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Kihansia jengiensis, a new species of Triuridaceae from southeastern Cameroon

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Summary. A new species of Triuridaceae, *Kihansia jengiensis* Sainge & Kenfack is described from the semi-deciduous forest of Southeastern Cameroon. The new species is illustrated and a key to the identification of the two species in the genus provided. The species constitutes the first record of the genus in central Africa and its conservation status is assessed as Critically Endangered.

Key Words. Critically Endangered, Jengi forest, Kupeaeae, myco-heterotrophic.

Introduction

Mycoheterotrophy — the requirement for certain plant species to obtain their carbohydrates from fungi — is a widespread condition among land plants. Myco-heterotrophic plants include about 885 species (Merckx *et al.* 2013) of which many are rather inconspicuous herbs found in forest floor in tropical and temperate forests worldwide. In addition to their small size, many myco-heterotrophic plants grow during the rainy season and their short life span exacerbates the difficulties in collecting them. Most collections of myco-heterotrophic plants are opportunistic and our current knowledge of the diversity of this group might be highly underestimated. During the last decade, the focus by the first author on myco-heterophic plants led to the description of six new species in Cameroon (Franke 2004; Franke *et al.* 2004; Sainge & Franke 2005; Sainge *et al.* 2005, 2013).

In 2005, during the establishment of 1-ha permanent plots for timber certification at the Jengi forest area, southeastern Cameroon (Thomas & Chuyong 2006), the first author came across a small population of myco-heterotrophic plants including *Burmannia hexaptera* Schltr., *Sebaea oligantha* (Gilg) Schinz, and an unidentified species, the focus of this paper. Specimens of this species had sessile unisexual flowers with 4 tepals and 4 sessile stamens, a combination of characters that did not match any myco-heterotrophic plant from the central Africa region. Further observation showed that these specimens have a perianth with a cup-like central part, including 4 sessile stamens below the rim, characteristic of *Kihansia* Cheek, a genus of Triuridaceae previously known only from Tanzania (Cheek 2003). Unlike *K. lovettii* Cheek, the only species so far known in the genus, specimens from Jengi bear flowers all along the inflorescence rachis and have entire lower tepals. We therefore conclude that we have a new species at hand that is described below as *K. jengiensis*.

Key to species of *Kihansia*

Inflorescence rhachis bearing flowers only in lower quarter to half, upper part sterile, lower perianth lobe, only rarely entire [Tanzania] . . . . . **Kihansia lovettii**

Inflorescence rhachis bearing flowers along the whole length, all flowers with lower perianth lobe entire [Cameroon] . . . . . **Kihansia jengiensis**

Kihansia jengiensis *Sainge & Kenfack* **sp. nov.** Type: Cameroon, Southeast Region, Green valley Industry, Forestry Management Unit 10021, Concession number 1018, approx. 25 km from sawmill, plot 2, 3°15'15.6"N, 14°28'46.8"E, 609 m alt., male fl., 28 July 2006, *Sainge M.* 1623 in spirit (holotype MO!; isotypes K!, YA!).

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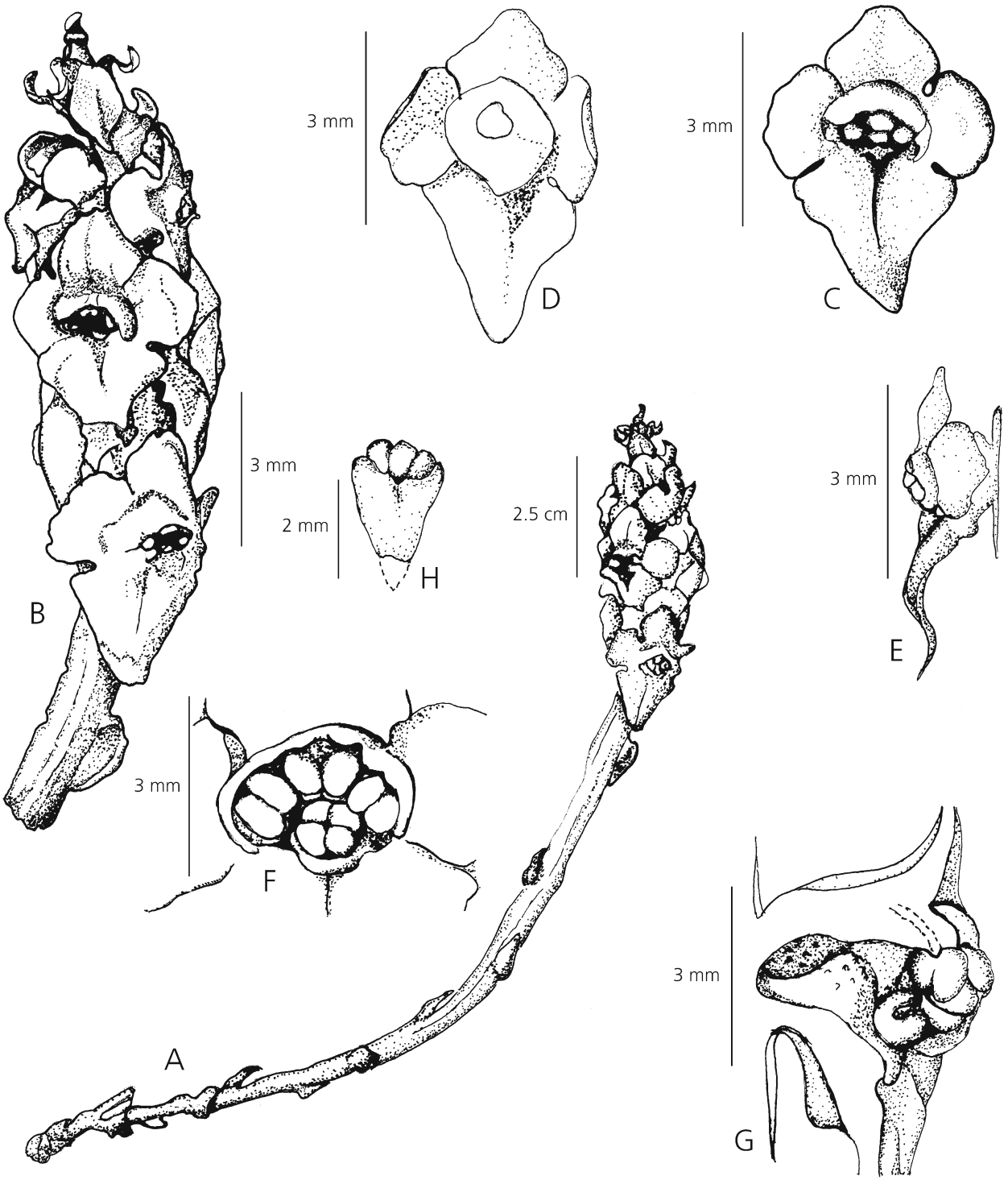

Fig. 1. *Kihansia jengiensis*. **A** habit; **B** male inflorescence; **C** & **D** abaxial and adaxial view of the male flower; **E** lateral view of the male flower; **F** detail of the androecial cavity; **G** longitudinal section of the male flower; **H** stamen. From *Sainge M.* 1623. DRAWN BY D. KENFACK AND THASSILO FRANKE.

http://www.ipni.org/urn:lsid:ipni.org:names:77144184-1

Dioecious myco-heterotrophic herb, cream-white, translucent, glabrous; roots brownish, star-like to radiating, filiform, glabrous, up to 1 cm long, below ground stem 2 – 4 cm long, above ground stem 1 – 2 cm long, erect, unbranched, cylindrical, c. 0.8 mm diam., internodes up to 1.2 cm long. *Leaves* alternate, scaly, sessile,

Fig. 2. *Kihansia jengiensis*. **A** male inflorescence on fresh material; **B** habit; **C** male inflorescence on pickled material; **D** scale leaf. PHOTOS: **A & B** SAINGE MOSES; **C & D** DAVID KENFACK.

adaxially concave, 0.7 – 3.6 × 0.3 – 1.5 mm. *Male inflorescence* terminal, compact, up to 7.5 mm long, 2.5 – 4 mm diam., 6 – 10 flowered. *Male flowers* cream-white to brownish, alternating at intervals of 0.5 – 1.5 mm; perianth bilaterally symmetrical, 4-lobed, c. 2.5 × 5 mm in frontal view; lower tepal longest, triangular, obtuse, 1.5 – 2.6 × 2.5 mm; the three other tepals sub-equal, rounded, 1 – 1.5 × 1 – 2.6 mm; androecial cavity central, concave, c. 1 × 1 – 1.5 mm. *Stamens* 4, white, each opposite a perianth, 0.3 mm diam, 4-lobed. *Female inflorescence* terminal, 1 – 3-flowered; perianth as male flowers; gynoecium white, c. 2.8 × 3.3 mm; carpels c. 70 per flower, ovoid, transluscent, c. 0.35 × 0.25 mm; style 0.6 – 0.8 mm long. *Fruit* black, bilobed, c. 0.25 × 0.48 mm, style persistent. Figs 1 & 2.

RECOGNITION. A dioecious myco-heterotrophic herb close to *Kihansia lovettii* but differing in the male inflorescence rhachis bearing flowers along its whole length and in the lower tepal being entire, versus inflorescence rhachis sterile in the upper half to three quarters, lower tepal usually 2 (– 3)-fid.

DISTRIBUTION. Southeastern Cameroon.

SPECIMENS EXAMINED. CAMEROON. Yokadouma: Green valley Industry, Forestry Management Unit 10021, Concession 1018, approx. 25 km from sawmill, plot 2, [3°15'15.6"N, 14°28'46.8"E, 609 m], 19 July 2005, fl., *Sainge M.* 1519, (MO!); 24 July 2006, fl., *Sainge M.* 1620, (YA!), all in spirit.

HABITAT. *Kihansia jengiensis* was observed growing on soil of up to 10 cm depth and within leaf litter on a semi-deciduous forest floor. The type locality is fairly flat at an altitude of 600 m a.s.l. The climate in the area is subequatorial with four seasons, a short rainy season from mid-March to June, a short dry season from July to mid-August, a long rainy season from August ending to mid-November and long dry season mid-November to mid-March (Green Valley Inc. 2003). Dominant canopy species in the area include *Celtis tessmannii* Rendle (Ulmaceae), *Zanthoxylum tessmannii* (Engl.) Ayafor (Rutaceae), *Eribroma oblongum* (Mast.) Pierre ex A. Chev., *Triplochiton scleroxylon* K. Schum., while the understory is dominated by several species of *Drypetes* (Putrangivaceae).

FLOWERING AND PHENOLOGY. With the exception of a few species that flower all year round such as *Sciaphila ledermannii* Engl. (Sainge pers. obs.), the anthesis of most myco-heterotrophic plants occurs in the wet season (Jonker 1938; Franke 2007). However, Cheek (2003) pointed out that the inflorescences of *Kupea* and *Kihansia* remain above the ground all year round. *Kihansia jengiensis* was found in flower and fruit only during the short dry season.

CONSERVATION STATUS. *Kihansia jengiensis* is known only from the type locality. During the two visits to the site in 2005 and 2006, only 18 individuals were found scattered in a small area of less than 400 m^2. We did not find additional populations or individuals of this species despite extensive survey in the area (2° to 4°N and 14° to 16°E) during the establishment of 1-ha permanent plots (Thomas & Chuyong 2006). The type locality is a forest concession and is seriously threatened by timber exploitation. We assess its conservation status as Critically Endangered CR D following IUCN redlist categories and criteria (IUCN 2001).

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References

Cheek, M. (2003). Kupeaeae, a new tribe of Triuridaceae from Africa. *Kew Bull.* 58: 939 – 949.

Franke, T. (2004). *Afrothismia saingei* (Burmanniaceae, Thismieae), a new myco-heterotrophic plant from Cameroon. *Syst. Geogr. Pl.* 74: 27 – 33.

____ (2007). *Miscellaneous Contribution to the Taxonomy and Mycorrhiza of AMT-exploiting Myco-heterotrophic Plants.* PhD Thesis, Ludwig Maximilian University, Munich.

____, Sainge, M. N. & Agerer, R. (2004). *Afrothismia foertheriana*. A new species of *Afrothismia* (Burmanniaceae; Tribe: Thismieae) from the Western Foothills of Mount Cameroon. *Blumea* 49: 451 – 456.

Green valley Inc., Groupe Decalvenaere (2003). *Plan d'aménagement.* Unpublished report.

IUCN (2001). *IUCN Red list Categories and Criteria.* Version 3.1. IUCN Species Survival Commission. IUCN, Gland & Cambridge.

Jonker, F. P. (1938). A monograph of the Burmanniaceae. *Meded. Bot. Mus. Herb. Rijks Univ. Utrecht* 51: 1 – 279.

Merckx, V. S. F. T., Freudenstein, J. V., Kissling, J., Christenhusz, M. J. M., Stotler, R. E., Crandall-

Stotler, B., Wickett, N., Rudall, P. J., Maas-van de Kamer, H. & Maas, P. J. M. (2013). Taxonomy and classification. In: V. S. F. T. Merckx (ed.), *Mycoheterotrophy. The biology of plants living on fungi*, pp. 19 – 101. Springer, New York.

Sainge, M. N. & Franke, T. (2005). A new species of *Afrothismia (Burmanniaceae)* from Cameroon. *Nordic J. Bot.* 23: 299 – 303.

____, ____ & Agerer, R. (2005). A new species of *Afrothismia* (Burmanniaceae; tribe Thismieae) from Korup National Park, Cameroon. *Willdenowia* 35: 287 – 291.

____, Kenfack, D. & Chuyong, G. B. (2013). Two new species of *Afrothismia* (Thismiaceae) from Southern, Cameroon. *Kew Bull.* 68: 591 – 597.

Thomas, D. W. & Chuyong, G. B. (2006). *The establishment of long-term forest monitoring plots for timber certification in the Jengi Project Area, Cameroon* by CTFS & WWF in collaboration with Groupe Decalvenaere Timber Company.