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## Waste to Wealth from Orchids

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### Abstract

Effective waste management has become a national priority of Swachh Bharat Mission which can bring back useless discarded waste products into economic use and reduces pressure induced by waste on the environment, creates opportunities for generation of income and employment and improves quality of life. In orchids, unwanted backbulbs or already flowered bulbs can be utilized as sources for generation of planting materials, unmarketable spikes and florets of different orchid species and hybrids for drying and dried leaves are used for making durable and attractive mattresses and baskets.

### Introduction

Waste is a natural product of unwanted or unusable materials which has been disposed or discarded after primary use. It may be dried leaves from plants, human excreta or garbage created by human beings. Effective waste management has become a national priority of Swachh Bharat Mission. It can bring back useless discarded waste products into economic use and reduces pressure induced by waste on the environment, creates opportunities for generation of income and employment and improves quality of life. The 5R's principle of waste management gives a sustainable, ecofriendly alternative with impact on human health, environment and natural ecosystems. These 5R's are Refuse, Reduce, Reuse, Recycle and Recover.

Orchids are the second largest families of flowering plants and are distributed throughout the world. In sympodial epiphytes, or in some species the entire stem may be thickened to form what is called a pseudo-bulb that contains nutrients and water for drier periods, e.g., *Cymbidium*, *Cattleya*, *Dendrobium*, *Oncidium*. Orchids generally have simple leaves with parallel veins, although some Vanilloideae have a reticulate venation. They may be ovate, lanceolate, or orbiculate and very variable in size. Orchids are arranged with flowers on an inflorescence, which is a spike, a raceme or a panicle. An orchid flower comprises of three sepals, two petals, a lip and the column.

### Backbulbs as Sources of Planting Materials

These are previously flowered or unflowered back pseudo-bulbs. In this case, it may take upto three years to obtain a flowering size plant. A backbulb having roots are pulled or rhizomes are cut just beyond it and are inserted at one side of a pot filled with orchid compost or sharp sand or grit keeping the cut surface of the bulb nearest the edge of the pot. The bulbs emerge shoots within two or three months which can be potted in orchid compost. *Cymbidium*,

*Cattleya Coelogynes* and *Oncidium* are propagated through this means. In *Cymbidium*, it has been found that both saw dust and cocopeat are effective media for generation of plants through backbulbs. Prior to planting, treatment the Backbulbs of *Cymbidium* orchids with BA 200 ppm or coconut water (1:5 or 1:10) is effective to enhance percent of germination. By this method, both the media take 90-99 days in spring season and 42-48 days in summer season to generate new plants (De et al., 2015).



Figure 1: Backbulbs in *Cymbidium*



Figure 2: Backbulbs in *Oncidium*

## Dry Flowers from Underutilized Florets and Spikes

Dry flowers are essential export items both in Indian and International markets and Indian export basket composed of 71% dry flowers which are exported to mainly USA, Japan, Australia, Russia and Europe. To overcome the problem of petal shrinking, the flowers are dried in an embedding technique. The flowers or leaves are embedded in a drying medium, namely, silica gel or borax or white sand depending upon the plant material. Embedding in silica gel is perhaps the easiest and the best method of embedded drying of flowers. This method is also effective for drying of orchid spikes and florets. Embedded drying with borax in oven at 50 °C was found successful in *Vanda teres*, *Dendrobium moschatum*, *Arundina graminifolia*, Den. 'Madam Pink', Den. 'Lervia', Den. 'A. Abraham', Phal. 'Casa Blanca', Phal. 'Detroit' and *Oncidium* 'Sweet Sugar' and embedded drying with borax at 60 °C in oven was found successful in *Epidendrum* spp., *Cattleya bowringiana* and *Cattleya* hybrids, Phal. 'O × Plum Rose × Black Jack' and Den. 'Big White'. Embedded drying with borax and silica gel at 55 °C in oven was found successful *Coelogyne flaccida*, *Coelogyne cristata*, *Dendrobium nobile*, *Dendrobium williamsonii*, *Dendrobium aphyllum*, Den, 'Erika', Den. 'Big White 4N', Den. 'Bangkok Blue', *Paphs.* 'Nagasaki' and *Cym.* 'Sungold'. Under room condition (24-25 °C and 75-79 % RH), perlite can be used for drying of spikes and florets of orchids of different species and hybrids within 15 to 20 days (De et al., 2017).



Figure 3: Dried *Vanda coerulea*





Figure 4: Dried *Coelogyne flaccida*



Figure 5: Dried *Dendrobium* 'Madam Pink'



Figure 6: Dried orchid florets with perlite



Figure 7: Dried *Epidendrum* spp.



Figure 8: Dried *Dendrobium densiflorum*



Figure 9: Dry orchids in wall hangings



Figure 10: Dry orchids in badges

## Wealth from Waste Cymbidium Leaves

Experimental evidences have shown that carbon produced in the leaves is transported to the pseudo-bulb in the first instance before being transported to the inflorescence. Tissue analyses of pseudo-bulb carbohydrate content had shown that there was no net accumulation of carbohydrate during inflorescence development. Taken together, these results indicated that there is substantial mobilization of carbohydrate to the inflorescence via pseudo-bulb. It is likely that there is mixing of different carbohydrate pools during the transport of carbon from leaves to the inflorescence. As result the leaves from backbulbs or old bulbs used to dry and become yellow or brown in colour. The baskets, mattress etc. can be made out from dry leaves of Cymbidium orchids which are durable, attractive and degradable (Raj Kumar and Singh, 2015).



Figure 11: Mattress from Cymbidium leaves



Figure 12: Baskets from Cymbidium leaves

## Conclusion

The primary emphasis of reuse or recycling of unwanted materials would be to understand the science and art of waste management and product development. It can trace the complete process of various forms of waste, starting from its generation to diverse forms of disposal; marked as biodegradable or non bio-degradable and hazardous or non-hazardous; techniques for management; mechanisms for conversion to usable commercial products, if any; impact on health, environment and socio-economic issues. In orchids, unmarketable spikes or florets could be tried also to make into valuable packed items.

## References

- De, L.C., Rampal and Singh, D.R., 2015. Techniques for production of quality planting materials in orchids. *International Journal of Development Research*, 5(6): 4587-4591.
- De, L.C., Singh, D.R., Suman, T., 2017. Drying Technologies in orchids. *International Journal of Environmental Sciences & Natural Resources*, 5(1): 1-5.
- Raj, K., Singh, D.R., 2015. *Orchid Technologies for Entrepreneurship Development*. ICAR-NRC for Orchids, Pakyong, Sikkim, pp.43.