

# **Asplenium aitchisonii Fraser-Jenkins & Reichstein spec. nova (Aspleniaceae, Pteridophyta)**

Autor(en): **Fraser-Jenkins, Christopher R. / Reichstein, Tadeus**

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*Asplenium aitchisonii* Fraser-Jenkins & Reichstein spec.  
nova (Aspleniaceae, Pteridophyta)

CHRISTOPHER R. FRASER-JENKINS  
&  
TADEUS REICHSTEIN

ABSTRACT

FRASER-JENKINS, C. R. & T. REICHSTEIN (1982). *Asplenium aitchisonii* Fraser-Jenkins & Reichstein spec. nova (Aspleniaceae, Pteridophyta). *Candollea* 37: 339-347. In English, German abstract.

An *Asplenium* found approximately a century ago by J. E. T. Aitchinson in the Kurram Valley, Afghanistan (now in Pakistan), has been recognized as a new species and is described as *A. aitchisonii* Fraser-Jenkins & Reichstein.

ZUSAMMENFASSUNG

FRASER-JENKINS, C. R. & T. REICHSTEIN, (1982). *Asplenium aitchisonii* Fraser-Jenkins & Reichstein spec. nova (Aspleniaceae, Pteridophyta). *Candollea* 37: 339-347. Auf English, deutsche Zusammenfassung.

Ein vor ca. 100 Jahren von J. E. T. Aitchison im Kurram Valley, Afghanistan (heute Pakistan), gefundenes *Asplenium* wird als neue Art erkannt und als *A. aitchisonii* Fraser-Jenkins & Reichstein beschrieben.

*Abbreviations* for herbaria according to Holmgren & Keuken: Index Herbariorum I Ed. 6. Utrecht 1974. TR means herb. T. Reichstein.

For the third article in this series, see: Reichstein & Schneller, "Asplenium pseudofontanum Kossinsky", *Candollea* 37: 117-128.

## 1. Introduction

The area of "Flora Iranica" (K. H. Rechinger Ed.) extends from N.-Iraq through Iran, Afghanistan and some adjacent mountain regions of the USSR to the western part of Pakistan, with the Indus as its eastern limit. The Flora of N.E. Afghanistan and N.W. Pakistan contains many Himalayan elements. When working on the ferns of this region, it was necessary to substantiate some of the indications found in the older literature. In a very interesting report on the Kurram Valley (situated between Afghanistan and Pakistan, but today almost entirely within the district of Kurram in Pakistan) AITCHISON (1881: 11) says that *A. varians* Wall. ex Hook. & Grev. (a typical Himalayan element) is frequent there. The senior author (TR) was only able so far to find specimens of a single collection: *Aitchison-256* in P with duplicates in other big herbaria. This material could meanwhile be identified as *Asplenium nesii* Christ, see CHING & REICHSTEIN (1981). For some time our joint efforts to find other Aitchison specimens under *A. varians* failed.

Fortunately the junior author (CRFJ) later (April 1979) found a further most interesting sheet in the Manchester Museum Herbarium (MANCH). It bears four fronds of an *Asplenium* new to us (see below and fig. 1a) and had been collected by J. E. T. Aitchison in 1879 in the mentioned region. The sheet carries the following label:

"*Asplenium varians* Hk. & Grev. (small form). From the Kurram Valley Afghanistan Coll. Dr. J. E. T. Aitchison Dec. 1879" (written in ink in Entwhistle's hand, with annotation "Manchester Museum Herbarium Kk 1255"). We are most grateful to D. W. Franks, the keeper of the herbarium, for identifying Entwhistle's handwriting and for providing us with the following information on the history of the specimen:

"In the 1870's J. Entwhistle was gardener in charge of herbaceous plants at Kew. Whenever specimens from abroad for cultivation or sowing came to Kew, he received them and usually removed some leaves and kept them in his herbarium. He later moved to Manchester where he was headgardener at the Manchester Botanic Garden. His herbarium went first to Stockport Museum and was later transferred to the Manchester Museum."

During a fern hunting expedition to India and Pakistan in 1978, CRFJ was able to locate the same species in Kashmir and Himachal Pradesh (see below). We were therefore able to study it in some detail, and living progeny raised at Basel from spores permitted cytological

examination and other experimental work to be carried out (publ. in prep.). This taxon has also been identified among the collections in the following herbaria: B, BM, DD, FI, K, M, MICH, P and TI (see below). It was usually classified as *A. varians*; sometimes otherwise, but, as far as we are aware (see also the list of consulted literature), it has never been recognized as a distinct species, which it undoubtedly is. We therefore describe it as:

2. ***Asplenium aitchisonii* Fraser-Jenkins & Reichstein, spec. nova. Typus:** 21.VIII.1978, C. R. *Fraser-Jenkins* 7473 holotype BM; isotypes G and Herb. TR-4887.

#### *Locus*

N. India, Kashmir, Liddar Valley, non-calcareous cliff, facing W., on E.-side of the upper Chatpotsal Nullah, near Bajipath, N.E. of Pahlgam, 3400 m alt., 21.VIII.1978

#### *Derivatio*

Dedicated to J. E. T. Aitchison (1836-1898), British botanist and physician who made large collections in India (1861-1872) and in Afghanistan (1879-1883) (see Stafleu & Cowan 1976: 24) and who collected the specimen mentioned above (four fronds, two of which are represented in Fig. 1a).

#### *Diagnosis*

Rhizoma breve, adscendens vel erectum, apice squamis obscuris, clathratis, acuminatis, 3-5 mm longis vestitum. Folia numerosa, caespitosa, maturitate circ. 2-15 cm longa, circ. 0.6-3 cm lata. Petiolus laminam plus minusve aequans, tantum per 2-15 mm basales obscurus, praeterea viridis ut lamina, basi squamis caespitosis iis rhizomatis similibus, superne diffusis, piliformibus, dimidium rhachidis attingentibus. Lamina longa, circumscriptione deltoidea vel lanceolata, infra bipinnata, paribus pinnarum suboppositarum vel alterantium 3-8(-10), apice pinnatifida. Pinnae dimidii inferioris breviter stipitatae, petiolulis ca. 0.5-2(-3) mm longis. Pinnae paris infimi vel secundi maximae, saepe pinnulis lateralibus duabus et apice magno, lato, profunde pinnatifido. Segmenta ulteriora basi cuneiformi, apice rotundato, dentibus acutis ca. 3-5(-7). Sori more 1-3 pro segmento, ca. 2-3 mm longi, dimidium vel partes duas basales obtegentes. Sporae magnae, exosporio (30-)36-42(-45)  $\mu$ m longo, perisporio

brunneo, irregulari, usque ad circ. 8  $\mu\text{m}$  protrudente. Numerus chromosomaticus  $2n = 288$  (octoploideus).

### *Description*

Perennial herb, evergreen [if not damaged by weather conditions]. Rhizome short, erect to ascending, its apex clothed with dark-brown, clathrate, ovato-lanceolate scales, ca. 3-5 mm long, without dark middle stripe, often bearing a few horn-like appendices, ca. 0.1-0.3 mm long at their margins. Fronds bright or somewhat dark-green, numerous, tufted, ca. 2-15 cm long and ca. 0.6-3 cm wide when mature. Stipes usually  $\pm$  as long as the lamina but sometimes only  $1/3$  as long or occasionally a little longer than the blade, dark only for ca. 2-15 mm at their base, green (like the rachis) higher up, ca. 0.3-1 mm thick, at their base with a tuft of scales like those on the rhizome apex, which become scattered and narrower higher up with a few hair-like ones extending to halfway up the rachis. Blade herbaceous, elongated-deltate or lanceolate in outline, widest at its base or a little above, bipinnate in the lower part with ca. 3-8(-10) pairs of subopposite and alternate pinnae which become  $\pm$  confluent at the tip of the frond. The lowest pinnae shortly stipitate with stalks of ca. 0.5-2(-3) mm in length, the upper ones sessile. Lowest or second pair of pinnae the largest, ca. 3-12(-18) mm long and  $\pm$  equal in width, the two lowest pairs remote (ca. 0.5-2 cm) from each other, each of these bigger pinnae usually bearing two pinnules and a broad deeply pinnatifid tip, smaller pinnae pinnatifid and entire; ultimate segments with a cuneiform base and roundish outline at their apex which is cut into ca. 3-5(-7) acute teeth, directed towards the tip of the segment. Sori usually 1-3 in number, ca. 2-3 mm long, covering the lower half or  $2/3$  of the last segments. Spores large, bean-shaped, with the exospore (30-)36-42(-45)  $\mu\text{m}$  long and irregular brown perispore protruding up to ca. 9  $\mu\text{m}$  in equatorial sight. Sexual octoploid. Chromosome number  $2n = \text{ca. } 288$ , forming ca. 144 regular pairs at meiosis (Schneller & Reichstein, 1983).

### *Paratypes*

“Afghanistan“ (today most probably in Kurram district, Pakistan), Aitchison, Dec. 1879, see above (MANCH).

**India.** Kashmir, from the same place and date as the holotype *C. R. Fraser-Jenkins-7474*, 7475 and 7476. One of these (No. 7475) will be deposited at G.

N.-W. India. Himachal Pradesh. *C. R. Fraser-Jenkins-7794* and 7795 rock overhung, ca. 10 km below Satrundi, N. of Tissa, N. of Ravi Valley, ca. 2900 m alt., 10.9.1978 (BM). Progeny (*TR-4991* and 4992) raised in Basel.

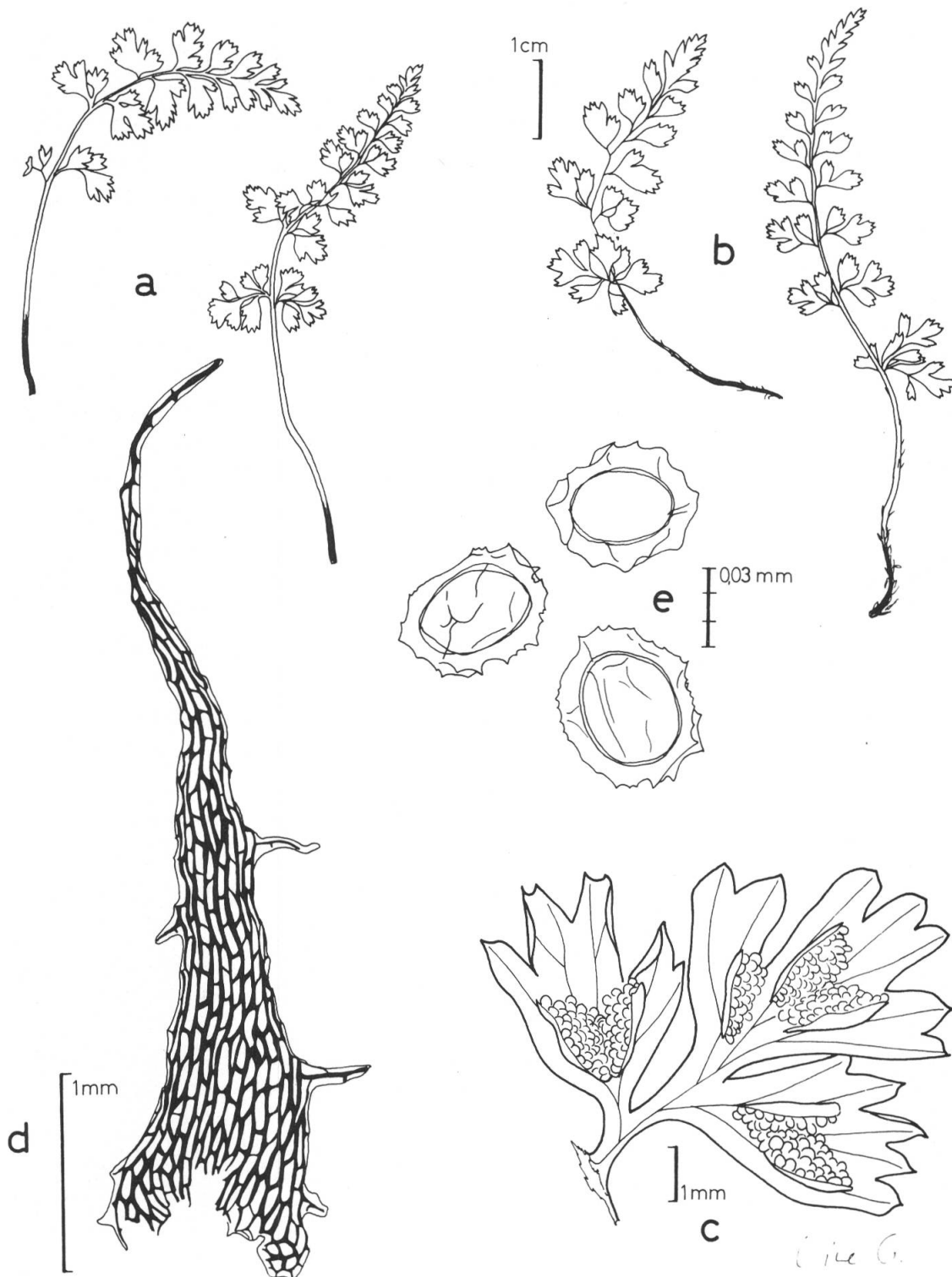


Fig. 1. - *Asplenium aitchisonii*.

a, two fronds of Aitchison's collection, KK-1255 (MANCH) natural size; b, two fronds of C. R. Fraser-Jenkins 7473; c, pinna enlarged ( $\times 7$ ) (second from b, right); d, rhizome scale enlarged ( $\times 25$ ); e, spores ( $\times 333$ ).

N.-W. India. *J. F. Duthie-398*. Tehri-Garhwal. Near Jaulea under Srikanta, 12-13 000', 7. Aug. 1883. Under *A. varians* (DD), (K).

N.-W. India. *J. F. Duthie-402*. Tehri-Garhwal, Ganges Valley, Ridge above Jangla, 11-12 000', 27. July 1883. Under *A. varians* (DD), (K).

N.-W. India. *J. F. Duthie-3639*. Kumaun. Kali Valley in Byans, 9-10 000', 19.IX.1884. Under *A. varians* (DD), (G), (K).

N.-W. India. *T. T.* (s.n.) Herb. Ind. Or. Hook. fil. & Thomson. Bath, Sol near Iskardo, Indus Valley. Under *A. varians* (K).

N.-W. India. Falconer. Herb. *G. Mettenius* (s.d.). Not quite typical. Under *A. varians* (M).

Ind. coll. *H. & T. No. 178*. Herb. John Smith sub *A. varians* (BM).

Baltistan. *J. F. D. 11916*. Swaran Nullah Vattu (?) 10-11 000', 7.VII.1892. Under *A. fontanum*, poor specimen, not quite certain (DD).

**Bhutan.** *H. Hara, H. Kanai, G. Murata, H. Ohashi, O. Tanaka & T. Yamazaki-6615* (Third Bot. Exp. to East. Himalaya 1967). Shodu (3800)-Barshong (3500). 24.V.1967 (BM, TI). Spores good large (TR-5129), but gave no progeny when sown 7.10.1979 in Basel.

**China.** *Harry Smith-1978*. Prov. Sze-ch'uan, reg. aust., Mellan Kaitangoch Pinyi-pu; Kleppe 24.V.1922. Under *A. varians* (BM).

*Harry Smith-3637*. Prov. Sze-ch'uan, reg. bor. occid. Dongrergo = Hsioch-pao-tung Kleppe. 22.VII.1922. Under *A. varians* var. *stip. longissimis* (BM).

*Harry Smith-4289*. Prov. Sze-ch'uan, reg. bor. occid., ca. 40 km N. of Sankar vou mâ. 5.IX.1922. Under *A. varians* (BM).

**S. Tibet.** *F. Ludlow & G. Sherriff 1311*. Trimo, Nyan Zang Chu, 10 500 ft. alt., 11.IV.1936. Under *A. exiguum* (BM).

**S.-E. Tibet.** *F. Ludlow, G. Sherriff & G. Taylor-3818*. Kongbo Prov. Molo. Longong Chu. Lat. N. 28°57' Long. E. 93°57', alt. 11 500 ft., 23.V.1938. Under *A. varians* (BM).

*F. Ludlow, G. Sherriff & G. Taylor-4158*. Takpo Prov. Lhapse Dzong, Tsangpo Valley. Lat. N. 26°6' Long. E. 92°32', 11 650', 9.V.1938. Under *A. varians* (BM).

*F. Ludlow & G. Sherriff-6507*. Kongbo Prov. Kulu Phu Chu, near Paka. Lat. N. 29°8' Long. E. 94°17', alt. 11 000', 21.IX. 1938. Under *A. varians* (BM).

*Note:* a small conspicuous *Asplenium* with long wiry stipe, in gross morphology reminiscent of *A. daghestanicum* Christ and *A. capillipes* Makino (but with acute teeth and no proliferous buds) occurs in Tibet and in N. India. It may be a distinct form of *A. aitchisonii* from high altitudes or another related but distinct species. Living material or viable

spores would allow experimental study to settle this question. Typical specimens of this taxon are as follows.

**N.-W. India.** *J. F. Duthie-3638*. Kumaun, rock above Garbyang (?) in the Kali Valley, 12 000', 15.IX.1884. Under *A. varians* (DD), (FI).

Coll. *T. T. Herb. Ind. Or. Hook. fil. & Thomson*. Kashmir. Regio temp. alt. 6000 ft. Under *A. varians* (B), (P).

*R. L. Fleming XXXX*. Pindari Glacier road on rocks, alt. 10 000', June 1943. Under *A. varians* (MICH).

**Tibet.** Frontier comission 1903. Coll. *Major F. E. Younghusband-143*. Rhambajong, 26.VII.1903 (K).

*Affinities*

Based on morphology *A. aitchisonii* is obviously a member of the *A. varians* group. It differs from *A. varians* Wall. ex Hook. & Grev. (publ. in prep.), i.a. in two characteristics (see Table 1).

	<i>Largest pair of pinnae</i>	<i>Spore size length of exospore</i>
<i>A. aitchisonii</i> .....	often the lowest otherwise the second	(33-)36-42(-45) μm
<i>A. varians</i> .....	second or third	(30-)33-36(-39) μm
Table 1		

For the difference in chromosome number see Schneller & Reichstein (in prep.). A hybridization program has been started (*A. Sleep* in prep.) with the aim to investigate the genetic relations within the whole *A. varians* group.

*Distribution and ecology*

The species seems to be scattered throughout the Himalayas growing on shaded rocks at altitudes of ca. 2000-4000 m. It seems to occur both on limestone and silicates but precise information is lacking. In cultivation it grows equally well in lime-free and in calcareous soil.



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Addresses of the authors: C. R. F.-J.: c/o British Museum (Nat. Hist.), Botany Department, Cromwell Road, London SW7-58D.

T. R.: Institute of Organic Chemistry, 19 St. Johannis-Ring, CH-4056 Basel.

