

**Zeitschrift:** Candollea : journal international de botanique systématique = international journal of systematic botany

**Herausgeber:** Conservatoire et Jardin botaniques de la Ville de Genève

**Band:** 63 (2008)

**Heft:** 2

**Artikel:** *Cadia multifoliolata* Nusb. & Labat (Fabaceae, Papilionoideae) : a new species from Madagascar

**Autor:** Nusbaumer, Louis / Labat, Jean-Noël

**DOI:** <https://doi.org/10.5169/seals-879229>

### **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:** 01.04.2026

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

# *Cadia multifoliolata* Nusb. & Labat (Fabaceae, Papilionoideae), a new species from Madagascar

Louis Nusbaumer & Jean-Noël Labat

## Abstract

NUSBAUMER, L. & J.-N. LABAT (2008). *Cadia multifoliolata* Nusb. & Labat (Fabaceae, Papilionoideae), a new species from Madagascar. *Candollea* 63: 189-195. In English, English and French abstracts.

*Cadia multifoliolata* Nusb. & Labat (Fabaceae, Papilionoideae), a new species from NE Madagascar, is described, illustrated and compared with the other seven species in the genus. This new species differs from the six other endemic species of Madagascar by the large number of leaflets and the morphology of the flowers. With its high leaflet number, *Cadia multifoliolata* is close to the North-East African and Arabian species *Cadia purpurea* (G. Piccioli) Aiton, but presents several differences with its shorter inflorescence bracts and its shorter hypanthium. *Cadia multifoliolata* is only known from the locality in the Daraina (Loky-Manambato) region in North-East Madagascar. This area is localized at the crossroads of four main phytogeographic units of Madagascar and presents a very steep environmental gradients.

## Key-words

FABACEAE – *Cadia* – Madagascar – Taxonomy

## Résumé

NUSBAUMER, L. & J.-N. LABAT (2008). *Cadia multifoliolata* Nusb. & Labat (Fabaceae, Papilionoideae), une nouvelle espèce de Madagascar. *Candollea* 63: 189-195. En anglais, résumés anglais et français.

*Cadia multifoliolata* Nusb. & Labat (Fabaceae, Papilionoideae), une nouvelle espèce du NE de Madagascar, est décrite, illustrée et comparée aux sept autres espèces du genre. Cette nouvelle espèce se différencie des six autres espèces endémiques de Madagascar par un nombre élevé de folioles et par la morphologie de ses fleurs. Par son nombre élevé de folioles, *Cadia multifoliolata* est proche de l'espèce du Nord-Est de l'Afrique et d'Arabie *Cadia purpurea* (G. Piccioli) Aiton, mais s'en différencie par ses bractées de l'inflorescence et son hypanthium plus courts. *Cadia multifoliolata* n'est connue que de la localité du Daraina (Loky-Manambato) dans le Nord-Est de Madagascar. Cette zone est localisée au carrefour de quatre principaux domaines phytogéographiques de Madagascar et présente de forts gradients environnementaux.

Addresses of the authors: LN: Conservatoire et Jardin botaniques de la Ville de Genève, chemin de l'Impératrice 1, case postale 60, 1292 Chambésy, Suisse.

Email: [louis.nusbaumer@ville-ge.ch](mailto:louis.nusbaumer@ville-ge.ch)

JNL: Muséum national d'Histoire naturelle, Département de Systématique et Evolution, USM 602, OSEB UMR 5202CNRS, rue Buffon 16, case postale 39, 75231 Paris Cedex 05, France.

Submitted on January 10, 2008. Accepted on July 10, 2008.

## Introduction

The genus *Cadia* Forssk. is placed in the subfamily *Papilionoideae* of the *Fabaceae*. The genus is composed of shrubs or small trees with actinomorphic white to purple flowers morphologically intermediate between the *Caesalpinioideae* and the *Papilionoideae* (TUCKER, 2002). Molecular data clearly place this genus in the genistoid clade of the *Papilionoideae* (DOYLE & al., 1997). *Cadia* was included in the tribe *Sophoreae*, a formal but not monophyletic group was indicated by diverse datasets studied in recent years (PENNINGTON & al., 2005). A recent phylogenetic study shows that the genus *Cadia* is monophyletic and sister to the *Podalyrieae*. Data of the study also indicate that the actinomorphic flowers may be interpreted as an apomorphy (BOATWRIGHT & al., 2008). The genus *Cadia* was revised by VAN DER MAESEN (1970), PELTIER (1972), and recently by DU PUY & al. (2002). These authors recognised 7 species in the genus, 6 being endemic to Madagascar. The remaining species, *C. purpurea* (G. Piccioli) Aiton, occurs in East & North-East Africa and Arabia. All Malagasy species, except *C. ellisiana* Baker from the eastern humid submontane forests, are rare and poorly known. The type specimen of the new species described here has been collected in the Daraina (Loky-Manambato) region during an ongoing vegetation study conducted in the North of Madagascar. This region is located at the crossroads of four main phyto-geographic units and exhibits very strong environmental gradients especially regarding rainfall and elevation. Several different forest types were recognized (GAUTIER & al., 2006) and several new species have been discovered. Some of them have already been described, including a new species of *Coffea* L. (DAVIS & RAKOTNASOLO, 2001), a new *Secamone* R. Br. (KLACKENBERG, 2005), a new *Dalbergia* L. f. (BOSSER & RABEVOHITRA, 2005), a new *Aspidostemon* Rohwer & H. G. Richt. (VAN DER WERF, 2006), two new *Calyptanthera* Klack. (KLACKENBERG, 2007b), two new *Impatiens* L. (FISCHER & RAHELIVOLOLONA, 2007), two new *Pentopetia* Decne. (KLACKENBERG, 2007a; KLACKENBERG & MEVE, 2007), a new *Plectranthus* L'Hér. (RANIRISON & PHILIPSON, 2007) and a new *Artabotrys* R. Br. (DEROIN & GAUTIER, 2008). The discovery of the present species confirms the role of Madagascar as the centre of diversity for the genus *Cadia*.

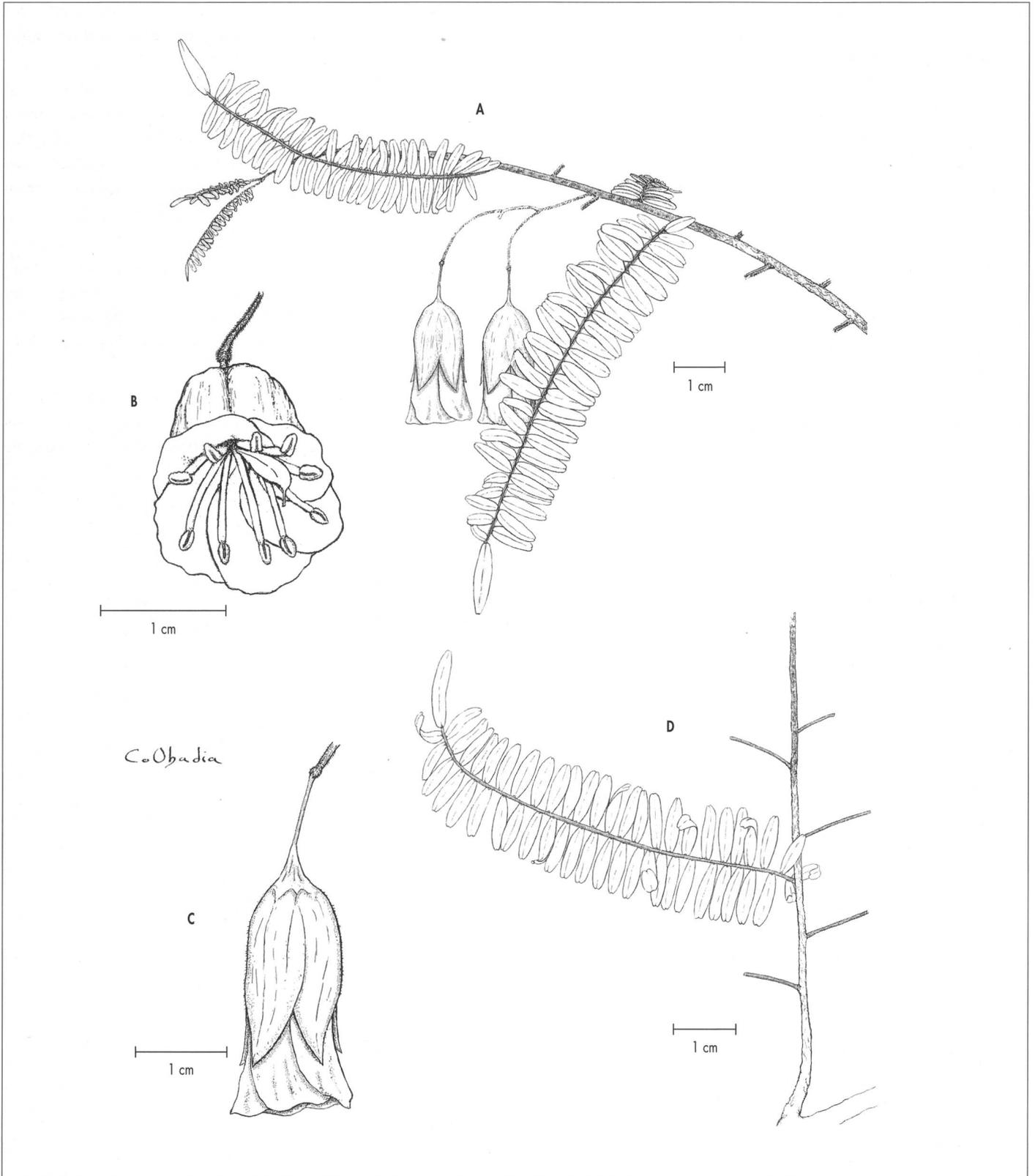
*Cadia multifoliolata* Nusb. & Labat, **spec. nova** (Fig. 1)

**Typus:** MADAGASCAR. Province de Diego-Suarez/Antsiranana: sous-préfecture de Vohemar, commune rurale de Daraina, forêt d'Antsahabe, 13°11,40'S 49°32,46'E, 580 m, orientation 340 degrés, pente 12 degrés, 5.V.2004, fl., Ranirison, P. PR 823 (holo-: G!; iso-: P!, MO!, K!, TEF, herbier de recherches de DARAINA).

*Arbuscula* 1,5 m alta; ramulis annotinis dense brunneo-pubescentibus, vetustioribus glabris. Foliis alternis imparipinnatis, (30-)45-103 mm longis, 16-22 mm latis, petiolis 0,5-1(-2,5) mm longis; stipulae 1 mm longis; rhachidibus

supra canaliculatis pubescentibus; foliolis (29-) 41-53(-63), sessilibus alternis vel suboppositis, emarginatis, coriaceis, supra glabris viridibus (viridi-nigris in sicco), oblongis 7-12 × 2.5-3 mm (1-2 paribus infimis 4-7 mm longis, foliolis terminalibus 13-17 mm longis). Floribus 1-2, axillaribus; bracteis pubescentibus lanceolatis, 0.9-1.3 mm longis; pedunculo 5-6 mm longi; pedicellis 15-18 mm longis; hypanthio 5-6 mm longo; receptaculo breviter obconico; calyce membranaceo roseo, dentibus subaequalibus 6-8 mm longis, 5-6 mm latis; corolla candida (fulva in sicco), 24-25 mm longa; ovario glabro. Fructus incognitus. Ab omnibus congeneribus in Madagascaria foliolis magis numerosis (29-)41-53(-63) (nec non 5-31) distinguitur.

*Shrub* much-branched, plagiotropic, flowering along with mature leaves. *Shoots* long, leafy, mainly unbranched, hell brown to yellowish, glabrescent, the bark smooth with shallow longitudinal ridges; branchlets of the current year dark brown-pubescent. *Leaves* alternate, distichous, subsessile (petiole 0.5-1(-2.5) mm), imparipinnate, (30-)45-103 mm long, 16-22 mm broad; rachis canaliculate with a groove 0.3 mm deep, densely pubescent especially when young, covered with 0.3-0.5 mm long brown hairs; stipules small ( $\leq 1$  mm), pubescent, often hidden by indumenta, deciduous, stipels absent. *Leaflets* (29-31-)41-53(-63) alternate or opposite, subsessile (petiole 0.7 mm long, fat, finely pubescent), coriaceous, oblong, mainly 7-12 × 2.5-3 mm (the 2 basal leaflets with an asymmetrical base, 4-7 mm long, terminal leaflet 13-17 mm long), glabrous, slender and blackish when dry above, thinly puberulous (hairs scattered, 0.2 mm long, white, caducous) and glaucous-green below, the base obtuse and mainly symmetrical, the margin decurved, emarginate apically. *Flowers* in 1-2-flowered axillary racemes which are shorter than the leaves; bracts minute (0.9-1.3 mm long) brown and triangular, covered with brown to ferruginous pubescence. Flower pendent; peduncle greyish-green, 5-6 mm long, covered with brown to ferruginous pubescence; pedicel greyish-green, 15-18 mm, with 2 very small bracteoles at the base; hypanthium pink, 5-6 mm long; pedicel and hypanthium covered with a thin brown to ferruginous pubescence. *Calyx* pink, whitish at the apex of teeth, 17-19 mm long, bell-shaped, with 5 sub-equal triangular teeth (8 mm long, 6 mm broad at the base); short, scattered hairs present along with tufts of glandular, bright yellow epithelium with dense hairs at the teeth sinuses. *Petals* 5, equal, symmetrical, white to cream (we suspect that the colour of the petals changes during the flowering season, as in *C. purpurea*), fulvous when dry, 24-27 mm long, 13 mm broad at the apex, gradually narrowing towards the base, slightly truncated apically. *Stamens* 10, free, the filaments slightly shorter than the petals (22 mm long), pale green, the anthers small, pale yellow. *Ovary* shortly stipitate, 16 mm long, pale green; style 2-3 mm long; stigma terminal. *Pods* unknown.



**Fig. 1.** – *Cadia multifoliolata* Nusb. & Labat. **A.** Part of a flowering shoot; **B.** Flower viewed from beneath; **C.** Flower viewed from the side; **D.** Shoot and leaf adaxial view. [Ranirison PR 823, G] [Drawn by C. Obadia]

*Distribution.* – North-East Madagascar, only known from this present collection locality in Antsahabe forest in the Daraina (Loky-Manambato) region. The localisation of this species represents the northernmost extension of the genus in Madagascar; its distribution is well separated from the other species of *Cadia* (Fig. 2).

*Habitat.* – Transitional forest (evergreen - semi-deciduous), on deep soil at 580 m altitude, on a 12 degrees slope orientated NNW.

*Flowering time.* – May (Fig. 3 & 4).

*Etymology.* – The species epithet alludes to the large number of leaflets in comparison to all the other known Malagasy species of this genus.

*Notes.* – *Cadia multifoliolata* differs from all the other Malagasy species of the genus by its large number of leaflets, by the blackish colour of the leaflets when dry and by its long leafy shoots that lack ramifications. In its high leaflet number it most closely resembles the North-East African and Arabian

species *C. purpurea*. This species presents several differences with *C. multifoliolata* especially by its longer inflorescence bracts and by its longer hypanthium.

The diagnostic characters of all species of *Cadia* are compared (Table 1). *Cadia rubra* R. Vig. and *C. ellisiana* cannot be confused with the new species. The four other Malagasy species of *Cadia* could be confused with the new species, however several differences permit the clear separation of it from these taxa in addition of the large number of leaflets.

*Cadia commersoniana* Baill. differs from *C. multifoliolata* by its bracts resembling reduced leaves or leaflets (9-10 mm long) vs. very reduced triangular bracts (0.9-1.3 mm long), by its glabrous leaf rachis vs. hairy rachis, by its hypanthium 12-25 mm long vs. 5-6 mm long, and also by its shorter pedicel 8-15 mm long vs. 15-18 mm long.

*Cadia pedicellata* Baker differs from *C. multifoliolata* by its pedicel up to 30 mm long vs. 15-18 mm long, by its glabrous calyx vs. presence of short scattered hairs on the

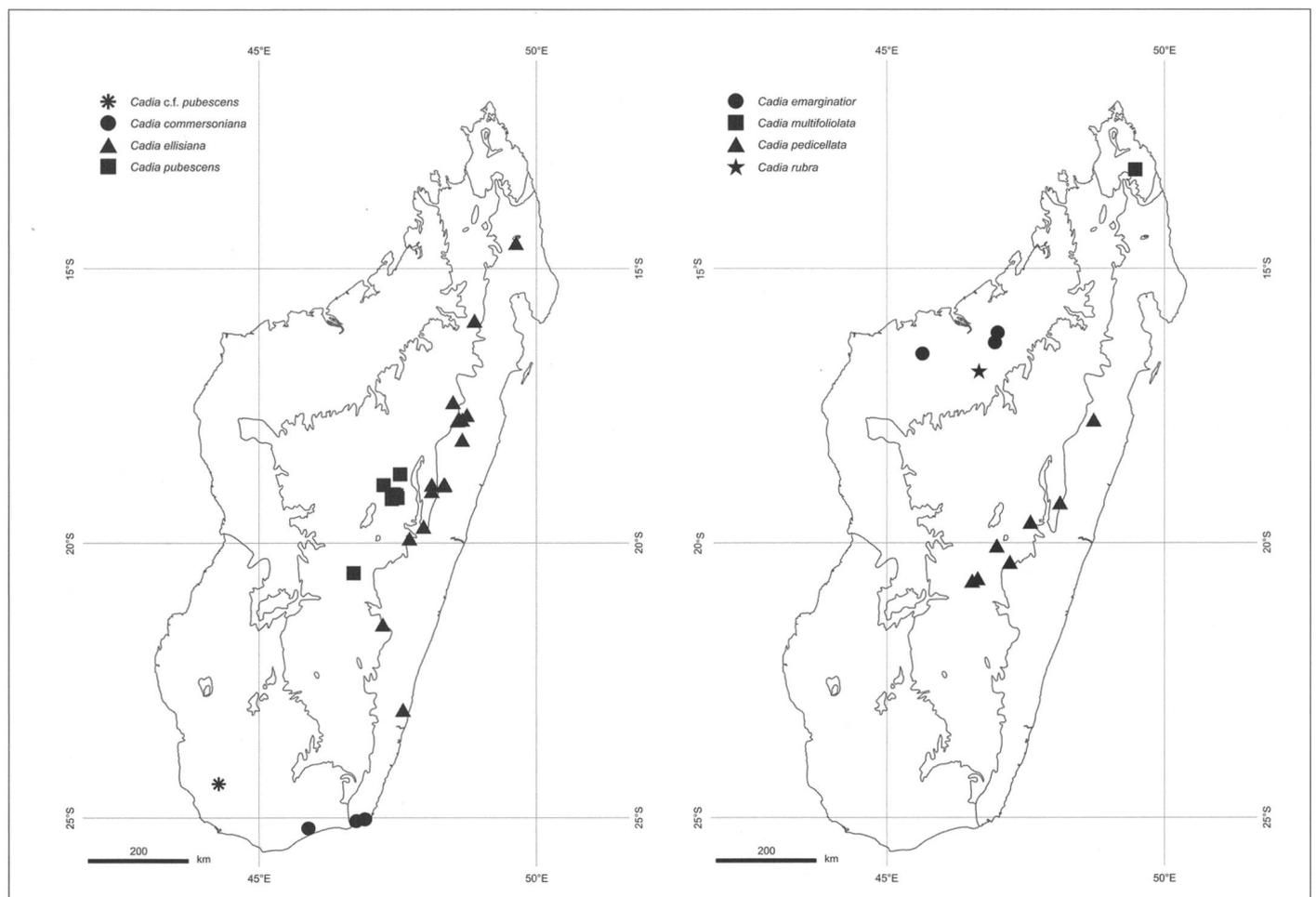
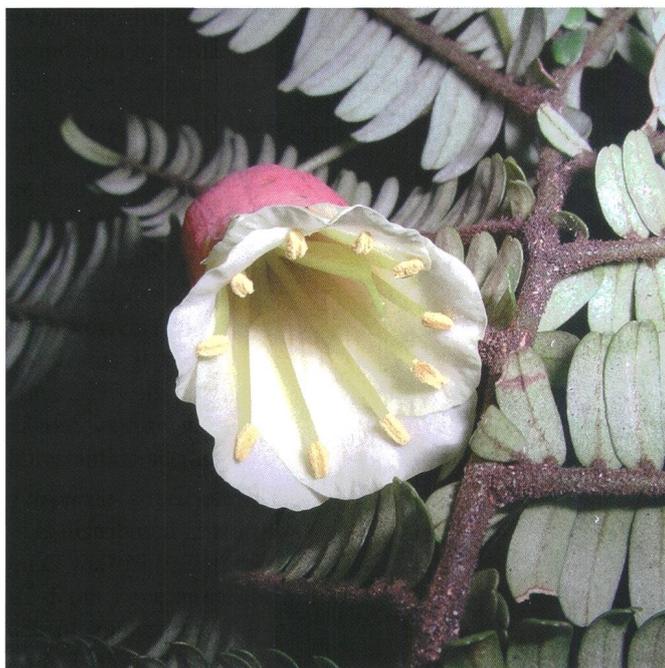


Fig. 2. – Current distribution maps of the different Malagasy species of *Cadia* Forssk.

[Drawn by P. Chesselet]



**Fig. 3.** – Flower of *Cadia multifoliolata* Nusb. & Labat, viewed from beneath on a flowering shoot; the abaxial surface of the shoot, leaf bases and leaflets are shown. [P. Ranirison PR 823, G] [Photo: P. Ranirison, project CJBG-Fanamby, 5.V.2004]



**Fig. 4.** – Flowering shoot of *Cadia multifoliolata* Nusb. & Labat, with the flower viewed from the side. [P. Ranirison PR 823, G] [Photo: P. Ranirison, project CJBG-Fanamby, 5.V.2004]

calyx, by its broader leaflets 3-17 mm wide vs. leaflets 2.5-3 mm wide and also by its subglabrous to thinly pubescent rachis vs. pubescent rachis.

*Cadia pubescens* Baker differs from *C. multifoliolata* by its pink petals vs. the white to cream petals, by its bracts resembling reduced leaves or leaflets vs. very much reduced triangular bracts, by its leaflets pubescent above vs. glabrous.

*Cadia emarginator* M. Peltier differs from *C. multifoliolata* by its smaller flowers (petals 16-19 × 7-8 mm, calyx 10-14 mm long) vs. bigger flowers (petals 24-27 × 13 mm long, calyx 18-20 mm long), by its glabrous or soon glabrescent rachis vs. pubescent rachis, by its broader leaflets 3-11 mm wide vs. leaflets 2.5-3 mm wide, by its longer inflorescence bracts (3 mm long) vs. shorter inflorescence bracts (0.9-1.3 mm long).

*Cadia purpurea* is the only non-Malagasy species of the genus and it is distributed in North-East Africa and Arabia. It differs from *C. multifoliolata* by the inflorescence with the quite long (3-5 mm) one or trifoliolate bracts vs. reduced triangular bracts of smaller size (0.9-1.3 mm long), by its longer hypanthium (12-15 mm) vs. shorter hypanthium (5-6 mm long), by its shorter calyx ((8-)10-14(-17) mm long) vs. larger calyx (18-20 mm long).

In the identification key to Malagasy species of *Cadia* (DU PUY & al., 2002: 314-315), *C. multifoliolata* would be clearly separated in the first couplet of the key which proposes either 6-11(-13) or 11-31 leaflets per leaf. It has (29-31-)41-53(-63) leaflets. It would otherwise key out most closely to *C. emarginator*.

### Acknowledgements

We thank Professor Rodolphe Spichiger, Dr. Pierre-André Loizeau and Dr. Laurent Gautier for giving us the opportunity to carry out this study. We thank Patrick Ranirison for providing herbarium specimens, Cyril Obadia for the illustrations, Pascale Chesselet for the distribution maps, Dr. Michelle Price for revising the English and Dr. Alain Chautems for his revision of the Latin description. The research in Daraina (Loky-Manambato) was funded by several institutions: the Conservatoire et Jardin botaniques de la Ville de Genève, University of Geneva, Conservation International (CBC fund), the Malagasy NGO “Fanamby” and “Fondation Jean-Marcel Aubert”. We also thank the Direction Générale des Eaux et Forêts de Madagascar and the Département de Biologie et Ecologie Végétale de l’Université d’Antananarivo for supporting our project in Daraina (Loky-Manambato).

**Table 1.** – Diagnostic characters of all species of *Cadia* Forssk. The most important characters differentiating the morphology of the previously described species

|   | <i>Cadia multifoliolata</i><br>Nusb. & Labat | <i>Cadia commersoniana</i><br>Baill. | <i>Cadia pedicellata</i><br>Baker | <i>Cadia pubescens</i><br>Baker |
|---|--|--------------------------------------|-----------------------------------|---------------------------------|
| Stipule size [mm]                           | < 1  | 1.5                                  | 5                                 | 1-2                             |
| Rachis of leaf                              | pubescent                                    | glabrous                             | subglabrous to thinly pubescent   | pubescent                       |
| Number of leaflets per leaf                 | (29-31-) 41-53 (-63)                         | (15-)19-31                           | (7-)11-15(-19)                    | (11-)13-21(-23)                 |
| Color of dried leaflets                     | blackish-green                               | greyish green                        | olive                             | bottle green                    |
| Leaflet length [mm]                         | 7-12   | 7-28                                 | 8-37                              | 10-25                           |
| Leaflet breadth [mm]                        | 2.5-3  | 2-8                                  | 3-17                              | 5-12(-14)                       |
| Terminal leaflet comparative size           | longer than the others (1.3x)                | identical                            | identical                         | identical                       |
| Leaflet upper surface pubescence            | glabrous                                     | glabrous                             | glabrous                          | pubescent                       |
| Flowering shoots                            | long, without branching                      | short                                | short                             | short                           |
| Inflorescence number of flowers             | 1-2  | 1-4                                  | 1-4                               | 2-3                             |
| Inflorescence bract form                    | unifoliolate, triangular, narrow             | (1-)3(-5)-foliolate                  | unifoliolate, triangular, narrow  | 1-3-foliolate                   |
| Inflorescence bract size [mm]               | 0.9-1.3                                      | 9-10                                 | 2                                 | 9                               |
| Lateral perules on the inflorescence bracts | absent                                       | present                              | absent                            | present                         |
| Pedicele size [mm]                          | 15-18  | 8-15                                 | up to 30                          | 8-10                            |
| Hypanthium size [mm]                        | 5-6  | 12-25                                | 1-3                               | 3-5                             |
| Calyx length [mm]                           | 18-20  | 13-19                                | 15-17                             | 15-20                           |
| Calyx pubescence                            | short scattered hairs                        | glabrous to short rare hairs         | glabrous                          | sparsely pubescent              |
| Petal length [mm]                           | 24-27  | 20-30                                | 20-23                             | 17-23                           |
| Petal breadth [mm]                          | 13   | 13-15                                | 8-9                               | 9-11                            |
| Colour of the fresh petals                  | white to cream                               | (no description)                     | purplish                          | pink                            |

## References

- BOATWRIGHT, J. S., V. SAVOLAINEN, B.-E. VAN WYK, A. L. SCHUTTE-VLOK, F. FOREST & M. VAN DER BANK (2008). Systematic Position of the Anomalous Genus *Cadia* and the Phylogeny of the Tribe Podalyrieae (Fabaceae). *Syst. Bot.* 33: 133-147.
- BOSSER, J. & R. RABEVOHITRA (2005). Espèces nouvelles dans le genre *Dalbergia* (Fabaceae, Papilionoideae) à Madagascar. *Adansonia* 27: 209-216.
- DAVIS, A. P. & F. RAKOTNASOLO (2001). Three new species of *Coffea* L. from NE Madagascar. *Adansonia* 23: 137-146.
- DEROIN, T. & L. GAUTIER (2008). *Artabotrys darainensis* Deroin & L. Gaut. (Annonaceae), a new species from Madagascar. *Candollea* 63: 93-99.
- DOYLE, J. J., J. L. DOYLE, J. A. BALLANGER, E. E. DICKSON, T. KAJITA & T. OHASHI (1997). A phylogeny of the chloroplast gene *rbcL* in the Leguminosae: taxonomic correlations and insights into the evolution of nodulation. *Amer. J. Bot.* 84: 541-554.
- DU PUY, D. J., J.-N. LABAT, R. RABEVOHITRA, J. F. VILLIERS, J. BOSSER & J. F. MOAT (2002). *The Leguminosae of Madagascar*. Royal Botanic Gardens, Kew.
- FISCHER, E. & M. E. RAHELIVOLOLONA (2007). New taxa of *Impatiens* (Balsaminaceae) from Madagascar. IV. *Adansonia* 29: 269-315.
- GAUTIER, L., P. RANIRISON, L. NUSBAUMER & S. WOHLHAUSER (2006). Aperçu des massifs forestiers de la région Loky-Manambato. In: GOODMAN, S. M. & L. WILMÉ (ed.), *Inventaire de la faune et de la flore du nord de Madagascar dans la région Loky-Manambato, Analamerana et Andavakoera*: 87-106. Centre d'Information et de Documentation Scientifique et Technique, Antananarivo.
- KLACKENBERG, J. (2005). *Secamone triochostemon* Klack. (Apocynaceae, Secamonoideae), a new species from Madagascar. *Candollea* 60: 119-122.
- KLACKENBERG, J. (2007a). New species of *Baroniella* and *Pentopetia* (Apocynaceae) from Madagascar. *Candollea* 62: 231-235.

from *C. multifoliolata* are highlighted in bold. The diagnostic characters of the new species compared with most of the others are highlighted in italic-bold.

| <i>Cadia emarginator</i><br>M. Peltier  | <i>Cadia ellisiana</i><br>Baker   | <i>Cadia rubra</i><br>R. Vig.     | <i>Cadia purpurea</i><br>(G. Piccioli) Aiton |
|---|-----------------------------------|-----------------------------------|--|
| 1                                       | < 1                               | 0.5                               | 1  |
| <b>glabrous or soon<br/>glabrescent</b> | <b>glabrous</b>                   | sparsely pubescent                | pubescent                                    |
| <b>(17-)19-30</b>                       | <b>(5-)6-11(-13)</b>              | <b>7-11</b>                       | <b>(9-)21-51(-69)</b>                        |
| <b>bottle green</b>                     | <b>bottle green</b>               | <b>greyish green</b>              | <b>greyish green</b>                         |
| 6-30                                    | <b>30-115</b>                     | <b>25-80</b>                      | 3-22   |
| <b>3-11</b>                             | <b>15-45</b>                      | <b>8-22</b>                       | 1-5  |
| longer than the others (1.3x)           | <b>identical</b>                  | longer than the others (1.3x)     | <b>identical or shorter</b>                  |
| glabrous                                | glabrous                          | glabrous                          | glabrous                                     |
| <b>short</b>                            | <b>long, without branching</b>    | <b>short</b>                      | <b>short</b>                                 |
| 1-5                                     | 1-3-4-7 (-15)                     | 1-3                               | 1-3  |
| unifoliate, triangular,<br>narrow       | unifoliate, triangular,<br>narrow | unifoliate, triangular,<br>narrow | <b>1-3-foliolate</b>                         |
| <b>3</b>                                | 0.5 (perule shape)                | 0.8-1.4                           | <b>3-5</b>                                   |
| absent                                  | absent                            | <b>present</b>                    | <b>present</b>                               |
| 6-8                                     | <b>20-30</b>                      | 10-15                             | <b>3-6</b>                                   |
| 2-5                                     | 3-5                               | 5-7                               | <b>12-15</b>                                 |
| <b>10-14</b>                            | <b>14-18</b>                      | <b>13-15</b>                      | <b>8-10-14(-17)</b>                          |
| short scattered hairs                   | short hairs, rare                 | short hairs, rare                 | puberulous                                   |
| <b>16-19</b>                            | 22-28                             | (only seen in bud)                | 12-25  |
| <b>7-8</b>                              | 13-16                             | (only seen in bud)                | 9-15   |
| yellowish to pale pink                  | <b>rose-red</b>                   | (only seen in bud)                | white to pink to purple                      |

KLACKENBERG, J. (2007b). Three new species of Calyptranthera (Apocynaceae, Secamonoideae) from Madagascar. *Adansonia* 29: 113-121.

KLACKENBERG, J. & U. MEVE (2007). Pentopetia viridis Klack. & Meve (Apocynaceae, Periplocoideae), a new species from Madagascar. *Candollea* 62: 211-214.

PELTIER, M. (1972). Les Sophorées de Madagascar. *Adansonia* 12: 137-154.

PENNINGTON, R. T., C. H. STIRTON & B. D. SCHRIRE (2005). Sophoreae. In: LEWIS, G., B. D. SCHRIRE, B. MACKINDER & M. LOCK (ed.), *Legumes of the world*: 227-249. Royal Botanic Gardens, Kew.

RANIRISON, P. & P. B. PHILIPSON (2007). Plectranthus papilionaceus Ranirison & Philipson (Lamiaceae), a new species to Madagascar. *Candollea* 62: 157-164.

TUCKER, S. C. (2002). Floral ontogeny in Sophoreae (Leguminosae; Papilionoideae). 3. Radial symmetry and random petal aestivation in *Cadia purpurea*. *Amer. J. Bot.* 89: 748-757.

VAN DER MAESEN, L. J. G. (1970). Primitiae Africanae 8. A revision of the genus *Cadia* Forsskal (Caesalpinoideae) and some remarks regarding *Dicraeopetalum* Harms (Papilionoideae) and *Platycephium* Harms (Papilionoideae). *Acta Bot. Neerl.* 19: 227-248.

VAN DER WERFF, H. (2006). A revision of the Malagasy endemic genus *Aspidostemon* Rohwer & Richter (Lauraceae). *Adansonia* 28: 7-44.

