



A review of *Scaphochlamys* (Zingiberaceae) from Borneo, with description of eleven new species

OOI IM HIN¹, MEEKIONG KALU¹ & WONG SIN YENG^{*1,2}

¹ Department of Plant Science and Environmental Ecology, Faculty of Resource Science and Technology, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia; *e-mail: sywang@unimas.my (author for correspondence).

² Research Associate, Harvard University Herbaria, 22 Divinity Avenue, Cambridge, MA 02138, United States.

Abstract

In the present paper, the genus *Scaphochlamys* from Borneo is revised. Twenty-four species are recognised, of which 11 are new species: *S. durga*, *S. graveolens*, *S. hasta*, *S. lanjakensis*, *S. lucens*, *S. nigra*, *S. multifolia*, *S. penyamar*, *S. pseudoreticosa*, *S. scintillans*, and *S. uniflora*. *Scaphochlamys depressa* is treated as a synonym to *S. argentea*. The Bornean species are arranged into six informal groups based on morphological characteristics: *Anomala* Group, *Callicola* Group, *Graveolens* Group, *Limiana* Group, *Petiolata* Group, and *Polyphylla* Group. The paper includes an overview of morphological characteristics, identification keys to groups and species, and species descriptions. A discussion of the recently recognized generic segregate, *Borneocola* is included.

Keywords: Bracts, cincinni, endemic, Peninsular Malaysia, Sarawak

Introduction

Scaphochlamys Baker (1892: 252) is a genus of 44 species in the *Kaempferia* Clade (Kress *et al.* 2002) occurring from southern Thailand through Peninsular Malaysia and Sumatera, to northern Borneo (Kress *et al.* 2002, Leong-Škornicková 2011). *Scaphochlamys* forms a clade with *Distichochlamys* Newman (1995: 65) and *Myxochlamys* Takano & Nagamasu (2007: 21) based on phylogenetic analyses (Takano & Nagamasu 2007). These genera are each defined by sets of morphological characters in combination rather than any single key characteristic. Each character trait on its own maybe shared by more than one genus, so the presence or absence of characters together must be considered before attempting to allocate a species to a genus (Searle 2010). *Scaphochlamys* is distinguished from closely related genera by the following combination of characters: petiole base pulvinate (Borneo only), spiral floral bract arrangement, flowering acroscopic, first bracteole 2-keeled and arising opposite to bract; bracteole split to base, and anthers with free basal spurs (Searle 2010).

Valeton (1918) and Holttum (1950) made their investigations based on living plants with Valeton (1918) focused on inflorescence and flower structure. Holttum (1950) reinstated *Scaphochlamys* and described nine new species from Peninsular Malaysia. Holttum confined himself to Peninsular Malaysian species. Consequently transfer of the Bornean species to *Scaphochlamys* was initiated only in 1972 with *S. polyphylla* (Schumann 1899: 332) Burt & Smith (1972: 315), *S. petiolata* (Schumann 1904: 90) Smith (1987: 210), *S. reticosa* (Ridley 1905: 195) Smith (1987: 209), *S. gracilipes* (Schumann 1899: 332) Sakai & Nagamasu (2006: 110), and *S. anomala* (Hallier 1898: 357) Searle (2010: 85). Smith (1987) described *S. argentea* (Smith 1987: 209) distinguished by raised silver veins on the adaxial surface of the leaf lamina. *Scaphochlamys callicola* Poulsen & Searle (2005: 29) was described and is to date the only species with a distichous arrangement to the inflorescence. Subsequently seven new species have been discovered and described: *Scaphochlamys iporii* Meekiong & Ampeng (2011: 19), *S. salahuddiniana* Meekiong *et al.* (2011: 22), *S. depressa* Mas Izzaty *et al.* (2014: 22), *S. stenophylla* Ooi & Wong (2014: 242), *S. biru* Meekiong (2015: 37), *S. limiana* Meekiong & Yazid (2015: 33), and *S. samunsamensis* Meekiong & Hidir (2015: 34). Up to date, 14 species have been described from Borneo. All species are endemic.