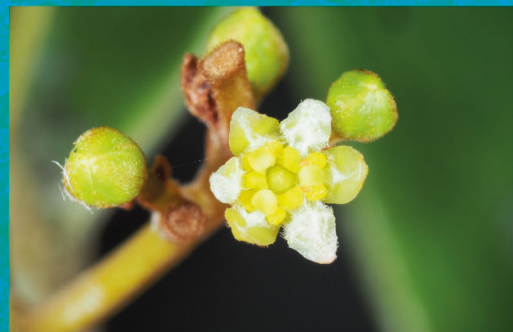


## Novitates neocaledonicae XV: Two new species of *Endiandra* R.Br. (Lauraceae) from New Caledonia

Jérôme MUNZINGER,  
Gordon McPHERSON &  
David BRUY



DIRECTEUR DE LA PUBLICATION / PUBLICATION DIRECTOR: Gilles Bloch  
Président du Muséum national d'Histoire naturelle

RÉDACTEUR EN CHEF / EDITOR-IN-CHIEF: Thierry Deroin

RÉDACTEURS / EDITORS: Porter P. Lowry II; Zachary S. Rogers

ASSISTANT DE RÉDACTION / ASSISTANT EDITOR: Emmanuel Côté (adanson@mnhn.fr)

MISE EN PAGE / PAGE LAYOUT: Emmanuel Côté

COMITÉ SCIENTIFIQUE / SCIENTIFIC BOARD:

P. Baas (Nationaal Herbarium Nederland, Wageningen)  
F. Blasco (CNRS, Toulouse)  
M. W. Callmänder (Conservatoire et Jardin botaniques de la Ville de Genève)  
J. A. Doyle (University of California, Davis)  
P. K. Endress (Institute of Systematic Botany, Zürich)  
P. Feldmann (Cirad, Montpellier)  
L. Gautier (Conservatoire et Jardins botaniques de la Ville de Genève)  
F. Ghahremaninejad (Kharazmi University, Téhéran)  
K. Iwatsuki (Museum of Nature and Human Activities, Hyogo)  
A. A. Khapugin (Tyumen State University, Russia)  
J.-Y. Lesouef (Conservatoire botanique de Brest)  
P. Morat (Muséum national d'Histoire naturelle, Paris)  
J. Munzinger (Institut de Recherche pour le Développement, Montpellier)  
S. E. Rakotoarisoa (Millenium Seed Bank, Royal Botanic Gardens Kew, Madagascar Conservation Centre, Antananarivo)  
P. H. Raven (Missouri Botanical Garden, St. Louis)  
G. Tohmé (Conseil national de la Recherche scientifique Liban, Beyrouth)  
J. G. West (Australian National Herbarium, Canberra)  
J. R. Wood (Oxford)

COUVERTURE / COVER:

Réalisée à partir des Figures de l'article/*Made from the Figures of the article.*

*Adansonia* est indexé dans / *Adansonia is indexed in:*

- Science Citation Index Expanded (SciSearch®)
- ISI Alerting Services®
- Current Contents® / Agriculture, Biology, and Environmental Sciences®
- Scopus®

*Adansonia* est distribué en version électronique par / *Adansonia is distributed electronically by:*

- BioOne® (<http://www.bioone.org>)

*Adansonia* est une revue en flux continu publiée par les Publications scientifiques du Muséum, Paris  
*Adansonia is a fast track journal published by the Museum Science Press, Paris*

Les Publications scientifiques du Muséum publient aussi / *The Museum Science Press also publish: Geodiversitas, Zoosystema, Anthropozoologica, European Journal of Taxonomy, Naturae, Cryptogamie* sous-sections *Algologie, Bryologie, Mycologie, Comptes Rendus Palevol*

Diffusion – Publications scientifiques Muséum national d'Histoire naturelle  
CP 41 – 57 rue Cuvier F-75231 Paris cedex 05 (France)  
Tél.: 33 (0)1 40 79 48 05 / Fax: 33 (0)1 40 79 38 40  
[diff.pub@mnhn.fr](mailto:diff.pub@mnhn.fr) / <http://sciencepress.mnhn.fr>

© Publications scientifiques du Muséum national d'Histoire naturelle, Paris, 2024  
ISSN (imprimé / *print*): 1280-8571/ ISSN (électronique / *electronic*): 1639-4798

# Novitates neocaledonicae XV: Two new species of *Endiandra* R.Br. (Lauraceae) from New Caledonia

**Jérôme MUNZINGER**

AMAP, Univ. Montpellier, IRD, CIRAD, CNRS, INRAE,  
F-34398 Montpellier (France)  
[jerome.munzinger@ird.fr](mailto:jerome.munzinger@ird.fr) (corresponding author)

**Gordon McPHERSON**

Herbarium, Missouri Botanical Garden,  
4344 Shaw Blvd, St. Louis, Missouri 63166 (United States)  
[gordon.mcpherson@mobot.org](mailto:gordon.mcpherson@mobot.org)

**David BRUY**

AMAP, Univ. Montpellier, IRD, CIRAD, CNRS, INRAE,  
F-34398 Montpellier (France)  
and AMAP, IRD, Herbier de Nouvelle-Calédonie, BPA5, 98848 Nouméa (Nouvelle-Calédonie)  
[david.bruy@ird.fr](mailto:david.bruy@ird.fr)

Submitted on 10 May 2023 | accepted on 17 July 2023 | published on 12 February 2024

Munzinger J., McPherson G. & Bruy D. 2024. — Novitates neocaledonicae XV: Two new species of *Endiandra* R.Br. (Lauraceae) from New Caledonia. *Adansonia*, sér. 3, 46 (3): 19–28. <https://doi.org/10.5252/adansonia2024v46a3>. <http://adansonia.com/46/3>

## ABSTRACT

Two new species of *Endiandra* R.Br. are described from New Caledonia. *Endiandra humboldtiana* Munzinger & McPherson, sp. nov. is distinguishable from *Endiandra lecardii* Guillaumin and *E. neocaledonica* Kosterm. only by rather subtle details of flower size (3 mm long versus 2–2.5 mm), leaf indument and distribution, even though molecular data indicate that it is genetically closer to an undescribed species from Roches de la Ouaième. *Endiandra trichogyna* Munzinger & McPherson, sp. nov. had previously been confused with *E. baillonii* (Pancher & Sébert) Guillaumin, but is easily distinguished from that and all other species present in New Caledonia by its densely pubescent ovary. A preliminary identification key is presented.

## RÉSUMÉ

*Novitates neocaledonicae XV: Deux espèces nouvelles d'Endiandra R.Br. (Lauraceae) de Nouvelle-Calédonie.* Deux nouvelles espèces d'*Endiandra* R.Br. sont décrites de Nouvelle-Calédonie. *Endiandra humboldtiana* Munzinger & McPherson, sp. nov. se distingue d'*Endiandra lecardii* Guillaumin et d'*E. neocaledonica* Kosterm. uniquement par des détails assez subtils de la taille des fleurs (3 mm de long, contre 2–2.5 mm), de l'indument des feuilles et de la répartition, même si les données moléculaires indiquent qu'elle est génétiquement plus proche d'une espèce non décrite des Roches de la Ouaième. *Endiandra trichogyna* Munzinger & McPherson, sp. nov. a été précédemment confondue avec *E. baillonii* (Pancher & Sébert) Guillaumin, mais se distingue facilement de cette espèce et de toutes les autres espèces présentes en Nouvelle-Calédonie par son ovaire densément pubescent. Une clef d'identification préliminaire est produite.

## KEY WORDS

New Caledonia,  
Lauraceae,  
conservation,  
new species.

## MOTS CLÉS

Nouvelle-Calédonie,  
Lauraceae,  
conservation,  
espèce nouvelle.

## INTRODUCTION

The Lauraceae of New Caledonia were treated in volume 5 of the *Flore de la Nouvelle-Calédonie et Dépendances* (Kostermans 1974) and a new species in the genus *Litsea* Lam. was added three years later (Kostermans 1977). Difficulties in specimen identification at the specific and even the generic levels, (Jaffré & Veillon 1990 [publ. 1991]) as well as evidence of undescribed species (Munzinger 2013) indicated that the treatment needed to be revised. We therefore undertook the revision of the family, within the framework of the *Flore de la Nouvelle-Calédonie*. Published results thus far include the description of five new species in the genus *Cryptocarya* R.Br. (Munzinger & McPherson 2016, 2021) one in *Endiandra* R.Br. (*in* Gâteblé *et al.* 2018), and the discovery that *Litsea mackeei* Kosterm. is synonymous with a species of Oleaceae (Munzinger & McPherson 2017), as well as our confirmation that *Adenodaphne* S.Moore is a synonym of *Litsea* (Munzinger *et al.* 2023).

*Endiandra* is a genus of about 100 species occurring in tropical regions of Asia, Australia, and the Pacific Islands (Rohwer 1993). From the closely related *Beilschmiedia* Nees, as well as from the other lauraceous genera in New Caledonia, it is distinguished by its possession of only three fertile stamens, these representing the third (usually extrorse and glanduliferous) whorl of the typical lauraceous androecium. Seven endemic species are currently recognized in New Caledonia; six of which were included in the treatment of the

flora by Kostermans (1974) plus the one recently described by two of us (*in* Gâteblé *et al.* 2018). *Endiandra* belongs to the “Cryptocarya group”, which had first been recognized based on wood and bark anatomy by Richter (1981), and was included in a phylogenetic analysis (Rohwer *et al.* 2014) that indicated the genus to be monophyletic if *Triadodaphne inaequitepala* (Kosterm.) Kosterm. (Kostermans 1993) is considered as an *Endiandra*, as originally described (Kostermans 1969). The three New Caledonian species included in Rohwer’s study form a well supported clade, sister to a clade with three Australian species and *Endiandra/Triadodaphne inaequitepala* from Papua New Guinea. However, Rohwer *et al.* (2014) pointed out that their *Endiandra* sampling was limited to Australia and New Caledonia (thus excluding central Malesia and mainland Asia), that the type of *Triadodaphne* Kosterm. (*T. myristicoides* Kosterm.) could not be included in their analysis, and that the question whether or not *Endiandra* is nested in *Beilschmiedia* cannot yet be answered with certainty. Thus, we here maintain the generic delimitations that Kostermans used in the *Flore* (Kostermans 1974), and that were accepted by Rohwer (1993), keeping *Endiandra* (three fertile stamens, with rare exceptions [Hyland 1989]) and *Beilschmiedia* (nine or six fertile stamens) distinct.

Among the six well-marked new taxa that we have detected in *Endiandra*, two are now represented by enough material that they can be described, while four others still need additional collection. Below we present a key to identify all these taxa:

### PROVISIONAL KEY TO NEW CALEDONIAN *ENDIANDRA* R.Br.

1. Both sides of leaf with pronounced raised honeycomb-like fine reticulum of veins; leaf blades glabrous at maturity; flowers 4-5 mm long ..... *E. polyneura* Schltr.  
— Leaf surfaces with open, somewhat irregular venation; leaf blades glabrous or pubescent at maturity; flowers up to 3 mm long ..... 2
2. Leaf blades 4-5(-6) cm long, usually roundish; petiole up to 6 mm long; mature fruit *c.* 2.7 cm long; northeast of main island ..... *E. poueboensis* Guillaumin  
— Leaf blades, at least the larger ones, more than 6 cm long, petioles, at least the longer ones, more than 8 mm long; fruit more than 3 cm long; variously distributed ..... 3
3. Petioles up to 1.5 mm wide near midpoint; blades chartaceous; Île Art ..... *E. artensis* Munzinger & McPherson  
— Petioles 2-3.5(-4.5) mm wide near midpoint; blades subcoriaceous; main island ..... 4
4. Young mature blades evenly pubescent abaxially with minute appressed hairs, this indument usually persistent in older leaves at least in sheltered places ..... 5  
— Young mature blades glabrous or very nearly so ..... 9
5. Abaxial leaf surface often copper- or silver-coloured because of dense, persistent indument obscuring the surface; fruit to 3.8 cm ..... *E. sebertii* Guillaumin  
— Abaxial leaf surface usually glaucous, the indument typically not obscuring the surface, either eventually falling or largely persistent; fruit *c.* 5 cm ..... 6
6. Ovary densely pubescent, as is the fruit in sheltered places; petioles typically less than 2 cm long, widespread on non ultramafic substrates ..... *E. trichogyna* Munzinger & McPherson, sp. nov.  
— Ovary and fruit glabrous (or very nearly so); petioles various (if less than 2 cm, then restricted to Mt. Humboldt ultramafics) ..... 7
7. Leaf blades typically ovate, indument persistent, abaxial surface glaucous; widespread on southern ultramafic substrates ..... *E. baillonii* Guillaumin  
— Leaf blades typically elliptical or narrowly elliptical, the abaxial indument eventually falling in exposed areas, abaxial surface not glaucous; Mt. Humboldt or Roches de la Ouaième ..... 8

8. Leaf blades elliptical, petioles 0.7-1.5 cm; restricted to Mt. Humboldt ..... *E. humboldtiana* Munzinger & McPherson, sp. nov.  
 — Leaf blades narrowly elliptical, petioles 2.0-3.0 cm; restricted to Roches de la Ouaième ..... *E. sp.* (ouaième)
9. Adaxial surface of midrib and often also the rest of the lamina pimpled due to raised oil glands (most evident in dark-drying areas, using lens) ..... 10  
 — Adaxial surface, including the midrib, smooth, the oil glands barely evident ..... 11
10. Blades (7-)10-16 cm long; Koniambo c.700 m ..... *E. sp.* (koniambo)  
 — Blades 4-10(-11) cm long; widespread but not known from Koniambo ..... *E. lecardii* Guillaumin/*E. neocaledonica* Kosterm. complex
11. Blades 17.5-27.0 cm long ..... *E. sp.* (taom)  
 — Blades (6.6-)8-9(-9.6) cm long ..... *E. sp.* (fridoline)

Both new species are illustrated, and photographs taken in the field and distribution maps are provided, as well as conservation evaluations following IUCN (2012) criteria made by the New Caledonia Red List Authority.

## MATERIAL AND METHODS

We used field observations and photographs, and examined all deposited specimens at MO, MPU, NOU (Bruy *et al.* 2021) and P (Le Bras *et al.* 2017) (abbreviations follow Thiers [2023]). We also studied the virtual collections of the Global Plants initiative (<https://plants.jstor.org/>) and used the RECOLNAT infrastructure (<https://www.recolnat.org/fr/>). Plant terminology follows Harris & Harris (2001), and Hallé *et al.* (1978) for architectural models.

Coordinates not given on original labels of herbarium specimens were added post-facto using the georep website (<https://georep.nc/>). When citing material, any information not available on the original label is given between brackets. We provided the consolidated species distribution dataset to the New Caledonian Red List authority (Endemia & RLA Flore NC 2022) who assessed the extinction risk of species according to IUCN criteria.

## SYSTEMATICS

Family LAURACEAE Juss.  
 Genus *Endiandra* R.Br.

*Endiandra humboldtiana*  
 Munzinger & McPherson, sp. nov.  
 (Figs 1; 2)

DIAGNOSIS. — Among New Caledonian species of *Endiandra*, the new species most closely resembles *E. lecardii* Guillaumin and *E. neocaledonica* Kosterm. because of its leaf size and shape and its leaf indument, each of them having hairs on the abaxial face of the blade that are short [not more than 1 mm long], appressed and eventually falling. However, in *E. humboldtiana* sp. nov., these hairs are denser, somewhat more persistent (typically remaining in at least protected areas of mature leaves vs quickly falling and rarely present on any but immature leaves); as well, these hairs are somewhat longer in

*E. humboldtiana* sp. nov., [0.3-1 mm long vs 0.2 mm] and typically appear whitish at high magnification (vs reddish). Furthermore, the flowers of *E. humboldtiana* sp. nov., are 3 mm long [vs 2-2.5 mm in *E. lecardii* and *E. neocaledonica*] and the new species appears to be endemic to the Mont Humboldt massif, from which *E. lecardii* and *E. neocaledonica* are not presently known.

TYPE MATERIAL. — New Caledonia • Province Sud, Nekando; alt. 1198 m; 21°51'48"S, 166°26'11"E; 20.XI.2019; fl.; *J. Munzinger, G. McPherson, D. Bruy & C. Laudereau 8063*; holo-, P[P00864943]!, iso-, MPU[MPU312580]!, NOU[NOU091935]!

PARATYPES. — New Caledonia • Province Sud, Mont Humboldt, c. 28 air-km N of Nouméa; alt. 1550 m; [21°53'0"S, 166°25'0"E]; 20.IX.1980; fl.; *G. McPherson 3119*; para-, MO[MO-3089854], NOU[NOU016563], P[P01963115] • Humboldt; alt. 1430 m; 21°52'32"S, 166°25'36"E; 30.VII.2009; fr.; *J. Munzinger, F. Rigault, W. Nigote & C. Grignon 5719*; para-, NOU[NOU051038], P[P02003042] • Thio, Nekando; alt. 1150-1300 m; 21°51'55.30"S, 166°26'7.37"E, 4.VI.2017, fr., *D. Bruy & L. Barrabé 856*; para-, NOU[NOU106887] • Nekando; alt. 1198 m; 21°51'48"S, 166°26'11"E; 20.XI.2019; st.; *J. Munzinger, G. McPherson, D. Bruy & C. Laudereau 8063bis*; para-, MPU[MPU312615], NOU[NOU091936], P[P00864959] (juvenile with leaves without epiphylls for molecular studies).

PHENOLOGY. — Flowers have been collected in September and November; fruits are known from June and July.

ETYMOLOGY. — The specific epithet refers to the type locality, Mt. Humboldt.

HABITAT. — The species grows in “Forêts denses humides d’altitude” on ultramafic rocks (peridotites), and more precisely in the orophilous facies with Lichens, Bryophytes and Hymenophyllaceae *sensu* Jaffré *et al.* (2012), above 1150 m.

DISTRIBUTION AND ECOLOGY. — *Endiandra humboldtiana* sp. nov., is only known from the Humboldt Massif (Mont Humboldt & Nekando), in the southern ultramafic region of the main island (Fig. 3).

CONSERVATION STATUS. — *Endiandra humboldtiana* sp. nov., is only known from one population, most of which is located in the “Réserve naturelle du Mont Humboldt”. The EOO calculated is 8 km<sup>2</sup> and the AOO is 8 km<sup>2</sup>. The environment is well preserved and the population seems to be dynamic; no clear plausible threat seems to affect it. Consequently, *E. humboldtiana* sp. nov., has been assigned a conservation status of Least Concern (LC) by the New Caledonian Red List Authority on 23/02/2023 (Endemia & RLA Flore NC 2022).

VERNACULAR NAME. — Unknown.

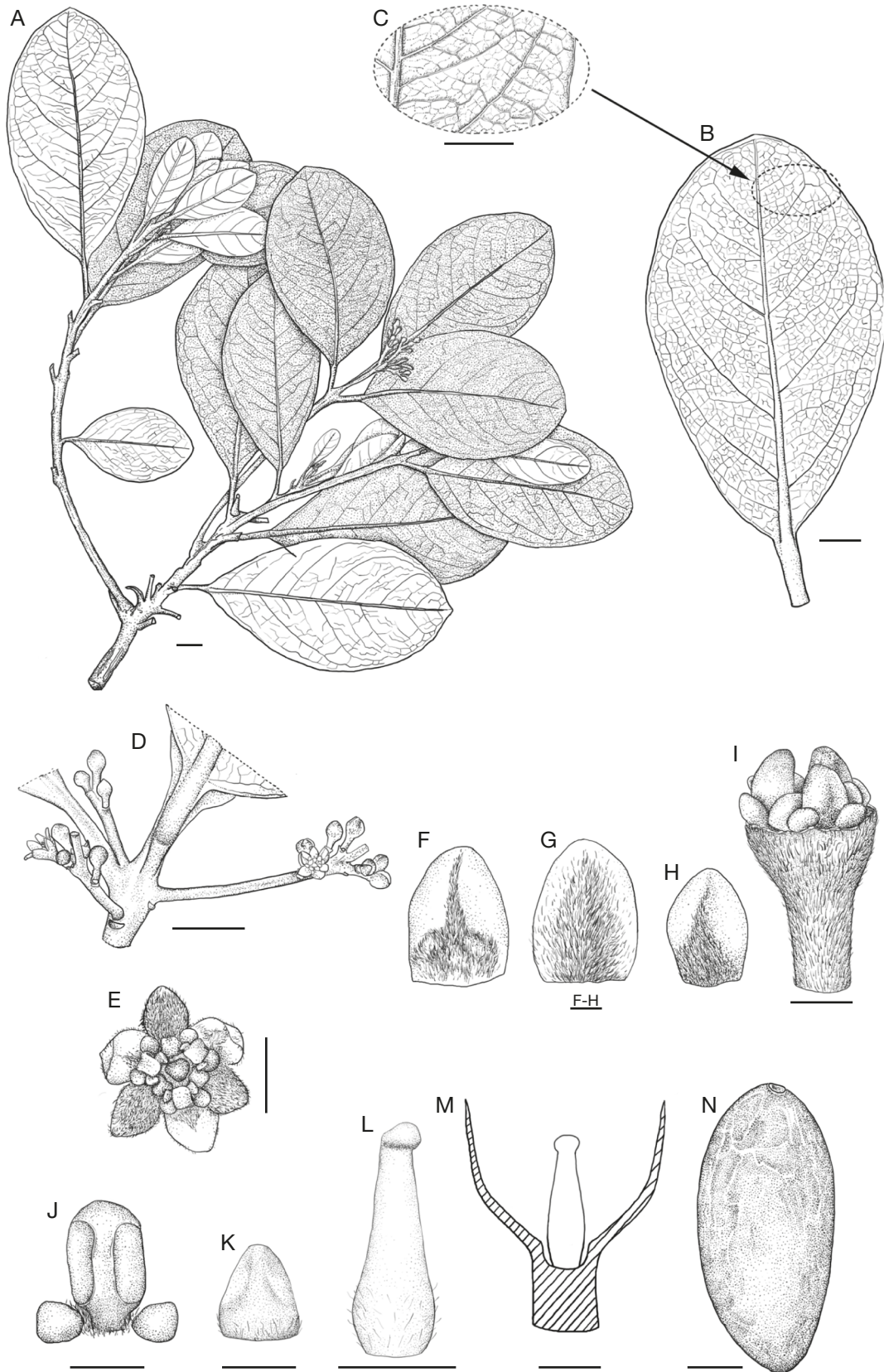


FIG. 1. — *Endiandra humboldtiana* Munzinger & McPherson, sp. nov.: **A**, flowering branch; **B**, abaxial face of a mature leaf; **C**, zoom on abaxial face; **D**, inflorescences; **E**, flower; **F**, tepal of the exterior cycle, abaxial face; **G**, tepal of the exterior cycle, adaxial face; **H**, tepal of the interior cycle, abaxial face; **I**, dissected flower with tepals removed; **J**, isolated stamen; **K**, staminode; **L**, gynoecium; **M**, schema of a longitudinal section of the hypanthium and gynoecium; **N**, mature fruit. **A-M**, Munzinger *et al.* 8063; **N**, Munzinger *et al.* 5719. Drawings: Laurence Ramon. Scale bars: A-D, N, 1 cm; F-H, J-M, 500  $\mu$ m; I, 1 mm.



FIG. 2. — Field pictures of *Endiandra humboldtiana* Munzinger & McPherson, sp. nov.: **A**, trunk and slash; **B**, adaxial face of a mature leaf; **C**, abaxial face of a mature leaf; **D**, vestiture on adaxial face of young leaves; **E**, inflorescences; **F**, flower and buds. **A-F**, *Munzinger et al.* 8063. Photographs: **A, C**, J. Munzinger; **B, D-F**, C. Laudereau.

#### DESCRIPTION

Tree 6-10 m tall. Diameter up to *c.* 17 cm. Rauh's architectural model. Bark pale brown to grey, slash reddish. Terminal buds densely appressed-pubescent with greyish brown to white hairs, the young stems somewhat flattened in cross-section, 2.5-3 mm in width, eventually glabrescent and shallowly furrowed, lenticels slightly raised. Leaves alternate to subopposite; blades elliptic to obovate, 5.0-12.5 × 2.3-7 cm, base broadly acute to obtuse, usually symmetrical, apex obtuse or shortly and obtusely acuminate, texture subcoriaceous, adaxial

and abaxial surfaces appressed-pubescent at first, the abaxial more densely and persistently so, with sheltered areas usually retaining some of their indument, the hairs 0.3-1.0 mm long, both surfaces at least partly glabrescent, the adaxial surface typically with raised oil cells at least along the midrib, these less obvious on the abaxial surface, lateral veins 4-6 on each side of the midrib, slightly raised (dried material) on both surfaces, as is the lesser venation; petioles 7-15 × 2-3.5 mm, flat adaxially, appressed-pubescent like the young leaf blades, glabrescent, petiole and primary vein yellow-orange *in vivo*.

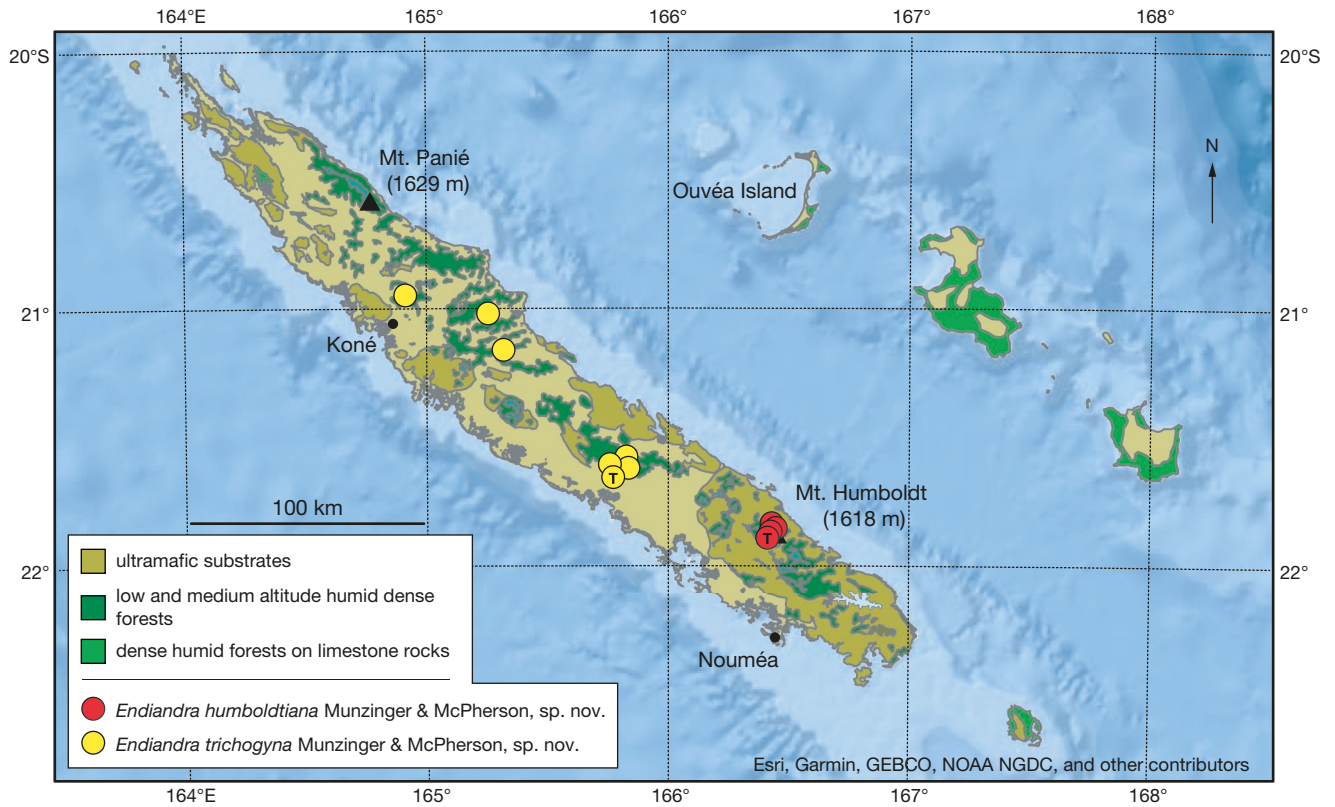


FIG. 3. — Distribution of *Endiandra humboldtiana* Munzinger & McPherson, sp. nov. and *Endiandra trichogyna* Munzinger & McPherson, sp. nov. Abbreviation: T, indicates Type specimen. Colors: **brown**, ultramafic substrates; **dark green**, low and medium altitude humid dense forests; **pale green**, dense humid forests on limestone rocks (Jaffré *et al.* 2012).

Inflorescences axillary, 3-6.5 cm long, paniculate, the axes appressed-pubescent but glabrescent; peduncle 7-35 mm long, *c.* 1.5 mm wide; bracts narrowly triangular, 1-2 mm long, up to 0.75 mm wide, pubescent like the axes, pedicels 2.5-3.5 mm long. Flowers at anthesis greenish white, 3 mm long, *c.* 4 mm in diameter; floral tube densely pubescent within, with a distinct central depression in which the pistil sits; tepals ovate, 1.5-2.2 mm long, subequal, spreading at anthesis, rounded or widely acute apically, sparsely pubescent or glabrous abaxially, densely pubescent except along the margins adaxially; fertile stamens 3, *c.* 1 mm long, equalling the pistil, subsessile, filament and connective abaxially pubescent, anther locules latrorse-subintorse, *c.* 0.6 mm long, glabrous, basal glands sessile, subspherical, *c.* 0.3 mm in diameter, glabrous; staminodes 3, *c.* 0.5 mm in length (*i.e.* *c.* half as long as the fertile stamens), subspherical to ovoid, glabrous or nearly so; pistil ovoid-elongate, *c.* 1 mm high, *c.* 0.5 mm in diameter at base, glabrous or with few scattered short hairs at the base, style attenuate, stigmata capitate, flattened. Fruit a single-seeded berry, black when ripe, elliptic-ovoid, 4.3-5.5 cm long and 2.4-2.8 cm in diameter, glabrous, seed colour in cross-section unknown.

NOTE

After we had detected the new species based on its morphology, some preliminary molecular data (unpublished) obtained by Chrissen Gemmill lent further support to its recognition.

These new data, based on ITS sequences, which have demonstrated the greatest discrimination success for Lauraceae species (Liu *et al.* 2022), indicate that *E. humboldtiana* sp. nov., (two accessions) is closely related to an undescribed taxon (one accession) only known from Roches de la Ouaième. The two taxa form a clade resolved as sister to a larger clade that includes *E. lecardii* (five accessions), *E. neocaledonica* (one accession), *E. poueboensis* Guillaumin (one accession), *E. baillonii* (Pancher & Sébert) Guillaumin (two accessions), and *E. trichogyna* sp. nov., (two accessions). Inside that large clade, *E. poueboensis* appears in sister position to a strongly supported clade (PP 0.95) that includes our six accessions of *E. lecardii* and *E. neocaledonica*. Thus, even though morphologically similar to them, *E. humboldtiana* sp. nov. is supported by molecular data as distinct from *E. lecardii* and *E. neocaledonica*.

*Endiandra trichogyna* Munzinger & McPherson, sp. nov.  
(Figs 4; 5)

DIAGNOSIS. — Among New Caledonian species of *Endiandra*, the new species most closely resembles *E. baillonii* and *E. sebertii* in leaf shape and size, but differs from both most markedly in that its ovary and fruit are pubescent (vs glabrous in *E. baillonii* and *E. sebertii*), its pedicels are shorter (1-1.5 mm in *E. trichogyna* sp. nov., vs 1.5-2 mm in *E. sebertii*, and 3 mm in *E. baillonii*), and its hypanthium is relatively deeply cupular (ovary halfway sunken in *E. trichogyna*



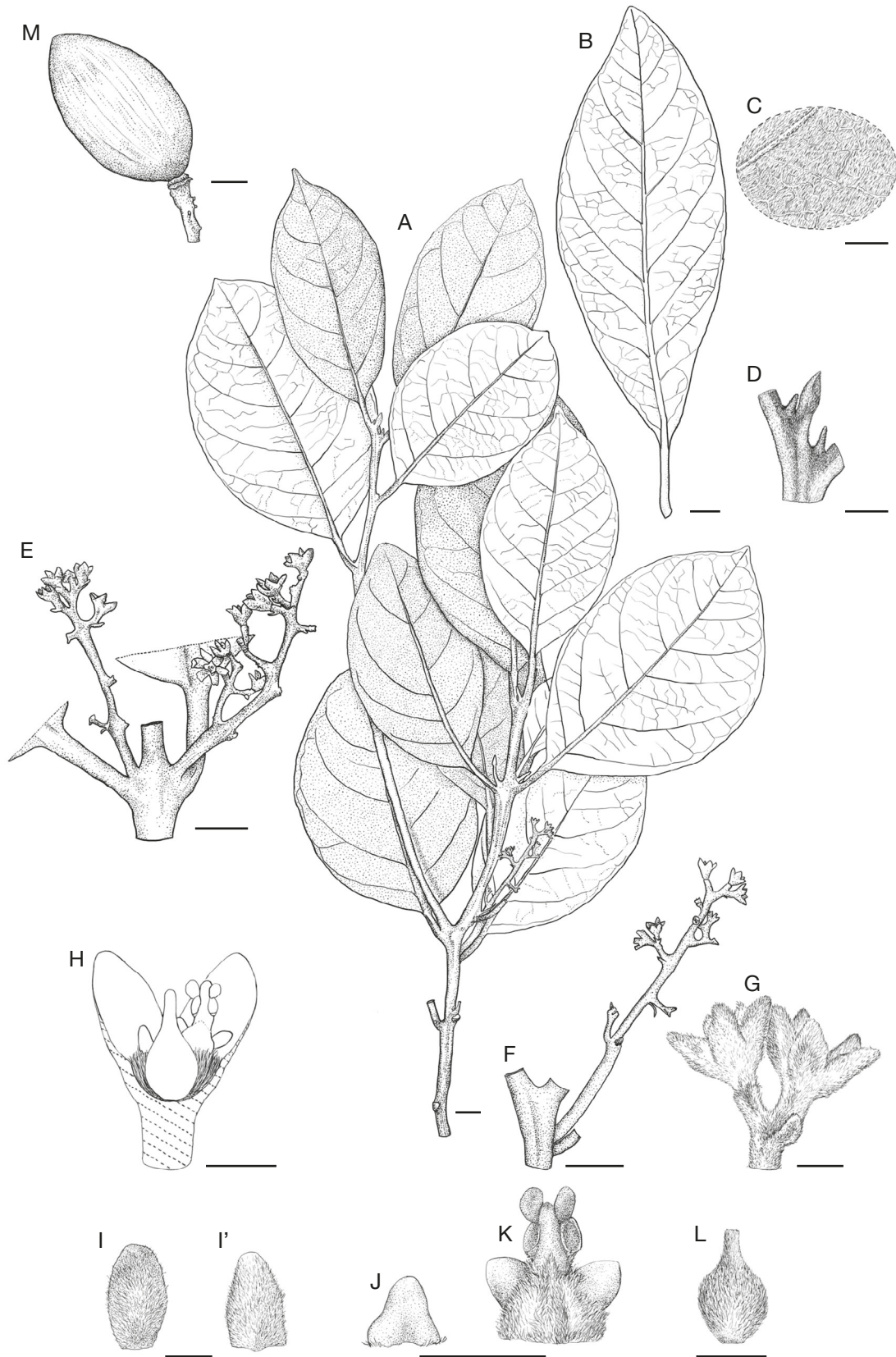


FIG. 4. — *Endiandra trichogyna* Munzinger & McPherson, sp. nov.: **A**, flowering branch; **B**, abaxial face of a mature leaf; **C**, zoom on abaxial face of a mature leaf; **D**, terminal vegetative bud of the branch; **E**, inflorescences in the axils of sub-opposite leaves; **F**, inflorescence in the axil of an alternate leaf; **G**, flowers; **H**, schema of a longitudinal section of the hypanthium and gynoecium; **I**, tepal of the exterior cycle, abaxial face; **I'**, tepal of the exterior cycle, adaxial face; **J**, staminode; **K**, isolated stamen with associated glands; **L**, gynoecium; **M**, mature fruit. **A, D-H, J-L**, *Munzinger et al.* 4955; **B, C, M**, *Pusset & Chauvière* 305. Drawings: Laurence Ramon. Scale bars: A, B, E, F, M, 1 cm; C, 2 mm; D, G, 5 mm; H-L, 1 mm.



FIG. 5. — Field pictures of *Endiandra trichogyna* Munzinger & McPherson, sp. nov.: **A**, trunk with slash; **B**, habit; **C**, flowering branches showing adaxial face of mature leaves; **D**, flowering branches showing abaxial face of mature leaves; **E**, inflorescence; **F**, flower. **A-F**, Bruy & Metzdorf 2123. Photographs: **A-E**, D. Bruy; **F**, C. Laudereau.

sp. nov., vs only the ovary base slightly included within the relatively flat hypanthia of *E. baillonii* and *E. sebertii*). As well, the petioles of *E. trichogyna* sp. nov., are relatively shorter than those of *E. baillonii* (petiole length typically  $< \frac{1}{6}$  blade length in *E. trichogyna* sp. nov., vs  $> \frac{1}{5}$  in *E. baillonii*), while *E. sebertii* is usually distinguishable from *E. trichogyna* sp. nov., by the former's much more lustrous abaxial leaf surface.

The substrate preferences of the three species also differ, with *E. trichogyna* sp. nov., found on non-ultramafic-derived soils, *E. baillonii* on ultramafic-derived soils, and *E. sebertii* on both.

TYPE MATERIAL. — New Caledonia • Province Sud, Farino, piste du Pic Vincent; [alt. 375 m]; [21°37'10"S, 165°46'17"E]; 16.XII.2007;

fl.; J. Munzinger, D., I. Létocart, R. Amice, B., S. Létocart, M. Mendes 4955; holo-, P[P02033031]!; iso-, MO[MO-3258178]!, NOU [NOU030849]!).

PARATYPES. — New Caledonia • Province Nord, Aoupinié, ancienne scierie; alt. 530 m; [21°9'20"S, 165°19'11"E]; fr.; 11.IX.2008; J. Munzinger, D. Létocart, I. Létocart, O. Chapelle, R. Amice 5166; para-, MO[MO-3258175], NOU[NOU049111], P[P04026859, P02032997] • Haute Tchamba; [21°1'12"S, 165°13'47"E]; fr.; 18.VII.1979; T. Sévenet & J. Pusset 1749; para-, NOU[NOU016569], P[P02033074] • *loc. cit.*; fr.; 25.V.1982; J. Pusset & G. Chauvière 305; para-, P[P02033068] • Col d'Amieu, Mt Rembai; alt. 800 m; [21°34'47"S, 165°49'59"E]; fl.; 8.X.1984; J. Pusset & S. Labarre

31; para-, NOU[NOU016568], P[P02033080] • Koné, Atéou; alt. 807 m; 20°57'0"S, 164°55'13"E; fl.; 1.XII.2019; *J. Munzinger, G. McPherson, D. Bruy, H. Vandrot, C. Laudereau, H. Cazé & J.-P. Butin* 8163; para-, MPU[MPU312643], NOU[NOU091916], P[P00864973] (same tree as *Vandrot et al.* 725) • Atéou, Parcelle 1ha NC-PIPPN; 20°57'0.14"S, 164°55'13.5"E; bt.; 13.IX.2013; *H. Vandrot, T. Ibanez, E. Blanchard, C. Chambrey & P. Birnbaum* 725; para-, NOU[NOU083432], P[P00806974] • Province Sud, Farino, Parc des Grandes Fougères; alt. 598 m; 21°36'38.228"S, 165°46'31.076"E; fl.; 1.XII.2021; *D. Bruy & M.S. Metzendorf* 2123; para-, MO, MPU[MPU1403416], NOU[NOU109101], NOU112330], P[P00940811] • Col Amieu; alt. 750 m; [21°36'24"S, 165°50'0"E]; bt., fr.; 8.X.1984; *H.S. MacKee (Leg. J. Pusset)* 42315; para-, MO[MO-3258174], NOU[NOU016550], P[P02002964] • Farino, piste du Pic Vincent; alt. 375 m; 21°37'10"S, 165°46'17"E; fr.; 7.VII.2007; *J. Munzinger, D. & I. Létocart, R. Amice, C. Létocart & O. Chapelle* 4385; para-, MO, NOU[NOU018942], P[P02032991]).

PHENOLOGY. — Flowers have been collected in October and December; fruits are known from July, September and October.

ETYMOLOGY. — The specific epithet refers to the densely pubescent gynoecium.

HABITAT. — The species inhabits low and medium altitude humid dense forests on volcano-sedimentary rocks *sensu* Jaffré *et al.* (2012), at 375–800 m, on volcanoclastic sandstone or undifferentiated polymetamorphic ensemble (Maurizot & Vendé-Leclerc 2012).

DISTRIBUTION. — The species grows on the central chain of the main island “Grande Terre”; the southernmost locality is Farino-Mont Rembaï, and the northernmost is Atéou (Fig. 3).

CONSERVATION STATUS. — *Endiandra trichogyna* sp. nov., is known from six localities *sensu* IUCN, two of which are in protected areas: “Réserve de nature sauvage du massif de l'Aoupinié” in the North Province, and “Parc des Grandes Fougères” in the South Province. The EOO calculated is 1483 km<sup>2</sup> and the AOO is 32 km<sup>2</sup>. Its habitat and range suggest that other populations are yet to be found in the central mountain range of New Caledonia. No direct threat to the species has been identified but it is present in areas where invasive species (*Rusa* deer in particular) are potentially responsible for habitat degradation. Consequently, *E. trichogyna* sp. nov., has been assigned a conservation status of Near Threatened (NT) by the New Caledonian Red List Authority on 23/02/2023 (Endemia & RLA Flore NC 2022).

VERNACULAR NAME. — Unknown.

#### DESCRIPTION

Tree 4–20 m tall. Diameter up to 17 cm. Rauh's architectural model. Bark brown with reddish slash. Terminal buds densely appressed-pubescent with whitish brown hairs, the young stems somewhat flattened in cross-section, 2.5–4 mm in width, subsersistently appressed-pubescent with minute hairs, somewhat granular in appearance and only obscurely lined, lenticels mostly below the leafy portions, slightly raised. Leaves alternate to subopposite; blades elliptic to ovate-elliptic, 6–12(–16) × 3.5–7 cm, base broadly acute to obtuse, usually symmetrical, apex shortly and obtusely acuminate, texture subcoriaceous, adaxial surface thinly appressed-pubescent, glabrescent except along the midrib, abaxial surface densely and subsersistently appressed-pubescent, the oil cells still visible below the hairs in newly mature leaves, adaxial surface typically with evident, raised oil cells, the abaxial surface smooth; lateral veins 5–7(–9) on

each side of the midrib, the midrib essentially flush adaxially, prominent abaxially, the lateral veins slightly raised adaxially, more prominently raised abaxially, the lesser venation slightly raised on both surfaces; petioles 7–18(–23) × 2–3 mm, flat adaxially, appressed-pubescent when young, later glabrescent, brown-green *in vivo*.

Inflorescences axillary, 1.5–11.5 cm long, cymose-paniculate, the axes persistently appressed-pubescent; peduncle 2–10 mm long, 1.5–2 mm wide; bracts triangular, up to 1.5 mm long and 1.5 mm wide, pubescent like the axes, pedicels 1–1.5 mm long. Flowers yellow-brownish, *c.* 2.5 mm long, 3–4 mm in diameter at anthesis; floral tube densely pubescent within, somewhat cupular, the pistil roughly half-immersed within it, tepals ovate, 1.5–2 mm long, subequal, more-or-less spreading at anthesis, rounded apically, uniformly pubescent with suberect hairs, more densely so adaxially; fertile stamens 3, *c.* 1.5 mm long, almost equaling the pistil, subsessile, connective pubescent, anther locules lateral, *c.* 0.5 mm long, glabrous, basal glands sessile, subspherical, *c.* 0.5 mm in diameter, glabrous; staminodes 3, *c.* 0.7 mm in diameter (i.e. *c.* half as long as the fertile stamens), subtriangular, thick; pistil ovoid, *c.* 1.5 mm high, *c.* 1 mm in diameter at base, the ovary densely pubescent. Fruit a single-seeded berry, black when mature, elliptic-ovoid *c.* 4.3–5.5 cm long and *c.* 2.2–2.8 cm in diameter, pubescent at least in sheltered places; seed (immature) pale pink in cross-section.

#### Acknowledgements

Laurence Ramon skillfully illustrated the new species. We warmly thank our friend Chrissen Gemmill for our preliminary molecular insights concerning *E. humboldtiana* sp. nov. We direct our sincere thanks to Dominique Fleurot and Christian Laudereau for help in the field; Christian Laudereau also let us use his field images. Drs Henk van der Werff (Missouri Botanical Garden Center), Jens Gunter Rohwer (Universität Hamburg Fakultät für Mathematik Informatik und Naturwissenschaften) and Thierry Deroin (MNHN) helped to improve a previous version of the manuscript. Herbarium curators at MO, MPU, NOU, and P are acknowledged for giving access to herbarium material. IRD and MNHN gave access to the collections in the framework of the RECOLNAT national Research Infrastructure (RECOLNAT-ANR-11-INBS-0004). Conservation authorities of the North and South Provinces of New Caledonia (DDEE and DDDT) provided us with collecting permits. The helicopter survey on the Nekando in November 2019 was possible thanks to the support of the DDDT of the Southern Province; we particularly thank Dominique Garnier for the organisation and Fabrice Vandannoote for the piloting. We thank the Parc des Grandes Fougères for allowing vehicle access and the RLA New Caledonia for the evaluations.

We are indebted to Odile Poncy and Serge Muller (MNHN) and the Programme Flores du MNHN, supported by the Fondation Franklinia, 2019–2022, for funding and facilitation of our studies.

REFERENCES

- BRUY D., BARRABÉ L., BIRNBAUM P., DAGOSTINI G., DONNAT M., FAMBART-TINEL J., GIRARDI J., HEQUET V., ISNARD S., JAFFRÉ T., MUNZINGER J., NIGOTE W., PILLON Y., RIGAUT F., VANDROT H., VEILLON J.-M. & ZAISS R. 2021. — L'Herbier de Nouvelle-Calédonie. UMR AMAP. IRD, CIRAD, CNRS, INRAE, Univ. Montpellier, Nouméa. <https://doi.org/10.23708/herbier-nouvelle-caledonie>
- ENDEMIAS & RLA FLORE NC. 2022. — La liste rouge de la flore menacée de Nouvelle-Calédonie, synthèse 2014-2021, 4 p.
- GATEBLÉ G., BARRABÉ L., MCPHERSON G., MUNZINGER J., SNOW N. & SWENSON U. 2018. — One new endemic plant species on average per month in New Caledonia, including eight more new species from Ile Art (Belep Islands), a major micro-hotspot in need of protection. *Australian Systematic Botany* 31: 448-480. <https://doi.org/10.1071/SB18016>
- HALLÉ F., OLDEMAN R. A. A. & TOMLINSON P. B. 1978. — *Tropical Trees and Forests: an Architectural Analysis*. Springer-Verlag, Berlin, 441 p.
- HARRIS G. J. & HARRIS M. W. 2001. — *Plant Identification Terminology: an Illustrated Glossary*. Spring Lake Publishing, Utah, 206 p.
- HYLAND B. P. M. 1989. — A revision of Lauraceae in Australia (excluding *Cassytha*). *Australian Systematic Botany* 2: 135-367. <https://doi.org/10.1071/SB9890135>
- IUCN. 2012. — *IUCN Red List Categories and Criteria: Version 3.1. Second edition*. IUCN Species Survival Commission, IUCN, Gland, Switzerland and Cambridge, 32 p.
- JAFFRÉ T. & VEILLON J. M. 1990 (publ. 1991). — Étude floristique et structurale de deux forêts denses humides sur roches ultrabasiques en Nouvelle-Calédonie. *Bulletin du Muséum national d'Histoire naturelle, Section B, Adansonia, Botanique, Phytochimie* 12: 243-273. <https://www.biodiversitylibrary.org/page/13739282>
- JAFFRÉ T., RIGAUT F. & MUNZINGER J. 2012. — La végétation, in BONVALLOT J., GAY J.-C., & HABERT É. (eds), *Atlas de la Nouvelle-Calédonie*. IRD-Congrès de la Nouvelle-Calédonie, Marseille-Nouméa: 77-80.
- KOSTERMANS A. 1974. — Lauracées, in AUBRÉVILLE A. & LEROY J.-F. (eds), *Flore de la Nouvelle-Calédonie et Dépendances*. Muséum national d'Histoire naturelle, Paris: 1-120.
- KOSTERMANS A. 1977. — Un nouveau *Litsea* (Lauraceae) de Nouvelle-Calédonie. *Adansonia*, sér. 2, 17: 95. <https://www.biodiversitylibrary.org/page/59850046>
- KOSTERMANS A. J. G. H. 1969. — Materials for a revision of Lauraceae II. *Reinwardtia* 7: 451-536. <https://doi.org/10.14203/reinwardtia.v7i5.947>
- KOSTERMANS A. J. G. H. 1993. — Notes on *Triadodaphne* Kosterm. (Lauraceae). *Rheedea* 3: 129-131. <https://doi.org/10.22244/rheedea.1993.03.02.07>
- LE BRAS G., PIGNAL M., JEANSON M., MULLER S., AUPIC C., CARRÉ B., FLAMENT G., GAUDEUL M., GONÇALVES C., INVERNÓN V., JABBOUR F., LERAT E., LOWRY II P. P., OFFROY B., PIMPARÉ E., PONCY O., ROUHAN G. & HAEVERMANS T. 2017. — The French Muséum national d'histoire naturelle vascular plant herbarium collection dataset. *Scientific Data* 4: 170016. <https://doi.org/10.1038/sdata.2017.16>
- LIU Z.-F., MA H., ZHANG X.-Y., CI X., LI L., HU J.-L., ZHANG C.-Y., JIANHUA X., LI H.-W., CONRAN J., TWYFORD A., HOLLINGSWORTH P. & LI J. 2022. — Do taxon-specific DNA barcodes improve species discrimination relative to universal barcodes in Lauraceae? *Botanical Journal of the Linnean Society* 199: 741-753. <https://doi.org/10.1093/botlinnean/boab089>
- MAURIZOT P. & VENDÉ-LECLERC M. 2012. — La géologie, in BONVALLOT J., GAY J.-C., & HABERT É. (eds), *Atlas de la Nouvelle-Calédonie*. IRD-Congrès de la Nouvelle-Calédonie, Marseille-Nouméa: 65-68.
- MUNZINGER J. 2013. — Inventaire botanique du massif du Panié et des roches de la Ouaième, Province Nord, Nouvelle-Calédonie: 45-86, in TRON F., FRANQUET R., LARSEN T. H., & CASSAN J.-J. (eds), *Évaluation rapide de la biodiversité du massif du Panié et des Roches de la Ouaième, Province nord, Nouvelle-Calédonie. RAP Bulletin of Biological Assessment*. Conservation International, Arlington, VA: 65-68. <https://doi.org/10.1896/978-1-934151-54-9>
- MUNZINGER J. & MCPHERSON G. 2016. — Novitates neocaledonicae IV: Three new species of *Cryptocarya* R.Br. (Lauraceae). *Adansonia*, sér. 3, 38: 165-174. <https://doi.org/10.5252/a2016n2a3>
- MUNZINGER J. & MCPHERSON G. 2017. — Typification of the name *Litsea mackeei* (née Lauraceae) and its reassignment to the synonymy of *Osmanthus austrocaledonicus* var. *austrocaledonicus* (Oleaceae). *Phytotaxa* 331: 137-143. <https://doi.org/10.11646/phytotaxa.331.1.13>
- MUNZINGER J. & MCPHERSON G. 2021. — Novitates neocaledonicae XII: Two additional new species of *Cryptocarya* from New Caledonia. *Adansonia*, sér. 3, 43: 151-161. <https://doi.org/10.5252/adansonia2021v43a13>. <http://adansonia.com/43/13>
- MUNZINGER J., MCPHERSON G., MEYER S. & GEMMILL C. E. 2023. — Phylogenetic study of the New Caledonian endemic genus *Adenodaphne* (Lauraceae) confirms its synonymy with *Litsea*. *Botany Letters* 170 (3): 479-487. <https://doi.org/10.1080/023818107.2022.2088613>
- RICHTER H. G. 1981. — Anatomie des sekundären Xylems und der Rinde der Lauraceae. *Sonderbände des Naturwissenschaftlichen Vereins in Hamburg* 5: 1-148
- ROHWER J. G. 1993. — Lauraceae, in KUBITZKI K., ROHWER J. G., & BITTRICH V. (eds), *The Families and Genera of Vascular Plants*. Springer, Berlin: 366-391.
- ROHWER J. G., DE MORAES P. L. R., RUDOLPH B. & VAN DER WERFF H. 2014. — A phylogenetic analysis of the *Cryptocarya* group (Lauraceae), and relationships of *Dahlgrenodendron*, *Sinopora*, *Triadodaphne*, and *Yasunia*. *Phytotaxa* 158: 111-132. <https://doi.org/10.11646/phytotaxa.158.2.1>
- THIERS B. 2023 [continuously updated]. — Index Herbariorum: a global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium [<http://sweetgum.nybg.org/ih/>].

Submitted on 10 May 2023;  
accepted on 17 July 2023;  
published on 12 February 2024.