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THREE NEW FERN RECORDS FOR KILIMANJARO

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ABSTRACT

Working on the flora and vegetation of Mt. Kilimanjaro, Tanzania, three ferns in three families were found that are not yet recorded for the floral region T2. The altitudinal range, localities and habitat description are given for *Adiantum reniforme*, *Azolla africana* and *Trichomanes radicans*.

INTRODUCTION

Due to its varied array of habitats Mt Kilimanjaro is distinctly richer in fern species than the other high volcanoes in East Africa (Hemp, in press). The main habitat is the luxuriant montane forest, which is exceptionally rich in pteridophytes (Hemp, under review). While working on the flora and vegetation of Mt Kilimanjaro, a total of over 140 ferns and fern allies have been found so far. Seventeen species out of these were only recently recorded for the floral region T2 (Hemp, 1997). In 1999, three more species: *Adiantum reniforme*, *Azolla africana* and *Trichomanes radicans* were found on the southern slope of Mt Kilimanjaro that are not yet recorded in the published fascicles on fern families in the Flora of Tropical East Africa and in the preliminary checklist of Pteridophytes (Johns, 1991). Two of them (*Adiantum reniforme* and *Trichomanes radicans*) are very rare in Africa (Johns, 1991). In this communication their habitat and ecological requirements on Mt Kilimanjaro are described.

MATERIALS AND METHODS

The nomenclature follows Faden (1994) and/or Johns (1991). Vouchers will be deposited in the National Herbarium of Tanzania (NHT), the East African Herbarium Nairobi (EA) and the Berlin Botanical Museum Herbarium, Germany (B), the National Museum of Natural History, Smithsonian Institution (US), Washington, as well as in Kew Herbarium, England (K).

NEW RECORDS FOR THE FLORAL REGION T2

Adiantaceae
Adiantum reniforme L. var. *reniforme*
Voucher: Hemp 2424, 2456.

Altitudinal range: 1450–1640 m.
Habitat: On vertical (basaltic) rock-faces in deep gorges. The habitats are always semi-shaded and humid. In full-shaded situations the vitality of *Adiantum reniforme* descends and only small tufts of this epilithic fern can be encountered. On optimal habitats whole cliffs are covered by thousands of specimens. *Adiantum reniforme* grows together with *Adiantum capillus-veneris*, *Selaginella abyssinica* and *Asplenium gemmiferum*.
Localities: Found only in the Mrusunga valley between Uru and Natiro, but here in several places and in the gorge of the Rau river. Coordinates: 3°14' S, 37°23' E; 3°16' S, 37°25' E.
Discussion: *Adiantum reniforme* varieties *reniforme* and *pusillum* occur in Madeira, the Cape Verde and Canary Islands (Benl, 1964). Variety *asarifolium* is recorded from Mauritius, Réunion and Madagascar (Christensen, 1932) and variety *crenatum* is only known from Madagascar. In Western China, *Adiantum reniforme* var. *sinense* occurs (Lin, 1980, 1989).

In Africa *Adiantum reniforme* is very rare and grows only in isolated or relict pockets. It is known from Mt. Marsabit in the Eastern Province and Mt Kulal in the Rift Valley Province of Kenya (K1) (Adamson 11649, 11691, Alexander H342/62, Lye & Katende 6337, Oteke 25, Wood 100 (Verdcourt, 1962)) and from one locality in northern Malawi at an altitude of 2005m (Burrows & Burrows 1993, Willis *et al.*, 2000). The origin of the only known collection from South Africa is uncertain (Crouch & Burrows, 1999). A further disputed record from Senegambia has been reported by Kuhn (1868). Three new record for Mt Kilimanjaro is a further link between its main distribution area on the Macaronesian islands and Madagascar and the Mascarene islands.

Azollaceae
Azolla africana R.Br. var. *africana* (Desv.) Bak. (=*A. pinnata* R.Br. var. *africana* (Desv.) Bak.)
Voucher: Hemp 2322.
Altitudinal range: 850 m.
Habitat: floating in areas of slowly flowing water in a river. Abundant.
Localities: Found only in one place near the road between Moshi and Kiboroloni, Moshi District, but probably more widespread. Coordinates: 3°20' S, 37°21' E.
Discussion: *Azolla africana* var. *africana* occurs in East Africa in several floral regions of Uganda, Kenya and Tanzania. Johns (1991) gives altitudes of 1100–2050 m.

Hymenophyllaceae
Trichomanes radicans Sw. (=*Vandenboschia radicans* (SW) Copel.)
Voucher: Hemp 2443.
Altitudinal range: 1650 m.
Habitat: Moist shady rocks near streams growing together with *Asplenium bugoiense*, *A. unilaterale* and *A. abyssinicum*, or scandent as a small liana on trees in *Mitragyna rubrostipulata*-riverine forests.
Localities: Found only once in the Mrusunga valley between Uru and Natiro. Coordinates: 3°15' S, 37°25' E.
Discussion: *Trichomanes radicans*, the largest filmy fern present in East Africa with fronds up to 60 cm, occurs in Kenya only in Thika (K4) at 1460 m (Faden, 1994). In Tanzania it is known from the Eastern Arc Mts. in the floral regions T3 and T6 (Schippers 1993 a, b). Besides *Lomariopsis warneckei,* it is the only fern on Mt Kilimanjaro that shows the habit of a liana.

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