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## A new threatened New Caledonian *Leichhardtia* (Apocynaceae, Asclepiadoideae, Marsdenieae) species discovered from a TV programme and social media

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### Abstract

Just a few months after the publication of the Flore de la Nouvelle-Calédonie treatment for Asclepiadoideae, Periplocoideae and Secamonoideae, an unknown plant species obviously belonging to the genus *Leichhardtia* R.Br. was spotted while watching the local Wéari television programme on Caledonia channel and made available on YouTube. The focus of the TV programme was the remote and difficult to access Yandé island, in the extreme north of New Caledonia's Grande Terre. Since few botanical investigations have been undertaken on this isolated island, the Wéari programme was an opportunity to get a better overview of its natural environment and plants. Here, we describe this *Leichhardtia* species and name it after this TV programme. *Leichhardtia weari* Gâteblé, Meve & Liede, *sp. nov.* is a narrowly endemic species with whitish flowers that is growing on serpentinite derived soils and known from less than ten individuals. Due to anthropogenic fire threat and its obvious rarity, we propose to consider it as Critically Endangered. In addition, a nomenclatural problem is fixed by proposing the new combination *Leichhardtia guillauminiana* (P.T.Li) Gâteblé, Meve & Liede, *comb. nov.*; and a key for the now 20 species of *Leichhardtia* native to New Caledonia is presented.

**Keywords:** endangered species, Flora of New Caledonia, *Leichhardtia micrantha* *nom. illeg.*, micro-endemism, new combination, new species, ultramafic soil, youtube

### Introduction

The rise of social media, online platforms and citizen science have recently proven to be useful tools for providing new data and insights to natural history researchers (Antonelli *et al.* 2020). In consequence, more and more new species are being first virtually discovered on these platforms (e.g. Winterton *et al.* 2012 on Flickr; Gonella *et al.* 2015 and Rahayu & Rodda 2019 on Facebook; Santamaria *et al.* 2020 and Pflingstl *et al.* 2021 on Twitter; Kasalo *et al.* 2021 on iNaturalist; Mirza *et al.* 2021 on Instagram). Undoubtedly, spotting new species from social media and citizen science platforms will increase dramatically in the future. To the best of our knowledge, the discovery of a new species through social media or traditional television programme had not yet been achieved in New Caledonia.

More than twenty years ago, when we (SLS and UM) started to study the New Caledonian Asclepiadoideae subfamily (Apocynaceae) for the Flore de Nouvelle-Calédonie treatment, we did not know the task would last for so long. After several additions to the New Caledonian genus *Marsdenia* R.Br. (1810: 460) (Meve *et al.* 2017, 2018; Gâteblé *et al.* 2019) and the publication of the flora account in December 2020 (Liede-Schumann *et al.* 2020) where all *Marsdenia* species were transferred to *Leichhardtia* R.Br. (1849: 81) according to the results of a detailed phylogeny of Marsdenieae (Liede-Schumann *et al.*, 2022), we were thus hoping that the work had been done. But this was disregarding the extreme floristic diversity of the New Caledonian biome where one new tracheophyte endemic species is described each month on average (Gâteblé *et al.* 2018).

Here, we are reporting how a new species of *Leichhardtia* has been first sighted on the YouTube platform where the local Caledonia television channel usually posts its videos after their first broadcasting. Dominique Fleurot, a

skilled amateur botanist (Schatz & Lowry 2018, Gâteblé *et al.* 2019, Barrabé & Fleurot 2021, Mouly & Fleurot 2021) from the north of New Caledonia, along with his cousin Patrick Dayé, were invited to visit the Yandé island by the Nénéma chiefdom. They were accompanied by the Caledonia reporter Cédric Tyea and cameraman Ismaël Waka-Céou. Jean-Paul Tidjine, the chief of the Nénéma and Yandé island inhabitants guided them on their customary lands. One of the main aims of their visit was the rediscovery of the enigmatic Apocynaceae *Cerberiopsis candelabra* var. *veixillaria* (Däniker 1933: 388) Boiteau (1981: 230), a taxon only known from the type specimen and discovered by Däniker in 1925 on the island. The visit to Yandé also had the goal to record as many plant species as possible as part of the work on the flora of the Poum municipality (Fleurot *et al.* 2021). Yandé is a remote and difficult to access island situated in the extreme north of New Caledonia between mainland Grande Terre and the Belep islands. It belongs to the Poum municipality, to the Hoot Ma Whaap customary area, with about 20–30 people living on it. Yandé measures about 13 km<sup>2</sup> and its highest peak is ca. 300 m a.s.l. Most of the island consists of ultramafic substrate and its derived soils. From a botanical perspective, the flora of the island is not well known with only ca. 200 herbarium specimens housed at NOU (Bruy *et al.* 2022). After Däniker, few botanical expeditions have been conducted on the island (e.g. Mackee in 1970, Morat, Veillon & Cabalion in 1978, Munzinger & Swenson in 2005). Apart from the putative endemic variety of *Cerberiopsis*, there is no further micro-endemic plant species known from the island. A few days after the first broadcasting on Caledonia channel, GG watched the programme on YouTube (<https://www.youtube.com/watch?v=4E9Xt8eIEH8>) and was surprised to see a *Leichhardtia* species he had never seen before. Based on the list of known taxa from Yandé, Dominique Fleurot identified it in the field and on the video (at 13:40 min; Fig. 1) as *Leichhardtia neomicrostoma* (Meve *et al.* 2018: 208) Liede, Gâteblé & Meve in Liede-Schumann *et al.* (2020: 132) and “known from only one specimen collected in 1970 on Yandé”. In fact, another specimen of *Leichhardtia* is known from Yandé, Däniker 177b [Z-000052740], collected in 1925 [1924], and also referred to *L. neomicrostoma* by Liede-Schumann *et al.* (2020).

After watching the video, GG called D. Fleurot to tell him the *Leichhardtia* on the video is not *L. neomicrostoma* but most probably a new species. Because D. Fleurot was thinking it was a common species already collected, he had only taken a single small herbarium specimen (Fleurot 838) for NOU. In order to get supplementary material (alcohol preserved flowers, silica, duplicates, photos) for study, D. Fleurot specially organized a second mission on Yandé in August 2021. *Leichhardtia neomicrostoma* and the new species we propose to describe here apparently can grow in sympatry and are very similar based on sterile material, but their flower morphologies are strikingly different. Along with the relationships of the new species, its etymology, ecology, phenology and conservation status are also discussed.

## Material and Methods

The recently published Marsdenieae phylogeny (Liede-Schumann *et al.* 2022) was used to assess the phylogenetic position of the new species. Together with 17 other, previously not analyzed *Leichhardtia* specimens from New Caledonia, the same partial sequences as in Liede-Schumann *et al.* (2022) (*trnT-L*, *trnL-F* and *psbA-trnH* intergenic spacers, *trnL* intron and *rps16* intron for chloroplast DNA, (rDNA); the entire Internal Transcribed Spacer (ITS), including 5.8S of ribosomal DNA, and the nuclear markers At2g06530a and At2g34620b) were obtained following the procedures detailed there. The resulting sequences (Genbank accession numbers OP251239–OP251342) were added to the matrix used in Liede-Schumann *et al.* (2022) and Maximum Likelihood (ML) analysis was conducted following the protocol given in Liede-Schumann *et al.* (2022).

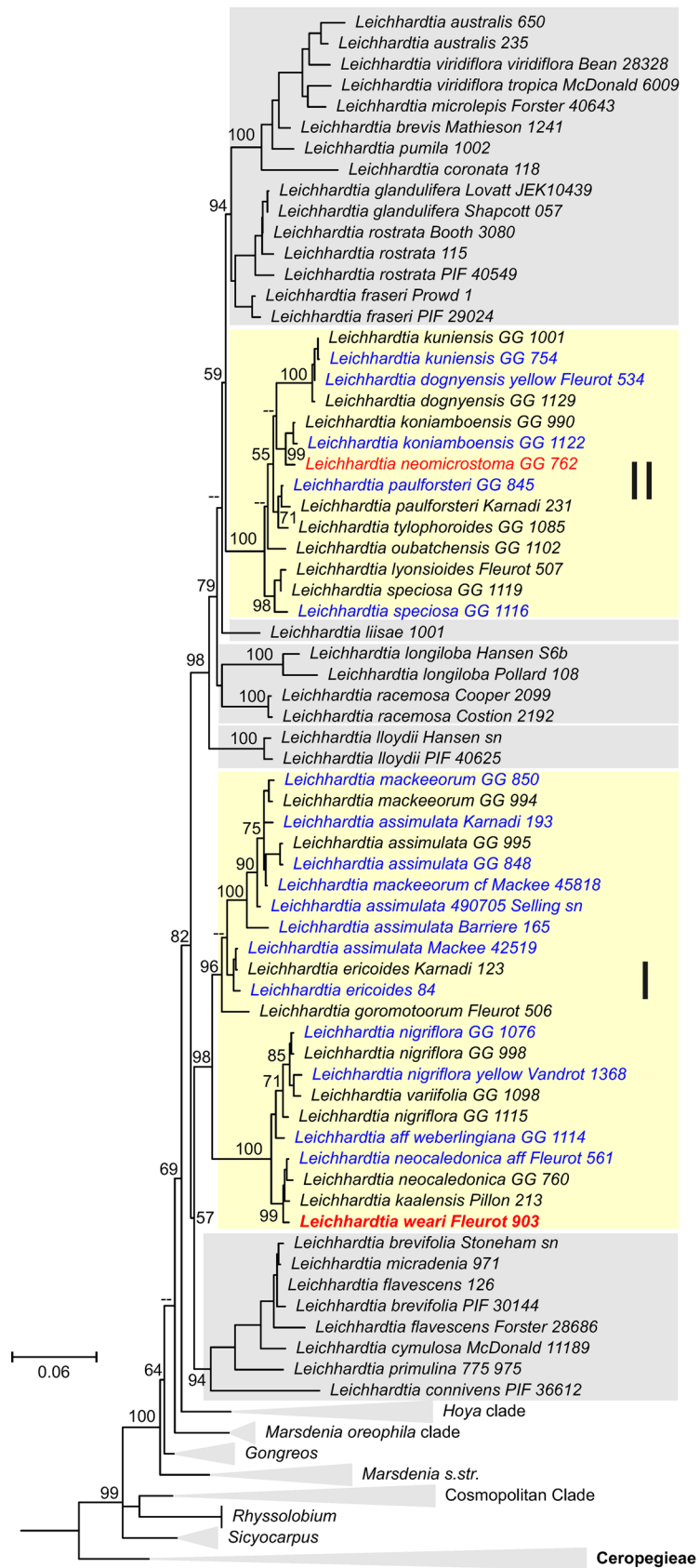
## Results

The two well supported ( $BS_{ML} = 98\%$  and  $100\%$ ) New Caledonian *Leichhardtia* clades, and their position relative to the Australian and New Guinean samples as retrieved in Liede-Schumann *et al.* (2022) are maintained (Fig. 2). The new species is member of Clade I, and forms a well-supported subclade comprising also *L. kaalensis* (Meve, Gâteblé & Liede 2017: 56) Liede, Gâteblé & Meve in Liede-Schumann *et al.* (2020: 106) and *L. neocaledonia* (Meve, Gâteblé & Liede 2017: 62) Liede, Gâteblé & Meve in Liede-Schumann *et al.* (2020: 128), to which it is sister. The other species found on Yandé, *L. neomicrostoma*, in contrast, is retrieved in subclade II as sister to *L. koniamboensis* (Guillaumin 1964: 190) Liede, Gâteblé & Meve in Liede-Schumann *et al.* (2020: 110).



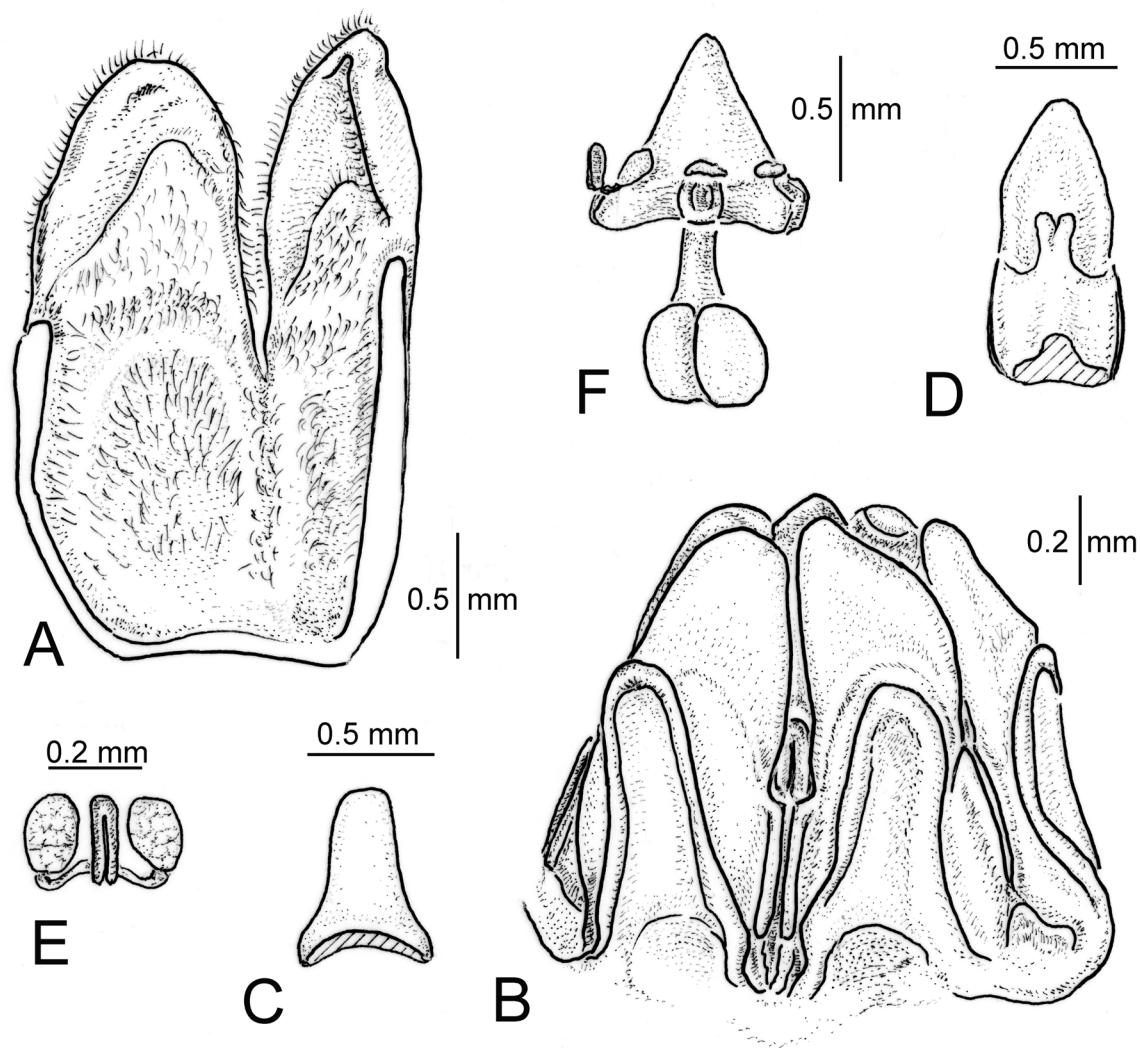


**FIGURE 1.** *Leichhardtia weari*. **A.** Screenshot of the Wearing programme “Yandé l’île mystérieuse” from Caledonia channel available on YouTube (<https://www.youtube.com/watch?v=4E9Xt8eIEH8>) displaying for the first time the new species (originally identified as *Leichhardtia neomicrostoma*). **B.** Degraded maquis vegetation in the Mariri creek area; **C.** A fertile branch with inflorescences; **D.** Detail of an inflorescence with flowers in lateral view; **E.** Flower in frontal view displaying the gynostegium. **A, C** showing *Fleurot 838*, *B Fleurot & Dayé 902*, and **D–E** *Fleurot & Dayé 905*. Photos by D. Fleurot.



**FIGURE 2.** Maximum Likelihood tree of Marsdenieae. The outgroup, and all Marsdenieae clades except for *Leichhardtia* are summarized as triangles. Numbers at important nodes indicate bootstrap percentages. New Caledonian clades I and II with yellow background, Australasian clades with grey background. Yandé species *L. weari* and *L. neomicrostoma* marked red, other New Caledonian accessions not shown in Liede *et al.* (2022) marked blue.





**FIGURE 3.** *Leichhardtia weari*. **A.** Adaxial view on parts of longitudinally cut corolla; **B.** Gynostegium in lateral view (lanceolate connective appendages hide the style-head); **C.** Single corona lobe, adaxial view; **D.** Single anther, adaxial view; **E.** Pollinarium; **F.** Isolated gynoecium with style-head atop. All from *D. Fleuret & P. Dayé 905* (UBT, in alc.). Drawn by U. Meve.

### Taxonomic treatment

*Leichhardtia weari* Gâteblé, Meve & Liede, *sp. nov.* (Figs. 1, 3, 4), (LSID: 77315163-1).

**Type:**—NEW CALEDONIA. Province Nord. Poum, Yandé Island, Mariri, 17 m, 20°02'46.265"S, 163°47'48.628"E, 21 August 2021, *Fleuret & Dayé 902* (holotype, P!; isotype, NOU [NOU091991!]).

**Diagnosis:**—*Leichhardtia weari* is most similar to *L. neomicrostoma* and *L. mackeeorum* (Meve *et al.* 2017: 60) Liede *et al.* in Liede-Schumann *et al.* (2020: 122) but differs from the former by leaves 1.5–5 mm long, peduncle nearly absent (to 0.3 mm), corolla 2–3 mm long, pollinia broadly ellipsoid and around 0.2 mm long (vs. leaves 6 to 8 cm long, peduncle 5–7 mm long, corolla 4–6 mm long, pollinia oblong and around 0.33 mm long in *L. neomicrostoma*). *Leichhardtia weari* differs from *L. mackeeorum* by sciadoidal inflorescences, corolla tube rounded in outline and longer than wide, corolla lobes widely pubescent to pilose (vs. bostrychoid inflorescences, corolla tube rounded pentagonal in outline and broader than long, corolla adaxially bearded below sinus of otherwise glabrous corolla lobes in *L. mackeeorum*).

*Plants* suffrutescent, ascending, twining 0.5 to 1 m high, up to 1 cm in diameter at the base, sparsely branched. *Shoots* semi-perennial, herbaceous, sericeous with 0.15–0.25 mm long trichomes; internodes 0.5–2 cm long, 1–2 mm diam. *Latex* white, abundant. *Leaves* opposite; petiole 1–3.7 × 0.4–0.7 mm, canaliculate, sericeous especially on adaxial

surface with 0.2–0.3 mm long trichomes, green to reddish on fresh material; blade without colleters at base (1.5–) 2.5–4.1 (–5.1) × (0.2–)0.3–0.4 (–0.5) cm, flat, linear (to very narrowly spatulate), apex with mucro 0.3–0.5 mm long; base cuneate, margin entire, slightly revolute, coriaceous, both surfaces mostly glabrous with rare scattered short trichomes, discolorous, adaxially green, abaxially usually purplish; midrib protruding abaxially, impressed adaxially, secondaries indistinct. *Inflorescences* extra-axillary, condensed, sciadioidal racemes, 5–15 flowered, 1–5 flowers open at a time. *Peduncles* 0.2–0.3 × 0.5–0.7 mm, sericeous with ca. 0.2 mm long trichomes. *Flowers* with floral bracts ca. 0.2 × 0.1 mm, triangular, with trichomes, caducous. *Pedicels* 1–3 × 0.3–0.5 mm, green to purplish, mostly glabrous with rare short trichomes. *Floral buds* 2–2.5 × 1.5–1.9 mm, ovoid. *Calyx* with 1–2 calycine colleters in sepal sinuses, sepals quincuncial, 1.3 × 1 mm, broadly ovate with round apex, brownish-red, ciliate, abaxially densely pubescent, especially in the central part and flanked with more or less glabrous sides. *Corolla* tubular to narrowly urceolate, slightly fleshy, glabrous, whitish; tube ca. 2.5–3 × 1.5–2 mm, adaxial corolla surface with two broad rings of trichomes, an upper one consisting of long antrorse, white trichomes on the basal halves of the corolla lobes and mouth of the tube, forming a cone of trichomes closing the corolla throat and hiding the gynostegium, a lower one consisting of scattered, horizontally spreading white trichomes surrounding the gynostegium; corolla lobes valvate in bud, lobes up to ca. 1 × 1 mm, triangular to broadly ovate, bent upward at anthesis, apically often pinkish, margins thin, even. *Corolline corona* absent; *gynostegial corona* of free staminal lobes, ca. 0.5 mm long, 0.5 mm wide basally, shorter than the gynostegium; lobes ligulate, whitish, laminar, with recurved margins. *Gynostegium* subsessile, conical, ca. 1.2 × 1.3 mm, filament tube basally with wing-like extensions; *anther wings (guide-rails)* ca. 300 µm long, consisting of distal and proximal ridge, oblique to 20–25°; *connective appendages* ca. 450 × 300 µm, lanceolate, narrower than the stamen, connivent-erect and appressed to style-head. *Pollinarium*: corpusculum 180–205 × 60–70 µm, oblong; caudicles ca. 150 × 30 µm, basally inserted at the corpusculum, bent upwards, linear, slightly broadened at both ends; pollinia basally attached to the caudicles, erect, ca. 200 × 100 µm, broadly ellipsoid, narrowly elliptic in cross-section. *Style-head* ca. 0.9 × 0.8 mm diam., upper part ca. 0.5 mm long, conical. *Ovaries* ovoid, glabrous. *Follicles* unknown.

#### **Additional specimens examined:**

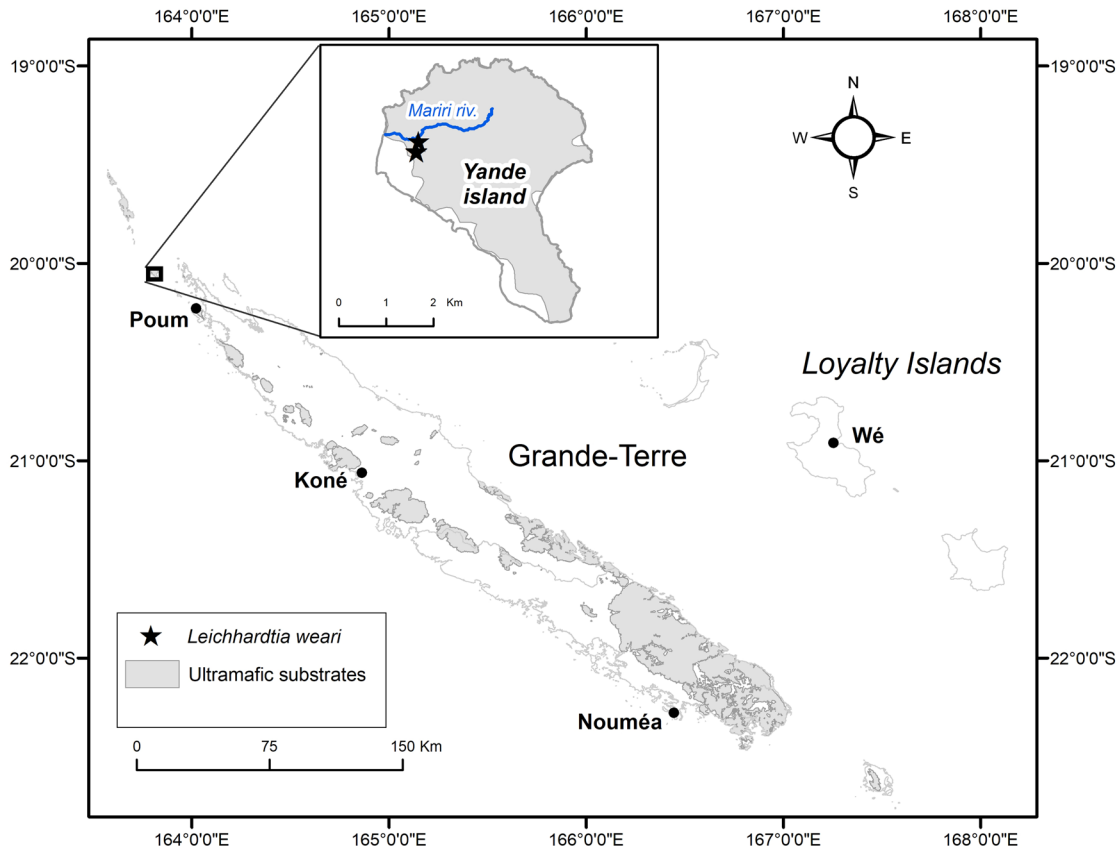
NEW CALEDONIA: Poum, Yandé, Mariri, 15 m, 20°02'48.207"S, 163°47'48.207"E, 11 June 2021, *Fleurot, Yandé people & Caledonia TV Wéari team 838* (NOU [NOU091854]); *ibid. loc.*, 24 m, 20°02'38.975"S, 163°47'50.202"E, 21 August 2021, *Fleurot & Dayé 905* (NOU [NOU0091993, NOU107969 alc.], UBT alc.).

**Phenology:**—Flowering in June and August.

**Distribution and habitat:**—New Caledonia, narrow endemic to the island of Yandé in the extreme north of Grande Terre. The species is known from degraded maquis vegetation (Fig. 1B) on serpentine soils (a kind of soils derived from ultramafic and more specifically from serpentinite rocks) at low elevation (14–17 m). It is so far only recorded from the Mariri creek area at the base of the Bwaadé massif (Fig. 4).

**Etymology:**—The name refers to the Wéari programme from the Caledonia television channel and made available on YouTube. The Caledonia channel journalist Cédric Tyea named his programme Wéari because it is a word meaning protect, preserve or conserve in Paicî native language from the Paicî-Cèmuhi customary area. Paicî is the most spoken native language on mainland New Caledonia and its area of influence is between Monéo to Amoa on the east coast and Poya to Koné on the west coast (<https://www.alk.nc/langues/paicî>). Yandé (or Yaadé) Island belongs to the Hoot ma Whaap customary area, to the Nénéma district and the native language spoken there is the Nélémwa (Bril 2002). The customary authorities of Yandé, Dominique Fleurot and Cédric Tyea welcome the proposed specific epithet. The epithet is here treated as a word in apposition and indeclinable (Turland *et al.* 2018, Art. 23.1, 23.2) as advocated for example for names derived from native languages in New Zealand (Webb *et al.* 1999, Heenan *et al.* 2021).

**Conservation status:**—The narrow endemic *Leichhardtia weari* is restricted to the island of Yandé. Chromium and cobalt used to be mined at the end of 19<sup>th</sup> century and the beginning of 20<sup>th</sup> century and presumably participated (along with probably deliberately set fires for mining access) to the lunar-like or tragic erosion situation known nowadays. Three mining rights have expired and one remains active (in the northern and highest part of the island) but without being operated (<https://georep.nc/explorateur-cartographique>). Thanks to its isolation and to the small concession, there should be no mining threat in the near future. The main current threat to the biodiversity of the island is anthropogenic fire that is regularly set up. Even though the Vulcain portal (<http://geoportail.oeil.nc/alerteincendies/>) does not reflect this status, the fire threat is high and at least a large wildfire impacted the island in December 2016. The island is not well known from a botanical perspective, and so far the new species is only known from a few individuals in the northwestern part of the island. Considering the small size of Yandé island and the population of *L. weari* thereof, as well as potential impact of a fire event, the proposed provisional IUCN Status is “Critically Endangered” using Red List criteria (IUCN 2017) under the criteria CR B B1ab(iii,v) + 2ab(iii,v); D.



**FIGURE 4.** Distribution map of *Leichhardtia weari* (stars) in New Caledonia in an insert showing the Yandé island and the Mariri creek in blue. Ultramafic substrates are shown in grey. Map by D. Fleurot.

**Notes:**—Regarding habit, leaf and flower morphology, *Leichhardtia weari* is very similar to *L. neomicrostoma*, so that quantitative characters (length of leaves, peduncle, corolla, pollinia) are most suitable for immediate recognition (s. diagnosis and key). Floral details are nevertheless also different like the almost sessile gynostegium in *L. weari* (shortly stipitate in *L. neomicrostoma*), the foliar corona lobes that are twice as long as the guide-rails (corona lobes inconspicuous, mostly a rounded thickened fringe, occasionally pointed, in *L. neomicrostoma*), guide-rails oblique up to 25° (oblique to 35° in *L. neomicrostoma*) and the pollinia that are broadly ellipsoid (oblong in *L. neomicrostoma*) (cf. Liede-Schumann *et al.* 2020). However, the two species do not seem as closely related as morphology suggests because in the molecular analysis (Fig. 2) the new species is member of New Caledonian Clade I, the older of the two subclades (stem age 20.6 Ma, Liede-Schumann *et al.*, 2022), where it is sister to the other two north-western species on ultramafic soils, *L. neocaledonica* and *L. kaalaensis*. Notwithstanding, *Leichhardtia weari* is easily distinguished from *L. neocaledonica* and *L. kaalaensis* because both have campanulate flowers (versus tubular to narrowly urceolate for *L. weari*). We were unable to highlight any clear synapomorphy among the three species because morphological characters in Asclepiadoideae, and particularly in Marsdenieae, are usually at best indicative of relationships (Liede-Schumann *et al.* 2022). *Leichhardtia neomicrostoma*, also a north-western species, is sister to the widespread *L. koniamboensis*, both also on ultramafic soils, and member of New Caledonian Clade II (stem age 15.1 Ma, Liede-Schumann *et al.*, 2022). *Leichhardtia neomicrostoma* and *L. weari* are yet another example of the high degree of morphological convergence found in unrelated Asclepiadoideae under similar ecological conditions.

### Nomenclatural correction

In an earlier paper, we validly published *Marsdenia guillauminiana* (Li 1994: 64) Meve *et al.* (2017: 69) as a new combination based on *Tylophora guillauminiana* Li (1994: 64), the replacement name for the illegitimate *Tylophora micrantha* Guillaumin (1944: 82). Later, in processing the necessary transfer of all New Caledonian *Marsdenia*



species to *Leichhardtia* (Liede-Schumann *et al.* 2020), we falsely based our new combination on the illegitimate name *Tylophora micrantha* Guillaumin to create “*Leichhardtia micrantha* (Guillaumin) Liede *et al.*” (Liede-Schumann *et al.* 2020: 126). *Leichhardtia micrantha* Liede *et al.* however, is as illegitimate as superfluous. We thus here propose the necessary new combination, *Leichhardtia guillauminiana*, now based on the earliest available legitimate name, *Tylophora guillauminiana*.

***Leichhardtia guillauminiana* (P.T.Li) Gâteblé, Meve & Liede, *comb. nov.* (LSID: 77315164-1).**

Basionym: *Tylophora guillauminiana* Li (1994: 64), replacement name for *Tylophora micrantha* Guillaumin (1944 : 82), *nom. illeg., non Tylophora micrantha* Decaisne (1834 : 377); *Marsdenia guillauminiana* (Li) Meve *et al.* (2017: 69); *Leichhardtia micrantha* (Guillaumin) Liede *et al.* in Liede-Schumann *et al.* (2020: 126), *nom. illeg. & nom. superfl.* Type:—NEW CALEDONIA. Grande Terre, North Province, Balade, 1855–1860, *E. Vieillard* 987 (lectotype, P [P00607353], designated by Liede-Schumann *et al.* (2020: 126)).

With the new species, New Caledonian *Leichhardtia* actually encompasses a total of 20 species, for which an updated key is provided here.

**Key to the species of *Leichhardtia* of New Caledonia**

1. Leaves linear, lanceolate, or very slenderly ovate, usually more than 4× as long as broad .....2
- 1'. Leaves ovate, elliptic, obovate or orbicular, usually less than 4× as long as broad .....7
2. Plants erect, even apically not twining; leaves caducous, leaving conspicuous scars .....*L. ericoides*
- 2'. Plants ascending, at least apically twining, leaves not caducous .....3
3. Corolla not longer than 3 mm, leaves less than 4 cm long; internodes less than 2 cm long .....4
- 3'. Corolla more than 3 mm long, leaves more than 6 cm long; internodes more than 3 cm long.....5
4. Corolla greenish-yellow, campanulate, tube around 1/3 of total corolla length..... *L. neocaledonica*
- 4'. Corolla whitish, narrowly urceolate, tube ovoid to tubular, at least 1/2 as long as total corolla length..... *L. weari*
5. Leaves more than 0.5 mm wide; inflorescences distinctly bostrychoid (check for scars that fallen pedicels left); floral buds cylindrical; corolla lobes not ciliate .....*L. mackeeorum*
- 5'. Leaves less than 0.5 mm wide; inflorescences sciadioidal; floral buds conical or cylindrical; corolla lobes ciliate or not .....6
6. Shoots glabrous; inflorescences sessile; floral buds conical, corolla lobes not ciliate..... *L. assimulata*
- 6'. Shoots with an indumentum; inflorescences with at least 5 mm long peduncle; floral buds cylindrical, corolla lobes ciliate .....  
.....*L. neomicrostoma*
7. Plants erect, not exceeding 30 cm; leaves suborbicular, abaxially with protruding rhachis .....*L. kaalensis*
- 7'. Plants twining, exceeding 30 cm; leaves of various shapes, but not suborbicular, abaxially without protruding rhachis.....8
8. Inflorescences richly branched, di- or monochasially cymose (at least the older ones) .....9
- 8'. Inflorescences usually sciadioidal, rarely slightly bostrychoid when old ..... 11
9. Style-head rostrate, conspicuously protruding 4–6 mm long corolla.....*L. paulforsteri*
- 9'. Style-head umbonate or conical, not conspicuously protruding from the less than 4 mm long corolla .....10.
10. Leaves less than 4 cm long, less than 3 cm wide, elliptic, basally rounded; corolla lobes with regularly distributed trichomes; corona of free staminal lobes.....*L. guillauminiana*
- 10'. Leaves more than 5 cm long, more than 3 cm wide, ovate, floral buds ovoid; corolla lobes glabrous; corona of free staminal lobes and a wavy ring of connate staminal and interstaminal parts.....*L. tylophoroides*
11. Inflorescences of more than 10 densely packed flowers, corolla brilliant red .....*L. goromotoorum*
- 11'. Inflorescences with less than 10 flowers or flowers not densely packed, flowers of different colours, but never red .....12
12. Mature buds at least three times longer than wide; corolla at least 10 mm long, radiantly white; style-head elongated-conical ...13
- 12'. Mature buds less than three times longer than wide; of various colours, at the most with some radiantly white parts; style-head umbonate to conical.....14
13. Corolla 10–12 mm long ..... *L. lyonsioides*
- 13'. Corolla 30 mm long or more .....*L. speciosa*
14. Corolla lobes at the most as long as tube, usually shorter; corolla shape urceolate.....15
- 14'. Corolla lobes at least as long as the tube, usually distinctly longer, corolla shape rotate .....18
15. Plants covered with a soft, yellowish indumentum .....16
- 15'. Plants (at least stems and leaves) glabrous; if indument present, then not yellowish .....17
16. Corolla purple red to purple brown, corolla tube more open, not explicitly fleshy or enclosing the corona; staminal corona lobes laminar and longer than broad; plants of Grande Terre.....*L. dognyensis*
- 16'. Corolla white to rose; upper rim of the corolla tube fleshy and protruding inwardly to create a suburceolate flower tube shape that strictly encloses the corona; staminal corona lobes protruding, broader than long; plants of Isle des Pins.....*L. kuniensis*
17. Leaves > 9°cm long; peduncles and pedicels glabrous; buds almost globose .....*L. koniamboensis*
- 17'. Leaves not exceeding 6 cm length; peduncles and pedicels with indument; buds conical .....*L. oubatchensis*
18. Flowers at least 10 mm diam., but distinctly fused, adaxially glabrous, but marginally ciliate..... *L. weberlingiana*
- 18'. Flowers not more than 7 mm diam., corolla adaxially with trichomes, but marginally not ciliate .....19
19. Corolla > 5 mm diam., purplish-brown; lobes adaxially densely and regularly covered with white trichomes.....*L. nigriflora*
- 19'. Corolla < 5 mm diam., yellowish; lobes sparsely pubescent .....*L. variifolia*

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## References

- Antonelli, A., Fry, C., Smith, R.J., Simmonds, M.S.J., Kersey, P.J., Pritchard, H.W., Abbo, M.S., Acedo, C., Adams, J., Ainsworth, A.M., Allkin, B., Annecke, W., Bachman, S.P., Bacon, K., Bárrios, S., Barstow, C., Battison, A., Bell, E., Bensusan, K., Bidartondo, M.I., Blackhall-Miles, R.J., Borrell, J.S., Brearley, F.Q., Berman, E., Brewer, R.F.A., Brodie, J., Cámara-Leret, R., Camprostrini Forzza, R., Cannon, P., Carine, M., Carretero, J., Cavagnaro, T.R., Cazar, M.-E., Chapman, T., Cheek, M., Clubbe, C., Cockel, C., Collemare, J., Cooper, A., Copeland, A.I., Corcoran, M., Couch, C., Cowell, C., Crous, P., da Silva, M., Dalle, G., Das, D., David, J.C., Davies, L., Davies, N., De Canha, M.N., de Lirio, E.J., Demissew, S., Diazgranados, M., Dickie, J., Dines, T., Douglas, B., Dröge, G., Dulloo, M.E., Fang, R., Farlow, A., Farrar, K., Fay, M.F., Felix, J., Forest, F., Forrest, L.L., Fulcher, T., Gafforov, Y., Gardiner, L.M., Gâteblé, G., Gaya, E., Geslin, B., Gonçalves, S.C., Gore, C.J.N., Govaerts, R., Gowda, B., Grace, O.M., Grall, A., Haelewaters, D., Halley, J.M., Hamilton, M.A., Hazra, A., Heller, T., Hollingsworth, P.M., Holstein, N., Howes, M.-J.R., Hughes, M., Hunter, D., Hutchinson, N., Hyde, K., Iganci, J., Jones, M., Kelly, L.J., Kirk, P., Koch, H., Grisai-Greilhuber, I., Lall, N., Langat, M.K., Leaman, D.J., Leão, T.C., Lee, M.A., Leitch, I.J., Leon, C., Lettice, E., Lewis, G.P., Li, L., Lindon, H., Liu, J.S., Liu, U., Llewellyn, T., Looney, B., Lovett, J.C., Luczaj, L., Lulekal, E., Magassouba, S. (ORCID), Malécot, V., Martin, C., Masera, O.R., Mattana, E., Maxted, N., Mba, C., McGinn, K.J., Metheringham, C., Miles, S., Miller, J., Milliken, W., Moat, J., Moore, P.G.P., Morim, M.P., Mueller, G.M., Muminjanov, H., Negrão, R., Nic Lughadha, E., Nicolson, N., Niskanen, T., Nono Womdim, R., Noorani, A., Obreza, M., O’Donnell, K., O’Hanlon, R., Onana, J.-M., Ondo, I., Padulosi, S., Paton, A., Pearce, T., Pérez Escobar, O.A., Pieroni, A., Pironon, S., Prescott, T.A.K., Qi, Y.D., Qin, H., Quave, C.L., Rajaovelona, L., Razanajatovo, H., Reich, P.B., Rianawati, E., Rich, T.C.G., Richards, S.L., Rivers, M.C., Ross, A., Rumsey, F., Ryan, M., Ryan, P., Sagala, S., Sanchez, M.D., Sharrock, S., Shrestha, K.K., Sim, J., Sirakaya, A., Sjöman, H., Smidt, E.C., Smith, D., Smith, P., Smith, S.R., Sofo, A., Spence, N., Stanworth, A., Stara, K., Stevenson, P.C., Stroh, P., Suz, L.M., Tambam, B.B., Tatis, E.C., Taylor, I., Thiers, B., Thormann, I., Vaglica, V., Vásquez-Londoño, C., Victor, J., Viruel, J., Walker, B.E., Walker, K., Walsh, A., Way, M., Wilbraham, J., Wilkin, P., Wilkinson, T., Williams, C., Winterton, D., Wong, K.M., Woodfield-Pascoe, N., Woodman, J., Wyatt, L., Wynberg, R. & Zhang, B.G. (2020) *State of the World’s Plants and Fungi 2020*. Royal Botanic Gardens, Kew.  
<https://doi.org/10.34885/172>
- Barrabé, L. & Fleurot, D. (2021) Deux espèces nouvelles de *Thiollierea* Montrouz. (Rubiaceae), endémiques des massifs Nord-Ouest de la Grande Terre (Nouvelle-Calédonie). *Adansonia* 43 (5): 37–47.  
<https://doi.org/10.5252/adansonia2021v43a5>
- Boiteau, P. (1981) Apocynacées. *Flore de la Nouvelle-Calédonie et Dépendances* 10. Muséum National d’Histoire Naturelle, Laboratoire de Phanérogamie, Paris, 302 pp.
- Bril, I. (2002) *Le nêlêmwa (Nouvelle-Calédonie): Analyse syntaxique et sémantique*, Peeters (SELAF LCP 16). Louvain-Paris, 528 pp.
- Brown, R. (1810) *Asclepiadeae*. In: Brown, R. (ed.) *Prodromus Florae Novae Hollandiae*. J. Johnson & Co., London, pp. 458–464.  
<https://doi.org/10.5962/bhl.title.3678>
- Brown, R. (1849) Botanical Appendix. In: Sturt, C. *Narrative of an Expedition into Central Australia* 2. T. & W. Boone, London. pp. 66–92.
- 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., Rigault, F., Vandrot, H., Veillon, J.-M. & Zaiss, R. (2022) *L’Herbier de Nouvelle-Calédonie*. Nouméa: UMR AMAP. IRD, CIRAD, CNRS, INRAE, Univ. Montpellier.  
<https://doi.org/10.23708/HERBIER-NOUVELLE-CALEDONIE>
- Däniker, A.U. (1933) *Pterochrosia vexillaria*. *Vierteljahrsschrift der Naturforschenden Gesellschaft in Zürich* 78 (Beibl. 19): 388.
- Fleurot, D., Meyer, S., Dayé, P., Gâteblé, G., Hmaé, H., Maurizot, P., Suprin, B., Veillon, J.-M., Warimavute, G. & Whaap, C. (2021) *Flore de Poum*. ASPMHNC, Commune de Poum et Endemia, Nouméa, 95 pp. [<https://endemia.nc/files/Flore-Poum-2021-web.pdf>]
- Gâteblé, 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 Île Art (Belep Islands), a major micro-hotspot in need of protection. *Australian Systematic Botany* 31: 448–480.  
<https://doi.org/10.1071/SB18016>
- Gâteblé, G., Fleurot, D., Meve, U. & Liede-Schumann, S. (2019) An unorthodox, new endemic species in New Caledonian *Marsdenia*

- (Apocynaceae, Asclepiadoideae, Marsdenieae). *Phytotaxa* 405: 121–126.  
<https://doi.org/10.11646/phytotaxa.405.3.3>
- Gonella, P.M., Rivadavia, F. & Fleischmann, A. (2015) *Drosera magnifica* (Droseraceae): the largest New World sundew, discovered on Facebook. *Phytotaxa* 220 (3): 257–267.  
<http://dx.doi.org/10.11646/phytotaxa.220.3.4>
- Guillaumin, A. (1944) Contribution à la flore de la Nouvelle Calédonie LXXXIV. *Bulletin du Muséum d'Histoire Naturelle*, sér. 2, 16: 78–85.
- Guillaumin, A. (1964) Contribution à la flore de la Nouvelle-Calédonie. CXXIII. Plantes récoltées par M. Mackee. *Journal d'Agriculture Tropicale et de Botanique Appliquée* 11: 188–201.  
<https://doi.org/10.3406/jatba.1964.2769>
- Heenan, P.B., McGlone, M.S. & Wilton, A.D. (2021) Te reo Maori and botanical nomenclature as complementary naming systems for New Zealand's flora, *New Zealand Journal of Botany* 59 (3): 291–322.  
<https://doi.org/10.1080/0028825X.2020.1861031>
- Kasalo, N., Deranja, M., Adžić, K., Sindaco, R. & Skejo, J. (2021) Discovering insect species based on photographs only: The case of a nameless species of the genus *Scaria* (Orthoptera: Tetrigidae). *Journal of Orthoptera Research* 30 (2): 173–184.  
<https://doi.org/10.3897/jor.30.65885>
- Li, P.T. (1994) Novelties in Asclepiadaceae from Africa and Asia. *Journal of South China Agricultural University* 15: 63–65.
- Liede-Schumann, S., Meve, U., Gâteblé, G., Barriera, G. & Fici, S. (2020) *Flore de la Nouvelle-Calédonie: 27. Apocynaceae pp, Phellinaceae, Capparaceae*. Muséum national d'Histoire naturelle, Paris ; IRD, Marseille, MNHN; IRD. 336 pp. [Faune et Flore tropicales ; 49]
- Liede-Schumann, S., Reuss, S.J., Meve, U., Gâteblé, G., Livshultz, T., Forster, P.I., Wanntorp, L. & Rodda, M. (2022) Phylogeny of Marsdenieae (Apocynaceae, Asclepiadoideae) based on chloroplast and nuclear loci, with a conspectus of the genera. *Taxon* 71 (4): 833–875.  
<https://doi.org/10.1002/tax.12713>
- Meve, U., Gâteblé, G. & Liede-Schumann, S. (2017) Taxonomic novelties in Apocynaceae subfam. Asclepiadoideae from New Caledonia. *Adansonia* sér.3, 39: 55–70.  
<https://doi.org/10.5252/a2017n1a5>
- Meve, U., Gâteblé, G. & Liede-Schumann, S. (2018) Two new species from the Ile des Pins (New Caledonia), and a not so new species from Grande Terre (New Caledonia). *Phytotaxa* 349: 201–213.  
<https://doi.org/10.11646/phytotaxa.349.3.1>
- Mirza, Z.A., Bhardwaj, V.K. & Patel, H. (2021) A new species of snake of the genus *Oligodon* Boie in Fitzinger, 1826 (Reptilia, Serpentes) from the Western Himalayas. *Evolutionary Systematics* 5 (2): 335–345.  
<https://doi.org/10.3897/evolsyst.5.72564>
- Mouly, A. & Fleurot, D. (2021) Une espèce nouvelle menacée de *Coelospermum* Blume (Rubiaceae, Morindeae), endémique du Nord de la Nouvelle-Calédonie et clarification du statut de *C. fragrans* (Montrouz.) Baill. ex Guillaumin. *Adansonia* 43 (25): 269–276.  
<https://doi.org/10.5252/adansonia2021v43a25>
- Pfingstl, T., Hiruta, S.F., Nemoto, T., Hagino, W. & Shimano, S. (2021) *Ameronothrus twitter* sp. nov. (Acari, Oribatida) a New Coastal Species of Oribatid Mite from Japan. *Species Diversity* 26: 93–99.  
<https://doi.org/10.12782/specdiv.26.93>
- Rahayu, S. & Rodda, M. (2019) *Hoya amicabilis* sp. nov. (Apocynaceae, Asclepiadoideae), from Java discovered on Facebook. *Nordic Journal of Botany* 37 (12): e02563. [6 pp.]  
<https://doi.org/10.1111/njb.02563>
- Santamaria, S., Enghoff, H. & Reboleira, A.S. (2020) The first Laboulbeniales (Ascomycota, Laboulbeniomycetes) from an American millipede, discovered through social media. *MycoKeys* 67: 45–53.  
<https://doi.org/10.3897/mycokeys.67.51811>
- Schatz, G.E. & Lowry, P.P. II (2018) Novitates neocaledonicae. IX. Taxonomic notes on new Caledonian *Diospyros* (Ebenaceae) with new synonymy and the description of two new species. *Candollea* 73: 91–100.  
<http://dx.doi.org/10.15553/c2018v731a8>
- Turland, N.J., Wiersma, J.H., Barrie, F.R., Greuter, W., Hawksworth, D.L., Herendeen, P.S., Knapp, S., Kusber, W.-H., Li, D.-Z., Marhold, K., May, T.W., McNeill, J., Monro, A.M., Prado, J., Price, M.J. & Smith, G.F. (eds.) (2018) *International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017*. Regnum Vegetabile 159. Glashütten: Koeltz Botanical Books.  
<https://doi.org/10.12705/Code.2018>
- Webb, C.J., Breitwieser, I. & Edgar, E. (1999) Orthography of some geographical epithets in the New Zealand flora revisited. *New Zealand Journal of Botany* 37 (4): 747–749.  
<https://doi.org/10.1080/0028825X.1999.9512668>
- Winterton, S., Guek, H. & Brooks, S. (2012) A charismatic new species of green lacewing discovered in Malaysia (Neuroptera, Chrysopidae): the confluence of citizen scientist, online image database and cybertaxonomy. *ZooKeys* 214: 1–11.  
<https://doi.org/10.3897/zookeys.214.3220>