

## Lesson 30

**Title of the Experiment:** Identification and culture of ornamental aquatic plants  
(Activity number of the GCE Advanced Level practical Guide - 67)

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### Introduction

Sri Lanka has great diversity of aquatic life and many fish and plant species are suitable for aquariums. Aquarium plant exportation has been one source of secondary income beside ornamental fish trade for aquarium companies in Sri Lanka.

### Theory

#### Ornamental aquatic plant propagation

Propagation is the making of more plants to keep a plant variety going. Propagation is also done to improve the health of a plant. Dividing and repotting a plant stimulates growth.

#### Aquatic plant types

**Floating Plants:** Floating plants are not attached to the ground, but they have roots which absorb water. The leaves of these plants are firm and remain flat in order to absorb more sunlight. Eg. *Pistia, Salvinia, Lemna*

**Submerged Plants:** Submerged or submersed plants are rooted to the water's floor and most of their vegetation is under water. The leaves of these plants are thin and narrow. Eg. *Hydrilla, Cabomba*

**Emerged Plants:** Emerged plants (also known as emersed) are rooted to the ground of the water but have most of their vegetation above water. These plants need constant exposure to sunlight. Eg. *Nymphaea*

### Common Types of Propagation

#### Sexual or seed propagation

Sexual propagation is when a new plant is grown from a seed or spore that the parent plants have produced. Eg. *Echinodorus, Sagittaria*

#### Vegetative propagation

Vegetative propagation is when the plant is propagated using a part of the plant itself. A stem cutting, corm, tuber, or other part of the plant is used to grow a new plant. This is the most widely used method and normally the easiest. Most aquatic plants are propagated this way.

- **Stolon:** A modified stem which grows horizontal from a crown above the ground, taking root at the tip, and ultimately developing a new plant. Eg. *Vallisneria, Sagittaria*
- **Runner:** A stolon consisting of a prostrate stem rooting at the node and forming a new plant, which eventually becomes detached from the parent plant. Eg. *Echinodorus*
- **Rhizome:** A subterranean, horizontal, root - like stem sending out leaves and shoots from its upper surface and roots from its lower surface. This one grows flat, or horizontally under the ground. Eg. *Cryptocoryne*

- Tuber: This is a modified stem found underground, but is fat. It is a food storage stem. A common tuber is the potato. Tropical water lilies and lotus make tubers.
- Propagation is by cutting of young stems. Eg. *Cabomba*, *Ludwigia*

Awareness of the various root types provides vital information on planting methods for improved cultural growth and control of a plant. When planting, remember plant size will be synonymous with pot size – the bigger the pot, the bigger the plant.

#### **Micro propagation/ Tissue propagation:**

Tissue propagation provides many advantages compared to traditional reproduction methods: rapid reproduction even from very sparse material, cloning and maintaining decorative mutants and hybrids, and production of virus-free plants. On the other hand, tissue propagation requires both laboratories and biological knowledge of the species in question, and for these reasons only the large scale producers can rely on it.

#### **Learning outcomes**

At the end of this practical session, you will be able to,

- Identify widely used ornamental plant species in Sri Lanka
- Propagate and culture aquatic plants and
- Harvest the cultured plants and prepare them for the market.

#### **Methodology**

##### **Materials**

List of items used in the practical session.

1. Live specimens of ornamental aquatic plants
2. River sand, top soil, mud and water
3. Garden rake and spade
4. Pair of garden scissors
5. Large plastic basin

##### **Identification of aquatic plants**

- Draw and label given specimens of aquatic plants.
- Prepare a table to compare different morphological features of given plants
- Prepare a key to identify given specimens

##### **Planting methods**

- Prepare a mixture of sand, top soil or mud (3 : 1 ratio).
- Select the planting material according to the following information.

**Stolen:** Divide into sections with portions of erect stems and roots. Plant in the center of a deep pot. Soil line should be about 2-3cm below the pot edge to discourage growth escaping the pot.

**Runner:** Plants that grow at the end of runners can be separated and potted in the center of a deep pot. Remove running stem back to main plant. Soil line should be about 2-3cm below the pot edge to discourage growth escaping the pot.

**Rhizome:** Clean rhizome. Divide rhizome maintaining a visible growing tip; two or more are preferred, with root growth on the underside. Place with growing tip about 2 inches below the pot top edge and cover with potting medium

**Tuber:** Naturally- generating plants can be separated and planted in a larger pot.

- Plant the planting material in the substrate and water.
- Keep in a shady environment. 60 – 70% shade is more suitable for root propagation.

## Identification of ornamental aquatic plants

### ***Aponogeton***

A beautiful plant exported from Sri Lanka to other countries from a long time. Large bright green leaves are strap shaped and wrinkled along the edges. Grows up to 30cm or more (Figure 1).

Needs strong light for better growth. A flowering stem may carry a hooked inflorescence above the water surface.

Propagation by bulbs.

### ***Cabomba***

This plant grows rapidly sometimes up to 90cm (Figure 2). Frequent pruning is necessary to maintain the plant. The pale green leaves are finely divided and arranged like a fan. Requires strong light. Most beautiful when a great number of stems are planted in a group.

Propagate easily from cuttings which can be planted in bunches into the gravel.

### ***Cryptocoryne***

There are about more than 50 *Cryptocoryne* species (Figure 3). They are submerged plants with variable colours. In general, have elongated, tough leaves coloured light to dark green. Underside of the leaves of some species are red to purple in colour. Grow from 7 to 60cm. Grow best in moderate light or in shade. Growth rate is slow.

Reproduce by means of small shootlets.

### ***Sagittaria***

They have long strap like leaves up to 45cm long and 2cm broad (Figure 4). May produce arrow head shaped aerial leaves on long stems. Grow well in moderate light. Place individual plants 2-4 cm apart.

Propagation by stolens.

### ***Limnophila***

It has two distinctly different forms of leaves, submersed and emersed (Figure 5). Submerged leaves are whorled; aerial leaves are whorled or oppositely arranged. The leaves pinnate, and the blades have smooth or serrated edges.

Propagation by runners.

### ***Vallisneria***

They have leaves with a length of 40cm and breadth of 1cm (Figure 6). Spreads rapidly into dense clumps. Requires very strong light. The leaves are narrow so they do not overshadow smaller plants.

Forms runners easily, and is thus easy to propagate.



Figure 1: Aponogeton Plant



Figure 2: Cabomba Plant



Figure 3: Cryptocoryne Plant



Figure 4: Sagittaria Plant



Figure 5: Limnophila Plant



Figure 6: Vallisneria Plant