



# Orchid Pollinaria

## Up Close and Personal

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POLLINARIA ARE COMPLEX STRUCTURES, IN MANY CASES COMPOSED OF different elements that originate from different parts of the reproductive organs of the plant. They range from the simple models, with pollen grains barely aggregated, to the most complex ones, provided with well-defined pollinia, caudicles and a stipe.

Orchid pollinaria bear a lot of information about the natural history and the different lineages in the orchid family. In their amazing variability and complexity, pollinaria constitute a true identification of the orchids. The vast variation in their shape, dimensions and organization are the result of an extraordinary adaptation of structures to the sophisticated pollination mechanisms that characterize the orchids and their relationships with pollinators. Each pollinarium is designed to accomplish, in the most precise way, its duty to ensure the transportation of the masculine gametes to the female reproductive organs of another flower.

Variations in the structure and shape of pollinaria have been widely used in orchid systematics (meaning, in the reconstruction of natural phylogenetic groups, based upon the affinities of the reproductive organs), and in studies on pollination biology and in the interpretation of the pollinator's behavior. As Robert Dressler, PhD, previously suggested, the presence of a pollinarium on the back of a bee is enough to detect the presence of an orchid in a certain area, and sometimes one can even detect the presence of a new orchid species. For example, the presence of *Houlletia tigrina* in the A.M. Brenes Biological Reserve in Costa Rica was first recorded thanks to a pollinarium stuck to the back of a bee captured in the reserve by Diego Bogarín and his collaborators. But how was it possible to identify the pollinarium?

The identification of such structures is facilitated by direct comparison with samples of pollinaria previously identified. That is the main purpose of the Pollinaria Collection at Lankester Botanical Garden (LBG), University of Costa Rica, which has been a part of the center's collections since June 2004. (These collections also include living plants, flowers preserved in spirit [alcohol] and tissues in silica gel.)

The Pollinaria Collection is growing and includes 1,330 accessions. It is coordinated by the taxonomy specialists at LBG and its emphasis is on the Maxillariinae, Oncidiinae and Stanhopeiinae subtribes. The collection includes the physical samples of all pollinaria, as well as high-resolution digital images of each accession. The images are organized in a database system that is now accessible through EPIDENDRA ([www.epidendra.org](http://www.epidendra.org)), the global orchid information network of LBG.

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OPPOSITE An arrangement of pollinaria samples included in the Pollinaria Collection at Lankester Botanical Garden, University of Costa Rica. Scale bar = 3 mm.

1. *Ada chlorops*
2. *Brassia arcuigera*
3. *Brassia arcuigera*
4. *Brassia gireoudiana*
5. *Oncidium stenotis*
6. *Systeloglossum costaricense*
7. *Miltoniopsis roezlii*
8. *Lycaste tricolor*
9. *Neomoorea wallisii*
10. *Lycaste puntarenasensis*
11. *Lycaste macrophylla*
12. *Houlletia tigrina*
13. *Anguloa ruckeri* × *uniflora*
14. *Camaridium cedralensis*
15. *Maxillariella elatior*
16. *Maxillaria endresii*
17. *Maxillariella tenuifolia*
18. *Maxillaria pachyacron*
19. *Heterotaxis crassifolia*
20. *Maxillariella sanguinea*
21. *Maxillariella diuturna*
22. *Camaridium bradeorum*
23. *Eriopsis wercklei*
24. *Camaridium nutantiflorum*
25. *Gongora unicolor*
26. *Gongora boracayensis*
27. *Stanhopea pulla*
28. *Stanhopea ecornuta*
29. *Huntleya burtii*
30. *Stanhopea gibbosa*
31. *Stanhopea wardii*
32. *Stanhopea cirrhata*
33. *Warczewiczella lipscombiae*
34. *Daiotyla albicans*
35. *Pholidota chinensis*
36. *Cymbidium hookerianum*
37. *Catasetum maculatum*
38. *Phalaenopsis violacea*
39. *Phalaenopsis schilleriana*
40. *Phalaenopsis lueddemanniana*
41. *Prosthechea baculibulbon*
42. *Guarianthe aurantiaca*
43. *Prosthechea ionocentra*
44. *Sobralia helleri*
45. *Phaius tankervilleae*
46. *Coelia bella*



