *Aponogeton rigidifolius* rhizome was  $0.8 \pm 0.26\text{cm}$  in 6 months and  $2.8 \pm 0.052$  in 12 months.

The quality of plants were better and the size of plants were more uniform in plants propagated through seeds.

## Discussion and Conclusion.

*Aponogeton* species produce large number seeds and these seed germinate when suitable environmental conditions are provided. However since the export size plants can be obtained faster through rhizome propagation this practice continues among those culture this plant for export. However collection of these rhizomes from the wild causes destroys the whole plant in nature thereby posing a threat to its natural existence. Therefore it is necessary to popularize the practice of seed culture so that the plants in nature would be conserved. Since the plants produced by seed propagation were of better quality and size of plants were more uniform these were more suitable for the export market. Considering the time taken for a rhizome to grow up to the size collected from the wild ( 2-3cm) it is recommended that seed propagation be used in plant nurseries and regulations be brought to ban collection of rhizomes from the wild

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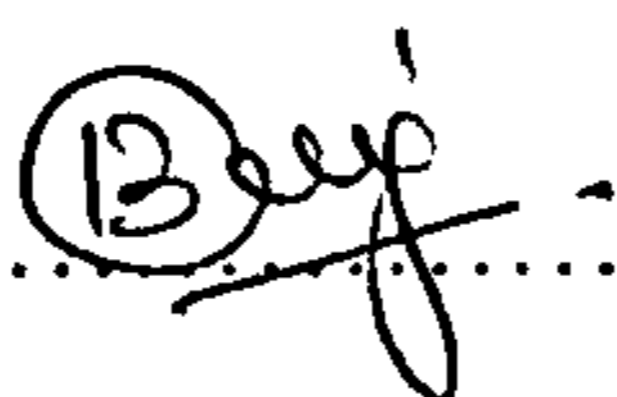
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