NEW PHILIPPINE GONIOPHLEBIUM (POLYPODIACEAE: PTERIDOPHYTA)

J.F. BARCELONA1 & M.G. PRICE2

1Philippine National Herbarium, National Museum, P.O. Box 2659, Manila, Philippines. Current address: Botany Department, Miami University, Oxford, OH 45056, U.S.A.
2P.O. Box 468, Michigan Center, MI 49254, U.S.A.

Key Words: Batanes, fern, Goniophlebium, Philippines, Polypodiaceae.

ABSTRACT

The new species Goniophlebium coadunatum (Polypodiaceae) from the Batanes islands, between Luzon and Taiwan, is described. An ally of G. benguetense, also from the Philippines, it is distinguished principally by its coadunate frond apex.

INTRODUCTION

Mount Iraya of Batan Island is the highest point in the wind-swept Batanes Islands, located nearly equidistant from northern Luzon and southern Taiwan, which are about 350 km apart. A detailed floristic analysis of the pteridophytes of Mt Iraya was prepared by Barcelona (1994). Previously, seven fern taxa were described from type collections made on Mt Iraya or in the Batanes, namely Athyrium irayense Copel. [=Diplazium doederleini (Luerss.) Makino], Cyathea fenicis Copel., Cyclosorus irayensis Copel. [=Sphaerocephalos irayensis (Copel.) Holtt.], Grammitis fenicis Copel., Lygodium meairnsii Copel. [=L. japonicum (Thunb.) Sw.], Pteris rigidula Copel. [=P. spinescens C. Presl], and Sphaerocephalos fenixii Holtt. [=S. irayensis (Copel.) Holtt.]. Two of these, G. fenicis and S. irayensis, are still recognized as endemic to Mt Iraya and Batan Island, and we are here adding a third:

Goniophlebium coadunatum Barcelona et M.G. Price, sp. nov. (Fig. 1)

Goniophlebio benguetensi Philippinarum maxime affinis autem apice frondis coadunato potissime differt. Etiam differt soris adaxialibus prominenteribus, paraphysibus setulosis vice clavatis in centro sororum, pinnis laitioreibus ambitu basis pinnarum angustioribus, glandulis minutis marginalibus palearum deficientibus.

Holotypus: J.F. Barcelona 988, Philippines, Batanes, Mt Iraya (PNH).

Rhizome long creeping, 2-5 mm across, surface uniformly dull blackish, not chalky, internal sclerenchyma strands over 100. Paleae dense, persistent, bright brown, lanceate, long attenuate, to 6 mm long, 1.5 mm broad at base, with projections of the clathrate lattice forming lateral teeth. Stipe (7.4-) 26-45 cm long, (1.4-) 2.1-3.6 mm across at base, stramineous to brown (green above, dark below when fresh), with numerous minute maroon palea-base remnants. Lamina lanceolate-ovate, apex coadunate, (14.5-) 38-51 x (7.5-) 21-32 cm, bearing (12-) 16-35 pairs of pinnae, thin-papyraceous, rachis with very narrow wing joining laminar tissue of pinnae, rachis and costae with small, toothed paleae below, glabrous above. Pinnae sessile,
Figure 1: Goniophlebium coadunatum Barcelona & M.G. Price.
a. Habit of adult plant; b. Portion of the lower surface of a pinna showing impressed sori and paleae; c. rhizome palea. (Barcelona 491). [Illustrated by Nemesio Diego, Jr. (PNH)]
articulate, opposite to subopposite, often ranging to alternate distally, patent to slightly ascending, the largest (4.4-) 12-15 cm x (5-) 8-12 mm, basal to submedial, base broadly cuneate, often auricled on both sides, margins serrulate, apex acuminate, uppermost pinnae adnate, decrescent to non-articulate segments, terminal lamina lobed at base, then pinna-like. Veins forming one series of large areoles with a fertile free-included-veinlet on each side of costa, then with irregular small areoles, or free. Sori medial, round to slightly oval, 1-1.5 mm across, notably impressed, bearing conspicuous variably-branched paraphyses with shiny dark maroon setae shorter than mature sporangia. Spores pale yellow, 42.5-52.5 x 25-30 μm, exospore smooth, perispore longitudinally winged with polar protuberances.


This amply distinct new species is most closely related to G. benguetense (Copel.) Copel. which also has similar rhizome sclerenchyma strands, paleae, stipes, lamina and pinna shape, sori, paraphyses and spores. It differs most notably from G. benguetense by the consistently coadunate apex, a character not found in any member of the ‘G. percussum-group’ in which Rödl-Linder (1990) placed that species. Whilst the absence of the coadunate apex character in all closely-related species facilitates the recognition of G. coadunatum, its presence in this species weakens the definition of any such group. Other differences are that G. benguetense has a more slender rhizome, shorter paleae having a thinner and grayish-brown lattice and bearing fewer marginal teeth but with numerous minute marginal glands, pinnae subtruncate at base but generally narrower, sori superficial or only very slightly impressed, and receptacular paraphyses with clavate branch-tips near the center of sori. The two known populations of G. coadunatum occur on trunks and rocks in shade in the remaining patches of lowland evergreen forest on the lower slopes of Mt Iraya from about 100-500 m whereas G. benguetense is a plant of mossy forests in Luzon at higher elevations, to 1500 m.

Also related to G. benguetense is G. demersum (Brause) Rödl-Linder of the Moluccas and New Guinea. It differs from G. coadunatum by its conform terminal pinnae, thicker lamina, broader rhizome paleae, supramedial and only very shallowly impressed sori, and paraphyses broadly scaly. The East Asian G. mengtzeense (Christ) Rödl-Linder, which extends to Luzon, also has a coadunate laminar apex (although described as conform by Rödl-Linder, 1990) but differs from G. coadunatum by its chalky rhizome, lamina paler in color, pinnae broader, ascending, more shallowly toothed, sori superficial, and paraphyses palea-like, among other characters.

The recent monograph of Goniophlebium by Rödl-Linder (1990) and her revision of the Philippine species (1987) provide useful information with descriptions, synonymy, and specimen citations, and have greatly increased our confidence in recognising this new species. In Barcelona (1994, p. 131, f. 18) this species appeared as an unnamed Goniophlebium.
The finding of a species of *Goniophlebium* apparently restricted to a single Philippine volcanic mountain of medium size (only slightly over 1000 m elevation), has the precedent of *G. terrestre* Copel. which has been collected only from Mt Makiling in south-central Luzon. Like *G. coadunatum*, *G. terrestre* is a forest shade plant surviving only as a few local populations.

**ACKNOWLEDGMENTS**

We are grateful to the directors and curators of MICH, MU, and PNH for their cooperation. This paper is partly derived from JFB’s project with the National Museum of the Philippines as well as her Master's thesis at the University of Santo Tomas, Manila. A thesis grant was provided by the National Research Council of the Philippines. Further thanks are given to Dr Romualdo M. del Rosario and JFB's thesis committee members, to the people of Batan Island, especially Mrs. Asuncion Fajardo and family, for their accommodation in Basco, and to Teodoro Baldimoro, Christy and Manuel Cordel and Leopoldo Villegas for their assistance in the field.

**REFERENCES**

