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Momordica mossambica sp. nov. (Cucurbitaceae) from miombo woodland in northern Mozambique

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Momordica mossambica, a new species of the Cucurbitaceae from miombo woodland in northern Mozambique is described. In spite of being known only from the type collected in 1964, a morphological and molecular survey of all known species of *Momordica* indicates that *M. mossambica* is a distinct species. The closest relatives are *M. calantha* and *M. cabrae* from Tanzania and central Africa, respectively, from which it is distinguished easily by its 7-lobed, maple-like leaves.

The genus *Momordica* consisting of 50–60 species is the second largest genus in the gourd family, Cucurbitaceae, next to *Trichosanthes*. Its diversity hotspot is sub-Saharan Africa, where 80% of the known species grow (Schaefer and Renner unpubl.). This region was also found to be the original area of the genus in a family-wide biogeographic analysis (Schaefer et al. 2009). In the course of a morphological and molecular revision of the genera *Momordica*, *Thladiantha* and relatives, I found material of several hitherto undescribed African *Momordica* species. Here, I provide a formal description and ecological data for one of these new species, an entity recognized as new decades ago (Jeffrey 1978, Jeffrey and Fernández 1986). Earlier authors refrained from describing it formally because it had been collected only once and female flowers and fruits remained unknown. However, molecular data (Schaefer and Renner unpubl.) confirm that it is a distinct species, and with more and more expeditions heading into northern Mozambique, additional plants of this beautiful species are likely to be discovered.

Material and methods

Momordica specimens were studied at or borrowed from A, B, BM, DSM, E, EA, FI, GH, K, L, M, MO, P, UPS, W, WAG, and WU. Measurements were taken from dry herbarium specimens.

DNA sequences of *M. mossambica* have been submitted to GenBank (<www.ncbi.nlm.nih.gov/>; GQ163051, GQ163175, GQ163298, GQ163420).

Results

The material collected by Torre and Paiva and later determined by C. Jeffrey as *Momordica* sp. A (Jeffrey

1978) and by R. Fernandes as *Momordica* aff. *calantha* Gilg (on a K herbarium sheet) clearly belongs to the genus *Momordica*. It is, however, different from *M. calantha*, a species of tropical rainforest in northern Tanzania, Kenya, and Uganda, in both leaf shape (unlobed or 3–5-lobed in *M. calantha*) and morphology of the male flower (urceolate in *M. calantha*). Furthermore, the new species is most likely dioecious (all eight duplicates of Torre & Paiva 9867 have only male flowers), whereas *M. calantha* is monoecious (pers. obs. in Tanzania 2005). The west African species *M. cabrae* (Cogn.) C. Jeffrey and *M. obtusisepala* Kerardren, which have been grouped together with *M. calantha* in a well-defined section *Dimorphochlamys* (Jeffrey and De Wilde 2006) are similar in flower morphology and dioecious, but again leaf shape (entire or shallowly 3–5-lobed) and inflorescences of the Mozambique specimen are different.

In a recent molecular phylogenetic study we sampled all but two species of *Momordica* – 58 ingroup species (Schaefer and Renner unpubl.). The only species not included were *M. macrosperma* Chiov., a small shrub close to *M. spinosa* (Gilg) Chiov., which is known only from the leafless type at FI and was not available for DNA extraction, and *M. sahyadrica* Kattuk. & V. T. Antony, a recently described entity from India, which based on morphological characters seems to be a hybrid (unpubl.). A maximum likelihood analysis of four plastid genes, introns and spacers (*matK*, *trnL*, *trnLF*, *rpl20-rps12* and *trnH-psbA*), the second intron of the nuclear *Leafy* gene, and the mitochondrial *nad1* gene placed Torre & Paiva 9867 in a well-supported clade together with the three species mentioned above. The east African *M. calantha* is sister to the west African *M. cabrae* and the Mozambique plant is sister to both species. I am therefore satisfied that this entity deserves species rank and describe it in the following.

***Momordica mossambica* H. Schaeef. sp. nov. (Fig. 1, 2)**

Momordica sp. A sensu C. Jeffrey (1978), not to be confused with *Momordica* sp. A sensu C. Jeffrey (1967).

Liana perennis a M. calantha Gilg et M. cabrae (Cogn.) C. Jeffrey foliis aceriformibus septemlobatis differt.

Type: Northeastern Mozambique. Nampula province, Eráti district, 12 km south from Namapa towards Alua, ca 280 m a.s.l., 8 Jan 1964, A. R. Torre & J. Paiva 9867 (holotype: MO, isotype: C, COI, EA, K, LMA, LISC, WAG).

Dioecious, perennial, woody liana with tuberous rootstock. Stems scandent, to several meters long, sparsely finely pubescent; bark grey. Leaves simple, petiolate; petiole 2.5–4.0 cm long, shortly finely sparsely pubescent; leaf blade up to 14 × 16 cm, broadly ovate to sub-circular in outline, base cordate, margin remotely sinuate-lobulate, denticulate, shortly pubescent on veins and scabrid-punctate beneath, punctate and almost glabrous above, palmately

(5–) 7-lobed to below the middle, central lobe ovate in outline, shortly 3-lobulate, acutely-acuminate, apiculate, lateral lobes shorter; tendrils 2-fid, uncoiled below branching point. Male flowers in 20- to 30-flowered pedunculate racemes; peduncle 1–2 cm long, ebracteate at the apex; pedicels 1–2 cm long; corolla campanulate, receptacle-tube 7–8 mm long, lobes 5, 7–10 mm long, very broadly ovate, shortly acuminate, rounded; petals 5, 2.5–3.0 cm long, yellowish-cream, with dark brown base, oblong, shortly acuminate, apiculate, inner side of the petals covered by dense fields of oil-producing glandular hairs. Female flowers, fruits and seeds not collected but in all related species of section *Dimorphochlamys* the female flowers are solitary in leaf axils, fruits are large, many-seeded and with characteristic persistent receptacle-lobes at apex.

Distribution and habitat

Known only from northeastern Mozambique, Nampula province (Fig. 3), where it was collected in open *Brachystegia* forest (miombo woodland) on red clay soil, among the

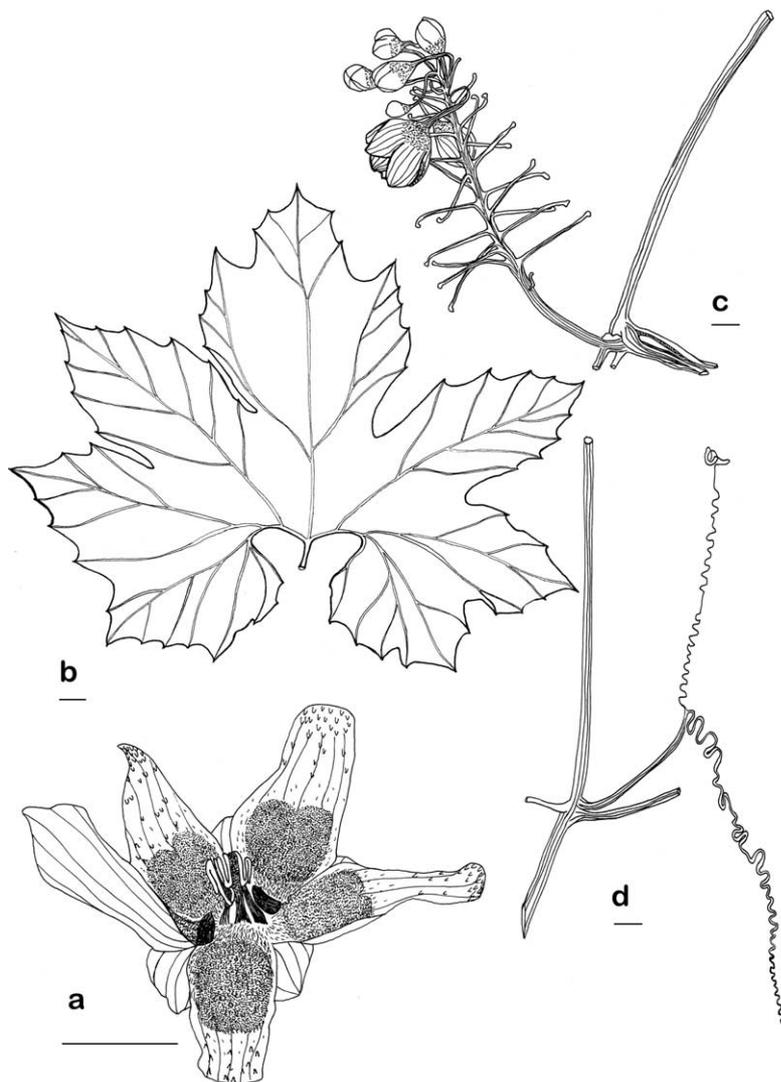


Figure 1. *Momordica mossambica* H. Schaeef. sp. nov. (a) male flower, (b) leaf, (c) male inflorescence, (d) tendril. Scale bar = 1 cm.

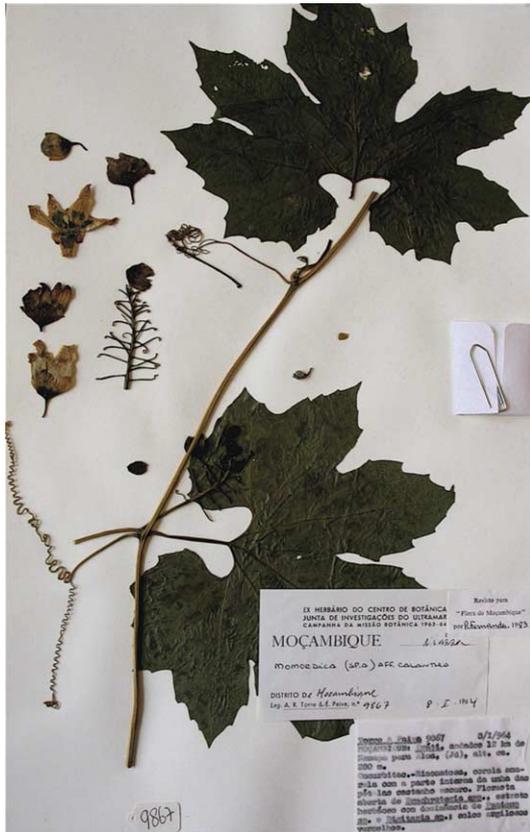


Figure 2. Photograph of the isotype of *Momordica mossambica* in the herbarium at Royal Botanic Gardens Kew (K).

undergrowth dominated by *Panicum* spp. and *Digitaria* spp. Collected in flower in January.

Conservation status

The species was collected only once and is therefore assumed to be rare. However, large parts of northern Mozambique, especially in the Niassa province are still virtually unexplored, and Mozambique's large areas of still undisturbed miombo woodland might harbour healthy populations of this species. It may grow in the huge Niassa reserve and thus benefit from some legal protection. Based on this, I suggest IUCN category 'DD' (data deficient) (IUCN 2001). Exploration of the natural habitat of *M. mossambica* will hopefully clarify the situation.

The new species is named after the southeast African Republic of Mozambique, where the cited material of this new species was collected.

Pollination

The label does not report any details on the flower biology or visitors. However, large numbers of oil-producing floral trichomes can be seen on the inner side of the petals, and oil bees of the tribe Ctenoplectrini are therefore the likely pollinators. The species *Ctenoplectra terminalis* Smith has been reported from Tanzania and South Africa (Schaefer

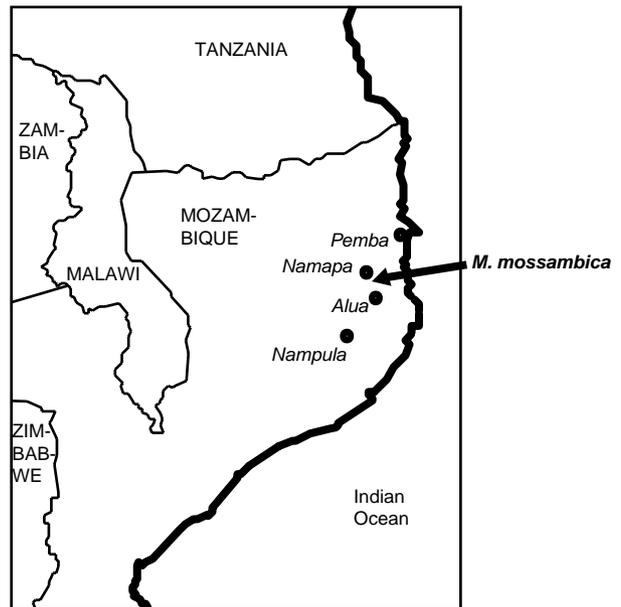


Figure 3. Map of northern Mozambique showing the locality where the newly described species was collected.

and Renner 2008) and might well occur in northern Mozambique. This oil bee is the most important pollinator of the related *Momordica calantha* (unpubl.).

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