



Thilachium madagascariense (Capparaceae), a new species from eastern Madagascar with a key to the species of the genus

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Summary. *Thilachium madagascariense* Fici, a small tree characterised by 1-foliolate leaves with articulate petioles, leaf blades elliptic or narrowly obovate with base attenuate and apex acuminate, flowers in groups of 2 – 3 at the top of lateral twigs and a high number of stamens, is described and illustrated from forest habitats of eastern Madagascar. The new species is similar to *T. laurifolium* Baker, a species endemic to central and eastern Madagascar, differing in the longer leaves with acuminate apex, flowers conferted at the top of lateral twigs, shorter pedicels, higher number of stamens and shorter gynophore. Its affinities are discussed and an updated key is provided for all the species of the genus *Thilachium*.

Key Words. endemism, historical collections, 1-foliolate leaves, taxonomy.

Introduction

The genus *Thilachium* Lour. (Capparaceae Juss.) comprises 15 species, seven of which endemic to Madagascar, six widespread in eastern Africa from Somalia southwards to Natal, one species, *T. africanum* Lour., recorded from both Madagascar and eastern Africa and one species, *T. panduriforme* Juss., from Madagascar and Mauritius (Elffers *et al.* 1964; Hadj Moustapha Haddade 1965; Harvey *et al.* 1995). The genus includes small trees, shrubs and a single herbaceous species (*T. roseomaculatum* Y.B.Harv. & Vollesen), with simple or 1 – 3-foliolate leaves and in some cases with tuberous roots, occurring in dry lowland and mountain forests, riverine formations, deciduous woodlands, xerophilous bushlands and thickets, secondary scrubs, dunes and grasslands, from sea level up to 1600 m a.s.l. With regard to the generic name, the spelling *Thylacium* was adopted in *Flora Zambesiaca* (Wild 1960), *Thylachium* in *Flora of Tropical East Africa* (Elffers *et al.* 1964) and in *Flore de Madagascar et des Comores* (Hadj Moustapha Haddade 1965). Later the original spelling *Thilachium* was conserved (McVaugh 1968), and adopted in *Flora of Somalia* by Thulin (1993), and by Harvey *et al.* (1995) in describing a new species from Kenya. Historically *Thilachium* was included by Pax & Hoffman (1936) — with the genera *Maerua* Forssk. and *Courbonia* Brongn. — in the tribe Maerueae Baill. belonging to the subfamily Capparoidae Burnett. Later DeWolf (1962) treated *Courbonia* as a synonym of *Maerua* and underlined that *Thilachium* “is a somewhat anomalous

genus” showing affinities also with the genus *Ritchiea* R.Br. More recently Kers (2003) did not retain the subdivision of Capparoidae in tribes proposed by Pax & Hoffman (1936), stating that *Thilachium* is related, in addition to *Maerua* and *Ritchiea*, to other Old World woody genera, i.e. *Boscia* Lam., *Bachmannia* Pax and *Cadaba* Forssk. The same author (Kers 2003) distinguished *Thilachium* from the allied genera mainly by the sepals connate, rupturing transversally at the midline, the conical calyptra tardily falling off and the absence of petals. With regard to the phylogeny of Capparaceae, Hall *et al.* (2002), based on chloroplast sequence data, identified within subfamily Capparoidae a mostly African Old World clade including *Thilachium*, *Maerua*, *Ritchiea*, *Boscia* and *Cadaba*.

Since the treatment of family Capparaceae provided by Hadj Moustapha Haddade (1965) no recent studies are available for Madagascar, which constitutes a centre of speciation of the genus *Thilachium*. During investigations on herbarium collections, material from the Lam & Meeuse expedition to Madagascar in 1938, originally identified as *Capparis* sp., turned out to belong to the genus *Thilachium*. Based on various differential features from the species known from Madagascar and eastern Africa, this specimen is referred to as a new species, distinguished by its leaf morphology and by the inflorescence and flower characters. The new species is here described and illustrated, its affinities are discussed and a key to the species of the genus is provided.

Materials and Methods

Herbarium investigations were carried out on historical and recent collections of Capparaceae from the Old World kept at the Nationaal Herbarium Nederland, Leiden University branch (L). To my knowledge the new species here described has been collected only once, in December 1938, by Lam & Meeuse in eastern Madagascar (*Lam & Meeuse* 5840).

The description and illustration are based on herbarium material. The species concept follows the one adopted by Elffers *et al.* (1964) and Hadj Moustapha Haddade (1965). The terminology of the vegetative and reproductive structures, as well as the main diagnostic characters within the genus, are based on the same treatments. The herbarium acronyms follow Thiers (continuously updated), while authors and plant names are based on IPNI (2020). The examination of type specimens of other species of *Thilachium* was carried out through electronic images available at JSTOR Global Plants (n.d.). The online collections available at P, K and MO and the Catalogue of the Vascular Plants of Madagascar (n.d.) were also consulted. The conservation status was provisionally assessed according to IUCN Red List Categories and Criteria (IUCN 2012).

Taxonomic Treatment

***Thilachium madagascariense* Fici sp. nov.** Type: Madagascar, Soanierana-Antasibe [Andasibe], 350 m, 10 Dec. 1938, *Lam & Meeuse* 5840 (holotype L 1851991!; isotype P 05457232 digital image!).

<http://www.ipni.org/urn:lsid:ipni.org:names:77218374-1>

Small tree c. 5 m tall. *Branches* greyish or reddish, beset with lenticels; twigs glabrous. *Leaves* 1-foliolate; blade chartaceous, elliptic or narrowly obovate, (7.5–) 10–15.3 × (2–) 3.3–5 cm; base attenuate; apex acuminate with tip 0.7–1.5 cm long; surfaces glabrous; veins c. 5–8 on each side of the midrib; petiole (1.1–) 2–4 cm long, glabrous, striate, articulate at the top; stipules 0.5 mm long or caducous. *Flowers* white, 2–3 conferted at the top of lateral twigs; pedicels 12–18 mm long, glabrous; bracts 0.2–0.5 mm long; flower buds c. 9–10 × 7–9 mm, with calyx at maturity rupturing transversally, the calyptra remaining attached at one side in the available material; receptacle c. 2–3 mm in diam.; petals 0; androgynophore 1–1.5 mm long, glabrous; stamens c. 57–70, filaments (20–) 23–30 mm long, anthers 1.5–2 mm long with thecae divergent at the base when mature; gynophore (20–) 23–26 mm long, glabrous; ovary oblong, 3–4 × 1–1.5 mm long, glabrous, striate, stigma sessile, flattened. *Fruit* unknown. Fig. 1.

RECOGNITION. Related to *Thilachium laurifolium* Baker in the articulate petiole of similar length and pauciflorous inflorescence, but differs in the longer, acuminate leaf blade, (7.5–)

–) 10–15.3 cm long vs subemarginate, 2.5–7.5 cm long, flowers 2–3 conferted at the top of lateral twigs vs 4–6 in corymbs, shorter pedicels, 1.2–1.8 cm long vs (3–) 3.5–5 cm long, higher number of stamens, c. 57–70 vs c. 30–46, and shorter gynophore, (2–) 2.3–2.6 cm long vs c. 5–7 (–8) cm long (Table 1). With regard to other 1-foliolate species from Madagascar, *T. madagascariense* differs from *T. monophyllum* Hadj-Moust. in the longer petiole, (1.1–) 2–4 cm long vs 0.8–1.2 cm long, longer leaf blade, (7.5–) 10–15.3 cm long vs 5–8 cm long, shorter pedicels, 1.2–1.8 cm long vs 2.3–2.5 cm long and higher number of stamens, c. 57–70 vs 25–30, and from *T. pouponii* Aubrév. & Pellegr. in the shorter petiole, (1.1–) 2–4 cm long vs c. 10 cm long, larger leaf blade, (7.5–) 10–15.3 × (2–) 3.3–5 cm vs 4–5 × 0.5–1 cm, shorter pedicels, 1.2–1.8 cm long vs 3–4 cm long, lower number of stamens, c. 57–70 vs c. 90–100 and shorter gynophore, (2–) 2.3–2.6 cm long vs 6–7 cm long (Table 1).

DISTRIBUTION AND HABITAT. The new species is only known from the type, which was collected in forest habitats of eastern Madagascar with *Sphenomeris decomposita* C.Chr., *Cyathea boivinii* var. *hildebrandtii* (Kuhn) Janssen & Rakotondr., *Tambourissa capuronii* Cavaco, *Exacum subacaule* Humbert, *Burasia* sp., *Neodypsis lastelliana* Baill., *Dypsipis nodifera* Mart., *Ravenala madagascariensis* Sonn., at an elevation of 350 m.

SPECIMENS EXAMINED. MADAGASCAR. Soanierana-Antasibe [Andasibe], 350 m, 10 Dec. 1938, *Lam & Meeuse* 5840 (holotype L; isotype P).

CONSERVATION STATUS. Lacking information to assess its risks, *Thilachium madagascariense* is categorised as Data Deficient (DD).

PHENOLOGY. Flowering in December (based on the available material).

VERNACULAR NAME. “Tafolona” (malagasy).

NOTES. *Thilachium madagascariense* is mainly distinguished by its leaf and inflorescence characters, as well as by the length of pedicels, number of stamens and length of gynophore. As mentioned above, among the species of the genus with 1-foliolate leaves *T. madagascariense* shows some affinities with *T. laurifolium*, endemic to central and eastern Madagascar (Hadj Moustapha Haddade 1965; Catalogue of the Vascular Plants of Madagascar n.d.) (Table 1). The new species is also related to *T. thomasi* Gilg, recorded from eastern Kenya and southern Somalia, which is distinguished by the shorter petioles (0.4–) 0.5–0.9 (–1.4) cm long, shorter, coriaceous or slightly fleshy leaf blade 3–9.3 cm long, inflorescence a 1–10-flowered loose corymbose raceme and lower number of stamens (c. 18–25) with longer anthers c. 3 mm long (Elffers *et al.* 1964; Thulin 1993) (Table 1). Other species with 1-foliolate leaves from Madagascar and eastern Africa, e.g. *T. monophyllum*, *T. pouponii*, *T. paradoxum* Gilg, *T. roseomaculatum* Y.B.Harv. & Vollesen, are readily recognisable by several vegetative and reproductive characters (Table 1). A key to all the



Fig. 1. *Thilachium madagascariense*. A flowering branch; B flower bud; C flower; D ovary. All from Lam & Meeuse 5840 (holotype L). DRAWN BY SILVIO FICI.

Table 1. Characters differentiating *Thilachium madagascariense* and related taxa.

Character	<i>T. madagascariense</i>	<i>T. laurifolium</i>	<i>T. thomasi</i>	<i>T. monophyllum</i>	<i>T. paradoxum</i>	<i>T. pouponii</i>	<i>T. roseomaculatum</i>
Habit	small tree	shrub or small tree	shrub or small tree	shrub or small tree	shrub	small tree	suffruticose perennial herb
Height (m)	c. 5	1–4	1–4	4–9	up to c. 0.6	6–10	up to 0.15
Petiole length (cm)	(1.1–) 2–4	(0.4–) 0.5–0.9	(0.4–) 0.5–0.9	0.8–1.2	8–30	c. 10	0.4–0.8
Leaf blade size (cm)	(7.5–) 10–15.3 × (2–) 3.3–5	2.5–7.5 × 2.5–3	3–9.3 × 1.8–7.2	5–8 × 3–4	0.9–5 × 0.2–0.45	4–5 × 0.5–1	6.2–12.5 × 3.4–7.5
Shape	elliptic or narrowly obovate	obovate or elliptic	suborbicular, elliptic, ovate or obovate	ovate, obovate-ovate-oblong	oblong to lanceolate	oblanceolate	elliptic or obovate
Inflorescence	2–3 flowers at the top of lateral twigs	4–6-flowered terminal corymb	1–10-flowered terminal, loose corymbose raceme	up to c. 10-flowered terminal corymb, some flowers solitary	5–7-flowered terminal, corymbose raceme	2–3 flowers in groups on the branches	(5–) 8–18-flowered terminal raceme
Pedicel length (cm)	1.2–1.8	(3–) 3.5–5	up to 2	2.3–2.5	0.7–0.8	3–4	0.25–0.6
Diameter of flower buds (mm)	c. 0.7–0.9	c. 12	up to 11	c. 10–12	c. 10	20–25	c. 5
Number of stamens	c. 57–70	c. 30–46	c. 18–25	25–30	c. 37–43	c. 90–100	c. 30–47
Length of filaments (cm)	(2–) 2.3–3	3.1–3.5	(1.6–) 2.5–3	1.8–2.5	c. 2–3	5–6	1–1.4
Anthers length (mm)	1.5–2	c. 2	c. 3	2.5	2.5–3	4–5	0.5–1
Gynophore length (cm)	(2–) 2.3–2.6	c. 5–7 (–8)	2–2.6	c. 3–3.6	c. 2.5–3	6–7	1.4–3
Ovary size (mm)	3–4 × 1–1.5	3.5–4 × 1.5–2	3–4.5 × 1.2–1.5	3–4 × 1.5–2	3–4 × 1.5–2	3–4 × 2	c. 2 × 1
Shape	oblong	ovoid-oblong	oblong	ovoid	ovoid-oblong	ovoid	cylindrical

species of *Thilachium* known from eastern Africa and Madagascar is provided below.

The description of this new species confirms Madagascar as a centre of speciation of the genus *Thilachium*, which includes here three other species with 1-foliolate leaves, i.e. *T. laurifolium*, *T. monophyllum* and *T. pouponii*, and six species with 3-foliolate leaves, in some cases intermixed with 1-foliolate leaves, i.e. *T. africanum* Lour., *T. angustifolium* Bojer, *T. humbertii* Hadj-Moust., *T. panduriforme* Juss., *T. seyrigii* Hadj-Moust. and *T. sumangui* Bojer. All these taxa, with the exception of *T. africanum* and *T. panduriforme*, are endemic to the island, where they are widespread along the coast and inland in xerophilous bushlands and woodlands, deciduous forests, dunes and riverine formations on limestone, gneiss, laterite, sandstone, alluvial and sandy-clay soils (Hadj Moustapha Haddade 1965). Within the Malagasy species, the pulp of the fruit is reported as sweet and edible in *T. pouponii* and *T. laurifolium*, while traditional medicinal uses are recorded for *T. seyrigii*.

Lam & Meeuse carried out their expedition to Madagascar from November to December 1938, landing at Tamatave on 4 November after visiting Réunion and Mauritius; in addition to wishing to address the lack of plant materials from Madagascar in the European Herbaria outside Paris, they were interested in the many ancient forms present in the island and in its floristic affinities with Malesia (Jacobs 1984). This was mainly a collecting trip, during which many areas of the island, up to 1550 m elevation, were explored. Lam & Meeuse collected 1030 numbers of herbarium specimens from the island (Jacobs 1984), currently kept at the Nationaal Herbarium Nederland (L and WAG) and including several types. Among these are the types of *Dichaetanthera lancifolia* H.Perrier (Melastomataceae) and *Decarydendron lamii* Cavaco (Monimiaceae), collected in the same locality as *Thilachium madagascariense*. The discovery of this new species confirms that historical collections are still a relevant source of data for taxonomic studies in less explored areas.

Key to the species of *Thilachium*

1. Leaves always simple or 1-foliolate 2
 - Leaves 3-foliolate, rarely with simple leaves intermixed or on fertile branches 10
2. Suffruticose perennial herb; leaves with conspicuous pink spots **T. roseomaculatum**
 - Shrubs or small trees; leaves without pink spots 3
3. Filaments up to 12 mm long 4
 - Filaments more than 16 mm long 5
4. Leaf blade 15 – 24 × 8 – 11 cm; filaments 11 – 12 mm long **T. macrophyllum**
 - Leaf blade 8.3 – 14 × 4.3 – 6.4 cm; filaments 7 – 8 mm long **T. alboviolaceum**
5. Petioles more than 8 cm long; leaf blade up to 1 cm wide 6
 - Petioles up to 4 cm long; leaf blade more than 1.8 cm wide 7
6. Petioles 8 – 30 cm long; leaf blade small, 9 – 50 × 2 – 4.5 mm, or frequently absent **T. paradoxum**
 - Petioles c. 10 cm long; leaf blade 40 – 50 × 5 – 10 mm **T. pouponii**
7. Petioles (1.1 –) 1.9 – 4 cm long; stamens ≥ 30 8
 - Petioles up to 1.2 (– 1.4) cm long; stamens ≤ 30 9
8. Leaf blade subemarginate 2.5 – 7.5 cm long; 4 – 6 flowers in terminal corymbs; pedicels (3 –) 3.5 – 5 cm long; stamens c. 30 – 46; gynophore c. 5 – 7 (– 8) cm long **T. laurifolium**
 - Leaf blade acuminate (7.5 –) 10 – 15.3 cm long; 2 – 3 flowers at the top of lateral twigs; pedicels 1.2 – 1.8 cm long; stamens c. 57 – 70; gynophore, (2 –) 2.3 – 2.6 cm long **T. madagascariense**
9. Pedicels 2.3 – 2.5 cm; fruit 1.5 – 2 cm long **T. monophyllum**
 - Pedicels up to 2 cm long; fruit 3 – 6 cm long **T. thomasii**
10. Inflorescence a dense corymb, usually with more than 20 flowers **T. densiflorum**
 - Inflorescence loose, with 1 – 10 (– 20) flowers 11
11. Leaflets linear or oblong, 0.2 – 1.2 cm wide **T. angustifolium**
 - Leaflets elliptic, lanceolate, oblanceolate, ovate, obovate or panduriform, (0.6 –) 1 – 5.3 cm wide 12
12. Leaflets heteromorphic, lanceolate and panduriform; simple leaves present on fertile branches **T. panduriforme**
 - Leaflets not heteromorphic 13
13. Pedicels 6 – 8 mm long **T. sumangui**
 - Pedicels 10 – 21 mm long 14
14. Filaments up to 3.6 cm long **T. africanum**
 - Filaments c. 1 cm long 15

15. Pedicels c. 1 – 1.3 cm long; stamens c. 15; fruit 4 – 5 cm long **T. humbertii**
 – Pedicels 1.5 – 2 cm long; stamens 30 – 40; fruit 0.7 – 0.8 cm long **T. seyrii**

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