

**The differences between *Paphiopedilum barbatum* (Lindl.) and *Paphiopedilum callosum* (Rchb.f.)
Stein var. *sublaeve* (Rchb.f.) P.J. Cribb**

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Abstract

The genus *Paphiopedilum* is a flagship species among orchids and comprises of some of the most sought after orchids for its beauty and rarity. Thus, all *Paphiopedilum* are placed in CITES Appendix I. Among orchids, *Paphiopedilum* has the most revised literature. In spite of this, misidentifications tend to occur even in publications. This is mainly due to the close resemblance that some species have with each other. Identification is important for the accurate knowledge on the distribution of the species done through biodiversity inventories as this can result in the decision making of environmental policies and conservation strategies. In the case of *P. barbatum* and *P. callosum* var. *sublaeve*, methods used for the correct species identification include morphological study, distribution and DNA barcoding. The morphology presents many similarities between both species but with some differences in the petal angle, staminode shape and the presence of ciliated hair on the petal margins. Distributions of both species in Peninsular Malaysia do not overlap. DNA barcoding using the molecular markers; *rbcl*, *matK* and *ITS*, were used to differentiate both species. Analysis of sequences generated shows *ITS* and *matK* forming two separate clades for each species in Neighbour-Joining trees. The *rbcl* sequences provided poor species resolution as evidenced from the formation of multiple clades for both species. Presence of barcoding gap and BLAST results were used to confirm the two species. DNA barcoding is an effective taxonomic tool and accuracy is increased when morphology and distribution data are included.

Keywords: Distribution, DNA barcoding, identification, morphology, *Paphiopedilum*.

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