



New species and records of grammitid ferns (Polypodiaceae) for Vietnam

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Abstract

Three new species (*Calymmodon concinnus*, *Oreogrammitis parvula*, *Xiphopterella parva*), and seven new records (*Dasygrammitis brevivinosa*, *Oreogrammitis sinohirtella*, *Radiogrammitis beddomeana*, *R. jagoriana*, *Scleroglossum pyxidatum*, *S. sulcatum* and *Themelium halconense*) of grammitid ferns (Polypodiaceae) are reported for the flora of Vietnam, mostly from newly collected specimens. We provide detailed morphological descriptions, illustrations, ecology and distribution, and taxonomic notes for each new species. Furthermore, type information, distribution, voucher specimens and taxonomic notes are provided for each newly recorded species. A checklist including synonymy and a key to Vietnamese grammitid ferns are also given.

Key words: checklist, grammitid ferns, key, new records, new species, Polypodiaceae, Vietnam

Introduction

The fern flora of Vietnam was firstly reported by Tardieu-Blot & Christensen (1941). The more recent comprehensive works were done by Pham-Hoang (1999), and expanded later by Phan (2010) who rearranged all the taxa in the light of modern phylogenetic systems. Very recently, several efforts continuously contribute to our understanding of fern diversity of Vietnam (Smith & Zhang, 2002; Wu *et al.* 2005a, b, 2006, 2012; Xiang *et al.*, 2011; Ding *et al.*, 2013; Lu *et al.*, 2014a, b; etc.), however, in the same time these studies also high light the insufficiency of investigation.

Between 2012 and 2014, we conducted 4 botanical surveys arranged by Vietnam National Museum of Nature and Southern Institute of Ecology. In total, over 1,000 specimens of ferns and lycophytes were collected representing over 250 species. Here, we describe three new species (*Calymmodon concinnus*, *Oreogrammitis parvula*, *Xiphopterella parva*) and three new records (*Radiogrammitis beddomeana* (Alderw.) Parris (2007: 241), *R. jagoriana* (Mett. ex Kuhn) Parris (2007: 242), *Scleroglossum pyxidatum* Alderw. (1914: 37)) of grammitid ferns for the flora of Vietnam based on these new collections. Furthermore, another four new records are reported based on the herbarium specimens collected in the 20th century. The occurrence of *Oreogrammitis sinohirtella* Parris (2013: 842), *Radiogrammitis alepidota* (M.G. Price) Parris (2007: 241) (= *R. beddomeana* (Alderw.) Parris) and *Scleroglossum sulcatum* (Kuhn) Alderw. (1912: 39) in Vietnam was noted by Zhang *et al.* (2013), but voucher specimens were not mentioned which is done here.

The taxonomic concepts of grammitid ferns have been changing considerably under the light of molecular phylogeny (Ranker *et al.* 2004; Sundue *et al.* 2014). *Ctenopteris* Blume ex Kunze (1846: 425), *Grammitis* Sw. (1800: 17) *s.l.* and *Xiphopteris* Kaulf. (1820: 35) were formerly widely used names for grammitid ferns, but are now considered to be unsatisfactory artificial genera based on frond dissection (Ranker *et al.* 2004). Recent developments in Old World grammitid taxonomy have centred on describing new genera based upon additional morphological characters and two of the three old genera are no longer recognized. The type species of *Ctenopteris* has been transferred to *Prosaptia* C.Presl (1836: 165) (Price 1982, 1987), *Grammitis* in the strict sense includes only species