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Notes on *Bulbophyllum* (Dendrobiinae; Epidendroideae; Orchidaceae): two new species and the dilemmas of species discovery via illegal trade

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Abstract

Bulbophyllum anodon (section *Brachystachyae*) and *B. dasystachys* (section *Hirtula*) are described. *Bulbophyllum cylindraceum* is newly recorded for Thailand. *Bulbophyllum dhaninivatii* and *B. tripaleum* (section *Lemniscatae*) are synonymized. Notably, all specimens discussed in this paper first came to scientific attention via illegal trade. Although many new species have emerged as a result of commercial ventures, it is alarming that contemporary orchidological discovery in some regions continues to be driven by trade. We briefly discuss the tensions associated with describing new species discovered via illegal trade, including some of the associated scientific and moral implications.

Introduction

In preparation for a revision of *Bulbophyllum* Thouars (1822: t.3) for the *Flora of Thailand*, we are gathering information on local species. A regular check of the channels along which wild-collected plants are illegally traded, both close to the point of harvest (i.e., plant markets in Thailand) and among overseas nurseries, has previously yielded many new species discoveries. Botanical discovery has historically been heavily driven by commercial trade, notably by the botanical adventurers of the 19th and early 20th Centuries (Fry 2009).

Alarmingly, this remains a trend in the contemporary orchid taxonomy in some parts of the world. Notably, Southeast Asian biodiversity research has lagged behind other regions (Sodhi *et al.* 2004), where collection effort for some charismatic taxa remains heavily driven by commercial interests. Despite declining rates of species discovery (Joppa *et al.* 2011), many new Southeast Asian orchid species first come to scientific attention via illegal trade. This is particularly alarming because a recent comparison of species discovery and habitat loss rates in the region suggest that many undescribed species are likely to go extinct before they are formally identified (Giam *et al.* 2010). Moreover, these still undescribed species are more likely to have small geographic ranges, which increases extinction risks (Giam *et al.* 2012).

All information presented in this paper originates from the commercial trade of wild-collected plants. We proceed cautiously with these descriptions, and highlight two serious drawbacks to this method of scientific enquiry, both of which merit greater attention in both the taxonomic and conservation communities. One drawback is scientific: in our experience, commercial collectors rarely know the exact provenance of the plants they sell. Even if they know this information, they are often reluctant to share locality details, due both to concerns over legality and secrecy about procurement networks. Although it is sometimes possible to trace plants from markets to harvest sites, verifiable type localities are usually absent for species discovered via trade (e.g., George & George 2011; the species discussed here). Therefore, one can never be entirely certain that a plant reported to be of Thai origin was actually collected in Thailand (O'Byrne 2009). Moreover, there is considerable cross-border botanical trade in Southeast Asia, which further complicates efforts to ascertain origin data (Phelps 2014). This creates considerable potential for misinformation. Perhaps most significantly, a lack of locality and distribution data limits any potential for further ecological research or conservation planning, which can be critical in the context of highly collectible species.

Another significant drawback concerns a set of moral issues: taxonomists, by engaging with illegal trade and describing a new species, can contribute to species loss (e.g., Cribb 2005; Phimmachak *et al.* 2012). The formal

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Notes:—*Bulbophyllum dhaninivatii* and *B. tripaleum* are similar, except for the presence of the paleae on the sepals in the latter species. Next to this, the drawing of *B. tripaleum* in Seidenfaden (1979: 203) shows a lip with keels, but the description only mentions a 'v-shaped concavity on upper surface' We assume that he meant to describe the v-shaped ridge surrounding the basal cavity. If so, the lip is about identical to that of *B. dhaninivatii*. The sample *Phelps 2012* (Thailand) is intermediate between the two types. It has some flowers without paleae on the sepals, and others with much smaller paleae than in *B. tripaleum*. We identify *Phelps 2012* as *B. dhaninivatii* and conclude that both names refer to the same species. Plants lacking the paleae are occasionally found in other species in section *Lemniscatae* with paleate sepals, e.g. in *B. lemniscatoides* Rolfe (1890: 672) (var. *exappendiculatum* Smith, 1920: 92).

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