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# Typification and redelimitation of *Nepenthes alata* with notes on the *N. alata* group, and *N. negros* sp. nov. from the Philippines

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In the course of studies to typify what has been regarded as the most widespread and common of the endemic Philippines species of *Nepenthes*, *N. alata* Blanco, we were able to review the morphological variation in what we previously regarded as a polymorphic species. This led us to redelimit that species in a narrower sense, to resurrect *N. graciliflora* Elmer, and to recognise *N. negros* sp. nov., here assessed as 'Critically Endangered' (CR) using the IUCN standard. The *Nepenthes alata* group is characterised and a key to its species is provided.

In preparation for our 'World monograph of *Nepenthes*', we have been reviewing typification and nomenclature in the genus.

## Typification of *Nepenthes alata* Blanco

Previously, we (Jebb and Cheek 1997) stated that we were delaying lectotypification of this name until we had completed a survey of the available material. While, according to TL-2, Merrill stated that nothing was known about a Blanco herbarium, Philippine plants collected by Blanco were said to be at MA according to Lanjouw and Stafleu (1954). Since 1997, we established with the curators at MA that no Blanco *Nepenthes* material exists there (Mauricio Velayos pers. comm. to MC). Delving more deeply into the literature on Blanco (Merrill 1918, 1923, Veldkamp 1989), it became clear that material previously ascribed to Blanco at MA was not collected by him, and that Blanco did not preserve any botanical specimens at all long-term, being unaware, as a gifted amateur, of the desirability of this action. Therefore, lectotypification of *Nepenthes alata* Blanco is impossible, and neotypification, using good material from or near to the type locality and fitting the original description, is the correct path.

The original description (Blanco 1837) of *N. alata* should be read understanding that Blanco was not a professional botanist and that this was probably his first encounter with *Nepenthes*. It was written in archaic Spanish, and was translated for us by Lucia Poveda Lopez. Clarifications and explanations using modern *Nepenthes* terms have been inserted in parentheses for some structures that he described colloquially. In English it reads as follows:

> "*Nepenthes alata*, the winged *Nepenthes.* Leaves crowded, one on top of each other, running down the petiole which is channelled (canaliculate), those leaves are stiff, lanceolate, they finish in a tendril which is thick and long and goes down and then turns up, holding the pitcher, the pitcher has two wings that go from top to bottom in the front, with little teeth on the margins, the mouth is oblique, the margin is reinforced with a double wing (the peristome), one side goes inside, the other out, it looks like a red rope. The lid is fixed on the acute side of the mouth, it is ovate. In the morning it bends down and closes completely. In the place where the lid hinges, under the lid, there is a small blade (basal appendage), like a tooth. When it closes, the blade (appendage) enters the gap between the two ends of the rope (peristome). As well, from behind (the lid) has a spike (the spur) which looks as though it has been put there to open it (the lid). This singular and beautiful plant is from Vintar in Ilocos, around three leagues, I brought some alive to Manila. It is a parasite (meaning an epiphyte) and easy to tangle with other trees due to the pitchers. These pitchers are nearly a cup of water (in volume). The rope of the mouth, as well as the stem and petioles are red. Each leaf has a pitcher, which is rare and extraordinary. The most unusual thing is the lid which closes the mouth so precisely that it is impossible for a drop of water to escape even in strong winds or if you turn the pitcher upside down. To this firmness

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of the lid, the lamina (appendage) contributes, this fits between the gap in the ends of the rope (peristome). This plant deserves admiration and amazement for its singular structures. To keep it alive and to propagate it, it is not good to plant it into the ground as I did, but attach it to a tree, scratching the bark beforehand. The indigenous people in Ilocos call it, Jarro, Batidor, Georgoreta, but pretty surely, omitting the name that they have for it in their language. Note I have not seen the flowers of this species but I managed to see them in the following ones."

For its time, Blanco's description is admirable in many respects except that he is incorrect in claiming that the lids close in the morning or, for that matter, at any time. Once the pitchers are open, the lids remain open and do not close again, as is true of the entire genus. The description itself and alone is not detailed enough to ascribe Blanco's plant to any particular species of the *Nepenthes alata* group to which it evidently belongs in view of the basal lid appendage and the leaf blade decurrent down the petiole. However, the location of the material being given as Vintar in Ilocos allows us to pinpoint the species exactly. Vintar in Ilocos is at the northern end of the Cordillera Central of Luzon.

We have studied about forty specimens attributed to *N. alata* from different parts of the Luzon and the Visayas and have discovered that what we previously thought was a polymorphic species (Jebb and Cheek 1997, Cheek and Jebb 2001) can be divided into two main morphologically and geographically distinct taxa. These can be separated using the table of characters below (Table 1). For some years horticulturalists have already informally recognised 'hairy *N. alata*' plants as distinct from the glabrous 'typical *N. alata*' that has long been widespread in cultivation.

Although numerous collections of *Nepenthes* are available from the Cordillera Central mountain range, they all belong to what has been named as the 'hairy alata' variant. No other species of the *N. alata* group is known from the Cordillera Central.

In the case of neotypification of Blanco's names, Merrill's (1918) work on the species described by Blanco, in which he selected 'illustrative' specimens, is often useful in choosing a neotype. However, in the case of *N. alata*, he selected a specimen from Mt Makiling, south of Manila (and far from the Cordillera Central), whereas Blanco clearly states that the material from which he described *N. alata* as coming from "Vintar en Ylocos" (Blanco 1837, p. 806). Today, Vintar is a municipality in Ilocos Norte Province, at the northern end of the Cordillera Central, and of Luzon Island itself. For this reason, we have chosen as neotype below, Fenix BS 26726 from near Vintar in the same province, being a good quality specimen that is geographically very close to the location given by Blanco (1837) for his *N. alata*.

The plant that Blanco describes as *N. alata* is at the rosette stage (leaves crowded) with intermediate pitchers (tendrils not coiled, fringed wings extending the length of the pitcher), and not yet at the flowering stage. A few pages later, concluding his remarks on the genus in the Philippines, Blanco notes a plant similar to his *N. alata* also from the Cordillera Central (Pangasinan Mts) which differs in having tendrils which are coiled and pitcher wings which are reduced above, and which bears inflorescences. The balance of probability is that this Pangasinan plant is of the same species but with upper pitchers, and that the differences with *N. alata* arise solely for this reason. Blume (1852) named the Pangasinan plant as *N. blancoi* Blume and we have discussed this name at length in a separate paper, concluding that it is indeed a synonym of *N. alata* (Cheek and Jebb 2013).

### *Nepenthes alata* Blanco (1837, p. 805)

**Type:** selected here (see note below): Philippines, Luzon, Prov. Ilocos Norte, Burgos, male fl. 23–25 Nov 1916 Fenix BS 26726 (neotype: US, photo, K, isoneotypes: BO n.v., SING n.v.).
**Previously referred to as:** *Nepenthes blancoi* Blume (1852, p. 10). Neotype designated in Cheek and Jebb (2013): Philippines, Luzon, Benguet Province, Trinidad, male infl. Oct 1904, Williams 1012 (US; photo. K, PNH, isoneotypes: PNH destroyed; NY n.v.).

#### *Distribution*
Philippines, Luzon, mainly north of Manila, almost confined to the Cordillera Central of northeast Luzon (provinces of Benguet, Bontoc, Ilocos Norte, Nueva Viczcaya, Mountain, Ifugao) more rarely in the Zambales Mts (Mt Pinatubo) and Sierra Madre (San Luis).

Table 1. The more important characters differentiating *Nepenthes alata* and *N. graciliflora*.

| | *N. graciliflora* (*N.* 'typical alata' of horticulture) | *N. alata* (*N.* 'hairy alata' of horticulture) |
|---|---|---|
| Upper pitcher shape | Base of pitcher broadest, ellipsoid, abruptly contracting to the long, narrowly cylindric upper part | Whole pitcher stoutly subcylindric, contracted only slightly at the waist |
| Upper pitcher wings | Completely reduced to ribs along the whole length, fringed wings absent | Fringed wings usually extending from base to apex of pitcher. Fringes always present below peristome even if reduced elsewhere |
| Indumentum of upper pitcher outer surface | Minute globose red glands and, very sparse simple hairs | Densely covered in small white stellate hairs 0.2 mm wide that nearly touch each other |
| Indumentum of stem and leaves | Glabrous apart from minute globose red glands | Young leaves and stems densely covered mainly in fine long white hairs often obscuring the epidermis |
| Inflorescence | Partial-peduncles 1-flowered, bracts absent | Partial-peduncles 1-flowered, bracts often present |
| Geography | Luzon (Sierra Madre, Zambales Mts, Bicol Peninsula) Visayas and Mindanao | Luzon (Cordillera Central, rarely in Zambales Mts and Sierra Madre Mts) |

***Ecology***
Mossy montane forest, altitudinal range 550 m a.s.l. and above. Ecological data on this species is lacking on most specimen labels.

***Additional specimens examined***
Luzon, Mountain Prov., Mt Pulog, st., Mar 1948, Celestino |BS 4416 (US); Tayabas Prov., Infanta, fr. Aug 1909 Robinson BS 9389 (US); Benguet Prov., Baguio, infl. 19 Jan–26 Feb 1903, Le Roy Topping 76 (US); Bontoc subprov., Mt Caua, male infl. Mar 1920, Ramos and Edano BS 38062 (US); Bataan Prov., Mt Mariveles, Lamao River, male infl. Oct 1903, Merrill 3229 (US).

Although geographically restricted to the northern half of Luzon, *N. alata* s.s. appears to be comparatively frequent within its range. Twenty-one of the 44 specimens of the *N. alata* group studied for this paper from Luzon and the Visayas belong to this species.

### The resurrection of *N. graciliflora* Elmer

Because the type of *N. alata* is hairy, from the Cordillera Central, that name cannot be applied correctly, at present, to the glabrous-stemmed plants known in cultivation for decades as 'typical *N. alata*'. For these glabrous-stemmed plants, the oldest name available is *N. graciliflora* Elmer for which the type is from Sibuyan Island in the Visayas. However, we are in the course of preparing a proposal to the 'Nomenclatural Committee for Vascular Plants of the International Botanical Congresses' to conserve the application of the name *N. alata* with a new type that will allow the name to be used as previously, for the glabrous-stemmed plants. If this proposal is approved, then the next oldest legitimate name for 'hairy alata' will be *N. blancoi* given the neotypification published in Cheek and Jebb (2013). For the moment, however, the correct application of names to these two taxa is as in Table 1.

### *Nepenthes graciliflora* Elmer (1912, p. 1494)

**Type:** (lectotype selected in Jebb and Cheek 1997, p. 15) Philippines, Sibuyan Island, Mt Guiting-Guiting, May 1910, Elmer 12465 (lectotype: K, isolectotypes: B, BO, E, U, US, W).
**Previously referred to as:** *N. alata* auctt. non Blanco.

***Distribution***
Philippines, Luzon, mainly south of Manila, Zambales Mts (Mt Mariveles), Sierra Madre (San Luis – most northerly location, Infanta, Rizal), Laguna (Mt Makiling), Bicol Peninsula (Sorsogon Prov.); Visayas: Mindoro Isl. Sibuyan Isl, Panay Isl., Samar Isl., Leyte Isl., Bohol Isl.; Mindanao Isl.

***Ecology***
Not well recorded, mossy, submontane forest; (300–) 800–1280 m a.s.l.

***Notes***
Most of the specimens seen lack habitat and altitudinal data. The 300 m altitudinal record may be anomalous, it derives from the type collection from Sibuyan.

*Nepenthes graciliflora* is the most widespread species of *Nepenthes* in the Philippines although we have seen no reliable records for Palawan, nor for several of the larger Visayas such as Cebu and Negros.

Since Elmer published *N. graciliflora* (Elmer 1912), all workers on Philippine *Nepenthes* have treated it as a synonym of *N. alata* (Macfarlane 1927, Merrill 1923). Elmer was evidently aware of the validity of his species and its distinctness from *N. alata* as he finished his account with "Apparently quite different from Blanco's species." He later distributed specimens of the same taxon from Mt Makiling, Luzon, as *N. graciliflora*. However, he neglected to ever make a case for his *Nepenthes graciliflora*: he did not diagnose it against *N. alata*, that is, provide the characters that distinguish the two from each other. Instead, he merely gave a description. Without this justifiction, perhaps it is no wonder that Merrill and Macfarlane remained unaware of the basis of Elmer's assertion, and treated the name as a synonym of *N. alata.* Both Elmer and Merrill had collected both *N. alata* and *N. graciliflora* in the field in Luzon. It seems that Merrill favoured the views of Macfarlane, the *Nepenthes* monographer, who seems never to have visited southeast Asia, above those of Elmer, who was probably the Philippines most prolific collector of herbarium specimens.

***Additional specimens examined***
Philippines, Luzon, Prov. Laguna, Los Banos, Mt Maquiling st. Jun–Jul 1917, Elmer 17766 (U, US); Prov. Sorsogon, Irobin, Mt Bulusan, fl. fr. Apr 1916, Elmer 15849 (U, US); Mindoro, Binabay River, male infl. Nov 1906, Merrill 5785 (US); Panay, Cuming 1682 (W); Bohol, Cuming 1812 (W).

## The *Nepenthes alata* group

Here we define the *Nepenthes alata* group as those species with: 1) a basal appendage on the lower surface of the pitcher lid and a narrow, finely ridged peristome; 2) the upper pitcher tending to be widest at the subglobose-ellipsoid base (except *N. copelandii*), contracting ± abruptly to a cylindrical upper part (the pitcher often subcylindric overall in *N. alata*), and 3) a more-or-less distinct but winged petiole, the petiole wings wide, patent and decurrent from the blade (petiole wings involute in *N. mindanoensis*, the petiole appearing canaliculate). These known species all appear to be climbers of the Philippines, producing both lower and then upper pitchers fairly abundantly before inflorescences are produced, and phyllotaxy is spiral, ca 2/3, stems are terete (rarely angled and grooved), glabrous or pubescent. The peristome is usually slender, cylindric, rarely slightly flattened, with fine ridges, the outer edge not or only slightly lobed, the inner surface lacking conspicuous teeth. The mouth is ovate, often cordate, oblique, without a developed column. The lid is usually elevated 45° above the horizontal and is usually more or less flat, or with the two sides angled slightly above midline, with a linear, unbranched spur. The inflorescence has either 1- or 2-flowered partial-peduncles, usually without a bract.

This definition excludes several species which were sunk into *N. alata* itself by Danser (1928), such as *N. eustachya* Miq., *N. philippinensis* Macfarl. and *N. blancoi* sensu

Macfarl. non Blume (resurrected as *N. abalata* in Jebb and Cheek 1997) all of which lack a basal appendage and the defining winged petiole but otherwise appear broadly similar. We resurrected these species respectively in Jebb and Cheek (1997), Cheek and Jebb (2001) and Cheek and Jebb (2013). *Nepenthes ceciliae* Gronem., Coritico, Micheler, Marwinski, Acil & V. B. Amoroso (Gronemeyer et al. 2012), recently described from Mindanao, and poorly known, does belong to the *Nepenthes alata* group because it has a basal lid appendage and a winged petiole. However, it is not certain at this stage that it is distinct from *N. copelandii* Macfarl. (below).

Danser (1928) included in *N. alata* several evidently disparate elements that he was evidently not able to resolve. Apart from the species mentioned above, which we exclude from the *N. alata* group for the reasons mentioned, he also treated as synonyms of *N. alata* several distinct taxa recognised by Macfarlane (1908). These are *N. copelandii*, which we maintain as a distinct species within the *N. alata* group as defined above, and two infra-specific taxa which we contend merit full species rank. *Nepenthes alata* var. *biflora* Macfarl. we recognise below as a species, *N. negros* Jebb & Cheek (q.v.). Finally, *Nepenthes alata* var. *ecristata* Macfarl. was unknowingly redescribed recently at the species level as *N. mindanaoensis* Sh. Kurata (Kurata 2001). Final epithets of infraspecific names are not required by the Code to be taken up at the species level.

The new species that we accept in this paper had been represented by specimens in herbaria for a century. However, we had assumed that most pre-1945 Philippine material had been lost in the destruction of PNH and were unaware, until recently, that the duplicates cited here survived in some herbaria in USA and Europe.

## Key to the species of the *Nepenthes alata* group

1. Lower surface of lid, including appendage, densely and evenly covered in uniformly minute circular nectar glands (0.15–0.20 mm in diameter). Luzon to Mindanao ..... 2
   – Lower surface of lid with nectar glands either absent from the appendage and/or, sparse, large or dimorphic, (larger glands 0.35–0.40 mm in diameter or larger). Visayas and Mindanao ..... 3
2. Stems glabrous or glabrescent, partial-peduncles lacking bracts, 1-flowered. Southern Luzon to Mindanao .....*N. graciliflora*
   – Stems persistently pubescent, partial-peduncles with or without bracts, 1-flowered. Northern Luzon … *N. alata*
3. Petiole appearing cylindric, the wings inrolled; blade abruptly contracting to the petiole: longitudinal nerves arising from petiole. Mindanao …… *N. mindanaoensis*
   – Petiole with wings patent; blade gradually contracting into the petiole; longitudinal nerves mostly arising from the midrib ..... 4
4. Upper pitchers funnel-shaped, i.e. widest at mouth and progressively narrowing towards the base. Mindanao, Mt Apo ..... *N. copelandii*
   – Upper pitchers not funnel-shaped, but widest at base, contracting slightly above into a narrower cylinder. Negros and Biliran Islands ..... *N. negros* sp. nov.

## *Nepenthes negros* Jebb & Cheek sp. nov. (Fig. 1)

Differs from *N. alata* Blanco in the upper pitchers widest at the swollen base, narrowing gradually to the more slender, subcylindric, upper two thirds (not subcylindric overall, slightly constricted in the middle); partial-peduncles of the inflorescence 2-flowered (not 1-flowered). Additional diagnostic characters are given in Table 2 below.

**Type:** Philippines, Negros Island, Mt Silay, May 1906, H. N. Whitford 1537 (holotype: PH, isotype: K).
**Previously known as:** *Nepenthes alata* var. *biflora* Macfarl. **Type:** Philippines, Negros Island, Mt Silay, May 1906, H. N. Whitford 1537 (lectotype: K, selected in Jebb and Cheek 1997, p. 15, isolectotype: PH).

### *Etymology*

The specific epithet is a noun in apposition. It signals the main home of this species, the Philippine Island of Negros.

### *Description*

Terrestrial climber, reaching 4–5 m high, stems terete or angular, 4–6 mm in diameter, internodes 3.5–4.5 cm long, axillary buds spike-like ca 4 mm long, inserted 4 mm above the axil, indumentum not caducous of grey or red, patent dendritic hairs 0.1–0.5 mm long, each with 2–7 scattered short lateral branches ca 0.05 mm long. Leaves spirally inserted, coriaceous, blade oblong-elliptic (10.0–) 11.0–15.5(−18.0) × (1.3–)2.4–3.8(−4.0) cm, apex obtuse, base obtuse-acute, abruptly decurrent into petiole, longitudinal nerves 1 pair, 3 mm from the margin, obscure or moderately conspicuous; pennate nerves patent, upper surface glossy, glabrous, lower surface drying brown, with scattered raised glands ca 0.05 mm diameter, glabrous or occasionally (Elmer 9725, W) with moderately dense bushy white hairs 0.25 mm long, midrib densely pubescent with basally bifid, patent, hairs 0.4–0.5 mm long. Petiole winged-canaliculate, (1.5–)3.4–5.7 × (0.4–)0.5–0.7 cm, clasping for 1/3 its circumference and often decurrent to node below as a low ridge. Lower and intermediate pitchers unknown from specimens. Upper pitchers (tendrils coiled) subcylindric, 13.0–18.5 × 3.4–5.0 cm, widest in the basal half, gradually constricting midway to 1.7–3.6 cm wide before dilating to 3–4 cm wide below the peristome outer surface with erect red, 4–5-armed bushy hairs 0.5–1.0 mm long, with one long arm, other arms ca 0.2 mm long, sparse, 1–2 per mm$^2$, mixed with smaller (2–)3–6-armed substellate hairs 0.15(–0.25) mm diameter, 7–9 per mm$^2$; fringed wings 10–30 mm long, (1–)2–3 mm wide, fringed elements 1–2 mm long, 3–5 mm apart, immediately below the peristome, otherwise reduced to ridges running the length of the pitcher. Mouth ovate, 3.0–5.5 × 3.0–4.5 cm, oblique; peristome cylindric to flattened, 1.2–2.0 mm wide at front, 2–6 mm wide at sides, 3.0–3.5 ridged per mm, ridges 0.1–0.2 mm high, inner edge with inconspicuous teeth, outer edge not, or only indistinctly lobed; column

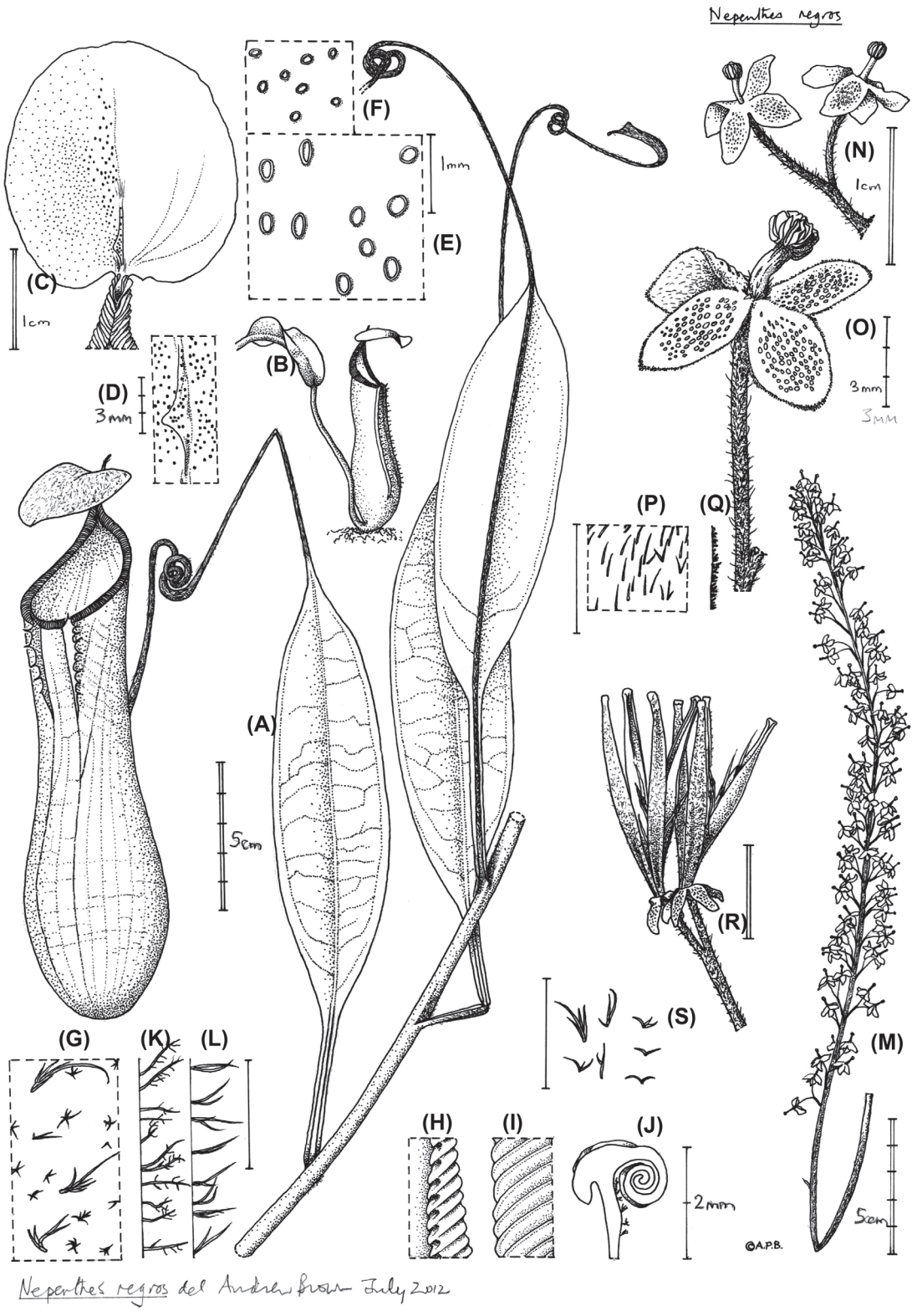


Figure 1. *Nepenthes negros* sp. nov. (A) habit, climbing stem with upper pitchers, (B) habit, intermediate pitcher with leaf, (C) lid of pitcher, lower surface, left side showing nectar glands, right hand showing nerves, (D) basal appendage (detail from C), (E) large, sparse elliptic glands from midline of lid, (F) small dense glands from near basal appendage, (G) indumentum from pitcher exterior, (H) peristome, inner edge showing inconspicuous teeth near rear of pitcher, (I) peristome, plan view of showing ridges, (J) peristome, transverse section (pitcher exterior to right), (K) indumentum of stem, side view, (L) indumentum of midrib (lower surface of leaf), side view, (M) male inflorescence, complete, (N) partial-peduncle with two male flowers, (O) single male flower, (P) indumentum of tepal outer surface, (Q) indumentum of tepal margin, (R) fruits, side view, (S) indumentum of peduncle. (A), (C)–(L), (R) from Elmer 10073, (B) from photo by L. Co, (M)–(Q), (S) from Whitford 1537. Scale bars single = 1 mm, graduated single = 2 and 3 mm, double bar = 1 cm; graduated double bar = 5 cm. Drawn by Andrew Brown.

Table 2. The characters separating *Nepenthes negros* sp. nov. from *N. alata* (additional characters are given in the diagnosis).

| | *N. alata* | *N. negros* |
|---|---|---|
| Indumentum of folded immature leaf-blade | White, long, dense | Red-brown, long, dense |
| Petiole | Poorly demarcated from blade, wings patent | Well demarcated from blade, appears canaliculate |
| Lid | Ovate, distinctly longer than broad | Orbicular, as long as broad |
| Nectar glands on lower lid surface | Minute, even in size and density over lid surface | Minute and dense on basal appendage and adjoining area, elsewhere very sparse and large |
| Indumentum of outer surface of pitcher | Minute white stellate hairs | Mixture of red stellate hairs and long, simple hairs |
| Inner surface of peristome | Teeth inconspicuous | Teeth short, visible |
| Geography | Northern Luzon | Visayas (Negros and Biliran Islands) |

not developed; lid orbicular, 2.2–4.3 × 2.5–4.0 cm, apex rounded to truncate, base slightly cordate; lower surface with basal appendage asymmetric, 2–4 × 2–4 mm, apex rounded, situated about the middle of a ridge ca 10 mm long, 1 mm high; nectar glands monomorphic, non-perithecoid, more or less circular, with a slight and slender marginal rim, densest in the proximal half flanking the appendage, about 4 nectar glands per mm², each 0.12 mm diameter, equally dense and small on the appendage and basal midline, becoming much sparser and slightly larger (0.15–0.40 mm diameter) in the distal half and periphery; upper surface of lid with moderately dense, erect, branched hairs 0.1–0.3(−0.5) mm long. Spur inserted ca 3 mm below junction of lid and pitcher, cylindric, 7–10 mm long, unbranched, apex rounded, surface densely appressed hairy, hairs coppery, 0.5–0.7 mm long. Male inflorescence with peduncle 19.5–26.0 cm long, 0.3–0.4 mm diameter at base, glabrous; rachis 26.5 cm long, 2–3 mm diameter, bearing ca 94 partial-peduncles evenly scattered along its length, partial-peduncles 2-flowered from base to apex of inflorescence, partial-peduncles (3.0–)3.5–4.0 mm long, bracts absent, pedicels divergent (7–)8–10(–12) mm long, rhachis to lower surface of tepals dense patent puberulent, hairs red or grey, erect 0.4–0.5 mm long and subappressed, 2–3-armed hairs 0.20–0.25 mm wide. Tepals 4, elliptic, 3(−4) × 2.0(−2.5) mm, apex rounded, lower surface with subappresed simple hairs 0.15–0.25 mm long, margin densely patent hairy, hairs 0.03–0.10 mm long, upper surface with elliptic nectar glands, drying black, live colour green, glabrous apart from hairs at base. Androphore 2.0(−3.5) mm long, proximal half with thinly scattered patent red hairs, distal half glabrous. Anther-head white, subglobose 1.5 × 1.5 mm. Female inflorescence not known. Infructescence peduncle with indumentum as male inflorescence, 24–39 cm long, 2–5 mm diameter at base, rhachis 11.5–12.5 cm long, partial-peduncles ca 35. Partial-peduncles 4–8 mm long, 2-flowered. Bracts absent. Pedicels 7–8 mm long. Tepals elliptic 3.50 × 1.75 mm, ovary stipe 1 mm. Fruit valves 4, narrowly elliptic, 25.0 × 2.5 mm, outer surface patent-puberulent, hairs 0.05 mm long.

### *Ecology and distribution*

Submontane forest; 1350 m a.s.l. (Biliran Isl). Restricted, so far as is known, to Biliran Island, and to the northern and southern ends of Negros Island in the Visayas of the Philippines.

### *Conservation status*

*Nepenthes negros* is known from only three locations: Mt Silay, the Cuernos Mts in Negros and Biliran Isl. (see Additional specimens examined). It is known with certainty only from about 10 individuals that must have been used to make these specimens, mostly over a hundred years ago. However, three photo records of what appears to be this taxon can be found at <www.phytoimages.siu.edu/imgs/pelserpb/r/Nepenthaceae_Nepenthes_alata_27082.html>. Taken by the recently deceased Leonard Co, 27 Nov 2004, at the Cuernos Mts location, this gives cause to hope that the species still survives in the wild unlike *N. robcantleyi* Cheek which is feared extinct in the wild (Cheek 2011). We assess *N. negros* here as 'Critically Endangered' (CR) under criterion D of IUCN (2001), as only about ten individuals have ever been documented (above). We hope that further searches will reveal additional locations and individuals, allowing a lower threat rating and also that, as a result of this publication, protection measures will be put in place to safeguard this species.

*Nepenthes negros* remains very poorly known in terms of its habitat, habit and female flowers. Further work is needed to rectify these gaps in our knowledge.

### *Similar species*

*Nepenthes negros* was previously recognised at varietal level by Macfarlane (1908), as *N. alata* var. *biflora* mainly on

Table 3. The diagnostic characters separating *N. negros* sp. nov. from *N. graciliflora*.

| | *N. negros* | *N. graciliflora* |
|---|---|---|
| Midrib of lower leaf-blade | Densely grey patent-pubescent, hairs 0.5 mm long persistent | Glabrous |
| Stem indumentum | Moderately pubescent, hair patent, 0.1–0.5 mm long | Glabrous |
| Partial peduncles | 2-flowered | 1-flowered |
| Upper pitchers | Subcylindric, widest at base, inconspicuously tapering to the middle before dilating to the mouth | Base ventricose-ellipsoid, more or less abruptly constricted to the cylindrical upper 3/4 |
| Nectar glands on lower lid surface | Small and dense in proximal half, larger and sparser in distal half | Even in size and density over lid surface |

the strength of the 2-flowered partial-peduncles. With the benefit of data from the additional specimens cited here that were not available to Macfarlane, we are satisfied that the number of morphological characters separating our taxon from others in the *N. alata* group warrants recognition at the species level. *Nepenthes alata* in the strict sense appears to be the taxon most closely similar to *N. negros*. The two have similarities in pitcher shape, indumentum, and in the placement of the fringed wings on the upper pitchers. The main diagnostic characters separating *N. negros* from *N. alata* are detailed in Table 2.

The only other *Nepenthes* species which is also known from mid Visayas is *N. graciliflora*. Although we have not seen records from Negros, it may yet be found there because its range extends from Luzon to Mindanao. The two taxa can be separated using Table 3.

***Additional specimens examined (paratypes)***

Philippines, Visayas: Negros Island, Prov. of Negros Oriental, Dumaguete (Cuernos Mts), male inflor. Apr 1908, Elmer 9725 (L, PNH destroyed, US, W); fr. May 1908, Elmer 10073 (L, PNH destroyed, US, W); Biliran Island, Mt Suiro, Summit, fl. 13 May 1954, Sulit 5589 (PNH herb no. 21715) (L, PNH n.v.).

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## References

Blanco, M. 1837. Flora de Filipinas, 1st ed. – Manila.

Blume, C. L. 1852. Nepenthaceae. – Mus. Bot. Lugduno-Batavum 2: 5–10.

Cheek, M. 2011. *Nepenthes robcantleyi* sp. nov. (Nepenthaceae) from Mindanao, Philippines. – Nord. J. Bot. 29: 1–5.

Cheek, M. and Jebb, M. 2001. Nepenthaceae. – Flora Malesiana 15: 1–157.

Cheek, M. and Jebb, M. 2013. Identification and typification of *Nepenthes blancoi* Blume, with *N. abalata* sp. nov. from the western Visayas, Philippines. – Nord. J. Bot. in press.

Danser, B. H. 1928. The Nepenthaceae of the Netherlands Indies. – Bull. Jard. Bot. Buitenzorg III, 9: 249–438.

Elmer, A. D. E. 1912. Nepenthaceae. – Two score of new plants. Leaflets of Philippine Botany 4: 1494–1496.

Gronemeyer, T. et al. 2012. *Nepenthes ceciliae*, a new pitcher plant species from Mount Kiamo, Mindanao. – In: Mc Pherson, S. (ed.), New *Nepenthes*. Vol. 1. Redfern Publi., pp. 413–423, Fig. 354–367.

IUCN 2001. IUCN red list categories and criteria, ver. 3.1. – IUCN Species Survival Commission.

Jebb, M. and Cheek, M. 1997. A skeletal revision of *Nepenthes*. – Blumea 42: 1–106.

Kurata, S. 2001. Two new species of *Nepenthes* from Sumatra (Indonesia) and Mindanao (Philippines). – J. Insect. Plant Soc. Japan 52: 30–34.

Lanjouw, J. and Stafleu, F. A. 1954. Index Herbariorum, part II, First installment A–D. – Reg. Veg. 2.

Macfarlane, J. M. 1908. Nepenthaceae. – In: Engler, A. (ed.), Das Pflanzenreich, Heft 36: 1–92.

Macfarlane, J. M. 1927. The Philippine species of *Nepenthes*. – Philipp. J. Sci. 33: 127.

Merrill, E. D. 1918. Species Blancoanae, a critical revision of the Philippine species of plants described by Blanco and Llanos. – Bureau of Printing, Manila.

Merrill, E. D. 1923. Enumeration of Philippine flowering plants. Vol. 4. – Bureau of Printing, Manila.

Veldkamp, J. F. 1989. A note on Philippine collections of F. M. Blanco and A. Llanas. – Flora Males. Bull. 10: 143–145.