

# REINWARDTIA

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*BULLETIN DU JARDIN BOTANIQUE DE BUITENZORG*  
(*BULLETIN OF THE BOTANIC GARDENS, BUITENZORG*)

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## FURTHER NOTES ON THE FERN-GENUS HETEROGONIUM PRESL

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In the "Sarawak Museum Journal," volume V (1949), pages 156-166, I gave a revised account of the genus *Heterogonium* Presl, based on specimens in the Singapore herbarium. Dr M. A. Donk wrote subsequently pointing out that specimens at Bogor (Buitenzorg) add materially to the information contained in that paper. The present paper gives the result of a study of the Bogor specimens. I am glad to express my gratitude to Dr Donk for calling my attention to species which I had overlooked when searching literature on Malaysian ferns for indications of affinity to *Heterogonium*.

The Bogor material includes the type specimens of *Acrostichum teysmannianum* Bak., *Phegopteris schizoloma* v. A. v. R., *Dryopteris sagenoides* forma *contracta* v. A. v. R., *Polybotrya nieuwenhuisii* Racib. and *Polybotrya nieuwenhuisii* var. *brooksii* v. A. v. R., also many sheets of *H. giganteum*, and material of *H. sagenoides* from a wider geographic range than I had previously seen.

Summarizing the results of the present paper, I have united *H. nieuwenhuisii* and *H. stenosemioides* of my former paper, and have also united *H. saxicola* with *H. giganteum*. Further, I now recognize a second exindusiate species allied to *H. sagenoides*; but the variation in pubescence among exindusiate specimens, as within the species *H. sagenoides* proper, is very considerable, and I find it very difficult to draw specific limits. It is likely that there are local races, but much more field work in many localities is necessary before one can speak with certainty about this or define their status taxonomically. One interesting fact is that no exindusiate specimens of this alliance have been found in the Malay Peninsula, whereas Peninsular collections of indusiate *H. sagenoides* are more abundant than from any other area. It is especially the variation in pubescence among specimens of *H. sagenoides*, and the lack of clear-cut varieties or subspecies within the Malay Peninsula, that deters me from distinguishing more species outside the Peninsula, based on few specimens. Another generalization based on many specimens is that fertile fronds are always much less hairy on the lower surface than sterile fronds of the same plant. As regards another kind of character, namely venation, I have noted that fronds of immature plants may not show the low

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attachment of the basiscopic veinlets characteristic of this genus and *Tectaria*.

## REVISED KEY TO THE SPECIES OF HETEROGONIUM

1. Veins free
  2. Sori indusiate. . . . . 1- *H. sagenoides*
    3. Lower surface of veins and costules hairy; sterile pinnae lobed to 2—3 mm from costa . . . . . typical form
    3. Lower surface of veins and costules glabrous; sterile pinnae lobed to 4—5 mm from costa . . . . . forma *contracta*
  2. Sori without indusia
    4. Fertile pinnae not acrostichoid; sori separate from each other . . . . . 2. *H. teysmannianum*
    4. Fertile pinnae acrostichoid, or at least some sori confluent
      5. Fronds to at least 70 by 30 cm . . . . . 2. *H. teysmannianum*
      5. Fronds not over 25 cm long . . . . . 3. *H. stenosemioides*
1. Veins anastomosing
  6. Fertile fronds acrostichoid or subacrostichoid
    7. Sori indusiate . . . . . 4. *H. alderwereltii*
    7. Sori not indusiate. . . . . 5. *H. pinnatum*
  6. Fertile fronds with distinctly separate sori which do not almost or entirely cover the lower surface
    8. Sori elongate, exindusiate
      9. Veins anastomosing in costal and costular arches only . . . . . 6. *H. aspidioides*
      9. Veins more copiously anastomosing . . . . . 7. *H. profereoides*
    8. Sori round, rather large, or only slightly elongate, apparently sometimes indusiate. . . . . 8. *H. giganteum*

I. *H. SAGENOIDES* (Mett.) Holtt. in Saraw. Mus. Journ. 5: 161. 1949.

This species is very variable in the shape of its pinna-lobes, and somewhat in its hairiness, even among plants growing in the same locality. Fertile fronds are always much less hairy than sterile. Sterile fronds have scattered hairs on the upper surface, sometimes also with numerous shorter papillae, and the costae are densely hairy; the lower surface normally has longer slender hairs on costae, costules and veins only, but specimens from Ginting Simpah (S.F.N. 31192, Holttum) have very finely hairy surfaces between the veins, in sterile fronds only.

Forma *contracta* v. A. v. R. in Bull. Buitenz. Sér. III, 2: 147. 1920.

Differs from the typical form of the species as follows: pinnae of sterile fronds lobed to 4—5 mm from the costa, the lobes commonly 5 mm wide; lobes of fertile pinnae about 2.5 mm wide, widely spaced; lower surface, veins and costules of sterile pinnae quite glabrous, costae bearing sparse very short hairs only, upper surface of costae bearing copious very short hairs, surface glabrous except for a small group of very short hairs at each sinus.

DISTRIBUTION.—Only known from Sibolangit in Sumatra (between Medan and Brastagi); the specimens are remarkably uniform.

Lörzing 5520, 5529, 6339 (all Herb. Bog.); S.F.N. 6iU (Md Nnr).

If this proves as distinct as these specimens indicate, it may rank as a distinct species, or at least as a distinct variety of *H. sagenoides*. Pending further information about the latter species in Sumatra however, it seems preferable not to propose a new name or new status for these specimens.

2. *H. teysmannianum* (Bak.) Posthumus (MS in Herb. Bog.), *comb. nov.*  
Basynym: *Acrostichum teysmannianum* Bak. in Malesia 3: 56. 1886.

*Polypodium obscurum* Hook., Sp. Fil. 4: 237. 1862 (not *P. obscurum* Mett. 1857).  
— *Phegopteris obscura* Chr. in Bull. Herb. Boiss. 6: 196 t. 5. 1898.

*Acrostichum teysmannianum* Bak. in Malesia 3: 56. 1886. — *Stenosemia teysmannianum* Diels in Eng. & Pr., Nat. Pflanzenfam. 1/4: 198. 1899.

*Phegopteris schizoloma* v. A. v. R. in Bull. Buitenz. Sér. II, 16: 24. 1914.

*Polybotrya nieuwenhuisii* var. *brooksii* v. A. v. R. in Bull. Buitenz. Sér. II, 23: 19. 1916.

The type collection of this species, made by Teysmann in Sumba, is a rather large fern, with sterile fronds (excluding stipes) some 70 cm long and 30 cm wide, the middle sterile pinnae rather more than 3 cm wide and lobed to 2 mm from the costa with lobes 4—5 mm wide, the lobes of fertile pinnae about 12 mm long and 2 mm wide, completely covered beneath with sporangia; the pubescence is slight, about as in *H. sagenoides* forma *contracta*. From the island of Sumba also is a collection by Iboet (no. 314) with fronds somewhat smaller in all parts and the sori mostly separate, not acrostichoid; the pubescence is like that of the type.

The type of *Phegopteris schizoloma* (northern part of S.E. Borneo, Bukit Sungai Tempilan, Amdjah 595) is very similar in all respects to Iboet 314 except that it is slightly hairy all over the lower surfaces, with fairly long hairs in costae and costules; the sori are mostly separate but the distal ones on some lobes coalesce to a subacrostichoid condition.

*Polybotrya nieuwenhuisii* var. *brooksii* v. A. v. R. (Bencoolen, Brooks 195/S) from South Sumatra is similar in general aspect to the type of *P. schizoloma*, but is nearer a fully acrostichoid condition, with rather longer hairs on costae and costules of the lower surface of sterile fronds but no hairs on the upper surface.

The type of *Polypodium obscurum* Hook. (as figured in Hook. & Bauer, Gen. Fil. t. 9U, fig. 5, 6) had quite separate sori, but evidently did not differ in frond form from all the above; the specimen came from Leyte (Cuming 302, not seen).

In view of the lack of sharply distinguishing characters between the above specimens, I think it best to unite them, and the oldest epithet which can be used is "teysmannianum." I have provisionally kept *H. stenosemioides* separate, though perhaps further collections will show intermediates between it and the specimens above discussed; possibly *Polybotrya nieuwenhuisii* var. *brooksii* is such an intermediate.

8. *H. STENOSEMIOIDES* (Bak.) C. Chr.; Holtt. in Saraw. Mus. Journ. 5: 161. 1949.

*H. nieuwenhuisii* (Racib.) C. Chr.; Holtt., l.e.

The type collection of Baker's species is not at Singapore, but we have a specimen from the type locality (Mt Matang) by E. S. Hose, and one from Mt Gading collected by Bishop Hose and labelled "stenosemioides n. sp." The Matang specimen has rather many scattered hairs on the upper surface, the (smaller) Gading specimen has few, but they are not confined to the sinuses, and I see no other difference. Kloss's specimen from Bettotan (see below) is closely similar to that from Matang.

The type of *H. nieuwenhuisii* was a plant cultivated at Bogor (Buitenzorg), brought from Borneo by Nieuwenhuis. The type specimen shows only quite small fronds (including fertile ones). Later specimens taken from the same plant have larger fronds, and are closely similar to the specimens of *H. stenosemioides* above mentioned, but the upper surfaces have no hairs except near the sinuses. The specimens collected by Amdjah, referred to this species at Bogor, are sparsely hairy on the upper surface, and Winkler's specimen is more hairy. It seems therefore that in this species hairiness of the upper surface is variable; and in any case such hairiness does not constitute a difference between *H. stenosemioides* and *H. nieuwenhuisii*. As noted under *H. teysmannianum*, var. *brooksii* may be an intermediate bridging the gap between *H. teysmannianum* and *H. stenosemioides*.

BORNEO: Cult. H. Bot. Bog. 2 K. XIII. 2: *Nieuwenhuis* (several specimens); northern part of S. E. Borneo: Bukit Sungai Tempilan, Amdjah 576; Bukit Ulu Sebulu, Amdjah 414; between Kundim Baru and Batu Bali, Hubert Winkler 2761; British North Borneo: near Sandakan, Kloss s.n.

4. *H. ALDERWERELTII* Holtt. in Saraw. Mus. Journ. 5: 163. 1949.

I have now examined the type of *Pleocnemia stenosemioides* v.A.v.R., on which this species was based. The sori are indusiate, in which the specimen differs from *H. pinnatum*, but the specimen is smaller than the Peninsular specimens upon which my description was based. I still think this is a good species, but one ought to get specimens and grow them side by side with *H. pinnatum*.

5, 6, 7. *H. PINNATUM*, *H. ASPIDIODES* and *H. PROFEREOIDES*.

The Bogor (Buitenzorg) specimens add no significant information concerning these species.

8. *H. GIGANTEUM* (Bl.) Holtt. in Saraw. Mus. Journ. 5: 166. 1949.

*H. saxieola* (Bl.) Holtt., l.e., with synonyms.

There are ten collections of this species in the Bogor (Buitenzorg) herbarium; in three of these there are indications of the presence of in-

usia, but in no case are the indusia well preserved. Apart from the indusia, I can see no clear distinction between these and the other specimens referred to *H. giganteum*; variation occurs in the shape and lobing of pinna-lobes among exindusiate specimens and does not appear to me significant. I therefore include all under the epithet "giganteum" (Backer and Posthumus have united the species and prefer this epithet; the two names *Aspidium giganteum* and *A. saxieola* were simultaneously published).

Specimens from outside Java at Bogor are: CERAM: Rutten 2210 (this has very large sori). — CELEBES: S. W. Celebes, Lambasing, Biinnemeijer 11171.

DOUBTFUL SPECIMENS. — Two small specimens are not clearly referable to any of the above species, and might represent new species. I believe however that the specimens, though partly fertile, are immature as regards size, and it therefore seems undesirable to use them as types for the description of new species. The Celebes specimen has the lowest basicopic veinlets borne above the bases of the costae, but (as above noted) I think this may be a juvenile character.

The specimens are: CELEBES: S. Celebes, between Makassar and Maros, van Steenis 10432. — PHILIPPINES: Luzon, Irosin, Prov. Sorsogon, Elmer 17230.