

A new species of *Thilachium* (Capparaceae) from the Analanjirofo Region, Madagascar

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Madagascar is a centre of speciation for the genus *Thilachium* Lour., which includes several species of small trees and shrubs occurring in a wide range of habitats. A new species of *Thilachium*, *T. latifolium* Fici, from the Analanjirofo Region of northeastern Madagascar is here described and illustrated. It is characterised by 1-foliolate leaves, leaf blades widely ovate or elliptic with shortly acuminate or acute apices, flowers in terminal, dense subumbels or corymbs, short pedicels and ellipsoid, ribbed fruit. The new species is related to *T. madagascariense* Fici, a species recently described from eastern Madagascar, differing in the wider, coriaceous leaves with shorter, mucronulate tip, flowers in terminal, 7–16-flowered subumbels or corymbs, shorter pedicels and longer anthers. The distribution, autecology and affinities of the new species are discussed, its conservation status is assessed, and an updated key is provided for the species of the genus *Thilachium* known from Madagascar.

Keywords: Capparoidae, conservation status, endemism, historical collections, Mananara, Masoala National Park, *Thilachium latifolium*.

Introduction

The classification of the tropical and subtropical family Capparaceae Juss., traditionally split into the three subfamilies Cleomoideae Pax, Dipterygioideae Pax and Capparoidae Pax, has undergone several changes due to new evidence from phylogenetic analyses (Hall et al. 2002; Hall 2008; Cardinal-McTeague et al. 2016). In addition, various genera in the neotropical area have been described or reinstated (Cornejo 2017; Cornejo & Iltis 2008a, 2008b, 2008c, 2008d, 2009; Iltis & Cornejo 2007, 2010, 2011). Based on these considerations, the Cleomoideae and Dipterygioideae are now referred to family Cleomaceae Horan., with 34 genera currently recognised within the Capparaceae (Fici 2020).

In Madagascar and the Comoro Islands the Capparaceae are represented by six genera, i.e. *Crateva* L., *Capparis* L., *Cadaba* Forssk., *Boscia* Lam., *Maerua* Forssk. and *Thilachium* Lour. After the treatment in *Flore de Madagascar et des Comores* (Hadj Moustafa Haddade 1965), little attention has been paid to these genera in the area, apart from the description of two new species of *Capparis* and *Thilachium* (Fici 2011, 2021a), while several studies were carried out during the last decades in southern Asia (Viswanathan 2000; Srisanga & Chayamarit 2004; Sy et al. 2013, 2015, 2016, 2017, 2020; Fici et al. 2018, 2020; Souvannakhoummane et al. 2018, 2020; Fici & Souvannakhoummane 2020; Murugan et al. 2020; Julius 2022), Indonesia (Fici 2012, 2021b) and New Caledonia (Fici 2017). The genus *Thilachium* includes 15 species of trees or shrubs (with a single herbaceous species), with 1- or 3-foliolate leaves, occurring in eastern Africa, Madagascar and Mauritius along a wide range of habitats (Elffers et al. 1964; Thulin 1993; Harvey et al. 1995; POWO 2019; Fici

2021a). The genus is characterised by the absence of petals and by the connate sepals rupturing transversally with a conical calyptra often remaining attached at one side. De Wolf (1962) regarded *Thilachium* as ‘somewhat anomalous’ within the African Capparaceae and hypothesised an affinity with *Ritchiea* R.Br. and *Maerua*, a relationship which has been confirmed by molecular phylogenetic data (Hall et al. 2002; Su et al. 2012; Cardinal-McTeague et al. 2016; Tamboli et al. 2018).

While studying the collections of *Thilachium* at the Muséum National d’Histoire Naturelle (P), flowering material collected in 1912 by Perrier de La Bâthie in the coastal forest of Mananara, in the Analanjirofo Region of northeastern Madagascar, was examined. This collection was formerly studied by Hadj Moustafa Haddade (1965), who regarded it as an undescribed species ‘insuffisamment connu’, characterised by large, coriaceous, 1-foliolate leaves and white flowers with short pedicels, arranged in compact inflorescences. The occurrence in the same herbarium (P) of a more recent fruiting specimen, collected in the same region, allowed for the completion of the morphological characterisation of this new species, which is here described.

Materials and methods

Herbarium investigations were carried out on historical and recent collections from Madagascar kept at P. To my knowledge the new species has been collected two times, in October 1912 (Perrier de La Bâthie 5029) and in April 1996 (Aridy et al. 260). The description and illustration are based on this herbarium material. The species concept follows the one adopted by Elffers et al. (1964) and Hadj Moustapha Haddade (1965). The main diagnostic characters among the new species and related taxa are based on the same treatments (Elffers et al. 1964; Hadj Moustapha Haddade 1965) and on Fici (2021a). The herbarium acronyms follow Thiers (continuously updated), while authors and plant names are based on the International Plant Names Index (IPNI) (2020). The examination of the type specimens of other species was carried out through electronic images available at JSTOR Global Plants (n.d.). The available online collections at MO and the Catalogue of the Vascular Plants of Madagascar (Anon 2022) were also consulted. The conservation status was provisionally assessed according to IUCN Red List Categories and Criteria (IUCN 2012).

Taxonomic treatment

Thilachium latifolium Fici, sp. nov.

TYPE: MADAGASCAR, **Analanjirofo Region**, Mananara, Côte Est, [16°10’S / 49°46’E], Oct. 1912,

Perrier de La Bâthie 5029 (P 05457228!, holo.; P 05457229!, iso.).

Description

Shrub up to ± 3.5 m tall. *Branches* reddish or brownish, beset with sparse lenticels; twigs glabrous. *Leaves* 1-foliolate, alternate; blade coriaceous, persistent, widely ovate or elliptic, (60–)70–140(–160) \times (30–)40–93 mm, with entire margins; base attenuate or obtuse; apex acuminate, with tip up to ± 8 mm long, or acute, mucronulate; surfaces glabrous; nerves (4–)5–6(–8) on each side of the midrib; petiole (7–)12–41(50) mm long, glabrous, articulate at the top. *Flowers* in 7–16-flowered terminal, subsessile, dense subumbels or corymbs; pedicels 8–12 mm long, glabrous; bracts ± 0.5 mm long or lacking; flower buds (5.0–)5.5–8.0 \times (4–)5–8 mm, with whitish, ovoid or ellipsoid calyx at maturity rupturing transversally, the calyptra often remaining attached at one side; petals 0; androgynophore ± 1.0 –1.5 mm long; stamens ± 51 to 72, filaments 22–28 mm long, anthers 2.5 mm long; gynophore ± 25 –26 mm long, glabrous; ovary oblong, ± 3 –4 mm long, glabrous. *Fruit* ellipsoid, 45–63 \times 29–45 mm, 8-ribbed; seeds ovoid, brownish, ± 13 –18 \times 10–11 mm. Figure 1.

Distribution and habitat

The new species is known from two localities of the Analanjirofo Region (Figure 2), at 16°10’S / 49°46’E and 15°40’S / 49°57’E, where it has been collected in coastal forest and in dense evergreen, humid forest, from sea level up to ± 300 m elevation. Based on the available material, flowering occurs in October, fruiting in April.

Etymology

The specific epithet is composed of the Latin words *latum*, meaning wide, and *folium*, meaning leaf.

Diagnosis and relationships

The new species is related to *Thilachium madagascariense* Fici, from which it differs in the coriaceous, widely ovate or elliptic, (30–)40–93 mm wide leaf blade (leaf blade chartaceous, narrowly obovate or elliptic, (20–)33–50 mm wide in *T. madagascariense*); leaf apex with tip up to ± 8 mm long, mucronulate (tip up to 15 mm long, not mucronulate in *T. madagascariense*); inflorescence a 7–16-flowered terminal, dense subumbel or corymb (2 or 3 flowers conferted at the top of lateral twigs in *T. madagascariense*); pedicels 8–12 mm long (12–18 mm long in *T. madagascariense*); and anthers 2.5 mm long (1.5–2.0 mm long in *T. madagascariense*).

With regard to other species with 1-foliolate leaves from Madagascar, *T. latifolium* shows also affinities with *T. laurifolium* Baker, which differs from the former in the

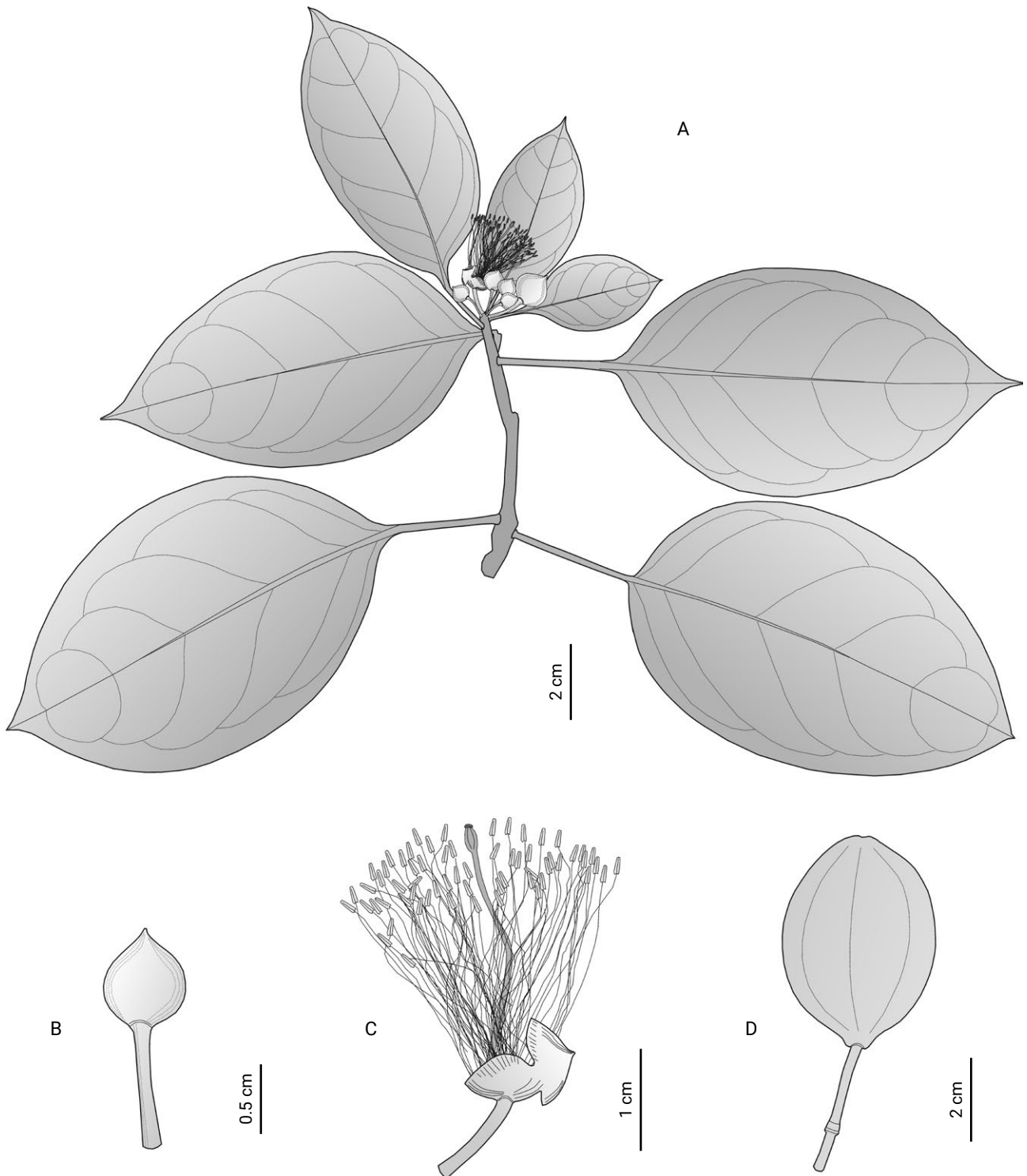


Figure 1. *Thilachium latifolium*. A, flowering branch; B, flower bud; C, flower; D, fruit and stipe. A, B, C from Perrier de La Bâthie 5029 (holotype), D from Aridy et al. 260. Artist: Silvio Fici.

smaller, submarginate leaf blade, 25–75 × 25–30 mm; inflorescence a 4–6-flowered terminal, loose corymb; pedicels (30–)35–50 mm long, stamens ± 30–46 with filaments 31–35 mm long; and gynophore ± 50–70(–80) mm long. Among the 1-foliolate species of the genus recorded from eastern Africa, *T. latifolium* is closer to *T. thomasii* Gilg, a species widespread in Kenya and southern Somalia (Elffers et al. 1964), which is distinguished by the petiole (4–)5–9(–14) mm long; leaf

blade with apex obtuse or rounded, not acuminate; inflorescence a 1–10-flowered terminal, loose corymbose raceme; pedicels up to 20 mm long; and stamens ± 18–25.

Conservation status

Lacking information to assess its risks, *Thilachium latifolium* is assessed here as Data Deficient (DD). However,

it is to be underlined that one of the known localities falls within a conservation area (Masoala National Park).

Other material examined

MADAGASCAR, **Analanjirofo Region:** Park National de Masoala, Andranobe, Fok. Ambanizana, Fir. Anjahana, Fiv. Maroantsetra, 15°40'S / 49°57'E, 200–300 m, 17 Apr. 1996, Aridy et al. 260 (MO, P 04746459).

Notes

Apart from the widely ovate or elliptic leaves with apex shortly acuminate, *Thilachium latifolium* is mainly differentiated from the other 1-foliolate species of the genus in Madagascar by its terminal, dense subumbels or corymbs. The inflorescence in *Thilachium* is commonly reported as a terminal, axillary or on short lateral branches, corymbose raceme (Elffers et al. 1964; Kers 2002), or more rarely 2 or 3 flowers are conferred at the apex of lateral twigs (Fici 2021a). Among the known species a dense, many-flowered corymb is reported only for *T. densiflorum* Gilg & Gilg-Ben., a 3-foliolate species from Tanzania, with buds up to 5 mm in diameter and receptacle elongating to \pm 8 mm at anthesis (Elffers et al. 1964). As mentioned above *T. latifolium* shows some affinities with *T. madagascariense*, a species recently described from eastern Madagascar, and with *T. laurifolium*, known from the central and eastern parts of the island (Hadj Moustapha Haddade 1965;

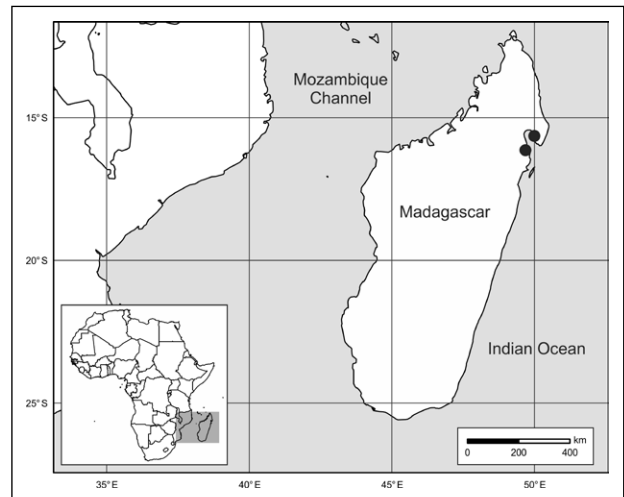


Figure 2. Distribution of *Thilachium latifolium*.

Fici 2021a; Anon 2022). A key to the species of *Thilachium* known from Madagascar is here provided.

Madagascar constitutes a centre of speciation of the genus *Thilachium*, which is represented here by nine endemic species, besides one species also native to eastern Africa and one to Mauritius; among these, five species have 1-foliolate leaves and six species 3-foliolate leaves. The description of this new species confirms that the historical herbarium collections still represent a remarkable and inspiring source of data for plant taxonomists (Fici 2021a) in areas such as eastern Madagascar.

Key to the species of *Thilachium* in Madagascar

- 1a. Leaves always simple or 1-foliolate:
 - 2a. Inflorescence dense subumbel or corymb up to 16-flowered; pedicels 8–12 mm long. ***T. latifolium*** Fici, sp. nov.
 - 2b. Inflorescence loose corymbose raceme up to 10-flowered, or 2 or 3 flowers at the top of lateral twigs or on the branches; pedicels \geq 12 mm long:
 - 3a. Petioles \geq 80 mm long; leaf blade \leq 10 mm wide *T. pouponii* Aubr v. & Pellegr.
 - 3b. Petioles \leq 40 mm long; leaf blade \geq 18 mm wide:
 - 4a. Petioles 8–12 mm long; inflorescence 8–10-flowered; stamens 25–30; anthers 2.5 mm long *T. monophyllum* Hadj-Moust.
 - 4b. Petioles (11–)19–40 mm long; inflorescence 2–6-flowered; stamens \geq 30; anthers 1.5–2.0 mm long:
 - 5a. Leaf blade submarginate, 25–75 mm long; 4–6 flowers in terminal corymbs; pedicels (30–)35–50 mm long *T. laurifolium* Baker
 - 5b. Leaf blade acuminate (75–)100–153 mm long; 2 or 3 flowers at the top of lateral twigs; pedicels 12–18 mm long *T. madagascariense* Fici
 - 1b. Leaves 3-foliolate, rarely with simple leaves intermixed or on fertile branches:
 - 6a. Leaflets linear or narrowly oblong, 2–12 mm wide; fruit 8–10 mm wide *T. angustifolium* Bojer
 - 6b. Leaflets elliptic, lanceolate, oblanceolate, ovate, obovate or panduriform, (6–)10–53 mm wide; fruit 12–40 mm wide:
 - 7a. Leaflets heteromorphic, lanceolate and panduriform. *T. panduriforme* Juss.
 - 7b. Leaflets not heteromorphic:
 - 8a. Pedicels 6–8 mm long. *T. sumangui* Bojer
 - 8b. Pedicels 10–21 mm long:
 - 9a. Gynophore 23–32 mm long; filaments 27–36 mm long *T. africanum* Lour.

9b. Gynophore 7–20 mm long; filaments \pm 10 m long:

10a. Pedicels \pm 10–13 mm long; stamens \pm 15; fruit 40–50 mm long *T. humbertii* Hadj-Moust.

10b. Pedicels 15–20 mm long; stamens 30–40; fruit 7–8 mm long *T. seyrigii* Hadj-Moust.

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Competing interests

The author declares that he has no financial or personal relationships that may have inappropriately influenced him in writing this article.

Ethical considerations

This article followed all ethical standards for research without direct contact with human or animal subjects.

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