

Evolution and development of *Phalaenopsis* flowers

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The size and shape of different orchid floral organs, such as the callus on the lip and stelidia along the column, serving as a holdfast for insects, evolved into a perfect fit with the bodies of specific pollinators. This morphological diversity is an attractive subject for studying the evolutionary basis of floral organ development, especially in the orchid genus *Phalaenopsis*. The objective of this study is to discover more about the evolution and development of the callus on the lip, and stelidia along the column for different species of the orchid genus *Phalaenopsis* that have large versus small calli and long versus short stelidia. Flowers of species such as *P. amabilis*, *P. equestris* and *P. pulcherrima* are currently being studied using Scanning Electronic Microscopy and 3D CT scanning. To investigate how their flowers fit with the bodies of their respective pollinators, scans of museum specimens of *Xylocopa* and *Amegilla* bees will be made and analyzed as well. Gene expression will be studied by transcriptome analysis and RT PCR of floral RNA to discover more about the evolution and development of specific floral organs enabling very precise placement of pollinia on specific body parts of pollinators.