Phytotaxa 230 (1): 039–053
www.mapress.com/phytotaxa/

Article

ISSN 1179-3155 (print edition)
PHYTOTAXA
ISSN 1179-3163 (online edition)

http://dx.doi.org/10.11646/phytotaxa.230.1.3

Afrohybanthus (Violaceae), a new genus for a distinctive and widely distributed Old World hybanthoid lineage

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Abstract

Recent traditional and molecular systematic studies of the violet family, Violaceae, have confirmed extensive polyphyly of the genus *Hybanthus* and substantial polyphyly in *Rinorea* as well. Phylogenetic analyses have proposed up to nine distinct hybanthoid clades. Broad studies of representative taxa within each clade have revealed coherent suites of macromorphological traits in foliage, flowers, fruits and seeds that easily discriminate the nine hybanthoid lineages from each other and from currently recognized genera in the family. Base chromosome numbers and biogeography also provide additional support for recognition of the hybanthoid clades as distinct segregate genera. Some hybanthoid clades have available older generic names, but one of the two Old World lineages, namely the *Hybanthus enneaspermus* group, is presently nameless. This clade, distinctive in its ellipsoid, pale yellow, often foveolate seeds, is the most diverse in the Paleotropics, with approximately 25 species distributed across Africa, Madagascar, southern Asia, northern Australia and the southwestern Pacific. The group is segregated here as *Afrohybanthus gen. nov.*, with new combinations provided for existing names, all of which have thus far proven morphologically distinct and worthy of recognition at the rank of species. Imminent future studies will describe additional taxa in the new genus.

Key words: Generic circumscription, *Hybanthus,* Old World

Introduction

The Violaceae is a medium-sized family with 23 accepted genera and ca. 1,100 species of trees, shrubs, lianas, and herbs (Ballard, 2007; Ballard *et al.*, 2014; Paula-Souza & Ballard, 2014). The family consists primarily of woody genera of trees, shrubs and lianas in the New and Old World tropics—*Viola* being the only sizeable herbaceous temperate to montane genus. Genera possess great diversity in growth form, inflorescence architecture, floral morphology, and fruit type. The genus *Hybanthus* Jacq. is the third largest in the family with ca. 125 species (Ballard *et al.*, 2014), and is primarily native to the tropics and subtropics; only one species, *Hybanthus concolor* (T.F. Forst.) Spreng., is distributed in temperate eastern North America. Species in the genus range in habit from herbs or subshrubs to shrubs or (rarely) treelets, and have been traditionally characterized and distinguished from other Violaceae by their distinctly zygomorphic corolla with the bottom (anterior) petal noticeably or substantially longer than the lateral and upper ones, differently shaped and often strongly differentiated into an abruptly expanded blade and claw, and with a "saccate" base; usually free stamens, uncommonly with the filaments fused into a short ring, the bottom pair of stamens each bearing a gland; fruits a three-valved thin-walled capsule typical of most genera in the family; and globose to ellipsoidal unwinged seeds. Species inhabit a broad elevational range, from sea-level to 3000 m, and occupy various habitats from lowland rainforest, savanna and grassland, through temperate and cloud forests, to paramo, with the greatest diversity of species in forest openings, shrubland and grassland habitats in Latin America, Africa and Australia. Recent interest has spawned intensive investigations into a bioactive class of proteins, cyclic peptides, and comparative studies have shown the Violaceae to be particularly rich in these (Broussalis *et al.*, 2001; Ireland *et al.*, 2006). Studies of cyclic peptide diversity in species of Australian *Hybanthus* have revealed hundreds of forms and shown that peptide composition closely reflected apparent morphological relationships among taxa (Simonsen *et al.*, 2005).

Accepted by Zhi-Qiang Zhang: 1 Jun. 2015; published: 6 Oct. 2015