



## Delimitation in the *Veratrum mengtzeanum*—*V. chiengdaoense* complex (Melanthiaceae) in Thailand based on morphology, with commentary on conservation status

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### Abstract

The two species of *Veratrum* in Thailand, *V. mengtzeanum* and *V. chiengdaoense*, are supported as conspecific with a detailed morphological study. Two distinct subspecies of *V. mengtzeanum* s.l. are defined based on morphology and distribution, and a new subspecies, *Veratrum mengtzeanum* subsp. *phuwae* is described. Conservation assessments are provided for both subspecies.

### Introduction

Melanthiaceae comprise five tribes of mainly perennial herbs occurring in the temperate zones (occasionally extending to Arctic zones) of the Northern Hemisphere (APG 2009; Tamura 1998; Zomlefer *et al.* 2001, 2003). *Veratrum* (26–50 species) is the largest genus in tribe Melanthieae (Tamura (1998); Chen & Takahashi 2000; Stevens 2001 onwards; Govaerts 2012). The species inhabit a wide range of habitats and vary morphologically mainly in characters of habit, leaves, tepals and perigonal nectaries (Zomlefer *et al.* 2003). Synapomorphies for *Veratrum* include dendritic pubescence of the vegetative parts (at least upper stem/inflorescence) and broadly winged seeds (Zomlefer 1997; Zomlefer *et al.* 2003).

Initial revisionary work by the first author on *Veratrum* for the *Flora of Thailand* indicated two species: *Veratrum chiengdaoense* Larsen (1961: 346), a narrow endemic from Doi Chiangdao (Chiang Mai province) in northwestern Thailand (Larsen 1961) and *Veratrum mengtzeanum* Loesner (1926: 145), native to the southwestern Chinese provinces of Yunnan, Guizhou and Sichuan and disjunct to the Doi Phu Wae mountain in Doi Phu Kha National Park (Nan province), Thailand. Tanaka (2001) suggested these two species may be conspecific. The *World Checklist* (Govaerts 2012) has recognised them as separate species. Additionally, the restricted distribution of *V. chiengdaoense* raises conservation concerns. Confirmation of conspecificity with *V. mengtzeanum* would suggest a wider distribution and revised conservation status. We thus conducted a morphological study to clarify the taxonomic status of these two taxa.

### Materials & Methods

A subset of 11 specimens including the types for each taxon was fully examined. These specimens were selected to represent *V. chiengdaoense* and *V. mengtzeanum* and geographical areas (Thailand and China). Additional specimens were also examined for the descriptions.

Floral dissections and measurements were made using a Leica M3Z microscope with a calibrated eyepiece. Vegetative and inflorescence characters were measured with a digital caliper. Measurements were