



The new fern genus *Calciphlopteris* (Pteridaceae)

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Abstract

A new genus of Pteridaceae subfamily Cheilanthroideae is established for what has long been known as *Doryopteris ludens*. The newly erected genus is named *Calciphlopteris* in reference to its substrate specificity to limestone. *Calciphlopteris* can be found throughout Southeast Asia, from Indo-China to New Guinea and Australia. New combinations are established for the four known species (*Calciphlopteris alleniae*, *C. ludens*, *C. papuana* and *C. wallichii*). *Calciphlopteris* is characterized by having a horizontal rhizome, semi-clathrate scales, indumentum on the petiole and lamina usually with fibrils and/or semi- to non-clathrate scales, and sporangia with 32 echinate or cristate spores.

Key words: Asia, *Calciphlopteris*, Cheilanthroideae, *Doryopteris*, ferns, Pteridaceae, taxonomy

Introduction

The application of DNA sequences to reconstruct the relationships among extant ferns has generated an unprecedented improvement in our knowledge of their deeper relationships (Hasebe *et al.* 1994, 1995, Pryer *et al.* 2004, Schneider *et al.* 2004, Smith *et al.* 2006a) and aided in the clarification of taxonomic concepts at the species and genus levels. Several of these studies provided evidence to support the merger of monotypic or small genera into larger genera, e.g. *Ceterach* Lam. & DC., *Diellia* Brack., *Phyllitis* Ludw. and other satellite genera in *Asplenium* L. (Pinter *et al.* 2002, Schneider *et al.* 2004a, 2005); *Hyalothrighopteris* W.H. Wagner in *Campyloneurum* C.Presl (Kreier *et al.* 2007), whereas others found evidence for the reestablishment of previously questionable genera such as *Acanthocorus* Underw. & Maxon (Crane 1997), *Haplopteris* C.Presl (Crane 1997), *Pentarhizidium* Hayata (Gastony & Ungerer 1997), *Polytaenium* Desv. (Crane 1997), *Scoliosorus* T.Moore (Crane 1997) and *Synammia* C.Presl (Schneider *et al.* 2006). The discovery of new genera is less common but relevant examples include *Radiovittaria* (Benedict) E.H.Crane (Crane 1997) and *Serpocaulon* A.R.Sm. (Smith *et al.* 2006b). In summary, all these studies underline the value of identifying flaws in our generic concepts (Smith *et al.* 2006a).

Evidence for inconsistent generic concepts has been reported in all studies on the pteridoid ferns, one of the three most species rich lineages among extant ferns (Pryer *et al.* 2004, Schneider *et al.* 2004b, Smith *et al.* 2006a). The phylogeny of this fern lineage was the subject of several recent studies using either a single genomic marker regions such as *rbcL* (Hasebe *et al.* 1995, Prado *et al.* 2007, Zhang *et al.* 2005) or up to three chloroplast genome markers (Schuettpelz *et al.* 2007, Zhang *et al.* 2007). Except for the exhaustive study on the Neotropical *Eriosorus* Fée/*Jamesonia* Hook. & Grev. complex (Sanchez-Baracaldo 2004) and the vittarioids (Crane 1997) most studies using DNA sequences focused on the cheilanthoid ferns (Gastony & Rollo 1995, 1998, Zhang *et al.* 2007). As might be expected, these studies reinforced major conflicts between the current classification and the observed phylogenetic hypothesis (Gastony & Rollo 1995, 1998, Smith *et al.* 2006b, Zhang *et al.* 2007).