

Collana Sapienza per tutti 16



# Orchid's velamen

*A thousand piece puzzle*

Franco Bruno



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[www.editricesapienza.it](http://www.editricesapienza.it)

[editrice.sapienza@uniroma1.it](mailto:editrice.sapienza@uniroma1.it)

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In copertina | *Cover image*: Group of orchids with abundant aerial roots wrapped in velamen, generated by artificial intelligence, but traceable to the genus *Vanda*, which is cultivated just like this.

## Orchid's velamen. A thousand piece puzzle

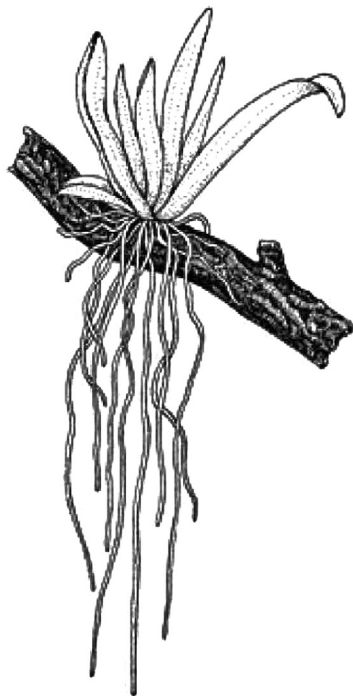
The ecological range within which a certain species may grow and reproduce itself is defined by the extreme limits of the environmental parameters; it differs noticeably from species to species and depends on the evolution of its adaptation and by selection. These characters are indelibly impressed in the gene sequences of its DNA that contains all of the information on its hereditary characters. Each species may therefore be defined by a particular ecological niche, according to the availability of water, mineral nutrients, temperature and light. For each of these factors the species has a tolerability range which varies from minimum to maximum and which, obviously, also includes an optimum value.

In the fight for light and space two groups of Cormophytes have developed, differing from the main type because they are characterised by particular morphological, structural and functional adaptations of the corm: liane and epiphytes, both typical, mainly, of tropical rain forests. Liane reach the light by climbing up trees but digging their roots into the earth, while epiphytes (Fig. 1) conquer a well-lit position by settling directly on branches and trunks and leaving their roots free in the air. Trees, rocks or other supports are therefore used uniquely as bases.

The main problem for typical epiphytes such as orchids is that of finding water and elements for their mineral nutrition at a considerable distance from the ground. It is immediately clear that the conditions most favourable to solve this problem are found in those areas of the planet, such as equatorial plane and mountain rain forests (or cloud forests), where it rains almost every day and there is a high and constant degree of humidity in the air: in this case the problem is not

where to find water, but how to take in water and mineral salts.

For this purpose special “absorbing” and “stocking” structures have developed, while the stemflow (water that flows along the branches and the stem) and the troughfall (water that passes through the leaves), two ecological processes which are essential for the biological cycle of the forests’ nutritive elements, ensure a constant replenishment of nutrients. These processes in fact continuously wash down and carry to the earth macro and micro elements that the tree has absorbed through its roots and has then sent to all the cells of its organs. Nutritive elements are therefore available for the orchids’ roots, especially



**Fig. 1.** Drawing of an epiphytic orchid (source: by the Author).



**Fig. 2.** Pseudobulbs of *Bulbophyllum nutans*, round or fusiform stems with water reserve (source: Wikipedia).







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