

Zeitschrift: Boissiera : mémoires de botanique systématique
Herausgeber: Conservatoire et Jardin Botaniques de la Ville de Genève
Band: 71 (2017)

Artikel: Taxonomic treatment of Abrahamia Randrian. & Lowr : a new genus of Anacardiaceae from Madagascar
Autor: Randrianasolo, Armand / Lowry, Porter P. / Schatz, George E.
Kapitel: Morphology and taxonomically informative characters
DOI: <https://doi.org/10.5169/seals-1036071>

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

Download PDF: 30.06.2025

ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>

Field studies Field work, conducted in Madagascar between 1996 and 2013, initially focused on collecting material needed to fill gaps identified during the first phase of herbarium studies, and was later aimed at sampling as many taxa as possible, including those that appeared to be new, in order to provide a robust understanding of morphological and geographic variation within the group. The collection of herbarium specimens followed standard MBG protocols [www.mobot.org/MOBOT/molib/fieldtechbook/pdf/handbook.pdf]. Whenever possible, a minimum of five duplicate specimens were prepared for each collection, two of which were deposited in Madagascar (at TAN and TEF) and the remaining were sent to MO, where the majority of herbarium studies were conducted (a single sheet was mounted at MO, and additional duplicates have been distributed). Fresh material (leaves, inflorescence, flower buds, flowers, and fruits) was also collected and preserved in FAA, and deposited in the spirit collection of the Missouri Botanical Garden. Leaf samples preserved in silica gel were prepared for as many species as possible for molecular studies (see PELL et al., 2008). Finally, mature seeds were collected and provided to the horticulture department of the Parc Botanique et Zoologique de Tsimbazaza in Antananarivo, Madagascar.

Risk of extinction assessments The conservation status of each species was assessed using the IUCN Red List Categories and Criteria (IUCN, 2012). Data from the collection records in the MADAGASCAR CATALOGUE (2017) were used to calculate geographic range parameters (area of occupancy AOO, extent of occurrence EOO, and number of localities), and the number of locations (sensu IUCN, 2012) was determined for each species with respect to the most serious threats.

**Morphology
and taxonomically
informative characters**

A number of morphological features have proven to be of value for recognizing and distinguishing species of *Abrahamia*. These characters are briefly presented below.

Habit Two major growth forms can be discerned in *Abrahamia*. All wet forest species are canopy or midstory trees with straight trunks and conical crowns. By contrast, those occurring in dry areas (i.e., Madagascar's western slopes and in the far South) or in highly impacted or degraded habitats (in particular on the high plateau) are usually short and/or scrubby trees (e.g. *A. ibityensis* (H. Perrier) Randrian. & Lowry and *A. itremoensis* Randrian. & Lowry). Also, the color of exudate in the bark, observable when a slash is made on the trunk, varies from milky white or translucent/watery white to red.

Leaves All species of *Abrahamia* have leaves that are entire and distinctly petiolate. Phyllotaxy, however, varies from alternate and subopposite to opposite or verticillate. Most species are evergreen, with the exception of *A. humbertii* (H. Perrier) Randrian. & Lowry, which is deciduous. Several additional foliar characters are also of taxonomic importance, as follows:

- Blade shape and size* The size and shape of the leaf blade vary significantly in *Abrahamia* and are useful for recognizing and identifying species. The smallest leaves occur in *A. minutifolia* Randrian. & Lowry and *A. louvelii* (H. Perrier) Randrian. & Lowry, ranging from 1.8-4 cm long, whereas in *A. latifolia* (Engl.) Randrian. & Lowry and *A. viguieri* (H. Perrier) Randrian. & Lowry they are 8-37 cm long. Some species have narrow leaves, such as *A. grandidieri* (Engl.) Randrian. & Lowry, in which the blade is oblanceolate and at least 3 times as long as wide, while in other species the length to width ratio is closer to 1.5-2 and the shape therefore ranges from widely elliptic or circular to broadly ovate (in *A. humbertii*) to broadly obovate (as in *A. pauciflora* (Engl.) Randrian. & Lowry).
- Venation* All species of *Abrahamia* have pinnately veined leaves in which the secondary (lateral) veins are either craspedodromous or semicraspedodromous. According to the classification proposed by ELLIS et al. (2009), in craspedodromous leaves the major secondary veins terminate at the margin whereas in semicraspedodromous leaves they branch near the margin and only one of the branches reaches the margin. Only five members of the genus have semicraspedodromous venation (viz. *A. antongilensis* Randrian. & Lowry, *A. latifolia*, *A. lecomtei* (H. Perrier) Randrian. & Lowry, *A. lenticellata* Randrian. & Lowry and *A. pauciflora*), whereas all others have craspedodromous venation. In addition to the overall venation type, three more venation characters are also of taxonomic value – the number and the shape of the secondary veins, and the distance between them – all three of which show considerable variation among species. When used in combination, these characters make it possible to distinguish, for example, species with parallel and very closely spaced (0.5-3 mm) secondary veins (e.g., *A. grandidieri*, *A. itremoensis*, *A. louvelii* and *A. sericea* (Engl.) Randrian. & Lowry) from those with arcuate and more distantly spaced (2-15 mm) secondary veins (such as *P. thouvenotii* (Lecomte) Randrian. & Lowry, and *P. viguieri*). Another useful venation character in *Abrahamia* is the pattern of tertiary veins. Two groups of species can be distinguished, one with prominent and visible tertiary venation on at least one of the leaf surfaces and the other in which it is impressed or inconspicuous reticulate.
- Leaf surface indument* The surface of leaf blades in *Abrahamia* species is glabrous or it can have indument comprising various types of trichome. The presence or absence of indument has proven to be particularly useful in delimiting species. Six general indument types are found within the genus, in addition to the glabrous condition. The definitions of these types, as presented below, are based in large part on HARRIS & HARRIS (1994). We use ‘pubescent’ in the narrow sense (HARRIS & HARRIS, 1994) rather than as a general term to refer to all types of indument comprising trichomes of various orientation, shape, texture.
1. Lanate: densely covered with long and tangled trichomes (e.g., *A. viguieri*).
 2. Pubescent: with various types of short and soft trichomes (e.g., *A. turkii* Randrian. & Lowry).
 3. Puberulent (puberulous): minutely pubescent (e.g., *A. itremoensis*).
 4. Velutinous: with short, soft, spreading trichomes. This type is only found on the abaxial leaf surface of a single species, *A. antongilensis*.

5. Strigose: very short and stiff appressed trichomes.

6. Scabrous: very short, stiff, erect trichomes. This type occurs on the leaves of *A. deflexa* (H. Perrier) Randrian. & Lowry.

Petiole The length of the petiole is also useful for distinguishing species within *Abrahamia*. For example, *A. buxifolia* (H. Perrier) Randrian. & Lowry and *A. itremoensis* have short petioles (2-5 mm and 1-3 mm, respectively) while the petiole is very long in *A. longipetiolata* (H. Perrier) Randrian. & Lowry (15-30 mm) and *A. sambiranensis* Randrian. & Lowry (20-58 mm).

Inflorescences In *Anacardiaceae* as a whole, various inflorescence characters such as structure, size, and type can be taxonomically informative (WANNAN & QUINN, 1991; KEARNS & INOUE, 1993). BARFOD (1988) hypothesized phylogenetic trends among South American *Anacardiaceae* using inflorescence morphology, and WANNAN & QUINN (1992) examined the affinities of the genus *Laurophyllus* Thunb. using inflorescence structure. In *Abrahamia*, inflorescence structure, length, type, and position are useful for recognizing and delimiting species. The terminology used here is that of WEBERLING (1989).

The inflorescences of all species of *Abrahamia* are compound and erect, and are either panicles or thyrses. Most species (such as *A. antongilensis* and *A. deflexa*) have a terminal inflorescence while in some others (e.g., *A. elongata* Randrian. & Lowry, *A. latifolia*, *A. lecomtei* and *A. littoralis* Randrian. & Lowry) it is axillary. However, a few species (such as *A. ditimena* (H. Perrier) Randrian. & Lowry and *A. turkii*) have both axillary and terminal inflorescences in the same individual and often even on the same branch.

Flowers The flowers of *Abrahamia* are actinomorphic, small (2-4 mm long), white to yellow in color, 4-, 5-, or rarely 6-merous, and borne on a short and articulate pedicel. Two floral characters are of particular taxonomic value.

Corolla While the petals in *Abrahamia* are consistently alternisepalous, their size, which is significantly larger than the sepals, is useful for separating certain species. For example, *A. ditimena* and *A. delphinensis* Randrian. & Lowry, which have small leaves, velutinous fruits, and overlapping distributions, can be separated by the size of their petals, which are $2.5-3 \times 1.5-2$ mm in *A. ditimena* vs 2×1 mm in *A. delphinensis*.

Disk The presence or absence of trichomes on the surface of the disk is also helpful for distinguishing species of *Abrahamia*. For example, both *A. buxifolia* and *A. itremoensis* have small leaves and similar ranges, but the former has a glabrous disk while that of the latter has evident indument.

- Fruits** The fruits of *Abrahamia* are always drupes with a resiniferous mesocarp and thin papyraceous endocarp, but several characters are very useful for delimiting species.
- Shape** Fruits in *Abrahamia* can vary from globose or ellipsoid to ovoid or obovoid, depending on the species.
- Size** Fruit dimensions are also useful for delimiting species within *Abrahamia*, varying from 1-1.5 × 0.5-0.8 cm in *A. minutifolia*, which has the smallest fruits, to 3-3.5 × 1.5-1.8 cm in *A. ellipticarpa* Randrian. & Lowry, which has the largest fruits in the genus.
- Surface indument** The fruits of *Abrahamia* are either glabrous or velutinous, and this character is very useful for distinguishing species. Eight species have fruits with indument, viz. *A. betamponensis* Randrian. & Lowry, *A. buxifolia*, *A. delphinensis*, *A. ditimena*, *A. itremoensis*, *A. lenticellata*, *A. minutifolia*, and *A. sericea*, while those of the remaining 25 species are glabrous (fruits of *A. pauciflora* are unknown).

Taxonomic treatment *Abrahamia* Randrian. & Lowry, **gen. nov.**

Typus: *Abrahamia ditimena* (H. Perrier) Randrian. & Lowry (\equiv *Protorhus ditimena* H. Perrier).

Diagnosis Dioecious trees or shrubs. Leaves simple, persistent, opposite, subopposite, verticillate or alternate, chartaceous, subcoriaceous or coriaceous, lateral veins parallel, arcuate, forming an obtuse to acute angle with the midrib toward the base of the blade. Inflorescence erect, a thyse or panicle. Flowers (4-)5(-6)-merous; pedicel short, articulated; sepals much smaller than petals; stamens alternipetalous, filament broadened at the base (sterile in female flowers, forming staminodes), anthers dorsifixed, introrse, glabrous; ovary pubescent or glabrous (rudimentary or absent in male flowers), with 1 locule containing a single subpendulous or pendulous ovule. Fruits drupaceous, ellipsoidal or ovoid, symmetrical or slightly asymmetrical, resiniferous; seeds ruminant; cotyledons usually inseparable (except in *Abrahamia ibityensis* (H. Perrier) Randrian. & Lowry, in which the resiniferous canals are only peripheral).

Description Dioecious trees or shrubs; bark with white, translucent or red resinous latex. Leaves alternate, opposite or subopposite (verticillate in one species), simple, coriaceous, subcoriaceous or chartaceous, persistent (deciduous in *A. humbertii*). Venation pinnate, craspedodromous or semicraspedodromous, midvein usually flat, rarely very slightly raised above, prominently raised below (rarely on both surfaces), secondary veins parallel or nearly so, straight or arcuate, prominent below or on both surfaces, forming an obtuse to acute angle with the midrib toward the base of the blade. Inflorescence terminal and/or axillary, an erect thyse or panicle, or intermediate and forming a paniculiform thyse. Flowers usually 5-merous (sometimes 4- or 6-merous); sepals much smaller than petals;