New distributional records of *Arthromeris elegans* Ching in India and Bhutan and lectotypification of *A. himalayensis* (Hook.) Ching (Polypodiaceae)

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**Abstract**

*Arthromeris elegans* Ching (Polypodiaceae), a Sino-Himalayan species, is reported for the first time from India and Bhutan. A lectotype is designated for *A. himalayensis*.

**Introduction**


*Arthromeris elegans* Ching is known to occur naturally in N. Myanmar and S.W. China (Zhang et al. 2013). During a revisionary study of ferns of Eastern India, specimens examined at the Central National Herbarium, Howrah, India (CAL), and personally collected from Darjeeling, India (Figs 1, 2), supported the conclusion that *A. elegans* also occurs in India and Bhutan. This distinct species (see key below), is often misidentified in herbaria as *A. himalayensis* or as *A. lehmannii*, but is correctly maintained by Zhang et al. (2013). *Arthromeris elegans* has more than 4 pairs of narrower lanceolate pinnae (Fig. 1), and sori in up to 2 (rarely 3) rows close to the costa (Fig. 2). In contrast to this, *A. himalayensis* has up to 4 pairs of wider ovate-lanceolate pinnae, and sori in 3 or more rows extending to the margin. Type specimens (syntypes) of *A. himalayensis* from Bhutan (held at B and K) are *A. elegans*. Lectotypification of *A. himalayensis* is designated below to clarify the application of this name.

*Arthromeris lehmannii* has pinna with caudate-acuminate apices, small scattered sori, and narrow or indistinct cartilaginous margin, whereas, *A. elegans* has pinnae with prominent cartilaginous margins, long caudate apices and large sori near the costa (Fig. 2).

One collection from Darjeeling (*Mazumdar 178*) has lamina that are hairy on the abaxial surface and rhizome scales that have a ciliate margin, thus resembling *A. elegans* Ching f. *pianmaensis* S.G.Lu (Lu 1998). However, the present author has not yet examined sufficient specimens necessary to comment on the distinctness of this forma.
Arthromeris elegans is morphologically close to A. himalayensis in having a similar caudate pinna apex and cartilaginous margin. The species is a Sino-Himalayan element that has reached Eastern India, Bhutan and N. Myanmar from S.W. China.

Taxonomic treatment

Arthromeris elegans Ching, Sunyatsenia 6: 8 (1941).

Type: China, Yunnan, Mekong-Salwin Divide, Londjrela, 3600 m, upon trunk of trees, 29 September 1938, T.T. Yü 23165 (Holotype: PE1048921, Isotype: PE1048919 – images!).

Description: Epiphytic on trees, Rhizome 4–5 mm wide, covered by dense scales; scales with darker centre and paler margin, ovate-lanceolate, wide at base; margin ciliate; apex acuminate. Fronds monomorphic, pinnate; stipe stramineous, glabrous, 11–18 cm long, 2 mm wide; lamina herbaceous, imparipinnate, 25–30 cm long, 18–21 cm wide, glabrous adaxially, sparsely hairy abaxially; lateral pinnae in 5–7 pairs (Fig. 1), opposite, sessile, lanceolate or narrowly elliptical, 10–14 × 2–2.5 cm, base rounded or cordate, cartilaginous margin prominent, apex long caudate. Sori orbicular, often confluent, up to 3 rows on each side of the costa, close to costa, in up to 2 rows between costules (Fig. 2).

Distribution: India (Arunachal Pradesh, West Bengal), Bhutan, China, Myanmar.

Specimens examined: INDIA. Arunachal Pradesh: Subansiri District, Anonymous 60864 (CAL); Arunachal Pradesh: Kameng F.D. (N.E.F.A.), Chalko, 1 Apr 1957, 8200 ft, G. Panigrahi 6321 (CAL); West Bengal: Darjeeling, Neora Valley, 3000 m, 2 Oct 1997, J. Mazumdar 178 (CAL, to be distributed, Fig. 1, 2). BHUTAN. W. Griffith s.n. (B200157576), Booth s.n. (K1044106, frond at right); Lisipong, 27 Oct 1965, N.P. Balakrishnan 44412 (CAL); Mar 1858, Anonymous s.n. (CAL22241).

Note: Types of A. elegans can be viewed on the PE website (http://pe.ibcas.ac.cn/en/).

Key to species of Arthromeris in India:

1a. Sori in one row on each side of costa

2a. Pinnae (at least in lower part of frond) stalked ................................................................. A. tenuicauda

2b. Pinnae sessile

3a. Rhizome scales with caudate apex ...................................................................................... A. tatsienensis

3b. Rhizome scales with acuminate apex ................................................................................ A. wallichiana

1b. Sori in more than one row on each side of costa

4a. Sori in single row in between costules ................................................................................ A. wardii

4b. Sori in more than one (commonly two) row between costules, or scattered

5a. Lateral pinnae in 1–4 pairs

6a. Rhizome scales dense, whitish ......................................................................................... A. tomentosa

6b. Rhizome scales sparse, brown .......................................................................................... A. himalayensis

5b. Lateral pinnae in more than 4 pairs

7a. Sori close to costa, pinna apex caudate ............................................................................. A. elegans

7b. Sori distributed up to margin, pinna apex caudate–acuminate

8a. Abaxial lamina glabrous .................................................................................................... A. mairei

8b. Abaxial lamina glabrous to hairy

9a. Costa not scaly ................................................................................................................. A. lehmannii

9b. Costa scaly ........................................................................................................................ A. cyrtomioides
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**Lectotypification**


**Specimens examined:** INDIA. West Bengal: Darjeeling, Gairibas, Singalila N. Park, 2620 m, 18 Sep 2002, A.K. Ghosh 31947 (CAL), Darjeeling, Upper Rimbier, Palmazwa block III-X, 2600 m, 28 May 1983, S.R. Ghosh 57636 (CAL), 2620 m, 28 May 1983, S.R. Ghosh 31947 (CAL), Darjeeling, Tonglu, Mighma, 15 May 1975, R.D. Dixit 52981 (CAL4568), Darjeeling, Tonglu, Gairibas, 10000 ft, 13 May 1975, R.D. Dixit 52954 (CAL4566); Sikkim: Chungthang, 2550 m, 26 Mar 1984, S.R. Ghosh 58359 (CAL, 3 sheets), Lachung, 9000 ft, 10 Sep 1892, G.A. Gammie 700 (CAL, 2 sheets).

Hooker (1863) proposed the name *Polypodium himalayense* as a replacement name for *Polypodium venustum* sensu Wall. (1829) non Desv. (1811) and in the protologue cited collections of Wallich (Catalogue no. 305) from Nepal, Griffith and Booth from Bhutan, Hooker & Thomson from Sikkim, India, and Simons from Khasia (Meghalaya, India).

An examination of the syntypes and Hooker’s (1863) description in protologue “sori vary, 1–2 biseriate between the costules, sometimes there is only one series parallel with the costa, sometimes 3–4” revealed that he had mixed four distinct species in his concept of *P. himalayense*, namely *A. elegans*, *A. himalayensis*, *A. lehmannii* and *A. wardii*. Here, for nomenclatural stability, a specimen held at B (J.D. Hooker s.n., B200157568), is selected as lectotype of *A. himalayensis* to restrict the application of the name to its current sense. Identities of the other syntypes are as follows:

1. *A. elegans*: Bhutan, W. Griffith s.n. (B200157576), Bhutan, Booth s.n. (K001044106, frond at right).
2. *A. himalayensis*: Bhutan, W. Griffith 2724 (K1044107, specimen at left).
3. *A. lehmannii*: Nepal, 1820, Wallich Cat. no. 305 (BM93793, K1109762; K1044108), Nepal, 1821, N. Wallich s.n. (BM1039689, K1044109).
4. *A. wardii*: Bhutan [‘Bhotan’], W. Griffith s.n. (B200146503).

For a long time, in the literature (see Beddome 1869: 318, t. 318; 1892: 372, Plate No. 212), *A. himalayensis* was depicted as a plant with an imparipinnate frond; pinnae up to 4 pairs, obovate-lanceolate, pinnae apex caudate, margin broad cartilaginous; rhizome with a whitish bloom and lower lamina with variable amount of hairs. An extreme form with densely hairy lamina has been recognised as *A. himalayensis* var. *niphoboloides* (C.B.Clarke) S.G.Lu (Lu 1998) but the present author considers this a synonym of *A. himalayensis* and not a distinct variety as cited by Zhang et al. (2013). It should be noted that Clarke (1880), himself, said that “there is a series of examples connecting this var. with the type.”

The name *A. venusta* (J.Sm.) J.Sm. is also based on Wallich Cat. no. 305 and has priority over *A. himalayensis*. However, specimens of Wallich Cat. no. 305 in K are actually *A. lehmannii* and Fraser-Jenkins (2008) correctly reduced *A. venusta* to the synonymy of *A. lehmannii*.

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Fig. 1. Specimen of *Arthromeris elegans* Ching (Polypodiaceae) from India (*J. Mazumdar 178*) showing habit.

Fig. 2. Part of specimen of *Arthromeris elegans* Ching (*J. Mazumdar 178*) showing shape of pinnae and soral arrangement.
References

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