DRYOPTERIS FILIPALEATA (PTEROPSIDA: DRYOPTERIDACEAE), A NEW SPECIES FROM TROPICAL EAST AFRICA

INTRODUCTION

In preparing a taxonomic review of the fern genus *Dryopteris* in Africa as well as for the *Flora of tropical East Africa*, several undescribed species have been identified. Earlier collectors generally ascribed their *Dryopteris* collections to either *D. inaequalis* (Schltdl.) Kuntze or to *D. pentheri* (Krasser) C.Chr., but a critical review of these species by me showed that they need to be more narrowly defined.

Dryopteris filipaleata J.P.Roux forms part of a group of species belonging to section *Marginatae* Fraser-Jenk. (Fraser-Jenkins 1986), to which both *D. inaequalis* and *D. pentheri* belong. The near similar stoma size in *D. filipaleata* [(40.0–)50.1(–62.0) µm] and *D. pentheri* [(34.0–)53.34(–72.0) µm], as well as spore size in *D. filipaeata* [(32.0–)41.1(–54.0) × (18.0–)26.26(–34.0) µm] and *D. pentheri* [(38.0–)45.08(–60.0) × (27.0–)31.32 (–40.0) µm], suggest that *D. filipaleata* is tetraploid.

Furthermore, the development of 64 normal spores per sporangium indicates that the species is sexual. *Dryopteris filipaleata* can, however, be separated from *D. pentheri* by being exindusiate, eglandular and without 2-celled hairs. In *D. pentheri*, oblong glands (60.0–) 137.02(–260.0) µm long and 2-celled hairs generally occur along the lamina axes and veins. The narrow lamina scales also separate it from *D. pentheri*.

Dryopteris filipaleata appears to be restricted to Kenya and Tanzania—the Kenyan and Tanzanian mountain forests forming part of the Afromontane Region (White 1983). Lovett (1988) divided the Tanzanian forests into a number of subdivisions based on geographical, edaphic and floristic factors. These include the coastal forests, the Lake Victoria Basin forests, the Western mountain forests, also termed the Eastern Arc mountain forests, and the volcanic mountain forests. The Eastern Arc mountain forests, which have strong floristic similarities, show a high percentage of endemism (Brenan 1978; Lovett 1988). Floristically these forests differ from those on the adjacent recent volcanic mountains and the basin forests (Lovett 1988). This may be ascribed to edaphic factors such as the different soil types.

Dryopteris filipaleata *J.P.Roux*, sp. nov., laminae paleis angustis denticulatis, paleis rhizomae stipitisque majoribus marginibus irregulariter laceratis et gemmis absentibus differt. Figura 1 & 2.

TYPE.—Tanzania, Eastern Province, Morogoro Dist. (T6), Uluguru Mountains, Mwere Valley, wet evergreen forest along stream with abundant *Cyathea manniana* and epiphytes, 1 400–1 450 m, 26 Sept. 1970, *R.B. Faden, T. Pocs, B.J. Harris, & P. & K. Csontos 70/596* [BOL!, holo. (2 sheets); K!, iso. (2 sheets)].

Plants terrestrial. *Rhizome* short-decumbent, up to 12 mm diam., closely set with roots, persistent stipe bases and scales; scales linear acuminate to narrowly lanceolate, up to 15 mm long, up to 5 mm wide, ferrugineous to castaneous, chartaceous, broadly attached, irregularly

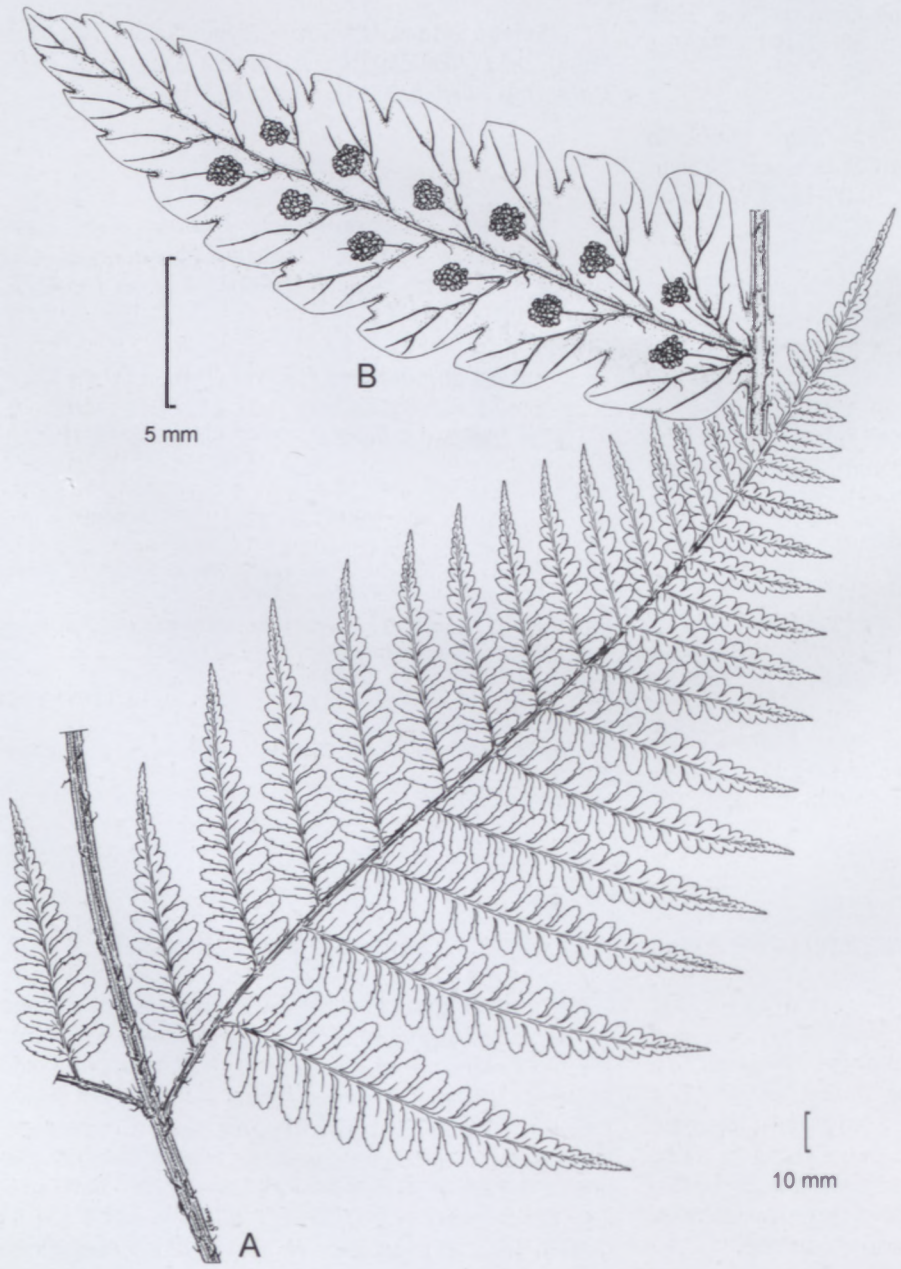

FIGURE 1—*Dryopteris filipaleata* J.P.Roux. A, basal pinna; B, abaxial view of pinnule. Drawn from *R.B. Faden et al. 70/596* (K) by J.P. Roux. Scale bars: A, 10 mm; B, 5 mm.

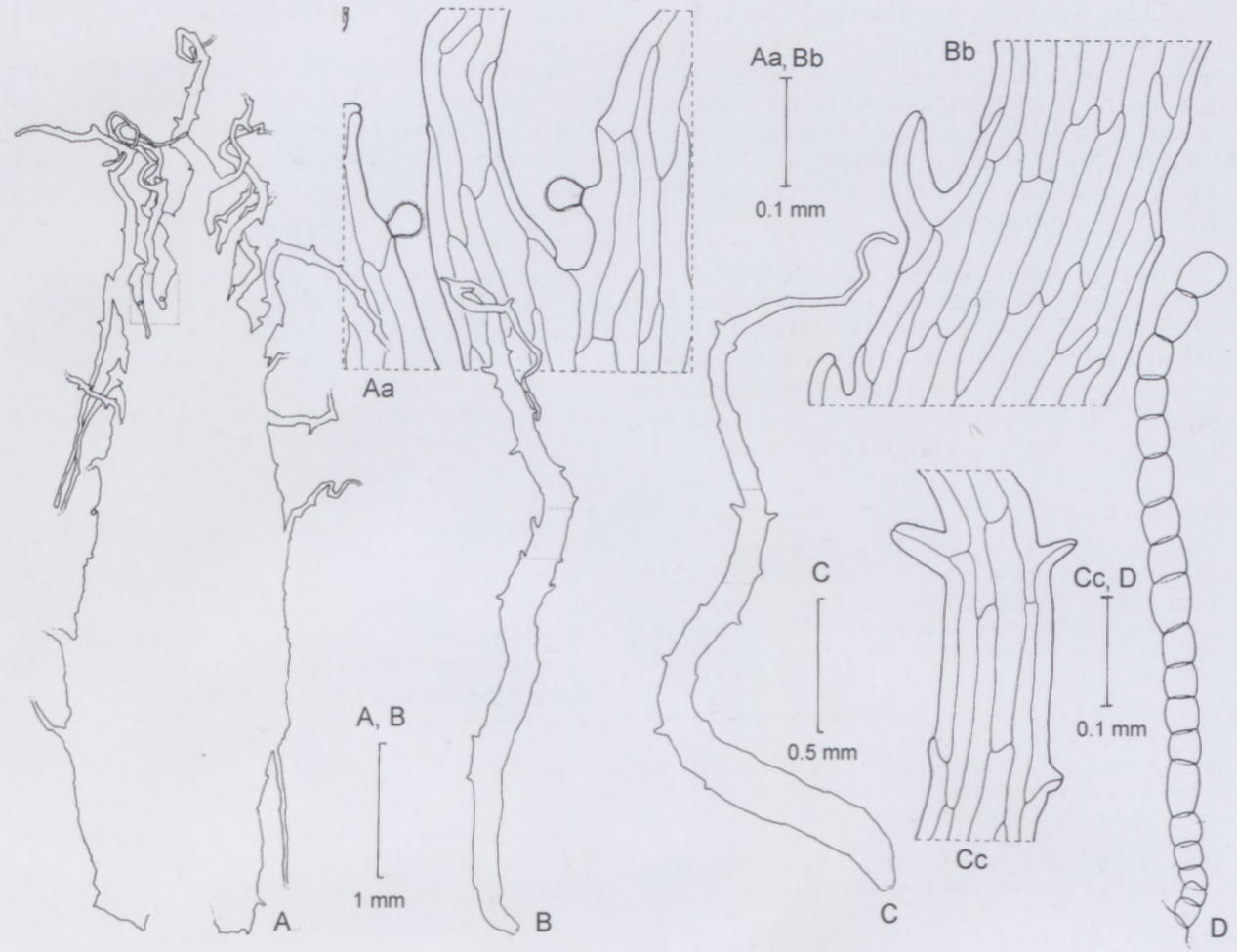

FIGURE 2—*Dryopteris filipaleata* J.P.Roux: vestiture. A, stipe scale; Aa, section showing cellular structure; B, rachis scale; Bb, section showing cellular structure; C, lamina scale, abaxial surface; Cc, section showing cellular structure; D, moniliform hair from abaxial surface of costa. Drawn from *R.B. Faden et al. 70/596* (K) by J.P. Roux. Scale bars: A, B, 1 mm; C, 0.5 mm, Aa–Cc, D, 0.1 mm.

denticulate, irregularly set with scattered capitate glands, and long, pluricellular, denticulate outgrowths, in larger scales these outgrowths increase in number towards scale apex; apex irregularly denticulate, terminating in a short uniseriate series of cells. *Fronds* closely spaced, suberect to arching, up to 1 130 mm long; *stipe* up to 610 mm long, up to 7 mm diam., proximally castaneous and adaxially flattened, stramineous higher up and shallowly sulcate, proximally densely scaled, sparsely scaled higher up; scales up to 18 mm long, up to 6 mm wide, ferrugineous, chartaceous, similar to those on the rhizome. *Lamina* 2-pinnate-pinnatifid to 3-pinnate, ovate to broadly ovate in outline, up to 590 mm long, up to 430 mm wide, with up to 13 petiolated pinna pairs; rachis stramineous, sulcate adaxially, initially closely scaled, sparsely scaled later; scales linear-acuminate to filiform, up to 4 mm long, up to 0.5 mm wide, ferrugineous to castaneous, firmly herbaceous to thinly crustaceous, short-stalked, cuneate to narrowly cuneate, irregularly denticulate, apex terminating in a short series of oblong cells. *Pinnae* 1-pinnate-pinnatifid to 2-pinnate, near opposite to alternate, proximally more widely spaced, overlapping or not, basal pinnae petiolate, petiole up to 13 mm long, increasingly more broadly attached and basiscopically decurrent along rachis towards lamina apex, basal pinnae longest, up to 270 mm long, up to 135 mm wide, basal pair mostly conspicuously basiscopically developed, inaequilaterally triangular, those higher up mostly near symmetrical, ovate, oblong-acuminate to lanceolate, with up to 7 stalked pinna pairs; pinna-rachis sulcate adaxially, narrowly winged towards apex, moderately scaled; scales linear to filiform, up to 3 mm long, up to 0.3 mm wide, ferrugineous to castaneous, firmly herbaceous to thinly crustaceous, short-stalked, irregularly denticulate, apex terminates in a short series of oblong cells. *Pinnules* firmly herbaceous, pinnatifid to 1-pinnate, near opposite to alternate, spaced to slightly overlapping, basal pinnules petiolate; petiolule up to 3 mm long, increasingly more broadly attached and basiscopically decurrent along pinna-rachis towards pinna apex; pinnules narrowly lanceolate to oblong-acuminate, up to 78 mm long, up to 26 mm wide, proximal basiscopic pinnules slightly basiscopically developed; costa sulcate adaxially, pronounced abaxially, flexuose towards apex, narrowly winged, sparsely scaled; scales filiform, up to 2.2 mm long, up to 0.1 mm wide, irregularly denticulate, apex terminates in a short series of oblong cells; segments and lobes ovate-obtuse to oblong-obtuse, up to 15 mm long, up to 7 mm wide, basiscopically decurrent, shallowly lobed to denticulate, adaxially glabrous or with few hairs and filiform scales along costa, abaxially sparsely set with scattered, (4–)6(–18)-celled moniliform hairs up to (78.0–)218.87(–615.0) µm long, on and between the veins. *Venation* evident, pinnately branched, mostly ending in teeth near margin. *Stomata* mostly of the polocytic type, (40.0–)50.1(–62.0) µm long. *Sori* predominantly 2-

seriate along pinnules, 2-seriate on lobes in larger plants, medial to inframedial on predominantly anadromous vein branches, exindusiate. *Sporangium*: stalk simple, glandular or haired; capsule with (13–)14(–19) indurated annulus cells, epistomium 4(–6)-celled, hypostomium (3–)6(–7)-celled; *spores* monolete, ellipsoid, with low reticulate ridges and bulges, up to (32.0–) 41.1(–54.0) × (18.0–) 26.26(–34.0) µm. Figures 1, 2.

Distribution and ecology: *Dryopteris filipaleata* appears to be restricted to the mountainous areas of tropical East Africa occurring at altitudes ranging between 1 350 and 2 000 m. It grows in moist to wet evergreen forests either on the forest floor or along streambanks with *Cyathea manniana, Piper capense, Ensete ventricosa, Symphonia* spp., *Melchiora schliebenii* and *Allanblackia ulugurensis*.

Material examined

KENYA.—South Nyeri Dist. (K4), Kirinyaga Dist., Thiba Fishing Camp, 31 July 1977, *M.G. Gilbert & D. Rankin 4821* (K); Meru Dist., Jombeni Range, 1 520 m, *H.D. van Someren 438* (K, 2 sheets); Meru, upper forest, Aug. 1949, *H.D. van Someren 493* (K); Kisumu-Londoni Dist. (K5), Kisumu, bushland, 2 128 m, Febr. 1915, *R.A. Dümmer 1524 & 1727* (K).

TANZANIA.—Morogoro Dist. (T6), Uluguru Mountains, Morningside to Bondwa, 1 350–1 900 m, 3–4 July 1970, *R.B. Evans et al. 70/351* (K, 2 sheets); Uluguru Mountains, Mwere Valley, 1 400–1 450 m, 26 Sept. 1970, *R.B. Faden et al. 70/596* (BOL, 2 sheets, K, 2 sheets); Uluguru Forest Reserve, Lupanga Peak, 2 000 m, 1981, *J.B. Hall s.n.* (K); Kanga Mountain, Northern Nguru, 1 800 m, 2 Dec. 1987, *J. Lovett & D.W. Thomas 2800, 2802 & 2802A* (MO); Bagamoyo Dist., mainland west of Zanzibar, March 1885, *J.T. Last s.n.* (K).

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