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NEW FERN RECORDS FOR KILIMANJARO

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ABSTRACT

Working on the flora and vegetation of Mt Kilimanjaro, Tanzania, 17 ferns in 10 families were found that had not yet been recorded for the floral region T2. The altitudinal range, localities and habitat description are given for *Adiantum raddianum*, *Asplenium bugoiense*, *Blechnum ivohibense*, *Blotiella stipitata*, *Dryopteris antarctica*, *D. fadenii*, *Sticherus flagellaris*, *Hymenophyllum splendidum*, *Trichomanes borbonicum*, *T. chevalieri*, *T. ramitrichum*, *T. rigidum*, *Elaphoglossum spathulatum*, *Lomariopsis warneckei*, *Pneumatopteris unita*, *Sphaerostephanos unitus* and *Xiphopteris* spec. A.

INTRODUCTION

The Flora of Tropical East Africa fascicle on ferns has not yet been published. Up to now only a preliminary checklist of Pteridophytes (Johns, 1991) exists. While working on the flora and vegetation of Mt Kilimanjaro, a total of over 130 ferns and fern allies have been found so far. Some of these ferns are very rare in East Africa and not yet recorded for the floral region T2.

Most of the ferns show a very distinct altitudinal distribution. The area with the highest richness in ferns is the montane rain forest on the southern slopes, especially between 2000 and 2300 m, followed by the plantation belt. The abundance of ferns decreases abruptly above 2900 m and below 1100 m. A study about the altitudinal range and ecology of ferns on Mt Kilimanjaro is in preparation.

In this paper, ferns new for the floral region T2 are arranged by family. Their habitat and ecological demands as observed on Mt Kilimanjaro are briefly described. The nomenclature follows Faden (1994) and/or Johns (1991). Vouchers have been deposited in the East African Herbarium Nairobi (EA) and the Berlin Botanical Museum Herbarium, Germany (B) as well as in Kew Herbarium, England (K).

NEW RECORDS FOR THE FLORAL REGION T2

Adiantaceae

Adiantum raddianum Presl

Voucher: Hemp 190.

Altitudinal range: 890–1,900 m (main range 1,000–1,800 m).

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Habitat: humid places in the plantation belt, mostly near irrigation canals.
Localities: common on the southern slopes of Mt Kilimanjaro.
Discussion: Faden (1994) lists only one locality, at an altitude of 1,460 m. Johns (1991) gives a range of 900 to 1,500 m in U4, K4 and T3 while for the area of the *Flora Zambesiaca* (Schelpe, 1970) *A. raddianum* has been found from 910 to 1,310 m.

Aspleniaceae

Asplenium bugoiense Hieron.
Vouchers: Hemp 911, 1109.
Altitudinal range: 1,630–1,900 m.
Habitat: very humid and shady places in riverine forests.
Localities: not common, found only at eight localities (Kikafu River, Weru-Weru River, Mweka -, Kidia -, Maua -, Umbwe - and Uru area).
Discussion: Faden (1994) gives altitudes of 2,000 to 2,200 m and Johns (1991) 1,830 to 2,400 m. Also recently mentioned from one collection at Mt Kilimanjaro by Schippers (1993). *A. bugoiense* is not listed in Schelpe (1970).

Blechnaceae

Blechnum ivohibense C. Chr.
Vouchers: Hemp 1115, 1140, 1206.
Altitudinal range: 1,640–2,240 m.
Habitat: upper and drier parts of gorge forests (*Ocotea*-forest).
Localities: growing in big colonies, but found only in the valleys of Kikafu - and Weru-Weru River and above Mweka.
Discussion: In Kenya this fern is known from only one locality (Faden, 1994). According to Johns (1991) *B. ivohibense* occurs in the floral regions T3, T6 and T7 between 1,400 and 2,400 m. In Schelpe (1970) *B. ivohibense* is recorded at an altitude of ca 1,830 m.

Dennstaedtiaceae

Blotiella stipitata (Alston) Faden ssp *angustisima* Faden
Voucher: Hemp 624.
Altitudinal range: 1,780–2,300 m (main range 1,900–2,200 m).
Habitat: montane rain forest (*Ocotea*-forest).
Localities: common in medium altitude montane forests.
Discussion: Faden (1994) gives a range of 1,800–2,300 m and Johns (1991) 1,400 to 2,300 m. Also recently mentioned from Mt Kilimanjaro by Schippers (1993). Not listed by Schelpe (1970).

Dryopteridaceae

Dryopteris antarctica (Bak.) C. Chr. (=*Dryopteris callolepis* C. Chr.)
Voucher: Hemp 510.
Altitudinal range: 2,500–3,500 m.
Habitat: *Erica excelsa*-forest, grassland.
Localities: common at upper altitudes.
Discussion: Faden (1994) gives altitudes of 2,550 to 3,150 m and Johns (1991) 2,900 to 3,150 m. According to Schelpe (1970) *D. callolepis* is found at ca 1,980 m. Also recently mentioned from one collection at Mt Kilimanjaro by Schippers (1993).

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Dryopteris fadenii Pic. Serm.
Vouchers: Hemp 913, 978, 993, 1077, 1112.
Altitudinal range: 1,600–3,100 m (main range 1,600–2,800 m).
Habitat: montane rain (*Ocotea*-) forest.
Localities: common, occurring from the lower to the upper forest parts.
Discussion: Faden (1994) gives altitudes of 2,050 to 2,550 m and Johns (1991) 1,800 to 2,100 m. Also recently mentioned from Mt Kilimanjaro by Schippers (1993). Not listed by Schelpe (1970).

Gleicheniaceae
Sticherus flagellaris (Willd.) Ching (=*Gleichenia umbraculifera* (Kunze) Moore)
Voucher: Hemp 1666.
Altitudinal range: 1,880 m.
Habitat: shady rock crevices.
Localities: found only once at Weru-Weru River.
Discussion: this rare fern was reported in East Africa only from the floral region T6, at an altitude of 1,800 m (Faden, 1994). Schelpe (1970) gives altitudes of 1,220 to 1,830 m. The specimens of Mt Kilimanjaro probably belong to a new variety.

Hymenophyllaceae
Hymenophyllum splendidum Bosch (=*Sphaerocionium splendidum* (Bosch) Copel.)
Vouchers: Hemp 974, 975, 1118.
Altitudinal range: 1,880–2,350 m (main range 1,900–2,200 m).
Habitat: moist shady rocky banks and epiphytic in the lower and middle parts of *Ocotea*-forests.
Localities: southern slopes of Mt Kilimanjaro, not common.
Discussion: Faden (1994) gives altitudes of 2,000 to 2,300 m and Johns (1991) 1,500 to 2,100 m. In Schelpe (1970) *H. splendidum* is not listed.
Trichomanes borbonicum Bosch
Vouchers: Hemp 899, 1119, 1202, 1386, 1387, 1607.
Altitudinal range: 1,820–2,310 m.
Habitat: moist shady boulder faces and epiphytic in the lower and middle parts of *Ocotea*-forests.
Localities: southern slopes of Mt Kilimanjaro, found at six localities (Kidia - and Machame area, Kikafu -, Weru-Weru -, Umbwe - and Namwi River), not common.
Discussion: Faden (1994) gives altitudes of 2,300 to 2,600 m and Johns (1991) 1,400 to 2,400 m. According to Schelpe (1970) *T. borbonicum* is found between 1,500 and 1,900 m.
Trichomanes chevalieri Christ. (=*Vandenboschia chevalieri* (Christ) Kunkel)
Vouchers: Hemp 798, 918, 1160.
Altitudinal range: 1,300–1,920 m.
Habitat: moist shady boulder faces and epiphytic in gorge forests and in the lower parts of *Ocotea*-forests.
Localities: southern slopes of Mt Kilimanjaro, found at four localities (Kidia -, Mweka -, Kikafu - and Siha area), not common.
Discussion: Faden (1994) gives altitudes of 1,460 to 2,100 m and Johns (1991) 1,470 to 1,800 m. Not listed by Schelpe (1970).

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Trichomanes rigidum Sw. (=*Selenodesmium rigidum* (Sw.) Iwatsuki)
Voucher: Hemp 1376.
Altitudinal range: 2,000 m.
Habitat: moist shady rocky bank near a stream.
Localities: very rare fern, found only once at Weru-Weru River.
Discussion: only recorded from the floral regions T3 and T6 (Johns, 1991). Schelpe (1970) gives altitudes of 1,370 to 1,890 m.

Trichomanes ramitrichum Faden (=*Vandenboschia ramitricha* (Faden) Pic. Serm.)
Vouchers: Hemp 703, 854, 1210.
Altitudinal range: 1,600–1,900 m.
Habitat: moist shady rocky banks and epiphytic in the lower parts of *Ocotea*-forests.
Localities: found above Kidia (Old Moshi) and at Weru-Weru River.
Discussion: Faden (1994) gives altitudes of 1,620 to 2,100 m and Johns (1991) 1,250 to 2,140 m. Not listed by Schelpe (1970).

Lomariopsidaceae

Elaphoglossum spathulatum (Bory) Moore (fig. 1)
Vouchers: Hemp 1123, 1587.
Altitudinal range: 1,630–1,700 m.
Habitat: lithophytic on bare boulders in stream beds, even in full sun (poikillohydr!).
Localities: rare, found only in Weru-Weru - and Kikafu River systems.

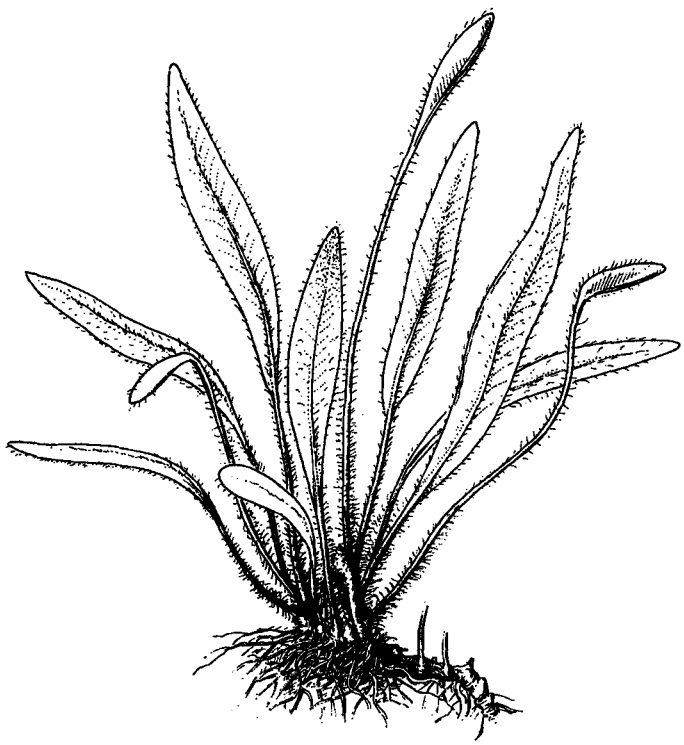


Figure 1: Elaphoglossum spathulatum, *growing on boulders in stream beds (x 1.3).*

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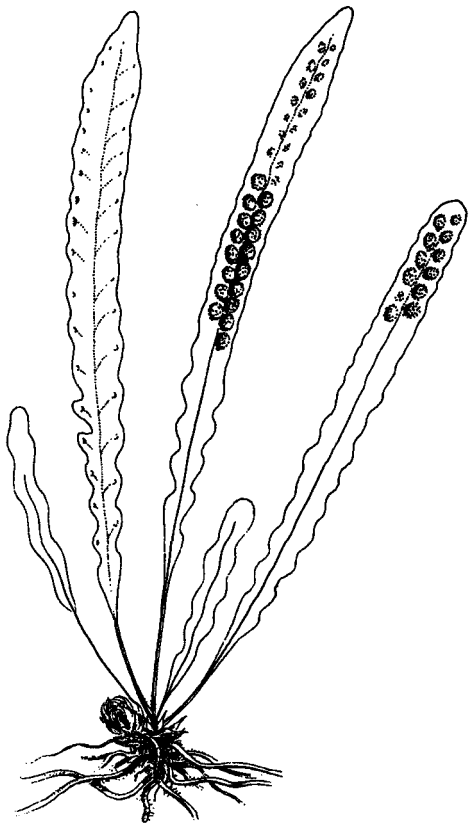


Figure 2: The tiny Xiphopteris *spec. A was only found once at Kikafu river of Mt Kilimanjaro (x 1.5).*

Discussion: Faden (1994) records only one locality in Kenya with an altitude of 2,450 m. According to Johns (1991) *E. spathulatum* grows between 1,710 and 2,450 m, according to Schelpe (1970) between 970 and 2,135 m.

Lomariopsis warneckei (Hieron.) Alston

Vouchers: Hemp 880, 906, 923, 1159, 1593.

Altitudinal range: 1,650–1,900 m.

Habitat: moist shady rocky bank near streams.

Localities: rare, found only in Ngari Nairobi - and Kikafu River systems and above Kidia and Mweka.

Discussion: Faden (1994) gives altitudes of 1,600 to 1,900 m, Johns (1991) 960 to 1,800 m and Schelpe (1970) about 1,100 m. Also recently mentioned from Mt Kilimanjaro by Schippers (1993).

Thelypteridaceae

Pneumatopteris unita (Kunze) Holttum (=*Cyclosorus madagascariensis* (Fee) Ching)

Voucher: Hemp 590.

Altitudinal range: 1,460–2,430 m (main range 1,600–2,200 m).

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Habitat: riverine forest.
Localities: common in lower and middle parts of the forest belt.
Discussion: Faden (1994) gives altitudes of 1,500 to 2,500 m, Johns (1991) 1,300 to 2,100 m and Schelpe (1970) 1,095 to 1,585 m.

Sphaerostephanos unitus (L.) Holtum (=*Cyclosorus unitus* (L.) Ching)
Voucher: Hemp 290.
Altitudinal range: 1,460 m.
Habitat: swampy place in a meadow.
Localities: found only once in the Msaranga Valley near Kidia/Old Moshi.
Discussion: Johns (1991) gives altitudes of 1,245 to 1,275 m. Not listed by Faden (1994) and Schelpe (1970).

Xiphopteridaceae

Xiphopteris spec. A in Johns (1991) (=*Xiphopteris* spec. B in Faden, 1994; fig. 2)
Voucher: Hemp 1636.
Altitudinal range: 2,300 m.
Habitat: lithophytic on boulders in stream bed.
Localities: found once, in Kikafu River.
Discussion: only one locality in East Africa on Mt Kenya at an altitude of 2,550 m is known (Faden, 1994). Johns (1991) gives a record in the floral region T6 referring to Faden *et al.* 69/524 and Faden 70/97. But these vouchers seen in EA are from Mt Kenya, in K4. Faden *et al.* found this species between 2,300 and 2,700 m.

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