



Dryopteris shiakeana (Dryopteridaceae): A new fern from Danxiashan in Guangdong, China

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Abstract

Dryopteris shiakeana, a new species of Dryopteridaceae from Danxia landform in Danxiashan National Park, Guangdong, China, is described and illustrated. This species exhibits morphological characteristics similar to *D. dehuaensis* but differs in terms of dense scales on the rachis of laminae and pinnae, dissected pinnules, more prominent veinlets, reddish-brown scales on stipes, and toothed margin. Based on results of molecular phylogenetic analysis of the *trnL-F* sequence, our conclusion is that *D. shiakeana* is most closely related to *D. dehuaensis*.

Key words: Danxia landform, *Dryopteris*, new species

Introduction

The family Dryopteridaceae is a large family comprising 25 genera with more than 2,100 species distributed worldwide (Zhang *et al.* 2013). A total of 10 genera can be found in China, with 493 species in two subfamilies. *Dryopteris* Adanson (1763: 20, 551) is one of the largest genera in this family, with approximately 400 species (Zhang *et al.* 2013) which usually grow in forests, open vegetation, and occasionally in rocky areas of temperate and tropical regions (Fraser-Jenkins 1986, Kramer *et al.* 1990, Zhang *et al.* 2013). *Dryopteris* is widely distributed on all continents except Antarctica, and this genus is abundant and diverse in Asia, especially in southwestern China and adjacent regions (Fraser-Jenkins 1986, Wu *et al.* 2013).

In May 2012, we surveyed the floristics of Danxiashan National Park in Guangdong, China. This park is characterized by unique Danxia landforms, which can be found in southern and eastern China. The soils in this landform are dry, nutrient-deficient, and acidic; the region serves as a habitat of some endemic ferns, such as *Polystichum gymnocarpium* Ching ex W.M.Chu & Z.R.He (in Kung *et al.* 2001: 227) and *Adiantum juxtapositum* Ching (1957: 312), and seed plants, such as *Firmiana danxiaensis* H.H. Hsue & H.S. Kiu (1987: 2), and *Danxiaorchis singchiana* J.W.Zhai, F.W.Xing & Z.J.Liu (2013: e60371) (Yan *et al.* 2012). We collected several specimens and living individuals of an interesting species similar to *Dryopteris dehuaensis* Ching (in Lin *et al.* 1982: 601). However, the new species can be easily distinguished by dense reddish brown scales, toothed segments, more prominent veinlets, and a number of other characteristics. In field investigations conducted in September 2012 and 2013, 17 specimens were collected as a population sample set. A total of 26 species and 20 sections of *Dryopteris* were subjected to molecular phylogenetic analysis based on DNA sequences of the chloroplast *trnL-F* region to obtain additional evidence for its taxonomic position.

Materials and methods

Taxonomic sampling

The sequence data of 26 species were analyzed to place the new species in the phylogenetic relationships of *Dryopteris*.