Miscellaneous Notes on Pteridophytes from China and Neighboring Regions (IV)—Validation of Some Combinations in *Diplopterygium* (Pteridophyta: Gleicheniaceae)

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ABSTRACT. Some names of *Diplopterygium* widely used in Chinese literature of pteridophytes are not valid; therefore, formal combinations of five names for *Diplopterygium* species from China are validated, i.e., *D. criticum* (Ching & P. S. Chiu) Ching ex X. C. Zhang, *D. rufum* (Ching) Ching ex X. C. Zhang, *D. rufopilosum* (Ching & P. S. Chiu) Ching ex X. C. Zhang, *D. simulans* (Ching) Ching ex X. C. Zhang, and *D. yunnanense* (Ching) Ching ex X. C. Zhang. *Diplopterygium rufopilosum* is lectotypified.

Key words: China, *Diplopterygium*, Gleicheniaceae, Pteridophyta.

Diplopterygium (Diels) Nakai was traditionally treated as a subgenus of *Gleichenia* Smith (Holttum, 1957, 1959; Tagawa & Iwatsuki, 1979; Tryon & Tryon, 1982), but is now generally accepted as a separate genus (Ching, 1978; Kramer, 1990; Wu & Ching, 1991; Østergaard Andersen & Øllgaard, 2001). The Chinese species of *Diplopterygium* were recorded under the generic name *Hicriopteris* C. Presl (Ching, 1940; Ching et al., 1959). Holttum (1959) discussed the reason why *Hicriopteris* was misused in this sense. The type of *Hicriopteris* was first described as a species of *Dicranopteris* Bernhardi, i.e., *D. speciosa* (C. Presl) Holttum. When Presl (1851) described the genus he compared it with *Gleichenia glauca* (Thunberg) Hooker, a species of *Diplopterygium*. Later authors (Ching, 1940; Copeland, 1947; Ching et al., 1959) thought he was describing a species of *Gleichenia* sect. *Diplopterygium* and consequently misapplied the generic name *Hicriopteris*. *Hicriopteris* is properly a synonym of *Dicranopteris* (see Holttum, 1959; Østergaard Andersen & Øllgaard, 2001).

Three genera of the fern family Gleicheniaceae occur in China: *Diplopterygium* (Diels) Nakai, *Sticherus* C. Presl, and *Dicranopteris* Bernhardi. Plants of *Diplopterygium* can be easily distinguished from those of *Sticherus* by their bipinnate or pinnate-pinnatifid branches, and from *Dicranopteris* by their dormant buds and rhizomes with scales, veinlets of segments once forked, and sporangia (2)3 to 5(7) per sorus; in *Dicranopteris* the dormant buds and rhizomes with hairs, veinlets of segments 2 to 4 times forked, and sporangia ca. 8 to 25 per sorus (Østergaard Andersen & Øllgaard, 2001) separate it from both *Diplopterygium* and *Sticherus*.

Diplopterygium (Diels) Nakai, Bull. Nat. Sci. Mus. Tokyo 29: 47. 1950. *Gleichenia* sect. *Diplopterygium* Diels, in Engler & Prantl, Nat. Pflanzenfam. 1(4): 353. 1900. *Dicranopteris* sect. *Diplopterygium* (Diels) Underwood, Bull. Torrey Bot. Club 34: 251. 1907. *Gleichenia* subg. *Diplopterygium* Holttum, Reinwardtia 4: 261. 1957. TYPE: *Diplopterygium glaucum* (Thunberg ex Houttuyn) Nakai (*Polypodium glaucum* Thunberg ex Houttuyn).

Diplopterygium contains about 25 species, from Asia to Queensland, Australia, and Polynesia (including Hawaii), mainly in tropical Asia, not in Africa. A single species, *D. bancroftii* (Hooker) A. R. Smith, occurs in tropical America.

Ching et al. (1959) recorded 16 species of *Diplopterygium* under the generic name *Hicriopteris* from China and one from northern Vietnam, the region bordering China. Six of these already have been transferred into *Diplopterygium*, including:

Diplopterygium blotianum (C. Christensen) Nakai, Bull. Nat. Sci. Mus. Tokyo 29: 49. 1950.

Diplopterygium cantonense (Ching) Nakai, Bull. Nat. Sci. Mus. Tokyo 29: 49. 1950.

Diplopterygium chinense (Rosenstock) De Vol, in H. L. Li et al., Fl. Taiwan 1: 92. 1975, "*chinensis*."

Diplopterygium giganteum (Wallich ex Hooker) Nakai, Bull. Nat. Sci. Mus. Tokyo 29: 50. 1950.

Diplopterygium glaucum (Thunberg ex Hout-

tuyn) Nakai, Bull. Nat. Sci. Mus. Tokyo 29: 51. 1950.

Diplopterygium laevissimum (H. Christ) Nakai, Bull. Nat. Sci. Mus. Tokyo 29: 52. 1950.

Ching (in Shing, 1982) published numerous combinations for Chinese species of *Diplopterygium*, but these were not validated properly according to Article 33.3 of the ICBN (Greuter et al., 2000). Two of these were validated later, i.e., *Diplopterygium maximum* Ching & H. S. Kung (in Kung, 1988: 134), and *Diplopterygium glaucoides* (Ching) Ching ex P. S. Wang & X. Y. Wang (in Wang & Wang, 2001: 279). Some of them are presently regarded as synonyms of various species and therefore need not be transferred into *Diplopterygium*.

The following five combinations for *Diplopterygium* are formally proposed here in order to solve the nomenclatural problems of these Chinese species and for the revision of fern flora of China.

Diplopterygium criticum (Ching & P. S. Chiu) Ching ex X. C. Zhang, comb. nov. Basionym: *Hiciopteris critica* Ching & P. S. Chiu, in S. S. Chien & Chun, Fl. Reipubl. Popul. Sin. 2: 348. 1959. *Diplopterygium criticum* (Ching & P. S. Chiu) Ching, in K. H. Shing, Gloss. Term. Nam. Ferns 50. 1982, nom. inval. TYPE: China. Yunnan: Pingbian, Dawei Shan, *R. C. Ching 55* (holotype, PE).

Diplopterygium rufum (Ching) Ching ex X. C. Zhang, comb. nov. Basionym: *Hiciopteris rufa* Ching, in S. S. Chien & Chun, Fl. Reipubl. Popul. Sin. 2: 347. 1959. *Diplopterygium rufum* (Ching) Ching, in K. H. Shing, Gloss. Term. Nam. Ferns 50. 1982. nom. inval. TYPE: China. Yunnan: Pingbina, Dawei Shan, *K. M. Feng 4832* (holotype, PE).

The collection number was misprinted as 4823 when the species was published, but on the label of the type in PE the number is 4832.

Diplopterygium rufopilosum (Ching & P. S. Chiu) Ching ex X. C. Zhang, comb. nov. Basionym: *Hiciopteris rufopilosa* Ching & P. S. Chiu, in S. S. Chien & Chun, Fl. Reipubl. Popul. Sin. 2: 348. 1959, "*rufo-pilosa*." *Diplopterygium rufopilosum* (Ching & P. S. Chiu) Ching, in K. H. Shing, Gloss. Term. Nam. Ferns 50. 1982, "*refo-pilosum*," nom. inval. TYPE: China. Yunnan: Dali, Cang Shan, *C. Y. Wu 11825* (lectotype, designated here, PE).

A second syntype, *H. C. Wang 3541* (PE), is of a young sterile plant, but *C. Y. Wu 11825* is a fertile plant; therefore, it is selected as the lectotype.

Diplopterygium simulans (Ching) Ching ex X. C. Zhang, comb. nov. Basionym: *Hiciopteris simulans* Ching, Acta Phytotax. Sin. 8: 133, 161. 1959. *Diplopterygium simulans* (Ching) Ching, in K. H. Shing, Gloss. Term. Nam. Ferns 50. 1982, nom. inval. TYPE: China. Hainan: *C. Wang 35496* (holotype, PE).

Diplopterygium yunnanense (Ching) Ching ex X. C. Zhang, comb. nov. Basionym: *Hiciopteris yunnanensis* Ching, in S. S. Chien & Chun, Fl. Reipubl. Popul. Sin. 2: 350. 1959. *Diplopterygium yunnanense* (Ching) Ching, in K. H. Shing, Gloss. Term. Nam. Ferns 50. 1982, nom. inval. TYPE: China. Yunnan: Jingdong, Wuliang Shan, *W. H. Hsu 6* (holotype, PE).

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