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a note about *Dendrobium kanakorum* Kraenzl.

Marc PIGNAL



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# Two new species of *Dendrobium* Sw. from New Caledonia in the section *Macrocladium* Schltr. and a note about *Dendrobium kanakorum* Kraenzl.

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## KEY WORDS

Orchidaceae,  
Epidendroideae,  
Dendrobieae,  
New Caledonia,  
lectotypification,  
new synonym,  
new species.

## ABSTRACT

Two new species of *Dendrobium* Sw. endemic to New Caledonia closely resembling *D. finetianum* Schltr. are described and illustrated. These taxa are vegetatively very similar and form the “*D. finetianum* group”. They can be distinguished based on differences in flower size and colour, and especially the shape of the labellum. The name *D. kanakorum* Kränzl is placed in synonymy under *D. finetianum* for which a lectotype is designated. A key to the members of the “*D. finetianum* group” is provided in English and French.

## RÉSUMÉ

*Deux nouvelles espèces de Dendrobium Sw. de Nouvelle-Calédonie dans la section Macrocladium Schltr. et une note sur Dendrobium kanakorum Kraenzl.*

MOTS CLÉS  
Orchidaceae,  
Epidendroideae,  
Dendrobieae,  
Nouvelle-Calédonie,  
lectotypification,  
synonyme nouveau,  
espèces nouvelles.

Deux nouvelles espèces endémiques de Nouvelle-Calédonie proches de *D. finetianum* Schltr. sont décrites et illustrées. Végétativement très proches, elles forment un « groupe *D. finetianum* ». Les différences entre les trois espèces concernent la taille et la couleur des fleurs, et surtout la forme du labelle. Le nom *D. kanakorum* Kränzl est placé en synonymie avec *D. finetianum*, pour lequel un lectotype est désigné. Une clef pour le « groupe *D. finetianum* » est donnée en anglais et en français



## INTRODUCTION

The latest investigations from the New Caledonian orchid review show that the genus *Dendrobium* Sw. is represented in New Caledonia by 42 species and four varieties including the described species in this paper. In his treatment of the Orchidaceae of New Caledonia, Hallé (1977) recognised one species, *D. finetianum* Schltr., which he considered to be particularly variable. Thanks

to the field inventories of orchids carried out for more than 20 years by Christian Laudereau and the many photographs he took of plants in the wild, we are now able to distinguish several taxa that fall within Hallé's broad concept of *D. finetianum* whose floral morphology is very distinctive. In the present paper, we discuss three species that together form a morphologically coherent ensemble that we refer to as the "*D. finetianum* group", to which we also provide an identification key:

### KEY TO THE SPECIES OF THE *DENDROBIUM FINETIANUM* GROUP

1. Labellum *c.* 10 mm long, the median lobe clearly bifid, the front surface of the column strongly pubescent. Anther cap white. Tepals green ..... *Dendrobium laudereavorum* M.Pignal, sp. nov.  
— Labellum less than 9 mm long, the median lobe rounded or slightly acute. Anther cap pinkish. Tepals greenish yellow ..... 2
2. Labellum with burgundy-colored median lobe. Dorsal sepal of 9 mm in length or more ..... *Dendrobium dangioanum* M.Pignal, sp. nov.  
— Labellum white with dark pink spots (sometimes entirely white). Dorsal sepal 7 mm in length or less ..... *Dendrobium finetianum* Schltr.

### CLÉ DES ESPÈCES DU GROUPE *DENDROBIUM FINETIANUM*

1. Labelle de 10 mm de longueur environ, à lobe médian clairement bilobulé. Opercule de l'anthère blanc. Tépales verts ..... *Dendrobium laudereavorum* M.Pignal, sp. nov.  
— Labelle de moins de 9 mm de longueur à lobe médian arrondi ou un peu en pointe. Opercule de l'anthère rosé. Tépales jaunes verdâtres ..... 2
2. Labelle à lobe médian rouge bordeaux. Sépale dorsal de 9 mm de longueur ou plus ..... *Dendrobium dangioanum* M.Pignal, sp. nov.  
— Labelle blanc à macules rose foncé (parfois entièrement blanc). Sépale dorsal de 7 mm de longueur ou moins ..... *Dendrobium finetianum* Schltr.

The *Dendrobium finetianum* group is vegetatively very homogeneous. All species are epiphytic, and are characterised by sympodial growth and closely spaced stems that are slender, unbranched, flexuose, swollen at the basal, rhizomatous internode, and yellowish when dry. Members of the group have leaves that are sheathed and a blade that is somewhat leathery and narrowly lanceolate. The inflorescences, which comprise loose racemes of 4-20 flowers, are produced at the base of the leaf sheaths, which they pierce as they expand, making them appear opposite the leaf below, although they sometimes arise from stems that have lost the leaf-blades. Within the group, its members can be clearly distinguished by differences in flower size and labellum shape.

Schlechter (1906) originally placed *Dendrobium finetianum* in the broadly defined *D.* sect. *Macrocladium* Schltr. Subsequent authors recognized several new sections with narrower delimitation, while Ormerod (2002) published *D.* sect. *Finetianthe* Ormerod specifically to accommodate *D. finetianum*. In the same year, Clements & Jones (2002) published *Bouletia* M.A.Clem. & D.L.Jones to accommodate this species in a separate monospecific genus. Clements (2006), using DNA sequences of the internal transcribed spacer (ITS) region of the 18-26S nuclear ribosomal repeat unit, sequenced 118 species of *Dendrobium* including 10 from New Caledonia (incl. *D. finetianum*). This work showed

that the New Caledonian sections of *Dendrobium* are not well supported, as mentioned by Pridgeon *et al.* (2014). Thus, more recent work has generally retained Schlechter's concept of a broadly defined Section *Macrocladium*, in which over 40% of New Caledonian *Dendrobium* species are currently placed, as summarised by Schuiteman (2011) and Pridgeon *et al.* (2014).

For the last several years, a working group formed by Christian and Pierre-Louis Laudereau, Jean-Pierre Butin, Jérôme Munzinger, Gildas Gâteblé, and Edouard Faria has been undertaking the study of the various orchid genera present in New Caledonia in order to refine and update their nomenclature and taxonomy. New species have been described in *Dendrobium* (Pignal & Munzinger 2020; Pignal *et al.* 2020), *Pterostylis* R.Br. (Pignal *et al.* 2021a), *Porpax* Lindl. (Pignal *et al.* 2023a), *Goodyera* R.Br. and *Zeuxine* Lindl. (Pignal *et al.* 2023b), and *Calanthe* R.Br. (Pignal *et al.* 2023c). In addition, three species have been reported as new for the territory: *Bulbophyllum savaiense* Schltr. (Pignal *et al.* 2021b), *Dendrobium vagans* Schltr. (Pignal *et al.* 2022b), and *Vrydagzyna albostrigata* Schltr. (Pignal *et al.* 2023b), along with confirmation of the validity of a species previously regarded as doubtful, *Dendrobium petrophilum* Kraenzl. (Pignal *et al.* 2022a). This is the tenth contribution in our series aimed at producing a comprehensive revision of Orchidaceae for the New Caledonian archipelago.

TABLE 1. — Comparison of the characters of the three species of the *Dendrobium finetianum* Schltr. group with those indicated in the protologue of *D. kanakorum* Kraenzl.

	<i>D. finetianum</i>	<i>D. kanakorum</i> (protologue)	<i>D. dangioanum</i> sp. nov.	<i>D. laudereavorum</i> sp. nov.
Flowers	Tepals orange-yellow with red streaks at the base. Labellum whitish with dark pink stripes	Tepals pale purplish pink (with more intense stripes?). Labellum colour not described.	Tepals yellow with irregular red stripes. Labellum burgundy red.	Tepals yellowish green. Labellum pink, white, with greenish tip.
Dorsal sepal length	(4-)5-6(-7) mm	4-5 mm	9-9.5 mm	8 mm
Lateral sepal size	5.7 × 2.2 mm	6-7 × 1.5-2 mm	8.2 × 3 mm	8.7 × 4 mm
Petal length	4 mm	4-5 mm	10 mm	8 mm
Labellum claw length	3.25 mm	5 mm	3 mm	4 mm
Labellum median lobe width	3.5 mm	3 mm	7-8 mm	10 mm

## MATERIAL AND METHODS

Observations and measurements were made on herbarium material at LY, NOU (Bruy *et al.* 2021; Bruy 2022), and P (Le Bras *et al.* 2017), as well as on specimen images available on line at <https://www.recolnat.org>. These images, as well as photos of living plants, were measured using the Annotate-on tool (version 1.9.56) made available by the RECOLNAT infrastructure (downloadable from <https://www.recolnat.org/fr/annotate>). When multiple measurements were made, the resulting values are presented in the following format: (minimum value-) first quartile-third quartile (-maximum value).

The geographical coordinates in square brackets were calculated post facto from the collection data.

Key reference collections were accessed via the website JSTOR *Global Plants* (<https://plants.jstor.org/>) as well the HBG database (<http://www.herbariumhamburgense.de/>).

## TAXONOMIC TREATMENT

Family ORCHIDACEAE Juss.  
Subfamily EPIDENDROIDEAE Lindl. ex Endl.  
Tribe DENDROBIEAE Lindl. ex Endl.  
Genus *Dendrobium* Sw.  
Section *Macrocladium* Schltr.

*Dendrobium finetianum* Schltr.  
(Figs 1C; 2; Table 1)

*Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie* 39 (1): 73-74 (Schlechter 1906). — *Grastidium finetianum* (Schltr.) Rauschert, *Feddes Repertorium* 94: 449 (Rauschert 1983). — *Bouletia finetiana* (Schltr.) M.A.Clem. & D.L.Jones, *The Orchadian* 13: 485 (Clements & Jones 2002). — Typus: Nouvelle-Calédonie. Auf den Bergen bei Oubatche, 1000 m, 19.XII.1902, fl., R. Schlechter 15505 (lecto-, P[P00121180], here designated; isolecto-, AD[AD966081664] image!, AMES[AMES00287710] image!, BM[BM000505873, BM000990513] images!, BR[BR0000009895034, BR0000009972636] images!, BRI[BRI-AQ0279518] image!, E[E00383607] image!, G[G00165517, G00165518] images!, K[K001085489] image!, L[L0059601] image!, LY[LY0562059]!, M[M0226903] image!, NSW[NSW927016] image!, P[P00121181]!, S[S-G-1927] image!).

*Dendrobium kanakorum* Kraenzl., *Das Pflanzenreich* (Engler) Orch.-Dendrob. pars 1, 107 (Kränzl 1910), *syn. nov.* — Typus: Nouvelle-Calédonie. J.F. Roberts *s.n.*, (holo-, HBG[HBG501543] image!).

ETYMOLOGY. — This species is dedicated to the French botanist Achille Eugène Finet (1863-1913), from the *Muséum national d'Histoire naturelle*. Finet worked on Orchids from New Caledonia and published new species from there.

PHENOLOGY. — The taxon has been observed in flower throughout the year (C. Laudereau, pers. comm.). The same stem produces several successive flowerings.

CONSERVATION STATUS. — Least Concern (LC), assessed on 26.X.2015 (<https://endemia.nc/flore/fiche123>). The species is protected in the Northern Province of New Caledonia.

MATERIAL STUDIED. — **New Caledonia.** Province Nord: Poindimié, Amoa GR Pombei, 20°56'17"S, 165°11'35"E, 7.VIII.2017, fl., C. Laudereau & P.-L. Laudereau 514 (NOU[NOU092567]!); Poindimié, Amoa GR Pombei, 20°56'17"S, 165°11'35"E, 20.X.2018, fl., C. Laudereau & P.-L. Laudereau 1012 (NOU[NOU092614]!); Plateau de Dogny, 900-1000 m, [21°37'24"S, 165°52'41"E], 18.I.1961, fl. H.S. MacKee 8201 (P[P00118594]!); Contrefort Nord-Est du Mt. Panié, forêt humide assez basse, 600-800 m, [20°34'8"S, 164°47'14"E], 11.XII.1965, fl., H.S. MacKee 13873 (P[P00118600]!); Haute Diahot: Forêt Tendé (Expl. For. Frouin), forêt humide, 500-600 m, 30.IX.1968, fl., [20°24'37"S, 164°31'19"E], H.S. MacKee 19671 (P[P00118596]!); Ponérihouen: Contrefort Est Mt. Aoupinié, forêt humide, 700-850 m, [21°11'1"S, 165°17'49"E], 28.VI.1972, st., H.S. MacKee 25625 (P[P00112235]!); Ponérihouen: Expl. For. Devillers, Pente E Mt. Aoupinié, forêt humide, 500-700 m, [21°10'32"S, 165°18'30"E], 7.XI.1972, fl., H.S. MacKee 25790 (P[P00112246]!); Grauwackes, Ponérihouen: pente E Mt. Aoupinié, forêt humide, 800 m, [21°11'1"S, 165°17'49"E], 20.VI.1973, yfr., H.S. MacKee 26807 (NOU[NOU002533] image!, P[P00112244]!); Pouébo: Crête entre Mandjélia/Tiebo, forêt humide, 750 m, [20°24'23"S, 164°32'15"E], 19.IX.1973, fl., H.S. MacKee 27393 (P[P00112243]!); Haute Houailou: Sphinx, forêt rabougrie, 860 m, [21°15'5"S, 165°25'39"E], 23.III.1974, fl., H.S. MacKee 28366 (P[P00112241]!); Balade: forêt au Sud du Col Parari, [20°21'11"S, 164°29'29"E], 23.VII.1974, fl. H.S. MacKee 28933 (P[P00112239]!); Kouaoua: Contrefort N Ménazi, Ravin boisé, 500 m, [21°25'13"S, 165°41'60"E], 26.VI.1977, fl., H.S. MacKee 33422 (P[P00118575]!); Pouébo: Mt. Mandjélia, forêt humide, 700 m, [20°24'9"S, 164°31'28"E], 1.VIII.1977, H.S. MacKee 33665 (P[P00118577]!); Ponérihouen: Mt. Aoupinié, forêt humide, 500 m, [21°9'25"S, 165°19'0"E], 25.VII.1978, fl., H.S. MacKee 35468 (P[P00118578]!); Kouaoua: Dahi, forêt, 500 m, [21°28'8"S, 165°52'44"E], 2.VIII.1978, fl., H.S. MacKee 35517 (P[P00118579]!); Kouaoua: Ménazi, maquis, 900 m, [21°27'13"S, 165°41'17"E], 6.VII.1989, fl., H.S. MacKee 44471 (NOU[NOU002539] image!).

P[P00118584]!); Mt. Do, c. 13 air-km NNW of Bouloupari, forested slopes c. 800 m, [21°45'S, 166°0'E], 5.VII.1980, fl., *G. McPherson* 2825 (MO[MO-3260102], P[P00118571]!); Hienghène, 500-570 m, [20°35'10"S, 164°46'19"E], 5.IV.2006, fl., *Y. Pillon, I. Spir et al.* 343 (NOU[NOU011623], P[P02103747]!); Mont Görö Até, [21°1'49"S, 165°10'13"E], 19.XI.2002, fl., *F. Tronchet, J. Munzinger, D. Létocart, I. Létocart, J.-P. Butin, A. Oddi & A. Obry* 483 (MO, P[P00354838]!); Poindimié près de Wagap, fl., *E. Vieillard* 3280 (P[P00118591]!). — Province Sud: Forêt "Mois de Mai", [22°6'56"S, 166°39'E], 22.VI.1951, fl., *M.G. Baumann-Bodenheim* 13948 (P[P00118610]!); Forêt "Mois de Mai", [22°6'56"S, 166°39'E], 23.VI.1951, fl., *M.G. Baumann-Bodenheim* 14112 (P[P00118609]!); Rain-forest called "Forêt de Thy", [22°10'42"S, 166°32'9"E], 28.XII.1959, fl., *A.S. Foster & J. Blydenstein* 56887 (P[P00118586]!); Port Boisé, 1.IX.1914, [22°20'44.016"S, 166°57'20.988"E], fl., *I. Franc* 2008 (P[P00112233, P00112234]!); Mont Algaoué, 100 m, [22°11'58"S, 166°30'59"E], 19.XI.1950, fl., *A. Guillaumin & M.G. Baumann-Bodenheim* 7027 (P[P00118608]!); Mont Algaoué, 100 m, [22°11'58"S, 166°30'59"E], 19.XI.1950, fl., *A. Guillaumin & M.G. Baumann-Bodenheim* 7031 (P[P00118607]!); Mé Amméri, 700 m, [21°39'28"S, 165°50'26"E], 28.XI.1950, fl., *A. Guillaumin & M.G. Baumann-Bodenheim* 8762 (P[P00118606]!); Lisière de forêt près de la rivière Bleue (riv. de Yaté), [22°6'S, 166°44'E], 13.VI.1951, fl., *H. Hürlimann* 1537 (P[P00118604]!); Mont Dore, Forêt de la Superbe, [22°09'25"S, 166°35'28"E], 10.XII.2016, fl., *C. Laudereau & P.-L. Laudereau* 185 (NOU[NOU092613]!); Yaté, Parc de la Rivière Bleue, [22°06'48"S, 166°38'51"E], 5.II.2017, fl., *C. Laudereau & P.-L. Laudereau* 317 (NOU[NOU092612]!); Dumbéa Mont Koghis, [22°10'42"S, 166°30'30"E], 19.VIII.2017, fl., *C. Laudereau & P.-L. Laudereau* 540 (NOU[NOU092611]!, P[P02275935]!); Boulouparis, mt. Do, [21°45'14"S, 166°00'01"E], 27.VIII.2017, fl., *C. Laudereau & P.-L. Laudereau* 554 (NOU[NOU092610]!); Mt. Pente Koghi Vallée Thy, forêt, 400-800 m, [22°10'42"S, 166°31'37"E], 22.VII.1956, fl., *H.S. MacKee* 4958 (P[P00118595]!); Vallée Haute rivière des Pirogues, 200 m, [22°10'48"S, 166°41'9"E], 14.VI.1965, fl., *H.S. MacKee* 12812 (P[P00118601]!); Plaine des Lacs: Haute Rivière Blanche – Forêt "Les Electriques", forêt humide, 400 m, [22°10'59"S, 166°39'54"E], 27.VII.1966, fl., *H.S. MacKee* 15383 (P[P00118599]!); Vallée de Mamié, forêt mixte à chêne gomme (*Spermolepis*), 200 m, [22°4'15"S, 166°51'38"E], 6.X.1966, fl., *H.S. MacKee* 15744 (P[P00118598]!); Col Amieu: Oua Némi, forêt humide, 300 m, [21°35'18"S, 165°48'47"E], 13.XI.1971, fl., *H.S. MacKee* 24682 (P[P00112237]!); Farino: Pic Vincent, forêt humide, 600-700 m, [21°36'43"S, 165°46'12"E], 3.III.1973, fl., *H.S. MacKee* 26348 (P[P00112245]!); Basse Vallée Ouinné, forêt-galerie, 20 m, [21°59'4"S, 166°39'56"E], 3.VII.1973, *H.S. MacKee* 27567 (P[P00112242]!); Crête au S Baie Ouinné, Forêt humide, 500-600 m, [21°59'51"S, 166°40'15"E], 27.V.1974, *H.S. MacKee* 28737 (P[P00112240]!); Pente SW Mt. Ouin, forêt humide, 1100 m, [22°0'43"S, 166°27'18"E], 11.VIII.1974, *H.S. MacKee* 29067 (P[P00112238]!); Mt. Do, forêt humide, 950 m, [21°45'38"S, 165°59'50"E], 22.XI.1976, *H.S. MacKee* 32285 (P[P00118585]!); Port Boisé, forêt, 20 m, [22°21'14"S, 166°56'38"E], 17.VI.1979, fl., *H.S. MacKee* 37042 (P[P00118576]!); Pente E Mt. Kouakoué, forêt humide, 600 m, [21°57'3"S, 166°33'38"E], 1.XI.1981, fl., *H.S. MacKee* 39721 (P[P00118580]!); Prony: Forêt Nord, forêt humide, 250 m, [22°19'45"S, 166°55'25"E], 7.VI.1988, *H.S. MacKee* 43968 (NOU[NOU002537]image!, P[P00118581, P00118582]!); Yaté, forêt, 250 m, [22°9'22"S, 166°53'58"E], 6.VII.1988, fl., *H.S. MacKee* 43990 (P[P00118583]!); Along old lumber road to top of Mt. Ori, above Katrikoin, c. 800 m, [21°31'S, 165°39'E], 7.IX.1980, fl., *G. McPherson* 3059 (P[P00118572]!); Along lumber roads W of seismic station at first pass along road to Mt. Dzumac from Dumbéa, forest c. 500 m, [22°2'29"S, 166°28'29"E], 19.VI.1981, fl., *G. McPherson* 3863 (NOU[NOU002538], P[P00118570]!); Forêt Faux Bon Secours, [22°10'10"S, 166°41'45"E], 13.IV.1977,

fl., *P. Morat* 5408 (P[P00118574]!); forêt Inco S2, "Forêt menacée", [22°18'14"S, 166°55'16"E], 16.VIII.2004, fl., *J. Munzinger & F. Rigault* 2313 (P[P00684686]!); Massif du Kouakoué, bassin de la Haute Ni, maquis, 950 m, [22°0'14"S, 166°29'8"E], 28.IV.2004, fl., *M. Pignal, J. Munzinger & P. Lowry* 2387 (K, NOU[NOU052392]!, P[P00771513]!); Auf den Bergen bei Oubatche, 1000 m, 19.XII.1902, fl., *F.R.R. Schlechter* 15505 (P[P00121181, P00118599]!); Versant Sud et Est du Minga, vers 1000-1200m, [21°45'12"S, 166°9'41"E], 8.VI.1972, fl., *J.-M. Veillon* 2585 (NOU[NOU002540]image!, P[P00118592]!); Forêts des pentes Sud-Ouest du Pic du Rocher, [22°5'35"S, 166°35'16"E], V.1938, fl., *R. Virot s.n.* (P[P00118590]!). — Without precise locality: Commun en plaine sur des arbres clairs, 1964, fl., *T. Legend* 14 (P[P00118603]!). — Grande Terre, 14.VI.1976, fl., *H.S. MacKee & R. Aymard* 31400 (P[P00118587]!).

NOTES

While Hallé (1977) was preparing his revision of the Orchidaceae Kränzlin's material at HBG was not available, but it is once again accessible (Christenson 1994) and the digital version can be examined at (<http://www.herbariumhamburgense.de/>). *Dendrobium kanakororum* was considered by Hallé (1977) to be a doubtful species, based only on his reading of the protologue. Careful examination, however, shows an inconsistency between the description and the illustration of the flower provided in Fig. 5L, M in the protologue. Schlechter (1911: 84) had already pointed out a possible error in Fig. 5E-G, which he regarded as belonging to another species, *D. minabassae* Kraenzl. Our review confirms that Fig. 5L, M indeed corresponds to the description of *D. minabassae* and Fig. 5E-G to that of *D. kanakororum*.

The description of the protologue and examination of the digitized specimen *Roberts s.n.* (HBG501543) confirm that the habit of this taxon is identical to that of members of the *Dendrobium finetianum* group. The description of the flower shape and size conforms broadly to that of *D. finetianum*: "Flores pallide roseo-violacei (*intensius striati?*). *Sepalum dorsale petalaeque* 4-5 mm, *sepala lateralialia* 6-7 mm longa, 1,5 v. 2 mm lata, *labellum cum ungue* 5 mm longum, *antice* 3 mm latum" (flowers pale purplish pink (with more intense stripes?). Dorsal sepal and petals 4-5 mm, lateral sepals 6-7 mm long, 1.5 to 2 mm wide, labellum with a 5 mm long claw, front [median lobe?] 3 mm wide). A comparison of the characters indicated in the protologue with those of the three species comprising the *D. finetianum* group is summarised in Table 1. The measurements and descriptions (with the exception of claw size, which is imprecise) clearly indicate that *D. kanakororum* falls within the range of variation of *D. finetianum* and should therefore be placed in synonymy.

DESCRIPTION

Epiphyte with erect, closely spaced stems with a slightly bulging basal internode. Rhizome short, flexuous, branching, sympodial. Stem flexuose, (146-)235-395(-530) × (1.2-)1.6-2.5(-4.6) mm, bearing (0-)10-15(-19) leaves, often leafless at the base. Internodes (9-)15-20(-29) mm. Sheaths slightly overlapping, same length as the internodes. Leaf blade lanceolate, (17-)39-52(-79) × (3-)5-7(-12) mm, apex long- or short-attenuate, slightly asymmetrical. Inflorescences 1-4



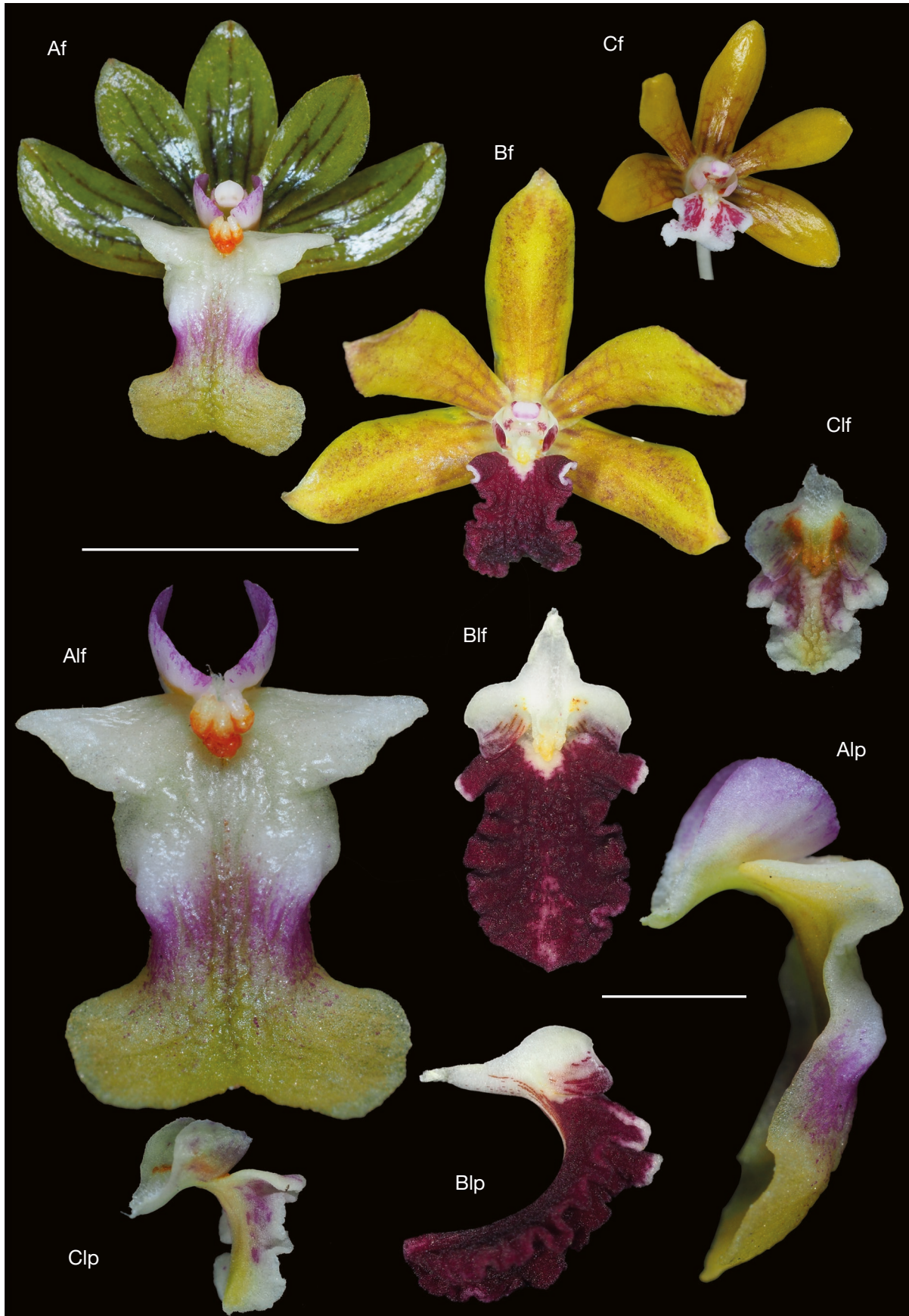


FIG. 1. — **A**, *Dendrobium laudereavorum* M. Pignal, sp. nov.; **B**, *D. dangioanum* M. Pignal, sp. nov.; **C**, *D. finetianum* Schltr. Abbreviations: **f**, flower; **lf**, labellum face; **lp**, labellum profile. Photos: C. Laudereau. Scale bars: **f**, 10 mm; **lf**, **lp**, 3 mm.

per stem, in axillary and subterminal racemes, sometimes bifid, (11-)31-50(-86) mm, borne at the base of the sheaths to which they are axillary, making them appear opposite the next-most proximal leaf, sometimes on defoliated stems (sheaths persistent), each bearing (4-)7-11(-18) flowers. Flowers resupinate. Triangular bracts *c.* 2 mm. Pedicel 8-12 mm. Tepals variable in color, yellow to brown, with irregular red streaks, glossy, margin revolute with age. Dorsal sepal narrowly ovate to oblong, (4-)5-6(-7) × (1.2-)2(-3) mm. Lateral sepals triangular-ovate, (5-)6(-7) × (1.5-)2.2(-3) mm. Petals obovate to spatulate, (6-)6.5 × 1.5-2 mm. Mentum white-yellow, 2 × 1.2 mm, furrowed. Labellum, 4-5 × 3-3.5 mm, 3-lobed. Lateral lobes erect, approximately ovate-rectangular, 1.5 × 1 mm, white with longitudinal stripes of dark or light pink (all-white labellum exists). Hypochile bright orange. Callus with 4 orange, yellow or sometimes white gibbositities, 0.5 mm wide. Median lobe ovate, 2.5 × 3 mm, white streaked laterally with pink (sometimes very pale), tips of lobules white, lateral lobules triangular ovate, *c.* 1 mm wide, median lobule, 2.25 × 2 mm, tuberculate in center on distal half, margin strongly undulate, with apex folded inward. Column 2 × 1.2 mm, *c.* 0.5 mm deep, yellowish-white externally, furrowed ventrally, with dark orange spots at base of stigmatic orifice, apex pink, margins of furrow very pubescent. Lateral staminodes white. Stigmatic cavity 0.6 × 0.8 mm wide. Connective dark pink, 0.7 mm wide, 0.5 mm high, 0.6 mm deep, with white fimbria on the front. Pollinia obovoid, dark yellow, 0.5 × 0.14 mm. Ovary 1-2 mm, slightly curved. Capsule fusiform to obovoid, green, 12 × 4 mm, pedicel 13 mm.

*Dendrobium dangioanum* M.Pignal, sp. nov.  
(Figs 1B, 2; Table 1)

*Dendrobium finetiano* *Finet similis, sed floribus largioribus (16 mm vs 9 mm), labello atrovinoso (vs roseum albumque), lobo mediano labelli longiore (2.8 vs 1.5 mm), praecipue differt.*

TYPUS. — Nouvelle-Calédonie. Province Nord, La Foa, Parc des Grandes Fougères, 21°36'38"S, 165°45'16"E, 20.I.2019, fl., *C. Laudereau 1251* (holo-, NOU[NOU092609]!; iso-, P[PO2275933]!).

PARATYPI. — Nouvelle-Calédonie. Province Nord, Poindimié, Amoa GR Pombei, 20°56'17"S, 165°11'35"E, 25.XI.2016, fl., *C. Laudereau & P.-L. Laudereau 156* (NOU[NOU092608]!, P[PO2275936]!); Poindimié, Pic Amoa, 22°14'48"S, 166°49'35"E, 4.IV.2017 fl., *C. Laudereau & P.-L. Laudereau 411* (NOU[NOU092607]!); Poindimié, Amoa GR Pombei, 20°56'17"S, 165°11'35"E, 7.VIII.2017, fl., *C. Laudereau & P.-L. Laudereau 513* (NOU[NOU092606]!); Haute Tchamba: Expl. For. Létocart, forêt humide, 500 m, [21°1'12"S, 165°13'47"E], fl., 21.XII.1967, *H.S. MacKee 17999* (P[PO0118597]!); Haute Tiwaka: Contrefort Est du Tchingou, maquis dégradé, Reste de forêt humide, terrain serpentineux, 800 m, [20°54'31"S, 165°1'7"E], 6.I.1969, fl., *H.S. MacKee 20130* (NOU[NOU002536] image!, P[PO0118588]!); Mont Boulinda, ravin face N, 800 m, [21°14'12"S, 165°7'31"E], 9.XII.1970, fl., *J.-M. Veillon 2228* (P[PO0118573]!). — Province Sud, Sarraméa, Plateau de Dogny, 21°36'51"S, 165°52'30"E, 25.II.2017, fl., *C. Laudereau & P.-L. Laudereau 344* (NOU[NOU092605]!, P[PO2275934]!); La Foa, Oupoin, 21°41'10"S, 165°59'02"E, fl., 14.XII.2018, *C. Laudereau 1237* (NOU[NOU092604]!); Plateau de Dogny, 900-1000 m, [21°37'24"S, 165°52'41"E], 18.I.1961, fl., *H.S. MacKee 8190* (P[PO0112236]!);

Farino: Forêt Mépéou, 500 m, [21°37'5"S, 165°46'35"E], 25.V.1965, fl. *H.S. MacKee 12678* (P[PO0118602]!); Col d'Amieu: Mt. Pembaï, forêt humide, schistes, 800 m, [21°35'20"S, 165°50'30"E], 15.IV.1976, fl. *H.S. MacKee 31056* (P[PO0118589]!). — Without precise locality: s.l., 25.IV.1975, fl., *J. Hoock 50* (P[PO0118605]!).

ETYMOLOGY. — This new species is dedicated to Jacques D'Angio, plant enthusiast, and especially of orchids, who was involved in the fight against invasive animals in the *Parc Provincial des Grandes Fougères* (Grandes Fougères Provincial Park) and in particular the protection of its "royal ferns".

PHENOLOGY. — The taxon has been observed in flower from October to August. Flower remain at anthesis for *c.* 7 days (C. Laudereau, pers. com.).

HABITAT AND DISTRIBUTION. — *Dendrobium dangioanum* sp. nov. is found in the central regions of New Caledonia. It grows between 300 and 1000 m altitude in wet forest or degraded maquis. It is difficult to differentiate from *D. finetianum* in the vegetative state.

CONSERVATION STATUS. — The species, like all other members of Orchidaceae, is protected in the Northern Province.

DESCRIPTION

Epiphyte with erect, close-spaced stems, with a slightly swollen basal internode. Rhizome short and flexuous, branching sympodial. Stem flexuose, (207-)238-315(-388) × (1,4-)1,7-2(-4) mm, bearing (6-)14-18(-23) leaves, often leafless at the base. Internodes of (11-)13-18(-23) mm. Slightly overlapping sheaths of the same length as the internodes. Leaf blade lanceolate, (28-)34-48(-66) × (4-)5-8(-10) mm with a slightly asymmetrical apex. Inflorescences, 1-4, in axillary and subterminal racemes, sometimes bifid, (23-)29-46(-173) mm, borne at the base of the sheaths to which they are axillary, making them appear opposite the next-most proximal leaf, sometimes on defoliated stems (sheaths persistent), each bearing (6-)10-11(-13) flowers. Flowers resupinate. Bracts *c.* 2 mm, triangular. Pedicel straight, *c.* 25 mm long. Tepals yellow with irregular red streaks, texture glossy with edge curling back with age. Dorsal sepal narrowly ovate to lanceolate, 9-9.5 × 3 mm. Lateral sepals asymmetrical, ovate, 8.2 × 3 mm. Petals obovate to spatulate, 10 × 3.4 mm. Mentum white, 2 × 1.5 mm and 0.6 mm deep, furrowed. Labellum, 7-8 × 4 mm, 3-lobed. Lateral lobes upright, roughly triangular, 2.8 mm long and 1.6 mm high, white, longitudinally streaked with burgundy red on the lower half. Callus white yellowish. Median lobe ovate, 4.8 × 4.2 mm, burgundy red except for a spot at the distal 1 mm and the tips of the lobules which are white, lateral lobules rectangular, 1.6 × 0.7 mm, median lobule tuberculate in the centre and with a strongly wavy margin and inwardly folded apex. Column, 2.3 × 1.6 mm and *c.* 0.9 mm deep, white, furrowed ventrally, with dark pink macules on the sides of the stigmatic orifice, very pubescent on the edges of the furrow. Lateral staminodes white. Stigmatic cavity, 0.7 × 0.8 mm wide. Connective pink, 0.9 mm wide × 0.8 mm high and 0.7 mm deep. Pollinia obovoid, dark yellow, 0.6 × 0.25 mm. Ovary 2.5 × 0.8 mm, slightly curved. Capsule fusiform, obovoid, green, 14 × 5 mm, borne on an 8 mm pedicel.



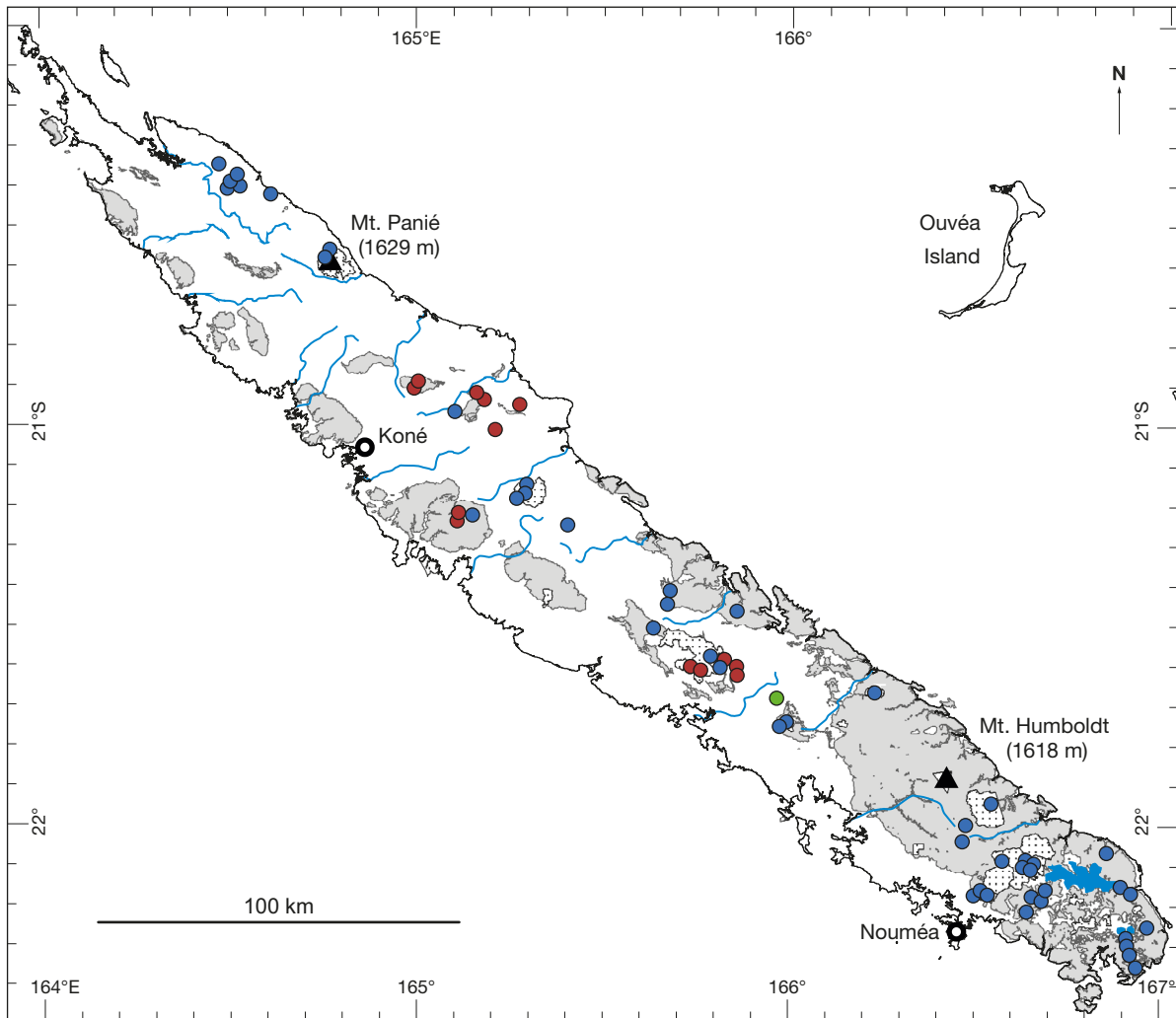


FIG. 2. — Distribution of members of the *Dendrobium finetianum* group: *D. finetianum* Schltr. (blue dots), *D. dangioanum* M. Pignal, sp. nov. (red dots), *D. laudereavorum* M. Pignal, sp. nov. (green dot) (undifferentiated ocean and geological units [white], ultrabasic rocks [grey], protected areas [dotted line]). A dynamic version of the map is available here: <http://u.osmfr.org/m/955223/>

*Dendrobium laudereavorum* M. Pignal, sp. nov.  
(Figs 1A, 2; Table 1)

*Dendrobium finetianum* *Finet similis*, sed floribus largioribus (12 mm vs 9 mm), lobis lateralibus labelli triangularibus (vs rotundatos), tepalis totis sursum (vs obliqua), lobo mediano labelli paucituberculato (vs tuberculatum), duobus lobis luteis (vs integros albosque), praecipue differt.

TYPUS. — Nouvelle-Calédonie. Province Sud, La Foa, Ouipoin, 21°41'10"S, 165°59'02"E fl., jfr., 13.XII.2018, C. Laudereau & L. Laudereau 1234 (holo-, NOU[NOU092603]!; iso-, G, K, P[P02275932]!).

PARATYPUS. — Nouvelle-Calédonie. Province Sud, La Foa, Ouipoin, 21°41'14.3"S, 165°59'10"E fl., 31.X.2021, C. Laudereau & L. Laudereau 1338 (para-, NOU[NOU092709]!).

ETYMOLOGY. — This new taxon is dedicated to my friends Christian and Pierre-Louis Laudereau. Christian has explored and studied the orchids of New Caledonia for twenty years with his wife Lydwine. His son Pierre-Louis accompanied him on many hikes. The photos presented in this paper are from Christian's collection.

PHENOLOGY. — The taxon has been observed in flower and young fruit in December.

HABITAT AND DISTRIBUTION. — *Dendrobium laudereavorum* sp. nov. has been encountered in three places by Christian Laudereau (pers. comm.), two at Ouipoin in the commune of La Foa, and one about 10 km away near Koindé.

DESCRIPTION

Epiphyte with erect, closely spaced stems with a slightly bulging basal internode. Rhizome short, flexuous, branching sympodial. Stem flexuose, 200-250 × 1.5-5 mm, yellow and ribbed on dry material. Internodes, (10-)14-20(-23) mm. Leaves alternate with developed sheaths, slightly overlapping, same length as the internodes. Leaf blade narrowly ovate to elliptic, (30-)34-37(-43) × (5-)5.5-7(-7) mm, apex acute, rounded and asymmetrical. Inflorescence in subterminal racemes, (10-)23-38(-50) mm borne at the base of the sheaths to which they are axillary, making them appear opposite the next proximal leaf, sometimes on leafless

stems, each bearing (2-)3(-6) flowers. Flowers resupinate. Triangular bracts *c.* 1 mm. Pedicel straight, 11 × 0.5 mm. Tepals dull on dorsal side and shiny on ventral side, yellowish green, revolute with edge revolute with age. Dorsal sepal obovate, 8 × 3.4 mm, with 3 longitudinal brown streaks and some transverse streaks (visible on ventral side). Lateral sepals, obovate to oblong, asymmetrical, 8.7 × 4 mm, with 3 longitudinal brown streaks extending to the tip, 2 lateral streaks slightly exceeding the lower half and with some transverse streaks (visible on the ventral side). Petals elliptic to obovate, 8 × 3.4 mm, somewhat asymmetrical with 4 brown streaks of unequal length. Mentum green, 2.6 × 1.5 mm, furrowed. Labellum, 10 × 7 mm, 3-lobed. Lateral lobes erect, triangular, 4.3 mm long and 2.5 mm high, white with pink tinge. Callus bright orange surmounted by 3 paler gibbositities. Median lobe panduriform, 8.5 × 9 mm, 3-lobed, dorsal side yellowish brown, ventral side with white hypochile, mesochile pink and epichile greenish. Lateral lobules triangular, white, 4 × 2.4 mm, median lobule with edges bent back 1.4 mm, with 2 central tuberculate ridges, reduced, epichile with 2 rounded rectangular lobes, 2.7 × 3.6 mm, divergent (forming an open angle of 150°). Column, 2.2 × 1.5-1.6 mm, *c.* 1 mm deep, greenish on the outside, enlarged at apex, furrowed ventrally, with dark orange macules at the apex near the anther, very pubescent at the furrow margins (white hairs up to 0.4 mm long). Lateral staminodes white, tinged with dark pink on the inside. Stigmatic cavity, 0.9 × 1 mm wide. Connective white, 0.8 mm wide and 0.6 mm high. Pollinia obovoid, dark yellow, 0.6 × 0.2 mm. Ovary, 2 × 1 mm, curved. Capsule fusiform to obovoid, green, 15 × 6 mm, pedicel *c.* 13 mm. Seeds ellipsoidal, *c.* 0.4 × 0.05 mm with green or orange embryo.

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### REFERENCES

BRUY D. 2022. — The Herbarium of New Caledonia (NOU): 60 years at the service of science for development. *Botany Letters*: 1-11. <https://doi.org/10.1080/23818107.2022.2123855>

BRUY D., BARRABÉ L., BIRNBAUM P., DAGOSTINI G., DONNAT M., FAMBART-TINEL J., GIRARDI J., HÉQUET 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. <https://doi.org/10.23708/herbier-nouvelle-caledonie>

CLEMENTS M. A. & JONES D. L. 2002. — Nomenclatural changes in the Dendrobieae (Orchidaceae). 1: The Australasian region. *The Orchadian* 13: 485-497.

CLEMENTS M. A. 2006. — Molecular Phylogenetic Systematics in Dendrobieae (Orchidaceae). *Aliso: A Journal of Systematic and Evolutionary Botany* 22 (1): 465-480.

CHRISTENSON E. A. 1994. — Significant collections of Orchidaceae conserved in Herbarium Hamburgense (HBG). *Brittonia* 46 (4): 344. <https://doi.org/10.2307/2806920>

HALLÉ N. 1977. — *Orchidaceae*. Muséum national d'Histoire naturelle, Paris, 565 p. (*Flore de la Nouvelle-Calédonie*; 8).

KRÄNZLIN F. 1910. — Orchidaceae: Dendrobieae. *Das Pflanzenreich* IV, 50 II B (21): 1-331. <https://www.biodiversitylibrary.org/page/22040880>

LE BRAS G., PIGNAL M., JEANSON M. L., MULLER S., AUPIC C., CARRÉ B., FLAMENT G., GAUDEUL M., GONÇALVES C., INVERNÓN V. R., JABBOUR F., LERAT E., LOWRY P. P., OFFROY B., PIMPARÉ E. P., 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>

ORMEROD P. 2002. — *Dendrobium* sect. *Finetianthe* Ormerod. *Oasis* 2 (2): 5.

PIGNAL M. & MUNZINGER J. 2020. — Morphological and anatomical investigation of New Caledonian graminoid *Dendrobium* (Orchidaceae) with the description of two new species. *European Journal of Taxonomy* (633): 1-26. <https://doi.org/10.5852/ejt.2020.633>

PIGNAL M., LAUDEREAU C. & LAUDEREAU P.-L. 2020. — Une espèce nouvelle du genre *Dendrobium* Sw. (Orchidaceae) de Nouvelle-Calédonie et une clé pour la section *Kinetochilus* Schltr. *Adansonia*, sér. 3, 42 (9): 189-200. <https://doi.org/10.5252/adansonia2020v42a9>. <http://adansonia.com/42/9>

PIGNAL M., LAUDEREAU C. & LAUDEREAU P.-L. 2021a. — Un *Pterostylis* R.Br. nouveau (Orchidaceae, Orchidoideae, Cranichideae) de Nouvelle-Calédonie. *Adansonia*, sér. 3, 43 (15): 177-183. <https://doi.org/10.5252/adansonia2021v43a15>. <http://adansonia.com/43/15>

PIGNAL M., LAUDEREAU C. & LAUDEREAU P.-L. 2021b. — Notes sur *Bulbophyllum* sect. *Pelma* (Orchidaceae) en Nouvelle-Calédonie. *Candollea* 76 (1): 65-70. <https://doi.org/10.15553/c202Xv761a5>

PIGNAL M., LAUDEREAU C., GÂTEBLÉ G. & LAUDEREAU P.-L. 2022a. — *Dendrobium petrophilum* (Kraenzl.) Garay ex N.Hallé, a well-named species describing its unusual chasmophytic ecology. *Adansonia*, sér. 3, 44 (1): 1-9. <https://doi.org/10.5252/adansonia2022v44a1>. <http://adansonia.com/44/1>

PIGNAL M., LAUDEREAU C., LAUDEREAU P.-L. & BRUY D. 2022b. — Une révision de *Dendrobium* Sw. Sect. *Rhizobium* Lindl. En Nouvelle-Calédonie. *Adansonia*, sér. 3, 44 (15): 153-164. <https://doi.org/10.5252/adansonia2022v44a15>. <http://adansonia.com/44/15>

PIGNAL M., LAUDEREAU C. & LAUDEREAU P.-L. 2023a. — Le genre *Porpax* Lindl. (Orchidaceae : Podochileae) en Nouvelle-Calédonie. *Candollea* 78 (1): 17-26. <https://doi.org/10.15553/c2023v781a3>

PIGNAL M., LAUDEREAU C. & LAUDEREAU P.-L. 2023b. — Liste annotée des *Goodyerinae* Klotzsch (Orchidaceae) de Nouvelle-Calédonie avec la description de deux nouvelles espèces. *Adansonia*, sér. 3, 45 (19): 307-325. <https://doi.org/10.5252/adansonia2023v45a19>. <http://adansonia.com/45/19>

PIGNAL M., LAUDEREAU C. & LAUDEREAU P.-L. 2023c. — Un synopsis du genre *Calanthe* R.Br. (Collabieae, Orchidaceae) en Nouvelle-Calédonie, avec la caractérisation de deux nothospèces. *Adansonia*, sér. 3, 45 (18): 293-305. <https://doi.org/10.5252/adansonia2023v45a18>. <http://adansonia.com/45/18>

PRIDGEON A.M., CRIBB P.J., CHASE M.W. & RASMUSSEN F.N. 2014. — *Genera Orchidacearum Volume 6: Epidendroideae*.

- (Part three) OUP Oxford, 576 p.
- RAUSCHERT S. 1983. — Beitrag zur Nomenklatur der Orchidaceae. *Feddes Repertorium* 94 (7-8): 433-471.
- SCHLECHTER R. 1906. — Beiträge zur Kenntnis der Flora von Neu-Kaledonien. *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie* 39 (1): 1-274.
- SCHLECHTER R. 1911. — Zur Kenntnis der Orchidaceen von Celebes. *Repertorium regni vegetabilis* 10 (5-9): 66-96.
- SCHUITEMAN A. 2011. — *Dendrobium* (Orchidaceae): To split or not to split. *Gardens' Bulletin Singapore* 63 (1-2): 245-257.
- UICN FRANCE 2018. — *Guide pratique pour la réalisation de Listes rouges régionales des espèces menacées – Méthodologie de l'UICN & démarche d'élaboration. Seconde édition. Paris, France. Comité français de l'UICN, Paris, France, 57 p.*

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