Tournefortia kirkii (I.M. Johnston)
J.S. Mill. (Boraginaceae): A new combination for a species from Madagascar

James S. MILLER
Missouri Botanical Garden, P.O. Box 298, St. Louis,
Missouri 63166-0299, U.S.A.
james.miller@mobot.org

ABSTRACT
A new combination, Tournefortia kirkii, is published, recognizing
Tournefortia puberula var. kirkii as a distinct species. An increase in available
collections demonstrates that this taxon is more widespread than originally
supposed and that it occurs sympatrically with T. puberula while maintaining
its distinct morphology, thus merit[ing recognition as a distinct species.

RÉSUMÉ
Tournefortia kirkii (I.M. Johnston) J.S. Mill. (Boraginaceae): Une nouvelle
combinaison pour une espèce de Madagascar.
Une nouvelle combinaison, Tournefortia kirkii, est établie à la suite de la
reconnaissance de Tournefortia puberula var. kirkii en tant qu’espèce distincte.
L’augmentation du nombre de récoltes démontre que ce taxon est plus
répandu qu’on ne le pensait et qu’il se trouve en sympatie avec T. puberula
tout en conservant sa propre morphologie, méritant ainsi d’être reconnu
comme une espèce distincte.

The genus Tournefortia L. (Boraginaceae, sub-family Heliotropioideae) consists of approxi-
mately 150 species (Miller 1988) and is represented in most warm areas of the world,
but the majority of the species occur in the New World tropics. Three sections have been
recognized in the genus and some recent authors (e.g. Martins 1990; Verdcourt 1991) have
chosen to separate some species into Argusia

Amman, but Nowicke & Skvarla (1974) have shown that variation in pollen morphology does
not support this distinction. Given that the vast majority of morphological complexity in
Tournefortia occurs among the New World species, and perhaps even its distinction from
Heliotropium L. is artificial, I have adopted a conservative generic concept, preferring to
wait for further molecular evidence before
guished it from typical *Tournefortia puberula* in occurring in more arid regions and having a stiff white strigose indument on the stems, petioles, and inflorescence branches, that is sometimes found on the lower leaf surface as well. The typical *T. puberula* was characterized by having minute brown puberulent stems, petioles, and inflorescence branches and occurred in moist to wet forests of central-eastern Madagascar.

These two taxa are currently known from much greater numbers of collections than were available to Johnston. From recent study of these collections during preparation of an account of Boraginaceae for the Flore de Madagascar et des Comores, it is apparent that the distributions of the two taxa overlap significantly (Fig. 1) and that the morphological differences seem to be maintained even when the two grow sympatrically, such as around Ambondrazaka and in the Zahamena National Park. Because of this, I have chosen to elevate *Tournefortia puberula* var. *kirkii* and recognize it as a distinct species necessitating the following new combination and emended descriptions.

**Tournefortia kirkii** (L.M. Johnston) J.S. Mill., **comb. nov.**


*Fig. 1. — Distributions of Tournefortia kirkii and T. puberula in Madagascar.*

Woody vine or scrambling shrub, the twigs strigillose to hispidulous, the hairs silaceous, white. Leaves alternate, persistent; blades ovate to elliptic or narrowly elliptic, the widest point below or rarely at or slightly above the middle, 6-11 × 2-4.5 cm, the apex acuminate to acute, the base obtuse to acute or approaching rounded, the margin entire, sometimes minutely and tightly revolute, the adaxial surface moderately to sparsely strigillose, the adaxial surface densely to sparsely puberulent or nearly glabrous, but always puberulent on the midrib; venation brochidodromous, the midrib slightly impressed on the adaxial surface, raised on the abaxial surface, the secondary veins 6-8, the tertiary venation reticululate; petioles 5-15 mm long, adaxial surface, dense or puberulent.

Inflorescences to 6-15 cm broad, the peduncle and branch hairs silaceous, lanate, strigillose; corolla tubes 1-2 mm long, the petals ovate, c. 1 mm broad, 1 mm long, the stamens 1-2 mm long, the ovary ovate, 0.7-1 mm long, the stigma 2-3 mm long, the carpels 3-5 mm long, the carpels bony, separate at maturity.

**DISTRIBUTION.** — from the Comore coast of Madagascar to the localities in north from near sea level.

*Tournefortia kirkii* var. *puberula*, which is puberulent. In adaxial surface (4-9 mm) are given in *T. puberula* (3-5 mm).

**ADDITIONAL MATERIAL.**

Académie Malgache
1904 (P); Beurlens 2
fl., 1849 (P); Coua
Alaotra, dist. d’An
48°25’S, fl., Feb. 15
1937 (P); Perrier d’
Ambongoro, 17°18’S
Perrier de la Bâthie
moyen de Bemariv
1907 (P); Perrier d’
Antsiranana, bois E
Aug. 1907 (P); l’
Antsiranana, bord...
Tournefortia puberula

shrub, the twigs glabrous to minutely brown puberulent, the hairs not mineralized and not white. Leaves alternate, persistent; blades ovate to lanceolate, 5-12 x 2.3-6.5 cm long, the apex acuminate, the base rounded or slightly cordate to obtuse or rarely acute, the margin entire, but usually minutely and tightly revolute, both surfaces glabrous; the venation brochidodromous, the midrib even with the adaxial surface or slightly impressed, raised on the abaxial surface, the secondary veins 4-6, the tertiary veins reticulate; petioles 7-23 mm long, prominently canaliculate on the adaxial surface, glabrous to minutely brown puberulent.

Inflorescences terminal, a well-branched cyme 7-20 cm broad; the peduncle 15-30 mm long, peduncle and branches glabrous to minutely brown puberulent. Flowers bisexual; sepals 5, triangular, somewhat uneven, 1.5-3 x 0.5-1 mm, sharply acute to attenuate at the apex, glabrous or sparsely striigillos; corolla white, tubular with 5 spreading and apically recurved lobes, 3-5 mm long; anthers lanceoloid 1-1.5 mm long; ovary ovoid, 0.7-1 x 0.7-1 mm, the style less than 1 mm long, the stigma capitulate, slightly bilobed.

Fruits drupaceous, white at maturity, ovoid, 2.5-3 x 2.5-3 mm, the exocarp thin, the endocarp bony, separating into 2, 2-seeded carpels at maturity.

Distribution. — Tournefortia kirkii is known from the Comores, Nosy Be off the northeast coast of Madagascar, and from several scattered localities in northern Madagascar north of 18°S from near sea level to 1300 m in elevation.

Tournefortia kirkii has white, mineralized, appressed hairs, which easily separate it from T. puberula, which is glabrous or minutely brown puberulent. In addition, the corollas of T. kirkii (4-9 mm) are generally longer than those of T. puberula (3-5 mm).

long, the lobes 5, ovate, c. 1 mm long; stamens 5, the filaments 2-3 mm long, adnate to the tube for their full length, the anthers lancoloid, c. 1 mm long; ovary ovoid 1.5 × 0.7-1.1 mm, the style shorter than 1 mm, the stigma capitate, somewhat bilobed.

Fruits drupaceous, white at maturity, broad ovoid, 3-6 × 5-7 mm, the exocarp thin, the endocarp bony, separating into 2, 2-seeded carpels at maturity.

**VERNACULAR NAMES.** — Laharohy, lardy, trontaka, vahibe, varaina.

**DISTRIBUTION.** — *Tournesolia puberula* occurs in eastern wet forests from about 14°S, around the Marojejy massif, to the Ft. Dauphin region near 25°S from near sea level to 1700 m. It is a relatively common species along edges of forests and streams.

**ADDITIONAL MATERIAL EXAMINED.** — MADAGASCAR: d'Alleizette 477, Prov. Antananarivo, Mandraka, 18°56'S, 47°55'W, fl., fr., Oct. 1905 (PI); Baron 2798, Central Madagascar, fl., Oct. 1882 (K).

**RÉSERVES NATURELLES.** — Zahamena, 17°50'S.

**Acknowledgement**

Fieldwork was generously supported by: Geographie Soci. K. REAGHAN, K. MARIA, and G. SC, assisting with field work in many ways, filling aspects of preparati- curators of K and F and Fas by editing the possibility to finish the book was completed while working at the Laboratoire National d'Histoire du Staff for the...

Acknowledgements

Fieldwork to study Malagasy Boraginaceae was generously supported by grant 4288-90 from the National Geographic Society. I thank J. Andriatiana, R. Keating, L. Miller, P. Phillipson, A. Randrianasolo, and G. Schatz for accompanying me and assisting with fieldwork. P. Lowry was of special help in many ways, facilitating fieldwork and help with all aspects of preparation of the manuscript. I thank the curators of K and P for loan of specimens and hospitality during herbarium visits and Prof. Ph. Morat for the possibility to finish this in Paris. This manuscript was completed while serving as a "Chercheur associé" at the Laboratoire de Phanerogamie, Muséum National d'Histoire Naturelle. I thank J.-N. Labat and the staff at P for their help during my visit. I also thank S. Andriambolona, J. Raharimamonjina, and K. Sikes for help compiling specimen data. Adam Bradley provided bibliographic assistance and T. Consiglio prepared the distribution map. Fieldwork essential to this study was conducted under a collaborative agreement between the Missouri Botanical Garden and the Parc Botanique et Zoologique de Tsimbazaza, Antananarivo, Madagascar. I gratefully acknowledge courtesies extended by the Government of Madagascar (Direction Générale de la Gestion des Ressources Forestières).

REFERENCES


Manuscript received 7 September 2001; revised version accepted 8 October 2001.