A new species of Malagasy *Gnidia* and the lectotypification of *Octolepis decalepis* (Thymelaeaceae)

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Rogers Z. S. 2006. — A new species of Malagasy *Gnidia* and the lectotypification of *Octolepis decalepis* (Thymelaeaceae). *Adansonia*, sér. 3, 28 (1): 155-160.

ABSTRACT
Two recent collections from the Bemangidy-Ivohibe Forest (SW Madagascar, N of Fort-Dauphin) represent an undescribed species of *Gnidia* L. (Thymelaeaceae). This new species, formally described here as *G. razakamalalana* Z.S.Rogers, differs most obviously from all other Malagasy Thymelaeaceae by its very long tubular flowers arranged in one-flowered terminal inflorescences. The description is accompanied by an illustration and a preliminary conservation assessment. A lectotype is also designated for *Octolepis decalepis* Gilg (Thymelaeaceae), a taxonomic synonym for the continental African *O. casearia* Oliv. var. *casearia*.

KEY WORDS
Thymelaeaceae, *Gnidia*, *Octolepis*, Madagascar, conservation, new species.

RÉSUMÉ
Une espèce nouvelle de Gnidia *de Madagascar et la lectotypification d'*Octolepis decalepis *(Thymelaeaceae).*
Deux récoltes récentes de la forêt de Bemangidy-Ivohibe (SO de Madagascar, N de Fort-Dauphin) représentent une espèce non décrite de *Gnidia* L. (Thymelaeaceae). Cette nouvelle espèce, décrite ici sous le nom *G. razakamalalana* Z.S.Rogers, se distingue particulièrement des autres espèces malgaches de Thymelaeaceae par ses très longs tubes floraux organisés en inflorescences terminales uniflores. Une illustration et le statut provisoire de conservation accompagnent la description. Une lectotypification est également indiquée pour *Octolepis decalepis* Gilg (Thymelaeaceae), synonyme taxonomique de la variété africaine continentale *O. casearia* Oliv. var. *casearia*.

MOTS CLÉS
Thymelaeaceae, *Gnidia*, *Octolepis*, Madagascar, conservation, espèce nouvelle.

INTRODUCTION

Gnidia L., when treated in the broad sense (i.e. including *Lasiosiphon* Fresen.), is perhaps the largest genus of Thymelaeaceae with *c.* 140-160 species occurring in Africa, Arabia, India, Madagascar, and Sri Lanka (Beaumont *et al*. 2001a; Herber 2003). About 100 species are endemic to South Africa (Bredenkamp & Beyers 2003), the majority of which occur in the Western Cape Province (Beaumont *et al*. 2001a). In most of the older literature (Fresenius 1838; Meisner 1857; Pearson 1910; Wright 1915; Domke 1934; Phillips 1944; Léandri 1950), several Afro-Malagasy genera were segregated from *Gnidia*. *Lasiosiphon*, as the largest of these segregates, has been retained most frequently on the basis of its 5-, rather than 4-merous flowers. Floral merocity, however, was shown by Robyns (1975) and Peterson (1978) to be an inconsistent character in the group, sometimes capable of varying from four to five within East African species, including the type species of *Lasiosiphon*, *L. glaucus* Fresen. (= *G. glauca* (Fresen.) Gilg). Peterson (1978) noted similar inconsistencies in *G. kraussiana* Meisn., *G. involucrata* A.Rich., and *G. stenophylla* Gilg. In Madagascar, four species of *Gnidia* and 15 species of *Lasiosiphon* were recognized in the most recent flora treatment (Léandri 1950). Since the publication of the *Flore*, all authors (e.g., Peterson 1959, 1978; Aymonin 1962, 1965, 1966a, b; Gastaldo 1969; Robyns 1975; Bredenkamp & Beyers 2000; Beaumont *et al.* 2001a, b; Herber 2003) have treated *Lasiosiphon* and the other segregates as synonyms of *Gnidia* based solely on morphological data.

To date, a single molecular phylogenetic study (Van der Bank *et al*. 2002) has investigated broad scale generic relationships in Thymelaeaceae. Based on combined *rbcL* and *trnL-F* sequence data and with very limited sampling (no Malagasy species analysed), this paper suggested that *Gnidia* is polyphyletic because constituent species were included in four distinct clades, two of those only moderately supported by bootstrap values. Clearly, sufficient molecular data is not yet available to clarify the circumscription of *Gnidia* and additional genes and much broader sampling will be necessary before more meaningful comparisons can be made between molecular phylogenies and the most comprehensive morphological classifications of the Thymelaeaceae (e.g., Gilg 1894; Domke 1934; Herber 2003). Based on the available morphological data and in the absence of a robust molecular phylogeny, it would appear best to maintain a broad circumscription of *Gnidia* that includes *Lasiosiphon*.

Two recent herbarium collections (*Razakamalala et al. 2670* and *Rabenantoandro et al. 1725*) from SE Madagascar (N of Fort-Dauphin) represent a very distinctive new species of Thymelaeaceae. With its 5-merous flowers, Léandri (1950) would have treated this species as *Lasiosiphon* in the *Flore*, but this novelty is certainly most morphologically similar to another Malagasy species *L. ambondrombensis* Boiteau, first indicated as belonging in *Gnidia* by Aymonin (1962). The name will formally be transferred to that genus in a future publication.

SYSTEMATICS

Gnidia razakamalalana Z.S.Rogers, sp. nov. (Fig. 1)

Haec species a Lasiosiphone ambondrombensi *hypanthio c. 5 (vs. 1.4-1.6) cm longo, calycis lobulis 1.7-2.2 (vs. 0.6-0.8) cm longis, inflorescentia uniflora (vs. 8-15 flora) atque foliis supra glabris (vs. dense pubescentibus) differt.*

TYPUS. — **Madagascar.** Prov. Toliara, Fivondronona, Fort Dauphin, Firaisana Iaboko, Fokontany Antsotso, forêt de Ivohibe, 112 m, 24°34'35"S, 47°11'55"E, 29.XI.2005, fl., *R. Razakamalala, E. Ramisy & B. Mara 2670* (holo-, MO!; iso-, K!, P!, TEF!).

PARATYPE. — **Madagascar.** Prov. Toliara, Région de l'Anosy, District Fort Dauphin, Commune Iabakoho, Quartier Antsotso, forêt dense humide de basse altitude d'Ivohibe-Bemangidy, sur dôme rocheux, 90 m, 24°34'09"S, 47°12'23"E, 12.II.2006, fl., *J. Rabenantoandro, P.P. Lowry II, E. Lowry, F. Randriatafika & M. Berger 1725* (MO!, P!, TAN!).

DESCRIPTION

Treelets 2 m tall; branches dichotomous, dark red, glabrous, covered with prominent leaf scars; internodes very short (*c.* 1 mm long near branch tips). Leaves exstipulate, spirally arranged, sessile or subsessile, persistent only at the tips of branches;

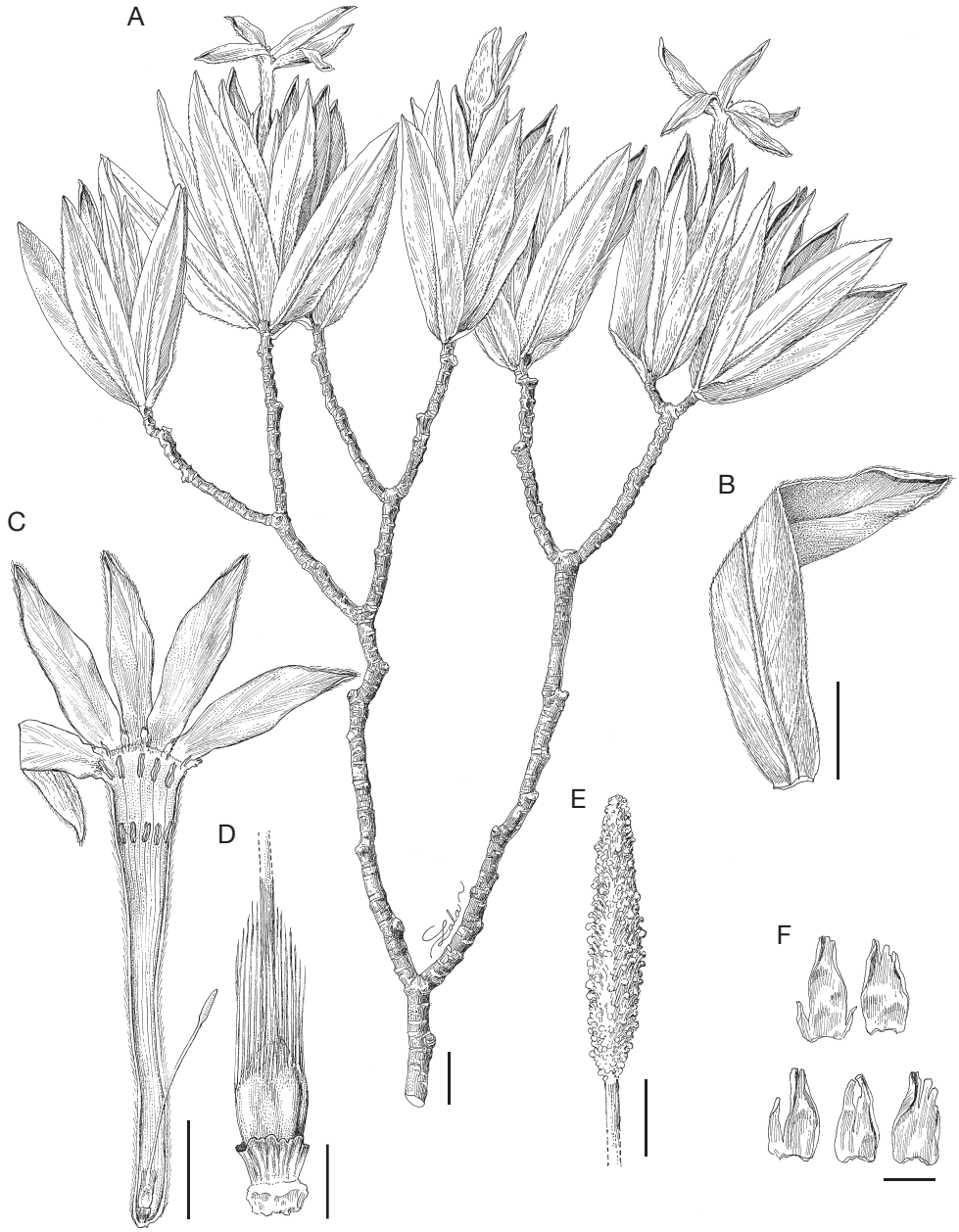

FIG. 1. — *Gnidia razakamalalana*: **A**, habit; **B**, leaf; **C**, flower in longitudinal section; **D**, gynoecium and subgynoecial disk; **E**, stigma; **F**, petals. *Razakamalala et al. 2670* (holotype). Scale bars: A-C, 1 cm; D-F, 1 mm.

petioles 0-0.3 mm long, densely sericeous; leaf blades elliptic or ovate-lanceolate, 4.5-8.4 cm long, 1-1.2 cm wide, length/width ratio 4-7:1, adaxially glabrous, abaxially densely sericeous, apex acute, margin entire, base obtuse-shortly decurrent or truncate; midrib impressed adaxially, raised

abaxially; venation brochidodromous, inconspicuous or only faintly visible, more obvious abaxially. Inflorescences terminal, erect, 1-flowered, leaving prominent scars on older branches. Flowers tubular, diplostemonous, 5-merous, reddish-white, sessile or subsessile, surrounded by several involute leaves (each at least partly adpressed to the lower portion of the floral tube, the distal ones becoming smaller in size and lighter in color); hypanthium *c.* 5 cm long, subcylindrical, *c.* 1 mm in diam. near base, *c.* 3 mm in diam. at mouth, adaxially glabrous, abaxially covered by dense shorter sericeous-tomentose trichomes intermixed with some longer straight trichomes, indument more or less uniform along length of tube, articulation not seen; calyx lobes 5, spreading, lanceolate-elliptic, 1.7-2.2 cm long, 3.5-5 mm wide, more membranous than hypanthium, adaxially papilliate and sparsely tomentose-sericeous, trichomes shorter than those on the abaxial surface, abaxial indument similar to but not as dense as that on the tube, apex acute or apiculate, with a dense tuft of straight trichomes; petals 5, scale-like, alternisepalous, oblong, ovate, or subtriangular, 1.8-2.2 mm long, 0.7-1 mm wide, membranous, apex irregularly erose, 1-5-lobed, lobes of varying length; stamens 10; filaments fused for most of their length to tube, upper whorl of anthers positioned just below mouth, lower whorl 2-4 mm below upper whorl; anthers bithecal, basifixed, longitudinally dehiscent, introrse, oblong, *c.* 3 mm long, *c.* 0.5 mm wide, subsessile; subgynoecial disk cup-shaped, up to 0.7 mm tall, glabrous, membranous, apex irregularly lobed, sinuses mostly shallow; gynoecium pseudomonomerous; ovary ellipsoid, *c.* 2.2 mm long, *c.* 1 mm wide, apex covered with a tuft of straight trichomes, each 1.5-2.3 mm long, lower 1/2 to 2/3 glabrous, base tapering; ovules 1, apical; style lateral, 1.5-1.8 cm long, filiform, flattened, *c.* 0.3 mm wide, glabrous; stigma inserted, reaching *c.* 1.5 mm below lower whorl of anthers (i.e. located near middle of tube), fusiform, *c.* 4 mm long, *c.* 0.5 mm wide, densely papilliate. Fruits not seen.

Distribution and habitat

Gnidia razakamalalana appears to be a narrow endemic, with only one known population occurring in subcoastal forest in SE Madagascar, at *c.* 100 m elevation. The species grows on a slope among exposed granite boulders on black sandy soil.

Phenology

This species flowers from November to February.

Conservation status

Gnidia razakamalalana is known from a single unprotected population. Given the apparent restricted range of the species, the area of occupancy is estimated to be no more than 10 km^2. Based on IUCN (2001) Red List criteria, the species is assigned a preliminary conservation status of Endangered (EN B1ab+B2ab).

Discussion

Among Malagasy Thymelaeaceae, *Gnidia razakamalalana* most closely resembles *Lasiosiphon ambondrombensis* but can be easily distinguished by its much larger hypanthium (*c.* 5 vs. 1.4-1.6 cm long) with longer calyx lobes (1.7-2.2 vs. 0.6-0.8 cm long), 1-flowered (vs. 8-15 flowered) inflorescences, and larger (4.5-8.4 vs. 1.5-2.3 cm long) leaves with a glabrous (vs. densely pubescent) adaxial surface. See the note by Aymonin (1975) regarding the affinities between *L. ambondrombensis* and the mainland African species of *Gnidia*.

The hypanthium of *Gnidia razakamalalana* is quite unusual in the genus because of its large size (5 cm long) and apparent lack of articulation. Most species of *Gnidia* have hypanthia measuring 1-2 cm long with those of only a few species (e.g., *G. anthylloides* (L.f.) Gilg) capable of reaching *c.* 3 cm in length. In fact, *G. razakamalalana* may prove to have the longest hypanthium in the family. The floral tube of nearly all species of the genus is articulated (lacking in *G. glauca* (Fresen.) Gilg from Africa and *G. gilbertae* Drake from Madagascar), which is used as a distinguishing character of *Gnidia*. This articulation appears as a straight line located some distance above the ovary and develops into a plane of abscission as the fruit matures. When an articulation is present, the portion of the hypanthium above it falls away, while the part below persists and surrounds the developing fruit, the two forming a single dispersal unit. The flowers

on the type material of *G. razakamalalana* do not show any trace of an articulation but the abscission line in some species (e.g., *L. ambondrombensis*) will often not clearly develop until the fruit is nearly mature. Fruiting collections of *G. razakamalalana* will be needed to determine if the species truly lacks an articulated hypanthium.

ETYMOLOGY

It is with great pleasure that I name *Gnidia razakamalalana* in honor of Malagasy botanist Richard Razakamalala, who was the first person to collect this species and who has accompanied me with enormous enthusiasm on numerous field trips in search of Malagasy Thymelaeaceae.

LECTOTYPIFICATION OF *OCTOLEPIS DECALEPIS* GILG

Octolepis Oliv. (Thymelaeaceae) was recently revised by Rogers (2005). In that publication, the name *O. decalepis* Gilg, appearing as a new synonym of the continental African *O. casearia* Oliv. var. *casearia*, was not effectively lectotypified in accordance with Art. 7.11 of the *International Code of Botanical Nomenclature* (Greuter *et al.* 2000) because the only material mentioned (a duplicate of *Dinklage 1741* deposited at B) was mistakenly cited as the "holo-[type]" and the words "here designated" or their equivalent were omitted. Two collections, *Dinklage 1741* and *1860*, were cited in the protologue (Gilg 1899), the first of which is hereby designated as the lectotype.

Octolepis decalepis Gilg

Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie 28: 142 (1899) [= *Octolepis casearia* Oliv. var. *casearia*]. — Type: Liberia, County Grand Bassa, Fishtown, fl., *Dinklage 1741* (lecto-, B!, here designated; iso-, A!, B[2 sheets]!, MO!).

Acknowledgements

The author thanks Lala Roger Andriamiarisoa for providing the illustration, Frédéric Tronchet for translating the abstract into French, Gordon McPherson and Roy Gereau for their comments regarding the Latin diagnosis, and Gérard-Guy Aymonin and P. P. Lowry II for carefully reviewing the manuscript.

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Submitted on 13 February 2006;
accepted on 10 May 2006.