

Propagation of Nobile-type *Dendrobium*

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***Dendrobium nobile* can be multiplied by several methods. In this report the methods of propagation, their various characteristics, and important points are presented.**

SEEDLING PROPAGATION

This is essential for the breeding of new cultivars. Although it is easy to produce seedlings by conventional aseptic culture, it takes a long time and is expensive. If the unwanted seedling plants can be sold, the breeding cost will be reduced. With *Dendrobium nobile*, the unwanted seedlings are usually of no use except from some diploid cultivars, and commercial production by seedlings is risky.

Because of this, breeding should be carried out using elite plants in a place where production costs are low. To select the type of cultivars preferred by the Japanese consumer, the selection of nominated plants should be made by a Japanese breeder.

STEM CUTTINGS

This is the usual method of propagation when production is from selected stock plants. Usually back pseudobulbs removed from the plants before shipment are used for this purpose. These pseudobulbs are laid on sphagnum moss or a mixture of peat-moss and vermiculite (1:1, v/v) in a tray, and kept half shaded, in a warm and moderately humid place.

In cultivars where flower bud initiation is good, the number of dormant buds on back pseudobulbs are limited and it is difficult to obtain enough plantlets. In this case, stem cuttings using lead pseudobulbs before flower bud initiation is an option. However, during October and November the stems used for cutting production will initiate flowers if the temperature falls below 20°C. It is important, therefore, to maintain good temperature control in order not to interrupt cutting production.

After 6 months, the 4- to 5-cm-long plantlets with 4- to 5-cm roots are transplanted to pots.

The prevention of diseases such as basal rot and the control of slugs are important.

The amount of sunlight must be carefully controlled, otherwise the pseudobulbs will turn yellow and shrink. Propagation can be considered a success if new buds sprout uniformly.

MICROPROPAGATION

When new cultivars are introduced from breeders or nurseries, or when it is necessary to propagate existing cultivars rapidly, micropropagation is adopted.

A fairly large number of plantlets can be supplied within 2 years by micropropagation, so micropropagated plants are now used in conjunction with cutting-grown plants. However, there is a risk of mutation in micropropagation. When propagation by cuttings is applied again to mericlonally produced stock plants in order to reduce costs, it can take up to 6 years to produce a saleable plant.

OFFSHOOT (KEIKIS)

Propagation from offshoots is rare in commercial production, but it is possible to produce saleable plants within 1½ years using big healthy offshoots.

A major reason for the development of offshoots is damage to the roots of the plants, another is the oversupply of nitrogenous fertilizers during summer. Nonflowered immature pseudobulbs sometimes develop offshoots in spring and summer under high temperature conditions.

Those cultivars in which the lateral buds change their type of growth easily from reproductive (flower) to vegetative (offshoot) under high temperature conditions are not suitable for commercial production and should not be propagated.

When the offshoots reach 6 to 7 cm in length with 3 to 4 roots, they are removed from the stock plants and planted in pots.

DIVISION

In commercial production, division is not an applicable method of propagation except when necessary to maintain the stock plant, because the damage to the plant's roots requires a long time for recovery.

The Cultivation of the Aquatic Plant *Fontinalis antipyretica* and the Red Bee Shrimp

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CULTIVATION

Fontinalis antipyretica occurs between the tropical zone and temperate zones of the world. It is a species related to sphagnum moss and grows around wetlands or in water. The linear stem has many small branches between 1 to 2 mm in length. This species develops many branches and these branches intertwine with one another forming a complex plant. *Fontinalis antipyretica* attaches itself firmly to stones and drift wood and by making use of this characteristic, aquarists can arrange various layouts in their aquariums. The plant is also a good refuge for young fish, so many aquarists use this species for that purpose.

Culture Conditions. Water temperature, 18 to 28C; water quality, weakly acidic or weakly basic with a pH 6.2 to 7.5; soft or medium hard water of a hardness rating between 0 and 5.

CULTIVATION AND BREEDING OF CRYSTAL RED BEE SHRIMP

Aquarists usually keep bee shrimps (*Caridina* sp.) in their aquariums because they eat moss and clean the aquarium. The wild species of bee shrimp is a small 2- to 3-cm shrimp and originated in the Hong-Kong islands, but it seems that no wild stocks exist there any longer and cultivation has recently ceased. I found a crystal red bee shrimp mutant, the original species is black and white in color but the mutant is red and white. We are now trying multiplication and expect it will take 7 years from discovery to having stocks available for sale.