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Caryophyllales.org – *Nepenthaceae* – Species list with descriptive data items

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Introduction

The following text represents output from the Caryophyllales.org *Nepenthaceae* database. Some of the content is still in the process of being added to the database and updates of this document will be produced and published on the Internet whenever significant changes in the database take place.

The content (descriptions, notes, etc.) was almost exclusively produced by other people – so if you wish to cite parts of this work, please do refer to the original authors' works. Where possible, links to full-text electronic versions of the referenced publications are provided in the online version.

The online version available under http://caryophyllales.org/nepenthaceae/Checklist represents the actual updated state of the database. The data are managed with the EDIT Platform for Cybertaxonomy software and the database being is at the Botanic Garden and Botanical Museum Berlin. Please refer to the above-cited article for background information.

At present, for technical reasons, type citations, misapplied names, and pro-parte synonyms (as well as other taxonomic concept relations) are displayed only online and are not included in this document. We also realise that the format of descriptions should be further structured to present a more uniform picture and that the various sections on excluded names need further comments.

Walter G. Berendsohn (compiler) and the EDIT Platform Team, August 2018.

Systematic treatment

Nepenthaceae Dumort sec. Angiosperm Phylogeny Group (2016)

Nepenthes L. sec. Jebb & Cheek (1997)

= *Anurosperma* (Hook.f.) Hallier f.

= *Bandura* Adans.

= *Phyllamphora* Lour.

Description: Carnivorous, dioecious, woody or subwoody climbers or subshrubs, terrestrial or epiphytic. Stems terete or 2-4-angled, or winged. Buds naked, lacking scales. Phyllotaxy spiral, 2/5 or 1/2. Leaves exstipulate; involute or convolute, marcescent, simple, chartaceous or coriaceous, petiolate or sessile; midrib extended into an unbranched tendril, the distal part of which expands into an elaborate, animal trapping receptacle (pitcher) containing digestive fluid. Pitchers dimorphic. Lower pitchers produced from rosettes or short stems, often resting on the ground, usually ovoid or globular, the mouth facing towards the stem, with two ventral fringed wings running from the base to the pitcher rim and with the tendril straight, not coiled. Upper pitchers (usually absent in *N. argentii, N. ampullaria*, and *N. pectinata*) usually more elongated and infundibuliform (funnel-shaped) than the lower pitchers, the mouth facing away from the stem, the wings reduced to ridges and not fimbriate, or absent, and the tendril coiled. Pitcher mouth apical or subapical, rimmed with a ribbed peristome (except *N. inermis*), the inner edge often toothed and bearing nectar glands, at the rear sometimes raised to form a column, supporting the lid; lid usually held over the mouth (reflexed e.g. in *N. dubia*), lower surface with a laterally flattened basal appendage, rarely an apical filiform appendage, or appendages absent; nectar glands usually abundant; spur inserted on dorsal surface at junction with lid, entire or variously divided, flattened or terete. Inflorescence terminal, appearing lateral by subsequent growth, a paniculoid thyrse or raceme, of 6-300 flowers, the main axis with indeterminate growth, the partial inflorescences 1-flowered (racemose) or 2-flowered, less usually 3-40-flowered, bracteate or ebracteate. Perianth imbricate, a single whorl of 4 (also interpreted as two whorls of 2) free or basally united, patent, nectariferous tepals. Female flowers with androecium lacking, ovary superior, 4-carpellate, incompletely 4-locular locules antitepalous, placentation lamellar, ovules erect, anatropous, bitegmic, crassinucellate, 200-500, stigmas sessile, as many as locules. Male inflorescence usually larger and more floriferous, perianth as in female; stamens 4-?12, filaments united into an androphore, anthers tetrasporangiate, in 1-3 dense whorls, united into a subspherical anther head, locules opening by longitudinal slits, extrorse; gynoecium lacking. Fruit sometimes stipitate, a loculicidally dehiscent capsule with 4 valves containing 50-500 seeds. Seeds filiform, 3-25 mm long, slender due to long basal and apical appendages. Testa reduced to an outer epidermis with thick outer walls to the cells and irregular thickenings on the radial and inner walls. Tegmen produced only around the embryonic cavity, crushed. Endosperm starchy or absent. Embryo minute, central, straight or U-shaped in a subellipsoid cavity, cotyledons and hypocotyl well-developed, though minute. Indumentum of simple, bifid, fasciculate, stellate, dendritic non-glandular and sunken, sessile or shortly stipitate glandular hairs. Colour of pitchers entirely green, or yellow or orange or white or purple or red, often marked with red streaks or blotches; peristome often glossy red; inflorescence with green, brown or red tepals. 2n = 80. [Cheek & Jebb (2001)].

Distribution: Mostly in Malesia, but with outlying species in: Madagascar, Seychelles, Sri Lanka, NE India, Indochina, Solomon Islands, New Caledonia and Australia. Most species are found in Borneo and Sumatra. [Cheek & Jebb (2001)].

Notes: Genus with 176 species and 9 natural hybrid described here (about 160 species according to Clarke & al. 2018). [Berendsohn (2017+)].

Conservation: Walters & Gillett (1997) in the IUCN Red list of threatened plant species treat 25% of the species of *Nepenthes* they recognise as 'threatened', and give IUCN ratings for 14 Malesian taxa as follows: Indeterminate 3 *(N. burbidgeae, N. deaniana, N. philippinensis)*; Vulnerable 3 *(N. edwardsiana, N. rajah, N. villosa)*; Rare 4 *(N. burkei, N. lowii, N. paniculata, N. veitchii)*; Endangered 4 *(N. gracillima, N. muluensis, N. northiana, N. neglecta)*. However, apart from these species, there are several others which are probably more highly threatened. *Nepenthes clipeata* is believed to be reduced to only 2-6 plants in the wild owing to collection of plants for horticultural purposes at its only known wild locality. The type locality of *N. campanulata* was destroyed by fire and the species considered possibly extinct until it was rediscovered at a hitherto unknown, second locality in the last two years.

The species of *Nepenthes* are particularly vulnerable to threats because so many of them have highly restricted distributions. Many are known from a single locality or small area, such as a mountain. There are two main threats to *Nepenthes*: horticultural trade and habitat destruction.

The Horticultural Trade — The horticultural trade in *Nepenthes* is mostly international. The main markets are

Western Europe, Japan, and the United States of America. Increasingly the supply of tissue-cultured plants is growing to meet the demand of purchasers. However, collection of plants from the wild for horticultural purposes continues.

All species of the genus *Nepenthes* are listed on CITES Appendix II, apart from *N. khasiana* (India) and *N. rajah* which appear on Appendix I (CITES is the Convention on International Trade in Endangered Species) (Knees & Cheek 1988; Cheek 1990). The average number of plants traded internationally in the period 1983-1989 (for which records were kept) was 1,168,000 plants per year (World Conservation Monitoring Centre 1991). Prices are generally highest in Japan, where a price of USD 304 per plant has been reported (World Conservation Monitoring Centre 1991). In Germany the highest price recorded has been USD 215 per plant, but plants can be bought for as little as USD 10, depending on rarity (Jenkins 1993).

Habitat Destruction — The species most threatened by habitat destruction are lowland species, particularly those of restricted distribution such as *N. sumatrana* and *N. bicalcarata*, and obligate ultramafic species, such as *N. philippinensis* and *N. argentii*. Lowland rain forest species are vulnerable to loss of habitat from non-sustainable logging, and the clearance of forest and scrub for agriculture, habitation, tourism, and associated house-building. Ultramafic-obligate species, and to a lesser extent species of limestone, are especially vulnerable to open-cast mining operations since ultramafic substrates have a super abundance of metals, such as manganese, nickel, and cobalt. *Nepenthes danseri* in particular, may be threatened by mining for nickel (Jebb, pers. obs.). Reference to mine-workings often appear on the collecting labels of such species. Underground workings are likely to have less impact than open-cast mining. Limestone-specific species may be under threat from mining if there are associated metal deposits (e.g. *N. northiana*: gold and antimony at Bau) or if the limestone itself is mined for cement production or other uses (*N. northiana*).

Montane species of *Nepenthes*, constituting most of the genus, are, generally, less threatened with habitat destruction than lowland species, although generally, of more interest to horticulturists. Lian (1995) sampled many of the montane localities in Peninsular Malaysia from which *N. macfarlanei* has been known historically, and found that it was still present at all the sites that she surveyed. However, there is concern that the expansion in number of touristic and leisure complexes situated in the mountains of Peninsular Malaysia has destroyed some populations of the endemic *Nepenthes* species there. [Cheek & Jebb (2001)].

***Nepenthes abalata* Jebb & Cheek in Nordic J. Bot. 31(2): 153. 2013. Sec. Cheek & Jebb (2013)**

= *Nepenthes blancoi* Blume in Mus. Bot. Lugd.-Bat. 2: 10. 1852.

Description: Terrestrial monopodial subshrub ca 50 cm tall. Stem terete, 4 – 5 – (7) mm wide, erect, 7 – 12 cm tall, bearing a rosette of 9 – 11 spirally inserted leaves; climbing internodes very short when in fl ower, sometimes later extending, stem then procumbent or scrambling (Co 3039), 30 cm long, with internodes 1.2 – 2.0 cm long, glabrous or with very sparse inconspicuous 0.5 mm long curved hairs; axillary area densely minutely hairy, with axillary bud 1 mm long, inserted 5 mm above the axil. Leaves thickly coriaceous; petiole not distinct; blade linear – oblanceolate, 1.3 – 2.8(– 3.4) x 14 – 22 cm, obtuse to abruptly emarginate at apex, not peltate, tapering gradually towards the stem, the proximal quarter more or less ligulate with parallel sides, ca 1.1 cm wide, clasping the stem by 1/2 its circumference, then decurrent in two wings, each 1 – 2 mm wide extending 4 – 8 mm below the node, not converging. Longitudinal nerves 2(– 3) on each side of the midrib in the marginal 1.5 mm, conspicuous; pennate nerves numerous, at 45° from the midrib, branching, more or less straight, conspicuous. Lower pitcher ovoid in the lower 1/2 – 2/3, cylindrical towards the mouth, 14.5 x 6.5 cm (the cylindrical portion 4.8 cm wide), with two fringed wings each 4 – 6 mm broad with fringed elements 3 – 4 mm long, 2 – 4 mm apart; mouth oblique, ovate, 5.7 x 4.8 cm; peristome rounded, 2 mm wide in the front, unevenly fl attened, 3.5 – 6.5 mm wide at the sides of the mouth, ribs 0.4 – 0.5 mm apart, conspicuous, about 0.25 mm high, outer edge with 3 lobes on one side, inner edge lacking teeth except in the 1/4 to 1/3 towards the lid, which has minute teeth 0.2 – 0.4 mm long; column weakly developed; lid not known. Intermediate pitchers (tendril not coiled) subcylindrical 10.5 – 13.5 x 2.5 – 3.7 cm overall, lower 4/10 to 1/2 ellipsoid, narrowing slightly above to 1.7 – 2.8 cm wide, the upper part cylindrical, widening slightly and gradually to the peristome, where 2.5 – 3.0 cm wide, bearing two fringed wings 1.0 – 1.5 mm broad, fringed elements 1 mm long, 1 – 3 mm apart; mouth ovate, 3.0 – 3.5 x 2.5 – 3.0 cm; peristome fl attened-rounded, 3 mm wide in the front, where raised in the centre, 5 mm wide at the front, otherwise as lower pitcher; lid ovate, 2.5 – 2.7 x 2.0 – 2.7 cm, rounded or retuse at apex, truncate at base; lower surface lacking appendages; nectar glands dimorphic, non-perithecoid glands moderately dense across most of the surface apart from a narrow ellipse along the midline ca 5 mm at the widest, which is free of glands apart from 10 – 12 large perithecoid glands; perithecoid glands longitudinally elliptic or circular, 0.50 – 0.65 x 0.30 – 0.50 mm, convex, with a central aperture 1/10 – 2/10 the diameter of the whole gland; smaller, non-perithecoid (but mainly perithecoid in Co 3039) glands circular or slightly elliptic, randomly orientated, ca 0.25 mm diameter, the central aperture 9/10 or more the diameter of the whole gland (but only 1/2 the diameter in Co 3039), glands densest, 12 per mm², at the base of the lid, fl anking the glandless midline, 4 per mm² elsewhere. Spur unbranched, 7 mm long, inserted 3 mm below lid, tapering slightly to a rounded apex, appressed hairy, white, unbranched. Pitcher mainly glabrous-glabrescent, except for below the

peristome rim and around the spur, with sparse, grey, more or less stellate hairs 0.1 mm in diameter, each 3 – 6-armed. Male infl orescence borne on stems with only lower pitchers (type), erect, 52 cm long; peduncle 22.0 x 0.4 cm, glabrous; partial peduncles ca 160, 1-fl owered; rachis densely puberulent with curved branched or straight, single white hairs ca 0.10 – 0.15 mm deep extending to the pedicel and outer perianth; bracts absent, but with a tuft of 1 mm long hairs; pedicels (2.5)4.0 – 4.5(– 6.0) mm long, patent; tepals elliptic 3 x 2 mm, acute or rounded at apex; androphore 2.0 – 2.5 mm long, glabrous apart from a few red hairs and peltate scales 0.1 mm in diameter, long at the very base; anther head (0.5 –)1.00 – 1.15 mm wide, 0.8 mm long truncated cone-shaped; anthers ca 8. Female inflorescence known only from infructescence, 44 cm long, peduncle 33.0 x 0.4 cm, partial peduncles 58, 1-fl owered; bracts absent; pedicels 5 – 6 mm long, appressed hairy; sepals 3 x 1 mm, fruit valves 4, 14 – 19 mm long, glossy pale brown. Seeds not seen. [Cheek & Jebb (2013)].

Distribution: Philippines, western Visayas; Culion Island, Cuyo Island and Malalison Island of Panay. [Cheek & Jebb (2013)].

Habitat: Open rocky grassland or scrub habitats on slopes in non-ultramafic areas near the sea; at ca 0 – 20 m a.s.l. [Cheek & Jebb (2013)].

Etymology: Meaning ‘from alata’, because *N. abalata* has been misidentified for many decades as *N. alata* Blanco. [Cheek & Jebb (2013)].

Conservation: *Nepenthes abalata* is known from only one or two plants at each of the three locations, none of which are known to be protected, in a country where habitat destruction has been extensive and is ongoing. Threats include development of beach resorts. The three locations are spread along a line ca 200 km long, most of which is sea. Accordingly *N. abalata* is here assessed as ‘ Critically Endangered ’ (CR) according to IUCN (2001), applying criterion D. [Cheek & Jebb (2013)].

***Nepenthes abgracilis* Jebb & Cheek in Phytotaxa 151(1): 29 (-30, fig. 1). 2013. Sec. Cheek & Jebb (2013)**

Description: Terrestrial climber to several metres tall. Rosette and short stems unknown. Climbing stems terete, lacking wings, 6–7 mm diam., internodes 15–18 mm long, indumentum absent, apart from moderately dense minute sessile depressed-globose red glands 0.05 mm diam; stem apex unknown. Leaves spirally inserted, coriaceous, apetiolate, narrowly oblanceolate-oblong, 23.2–29 × 2.6–3.1 cm, apex attenuate, base gradually attenuate to ca. 1.3 cm wide at base, clasping the stem for 3/4 to 4/5 its circumference, at an acute angle from the vertical, forming wings 0.3–0.4 cm wide and extending 0.9–1.2 cm below the leaf axil; longitudinal nerves 3–4 pairs on each side of the midrib in the outer ¾ of the blade, arising from the leaf base and along the midrib, visible only on adaxial surface; pennate nerves not visible, upper surface dark green, lower surface drying brown, moderately densely scattered with sessile glands as the stem, hairs absent. Lower and intermediate pitcher unknown. Upper pitchers (tendrils coiled) subcylindric ca. 16.4 cm × 5.5 cm, broadest at the slightly ellipsoid base, gradually and slightly constricting to 4.1 cm wide at the centre, before dilating to 5 cm wide below the peristome, outer surface yellow-green, with sessile glands as the stem, 3–4 per mm², hairs absent except a few inconspicuous simple hairs 0.05–0.10 mm long near peristome; fringed wings reduced to ridges running the length of the pitcher. Mouth ovate, ca. 6 × 4 cm, oblique; peristome cylindric, ca. 2.5 mm wide, red, faintly lobed, to 4 mm wide, 2 ridges per mm, ridges 0.1 mm high, inner and outer edges tightly in-rolled, teeth not visible; column short, not strongly developed, with holes visible at the inner edge; lid ovate-elliptic, ca. 5.2 × 4 cm, apex rounded to truncate, base rounded at base; lower surface suffused or blotched red, lacking an appendage, but with a basal ridge (probably an artefact of drying), ca. 10 mm long, 1 mm, flat-topped; nectar glands more than 100, 95% or more monomorphic and relatively uniform in size, orbicular or slightly elliptic, 0.6–0.75(–0.9) × 0.4–0.5 mm, including a narrow rim ca. 0.05 mm wide; the basal ridge upper surface with circa 20 narrowly elliptic-oblong glands 0.75 × 0.25 mm; glands at the junction of blade with peristome, deeply sunken, lacking a rim, ca. 0.25 mm diam.; sessile glands as on stem evident only at the edge of the lid, few and inconspicuous; spur entire. Inflorescence and fruit unknown. [Cheek & Jebb (2013)].

Distribution: Philippines, Mindanao, Surigao Province [Cheek & Jebb (2013)].

Habitat: Forested submontane ridges, probably ultramafic, 670 m a.s.l. [Cheek & Jebb (2013)].

Etymology: The epithet abgracilis means ”from gracilis” referring to the type specimen that was early identified by Merrill as a form of the species of that name. [Cheek & Jebb (2013)].

Conservation:Conservation: *Nepenthes abgracilis* is here assessed as Critically Endangered, under Criterion D of IUCN (2012 [2001]). A single location is currently known (NE Mindanao). Although mining for metal ore occurs at the Mt Legaspi location, this is so far at lower altitudes than the species is known to occur (McPherson 2009). [Cheek & Jebb (2013)].

***Nepenthes adnata* Tamin & M. Hotta ex Schlauer in Blumea 39: 141. 1994. Sec. Cheek & Jebb (2001)**

– *Nepenthes adnata* Tamin & M. Hotta in M. Hotta, Divers. & Dynam. Pl. Life Sumatra: 76, f. 1. 1986, nom. nud.

Description: Terrestrial climber to 3 m tall. Rosette reported as 8 cm diam., short stems unknown, climbing stems rounded, internodes 3-10 cm long, 0.2-0.25 cm diam., with a conical axillary bud c. 0.5 by 1 mm, 5 mm above the axil. Leaves coriaceous, sessile, subperfoliate-adnate, those of climbing stems narrowly oblanceolate, (6.8-)9-11 by 2.5-3.1 cm; apex rounded, slightly emarginate and peltate by c. 1 mm; base tapering to c. 1 cm wide, decurrent and perfoliate-adnate for 1-1.5(-2) cm on the stem. Longitudinal nerves 3 or 4 (or 5) on each side of the midrib in the outer 4/5, conspicuous above. Pennate nerves numerous, patent, straight and branching little, running to the margin, conspicuous above but not below. Lower and intermediate pitchers slightly ventricose below, tubular above, to 6.8-7.5 by 1.7-2.3 cm, with two fringed wings 1(-2) mm broad, fringed elements sometimes paired, 5-6 mm long, 2 mm apart; mouth oblique, highly concave, probably ovate, rising at the apex into a slender column; peristome rounded, 0.6-1.2 mm diam., ribs pronounced, 0.1 mm high, 0.2 mm apart, outer edge entire, inner edge, towards the column, with teeth 0.2 mm long; lid broadly ovate to suborbicular, 1.8-2.1 by 1.5-1.9 cm, apex rounded, base cordate, lower surface lacking appendages, with sparsely scattered conspicuous, round, volcano-like glands 0.1-0.2 mm wide, upper surface with up to 8 inconspicuous tentacles 1-2 mm long on each side near the margin; spur 7-9 mm long, filamentous, forked 4-6.5 mm from the apex. Upper pitchers unknown. Inflorescence reported as a short, lax raceme; peduncle 3-10 cm long; partial peduncles 1-flowered, 4-8; pedicels 5-10 mm long. Indumentum of sessile red glands on stems, lower surface of the leaves and outer pitchers; leaf blade margin thickly red-brown hairy with fasciculate erect hairs 0.7-1 mm long; pitcher outer surface, including lid and spur sparsely puberulent with scattered simple erect hairs 0.1-0.3 mm long; indumentum of inflorescence unknown. Colour of outside of dried pitchers white, about 3/4 overlaid with red stripes and blotches, veined dark violet; peristome dark violet; inside of pitcher blue-green; inflorescence unknown. [Cheek & Jebb (2001)].

Distribution: C Sumatra. [Cheek & Jebb (2001)].

Habitat: Sandstone ridges; 700-1000 m. [Cheek & Jebb (2001)].

Notes: In its adnate-perfoliate leaves, slender glabrous stems, tentaculate lid, and diminutive, few-flowered, ebracteate raceme, seen in no other Sumatran species, *N. adnata* is clearly one of the *N. tentaculata* group, having many similarities especially with the most widespread and common of that group, *N. tentaculata* of Borneo and Sulawesi. Nonetheless, *N. adnata* has several features that distinguish it from *N. tentaculata* and most of the rest of the group. The leaves are 3- or 4-nerved with a brown hairy margin (not 1- or 2-nerved with a glabrous margin) and the pitchers have distinct peristome ribs with teeth on the inner edge near the column, conspicuous glands on the lower surface of the broadly ovate-round, cordate lid and a filiform, once-forked spur 7-9 mm long. In *N. tentaculata*, the peristome ribs are indistinct and teeth are absent, the glands are inconspicuous on a narrowly ovate to elliptic, truncate or round-based lid, and the spur is fasciculate, with up to 5 branches at the base, each themselves repeatedly branched.

The description is based only on the holotype, supplemented with data from the protologue. The holotype is sterile, and lacks fully developed upper pitchers, e.g. those with a coiled tendril. Consequently our knowledge of this species is poor and fragmentary. [Cheek & Jebb (2001)].

***Nepenthes adrianii* J.Bartoro & A.Wartono in Ind. J. Pl. Sci. 6(1): 14-15, fig. 1. 2017. Sec. Bartoro & Wartono (2017)**

Description: Epiphytic. Climbing 30 cm-2 m in length, woody-herbaceous, green to orange-red, 0.6-0.8 in diameter, internodes 1-9 cm long, terete-triangular. Stem of the basic terete-triangular 5-9.7 mm diameter, internodes 1-9 cm long. Climbing terete and slightly angular, 0.6-0.8 cm in diameter, part of this stem which angular formed midrib, covered like tomentose internode 2.5-9 cm long, green to orange-red, covered with field like tomentose. Leaves: coriaceous, sessile, lanceolate-spathulate to oblanceolate 15-24 cm by 3-5 cm, apex acute, acuminate, cordate at the base, clasping and decurent the stem for 2/3 its diameter, margin integer, indumentum glabrous or density pubescent hairs. Midrib large, terete on below and flattened on the upper, red to pink, longitudinal veins 4-5 on each side of the midrib, pinnate veins reticulate and inconspicuous; apex obtuse-rounded, margin entire. Tendril insertion usually sub-apical 5-21 cm long, 1-4 mm in diameter, terete green and orange-red less or more long as the leaf, curved downwards. Rosettes and lower pitcher: shortly incurved at the base, ovate, conical to wards, the mouth or more ellipsoidal with two fringed wings 2-4 mm wide, running from top to bottom, the fringed segments filiform 3-6 mm long green pink, glandular region cavers ellipsoid portion of the inner surface. Mouth round oblique rounded to elliptic, peristome cylindrical or slightly exponded 1.5 cm wide. Teach distinct papery and spear shaped, variable in length. Lids ovate to orbicular cordate at the base 4.5 by 3.2 cm, apex rounded, green to pink with appendage. Near the base lid with the collum biggest red near base lid. Spur dorsiventraly flattened 0.6 mm by 1 mm long, divided into 3-4 apex branched acute. Upper pitcher: Tendril more long than leaf and pitcher, shortly incurved from the longing, tendril, 15-16 by 3-4 cm, rounded at the base, ovate conical to wards. The mouth ellipsoidal the well developed. Lower 0.3-0.5 cm ovoid contracted at the hipe, cylindrical above, wings reduced to rib, to short wings 16 cm-1 mm, but sometimes a few fringe elements persistence. Colour of pitcher reddish green to purple. Glandular zone, small spread in the central and the margin to midrib lid. Inflorescence: a

raceme 22 cm long, peduncle 16 cm long 0.2-0.5 mm in diameter opposite the leaf, green, smooth, mostly thicker belows, rachis 7-7.5 cm long. Partial peduncles with one flower has lower pedicels 1.5-2 cm long, terete. Upper pedicles 0.5-1 cm long terete without bracteole, covered dense pubescent white hairs. Tepal 4-5 orbicular-oblong-linear 5 by 2 mm united in base, apex obtuse to acute, covered pubescent white hairs, sometimes tepals reduction. Staminal collum orbicular with for angular 1 cm by 6 mm more long than tepal. The anthers included, which are situated in one whorl and an apical group. [Bartoro & Wartono (2017)].

Distribution: Indonesia, Central Java Province, Slamet Mountain region in the Baturaden Purwokerto. [Bartoro & Wartono (2017)].

Habitat: Extrem epiphytes in lower to highest mountain forest; 950-2000 m a.s.l. [Bartoro & Wartono (2017)].

Notes: May be a synonym of *Nepenthes spathulata* Danser. [Berendsohn (2017+)].

Etymology: The specific epithet refers to Adrian, an Indonesian Nepenthes observer and enthusiasm. [Bartoro & Wartono (2017)].

***Nepenthes aenigma* Nuytemans, W.Suarez & Calaramo in Plants (Basel) 5(2) (23): 2 (-6, fig. 1,2). 2016. Sec. Gronemeyer, Suarez & al. (2016)**

Description: A terrestrial, climbing vine. Stems up to 5 m long, glabrous, terete to triangular in transection, 5 to 6 mm in diameter; internodes are up to 5 cm in length. There are dormant buds situated 3 to 5 mm above each leaf base. The vining stems produce short stems formed above the ground, which produce traps nested or buried in leaf litter. Aged stems eventually die off at the tips but the growing point is taken up by aerial shoots which sprout from the aforementioned dormant buds and which grow rapidly and produce traps. One of the photographs originally taken from these plants, taken at the time of the discovery of the species, clearly shows this behavior (McPherson 2012).

Leaves are sessile, linear to ensiform with rounded to acute apices. They are up to 19 cm long by 5.4 cm wide and with 3 to 4 nerves on either side of the midrib; bases are strongly decurrent to the stems where they form narrow wings.

Lower pitchers are unknown. Intermediate pitchers originate abruptly from the tendril, which is at the side or the rear of the pitcher. Tendrils are 35 cm long, uncoiled and approx. 2 mm in diameter. The intermediate pitchers are barrel-shaped though the profile is slightly more elongated on those that are not buried in leaf litter. They are entirely cylindrical in transection and without a hip. They are 11.7–15.9 cm high by 4.1–6 cm in diameter. Wings are 4.5 mm wide with fringes often branched and measuring up to 4.85 mm long. The pitcher opening is circular and oblique to an angle of about 40 degrees when viewed from the sides. The lid is 41–48 mm long by 37–41 mm wide and has a cordate base. Lid glands are oblong, without borders and arranged in a V-like manner. The peristome is rounded in transection, up to 7 mm wide from the front of the mouth to 8.5 mm in breadth near the lid. Beneath the lid, the peristome is appressed to form a short neck. Peristome ribs are 0.5 mm high and spaced 0.8 mm apart. Inner edges of ribs end in downward pointing teeth up to 0.8 mm long from those near the lid but shorter elsewhere. Outer peristome margins are curved and slightly crenellated. The spur is 2.5 mm long and bifid at the tips.

Upper pitchers originate rather abruptly from the tendrils but less so than those in intermediate pitchers; they are cylindrical and slightly curved forward with the bases widely infundibular; 7.1 to 11 cm high by about 3 cm wide near the pitcher mouth. The peristome is somewhat flattened, 4.7 mm wide and broadening to 6.2 mm near the lid. Peristome ribs are 0.5 mm high and spaced 0.7 mm apart. Inner margins bear barely discernible teeth; outer margins are only moderately curled and only sparsely crenellated. The pitcher opening is circular and oblique to 30 degrees from the horizontal. The lid is oblong with cordate base, hardly keeled beneath, lacks an appendage and is 29 mm long and 25 mm wide. Lid glands are more numerous near the lid base, crateriform but very tiny. Wings are 2.4 mm wide with filaments up to 2.9 mm long, end abruptly at ⅔ to ⅞ of the pitcher length and as such do not reach the pitcher mouth. Higher up, the wings are reduced to narrow ridges. Sometimes, these wings are not symmetrical, one wing being markedly longer than the other one on the same pitcher. The spur is simple and 1.8 mm long. Tendrils are twice coiled.

The inflorescence develops from the axils, sub-terminal on stem. The male inflorescences measure 15–30 cm with mostly two-flowered partial peduncles. It is pubescent with flowers 6–9 mm in diameter; the pedicel is 6–8 mm long. Four tepals are present with elliptic apex and acute bases to 5 mm long; staminal column 4–5 mm long. Female flowers have an elliptic corolla, with bases and apices acute. Four pistils are present with fused apices, being white in color. The infructescence is unknown.

Indumentum is not significantly present; the plant is mostly glabrous, but short (0.35 mm), brown hairs are found on undeveloped traps and their subtending tendrils. In opened pitchers, indumentum is confined to the spur.

The color of the stems is bright green to dark reddish; the leaves are green with green midribs adaxially, green to red abaxially. Intermediate pitchers are pale green with elongated vertical dark red spots that often coalesce into larger blotches and which are densest underneath the lid. Lids are pale green with numerous tiny red spots that are mostly distributed on the margins. The peristome is cream to reddish, less commonly dark red, on those traps that form on

the ground but is green with dark red suffusion on aerial pitchers. Upper pitchers are entirely green. Tendrils of intermediate pitchers are colored red, and green on the upper traps. [Gronemeyer, Suarez & al. (2016)].

Distribution: Philippines, Luzon Island, Ilocos Norte province [Gronemeyer, Suarez & al. (2016)].

Habitat: *Nepenthes aenigma* grows terrestrially in leaf litter at altitudes ca. 1200 m a.s.l. in deep shade in windswept ravines. The vegetation where the observed populations occur consists mostly of dense stands of bamboo, interspersed with various species of rattan and *Pandanus*. The vining plants have been seen to scramble and climb over these often spiny plants, but were not seen to direct their growing tips and reach for brighter light. A mossy forest formation is absent despite the elevation in which this new *Nepenthes* occurs. [Gronemeyer, Suarez & al. (2016)].

Etymology: The specific epithet is derived from the Latin word aenigma, which means ”puzzling”, a reference to the very unusual ecological preferences of this taxon. [Gronemeyer, Suarez & al. (2016)].

Conservation: Based from the very low number of plants found, it is easy to assess *N. aenigma* as “Critically Endangered” (CR) under IUCN [IUCN (2013)], but it should be noted that all plants from the three known sites are not in any way threatened by poaching or habitat disturbances. Pending further population studies of this species, we recommend that *N. aenigma* be deemed “Data Deficient” (DD) with regards to its conservation status. [Gronemeyer, Suarez & al. (2016)].

***Nepenthes alata* Blanco, Fl. Filip.: 805. 1837. Sec. Cheek & Jebb (2013)**

= *Nepenthes blancoi* Blume in Mus. Bot. Lugd.-Bat. 2: 10. 1852.

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). [Cheek & Jebb (2013)].

Habitat: Mossy montane forest, altitudinal range 550 m a.s.l. and above. Ecological data on this species is lacking on most specimen labels. [Cheek & Jebb (2013)].

Notes: This is the *Nepenthes* 'hairy alata' of horticulture. [Cheek & Jebb (2013)].

***Nepenthes albomarginata* T.Lobb ex Lindl. in Gard. Chron. 1849: 580. 1849. Sec. Cheek & Jebb (2001)**

– *Nepenthes albocincta* Hort. ex Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 38. 1908, nom. nud.

= *Nepenthes albomarginata* var. *rubra* Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 38. 1908. *Nepenthes albocincta* var. *rubra* Hort. ex Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 38. 1908, nom. nud.

– *Nepenthes albomarginata* var. *typica* Beck in Wiener Ill. Gart.-Zeitung 20: 191. 1895, nom. inval.

= *Nepenthes albomarginata* var. *villosa* Hook.f., in: de Candolle, A. L. P. P., Prodr. 17: 103. 1873.

= *Nepenthes laevis* C.Morren in Belgique Hort. 2: 234, pl. 40. 1852.

= *Nepenthes tomentella* Miq., Fl. Ned. Ind. 1(1): 1075. 1858.

Description: Terrestrial climber 2(-10) m tall. Stem cylindrical, 0.3-0.5 cm diam., sometimes slightly flexuose, internodes of climbing stems 3-9 cm long. Leaves coriaceous, sessile, narrowly oblanceolate to spathulate, basal rosette leaves 20-36 by 2-3.5 cm, apex ± acute, the basal 4 cm abruptly narrower, ± 1 cm wide; climbing leaves 7-17 by 1.2-2 cm, the basal part often ± abruptly narrower or gradually tapered; apex acute, base not decurrent, clasping half the stem circumference. Longitudinal nerves 1 on each side of the midrib near the margin, inconspicuous. Pennate nerves numerous, held at ± 90° from the midrib, not reaching the marginal vein, inconspicuous. Lower pitchers ellipsoid at base, tapering gradually into the cylindrical upper half, 8.5-15 cm long, 3.5-6 cm wide at base, tapering to 2-3 cm wide above, with two fringed wings to 6 mm broad, extending to above the level of the peristome, the fringed elements to 4 mm long; mouth ± ovate, oblique, straight; peristome ± cylindrical in section, 1 mm wide, with fine, closely spaced ribs, 0.1-0.15 mm apart (with a bright white or pale brown band immediately below the peristome composed of densely packed hairs), outer edge entire, inner edge lacking teeth; lid ovate, c. 4 by 3 cm, lower surface without appendages, nectar glands densely packed, elliptic, crater-like, ± 0.3 mm long; spur simple, 1-3(-7) mm. Upper pitchers as lower pitchers but cylindrical to infundibulate, 7.5-12 by 1.2-3.2 cm or flaring from 0.8(-1.8) cm at base to 3.2(-6) cm at apex; with two ridges to 1 mm broad, occasionally with short wings towards the pitcher mouth, and then usually extending to above the level of the peristome, lacking fringed elements. Male inflorescence 11-45 by 3 cm; peduncle 6-13 cm long, 1.5 mm diam. at base; partial peduncles 20-80, (1- or) 2- (or 3-)flowered, (0-)3(-6) mm long; bracts rarely present; pedicels 14-20 mm long; tepals 1.75-2.5 by 1.2-1.5 mm; androphore 0.7-2 mm long; anther head 0.5-1 by 1 mm. Fruits with valves 25-29 by 2-2.2 mm. Seeds fusiform 10-12 mm long. Indumentum a mixture of small, white, 5-8-armed stellate hairs and large patent sparsely branched red, bristle-like hairs 0.3-0.7 mm long; the stem, lower leaf, pitcher and inflorescence subglabrous to tomentellous with dark coppery hairs when young, later inconspicuous or whitish. Colour of pitchers green, red or green mottled with red, with a conspicuous glistening white band below the mouth. [Cheek & Jebb (2001)].

Distribution: Sumatra, Peninsular Malaysia (absent from Singapore) and Borneo. [Cheek & Jebb (2001)].

Habitat: Lowland kerangas forest, submontane forest or exposed ridge-tops, on limestone or sandstone; sea level to 1100 m. [Cheek & Jebb (2001)].

Notes: This species is sometimes confused with *N. gracilis*, but is immediately distinguished from this and all other species by the bright white (less usually brown), narrow band of densely packed silky hairs just below the peristome and the dense long coppery red indumentum on young stems and leaves.
Herbarium specimens fall largely into two forms, those with upper pitchers infundibulate, with a sub-triangular lid, and those with narrow, pencil-like, tubular pitchers with an orbicular lid. Clarke, *Nepenthes* of Borneo (1997), has drawn attention to the possibility that this species specialises in trapping termites. [Cheek & Jebb (2001)].

***Nepenthes alfredoi* V.B.Amoroso & Lagunday in Philippine J. Syst. Biol. 11(2): 15 (-16, fig. 2-3). 2017. Sec. Amoroso, Lagunday & al. (2017)**

Description: Terrestrial climber 8-12 m tall, scrambling in tall trees 12-30 m tall or on neighboring vegetation, glabrous, terete to triangular in transection, up to 7 mm in diameter; climbing stems with internodes up to 6 cm in length. Hydathodes evenly distributed in the stem, upper and lower leaf surface, midveins, tendrils and pitcher exterior. Leaf blade broadly linear to ovate up to 27 cm long and 4.3 cm wide, obtuse to rounded leaf apex, base deccurent to petiole, with 2 veins running on either side of the midrib. Midvein and leaf margin pubescent, leaf upper surface dark green and light green in the lower surface. Petioles ca. 3 mm wide, ca. 1 mm thick, 2 mm wings on both sides, broadly U-shaped in section, not inrolled, tapering towards the wings. Rolls abaxially upon maturity. Lower pitchers up to 12 cm tall and 4.5 cm wide in the inflated zone, inflated in the bottom thirds with a distinct hip then becoming cylindrical in the mid-region becoming cylindrical to slightly funnel-shaped towards the opening. Wings up to 0.8 cm wide with entire to sinuate margins and run down the entire trap anterior extending for some distance along the tendril. Wing filamentous fringes are up to 8 mm long filiform ca. 0.5 mm in diameter, triangular base ca. 2 mm long, widest at base ca. 1 mm. The wings and fringes are pubescent. Pitcher opening ovate acuminating towards the lid forming the neck. Tendrils not coiled, up to 16 cm long and 1.5 mm in diameter. Exterior of lower pitchers olive drab green with blotches of garnet/blood red or suffused with ruby red depending on sunlight exposure. Interior of the pitcher is olive drab green. Tendrils and the leaf midribs suffused red.
Peristome teeth are absent with nectar glands in the semilunar depressions between the ribs, with canals emptying into the inner pitcher wall. Peristome cylindrical, ca. 5 mm wide, ribs ca. 0.1 mm wide, 0.1 mm thick, ca. 0.2 mm spaces in between ribs, tapering posteriorly forming a slightly anteriorly inclined neck. Lids ovate, up to 5.3 cm long and 4.1 cm wide, suffused with blood red. The basal upper surface may be covered with wax, may have orbicular to elliptic dark gland-like spots ca. 1 mm in diameter. Triangular lid appendage is basal, up to 4 x 7 mm, tapering towards the apex, well-developed lid appendage rounded apex curve posteriorly toward the lid base. Nectar glands ca. 0.2 mm are evenly distributed in the lid's lower surface including the appendage, elliptic in the centre and orbicular elsewhere. Lid spur filiform, pubescent and mostly unbranched, may be covered with wax, up to 1.2 cm long and up to 1 mm in diameter.
Upper pitchers up to 19 cm tall and 8 cm wide, funnel-shaped and slightly inflated in the bottom third with a distinct hip and tapering posteriorly towards the tendril, cylindrical mid-region, slightly funnel-shaped towards the opening. Wings up to 0.8 cm wide with entire to sinuate margin and running down the entire trap anterior, extending for some distance along the tendril, filamentous fringes up to 0.7 cm long. Tendril coiling and terete in cross section. Peristome occasionally with slightly elevated anterior. Lid and peristome morphology consistent with lower pitchers, mostly olive drab.
Male inflorescence a raceme up to 41 cm long, pubescent, bracts filliform up to 3 mm long, ca. 0.2 mm in diameter, partial peduncles bearing two flowers up to 6 mm long and 1 mm in diameter, pedicels up to 10 mm and 0.2 in diameter. Occasionally one flowered towards apex of the inflorescence. Petals tetramerous, ovate, up to 3 x 2.5 mm with orbicular to elongated nectar glands ca. 0.1 x 0.2 mm in the upper surface. Androphore are 2 mm long and 0.5 mm in diameter, anther-head subglobose 1 mm in diameter. Pollen in tetrads.
Female inflorescence is a raceme up to 40 cm long. Bracts absent, pubescent, partial peduncles up to 5-10 mm long, 1 mm in diameter, shortest at the apex, pedicels 4-10 mm long, 0.5 mm in diameter, shortest at the apex. Flowers without partial peduncles have pedicels that are 4-15 mm long ca. 0.2 mm in diameter, shortest at the apex. Bearing tetramerous narrow ovate petals 3 x 2 mm with orbicular to elongated nectar glands ca. 0.1 x 0.2 mm on the upper surface. Capsule bearing the seeds up to 2 cm long and 0.4 cm wide. Seeds filiform, appendages up to 1.2 cm long. [Amoroso, Lagunday & al. (2017)].

Distribution: Philippines, Mindanao, along the ultramafic ridges of Brgy. Luzon, Gov. Generoso, Davao Oriental in the Mt. Hamiguitan range [Amoroso, Lagunday & al. (2017)].

Habitat: Lowland mixed dipterocarp forest at 175-345 m a.s.l. [Amoroso, Lagunday & al. (2017)].

Etymology: The specific epithet honors Alfredo Bolante Sr. “Pidoy”, a forest guard and well-trained local researcher of MHRWS who first observed and collected the new species described herein. [Amoroso, Lagunday & al. (2017)].

Conservation: Critically Endangered [CR B1ab (i)] (IUCN 2016); extent of occurrence estimated to be less than 10 km². [Amoroso, Lagunday & al. (2017)].

***Nepenthes* ×*alisaputrana* J.H.Adam & Wilcock in Reinwardtia 11(1): 37. 1992. Sec. Cheek & Jebb (2001)**

Notes: Specimens of this hybrid share the triangular stem, smaller lid with glandular crest, and pitcher coloration of *N. burbidgeae*, while with *N. rajah* they share the peltate leaf tip and the expanded peristome with an undulate outer edge.
As with other wild collected hybrids, the parentage is assumed rather than known. *Nepenthes burbidgeae* is an uncommon species, as is *N. rajah* and this hybrid is correspondingly a great deal rarer. [Cheek & Jebb (2001)].

Notes: [Move to typification] Four duplicates (at UKMS) are cited as the holotype in the protologue, of these one (sheet 4) appears to be the only sheet annotated with "Type Specimen", although clearly all duplicates were used in the description by the authors. As sheet 4 comprises a pitcher alone, sheet 3 which includes leaf-blades and stem material would probably be a better lectotype. Without having seen the material we have deferred lectotypifying any particular element. [Jebb & Cheek (1997)].

Hybrid parent formula: *Nepenthes burbidgeae* Hook.f. ex Burb. × *Nepenthes rajah* Hook.f. [Jebb & Cheek (1997)].

***Nepenthes alzapan* Jebb & Cheek in Phytotaxa 100(1): 59 (57-60, fig. 1). 2013. Sec. Cheek & Jebb (2013)**

Description: Terrestrial climber (probably) to at least 0.4 m tall. Stems alabaster to pale brown- coloured, acutely triangular in transverse section, 5(–7) mm diam., two of three angles extended into wings up to 3–4 mm wide, decurrent from the leaves, internodes 1.3–2 cm long, glabrous but with scattered sessile red-coloured glands. Leaves coriaceous, sessile, ligulate–oblong, (7–)8–13.5 × 1.5–2.5(–3.4) cm, apex acute, base clasping the stem for 2/3 its circumference, decurrent almost to the node below as a wing up to 4mm wide. Longitudinal nerves 5–7 on each side of the midrib, almost evenly scattered. Pennate nerves irregular, oblique. Indumentum as stem. Lower pitchers not recorded. Upper pitchers subglobose to globose- infundibuliform, 6.5–6.8 × 4.2–5 cm, with moderately sparse appressed simple hairs 0.2–0.5 mm long; wings present only for 5–17 mm of the pitcher length, at the midpoint or apex, 1–2 mm wide, with fringed elements 1.5 mm apart, 3–4mm long with moderately sparse simple or basally 2–3-branched hairs 0.1–0.15 mm long; mouth suborbicular, forming the broadest part of the pitcher; peristome subcylindrical to flattened, 6–10(– 14)mm broad, ribs 1.5 mm apart, about 0.25 mm high, outer margin entire, revolute, inner margin dentate, teeth curved, 0.5–0.75 mm; lid elliptic, 2.5–2.7 × 2.2–2.3 cm, apex rounded, base truncate; lower surface lacking appendages, midline thickened and lacking nectar glands which occur only in two curved lateral bands, each with 35–110 glands, densest at base of the lid, where 3 per mm²; nectar glands slightly transversely elliptic or suborbicular 0.3–0.5 × 0.3–0.5mm, with a thin marginal rim 0.05 mm thick; sessile red-coloured glands 0.05–0.07 mm in diameter, about 4 per mm², spur not recorded. Male inflorescence 31.5– 42 × 1.5–2.5 cm, indumentum dense, completely covering the surface, hairs simple, bronze-coloured, 0.15–0.35 mm long; peduncle 20–22.5 cm long, 3–4.5 mm diam.; rhachis 11.5–20 cm long, with partial-peduncles 80–110, 1-flowered; bracts inconspicuous, at apex of inflorescence only, about 0.2 mm long, inserted 0.3–1.5 mm from junction with rhachis; pedicels 7–8(–10) mm long; tepals red, narrowly elliptic, 3.5 × 1.5–1.8 mm, lower surface and margins completely covered in sinuous thin-walled bronze-coloured hairs about 0.1 mm long, apices round; staminal column 2–2.5 mm long, with thinly scattered ± patent copper-coloured hairs 0.25–0.35 mm long; anther-head globose, about 1.5 mm diam. Female inflorescences, infructescences and seed unknown. [Cheek & Jebb (2013)].

Distribution: Philippines, Luzon, Sierra Madre Mts., Mt Alzapan [Cheek & Jebb (2013)].

Habitat: Submontane mossy forest, 1800 m a.s.l. [Cheek & Jebb (2013)].

Etymology: The epithet alzapan refers to Mt. Alzapan, the type locality. [Cheek & Jebb (2013)].

Conservation: *Nepenthes alzapan* is known only from three individuals at most, at a single location on an island which has seen high-levels of habitat-loss in the twentieth century (Sohmer & Davis 2007). The species appears not to have been seen alive since 1925, and may already be extinct as is thought to be the case with *N. robcantleyi* Cheek (2011: 678). *Nepenthes alzapan* is here assessed as Critically Endangered under IUCN (2001), Criterion D. [Cheek & Jebb (2013)].

***Nepenthes ampullaria* Jack in Comp. Bot. Mag. 1: 271. 1835. Sec. Cheek & Jebb (2001)**

– *Nepenthes ampullacea* H.Low ex W.H.Baxter, Suppl. Hort. Brit.: 593. 1850. *Nepenthes ampullacea* H.Low, Sarawak: 69. 1848, nom. nud.

= *Nepenthes ampullaria* f. *vittata* Hort. ex Beck in Wiener Ill. Gart.-Zeitung 20: 150. 1895.

= *Nepenthes ampullaria* var. *geelvinkiana* Becc., Malesia 3: 8. 1886.

= *Nepenthes ampullaria* var. *guttata* Moore in Gard. Chron. 1872: 360. 1872.

= *Nepenthes ampullaria* var. *longicarpa* Becc., Malesia 3: 8. 1886.

= *Nepenthes ampullaria* var. *microsepala* Macfarl. in Nova Guinea 8: 340. 1910.

= *Nepenthes ampullaria* var. *racemosa* J.H.Adam & Wilcock in Mal. Nat. J. 44: 30. 1991.

= *Nepenthes ampullaria* var. *vittata major* Mast. in Gard. Chron. 1872: 542. 1872.

= *Nepenthes ampullaria* var. *vittata* André in Ill. Hort. 24: 272. 1877.

Description: Terrestrial climber to 15 m tall, with many terrestrial and some aerial rosettes. Stem cylindrical, 1-1.5 cm diam., internodes 1.5-7 cm long. Leaves sessile or with a short, poorly defined petiole, blade thickly chartaceous, lanceolate to spathulate; rosette leaves 2-5 by 0.5 cm, climbing leaves c. 25 by 6 cm; apex acute, rarely acuminate, base attenuate, clasping the stem by 1/2 its circumference. Longitudinal nerves 3-5 on each side of the midrib, in the outer 1/3 or 1/2. Pennate nerves numerous, oblique, straight, nearly reaching the margin. Lower pitchers obliquely urceolate, semi-circular on dorsal side, almost flat ventrally, to 10 by 9 cm, with two fringed wings to 1.5 cm broad, the fringe elements 0.5-1 cm long, 0.2 mm apart; mouth oval, almost horizontal, straight; peristome flattened, to 1.5 cm wide, and sloping steeply inwards; lid narrowly oblanceolate, to 4 by 1.5 cm, apex rounded, base cuneate, lower surface lacking appendages, nectar glands extremely sparse, usually 6-12, sometimes absent, orbicular, broadly bordered, 0.4-0.5 mm diam., central pore c. 0.1 mm diam.; spur simple or branched, up to c. 10 mm long. Upper pitchers generally not developed, rudimentary, broadly infundibuliform, c. 2 by 2 cm. Male inflorescence a panicle to 40 by 4-5 cm; peduncle 2.5 cm long, 3 mm diam. at base; partial peduncles 8-12(-50) cm long, fasciculate at apex, (1-)3-6(-10)-flowered; bracts foliose, spathulate, 12-14 by 4-5 mm, inserted 0-2 mm from base of partial peduncles; pedicels 7-8 mm long; tepals broadly elliptic, 4-5 by 3-5 mm, androphore 3-5 mm long; anther head 2 by 1.5 mm. Indumentum densely velvety in young parts, under leaf blades, especially margins, on young pitchers and on the inflorescence; hairs red or brown, mostly simple, c. 0.3 mm long. Colour of pitchers usually green, deeply flecked with maroon, rarely entirely red, sometimes almost whitish yellow, with pale pink flecks, likewise the leaves of these pitchers may be a pale yellow-pink if buried beneath leaf litter; tepals green to yellow; indumentum deep red. [Cheek & Jebb (2001)].

Distribution: Thailand, Sumatra, Peninsular Malaysia, Borneo, New Guinea. [Cheek & Jebb (2001)].

Habitat: Damp shady-forest, in Borneo swamp and kerangas forest, in New Guinea Araucaria forest, also in secondary forest, open microphyllous vegetation, or swamp grassland; sea level to 200(-2100) m. [Cheek & Jebb (2001)].

Notes: The globular pitchers of *N. ampullaria* with their reflexed linear-oblong lids are not easily confused with any other species. The habit of this species is characteristic, with numerous rosettes sunken in the leaf litter or moss of the forest floor, and tall climbing stems which lack upper pitchers, though pitchers may be borne in rosettes arising from stems up to 2 m from the ground. Recently a few isolated cases of plants bearing upper pitchers have been reported in Brunei and Peninsular Malaysia. These are small, infundibuliform pitchers no more than 2 cm high, but extremely uncommon.
The species is apparently absent from the Moluccas and Sulawesi, but the eastern (New Guinea) and western (Thailand to Borneo) populations are morphologically indistinguishable.
Hybrids between this species and *N. gracilis (N. trichocarpa*) and *N. rafflesiana (N. hookeriana)* are widespread though scarce, and are treated in this account. [Cheek & Jebb (2001)].

Notes: [Nomenclature of *N. ampullaria* Jack: IPNI (acc. 23 feb 2017; urn:lsid:ipni.org:names:603652-1) gives the protologue reference as "Desc. Malay. Pl. iii. [1823 ?] 23.". The (posthumous) publication in Comp. Bot. Mag. is supposed to be a reprint from the "Malayan miscellanies". Part 1 and 2 of the "Descriptions of Malayan Plants" can be found in Vol. 1 (1820) of that publication; an unnumbered subsequent part with the same title in Vol. 2 (1822). These two volumes are accessible on-line under https://books.google.de/books?id=fBYIAAAAQAAJ [acc. 24 Feb 2017]. Neither of them contains *Nepenthes*. See also note under *N. rafflesiana*. [Berendsohn (2017+)].

[Nomenclature of *N. ampullaria f. vittata* Beck:] Original entry in IPNI: "*Nepenthes vittata* hort. ex Beck, Wiener Ill. Gart.-Zeitung (April 1895) 150." Beck's text clearly states that this is a forma ("Formen der *N. ampullaria:* 1. *vittata* Hort."). [Berendsohn (2017+)].

***Nepenthes andamana* M.Catal., Nepenthes Thailand.: 34 (fig. 1-6). 2010. Sec. Catalano (2010)**

Description: Terrestrial climber to 3 m tall. Stem terete, 5 mm in diameter, internodes 2.5-3.5 cm long. Leaves coriaceous, 0.5 mm thick, lamina linear to lanceolate, 15-30 cm long, 2-3.5 cm wide, apex acute to narrowly acuminate, base attenuate and sessile, clasping the stem by three quarters of its circumference; longitudinal veins 3 on each side of the midrib in distal quarter of the lamina, pinnate veins arising obliquely from midrib; tendrils terete, 8-18 cm long, 1.5-2.5 mm in diameter, coiling in upper pitchers. Lower pitchers 10-16 x 3.5-5 cm, ovate in the lower half and narrowing above, hip at the mid-section; two alae, 4-6 mm wide, run down ventral exterior surface from mouth to tendril, fringed with narrow filaments; pitcher mouth oblique, oval; peristome cylindrical, 4-10 mm

wide, teeth 0.5-1 mm long; lid orbicular to broadly ovate, 3-4.5 x 3-4.5 cm, larger than the mouth, often vaulted or bent towards the mouth, base cordate, lower surface without appendages, crateriform glands densely arranged and numerous, to 0.5-1 mm in diameter along the midrib; spur 5-7 mm long, simple, rarely branched; longitudinal veins 4-6 on each side of midrib. Upper pitchers 10-16 x 2.5-3 cm, tubulose or narrowly infundibular; alae 0-1 mm wide; pitcher mouth oblique, orbicular or broadly ovate; peristome as for lower pitchers but with outer margin often slightly lobed; lid as for lower pitchers. Male inflorescence a raceme, to 110 cm, peduncle 45-65 cm long, rachis 20-45 cm long with ca. 40-190 solitary flowers borne on pedicels 3-6 mm long, occasionally on 2-flowered partial peduncles, androphore to 1 mm; tepals elliptic, green when young, then red, 3-4 x 2-2.5 mm; a bract, to 2 mm long, is often present at the base or on the lower half of the pedicel. Female inflorescence as for male inflorescence, but rachis 17-22 cm long, with solitary flowers borne on pedicels 5-15 mm long; tepals elliptic, green, 4 x 1.5 mm; bracts absent or greatly reduced in size and number. Indumentum of orange or brown hairs, 0.1-0.8 mm long, covering the inflorescence and the bases, tips, margins and midrib of the leaves; stem glabrous; leaf indumentum caducous, absent in the lower part of plant. Colour: leaves light green, often with a reddish hue; stem, midrib and tendril green to red; lower pitchers green to orange with red stripes or completely red, with red blotches over the inner, non-glandular zone, peristome green or white to orange or red, lid orange to red, marked by fine red stripes; upper pitchers yellow to white, with or without red blotches over the inner, non-glandular zone, peristome white, lid green to white or yellow. [Catalano (2010)].

Distribution: Southern Thailand, coastal Phang-nga Province. [McPherson (2011)].

Habitat: In sandy soil, on open savannahs and grasslands, at sea level. [Catalano (2010)].

Notes: *Nepenthes andamana* is closely related to *N. kongkandana*, *N. bokorensis*, *N. kerrii* and *N. suratensis*. It differs from *N. kongkandana* in having linear to lanceolate leaves (vs. obovate) and a caducous indumentum limited to the tips and bases of upper stem leaves (vs. a persistent indumentum covering the whole plant). It differs from *N. bokorensis* in having bracteate pedicels (vs. abracteate), a caducous indumentum limited to the tips and bases of upper stem leaves (vs. a persistent indumentum of variable distribution), narrower leaves (2-3.5 cm vs. 7-8 cm) and peristome (10 mm vs. 20 mm). It differs from *N. kerrii* in having linear to lanceolate leaves (vs. obovate) and a caducous indumentum limited to the tips and bases of upper stem leaves (vs. a persistent indumentum limited to leaf axils). It differs from *N. suratensis* in having red flowers (vs. green with red margins), a shorter androphore (1 mm vs. 3 mm), flower bracts that are bent outwards (vs. bracts that are bent inwards), a caducous indumentum, 0.8 mm long, limited to the tips and bases of the upper stem leaves (vs. caducous indumentum, 0.3 mm long, covering the whole upper part of plant), less variable glandular zone (1/2 vs. 1/3 to 2/3 of pitcher length), narrower wings in upper pitchers (0-1 mm vs. 0-3 mm) and lower pitchers (up to 6 mm vs. up to 12 mm), orbicular to broadly ovate lids larger than the mouth, with flat margins and without depression (vs. broadly to narrowly ovate lids smaller than mouth, with wavy margins and with a small depression under the tip), a longer spur (5-7 mm vs. 3-5 mm), an ovate mouth, as large as 1/4 of the lower pitcher (vs. triangular mouth, as large as 1/3-1/2 of the lower pitcher), whitish upper pitchers with peristome slightly lobed on outer margin (vs. greenish upper pitchers without a lobed peristome) and a cylindrical peristome (vs. flattened). [Catalano (2010)].

Nepenthes appendiculata **Chi.C.Lee, Bourke, Rembold, W.Taylor & S.T.Yeo, in: McPherson, S., New Nepenthes 1: 24 (-32; figs. 15-21). 2011. Sec. Lee, Bourke & al. (2011)**

Description: Climbing stems cylindrical, up to 2 m long, 6-9 mm in diameter, internodes 8-9 cm long, axillary buds spike-like.

Leaves of the climbing stem sub-petiolate, lamina elliptic, to 14 cm long and 6 cm wide, apex acute, with 2 longitudinal veins in the outer ¼ of the lamina. Petiole decurrent for the entire length of the internode. Tendrils ca. 30-40 cm long, 2-5 mm in diameter, coiled in the middle.

Lower pitchers originating laterally from the tendril, sub-cylindrical and slightly swollen in the lower half, up to 10.5 cm tall and 3 cm wide, with two fringed wings up to 2 mm wide in the upper half, fringe elements 4-5 mm long, ca. 2 mm apart. Mouth ovate, inclined at ca. 45° angle, attenuated at base of lid. Peristome rounded on inner and outer edge, to 8 mm wide, widest at rear of mouth, teeth on inner margin comb-like, up to 0.5 mm long, ribs ca 0.2 mm apart. Interior of pitcher with waxy zone in upper half, lower half glandular. Spur inconspicuous. Lid broadly triangular to slightly cordate, 2.6 cm long and 2.5 cm wide, flat, underside with small, scattered inset glands and several large, raised glands near the base, with a flat, filiform appendage 1.5 mm long near the base and a filiform appendage 3 mm long at the apex.

Upper pitchers originating gradually from a curved, tubulose base, with a curve ca. 5.5 cm wide, ovate and swollen in the lower half, constricting at an obvious hip and cylindrical in the upper half, up to 24.5 cm tall and 4.8 cm wide, lacking wings, but with two prominent ventral ridges running nearly the length of the pitcher. Mouth sub-orbicular, inclined at ca. 45° to horizontal, attenuated at base of lid. Peristome rounded on inner and outer edge, to ca. 5 mm wide, with scalloped edges, widest at rear of mouth, teeth on inner margin inconspicuous, ribs ca. 0.3 mm apart. Interior of pitcher with waxy zone in upper half above hip, and glandular in the lower half. Spur simple, filiform,

inserted ca. 1 cm from base of lid, 1.8 cm long. Lid cordate, 5.6 cm long and 4.9 cm wide, flat, underside completely covered with small, inset glands, with a central ridge ca 1.5 mm high near the base of the lid, extending into a flat, hook-shaped appendage 1.3 cm long, and at the apex of the lid extending into a stalked, woody appendage ca. 3.4 cm long and 0.8 cm wide, the underside of which is covered with 9-15 very large (up to 2.5 mm diameter), swollen nectar glands.
Male inflorescence a racemose panicle, ca. 10 cm long, peduncle 2.5 cm long, 2 mm in diameter. Partial peduncles 2-flowered, ca. 6 mm long, lacking bracts.
Female inflorescence up to 24 cm long, peduncle 10 cm long, 6 mm in diameter. Partial peduncles 2-flowered, 1.5-2 cm long, lacking bracts. Approximately 75 fruit in total, each up to 4.5 cm long.
Indumentum moderately dense and partially caducous on stems, undersurface and margin of leaves, tendrils, and inflorescence, consisting of short red-brown hairs. [Lee, Bourke & al. (2011)].

Distribution: Malaysia, Sarawak, Hose Mountains. [Lee, Bourke & al. (2011)].

Habitat: Epiphytically in upper montane mossy forest at 1450-1700 m a.s.l. [Lee, Bourke & al. (2011)].

Etymology: Named for the unique and distinctive glandular appendages found on the lower surface of the lid. [Lee, Bourke & al. (2011)].

Conservation: Assessed as Data Deficient using the IUCN (2001) criteria. [Lee, Bourke & al. (2011)].

***Nepenthes argentii* Jebb & Cheek in Blumea 42(1): 19, f. 1. 1997. Sec. Cheek & Jebb (2001)**

Description: Terrestrial, monopodial shrub c. 30 cm tall. Stem erect, terete, 2-4 mm wide, 22 cm apparently buried in leaf litter, 4 cm above ground, with leaves congested (4 per cm of stem), internodes obscured. Leaves thickly coriaceous, more or less petiolate; blade obovate-oblanceolate, 3.5-4 by 1.4-2.2 cm, apex obtuse to truncate, base cuneate-decurrent; petiole 1-1.8 cm long, sheathing, clasping the stem for about half its circumference, not auriculate or decurrent. Longitudinal nerves 1 or 2 on each side of the midrib in the marginal half, mostly inconspicuous. Pennate nerves inconspicuous. Lower pitchers infundibuliform-shortly cylindrical, 4-4.7 by 2.2-2.4 cm, with two fringed wings 1.5-2 mm wide, fringed elements 3 mm long, often grouped and webbed together in clusters of 2-4, elements or groups of elements 1-2 mm apart; mouth subcircular, almost flat, abruptly rising in the rear to provide a stout column 5 mm high, 2.5 mm wide, for the lid; peristome subcylindrical, c. 1 mm wide, ribs laterally flattened, highly pronounced, 0.1-2 mm high, 5 mm apart, inner surface with stout, incurved teeth, up to 1 mm long near the column, outer surface never sinuate, adnate to underside of lid, forming a short transverse wall c. 7 by 2-3 mm high, with triangular teeth below; lid suborbicular, to 1.3 by 1.8 cm, apex rounded, base cordate, lower surface lacking appendages, glands very dense, pit-like, near the centre elliptic, 0.2 by 0.3 mm, near the edge orbicular, 0.15 mm wide; spur stout, rounded 1-1.5 mm long. Upper pitchers apparently not formed. Male inflorescence unknown. Fruit (mature) unknown. Seed unknown. Indumentum absent from stem and upper surface of leaves, lower surface of leaf and tendril densely invested with persistent patent red hairs c. 2 mm long, simple or with a short inconspicuous branch, remainder of blade with red sessile glands only. Pitcher outer surface and lid densely invested with minute reddish stellate hairs 0.1-0.2 mm wide, with 3-5 erect arms, and with sparser appressed, twisted, sub-simple hairs 2-3 mm long bearing up to 5 or 6 short branches, giving a slightly matted appearance and felty texture. Inflorescence axis with whitish hairs c. 0.6 mm long, particularly at base and apex; tepals glabrescent; carpels densely hairy with appressed reddish hairs. Colour of pitchers buff mottled red, peristome dark purple, lid spotted red underneath, mostly mottled red on top. Young fruit brown. [Cheek & Jebb (2001)].

Distribution: Philippines: Sibuyan, Romblon Province [Cheek & Jebb (2001)].

Habitat: Subalpine shrubbery with smooth wind-clipped canopy 30 cm tall on a ridge of ultramafic rock; 1400 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes argentii* is unusual in that it has a long, vertical, subterranean rhizome. It seems that the stem may grow slowly upwards, keeping pace with the accumulation of organic matter on the surface which continually buries the lower portion of the stem as with *Drosera rotundifolia* in a *Sphagnum bog.* More field studies are needed to verify this hypothesis. The diminutive stature, lack of upper pitchers and lack of climbing habit are also unusual in the genus and this species must contend as the smallest at maturity of all. Argent (pers. comm.) reports that the plants he collected were completely concealed below the low (c. 30 cm high), wind-clipped shrubbery and that the pitchers were buried in the substrate amongst grasses or sedges. Plants were only detected by the inflorescences emerging above the shrub canopy. Several other species of *Nepenthes* known from ultramafic derived soils (e.g. *N. rajah, N. burbidgeae* and *N. macrovulgaris,* all from Sabah and unrelated) are entirely restricted, as far as known, to such soils and this may be the case with *N. argentii.*
Nepenthes bellii of Surigao Province, Mindanao is the only other Philippine species with subglobose lower pitchers, with upper pitchers absent or rare and with grouped fringed elements of the pitcher wings. *Nepenthes argentii* differs in the lack of climbing habit and the subpetiolate oblanceolate leaves with truncate apices. *Nepenthes argentii* is unique in the peristome being adnate to the underside of the lid. [Cheek & Jebb (2001)].

Etymology: *Nepenthes argentii* commemorates one of the collectors of the only known specimen, George Argent, a botanist of the Royal Botanic Gardens, Edinburgh, well known for his fieldwork in Borneo, Philippines, and New Guinea, and for his research on the species of *Musa* and *Rhododendron*. [Cheek & Jebb (2001)].

***Nepenthes aristolochioides* Jebb & Cheek in Blumea 42(1): 22, f. 2. 1997. Sec. Cheek & Jebb (2001)**

Description: Terrestrial climber, height unknown. Stem terete 0.2-0.4 cm diam., internodes 5.5-13 cm long; axillary buds conspicuous, 0.15-0.7 cm above axil. Leaves coriaceous, sessile; leaves of short stems narrowly lanceolate to lanceolate-spathulate, to 15 by 2.5 cm; apex acute, rarely sub-peltate; base more or less parallel-sided, ultimately with rounded auricles; leaves of climbing stems 7.5-15 by 1-3 cm, as the short-stem leaves, but lacking auricles, the base clasping the stem for 1/3-1/2 its circumference, rarely decurrent. Longitudinal nerves indistinct in dried leaves, 2 or 3 on each side of the mid-rib, in outer 1/3 of blade, arising from base, and sometimes along the midrib. Pennate nerves few, indistinct, arising obliquely and curving towards apex. Lower pitchers unknown. Upper pitchers utriculate, basally infundibuliform, obovoid above; to 9 by 3.5 cm; wings lacking; mouth almost vertical, lateral, not apical, ovate, to 2 cm wide; peristome externally rounded, to 1.5 mm wide, internally flattened, to 8 mm, broadening within, ribs 0.5-0.8 mm apart, inner margin entire, with large glands between ribs; spur simple, c. 9 mm long, apex with 2-4 acute points; lid orbicular, c. 2.7 by 2.1 cm, apex rounded to emarginate, base slightly cordate, lower surface lacking appendages, nectar glands evenly scattered, thinly bordered, circular or shortly elliptic, c. 0.3 mm diam., somewhat larger and denser on midline, the rims distinctly asymmetric, being highest toward lid apex. Inflorescence, fruit and seed unknown. Indumentum inconspicuous, of short, irregularly branching or simple, appressed white hairs to 0.2 mm long, in leaf axils, on midrib and on pitcher particularly around the peristome, and on the lid; lower leaf blade with sessile glands. Colour of pitchers green with brown-red flecks, becoming denser towards mouth, conspicuous in dried specimens; peristome dark red-brown. [Cheek & Jebb (2001)].

Distribution: Indonesia, Sumatra, Jambi Province (Mt Kerinci). [Cheek & Jebb (2001)].

Habitat: Mossy forest; 2000-2200 m. [Cheek & Jebb (2001)].

Notes: Resembling *N. bongso* in leaf shape, the pitchers of *N. aristolochioides* however, are unmistakable in their bladder-like shape with a lateral, porthole-like mouth, and the unusual hooded nature of the lid nectar glands. [Cheek & Jebb (2001)].

Etymology: The specific epithet signifies the resemblance of the pitchers, in their shape and coloration, to the flowers of *Aristolochia.* [Jebb & Cheek (1997)].

***Nepenthes armin* Jebb & Cheek in Blumea 59: 147, fig. 1. 2014. Sec. Cheek & Jebb (2014)**

Description: Terrestrial climber 5 m tall. Rosette and short stems unknown. Climbing stem rounded-quadrangular (3–)4–5(–5.5) mm diam; internodes (1.2–)1.8–4.2(–4.9) cm long; axillary buds not seen; indumentum absent apart from dense brown simple hairs in the leaf axils, otherwise only with sessile depressed-globose glands 0.04 mm diam throughout. Leaves thinly coriaceous, petiolate narrowly oblong-elliptic to narrowly elliptic-linear, (10–)13.1–15(–17.5) by (1.4–)1.8–2.6(–3.7) cm; apex acute or obtuse-rounded; base gradually decurrent to the petiole; nerves visible on the upper, not the lower, surface; longitudinal nerves 2 pairs, in the outer third of the leaf, the innermost pair arising from the midrib 1/2–1/3 the length of the blade from the petiole; pennate nerves numerous, patent, irregular; indumentum absent except for simple hairs along the upper surface of the midrib, hairs (0.1–)0.4–0.6 mm long, erect, pale brown, covering (5–)20–40 % of the surface, densest in the distal half of the blade, otherwise with sessile glands as the stem, 10–12 glands per mm2. Petiole (4.2–)4.7–5.6(–7) by (0.2–)0.3–0.4(–0.6) cm, wings patent in life (revolute in herbarium specimens), base clasping the stem by 1/2 its circumference, not decurrent, indumentum absent apart from sessile glands, and with very sparse and inconspicuous simple hairs along the abaxial midrib. Lower and intermediate pitchers unknown. Upper pitchers (coiled tendril) green, with faint purple mottling, narrowly cylindrical in outline, 10.2–12.9(–16) by 1.9–2.6(–3.2) cm, the lower half narrowly ellipsoid, gradually constricted to 1.3–1.8(–2.2) cm wide at the midpoint, then widening gradually to (1.7–)2.2–2.8(–3.2) cm wide below the peristome; fringed wings absent, reduced to inconspicuous ridges c. 1 mm wide extending from base to apex; indumentum of minutely branched hairs 0.1–1 mm long, 16–20 per mm2, the smallest hairs with 2–3 branches at the base, the longer hairs with 1–2 short branches along their length, mixed with sessile depressed-globose glands 10–12 per mm2. Mouth broadly ovate, 1.8–2.5(–3.8) by 1.8–2.3(–2.4) cm, oblique, slightly concave, column not well-developed; peristome cylindric, 1–2 mm diam, ± even in width along its length, ribs 0.25 mm apart, raised 0.04–0.08 mm, inner edge inrolled, teeth and holes visible only when dissected, outer edge often with 2–3 shallow lobes; inner surface of pitcher glaucous green with scattered purple mottling. Lid orbicular, (1.8–)2.3–2.7 by (1.8–)2.1–2.6(–3.3) cm, apex rounded, or rarely emarginate, base cordate, sinus 3–4 mm deep, 10 mm wide; lower surface brightly mottled purplish red, basal ridge c. 1 mm high 3 mm in length, convex basal appendage absent; nectar glands evenly and densely spread across the lid and ridge surface, (4–)6–8(–10) per mm2, monomorphic, directed to lid base (rims are asymmetric, being highest towards lid apex), orbicular, 0.2 mm diam, with membranous walls projecting vertically, 0.07 mm tall; mixed with sessile depressed-globose glands 0.04 mm diam at the edge of the

lid, which are otherwise absent from the larger, central part of the surface. Spur recurved, simple, 3.5–5 mm long, tapering to an acute apex, base completely covered in appressed hairs 0.2–0.3 mm long, simple, copper-coloured, distal three-quarters 50 % covered in hairs. Male inflorescence 25–28 by 1.2–1.5 cm, indumentum of appressed, simple, copper-coloured hairs 0.3–0.4 mm long covering 40–50 % of the surface, mixed with sessile depressed-globose glands as the stem; peduncle 7–11 by 0.1–0.2 cm; rhachis 17–18 cm long, with 70–95, 1-flowered partial-peduncles; bracts absent; partialpeduncles/ pedicels 3.5–4.5 mm long, indumentum covering 80–100 % of the surface; tepals 4, green at anthesis, turning red with age, 2.4 by 1.2–1.6 mm, outer surface completely covered in appressed, simple, copper-coloured hairs 0.2 mm long, papillae absent or inconspicuous, inner surface densely covered in elliptic nectar glands; staminal column 1–1.7 mm long, glabrous; anther-head subglobose, 0.45–0.9 by 1.2 mm. Female inflorescence as the male, but c. 30 by 1.2 cm; peduncle c. 16 cm long; rhachis c. 14.5 cm (immature), partial-peduncles/ pedicels c. 110, 3.5–6 mm long, tepals narrowly oblong 2.8 by` 1.2 mm, outer surface densely papillate with hairs sparse, scattered; ovary ellipsoid, 4-lobed, 2.2–3 by 1.1–1.4 mm completely covered in hairs as the pedicels; stigmas glossy black, 4-lobed, 1.25 mm diam. Infructescence and seeds unknown. Data on colour and posture when live in this description is taken from the field notes of the specimens cited. [Cheek & Jebb (2014)].

Distribution: Philippines, Sibuyan Island [Cheek & Jebb (2014)].

Notes: Nomenclatural citation according to IPNI (accessed 15 March 2017): Jebb & Cheek in Blumea preprint: 7. 2014 [4 Nov 2014]. [IPNI (1999+)].

Etymology: Named after Armin Rios Marin, Municipal Councilor on Sibu-yan and former World Wildlife Fund official who, on 3 October 2007, was shot and killed by a mining company official while leading a protest of his community against the clearance of forest trees to facilitate mining (Goodland & Wickes 2008: 175); [http://www.piplinks.org/system/files/Mining+or+ Food+Case+Study+6.pdf]. [Cheek & Jebb (2014)].

Conservation: *Nepenthes armin* is here assessed as Critically Endangered under criterion D (< 50 mature individuals) of the categories and criteria of IUCN (2012 [2001]). [Cheek & Jebb (2014)].

***Nepenthes attenboroughii* A.S.Rob., S.McPherson & V.B.Heinrich in Bot. J. Linn. Soc. 159(2): 196 (195-202; figs. 1-2, map). 2009. Sec. Robinson, Fleischmann & al. (2009)**

Description: Terrestrial upright to scrambling unbranched shrub, to 1.5 m tall. Stem terete, 2.5–3.5 cm in diameter, internodes 3–4.5 cm long. Climbing stems unknown. Rosette leaves coriaceous; lamina oblong to narrowly elliptic, 25–30 cm long, 8–10 cm wide, apex obtuse or occasionally retuse, not peltate, base shortly attenuate, sessile or subpetiolate to 2 × 4 cm, amplexicaul, clasping the stem by two-thirds to four-fifths its circumference, decurrent along internode for 2–3 cm; longitudinal veins conspicuous, arising from basal part of midrib, five to seven on each side in outer two-thirds of lamina, pennate veins numerous, almost perpendicular to midrib, finely reticulate towards margin; tendrils 30–40 cm long, broad, 4–9 mm in diameter, straight, sharply descending, flattened along adaxial surface in upper one-third. Leaves of scrambling stem as those of rosettes, but larger, 30–40 cm long, 8–15 cm wide, base subpetiolate; tendrils to 50 cm long, uncoiled. Lower pitchers brittle, campanulate to broadly tubulate, often dilating abruptly below the mouth, to 30 × 16 cm excluding lid, originating from tendril at front of pitcher; inner surface entirely glandular, c. 350–750 glands cm−2, ventral exterior surface rarely winged and usually marked by two pronounced ribs from tendril to mouth, infrequently ciliate in upper one-third; mouth oblique, orbicular to transversely elliptic, being the widest part of the pitcher, rising in the rear to a column 2–3 × 1.5–2 cm, in section an isosceles triangle with longest sides concave, formed by teeth of peristome held in apposition, to 2 cm long; peristome broad, 0.8–2 cm wide, striate with ribs to 0.5 mm high, flattened across middle at front of mouth, gently rounded at other parts, outer margin entire, occasionally sinuous on opposing sides, strongly revolute, inner margin flattened, curving sharply downwards, descending 3–8 mm, terminating in fine, conspicuously incised teeth to 2 mm long below mouth and 3 mm on the column. Lid held upright, usually 0°–20° from vertical, very slender relative to pitcher mouth, elliptic or slightly ovate, to 10 × 6.5 cm, apex rounded, base truncate to shallowly cordate, lower surface with flattened, rigid keel, up to 3 mm high at base, 3–5 mm broad, but no appendages, densely glandular except around upper one-third of keel where glands are most sparse, glands large, crateriform, conical, 0.1–0.3 mm across, with the smallest towards margin of lid, longitudinal veins conspicuous, four on each side, arising from base of midrib; spur substantial, 8–15 mm long, up to 6 mm wide at base, often bifurcated in distal one-third, each segment to 2 mm wide. Upper pitchers similar to lower pitchers, but tubulate or infundibular, 25 × 12 cm, originating from tendril to side or from rear of pitcher, expanding gradually from base and abruptly flaring widely 2–4 cm below mouth; mouth orbicular to transversely elliptic, inner surface entirely glandular, ventral ribs prominent, without cilia, occasionally bifurcating towards the mouth; peristome flattened at front and sides, to 1.5 cm wide, rising in the rear to a column to 2.5 × 1.5 cm. Lid similar to those of lower pitchers but smaller, occasionally reflexed, elliptic, to 8 × 5 cm. Inflorescence a raceme. Male inflorescence to 80 cm, 4 cm at widest point, with c. 100 flowers; peduncle 25–35 cm long, striate, 1 cm wide at base, rachis 30–45 cm, occasionally bifurcating; pedicels one-flowered, lacking bracts, to 2 mm in diameter, 1.2 cm long at base of rachis, 2 mm at tip;

tepals red, broadly ovate, 4 × 5 mm, apex obtuse; staminal column 3–4 mm, anther head 2 × 3 mm of eight fused anthers. Female inflorescence to 65 cm, 5 cm at widest point, with c. 70 flowers; peduncle 45–52 cm long, to 1.5 cm at base, rachis to 20 cm, never bifurcating; pedicels one-flowered, tightly clustered in last one-third of rachis, lacking bracts, to 3 mm in diameter, 1.5 cm long at base of rachis, 1 mm at tip; tepals brown to purple, ovate, 5 × 3.5 mm, apex acute; ovary ovoid, 5 × 2.5 mm; fruit up to 20 × 8 mm, staminal surface drying black; seeds filiform, c. 7 mm long, pale brown. Indumentum of reddish-brown sessile glands evenly distributed over surface of stem, increasing in density on abaxial leaf surfaces and accounting for a slightly scabrous texture, largely absent from adaxial leaf surfaces, occurring sparsely and irregularly on tendrils and pitchers; juvenile foliage including apex of stem, underside of midrib and floral organs pubescent, with simple, densely arranged, caducous reddish-copper hairs to 1 mm long, becoming velutinous along tendril and developing pitcher; adult leaf margin ferruginous-tomentose or woolly, underside of midrib coarsely velutinous, dark golden-brown, especially in distal one-third, becoming lightly velutinous down upper one-third of tendril only; surface of pitcher and lower two-thirds of tendril largely glabrous, occasionally glaucous, a fine brown tomentum developing towards and encompassing spur; inflorescence covered with short, coppery hairs, more dense on pedicels, staminal columns and carpels and absent from adaxial surface of tepals. Colour of pitcher exterior pale yellow to light green, unmarked, reddish pigment highlighting external ribs, interior strongly flecked with maroon, in direct sunlight pitcher suffused entirely red, interior turning purple–black with quadrangular yellow–green flecks; lid green or red above, dark purple–mahogany beneath, flecked green; peristome green or yellow, boldly decorated with different shades of red, brown and purple; tendrils turning red with age; adaxial leaf surfaces dark green, abaxial surfaces light green but occasionally red or purple. [Robinson, Fleischmann & al. (2009)].

Distribution: Philippines, Palawan, Mount Victoria [Robinson, Fleischmann & al. (2009)].

Habitat: From 150 m below the summit of Mount Victoria to the 1726 m summit itself. Plants grow singly or in sparsely scattered groups amongst serpentine protrusions and stunted summit vegetation consisting of a continuous thicket of shrubs 0.8–1.8 m tall. Associated species consist predominantly of a *Pleomele* sp. *(Asparagaceae)*, as well as *Leptospermum (Myrtaceae)*, *Vaccinium (Ericaceae)* and *Medinilla* spp. *(Melastomataceae)*, a variety of grasses, and the pseudometallophytic orchid *Spathoglottis kimballiana* Hook.f. *(Orchidaceae)*. [Robinson, Fleischmann & al. (2009)].

Etymology: The specific epithet, attenboroughii, is a commemorative, genitive noun in apposition taken from the patronym Attenborough. We have chosen to name this species after broadcaster and naturalist, Sir David Attenborough, whose outstanding television documentaries have made the world's natural history accessible and understandable to millions. As a keen enthusiast of the genus and a patron of Philippine conservation efforts, it is fitting that this spectacular new species be dedicated to him on the occasion of his 80th birthday. [Robinson, Fleischmann & al. (2009)].

Nepenthes barcelonae **Cheek, Tandang & P.B.Pelser in Phytotaxa 222(2): 146 (145-149, fig. 1-2). 2015. Sec. Cheek, Tandang & al. (2015)**

Description: Terrestrial climber to 2 or 3 m tall, glabrous apart from the pitcher and inflorescence. Rosette and short stems unknown. Climbing stems terete, 4.5–7.0 mm, mainly 2-winged, internodes 1.5–3.0(–4.5) cm long, winged for 0.5–2.5 cm of their length, wings decurrent from leaf, 0.6–0.7 cm wide at midlength, leaf-base clasping stem for half its circumference. Leaves sessile, ligulate-oblong, (13.2–)19.5–23.0(–24.5) × (1.9–)2.5–4.0(–4.5) cm, apex obtuse- acute, tendril not arising peltately, leaf base not tapering towards the stem. Upper pitchers (mouth facing away from tendril, fringed wings absent) dimorphic and dichromic, slightly curved, cylindrical or slightly laterally compressed, constriction slight, gradual, inconspicuous, 0–1/4 the diameter, about two-thirds the length from the base, or constriction absent; apex of pitcher tube abruptly constricted, so that the mouth is inset, and only the tips of the lobes of the broad peristome extend beyond the circumference of the top of the pitcher tube; fringed wings reduced to inconspicuous ridges 1.10–1.25 cm apart, or absent; indumentum of expanding, immature pitchers dense, 100% cover, hairs matt, medium brown, appressed, simple hairs 0.4–0.6(–0.9) mm long; indumentum of mature pitchers sparse, cover <5%, hairs patent, simple, (1–)2–3(–4)-celled, mostly 0.15–0.25 mm long, suberect or appressed, mixed with depressed-globose red glands 0.05 mm in diameter. Inner surface of pitcher with crescent-shaped pits, waxy surface absent. Mouth orbicular, 2.70–3.75 cm interior diameter, oriented at 45–50 degrees from the horizontal, straight, not curved until the dorsal 1/10 which is abruptly concave, forming a short but distinct column 3–4 × 4–5 mm. Peristome glossy dark red, subcylindrical in section, outer edge gradually attenuate until membranous, mostly appressed to outer pitcher surface, undulate, with 1–2(–4) shallow lobes on each side, inner edge with slender teeth c. 1 mm long, conspicuous only near the column, elsewhere inconspicuous due to the slight reflexing of the edge under the main peristome body. Lid ovate, length:breadth ratio 1.15–1.5:1, held more or less horizontally, apex rounded, base cordate, basal appendage absent, upper surface sparsely puberulous, indumentum as outer pitcher, with a pair of low, curved ridges each side of the slightly depressed midline, lower surface with 30–90 nectar glands scattered over the surface on each side of a midline band 4–5(–7) mm wide which lacks nectar

glands, nectar glands thinly bordered, transversely elliptic, (0.4–)0.5–0.8(–0.95) × 0.35–0.50 mm. Spur erect, cylindrical, 3–5 × 0.9–1 mm, apex acute, puberulous with hairs 0.2–0.3 mm long. Primary upper pitchers produced on the lower part of the stem, up to c. 1.5m from the ground, tendrils (30–)73–79 cm long, not coiled, pitchers sometimes resting on ground, outer pitcher surface uniformly bright red, lid green flushed red, pitcher length:breadth ratio 2–3:1, 5.7–18 × 2.7–6.8 cm, peristome (4–)6–10.5(–20) mm broad, ridges (0.9–)1.5–2.0 mm apart, (0.5–)1.5 mm high; lid (3.6–)8.0 × (2.7–)6.0 cm. Secondary upper pitchers produced from stems more than 1.5m tall, tendrils 20–21 cm long, coiled, pitchers all aerial, outer pitcher surface glossy pale green, pitcher length:breadth ratio 4–5:1, 10–12 × 2.6–2.7 cm; peristome 6–7 mm across, ridges less pronounced than in primary upper pitchers; lid c. 3.85 × 1.75 cm. Infructescence racemose, c. 35 × 6 cm, peduncle c. 19 cm long, 0.6 cm diam. at base, rhachis c. 15.7 cm long with at least 78 1-flowered partial-peduncles; bracts absent; pedicels 8.5–9.0(–11.0) mm long, sepals elliptic-oblanceolate, c. 3.5–4.0 × 1.175 mm. Fruit stipitate, 4-valved, fusiform, 10–16 mm long, stipe 1.25 mm long. Seed fusiform, pale brown, 4.5 mm long, seedbody oblong, 1.75 mm long. [Cheek, Tandang & al. (2015)].

Distribution: Philippines, Luzon, Sierra Madre Mts. [Cheek, Tandang & al. (2015)].

Habitat: Submontane forest, sometimes stunted, 1500– 1700 m a.s.l. [Cheek, Tandang & al. (2015)].

Notes: *Nepenthes barcelonae* is a poorly known species, since rosette and short stem phases (if produced), and flowers, remain undocumented. However, these features are also unknown in other species of the genus and are not a barrier to description and naming. [Cheek, Tandang & al. (2015)].

Etymology: The specific epithet is chosen in honour of Julie F. Barcelona, Philippine botanist, specialist in Philippine ferns and *Rafflesia* Brown (1821: 207) and co-discoverer of this new *Nepenthes* species. [Cheek, Tandang & al. (2015)].

Conservation: We here assess *N. barcelonae* as Critically Endangered under Criterion B2ab(iii) of IUCN (2014) since it is known from a single location, with an area of occupancy and extent of occurrence of < 10km² (using the currently IUCN-favoured 4km² grid cell size), where it is threatened by collecting of mature individuals and where habitat degradation is encroaching. [Cheek, Tandang & al. (2015)].

***Nepenthes ×bauensis* Chi.C.Lee in Sarawak Mus. J. 59(80) Special Issue 6: 173. 2004. Sec. Lee (2004)**

Description: Terrestrial climber or scrambler to 2 m high. Climbing stems triangular to rounded, 6 mm diam., internodes 3.0-4.5 cm.

Leaves of the climbing stems coriaceous, sessile, lanceolate to slightly oblong-lanceolate 16-18 by 2.5-3.0 cm, apex acute, occasionally sub-peltate, base narrowing and decurrent into stem wings extending ½–¾ length of internode.

Upper pitchers subcylindrical, slightly swollen in the lower half and slightly expanded below the mouth, 14.0-14.5 by 3.0-3.7 cm, with two fringed wings extending down the entire length of the pitcher; mouth ovate; peristome rounded to slightly flattened in cross section, 0.2–0.6 cm wide, ribs c. 0.4 mm apart; lid as large as or larger than mouth, broadly elliptic to suborbicular, 4.5-5.0 by 3.0-3.5 cm; spur simple, to 4 mm long.

Male inflorescence length unknown; peduncle 6.0 cm long; partial-peduncles 2-flowered, bracts absent, to 1.6 cm below the branch, with each branch to 1.0 cm long; tepals ovate, to 4.0 mm long; androphore c. 1 mm long. Female inflorescence unknown.

Indumentum absent from all parts except for outer surface of pitcher which consists of scattered short simple brown hairs. [Lee (2004)].

Notes: This hybrid represents a natural cross between *N. gracilis* and *N. northiana*. It was recorded from a single location in the Bidi area in Bau growing in the immediate vicinity of *N. gracilis* and *N. northiana*. There are no other possible parental species in the area which could contribute to the combination of vegetative and flower characteristics shown by this plant. As with most wild *Nepenthes* hybrids this taxa represents a form somewhat intermediate between the two putative parent species. It can be distinguished from *N. gracilis* by the more robust stems and coarse foliage, as well as the 2-flowered partial peduncles and much larger inflorescence. The pitchers are larger and distinctly broader than those of *N. gracilis*, with a wider peristome and more elliptical lids. [Lee (2004)].

Hybrid parent formula: N. gracilis × N. northiana [McPherson & Robinson (2012)].

***Nepenthes beccariana* Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 67, f. 17. 1908. Sec. Schlauer & Nepi (2000)**

Description: The following description is based upon the text and illustration presented in Macfarlane (1908).

The lamina is elliptic or lanceolate, up to 40 cm long and 9 cm wide. The apex of the leaf is obtuse or rounded, and the base is attenuate and petiolate. The petiole is up to 10 cm long, winged, and amplexicaul, clasping up to half of the stem. Most parts of the plant are covered with dark, reddish brown hairs.

The lower pitchers are up to 18 cm tall and 5 cm wide. The bottom half of the trap is swollen, narrowing above this part and becoming cylindrical towards the pitcher opening. Broad wings run down the front of the pitcher and are fringed with long, narrow filaments. The pitcher opening is oblique and ovate, rising at the rear to form a short,

elongated neck. The peristome is broad, up to 10-15 mm wide, recurved along the outer margin, and lined with distinct ribs that form a rim of short teeth on the inner margin. The lid is up to 7 cm long and 5 cm wide, and is ovate with a cordate base, and has numerous glands on its lower surface that are large towards the middle and smaller towards the edges. The spur is unbranched and up to 15 mm long, with a club-shaped tip.
The upper pitchers are up to 30 cm tall, 6 cm wide, and cylindrical. The wings are partly reduced to irregular fringes or entirely to narrow ridges. The peristome is oblique and narrower than in the lower pitchers. The lid and spur are similar to those of the lower pitchers.
The colour of the leaves and pitchers is not known, although the depiction presented by Macfarlane (1908) indicates that colouration may include interior mottling of upper and lower pitchers. The structure of the inflorescence and fruit is not known. [McPherson (2009)].

Distribution: Pulo Nias Island near Sumatra. [McPherson (2011)].

Notes: Danser (1928) reduced this species to a synonym of *N. mirabilis*, but noted that he did not examine the type. Jebb & Cheek (1997) [and Cheek & Jebb 2001 - Berendsohn 2017+] did not examine the type either and followed Danser's interpretation. Recent observation of the type by Schlauer & Nepi (2000) suggested that *N. beccariana* is related to *N. sumatrana* and *N. longifolia*, and has little in common with *N. mirabilis*. [Clarke (2001)].

Etymology: Cujus speciei notabilis specimen unicum a cl. Beccari benigne mihi communicatum est cui clarissimo viatori magna cum voluptate eandem dedico. [Macfarlane (1908)].

***Nepenthes bellii* K.Kondo in Bull. Torrey Bot. Club 96: 653, f. 1. 1969. Sec. Cheek & Jebb (2001)**

= *Nepenthes globamphora* Sh.Kurata & Toyoshima in Gard. Bull. Singapore 26: 155, t. 1, f. 1. 1972. *Nepenthes globamphora* Sh.Kurata in J. Insectiv. Pl. Soc. no. 36: 15. 1966, nom. nud.

Description: Terrestrial climber 0.3-2.5 m tall. Stems terete, or slightly angular, 3-5 mm diam., internodes 0.8-2 cm long. Leaves coriaceous, sessile, narrowly elliptic, 8-15 by 1-1.8 cm, apex acute, base barely attenuate, clasping the stem for 1/2-3/4 its circumference, slightly auriculate, obliquely attached, not or only slightly decurrent. Longitudinal nerves 3 on each side of the midrib, in the outer 1/3. Pennate nerves numerous, running obliquely to the margin. Lower pitchers ovoid-ellipsoid to subglobose, 4-9 by 3-5 cm, with two densely fringed wings, wings 6-10 mm broad, fringe elements 5 mm long, often in groups of 3, groups 0.8-1.3 mm apart; mouth suborbicular to broadly ovate, ± straight, slightly oblique; peristome subcylindrical to flattened, 5-8 mm broad, ribs 0.7 mm apart, c. 0.2 mm high, outer margin entire or slightly sinuate, revolute, inner margin finely dentate, teeth c. 1 mm long; lid ovate to broadly ovate, 2-3.5 by 1.5-3.5 cm, apex rounded, base shallowly cordate, lower surface lacking appendages, nectar glands few, only 5 or 6, sparsely scattered, pit-like, deep, unbordered, transversely elliptic or circular, 0.2-0.4 mm long; spur entire, 1-5 mm long. Upper pitchers reported as infundibuliform, 7.3-7.5 by 2-2.5 cm, but upper pitchers not formed in flowering specimen seen. Male inflorescence 10-15 by 1 cm; peduncle 6-9 cm long, 1 mm diam.; partial peduncles 1-flowered, c. 40; bracts absent; pedicels 3-4 mm long; tepals ovate, 2-2.5 by 1-1.2 mm; staminal column c. 1.5 mm long; anther head diameter unknown. Fruit valves 17-20 mm long. Seed unknown. Indumentum absent from stems and leaves; pitchers and inflorescence inconspicuously ferruginous-tomentose, hairs simple, 0.1 mm long, tepals minutely tomentose, staminal column glabrous. Colour of pitchers yellowish or reddish with diffuse purple spots; peristome yellow. [Cheek & Jebb (2001)].

Distribution: Philippines: Mindanao (Surigao Province). [Cheek & Jebb (2001)].

Habitat: Possibly on ultramafic substrate; 250-800 m. Little ecological information is available on this species. However, the localities known appear to coincide roughly with ultramafic areas in Surigao. [Cheek & Jebb (2001)].

Notes: *Nepenthes bellii* is unusual in the subglobular pitchers, with very densely fringed wings, the fringed elements c. 1 mm apart (cilia trifid) on tendrils up to twice as long as the blades. Not easily confused with any other species besides *N. argentii*. The lower pitchers of *N. tomoriana*, only recently collected, also bear a remarkable resemblance to those of *N. bellii*. However, the affinities of *N. bellii* may be with the Insignes group (*N. burkei, N. insignis, N. merrilliana, N. sibuyanensis*, and *N. ventricosa*). [Cheek & Jebb (2001)].

***Nepenthes benstonei* C.Clarke in Sandakania 13: 80, f. 1, 2 & 3. 1999. Sec. Cheek & Jebb (2001)**

Description: Terrestrial climber up to 10 m tall. Stem terete, 0.4-0.8 cm diam., internodes 5-20 cm long on climbing stems, up to 1 cm on rosettes. Leaves of the rosettes and short shoots broadly linear-lanceolate to slightly spathulate, sessile to sub-petiolate; lower leaf blades 25-30(-60) by 4-5(-9) cm, upper blades to 20 by 4.5 cm; apex rounded to acute, base gradually tapering throughout, to a broad amplexicaul sheath clasping the stem for 1/2-3/4 of its circumference, the margins decurrent in tapering wings 1-3 cm long; longitudinal veins 3-5 on each side, in outer 1/2 of blade; pennate veins inconspicuous, forming a network with the longitudinal veins. Lower pitchers distinctly hipped, ovoid in the lower half, cylindrical in the upper part; to 15 by 5 cm; with two fringed wings to 4 mm wide, fringe elements 4-6 mm long, 4-6 mm apart; mouth round to ovate, oblique; peristome cylindrical, 3-6 mm wide, ribs to 0.1 mm wide, 0.3 mm apart, outer edge entire, inner edge with short, broad teeth to 0.1 mm long, interspersed with circular, deeply sunken glands about 0.2 mm wide; lid broadly ovate, to 4 by 3.5 cm, apex rounded to obtuse,

base cordate, underside with a pronounced keel near the base, to 1 cm long, this keel densely covered with larger elliptical glands to 0.3 by 0.1 mm, spur simple or bifurcate, to 12 mm long. Upper pitchers as the lower, but narrower, to 15 by 3 cm; the cylindrical upper part abruptly contracted below the peristome; wings reduced to prominent ridges 1 mm broad; peristome somewhat flattened; spur entire, to 5 mm long. Inflorescences usually 2 or 3 produced sequentially at the apex of the stem, separated by 1 or 2 very short internodes, the intervening leaves very short, broadly linear and not bearing pitchers. Male inflorescence to 50 by 4 cm; peduncle terete, to 9-20 cm long; partial peduncles 2-flowered, without bracts, to 10 mm long, pedicels to 9 mm; tepals ovate, 4 by 3.5 mm, apex rounded to acute; androphore 4 mm long, anther head 1.5 by 1.5 mm. Female inflorescence as male, but partial peduncles 1-flowered in upper half; ovary to 16 mm long. Indumentum mostly persistent on vegetative parts, caducous on the inflorescence; simple white hairs to 1 mm long; sparse on stem, leaf bases and on upper leaves, denser and longer (2-3 mm) on the surface of lower leaves; short, branched, reddish brown hairs to 1 mm long forming a dense fringe to lower leaf margins, sparser on upper leaves and on the pitcher surface; inflorescence with both hair types. Colour of the living specimens variable: leaves and stems dull green with a white-blue waxy sheen; lower pitchers varying from green through yellow to brick red throughout, with red blotches on the inner surface and underside of lid, the peristome usually yellow-white, often with thin red bands; upper pitchers often light yellow-green throughout, sometimes with red blotches on the inner surface and underside of the lid, and with red bands on the peristome; inflorescence rhachis fuscous, tepals green, androphore maroon, anther head yellow. [Cheek & Jebb (2001)].

Distribution: Peninsular Malaysia. [Cheek & Jebb (2009)].

Habitat: Locally common in secondary vegetation; 450-600 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes benstonei* differs from *N. sanguinea* in its cylindrical (vs. angular) stem, the longer, narrower leaves which taper gradually to the base (vs. leaves broad and base parallel-sided) which is sub-petiolate, and the decurrent leaf bases (vs. abruptly amplexicaul), in the absence of bracts, the hairy (not glabrous) stems and in the lower altitudinal range.
The existence of this species was first suggested in Jebb & Cheek Blumea 42 (1997) 80. [Cheek & Jebb (2001)].

Etymology: *Nepenthes benstonei* is named in honour of Ben Stone, who dedicated his life to South-East Asian botany. [Cheek & Jebb (2001)].

***Nepenthes biak* Jebb & Cheek in Blumea 62: 174 –178, fig. 1. 2018. Sec. Cheek, Jebb & al. (2018)**

Description: Terrestrial climber to at least 3 m tall, indumentum of scattered red sessile glands 0.05 mm diam, inconspicuous, on all outer surfaces, glabrous apart from the tendril and pitcher (and probably the inflorescence). Rosette stems with lower pitchers only known from a photograph. Short stems not strongly differentiated from climbing stems, with internodes cylindrical 6 –7 mm diam, 2.5 – 4 cm long. Climbing stems as short stems, internodes 5 mm diam (hydrated material), 5.8 – 9 cm long, axillary buds not conspicuous. Leaves of short stems spirally inserted, glossy, leathery, linear-narrowly oblanceolate, apex rounded-acute, not peltate, base gradually attenuate, broader than stem, clasping the stem for 3/5 its circumference, shortly decurrent for 2 –7 mm. Longitudinal nerves 2(– 3) pairs on each side of the midrib in the outer half, pennate nerves numerous, arising at c. 60° from the midrib; nerves conspicuous only in dried specimens. Leaves of climbing stems as short stems, but generally shorter and narrower 16.4 –17.5(– 26.5) by 2 – 2.9(– 4.8) cm. Lower pitchers (tendril vertical, uncoiled; fringed wings) seen only in photos of seedlings in the wild small ovoid-cylindric. Intermediate pitchers (tendril arising laterally from pitcher base, uncoiled) variable in shape and size, from those resembling the lower pitchers in being partly with fringed wings, etc. to those which are larger, resembling the primary upper pitchers. Intermediate pitchers resembling lower pitchers ovoid-cylindric 4.5– 8.5 cm high, 1.8– 3.5 cm wide at base, tapering to 1.4 – 2 cm wide below peristome; fringed wings (rarely present only in smallest pitchers) c. 1 mm wide, fringe elements c. 2 mm long, 2 mm apart. Mouth ovate, peristome green, 1.2 mm diam; lid ovate, c. 1–1.5 cm diam. Upper pitchers (mouth facing away from the coiled tendril) dimorphic and dichromic, the lowermost 2 – 4 (primary) larger and heavily blotched with purple over a green background, the peristome uniformly purple; the uppermost (secondary) small, almost pure yellow. Upper pitchers overall ± cylindrical in side view, gradually laterally constricted in the middle in frontal view, fringed wings absent reduced to ribs that are increasingly thickened and mechanical towards the base in lower half of the pitcher, extending as flanges around the curve of the base and up the tendril. Lowermost (primary) upper pitchers 19 – 23 cm high, in side view 3.2 – 3.6 cm wide at midlength, 3.5 – 4.2 cm wide near base, 4.0 – 4.5 cm wide below peristome; in frontal view 2.5 – 2.9 cm wide at midlength, 3.5 cm wide near base, 4.0 – 4.1 cm wide below peristome; ribs c. 1.7 cm apart below peristome, extending to 2.5 cm apart near base, indumentum of sparse, c. 1 % cover, of simple translucent brown 4 – 5-celled acute stiff hairs 0.15 – 0.4 mm long, mixed with red sessile glands 0.025 – 0.05 mm diam, about 3 % cover. Mouth ovate-elliptic 40 – 60 mm interior length by 23 – 38 mm width, oriented at 45° from the horizontal, straight, not curved until the dorsal 1/10 which is abruptly erect forming a short, ill-defined column. Peristome dark glossy purple, subcylindrical in section 5 mm wide in frontal part, 7 mm wide towards the column, outer edge undulate, rigid, with about 5 pointed, rigid lobes on each side,

mainly held flat against the pitcher wall, but some patent, variable in length, 1– 5 mm long, inner edge lacking teeth and directed towards pitcher wall; ridges conspicuous, 0.3 – 0.35 mm apart, c. 0.2 mm high; lid ovate-elliptic (3.5 –)4 – 5.8 by (2.9 –)3 – 4.7 cm held about 45° above the horizontal, apex rounded-truncate, base truncate, basal appendages absent, upper surface lacking hairs but with sessile red glands on the upper surface, with a pair of low, curved ridges each side of the midline, corresponding on the lower surface with two arced bands of 80 –130 nectar glands on each side of a gland-free midline band 5 – 6 mm wide, the marginal 5 –7 mm also lacking nectar glands; nectar glands orbicular or transversely elliptic, drying purple, surrounded by a low crater-like yellow wall 0.25 – 0.5 mm by 0.15 – 0.25 mm, entire lower surface with scattered minute red globose glands 0.05 mm diam. Margin of lid width minute erect branching hairs 0.05 – 0.1 mm high in a dense line. Spur patent, curved downwards, dorsiventrally flattened 7.8 mm long, apex forked, the lobes acute, c. 0.5 mm long. Uppermost (secondary) upper pitchers as the primary except, 12.5 –13.5 cm high, in side view 2.6 – 3 cm wide at middle, 2.8 – 3.2 cm near the base and 2.6 – 3 cm wide below the peristome; in frontal view 1.6 –1.8 cm at middle, 2.3 – 2.5 cm wide near base, and 2.5 – 3.5 cm wide below the peristome, ribs c. 1.7 cm apart below peristome, 2.5 cm apart towards base. Mouth 36– 45 mm interior length, 25– 32 mm wide. Peristome yellow, 4 mm wide in frontal part, 5 mm towards column; lobes 5 –7(– 9) on each side; lid 3.6 – 4.8 by 3 – 4 cm. Inflorescences and infructescences unknown. [Cheek, Jebb & al. (2018)].

Distribution: Indonesia, Papua, Biak Island. Endemic. [Cheek, Jebb & al. (2018)].

Habitat: Limestone coastal cliffs in the low- land evergreen forest zone – sometimes epiphytic on mangrove trees; sea-level. [Cheek, Jebb & al. (2018)].

Etymology: Named for the island of Biak (noun in apposition). [Cheek, Jebb & al. (2018)].

Conservation: It seems likely that *N. biak* should be assessed as Critically Endangered given the single location (Biak) and the threats stated by McPherson (2009: 1061), according to Criterion D of IUCN (2012). [Cheek, Jebb & al. (2018)].

***Nepenthes bicalcarata* Hook.f., in: de Candolle, A. L. P. P., Prodr. 17: 97 (-98). 1873. Sec. Cheek & Jebb (2001)**

= *Nepenthes dyak* S.Moore in J. Bot. 18: 1, t. 206. 1880.

Description: Terrestrial climber up to 15 m tall. Stem terete, c. 1.8 cm diam., sometimes hollow with small circular entrance holes cut by ants, internodes 0.5-8 cm long. Leaves thickly chartaceous, petiolate, oblong-lanceolate, 20-65 by 6-14 cm, apex acute to truncate and emarginate, occasionally peltate, base attenuate; petiole narrowly winged, 4-12 cm long, clasping the stem for 3/4 of its circumference, petiole wings sometimes decurrent to next node, usually large rimmed nectaries present on lower surface of pet-iole immediately adjacent to stem. Longitudinal nerves 10 or more on each side of the midrib. Pennate nerves patent, numerous, distinct almost to leaf margin. Tendril of lower pitcher swollen, to 12 mm thick, and with a thin-walled spot which is usually hollowed and inhabited by an ant colony, entrance hole facing towards pitcher surface; tendril of upper pitcher only once coiled, coil in contact with the dorsal surface of pitcher, and it is at this point that the entrance hole to the hollow tendril lies. Lower pitchers globose, to 13 by 6.5 cm; with 2 fringed wings to 2.3 cm broad, fringed elements to 1.2 cm long, 0.5-4 mm apart; nectaries scattered on pitcher surface, especially dorsally, on ventral wings and on tendril; mouth suborbicular, straight and almost horizontal at front, rising abruptly at rear and forming a stout vertical or overarching column; peristome with outer edge cylindrical, c. 0.4 cm wide, inner edge flat, 1-2 cm wide, ribs 0.2-0.5 mm apart, inner margin with teeth c. 0.6 mm long, with a pit between each tooth; the apical most 10-12 ribs of the column drawn out into a pair of long downward curving acute thorns 1-2.5 cm long; lid reniform, much wider than long, 3.5-6 by 4.7-6 cm, glands thinly bordered, circular, c. 0.3 mm diam., densest towards the two sides, ± absent towards centre and near junction with pitcher; spur simple, flattened, recurved, glandular, 10-20 mm long. Upper pitchers ovoid-cylindrical, slightly narrowed towards mouth, to 13 by 6 cm, with 2 prominent ribs, these sometimes minutely winged near peristome; peristome and spur as in lower pitchers, lid often larger still, to 4 by 10 cm. Male inflorescence to 1 m long; peduncle 0.6 cm diam. at base; partial peduncles to 10 cm long, fasciculate,(1-)4-15-flowered, sometimes with nectaries near the base; pedicels to 2.5 cm long; occasionally with a bract on the lower half of the basal partial peduncles; tepals suborbicular, 5 by 4 mm; androphore 1.5-2 mm long; anther head 1 by 1.5 mm. Fruit with valves to 3 by 0.5 cm, lanceolate. Seed not seen. Indumentum sparse on leaves and stem, dense on pitchers and inflorescence; on the latter of two kinds, a dense short pubescence, and scattered longer hairs of 1-2 mm. Colour of pitchers green with orange to red flush from the indumentum, peristome green, rarely red; lid yellowish above, often deeper red or purple below, especially towards margin; tepals deep purple, almost black. [Cheek & Jebb (2001)].

Distribution: Borneo: NW Kalimantan, Sarawak, Brunei, SW Sabah. [Cheek & Jebb (2001)].

Habitat: Locally common in peat-swamp forest dominated by Shorea albida, also occasionally in heath forest on white sand soils; sea level to 950 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes bicalcarata* is not easily confused with any other species of the genus: the huge peristome thorns formed from united ribs, the reniform lid which is broader than long, and the ant-hollowed tendrils and stems, are each features unique to this species. The paniculate inflorescence has fasciculate partial peduncles similar to those of the Madagascan species (*N. madagascariensis* and *N. masoalensis*).
The tendril of the pitcher is nearly always hollowed out and occupied by small red ants *(Camponotus schmitzii)*. The ants are said to recover prey items from the pitcher fluid. Numerous nectar glands are found scattered on the stem, upper midribs and tendrils, and the spur is also often densely glandular. The long lid-column and the recurved thorns may comprise parts of the mechanism of prey capture, rather than the fanciful protective role suggested by Burbidge (Gard. Chron. (28/2/1880)).
The upper pitchers of this species are often surprisingly small relative to the large leaf blades. This may be an adaptation to the somewhat shady sites that this species favours. [Cheek & Jebb (2001)].

***Nepenthes bokorensis* Mey in Carniflora Australis 7(1): 8 (6-15; figs.). 2009. Sec. Mey (2009)**

= *Nepenthes bokor* Cheek in Kew Bull. 64(2): 320 (-321, fig. 1). 2009.

Description: Climbing shrub 1.5 - 3 m high. Rosette and short stems unknown. Climbing stems terete, subglossy, 6 - 8 mm diam., internodes 1.5 - 6 cm long, axillary buds absent. Leaves pseudo-petiolate, coriaceous, lanceolate to narrowly oblong and subspatulate, 21 - 32 (- 37) x 3 - 5 (- 9) cm, blade apex broadly acute, not peltate, ± symmetrical, pseudopetiole 3.5 - 4 x 1.2 (- 1.7) cm, dilating at the node, decurrent down the stem for 9 - 17 (- 22) mm, clasping the stem for ¾ -5/6 of its circumference, projecting from the stem as wings c. 5 mm wide. Longitudinal nerves 3 - 4 (- 5) on each side of the midrib in the outer 1/3 inconspicuous. Pennate nerves inconspicuous. Lower pitchers ovoid, c. 9 x 6 cm, with two fringed wings c. 11 mm wide extending the length of the pitcher, fringed elements 2 - 6 mm long, 6 - 8 per cm; mouth slightly concave in profile, rising steeply c. 5 cm from front to rear, column not distinct; peristome subcylindric, not flattened, 3 - 4 mm wide, expanding to 6 mm wide towards the lid, with outer edge entire, ridges 0.25 mm apart, c. 0.1 mm high, the inner edge with teeth 0.5 mm long; lid elliptic, c. 4.2 x 3 cm, apex rounded-truncate, base rounded, lower surface lacking distinct appendages or ridge when dried, nectar glands thin-walled, longitudinally elliptic along the midrib, c. 0.6 x 0.25 mm, otherwise scattered over the lower surface of the lid, directed towards base and midrib of lid, circular, volcano-like, c. 0.25 mm diam., decreasing in size at the margin, absent from outer 5 mm; spur filiform, c. 6 mm. Intermediate pitchers not seen. Upper pitchers with tendrils coiled, pitchers narrowly infundibuliform to cylindrical (16.5 -) 21 - 30 cm tall, 'hip' c. 1/3 the length from the base, 3.3 - 5 cm wide; waist, above the hip, slightly constricted, (1.8 -) c. 2.8 cm wide, dilating gradually towards the mouth, where (3.5 -) 4 - 5.7 cm wide, wings absent; mouth slightly concave in profile, occupying the upper (3.5 -) 4.5 - 7.6 cm of the pitcher, ovate-cordate; peristome flattened, 4 - 9 mm wide, ± even in width, column not well-defined; often raised at front into an acute, triangular lobe 4 - 10 mm high; ridges distinctly pronounced, 0.3 - 0.5 (- 1) mm apart, c. 0.1 - 0.2 mm high, the inner edge with teeth just visible near the column; teeth 0.1 mm long; lid suborbicular, wider than long, 4 - 6.5 (7.8) x 4.2 - 6.5 (- 7) cm; apex retuse, the notch 0 - 4 mm deep, with sides shallowly convex, rarely apex rounded; base shallowly cordate; lower surface lacking keel or appendages when dried; nectar glands angled towards the base and centre of the lid, scattered densely (c. 400 - 500 per cm2), circular, volcano-like, crater walls with radiating striations, glossy, 0.12 - 0.25 mm diam. midrib area with 10 - 20 sparse longitudinally elliptic glands c. 0.5 mm long absent from marginal 1 - 2 mm; spur inserted c. 4 mm from the lid, c. 7 mm long, unbranched, apex rounded. Male inflorescences c. 60 cm long; peduncle c. 42 cm long, c. 4 mm diam. at base, partial-peduncles c. 60, 2-flowered (the distal quarter of rhachis 1-flowered), c. 2.5 mm long; bracts inserted 0.5 - 1.5 mm from the base of the partial- peduncle, filiform, 0.5 - 1.5 mm long; pedicels (4-) 5 - 6.5 mm long; tepals elliptic 3.25 - 4.5 mm; androphore 2 - 3 mm long; anther head 0.6 - 1 x 1 - 1.25 mm long, anthers c. 5. FemalR inflorescences 18 - 26 cm long; peduncle 9 - 10 cm long, partial- peduncles 20 - 30, 1-flowered; bracts inserted 3 mm from the base of the pedicel, filiform, 0.7 mm long; pedicel 9 - 12 mm long; tepals 4 - 5 x 2 mm; stipe 1.5 - 2 mm long; ovary obclavate, 8 - 12 mm long. lnfructescence similar to female inflorescence, tepals persistent. Fruit valves 4, c. 18 mm long. Seeds not seen. lndumentum of stems, leaves and outer pitchers moderately dense, 0.25 - 0.5 mm long, patent, predominantly simple but often with a short branch, slightly crinkled, 7 - 8 hairs per mm2 stem hairs pale brown, soon lost by abrasion, but persisting in leaf axils; leaves completely concealed by dense red hairs when in bud, persisting in mature leaves, where not abraded, upper surface of leaves with grey-brown, shorter (0.1 - 0.25 mm) hairs, lower surface with brown hairs, pitchers' hairs shorter, 0.1 - 0.2 mm long, red brown; leaves with sessile red glands 8 - 10 per mm2. Pitcher lid upper surface, lower margin 1 - 10 mm wide, and outer pitcher (adjacent to peristome) with 5 - 8-armed red, erect dendroid hairs, c. 0.25 mm long; spur densely brown puberulent. Inflorescence with appressed grey or red-brown simple hairs c. 0.25 mm long, sparser on peduncle, absent from adaxial tepal surface; androphore shortly puberulent to subglabrous. Colour of live pitchers green, purple- mottled, peristome reddish, purple-banded; inner pitcher greyish-reddish purple blotched; lid reddish purple on lower surface (Smitinand 6496). Dry specimens with subglossy, dark brown stems, leaves grey-green, pitchers red-brown, peristome glossy brown, inner pitcher mottled purple, lower lid glossy chestnut brown, flower colour not recorded. [Cheek & Jebb (2009)].

Distribution: Cambodia, Kampot Province, Chaîne des Elephants. [Cheek & Jebb (2009)].

Habitat: Edge of submontane evergreen forest; c. 1000 m. [Cheek & Jebb (2009)].

Notes: Member of the Montanae species group. [Cheek & Jebb (2009)].

***Nepenthes bongso* Korth. in Verh. Nat. Gesch. Ned. Bezitt., Bot. 19: 19 (-21), t. 14. 1840. Sec. Clarke (2001)**

= *Nepenthes carunculata* Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 277, f. 1. 1928.

= *Nepenthes carunculata* var. *robusta* Nerz & Wistuba in Carniv. Pl. Newslett. 23(4): 111, f. 5. 1994.

Description: Stem: climbing, ≤ 5 m in length, ≤ 0.8 cm in diameter, internodes ≤15 cm long, cylindrical to angular.

Leaves: coriaceous, sessile; lamina obovate to spathulate, margins roughly parallel near the base, ≤ 20 cm long, ≤ 5 cm wide. Apex acute to rounded, tendril insertion usually sub-apical, base abruptly contracted where it meets the stem. Longitudinal veins 2-5 on each side of the midrib, pennate veins scattered and irregular; tendrils ≤ 30 cm long.

Rosette and lower pitchers: ellipsoid throughout, or ellipsoid in the lower ½ and cylindrical above, usually hipped (in which case the parts above the hip are always cylindrical), ≤ 20 cm high, ≤ 7 cm wide, with two fringed wings (≤ 5 mm wide) running from top to bottom. Glandular region covers the inner surface up to the hip. Mouth round, oblique throughout, raised into a short neck at the rear. Peristome expanded and either loosely cylindrical or flattened, ≤ 20 mm wide, teeth narrow, distinct and relatively long, ribs ≤ 2 mm apart. Lid cordate to orbicular, sometimes with a simple, bifid or grossly carunculate appendage near the apex. Spur ≤ 7 mm long, unbranched.
Upper pitchers: arising abruptly from the tendril, the latter having a wide arc. Pitchers infundibular, widening gradually throughout, but noticeably contracted immediately below the peristome, ≤ 35 cm high, ≤ 8 cm wide, wings reduced to ribs. Peristome considerably narrower than in the lower pitchers, often loosely cylindrical, teeth shorter and less distinct, mouth elongated into a short neck at the rear. Lid may bear a carunculate appendage on the lower surface towards the apex, and/or a simple or hook-shaped appendage on the lower surface, towards the base. All other parts similar to those of the lower pitchers.
Inflorescence: a raceme; peduncle ≤ 10 cm long, rachis ≤ 15 cm. Partial peduncles ≤ 12 mm long, one- or two-flowered, with or without bracteoles. Sepals ovate, ≤ 3 mm long. Female inflorescence of similar structure to the male, but often more robust and with a shorter rachis.
Indumentum: most parts covered with short, simple caduceus hairs when young. Mature parts virtually glabrous, but for the rachis, which may be fringed with short brown to white hairs. [Clarke (2001)].

Distribution: Indonesia, Sumatra: Jambi, Bengkulu, Sumatra Barat, Sumatra Utara. [Clarke (2001)].

Habitat: Epiphytic in lower montane forest; less commonly in upper montane forest, either epiqphytic or terrestrial; 1000-2700 m a.s.l. [Clarke (2001)].

Etymology: After a local name, "Putri Bungsu" [Clarke (2001)].

***Nepenthes boschiana* Korth. in Verh. Nat. Gesch. Ned. Bezitt., Bot. 19: 25 (t. 2, 4[39-54]). 1840. Sec. Cheek & Jebb (2001)**

= *Nepenthes borneensis* J.H.Adam & Wilcock in Gard. Bull. Singapore 42: 26, t. 1, f. 1. 1990.

Description: Terrestrial shrub or climber to c. 5 m tall. Stems of short shoots terete, 0.9 cm diam., internodes c. 2 cm long; tall shoots with internodes 2-3 cm long, (0.7-)1.1 cm diam., slightly 2-winged or 2-ridged, axillary buds spike-like. Leaves chartaceous, petiolate, those of short stems oblong, 18-19(-28) by 10 cm, apex broadly acute, not peltate, base abruptly attenuate; petiole canaliculate, 6.5-10 by 0.5 cm, sheathing and clasping the stem for 5/6 of its circumference; leaves of tall shoots lanceolate or oblong-lanceolate, 16-26 by 3.8-6.5(-7) cm, apex acute, peltate by 1-2 mm or not peltate, base gradually attenuate; petiole 3-7.5(-10) cm long, 0.75-1(-1.7) cm wide at the base, sheathing and clasping the stem for 1/2 its circumference, then decurrent in two appressed or patent wings, each up to 2 mm wide, descending to the node below as an arc, diminishing to ridges. Longitudinal nerves 2(-4) on each side of the midrib in the outer 1/3-1/2. Pennate nerves numerous, oblique, straight, reaching the margin. Longitudinal and pennate nerves fairly conspicuous above and below in short stem leaves, inconspicuous in tall shoot leaves. Lower pitchers 17-22 cm long, ellipsoid in the lower half, c. 4 cm broad, contracted to 2 cm at the centre, the upper half cylindrical to slightly infundibulate, c. 3 cm broad at the mouth; with two fringed wings 3 mm wide, fringed elements 5-7 mm long, 1-5 mm apart; mouth ovate, highly concave and oblique, rising abruptly at the rear to form a column; peristome subcylindrical, 5 mm wide, ribs conspicuous, 0.2 mm high, 0.5 mm apart, the outer edge infrequently sinuate-lobed, lobes to 5 mm long, inner edge toothed near the column; lid ovate, 5.5 by 3.5 cm, apex round-ed, base truncate to cordate, lower surface with a long keel, 2-3 mm high, along the midrib, but lacking a protruding appendage, nectar glands as in upper pitchers, 0.2 mm diam., sparsely scattered over the entire surface; spur dorsiventrally flattened, 6-8 by 1 mm, apex rounded. Upper pitchers entirely cylindrical, narrowly infundibulate, or ellipsoid in the lower 1/4-1/3 and cylindrical above, 15-30 cm tall, 4-6 cm wide, lacking fringed wings, but with two ridges c. 0.5 mm wide; mouth ovate or orbicular, oblique, slightly to markedly concave, rising

at the back to a short column, peristome subcylindrical, the outer part flattened, 9-28 mm wide, ribs conspicuous, c. 0.2 mm high, 0.5-0.75 mm apart, the outer edge deeply or shallowly undulate-sinuate, with up to 7 lobes per side, inner edge slightly toothed at the column; lid orbicular, 3.8-6.2 by 5-6.5 cm, apex rounded, base cordate, lower surface with a keel along the midrib 8-12 by 1-2 mm high, with an appendage up to 3 mm high; nectar glands circular, 0.2-0.4 mm diam., broadly bordered, either evenly scattered, moderately densely, over the surface of the lid, or, the largest glands densely concentrated in two arms diverging from the keel towards the apex, the remainder of the lid with smaller, sparsely scattered glands; spur as in lower pitcher. Inflorescences incompletely known, rhachis with 2-flowered partial peduncles at base, 1-flowered above. Male inflorescence known only from fragments, partly 1-flowered and partly 2-flowered, partial peduncles 1-2 mm; bracts absent; pedicels 7-9 mm; tepals oblong-elliptic, 4-4.5 by 1.5-2 mm, reflexed; androphore 3.5 mm; anther head 1.5 by 1.5 mm. Infructescence 91 by 7.5 cm; peduncle 51-55 cm long, 1-1.2 cm wide at the base; partial peduncles 4-10 mm long; bracts absent; pedicels 7-14 mm long. Fruit with valves 25 by 2.5 mm. Seed filiform, 24 by 0.5 mm. Indumentum of stems obscurely simple, branched and substellate red-brown hairs 0.2 mm long, mixed with sessile glands; midrib above, edges of petiole and wings of stems with pale brown simple and branched hairs 0.5-0.7 mm long; lower surface of leaves with sessile glands only; male inflorescence axis white-puberulent as the stem, androphore glabrous. Colour of dried stem and leaf blackish grey; pitchers pale or yel-lowish green splashed lightly to heavily with red to purple; inflorescence colour unknown. [Cheek & Jebb (2001)].

Distribution: Borneo: S Kalimantan (Meratus Mt Range: G. Sakoembang, G. Sarempaka, G. Besar). [Cheek & Jebb (2001)].

Habitat: Open, stunted forest on limestone hills; 780-1880 m. [Cheek & Jebb (2001)].

Notes: On the evidence of Ch. Clarke (pers. comm. and Nepenthes of Borneo (1997) 72-73) and of specimens that we have seen since our skeletal revision (Jebb & Cheek Blumea 42 (1997)), we here unite *N. borneensis* J.H. Adam & Wilcock with *N. boschiana*, which we previously maintained as distinct species (op. cit.). Clarke reports that at the type locality of *N. borneensis* (G. Besar), he has seen in one population plants with the pitcher, peristome and lid appendage characteristics of *N. borneensis*, other plants with the characteristics of *N. boschiana*, and intermediates between both. The previously overlooked De Vogel 1934, from a third locality in the same mountain range, is also intermediate in several characters between *N. borneensis* and *N. boschiana. Nepenthes boschiana* is a polymorphic species and still poorly known: more study is needed to evaluate its variability and habitat.

Nepenthes boschiana seems closely related to *N. stenophylla* and *N. faizaliana* of Sarawak, but differs in always having arcuate stem wings (if present at all in the latter species they are straight), a less pronounced basal lid appendage (in the latter species it is 3-5 mm long), in the glabrous androphore (pubescent in the latter two species), in the sparse indumentum of white, simple hairs 0.2 mm long on the stem (in the latter the stem indumentum is dense, covering the surface of the stem, and usually brown and longer than 0.2 mm). Neither *N. stenophylla* nor *N. faizaliana* ever have a peristome as broad or as undulating as seen in the type collection of *N. boschiana*, nor a pitcher with a ventricose basal 1/4-1/3 and a narrowly cylindrical upper part. However, it seems that these characters are just an extreme variant of *N. boschiana* and not characteristic of that species. *Nepenthes boschiana* shares with *N. faizaliana* the affinity for limestone (as Ch. Clarke first pointed out (Nepenthes of Borneo (1997) 73), and also infructescences/inflorescences reaching over 90 cm long.

Danser in Bull. Jard. Bot. Buitenzorg III 9 (1928) 275 reinstated *N. boschiana* in the sense we use it here, after the name had been applied differently by earlier authors. Miquel included within *N. boschiana* what we now accept as *N. sumatrana* Beck, whilst Beccari included *N. boschiana* within his concept of *N. maxima* Nees. Both Hooker and Macfarlane included *N. stenophylla* Mast. within *N. boschiana*. [Jebb & Cheek (1997)].

***Nepenthes burbidgeae* Hook.f. ex Burb. in Gard. Chron. n.s. 17: 56. 1882. Sec. Cheek & Jebb (2001)**

Description: Terrestrial climber to 10 m tall. Stem of short, non-climbing shoots with stem terete, 1.1-1.5 cm diam., internodes c. 2 cm long; climbing stems D-shaped, semi-circular, or subtriangular in cross section, 0.7-1.2 cm wide, with two wings 1-9 mm wide, internodes 7-10 cm long, the wings running the length of the internode, stopping just above the node to 9 mm wide; axillary buds prominent, rarely absent, cylindrical, slender, 2-5.5 mm long, acute, inserted c. 1 cm above the axil. Leaves of short stems distinctly long petiolate, oblong, 44-50 by 9-11.5 cm, apex acute, base attenuate; petiole 10-17 by 0.9 cm, canaliculate, the margins sheathing and clasping the stem for 5/6 its circumference; leaves of climbing stems elliptic-lanceolate, 13-25 by 3.8-7.5 cm, apex acute, base acute to rounded; petiole 6-11 cm long, semi-circular in cross section, the upper surface flat, 4-10 mm wide, ± winged, clasping the stem for 1/3-1/2 its diameter and decurrent into two wings. Longitudinal nerves 1 or 2 on each side of the midrib in the outer 1/4 of the blade. Pennate nerves numerous, patent. Lower pitchers ellipsoid or ovoid, 19-25 by 8.5-10 cm, wings 5-7 mm wide, with fringe elements 3-6 mm long, 2-3 mm apart; mouth obliquely concave; peristome broad, subcylindrical to slightly flattened, c. 20-30 mm wide, with fine ribs 0.6 mm apart, 0.1-0.2 mm high, outer surface sinuate, inner surface with teeth c. 1 mm long; lid ovate, 7-9.5 by 6.4-9 cm, apex round, base cordate, margin straight, lower surface densely uniformly glandular, excepting the non-glandular marginal 0.9 cm, glands volcano-

like, 0.3 mm diam.; lower surface of lid with base keeled, bearing a rounded appendage 3-14 mm high from a ridge up to 18 mm long; spur c. 15 mm long, unbranched. Upper pitchers shortly infundibuliform, 7.2-11 by 5-8 cm, arising abruptly from the tendril, dilating to 1 cm and curving for 3-4 cm before expanding, slightly contracted below the peristome, lacking fringed wings but with two prominent ridges 1(-2) mm wide, these rarely, then in the upper part only, with fimbriae 1.5 mm long, 1-2 mm apart; mouth round, horizontal, abruptly rising at the rear into a neck c. 1 cm long; peristome cylindrical, (1-) 2.5(-4) mm broad, with ribs 0.1 mm high, 0.2-0.3 mm apart, outer edge not sinuate, inner edge lacking teeth; lid ovate, 2.5-6.5 by 2.6-5.2 cm, apex rounded, base cordate, margin slightly sinuate, lower surface uniformly, densely glandular, glands circular to slightly elliptic, rimmed, 0.15-0.2 mm diam., midline keeled at base, the appendage 1.5-10 mm high from a raised ridge 4-15 mm long; spur c. 10 mm long, unbranched or shortly bifurcate. Inflorescence (fide Kurata 1976) 25-35 cm long, partial peduncles 2-flowered, pedicels 10-15 mm long. Fruits and seeds unknown. Indumentum of sessile red glands 0.1 mm diam. on stem, petiole, lower surface of leaf blade, outer pitcher and upper lid; intermixed with simple red hairs 0.5 mm long on outer pitcher, upper lid and on spur; dark brown 1- or 2-branched hairs 0.6-1 mm long line the edge of the leaf blade and the petiole wing. Colour of lower pitchers pale green, streaked and blotched red or purple, peristome with numerous red stripes; upper pitchers translucent white or pale yellow, speckled or blotched with red or purple. Inflorescence colour unknown. [Cheek & Jebb (2001)].

Distribution: Borneo: Sabah (Mt Kinabalu & Mt Tambuyukon). [Cheek & Jebb (2001)].

Habitat: Ridges in open moss forest on ultramafic soils; 1200-2250 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes burbidgeae*, on account of its shortly infundibuliform, translucent, porcelain white, lightly red-flecked upper pitchers is unlikely to be confused with any other species on Mt Kinabalu. It is part of the *N. maxima* group, as evidenced by the appendage on the lower surface of the lid, and the distinctly petiolate leaves with prominent axillary buds. Although well-known to nepenthophiles through Kurata, Nepenthes of Mount Kinabalu (1976: 40), this species is represented by only a few incomplete sheets: we have found no fertile material of *N. burbidgeae* and lower pitchers are represented by only two collections. [Cheek & Jebb (2001)].

***Nepenthes burkei* Mast. in Gard. Chron. ser. 3 6: 492, f. 69; 566. 1889. Sec. Cheek & Jebb (2001)**

= *Nepenthes burkei* var. *excellens* Veitch in J. Roy. Hort. Soc. 21: 233. 1897.

= *Nepenthes burkei* var. *prolifica* Mast. in Gard. Chron. ser. 3 8: 184. 1890.

Description: Terrestrial or epiphytic climber 1-2 m tall. Stem terete, ± 4 mm diam., apparently climbing. Leaves subcoriaceous, sessile, those of basal rosettes unknown; leaves of short stems narrowly oblanceolate-oblong, 8.5-26 by 1.2-2.9(-3.5) cm, apex obtuse, inconspicuously peltate, base gradually attenuate, ± 1.1 cm wide at the base, clasping the stem for 1/2 its circumference, decurrent for up to 1.5 cm with wing 2-3 mm wide, not auriculate or sheathed; leaves of climbing stems shorter and more oblong, scarcely de-current. Longitudinal nerves 4 on each side of the midrib, evenly spread, fairly conspicuous. Pennate nerves held at 90° from midrib, sinuous, scattered, inconspicuous. Lower pitchers unknown, not produced? Upper pitchers broadly cylindrical, 10-17.5 cm long, 3.7-8 cm wide in the basal half, gradually constricted to 4-4.5(-6.7) cm at the centre, flaring slightly to 4.3-6 cm wide below the peristome; wings not fringed, reduced to ridges < 1 mm wide; mouth elliptic, oblique, straight or slightly concave, peristome flattened, 11-12 mm wide, bearing coarse ribs (0.7-)1 mm apart interspersed with 10-15 striae, outer edge with 4-6 undulations each protruding ± 3 mm, inner edge with coarse teeth; lid elliptic, 3.8-6.3(-8) by 2.9-3.8(-5) cm, apex broadly acute, base rounded, lower surface lacking appendages, nectar glands transversely elliptic 0.5-0.7 mm wide, slightly raised but unbordered; spur stout, cylindrical, 7-10 mm long. Inflorescences unknown. Infructescence 26 cm long, peduncle 17 cm long; partial peduncles ± 55, 1-flowered, lacking bracts, 6-8 mm long. Fruit valves up to 15 mm long. Seed unknown. Indumentum absent from stems and leaves; pitchers subglabrous, with scattered, inconspicuous, translucent appressed simple hairs 0.5 mm long. Colour of pitchers dull green spotted with red-purple, interior of pitcher waxy yellow, rarely violet, overlain with glaucous bloom, peristome deep red. [Cheek & Jebb (2001)].

Distribution: Philippines: Mindoro and Panay Islands. [Cheek & Jebb (2001)].

Habitat: Not recorded; 1300-1600 m. [Cheek & Jebb (2001)].

Notes: Cited as *"Nepenthes × burkei* Hort.Veitch, Gard. Chron. ser. 3, 6: 492, 493, f. 69. 1889" in IPNI (acc. 19 Mar 2017), with "Original Data: Notes: Hybr. artef" - but in the original description there seems to be no indication of the hybrid nature of the species. [Berendsohn (2017+)].

Notes: *Nepenthes burkei* is closely related to *N. ventricosa* of Luzon and even more closely related to *N. sibuyanensis* of Sibuyan. *Nepenthes burkei* can be distinguished from the former by the less strongly waisted, green-blotched purple pitchers with lid as large as mouth. In *N. ventricosa* the pitchers are more narrowly waisted, glossy yellowish white, with lids much smaller than the mouth. *Nepenthes sibuyanensis* has non-waisted, massive pitchers. [Cheek & Jebb (2001)].

***Nepenthes campanulata* Sh.Kurata in Gard. Bull. Singapore 26(2): 227 (t. 1, 2). 1973. Sec. Cheek & Jebb (2001)**

– *Nepenthes campanulata* Sh.Kurata in The Heredity 26(10): 44 & 50. 1972, nom. nud.

Description: Terrestrial shrublet to 30 cm tall. Stems terete, c. 0.4 cm diam., internodes c. 2 mm long. Leaves coriaceous, sessile, obovate, 5-9 by 1.2-2.5 cm, apex rounded, peltate by 0.1-0.4 cm, base attenuate, margin regularly undulate and sinuate. Longitudinal nerves 3 on each side of the midrib, scattered throughout lamina and arising from base of mid-rib. Pennate nerves obscure. Pitchers campanulate, i.e. ventricose near base, narrowed at middle, upper half infundibulate, c. 8 by 4 cm; wings absent, but with a pair of ridges; mouth circular, horizontal, to 4 cm wide; peristome reduced to small but prominent teeth 0.25-0.4 mm apart, these conical, curving inwards, c. 0.2 mm long; the margin scarcely thickened between these teeth, outer edge entire; lid elliptic-oblong to ovate, 1.5-2 by 1.2-1.5 cm, junction with pitcher broad, 3-4 mm wide, lower surface lacking appendages, nectar glands volcano-like, 0.1-0.2 mm wide, dense near base and along midline, becoming sparse towards margin; spur simple, flattened, 1.5-3 mm long. Inflorescence unknown. Fruit and seed unknown. Indumentum sparse, dense below peristome and around spur, brown, < 0.1 mm long. Colour: “pitcher yellowish green; base inside with red brown dots. Lip inside dark green” (Kostermans 13764). [Cheek & Jebb (2001)].

Distribution: Borneo: E Kalimantan (Ilas Bungaan) and Malaysian Borneo. [Cheek & Jebb (2001)].

Habitat: On sheer limestone walls; 300 m. [Cheek & Jebb (2001)].

Notes: In other species with strongly infundibuliform pitchers such as *N. dubia, N. eymae*, and *N. inermis* the lid is very narrow, and before opening the pitcher is laterally flattened along its length. *Nepenthes campanulata* on the other hand has a relatively small, elliptic lid. Thus after opening, the mouth of these pitchers must expand far more than is the norm in the genus. In this respect they are similar to the pitchers of *N. reinwardtiana* which has a broad infundibuliform pitcher with a wide mouth, but a relatively small lid and a very reduced peristome. The pitchers are not clearly differentiated as either upper or lower pitchers. The pitcher tendrils do not twine, but are short and bent abruptly, as in *N. pervillei* of the Seychelles. No flowering material of this species is known.
This species was reported to be absent from the type locality in 1987, the whole area having been burnt over during the drought of 1982. It is possible that the species is now extinct at this location. However, it has recently been discovered at an unspecified second site in Malaysian Borneo (Chi’en Lee: website http://wayback.archive.org/web/*/http://www.malesiana.tropicals.com.my/tropicals/campanulata.html (original link defunct; linking to Internet Archive instead)). [Cheek & Jebb (2001)].

***Nepenthes ceciliae* Gronem., Coritico, Micheler, Marwinski, Acil & V.B.Amoroso, New Nepenthes 1: 413 (-423; figs. 354-367). 2011. Sec. Gronemeyer, Coritico & al. (2011)**

Description: Stems branched, up to 3 m tall, cylindrical in cross section, up to 4 mm in diameter, internodes up to 2 cm. The stem is either yellowish green or reddish.
Leaves of the climbing stem petiolate, lamina linear, up to 16 cm long and 2.5 cm wide. The apex of the lamina is acute and the base broadly attenuate and petiolate. The petiole is winged and up to 4 cm long. 2 longitudinal veins are present on each side of the midrib. Numerous pennate veins run obliquely towards the margin. Tendrils are up to 20 cm long and mostly coiled. All parts of the foliage are generally yellowish green in mature plants, and reddish in juveniles.The midrib and tendril are usually light yellowish green.
Lower pitchers cylindrical, with the lower third variably inflated and often ovate, up to 10 cm long and 3 cm wide. Wings up to 4 mm wide extend down the front of the pitcher, fringed with filaments up to 3 mm long.The pitcher opening is positioned at an oblique angle, and is up to 3 cm wide. The peristome is flattened, up to 4 mm wide, and elevated towards the rear of the pitcher opening to form a neck below the lid. It is lined with very fine ribs up to 0.1 mm high spaced up to 0.1 mm apart. The lid is cordate, up to 3.5 cm long and 4.0 cm wide, with glands evenly distributed over the lower surface.
The spur is unbranched and up to 5 mm long. A small appendage 2 mm long is present on the lower surface of the lid. The exterior of the lower pitchers is variable in colour, but usually light yellowish green, densely mottled with large, dull, dark red, rust-brown or blackish blotches. The peristome is yellow in newly opened pitchers, and dark red or rust brown in aged foliage. The interior of the pitcher is light yellow to whitish, occasionally speckled with small, dull, dark red, rust-brown or blackish blotches.
Upper pitchers up to 10 cm long,4 cmwide and wholly infundibular. The wings are reduced to ridges that run down the margins of the flat fronted face of the trap, or are hardly discernible at all. The pitcher opening is positioned at an oblique angle and is up to 2.5 cm wide. All other parts are consistent with the lower pitchers. The upper pitchers are usually uniformly yellow, where growing in strong sunlight, or yellowish green where growing in shade. In a minority of plants, the interior of the pitcher and the lower surface of the lid are variably lined with small blotches of dark red to purple colouration, and the peristome may be variably striped with bands of red and purple.
Inflorescence a racemose panicle, up to 32 cm long, partial peduncles mostly branched and 2-flowered, bracts

absent. Fruits to 2 cm long.
Indumentum absent on all parts of the foliage and inflorescence. [Gronemeyer, Coritico & al. (2011)].

Distribution: Philippines, Mindanao, Mount Kiamo [Gronemeyer, Coritico & al. (2011)].

Habitat: Ultramafic soils at altitudes from 1500–1880 m, mostly in open, upper montane habitats. [Gronemeyer, Coritico & al. (2011)].

Etymology: *Nepenthes ceciliae* is named in honour of the Philippine botanist Cecilia Beltran-Amoroso, who passed away on January 16, 2011. Cecilia Beltran-Amoroso conducted extensive ex-situ conservation studies on many species of *Nepenthes* in Mindanao and other threatened, endemic and economically important plants from across the Philippines. [Gronemeyer, Coritico & al. (2011)].

Conservation: On the basis of current understanding, *N. ceciliae* should be considered vulnerable [Gronemeyer, Coritico & al. (2011)].

***Nepenthes chang* M.Catal., Nepenthes Thailand.: 38 (fig. 1-6). 2010. Sec. Catalano (2010)**

Description: Terrestrial climber to 5 m tall. Stem terete, 4-6 mm in diameter, internodes 1-5 cm long. Leaves coriaceous, 0.2 mm thick, lamina lanceolate, 20-35 cm long, 3.5-5 cm wide, apex acute, base attenuate and sessile, clasping the stem by three quarters of its circumference, decurrent for 1-4 cm of its length; longitudinal veins 3 on each side of the midrib in distal quarter of the lamina, pinnate veins arising obliquely from midrib; tendrils terete, 10-30 cm long, 1-2 mm in diameter, coiling in upper pitchers. Lower pitchers 7-12 x 2-5 cm, ovate in the lower third and narrowing above or completely ovate, hip at the mid-section or absent; two alae, 2-6 mm wide, run down ventral exterior surface from tendril to mouth, fringed with narrow filaments; pitcher mouth oblique, orbicular to ovate; peristome cylindrical, 2-5 mm wide, often wider at the sides of the mouth, teeth 0.1-0.3 mm long; lid orbicular to ovate or elliptic, flat, 2-4 x 1.5-3.5 cm, base slightly cordate, lower surface without appendages, crateriform glands densely arranged and numerous, larger at the base of midrib, to 0.5-1 mm; spur 2-6 mm long, simple; longitudinal veins 3-4 on each side of midrib. Upper pitchers to 25 x 3 cm, tubulose; alae 0-1 mm wide; pitcher mouth oblique; peristome as for lower pitchers, but outer margin often slightly lobed, with uniform width throughout; lid as for lower pitchers. Male inflorescence a raceme, to 70 cm, peduncle 35-50 cm long, rachis 17-22 cm long, ca. 30-130 flowers borne on 2-flowered partial peduncles 1-3 mm long, pedicels 2-9 mm, androphore 1-1.5 mm long, hairy up to half of its length; tepals elliptic, green when young, then orange to red, 2-3 x 1-1.5 mm; often a bract, to 0.5 mm long, is present at the base or on the lower half of the partial peduncle of some or all flowers. Female inflorescence as for male inflorescence, but rachis 8-22 cm long with solitary flowers borne on pedicels 3-12 mm long; tepals elliptic, green, 2-3 x 1-1.5 mm; bracts absent. Indumentum of white or golden hairs, 0.1-0.5 mm long, covering all parts of plant except adaxial surface of leaf. Colour : older leaves dark green; young leaves of rosette with a reddish hue, those of lower stem with an orange hue and those of upper stem with a yellowish hue; midrib, tendrils and stem of rosette, orange to red; those of climbing stem, light green; lower pitchers green to orange, or pink with red stripes, with or without red blotches over the inner, non-glandular zone, peristome green to red; upper pitchers light green, with or without red blotches over the inner, non-glandular zone, peristome green; lid green or marked by fine red stripes. [Catalano (2010)].

Distribution: Thailand, Trat Province [McPherson (2011)].

Habitat: On peaty soil, in open, steep forest, from 300-600 m altitude. [Catalano (2010)].

Notes: *Nepenthes chang* is closely related to *N. kampotiana*, from which it differs in having male flowers borne on 2-flowered partial peduncles (vs. borne solitary), androphore hairy up to half of its length (vs. androphore glabrous), leaves half as thick (0.2 mm vs. 0.5 mm) and darker in colour, with reddish, orange or yellowish hues when young (vs. always light green), white or golden indumentum over all parts of plant except the upper surface of the leaf (vs. all plant glabrous), peristome often larger at the sides of mouth (vs. peristome uniformly wide), lower pitchers broader than deep (vs. uniformly ovate) and upper pitchers tubulose (vs. obovate or ovate in the lower half). [Catalano (2010)].

Etymology: Presumably named after the collector of the type specimen, Ko Chang. [Berendsohn (2017+)].

***Nepenthes chaniana* C.Clarke, Chi.C.Lee & S.McPherson in Sabah Parks Nature J. 7: 56 (54, 57-61; figs. 1-3). 2006. Sec. Clarke, Lee & al. (2006)**

Description: A vine of up to 8 m in lenght taht trails or scrambles through the upper branches of surronding trees and shrubs.
The lamina is oblong to elliptic, up to 30 cm long and 10 cm wide. The apex of the leaf may be obtuse to truncate, and is occasionally acuminate. The base of the lamina is obtuse or attenuate and petiolate. The petiole is up to 8 cm long and is winged or, especially in young plants, canaliculate. The base of the petiole clasps the stem and forms a sheath. In young plants, the leaf blade is short, expanding rapidly from the narrow petiole towards the abruptly truncated and emarginated apex and may appear heart shaped. The stem and leaf blade of *N. chaniana* is pure green whereas the midrib and tendril are usually yellow. The tendril is generally short, especially in the upper pitchers. All

parts of the foliage of *N. chaniana* are densely covered with soft, white, yellow or golden hairs up to 7 mm in length. The hairs are especially long and conspicuous on the tendril and are relatively short and sparse on the upper surface of the lamina.
The lower pitchers are produced only briefly in the life cycle of this species, and generally only by seedlings and young plants prior to the production of a climbing stem. The lower traps are up to 15 cm tall and 4 cm wide, but are usually much smaller than this. The lower half of the pitcher is infundibular, ovate or cylindrical and variably swollen. The width of the trap narrows slightly above this part, becoming cylindrical or very slightly infundibular towards the pitcher opening. Wings up to 8 mm wide run down the front of the pitcher and are sparsely fringed with narrow filaments up to 7 mm long. The peristome is cylindrical, up to 4 mm wide, and lined with very fine ribs up to 0.3 mm high, spaced up to 0.3 mm apart. The peristome varies little in width around the margin of the pitcher opening, and a narrow gap up to 3 mm wide is usually present immediately below the lid. The lid is orbicular or elliptic and up to 4 cm long and 4 cm wide. A narrow, hook-shaped appendage, up to 1 cm long is present on the underside of the lid, close to the top of the peristome. The spur is unbranched and up to 3 mm long, although often greatly reduced.
The lower pitchers are usually a pure yellow-green, although elongated red blotches are occasionally present on the exterior and interior of the trap and on the lid.
The upper pitchers are up to 30 cm tall and 7 cm wide. The bottom half of the trap is narrowly infundibular, and laterally compressed, especially in mature plants. Above this part, the pitcher is broadly infundibular, particularly towards the pitcher opening. The peristome is up to 1 cm wide, and is lined with very fine ribs up to 0.3 mm high, spaced up to 0.3 mm apart. The peristome is often raised to a small point at the front, such that the pitcher opening takes on an inverted heart shape, and is variably flattened and expanded towards the sides and back. Wings are reduced to narrow ridges which run down the flattened front of the upper pitchers. The lid is ovate or elliptic, up to 8 cm long and 6 cm wide, with an appendage that is identical in shape to those of lower pitchers, but up to 1.5 cm long. All other characteristics, including colouration, are consistent with the lower pitchers.
The inflorescence is a raceme, to 55 cm long. The peduncle is approximately 20 cm long and the rachis to 30 cm long. Flowers are borne on 2-flowered partial peduncles, to c. 2 mm long, with pedicels usually less than 10 mm long. Tepals are oblong, 5-6 mm by 3 mm, and the anther head is borne on a smooth column up to 3 mm long. Fruits are up to 34 mm long. [McPherson (2009)].

Distribution: Borneo, Sabah, Sarawak and ?Kalimantan. [McPherson (2009)].

Habitat: Terrestrially or as an epiphyte on humid, mossy ridge tops and mountain summits, usually amidst tall, sparse, lower or upper montane vegetation and often in relatively shaded situations; 1100-1800 m a.s.l. [McPherson (2009)].

Notes: Although apparently digitised, at present the original publication of this taxon is not openly available on-line (accessed 5 Aug 2018). [Berendsohn (2017+)].

Etymology: The specific epithet honours Datu Chan Chew Lun who assisted with the publication of several studies of *Nepenthes* and other works on the diversity of wildlife in Borneo. [McPherson (2009)].

Conservation: Does not appear to be currently threatened in the wild. [McPherson (2009)].

***Nepenthes cid* Jebb & Cheek in Phytotaxa 151(1): 30 (-32, fig. 2). 2013. Sec. Cheek & Jebb (2013)**

Description: Epiphytic shrublet high in trees, 0.1–0.5 m tall. Stems several from a woody rootstock ca. 2 × 5 × 2 cm, roots numerous, stout, 2 mm diam. Rosette shoots and climbing stems not seen, short stems terete, 3–4 mm in diameter, internodes 1.5–2.5 cm long, axillary buds not seen, moderately densely and persistent hairy in distal internodes, hairs white, covering ca. 50% of the surface, hairs 0.2–1.0 mm long, mainly simple, some with 2–6 erect branches from the base, either all equal or with a bristle hair longer than the others, intermixed with dark red depressed globose sessile glands 0.05 mm in diameter. Leaf blades chartaceous, drying brown on both sides, oblong-elliptic, (9.0–)11.5–13.0(–14.0) × (1.2–)2.2–3.0 cm, apex acute, not peltate, base decurrent, longitudinal nerves 2(–3) pairs in the outer half of the blade, arising from the base of the midrib, conspicuous on the upper surface; pennate nerves moderately numerous and conspicuous on the upper surface, more or less patent; midrib on both surfaces moderately densely hairy (ca. 20% cover) with white, simple, mostly appressed hairs 0.2–0.4(–0.5) mm long, on lower surface, 0.3–1.0 mm long, on upper surface, the leaf-blade otherwise with sparse simple hairs and moderately dense depressed globose red-black glands 0.05 mm diam. Petiole 2.5–4.0 × 0.4–0.5 cm, wings held flat or slightly u-shaped, clasping the stem for ½ its circumference, not, or very slightly decurrent, indumentum as leaf-blade. Tendril >50% covered in appressed hairs 0.25–1 mm long, hairs simple or basally branched, arms equal or with one long and bristle-like (Fig. 2E). Lower pitchers not seen. Intermediate and Upper pitchers (tendrils not fully coiled) subcylindrical in outline (4.5–)6.0–11.0 × 1.9–2.8 cm, often with the basal 1/2–3/5 ellipsoid, narrowing gradually and slightly about the middle to ca. 1.6 cm wide before widening slightly to the peristome, outer surface 10–30% covered in minute, 4–5-armed, stellate hairs 0.1 mm diam., mixed with sparse minute simple hairs and larger basally branched hairs 0.4 mm long, together with depressed globose glands 0.05 mm in diameter; fringed wings running

from the peristome to within 1–2 cm of the base of the pitcher, 1.8–2.0 mm wide, fringed elements (0.5–)1.0(–1.5) mm long, 3–4 mm apart, held close to the pitcher surface; mouth ovate 1.1–2.1 × 1.8–2.8 cm, moderately oblique, straight to slightly concave. Peristome cylindrical 1–1.5(–2) mm wide, even in width from front to lid, 3 ridges per mm, ridges 0.10–0.15 mm high, inner edge in life inconspicuous, incurved, (Fig. 2J), when dissected and unrolled, with a line of holes, teeth absent (Fig.2 L&K), outer edge not lobed; column not developed. Lid orbicular 1.9–2.2(–2.8) × 1.8–2.0 cm, apex emarginate or rounded, base rounded or weakly cordate, lower surface lacking a basal ridge or appendage, drying brown; nectar glands more or less monomorphic and evenly and moderately distributed over the lower surface of the lid, 1.5–3 nectar glands per mm², glands large, orbicular or slightly longitudinally elliptic, borders low, rounded, (0.3–)0.4–0.6 mm long, lacunae drying black, glossy; glands slightly denser along the midline and more diffuse at the margin; red sessile peltate or depressed-globose glands 0.05 mm diam., scattered evenly; marginal areas with minute inconspicuous branched hairs. Spur simple, tapering from base to apex, acute, 4–5 mm long, moderately to densely hairy. 10–20% covered in simple hairs 0.2 mm long. Inflorescence and Infrutescence unknown. [Cheek & Jebb (2013)].

Distribution: Philippines, Mindanao, Bukidnon. [Cheek & Jebb (2013)].

Notes: Excepting for *Nepenthes cid,* and *N. truncata* Macfarlane (1911: 209), all other species of *Nepenthes* known from Mindanao are mainly terrestrial, although a few can sometimes root on the base of trunks of stunted trees in mossy forest on mountain peaks. However, examples of high epiphytes such as *N. cid,* on tall trees in lower submontane forest (700 m a.s.l) are rarer. Potentially *N.* cid could be more common than the sparsity of the existing material indicates, but due to its inaccessibility on tall trees is rarely seen. *Nepenthes cid* remains incompletely known to science. Botanists in Mindanao are urged to search for this species to establish whether or not it survives, to reveal its full range and to obtain collections with inflorescences, thus far unknown. [Cheek & Jebb (2013)].

Etymology: The specific epithet is dedicated to the collector of the type specimen, F. Cid (fl. 1952) of the Herbarium of the Department of Botany, University of the Philippines. [Cheek & Jebb (2013)].

Conservation: The population found include less than ten individuals (two), so *N. cid* is here assessed as Critically Endangered under Criterion D of IUCN (2012). [Cheek & Jebb (2013)].

***Nepenthes clipeata* Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 281, f. 2. 1928. Sec. Cheek & Jebb (2001)**

Description: Terrestrial scrambler or prostrate herb c. 30 cm tall. Stem terete or slightly flatten-ed, to 1 m or more in length, 0.6-1.2 cm diam., internodes 2-5(-10) cm long. Leaves thickly coriaceous, petiolate, orbicular to ovate, 7-20 by 6-16 cm, apex rounded, peltate 1/2-1/3 way from apex, base obtuse to cordate; petiole stout, 5-10.5 by 0.5-0.8 cm, V-shaped in transverse section, the lower 3 cm clasping the stem for 4/5 or its complete circumference. Longitudinal nerves 3-5 on each side of the margin, spread evenly through the marginal half of the blade. Pennate nerves ± 9 pairs, at 45° from the midrib and branching within the innermost of the longitudinal vein pairs. Lower pitchers unknown. Upper pitchers 10-30 cm long, lower third globose to obovoid, leathery-woody, 8-11.5 by 6-8.5 cm, abruptly constricted above, the upper 2/3 narrowly infundibuliform, 2.8-5 cm wide at the base, chartaceous, flaring gradually to 5.2-9 cm at the mouth, ridges and wings absent except the smallest pitchers with two thin fringed wings 1.5 mm wide; mouth ± circular, horizontal to slightly oblique; peristome subcylindrical, 1-12 mm wide, ribs 0.3-0.7 mm apart, 0.1-0.2 mm tall, outer edge entire or slightly sinuate, inner edge toothed; lid ovate, vaulted, being markedly concave below, 3-8 by 2-5 cm, apex rounded, base cordate, the lower surface with a laterally flattened basal appendage to 8 mm tall, nectar glands crater-like, slightly longitudinally elliptic, 0.2-0.3 mm long, fairly densely and evenly scattered; spur simple, c. 5 mm long. Male inflorescence unknown. Fruit unknown. Seed unknown. Indumentum of coarse, patent, bronze hairs 1-2 mm long, dense on the stem, lower leaf, petiole and tendril, less dense, shorter (0.5-0.6 mm long), less conspicuous and browner on the outer pitcher. Colour of stems, petioles and midribs red; pitcher, including lid white, with a few red flecks; peristome white, heavily streaked with red; inflorescence colour unknown. [Cheek & Jebb (2001)].

Distribution: Borneo: W Kalimantan (Mt Kelam). [Cheek & Jebb (2001)].

Habitat: Crevices in sheer granite walls; 600-800 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes clipeata* is a member of the *N. maxima* group. It is unmistakable, with its orbicular leaf blade from which the tendril arises near the centre of the lower surface. It is known in herbaria only from the type gathering made over 100 years ago, and reports from nepenthophile tourists. Kurata in Nepenthes of Borneo (1976) 23 and Adam et al., J. Trop. For. Sci. (1991) claim that the species is a limestone endemic, but this is not in agreement with either the collection notes or the type locality (granitic). The best data on its habit and habitat is to be found in Clarke, Nepenthes of Borneo (1997: 78).

A number of horticultural collectors are reported to have visited the only known locality over the last ten years and the species is now said to be much scarcer than for-merly, and in danger of extinction. Clarke (pers. comm.) believes only 2-6 plants may survive in the wild. [Cheek & Jebb (2001)].

***Nepenthes copelandii* Merr. ex Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 51. 1908. Sec. Cheek & Jebb (2013)**

Description: Readily forms a branched stem up to 10 m long that climbs and scrambles through surrounding vegetation.
The lamina is linear, up to 28 cm long and 6 cm wide. The apex of the leaf is acute or obtuse and the base is attenuate and petiolate. The petiole is canaliculate, up to 7 cm long, and clasps the stem. The upper surface of the lamina is green, the lower surface light green, and the stem, midrib and tendril generally yellowish green. Stems and leaves are generally glabrous, but may occasionally be sparsely covered by minute hairs, particularly towards the base of the leaves. If present, these hairs are slightly more prevalent on the lower part of the inflorescence.
The lower pitchers are up to 26 cm tall and 5.5 cm wide. The bottom third to half of the trap is ovate and variably swollen. Above this part, the width of the pitcher narrows, often forming a faint hip, and becomes cylindrical or infundibular towards the pitcher opening. Wings up to 1.4 cm wide, fringed with filaments up to 12 mm long, run down the front of the pitcher. The peristome is loosely cylindrical, up to 1.2 cm wide, and is lined with ribs up to 1 mm high, spaced up to 1.5 mm apart. The peristome may be slightly expanded at the sides of the pitcher opening. The lid is elliptic or ovate, up to 5.5 cm long, 4.8 cm wide, and generally lacks an appendage, though in some populations a vestigial appendage a few millimetres tall may be observed. The spur is unbranched and up to 14 mm long.
The exterior of the lower pitchers is yellowish green, mottled with long, dark red or purple blotches. The interior of the trap is creamy white, or light yellowish green and lightly flecked with dark purple. The peristome may be dark red or purple and both sides of the lid are yellowish green with dark purple blotches.
The upper pitchers are up to 12 cm tall, 4.5 cm wide, and are wholly infundibular, being uniformly funnel shaped or more strongly elongated. Wings are reduced to narrow ridges that run down the front of the pitcher, but these may hardly be discernable at all. The peristome is loosely cylindrical, up to 9 mm wide, and is lined with ribs up to 1 mm high, spaced up to 0.8 mm apart, but these ribs are often not apparent. The peristome may be slightly expanded at the sides and particularly towards the raised and elongated rear of the pitcher opening. The lid is elliptic or ovate, up to 4.5 cm long, 4 cm wide, and generally lacks an appendage, though in some populations a vestigial appendage a few millimetres tall may be observed. The spur is unbranched and up to 12 mm long.
The exterior of the upper pitchers is usually yellowish green, but may be a pale, whitish-green, tinged orange, pink, or red. The exterior is often mottled with dark red or purple blotches. The interior surface of the trap may be light yellow or creamy white, often faintly flecked with red or purple. The peristome is yellow, red or purple and both sides of the lid may be yellow, orange or red, often blotched with dark red, orange or purple. The colouration of the upper pitchers is usually vibrant and very attractive.
The inflorescence is a raceme, to 35 cm long. The peduncle is up to 25 cm long, the rachis to 12 cm long. Flowers are mainly borne on 2-flowered partial peduncles lacking bracts. Tepals are ovate, and the anther head is borne on a column of equivalent length to the tepals. Fruits are 15-20 mm long. [McPherson (2009)].

Distribution: Philippines, Mindanao, Mts Apo and Matutum. [Cheek & Jebb (2013)].

Habitat: Volcanic substrate. [Cheek & Jebb (2013)].

Habitat: Terrestrially or as an epiphyte in mossy, lower and upper montane forest and is particularly common on humid ridges. 1400-1600 (-2400) m a.s.l. [McPherson (2009)].

Notes: *N. copelandii* belongs to the *Nepenthes alata* Group. [Cheek & Jebb (2013)].

Etymology: The specific epithet honours Edwin Copeland, curator of the Manila herbarium, who first discovered and collected this species in 1904 on Mount Apo. [McPherson (2009)].

***Nepenthes cornuta* Marwinski, Coritico, Wistuba, Micheler, Gronem., Gieray & V.B.Amoroso in Plants (Basel) 3: 289 (-292, fig. 2). 2014. Sec. Cheek & Jebb (2001)**

Description: The stem is up to 3 m long and 7 to 8 mm in diameter; the internodes are 4 to 5 cm long.
Leaves of the climbing stem are petiolate and linear to lanceolate, up to 30 cm long and 4.5 cm wide. The apex of the leaf blade is acute, the leaf base broadly attenuate and petiolate. The petiole is up to 4 cm long, canaliculate and amplexicaul, clasping between one third and half of the stem. Three parallel longitudinal nerves run on each side of the midrib, on the outer half of the lamina. The tendrils can reach up to 24 cm in length. The foliage and the midrib are green or yellowish green, while the stem and the tendrils can take on a slight red hue when growing in full sunlight.
Lower pitchers are up to 15 cm long and 3.4 cm wide. The pitcher opening is ovate and up to 2.8 cm in diamete . The pitcher's bottom third is bulbous; above this part, the pitchers narrow, sometimes forming a faint hip and becoming cylindrical to slightly infundibular towards their opening. The lid is up to 3.2 cm long, 2.8 cm wide and ovate. The appendage is reduced to a rudimentary keel of up to 1 mm. The spur is up to 3 mm long. The gland distribution is unknown. The peristome has a cylindrical cross-section of up to 5 mm in diameter, positioned at an angle and is lined with very fine ribs. The wings of the pitchers are reduced to ridges, usually without fringes.

Occasionally, a few fringes can appear on the top end of those ridges, just below the peristome. The pitchers are green in their bottom third, sometimes taking on a yellowish hue towards the pitcher opening, whilst the upper two-thirds of the pitchers are mottled with red or maroon blotches. The peristome is yellowish to orange or reddish with fine red stripes. The lid is red to maroon with yellowish blotches.
Upper pitchers are up to 20 cm long and 4.5 cm wide, the pitcher opening being the widest part. The bottom third is swollen to varying degrees, sometimes displaying a faint hip, and tapers towards the tendril, giving the pitcher its typical, horn-shaped appearance. Above this part, the pitcher narrows faintly and becomes almost completely cylindrical or slightly infundibular towards its opening. The narrowing between the swollen base and the upper part of the pitcher is less pronounced than in the lower pitchers. The lid is up to 5 cm in diameter, ovate to cordate and lacks an appendage. The glands are evenly distributed across the lower surface of the lid. The spur is up to 8 mm long. The peristome is oblique and has a cylindrical cross-section of 5 to 7 mm in diameter. The wings are reduced to inconspicuous vestigial ridges. The pitchers are always green or yellow, except for the interior and the bottom side of the lid, which can have red to maroon speckles. The peristome is green or yellow, often with fine red stripes. The inflorescence is a predominantly two-flowered rachis up to 40 cm long sitting on a scape of up to 21 cm. The individual pedicel can measure up to 15 mm. Bracts are absent.
Indumentum is absent from stems, leaves, pitchers and flowers, but the developing pitcher buds are covered with minute, orangey brown hairs. [Gronemeyer, Coritico & al. (2014)].

Distribution: Philippines, Mindanao Island, Bukidnon Province, Pantaron mountain range. [Gronemeyer, Coritico & al. (2014)].

Habitat: Terrestrial on ultramafic soils on clearings or open scrub. [Gronemeyer, Coritico & al. (2014)].

Notes: *N. cornuta* belongs to the *N. alata* complex of species that was recently installed by Jebb and Cheek (2013). [Gronemeyer, Coritico & al. (2014)].

Etymology: The specific epithet, cornuta (lat. cornu = horn), refers to the plant's horn-shaped upper pitchers. [Gronemeyer, Coritico & al. (2014)].

Conservation: Assessed as VU (vulnerable) according to the IUCN Red List criteria. [Gronemeyer, Coritico & al. (2014)].

***Nepenthes danseri* Jebb & Cheek in Blumea 42(1): 30, f. 3. 1997. Sec. Cheek & Jebb (2001)**

Description: Terrestrial shrub or climber 0.3-4 m tall. Stem terete, 0.3-0.9 cm diam., internodes of climbing stems 0.5-2.5 cm long. Leaves thinly coriaceous, petiolate, those of climbing stems with leaf blade broadly to narrowly elliptic; 6-11.5 by 2-4.3 cm; rosette leaf blade sometimes very reduced; apex acute to rounded, base tapering to a winged petiole; petiole 1.5-4 cm long, amplexicaul, clasping the stem by half its circumference, or rarely decurrent to 1.5 cm below the node, with the two margins becoming united on the opposite side of the stem. Leaves of short stems with blades narrowly lanceolate, 1.5-9.5 by 0.5-2.5 cm; petioles 0.5-2 cm, sheathing at the base. Longitudinal nerves 4-8 on each side of the midrib, mostly arising from base, but sometimes 1 or 2 arising from midrib, spread throughout width of the leaf blade, fairly conspicuous. Pennate nerves numerous, arising obliquely and curving towards the margin, less distinct than the longitudinal nerves. Lower pitchers ovoid in lower 2/3, cylindrical towards mouth, and broadening there, 4.5-10 by 1.8-2.7 cm, with 2 fringed wings c. 0.5 cm broad, fringe elements 0.5-1.5 mm long, c. 0.5 mm apart; mouth oblique, straight, ovate-elliptic; peristome cylindrical, 0.5-2 mm wide, ribs c. 0.3 mm apart, barely perceptible, outer edge entire, inner edge with triangular teeth c. 0.5 mm long; lid elliptic to orbicular, 2-3.5 by 2.1-3 cm; apex rounded, base truncate to cordate, lower surface lacking appendages, nectar glands 15-50, thinly bordered, 0.2-0.7 mm wide, most numerous towards midline of lid; spur 1-1.5 mm long, stout, apex rounded. Upper pitchers narrowly ovoid in lower half, gradually narrowing towards mouth, but widening again at c. 2/3 its length, upper 1/3 narrowly infundibuliform, 9-13.5 by 2.2-3.2 cm, with 2 prominent ventral ridges, lacking fringed elements; mouth as in lower pitcher; peristome subcylindrical, 1-3 mm wide, ribs 0.3-0.5 mm apart, 0.1-0.3 mm high; lid as in lower pitcher; spur stout, c. 2 mm long. Male inflorescence 18 cm long; peduncle 10 cm long, 0.2 cm diam. at base; partial peduncles 1-5-flowered, 4-16 mm long; pedicels 3-7 mm long; tepals elliptic, 2 by 1.5 mm; androphore c. 1.5 mm long; anther head sub-globular, 0.5 by 1 mm. Fruit with valves 14-28 by 2.5-4 mm. Seeds fusiform, 11.5 by 0.5 mm. Indumentum sparse and inconspicuous, of appressed, simple bronze hairs c. 0.4 mm long on new parts, lower pitchers, near spur (only upper pitchers), dense on inflorescences, and midribs of new leaves. Colour of stems reddish; leaves yellowish green, occasionally lower leaves maroon; midrib and tendrils red; lower pitchers green with khaki to brown marbling; upper pitchers greenish yellow to pale green; underside of lid with red streaks; tepals green, red in fruit; fruit olive yellow; indumentum golden-orange. [Cheek & Jebb (2001)].

Distribution: New Guinea (Waigeo Island) and Moluccas (Halmahera). [Cheek & Jebb (2001)].

Habitat: Most commonly in open scrub or on bare soils on ultramafic rock, also in forest; sea level to 300 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes danseri* is slender, with a yellowish coloration overall. Other unusual features of this species are the very small blades of the rosette leaves, and the ability of the plants to grow in shade, though they apparently fail to produce pitchers there.
Nepenthes tomoriana from Sulawesi is the only paniculate species with which *N. danseri* is likely to be confused. *Nepenthes danseri* is distinguished from it by the lack of a bract on the partial peduncles, and the fewer, larger glands on the lid. The rosette and lower pitchers of *N. tomoriana* are ellipsoid and much more inflated, 3.5-4 cm wide (not 1.8-2.5 cm), the fringe elements 5-10 mm long (not 0.5-1.5 mm) and grouped in clusters (not evenly spaced); the peristome is 4 mm deep on the inner face (not to 2 mm) with teeth to 7 mm long (not 0.5 mm) and has prominent, ridge-like (not barely perceptible) ribs. [Cheek & Jebb (2001)].

Etymology: The species was named in honour of Benedictus Danser (1891-1943), whose taxonomic studies of this genus are without parallel. [Cheek & Jebb (2001)].

***Nepenthes deaniana* Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 57. 1908. Sec. McPherson (2009)**

Description: Most plants produce a compact rosette or a short, rigit, upright stem to 1 m tall. Very occasionally, strong climbing stems up to 6 m are produced, and these bear upper pitchers.
The lamina is oblong, up to 40 cm long and 18 cm broad. The apex of the leaf is rounded or obtuse and the base is abruptly contracted into a canaliculate petiole that clasps the stem. The apex of the lamina is occasionally sub-peltate, and the tendril may emerge up to 10 mm from the apex of the leaf. The lamina is green and the stem, midrib and tendril are yellow. The tendrils, pitchers and the upper side of the lid are lined with short, reddish-brown hairs. The stem, inflorescence and upper surface of the leaves are generally glabrous.
The lower pitchers are up to 30 cm tall and 20 cm wide, and may have a total volume of 1 litre (Stewart McPherson, pers. observ.), though I suspect that more extensive observation will reveal traps in excess of 1.5 litres in volume. The lower pitchers are variable in shape and may be ovate, globose, amphora-shaped, urceolate, or almost cylindrical. Wings up to 18 mm wide, fringed with filaments up to 15 mm long, run down the front of the lower pitchers. The peristome is loosely cylindrical, up to 2.5 cm wide and expanded towards the sides and back of the pitcher opening. The peristome is lined with ribs up to 2 mm high, spaced up to 3 mm apart. The ribs are elongated on the inner edge of the peristome and form incurved, needle-like teeth approximately 4 mm long. The peristome is raised at the back of the pitcher opening, immediately below lid. At this point, the peristome teeth are particularly prominent and splayed forward. Occasionally, the peristome is slightly raised at the front of the pitcher opening and forms a distinctive triangular point. The outer margin of the peristome is recurved and often crenellated. The inner edge of the peristome extends into the pitcher opening for several millimetres, particularly below the lid. The lid is broadly elliptic to ovate, up to 8 cm long, 6 cm wide, and lacks appendages. The spur is narrow, unbranched and up to 15 mm long.
The exterior of the lower pitchers may be orange, red or reddish-brown, sometimes mottled with faint, dark purple blotches. The interior of the pitcher is yellowish-orange and the peristome is orange, red or purple. Both sides of the lid are the same colour as the exterior of the pitcher, and sometimes decorated with darker flecks. The colouration darkens as the pitchers age, much like *N. attenboroughii* and *N. rajah*.
True upper pitchers are produced more rarely, on strongly climbing stems. Intermediate pitchers are more common, and these show characteristics of both upper and lower traps. The upper traps are wholly infundibular, often narrowly so, up to 35 cm tall, and up to 16 cm wide. Wings are reduced to narrow ridges that run down the front of the traps. The peristome is loosely cylindrical, up to 1.5 cm wide, and slightly expanded towards the sides and back of the pitcher opening. The peristome is lined with ribs up to 1.5 mm high, spaced up to 2 mm apart. The ribs are elongated on the inner edge of the peristome and form incurved, needle-like teeth up to 3 mm long. The peristome is raised at the back of the pitcher opening, immediately below lid. At this point, the teeth are particularly prominent and splayed forward. The outer margin of the peristome is strongly recurved. The lid is broadly elliptic or ovate, up to 7 cm long, 5.5 cm wide, and lacks appendages. The spur is narrow, unbranched and up to 15 mm long.
All parts of the upper pitchers are yellow, with orange colouration on the vestigial wings, peristome and lid. The intermediate pitchers are more variable in colouration, and may be marked with dark red or purple blotches on both the interior and exterior of the pitcher, and often have a red or purple peristome.
The inflorescence is a raceme, to 40 cm long. The peduncle is up to 20 cm long, the rachis to 25 cm long. Flowers are borne on 1- or 2-flowered partial peduncles, sometimes with narrow bracts to 2 mm long, with pedicels to 15 mm long. Tepals are ovate and up to 6 mm long and the anther head is borne on a column up to 4 mm long. Fruits are up to 12 mm long and borne on bractless pedicels to 18 mm long. [McPherson (2009)].

Habitat: Terrestrially in mossy, upper montane forest and scrub and in small clearings; 1180-1300 m. [McPherson (2009)].

Notes: *Nepenthes deaniana* was described from Palawan but referred tentatively, on the basis of its short and incomplete description, to *N. alata* (Jebb & Cheek Blumea 42 (1997)). It may well yet represent a fourth species of *Nepenthe*s for Palawan, but neither illustration nor original material has been traced. *Nepenthes deaniana* has

characteristics in common with *N. mira*, but differs, for example, in being a much smaller, non-climbing plant, 20-30 cm tall, with glabrous stems (not strongly petiolate, 35-50 by 8-10.5 cm) and partial peduncles bracteate and 1-flowered (not ebracteate and 2-flowered).
The Manila herbarium was destroyed in 1945. We have searched the following herbaria without success for duplicates of the type specimen or for any other material that matches the original description: B, BM, BO, DBN, FHO, FI, K, KEP, L, OXF, P, S, SAR, TCD, U, US, W. [Cheek & Jebb (2001)].

Etymology: The specific epithet honours the Philippine plant collector and explorer, Dean C. Worcester. [McPherson (2009)].

***Nepenthes densiflora* Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 16: 268. 1940. Sec. Cheek & Jebb (2001)**

Description: Terrestrial climber, to 2.5 m tall. Stems obtusely triangular to quadrangular, 0.2-0.8 cm diam., internodes 1-9 cm long. Leaves thinly coriaceous, sessile, obovate to obovate-lanceolate or slightly spathulate, 3-15 by 1-3.2 cm, apex acute to rounded, base attenuate, clasping the stem for 3/4 of its circumference. Longitudinal nerves 2 or 3 on each side of the midrib in outer 1/2 of blade, innermost arising from base of midrib, fairly conspicuous. Pennate nerves numerous, oblique, ± curving towards margin. Lower pitchers ovoid, c. 10 by 3 cm, fringed wings 3 mm broad, fringe elements c. 5 mm long; mouth oblique, but horizontal in front part; peristome cylindrical at front, 3-5 mm broad, flattened towards lid, and to 18 mm broad, ribs 0.5-1 mm apart, less marked than in upper pitchers, outer edge strongly recurved, entire, inner edge with teeth 3 mm long, increasing to 7 mm long near the lid; lid orbicular, 3-3.5 cm diam., apex rounded, base cordate, lower surface lacking appendages, nectar glands dense over whole surface (rarely absent from the edge), orbicular (rarely transversely elliptic), shallow, pit-like, 0.15-0.4 mm diam., much larger and longitudinally elliptic along the midline, to 1-1.5 mm long; spur simple, ± flattened, to 7 mm long. Upper pitchers broadly to narrowly infundibuliform, somewhat contracted at mouth, 9-23 by 3-4.5 cm, lacking fringed wings; mouth horizontal at front, with peristome rising more or less to the vertical towards lid; peristome cylindrical, 2-4 mm diam. at front, to 11 mm broad near lid, ribs 1-2 mm apart, outer edge entire, inner edge with teeth 3 mm long, otherwise as lower pitcher; lid orbicular to 5.5 cm diam., lower surface lacking appendages, nectar glands dense, largest, c. 1 mm diam., near base of lid. Male inflorescence to 20 cm long, 1.5 cm wide; peduncle 7 cm long, 1 mm diam. at base; partial peduncles 10-20, 1-flowered, rarely 2-flowered, 3-5(-7) mm long; bract 3-4 mm long, inserted at or near base; tepals elliptic, c. 5.5 by 3 mm; androphore c. 3 mm long; anther head c. 1.75 by 3 mm. Fruit valves 15-20 by 5 mm. Seeds fusiform, c. 8 mm long. Indumentum dense on inflorescence, new growth and tendrils, sparse elsewhere. Colour of pitchers pale green, peristome streaked with red; midrib red; indumentum reddish brown. [Cheek & Jebb (2001)].

Distribution: Sumatra: Aceh province (G. Leuser National Park). [Cheek & Jebb (2001)].

Habitat: Montane scrub; 1700-3000 m. [Cheek & Jebb (2001)].

Notes: According to Cheek & Jebb 2001, *Nepenthes bongso* Korth. × *Nepenthes pectinata* was based on the same type by Danser (1940) [Berendsohn (2017+)].

Notes: Among the Sumatran species, *N. densiflora* can only be confused with *N. bongso* s.l. or *N. ovata,* which share infundibuliform upper pitchers, which are constricted below the mouth. From *N. bongso* it differs by the more abrupt origin of the pitcher from the tendril (in the latter the curve of the lower pitcher is broad, and the pitcher widens gradually), the clasping, non-auriculate leaf bases, and the larger lid glands. From *N. ovata* it differs by its lack of an appendage on the lower surface of the lid. *Nepenthes diatas,* which occurs in the same area as *N. densiflora*and which is probably closely related, is distinguished by its ventricose-tubular pitcher, and stiff, almost woody peristome. [Cheek & Jebb (2001)].

***Nepenthes diatas* Jebb & Cheek in Blumea 42(1): 33, f. 4. 1997. Sec. Cheek & Jebb (2001)**

Description: Terrestrial subscandent shrub to 2.5 m tall. Stem base woody; stem quadrangular, angles being most marked below the nodes, 0.4-0.8 cm diam., internodes 1-3.5 cm long. Leaves thinly coriaceous, sessile, leaves of climbing stems oblanceolate, 9.5-17 by 2.5-3.5 cm, apex acute, base attenuate, subparallel-sided, to 1.6 cm wide, clasping the stem for 1/2 its circumference, occasionally auriculate. Longitudinal nerves 3 or 4 on each side of the midrib, in outer half of blade, fairly conspicuous. Pennate nerves numerous, oblique and parallel, inconspicuous. Lower pitchers not known. Upper pitchers ventricose in lower 1/3, cylindrical to slightly infundibuliform in upper 2/3, and gradually broadening towards mouth, 14-22 by 3-4.5 cm; with prominent ridges, and rarely with very short fringed wings immediately below peristome to 1 cm broad including fringed elements; mouth oblique and slightly concave; peristome woody, 5-15 mm wide, rounded at front, flattened towards lid, ribs 1-2.5 mm apart, to 1.5 mm high, outer edge entire and extending further than inner edge, inner edge toothed, teeth to 2.5 mm long; lid orbicular, 3.2-6.5 cm diam., apex rounded to truncate, base cordate, lower surface lacking appendages, thickened on midline, nectar glands circular, 0.15 mm diam., very numerous, on midline larger, elliptic, to 0.6 mm long; spur simple to 12 mm long. Male inflorescence 26-38 cm long, flowers clustered and dense in topmost 1/3-1/4; partial peduncles 1-flowered, rarely 2-flowered, 5-10 mm long; bract c. 6 mm long, flattened, inserted at the base of the partial

peduncle, or even somewhat below on the rhachis; tepals ovate, 4-6 by 2-3 mm; androphore 2-4 mm long; anther head 2 by 2.5 mm. Fruit valves 27-32 by 3-4 mm. Seeds unknown. Indumentum of erect reddish brown hairs c. 0.5 mm long, more or less dense throughout, absent from upper leaf blade, soon glabrescent, but persistent on tendril and in leaf axils, and dense on inflorescence, including staminal column and valve. Colour of pitchers reddish brown; flowers brownish or purple-brown, or tepals rusty, purple inside; anthers pale yellow; fruits rusty brown. [Cheek & Jebb (2001)].

Distribution: N Sumatra. [Cheek & Jebb (2001)].

Habitat: Montane scrub and mossy forest; 2400-2600 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes diatas* is part of the Sumatran *N. singalana* group. In its ventricose-tubular upper pitchers and attenuate, subparallel-sided leaf bases it resembles *N. singalana* and *N. spathulata,* but differs from both in the woody, rather than papery, peristome. It is probably derived from *N. singalana,* representing a far more robust version of that species.
Collections of lower and rosette pitchers are needed to complete our knowledge of *N. diatas*. [Cheek & Jebb (2001)].

Etymology: Diatas is a Bahasa Indonesian word for 'on top': the species is found both on top of mountains, and in Aceh, the most northerly, or 'topmost' region of Indonesia. [Cheek & Jebb (2001)].

***Nepenthes distillatoria* L., Sp. Pl.: 955. 1753. Sec. Jebb & Cheek (1997)**

= *Bandura zeylanica* Burm. ex Brongn. in Ann. Sci. Nat. 1: 43. 1824. *Nepenthes zeylanica* (Brongn.) Raf., Fl. Tellur. 4: 101. 1838.

= *Nepenthes chapmanii* N.P.Balakr. in J. Bombay Nat. Hist. Soc. 67: 65. 1970.

= *Nepenthes hirsuta* var. *glabrescens* W.G. Sm. in Gard. Chron. n.s. 17: 398, fig. 59. 1882. *Nepenthes smithii* Beck in Wiener Ill. Gart.-Zeitung 20: 188. 1895.

= *Nepenthes indica* Poir., Encycl. 4(2): 458. 1798.

= *Nepenthes rubra* G.Nicholson, Ill. Dict. Gard. 2: 439. 1886. *Nepenthes zeylanica* var. *rubra* Hort. ex Beck in Wiener Ill. Gart.-Zeitung 20: 226. 1895. *Nepenthes zeylanica* var. *rubra* (G.Nicholson) Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 37. 1908.

= *Nepenthes speciosa* Hort. ex Beck in Wiener Ill. Gart.-Zeitung 20: 226. 1895.

Description: Terrestrial branched stems up to 9 m long, scambling and climbing on surrounding vegetation.
The lamina is linear, elliptic or narrowly oblong, up to 30 cm long and 6 cm wide. The apex of the leaf is acute or obtuse and the base is attenuate and sub-petiolate or petiolate. The petiole is winged, up to 8 cm long by 2 cm wide, clasps the stem and may become slightly decurrent. The stem, midrib and tendril may be green, yellow, orange or red, especially in direct sunlight, and the lamina is green. Some short uniseriate hairs are found on the young parts of the inflorescence, small pitchers and tendrils. Hairs near the transition between tendril and lamina may be clustered, branched and up to 0.4 mm long (Eric Schlosser, pers. comm.).
The lower pitchers are up to 14 cm tall and 5 cm wide. The bottom third to half of the trap is ovate and usually swollen, sometimes becoming nearly spherical. The pitcher narrows above this part and becomes cylindrical towards the pitcher opening. Wings up to 22 mm wide run down the front of the pitcher and are often incurved towards one another. The wings may be fringed with narrow filaments up to 18 mm long, but such filaments are often entirely absent. The peristome is of a constant width, up to 5 mm wide, and is lined with fine ribs up to 0.5 mm high, spaced up to 0.3 mm apart. These ribs may be indiscernible. A gap of a few millimetres is often present in the peristome, below the lid. The lid is elliptic or sub-orbicular, often with a cordate base, up to 4.5 cm long by 5 cm wide, and lacks an appendage. The spur is unbranched and up to 6 mm long. The density of the tiny nectar glands underneath the lid is very high (usually in excess of 1,000 glands in total). The highest density of nectar glands occurs around the periphery of the underside of the lid, where density is between 500-800 cm². The glands are very small and hard to see especially near the rim of the lid. The density of the digestive glands is also very high compared to the other western outlying *Nepenthes* species, and ranges from 1000-1200 cm², Schmid-Hollinger (1979).
The exterior of the lower pitchers is usually yellow-green, but may have an orange or red hue, sometimes mottled with dull red blotches. The interior of the trap is white, cream coloured, yellowish green or pink, and the peristome is entirely yellow, pale orange or red. The lid is the same colour as the pitcher exterior.
The upper pitchers are up to 18 cm tall and 4 cm wide. The bottom fifth to quarter of the pitcher is infundibular and variably swollen. The pitcher narrows above this part, often forming a faint hip, and becomes cylindrical towards the pitcher opening. The pitcher also often narrows immediately below the peristome. The wings are reduced to narrow ridges, but may be indiscernible. All other parts are similar to the lower pitchers.
The exterior of the upper pitchers is pale yellow, yellowish green or occasionally orange suffused with red. The pitcher interior and peristome are light yellow. The lid is the same colour as the exterior of the pitcher, but often has a bright red underside.

Insufficient observations of *N. distillatoria* have been made to fully document the structure of inflorescences. The inflorescence is a racemose panicle, with widely spaced 3- to 5-flowered partial peduncles. Further studies of the floral parts of this species are required. [McPherson (2009)].

Distribution: Sri Lanka. [Jebb & Cheek (1997)].

Habitat: Waterlogged open scrub, road embankments and other cleared areas, also in forest; from sea level to 700 m. [Jebb & Cheek (1997)].

***Nepenthes dubia* Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 285, f. 4. 1928. Sec. Clarke (2001)**

Description: Stem: climbing, ≤ 3 m in length, ≤ 0.4 cm in diameter, internodes ≤ 10 cm long, cylindrical.
Leaves: sessile; lamina lanceolate-spathulate, ≤ 10 cm long, ≤ 2 cm wide, apex acute, lamina gradually attenuate towards the base, which clasps the stem for up to half its circumference. Longitudinal veins 3 on each side of the midrib, pennate veins not easily distinguished, tendrils ≤ 15 cm long.
Rosette and lower pitchers: infrequently produced, lower 2/3 narrowly infundibular, upper 1/3 ovoid, but contracted sharply beneath the rim, ≤ 5 cm high, ≤ 3.5 cm wide, with two fringed wings (≤ 3 mm wide) running from the rim about 1/3 of the way down the front of the pitcher. Glandular region covers the lower 2/3 of the inner surface. Mouth round, very slightly raised at the rear. Peristome cylindrical in cross section, ≤ 3 mm wide, teeth indistinct. Lid ovate, slightly raised in the centre, no appendages. Spur ≤ 4 mm long, unbranched.
Upper pitchers: ≤ 8 cm high, ≤ 4 cm wide, radically different in shape from the lower ones: the lower parts are tubular to infundibular when viewed from the side, but the pitcher walls are laterally appressed, with almost no gap between them in mature pitchers. Upper half widely infundibular throughout; mouth round and horizontal, peristome cylindrical or involute in cross section, ≤ 4 mm wide, teeth indistinct. Lid narrow and cuneate, no appendages, always reflexed beyond 180°. Wings and fringe elements absent. Spur ≤ 5 mm long, unbranched.
Inflorescence: a short, compact raceme; peduncle ≤ 8 cm, rachis ≤ 10 cm; pedicles ≤ 8 mm, with bracteoles. Sepals oblong-lanceolate, ≤ 3 mm long. Rachis of the female inflorescence usually shorter than the male.
Indumentum: some caducous hairs produced on young parts of the plant. Mature plant parts virtually glabrous, except for the inflorescence, which may be sparsely covered with simple hairs. [Clarke (2001)].

Distribution: Indonesia, Sumatra Barat, Gunung Talamau. [Clarke (2001)].

Habitat: Epiphytic in lower montane forest; epiphytic or terrestrial in stunted upper montane forest; 1800-2700 m a.s.l. [Clarke (2001)].

***Nepenthes edwardsiana* H.Low ex Hook.f. in Trans. Linn. Soc. London 22: 420, t. 70. 1859. Sec. Cheek & Jebb (2001)**

= *Nepenthes edgeworthii* Rchb.f. ex Beck in Wiener Ill. Gart.-Zeitung 20: 183 (in syn.). 1895.

Description: Terrestrial or epiphytic, climbing shrub to 15 m tall. Stem terete, 5-10 mm diam., internodes of climbing stems 20-35 cm long. Leaves coriaceous, petiolate; blade narrowly oblong, 15-20 by 4-6 cm, apex acute, base cuneate; petiole 6-10 cm long, canaliculate, clasping the stem for up to 3/4 its circumference, not auriculate or decurrent. Longitudinal nerves 2 or 3 on each side of the midrib in the marginal half, conspicuous. Pennate nerves numerous, patent, reaching the margin, conspicuous. Lower pitchers rarely collected, as the upper pitchers, but with two fringed wings 1-7 mm wide, fringed elements 2-3 mm long, 3-5 mm apart. Upper pitchers papery, subcylindrical, lower 1/4-1/3 ovoid, upper part narrowly cylindrical to infundibuliform, 10-35(-50) by 2-6(-15) cm, lacking fringed wings, but with two low ridges; mouth elliptic, markedly oblique, concave, gradually rising to the vertical or overarching the mouth, forming a stout column; peristome rounded, 6-12(-25) mm broad, ribs 4-6 mm high, 3-9 mm apart, outer edge not sinuate or curved, inner edge coarsely dentate, teeth up to 10 mm long; lid orbicular, 3-8.5 cm diam., apex rounded, base cordate, lower surface lacking appendages, nectar glands, sparsely scattered, minute, pit-like, not bordered, c. 0.2 mm diam.; spur stout, entire, ± 10 mm long. Male inflorescence 30-40 by 3.5 cm; peduncle 15 cm long, 5 mm diam. at base; partial peduncles 1-flowered; pedicels 6-20 mm long; bracts absent; tepals elliptic, 4 by 1.5-2 mm; androphore 2-3 mm long; anther head 1 by 1 mm. Fruit valves 20 mm long. Seed fusiform, 8 mm long, central part smooth. Indumentum of stem, midrib, pitcher and inflorescence sparsely hairy with simple red-brown hairs 0.5-0.75 mm long, eventually glabrescent. Colour of pitcher yellowish green, sometimes suffused with orange; peristome darker; inner pitcher white. [Cheek & Jebb (2001)].

Distribution: Borneo: Sabah (Mt Kinabalu and Mt Tambuyukon). [Cheek & Jebb (2001)].

Habitat: Moss forest, on ultramafic soils; 1500-2700 m a.s.l. [Cheek & Jebb (2001)].

Notes: [Nomenclature] The citation in IPNI (acc. 17 mar 2017) seems to be incorrect (vol. 20(3): 420. 1851). [Berendsohn (2017+)].

Notes: *Nepenthes edwardsiana* is closely related and sometimes confused with *N. villosa* and *N. macrophylla*. *Nepenthes mira* of Palawan also appears to be related. *Nepenthes edwardsiana* is a climber and the pitchers are elongated, ventricose below, tubular above, whereas *N. villosa* is a prostrate scrambler with short urceolate pitchers.

An important difference between *N. edwardsiana* and *N. villosa* is in the structure of the internal peristome. In *N. edwardsiana* the flattened peristome teeth bear a narrow-mouthed gland on the abaxial surface (i.e. away from the lid), and below each peristome tooth there is a distinct, elliptic pocket. In *N. villosa* the gland has a toothed opening, and the pockets are so deepened as to form a series of rectangular partitions between the front peristome, and a second series of irregular teeth. Clarke in Nepenthes of Borneo (1997: 79), points out further differences: *N. edwardsiana* has an acute leaf apex, inconspicuous indumentum and no inflorescence bracts, whilst *N. villosa* tends to have an emarginate leaf apex, densely villose indumentum and filiform inflorescence bracts.
The pitchers of *N. edwardsiana* are distinct from those of the very closely related *N. macrophylla* in being more papery, narrowly subcylindrical, at least 4 times as long as broad (vs. woody, broadly cylindrical, less than 3 times as long as broad), the lower 1/3-1/4 slightly swollen, the upper part narrower and cylindrical (vs. pitcher with a shallow central constriction), the peristome teeth are larger and sparser, and the leaf blade never exceeds 20 cm long (vs. frequently reaching 35 cm). [Cheek & Jebb (2001)].

***Nepenthes ephippiata* Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 286, f. 5; 426, f. 36. 1928. Sec. Cheek & Jebb (2001)**

Description: As *N. lowii* but differing as follows: Leaves of climbing stems with petiole base de-current as two prominent, recurved ridges that unite above the node below. Longitudinal nerves entirely absent, rarely 1. Pennate nerves oblique, branching 1 or 2 times before reaching edge of leaf, conspicuous. Upper pitchers only very slightly constricted at midpoint; the peristome more pronounced; the lid relatively broader and larger than *N. lowii*, lower surface with numerous stout spike-like processes 2-3 by 1 mm towards the base, nectar glands volcano-like, 1 mm wide with a narrow central opening < 0.1 mm wide, these glands more numerous toward the lid margin, where the processes are absent. [Cheek & Jebb (2001)].

Distribution: Borneo: C Kalimantan (Bukit Raya, Bukit Lesong). [Cheek & Jebb (2001)].

Habitat: Forest, substrate unknown; 1000-1900 m. [Cheek & Jebb (2001)].

Notes: The drawing of *N. ephippiata* in Danser Bull. Jard. Bot. Buitenzorg III 9 (1928) 427, f. 36 is not accurate. In *N. ephippiata* the lid bristles are less numerous, more concentrated towards the base of the lid and are both shorter and stouter than those shown. Danser in Bull. Jard. Bot. Buitenzorg III 9 (1928) 426 seems not to have fully appreciated how similar this species was to *N. lowii*. Both *N. ephippiata* and *N. lowii* have more or less cylindrical lower pitchers with a well-developed peristome: it is only the upper pitchers that are so bizarrely formed. The saddle-like decurrent petiole-bases, from which *N. ephippiata* derived its name, are similar to those of some *N. northiana* collections.
Nepenthes ephippiata appears to replace *N. lowii* in the central mountains of Kalimantan, the latter being abundant in parts of Sarawak, Brunei and Sabah. [Cheek & Jebb (2001)].

***Nepenthes epiphytica* A.S.Rob., Nerz & Wistuba, in: McPherson, S., New Nepenthes 1: 36 (-51; figs. 25-36). 2011. Sec. Robinson, Nerz & al. (2011)**

Description: Epiphytic climbing, scrambling or pendant branched shrub, to 2 m tall. Stems terete to slightly trigonous, to 5 mm in diameter, internodes 0.5 – 1.5 cm long in rosettes, 2-5 cm long in climbing stems, often with a waxy bloom. Stems range from green to reddish purple in colour.
Leaves coriaceous, with a slightly scabrous texture, lamina lanceolate to narrowly elliptic, rosette leaves to 15 cm long and 5 cm wide, leaves of climbing stem to 10 cm and 4 cm wide, apex acute to slightly acuminate at the very tip, base strongly petiolate, attenuate, semi-amplexicaul, clasping the stem by ½-⅔ its circumference, occasionally decurrent down internode for 2-4 mm; longitudinal veins conspicuous, generally 2 on each side of midrib in outer ⅓ of lamina, pennate veins numerous, almost indiscernible, perpendicular to midrib; tendrils to 3.5 mm in diameter, to 10 cm long in lower pitchers, occasionally coiling, to 15 cm in upper pitchers, usually coiling.
Lower pitchers narrowly cylindric, narrowly ventricose in the lower half, dilating slightly towards the mouth, up to 20 cm tall and 3 cm wide excluding lid, originating from tendril at front, side or rear of pitcher; inner surface glandular in the lower half, ventral exterior surface with wings normally reduced to ridges from tendril to mouth, small fringe elements being always present below the peristome; mouth strongly oblique, ovate, slightly concave in profile, rising at the rear to form a short column, triangular in cross-section; peristome cylindric, slightly flattened, narrow, up to 6 mm wide towards sides and lid, outer margins occasionally sinuate. Lid narrowly ovate to 3.5 cm long by 2.5 cm wide, no terminal appendages, but a slightly thickened ridge towards base with deep, ovate glands and smaller, shallower, round glands scattered across remainder of the lower surface; spur simple, 4-8 mm long. Pitcher exterior usually yellow, olive or suffuses purplish-red, with sparse, red to black blotches towards mouth; pitcher interior creamy in colour, with liberal red speckling in the upper half; lid as per pitcher exterior; peristome generally red to dark purple.
Upper pitchers narrowly infundibular in the lower half, broadly infundibular above, up to 15 cm tall and 10 cm wide excluding lid, originating from tendril at rear of pitcher; inner surface entirely glandular, exterior surface with wings reduced to fine ridges or entirely absent; mouth horizontal, rising abruptly at the rear to form short neck; peristome

cylindric to flattened, up to 5 mm wide at front, up to 10 mm wide at sides and up to 7 mm wide at neck, striate with ribs up to 0.4 mm high, terminating on inner margin in fine teeth up to 0.2 mm long, but up to 0.5 mm long on neck. Lid broadly subulate, to 4 cm long by 1.5 cm wide, usually held at 30-40° above horizontal. Pitcher exterior yellowish green to yellow, occasionally with sparse, red flecks towards peristome; pitcher interior similar, but with greater degree of flecking; lid and peristome generally as per pitcher exterior, but often suffused red, with distinct striping of the peristome.
Inflorescence a racemose panicle. Male inflorescence unknown. Female inflorescence up to 30 cm long, with a peduncle 8- 15 cm long and a rachis 12-18 cm long. Flowers borne on predominantly 2-flowered partial peduncles, lacking bracts, with ca. 70-90 flowers per scape. Tepals narrowly elliptic, 3-4 mm long by 1.5-2 mm wide.
Indumentum of golden to dark brown hairs 0.1-0.2 mm long is present on the stem, the adaxial surface of the leaves, the abaxial surface of the midrib, on the tendrils and pitchers. It is shorter on the leaves, giving them a rough texture, and is more obvious on lower pitchers than upper pitchers. Hairs are more dense on juvenile foliage, the spur, and on the stem and partial peduncles of inflorescences, normally being rusty brown on the latter organs. [Robinson, Nerz & al. (2011)].

Distribution: Indonesia, East Kalimantan, Berau Regency, Mount Nyapa [Robinson, Nerz & al. (2011)].

Habitat: Obligate epiphyte; in open forest on limestone substrate. [Robinson, Nerz & al. (2011)].

Etymology: The epithet was chosen because all known specimens of this taxon have been observed growing exclusively as epiphytes on trees, an ecological characteristic that is relatively unusual within the genus. [Robinson, Nerz & al. (2011)].

***Nepenthes eustachya* Miq., Fl. Ned. Ind. 1(1): 1074, suppl. 151. 1858. Sec. Cheek & Jebb (2001)**

Description: Terrestrial climber to 5 m tall. Stem terete, 0.3-0.7 cm diam., internodes of climbing stems 1-6.5 cm long. Leaves chartaceous, petiolate, leaves of climbing stems obovate to oblong-lanceolate, 14-19.5 by 2.9-5 cm, apex rounded, sub-peltate, or slightly emarginate, base tapering to winged; petiole c. 5 by 0.7 cm wide, broadening at very base, and clasping stem for 1/2 its circumference, not decurrent or auriculate. Longitudinal nerves 2 or 3 (or 4) on each side of the midrib, some arising from midrib base, confined to outer 1/2-1/3 fairly conspicuous. Pennate nerves arising obliquely from the midrib at an angle of c. 30°. Lower pitchers not seen. Upper pitchers ventricose-tubular, widening abruptly from base, and somewhat woody and angular there, becoming obovoid, then narrowing and gradually enlarging towards the mouth, 11-24.5 by 2.5-4.5 cm, normally lacking wings, but rarely with fringed wings to 0.3 cm wide, the fringe elements to 0.4 cm long; mouth oblique, more or less straight, attenuate to lid; peristome rounded to slightly flattened in cross section, 0.2-0.5(-0.7) cm wide, ribs 0.3-0.4 mm apart, outer edge entire, inner with no teeth apparent; lid obovate to orbicular, rarely somewhat broader than long, base rounded to scarcely cordate, 3-6.5 by 2.5-6.7 cm, lower surface lacking an appendage or keel, nectar glands orbicular, not prominently bordered, 0.1-0.15 mm diam., scattered, densest near base; spur 2-4 mm long, usually bifid, occasionally with ancillary hair-like appendages arising from near base, rarely simple, flattened to 10 mm long. Male inflorescence 50 by 2.5 cm; 15 cm long, 5 mm diam. at base; partial peduncles diffuse, c. 25, 2-flowered near base of inflorescence, 1-flowered above, 4-5 mm long; bracts absent; pedicels 10-23 mm long; tepals lanceolate, 3.5-4 by 2-2.5 mm; androphore 2.5-3 mm long; anther head 1 by 1.5 mm. Fruit valves to 17 by 2.3 mm. Seeds unknown. Indumentum sparse, evanescent, most conspicuous on upper surface of midrib, 0.4 mm long, simple, brown and on pitchers below peristome c. 0.2 mm long, branched, dull yellow. Colour of pitchers green. [Cheek & Jebb (2001)].

Distribution: Sumatra: from Lake Toba in the north to the Padang region in the south [Cheek & Jebb (2001)].

Habitat: Forest margins; sea level to 1600 m. [Cheek & Jebb (2001)].

Notes: Danser in Bull. Jard. Bot. Buitenzorg III 9 (1928) 259 united *N. eustachya* with *N. alata* Blanco of the Philippines. The two species differ most conspicuously in the presence of a lid appendage in *N. alata*.
Danser in Bull. Jard. Bot. Buitenzorg III 9 (1928) 261 included Peninsular Malaysia in the range of what he treated as *N. alata* (which also included *N. eustachya*) on the basis of a single misidentified specimen of *N. gracillima* (Ridley 16097) from Mt Tahan (Kiew J. Wildlife and National Parks (Malaysia) 10 (1990) 34-37). [Cheek & Jebb (2001)].

***Nepenthes extincta* Jebb & Cheek in Eur. J. Taxon. 69: 14 (-17, fig. 3). 2013. Sec. Cheek & Jebb (2013)**

Description: Terrestrial shrub, probably about 1 m tall. Leaves elliptic to elliptic-lanceolate, 13–17 × 5.5–8 cm, thickly leathery, glossy above, matt mid brown below; apex obtuse to acute, not peltate; base rounded to obtuse, not decurrent; longitudinal nerves arising from base of blade, where 5–6 pairs arise on each side of the midrib, at blade midpoint 4–5 pairs occur in the outer third of the blade; pennate nerves arising at ca. 45° from the midrib, irregularly branching, ends traversing the inner longitudinal nerves; all nerves most conspicuous on upper surface; midrib deeply depressed on upper surface, lacking hairs, highly exserted on lower surface and densely (80–90% cover) grey-white stellate hairy, the hairs gathering dirt, hairs sessile, arms 5–8, 0.25–0.5 mm diam., fine, acute, appressed

to surface; lower surface of blade sparsely hairy, densest towards midrib, ca. 15% cover, decreasing at margin to 5–10%, cover, hairs mainly stellate, as midrib, mixed with sparser erect, bristle-like hairs 1–2 mm long, of several types (1) with short branches arising along the length of the main axis; (2) with 2–6 ± equal erect arms; (3) with a single long erect bristle arising from a stellate hair, the "dagger-hair" of Kurata (2003) more rarely (4) hairs with 2–3 erect, equal arms from the base; depressed-globose sessile red-black glands 0.03 mm diam., raised, dense, conspicuous; upper surface of blade with stellate hairs, as lower surface, scattered along the margins of the midrib. Petiole 4.5 × 0.5–0.7cm, appearing cylindric due to the two involute wings, indumentum of appressed, stellate, fine 5–8-armed hairs, ca. 20% cover. Lower and upper pitchers unknown, possibly not produced. Intermediate pitchers (tendrils not coiled, fringed wings absent) ovoid-cylindric, 18–24 × 5.9–8.2 cm, widest in the basal half, narrowing gradually to the cylindric upper half (4.8–5.5 cm wide), not constricted or waisted; outer surface 10–20% covered in minute, white, 2–4-armed, bushy-stellate hairs 0.12–0.15 mm wide and high, the arms stout and raised, 10–15 hairs per mm2, mixed with sparser black depressed-globose sessile glands 0.07 mm diam., 4–5 per mm2, long simple and bristle-like hairs absent; fringed wings absent, reduced to ridges; mouth ovate 7–8 × 4.5–5.5 cm, oblique, concave, column weakly defined ca. 1.5 × 0.7 cm; peristome subcylindric, 7–8 mm wide, widest at sides, outer edge lobed, lobes 1–3 per side, 10–12 mm wide, inner side inconspicuously toothed, teeth 0.25 mm long; ridges 4 per mm, 0.1 mm high. Lid ovate 5.2–6.5 × 4–5.2 cm, apex rounded, base truncate, lower surface with a basal ridge ca. 8 mm long, 1–2 mm high, bearing a pronounced straight convex appendage 4 × 2.5–5 mm; nectar glands of two distinct size classes (1) smaller, elliptic or orbicular, frequent, bordered glands 0.3–0.6(–0.7) × 0.25 mm, the border ca. 0.1 mm wide, glossy pale brown, dense, (1(–2) per mm2) along the midline these are longitudinally elliptic, elsewhere with their short axis orientated towards the base of the lid; the appendage completely covered in smaller type nectar glands; (2) larger glands elliptic to orbicular, (1–)1.25–2 × 1.25 mm, the lumina often invaginated by a projection of the border, border 0.2 mm thick, 4–15 on each side of the lid, scattered around the margin and towards the apex of the midline; sessile, depressed-globose, red glands, 0.05 mm in diam., 1–2 per mm2; marginal 0.5–1 mm of lower surface with minute branched hairs 0.1 × 0.1 mm; upper surface with indumentum as outer pitcher. Spur inserted 5–6 mm below junction of lid with peristome, cylindric 8–14 × 1–1.2 mm, apex shortly bifid, surface covered in minute appressed, matted, white-grey stellate hairs. Male and female inflorescences and infructescence unknown. [Cheek & Jebb (2013)].

Distribution: Philippines, Mindanao, Surigao del Sur. [Cheek & Jebb (2013)].

Habitat: Open scrub habitats on ultramafic substrate with *N. merrilliana* Macfarl. (Macfarlane 1911) and *N. graciliflora* Elmer (Elmer 1912). Elevation: ca. 400 m. [Cheek & Jebb (2013)].

Etymology: *Nepenthes extincta* is named to signify that this species may already be extinct globally. [Cheek & Jebb (2013)].

Conservation: Assessed as Critically Endangered under Criterion D of IUCN (2012) since only a single individual has ever been recorded (the type specimen collected in 1978). [Cheek & Jebb (2013)].

***Nepenthes eymae* Sh.Kurata in J. Insectiv. Pl. Soc. 35(2): 41. 6.2.1984. Sec. Cheek & Jebb (2001)**

= *Nepenthes infundibuliformis* J.R. Turnbull & A.T. Middleton in Reinwardtia 10(2): 110 (-111). 10.2.1984.

Description: Terrestrial climber to c. 5 m (?) tall. Stem 2-ridged, 5-8 mm diam., internodes of climbing stems 1.5-6 cm long, axillary buds spike-like, 6-10(-20) by 1.5 mm, inserted 3-5(-10) mm above the axil. Leaves of the climbing stems coriaceous, petiolate, blade oblong-elliptic, 8-13(-20) by 3-4.5(-7) cm, apex acute to obtuse, not peltate, base attenuate, petiole winged, 4.2-8.5 cm long, wings c. 4 mm wide, clasping the stem for 1/2 its circumference, abruptly decurrent as two low ridges to the node below. Longitudinal and pennate nerves inconspicuous. Lower pitchers cylindrical, slightly constricted below the mouth, 10-18 by 2-6 cm, with fringed wings in upper 2/3, 2 mm wide, fringe elements 3 mm long; mouth ovate, oblique, concave; peristome rounded in transverse section, 2-5 mm wide at front, expanded, and sinuate towards lid, then to 25 mm wide; lid subtriangular, to 4.5 by 2 cm, apex acuminate, base truncate to auriculate, with broad, rounded lobes, lower surface with basal appendage hooked, apical appendage filiform, midline and appendages with large, elliptic, bordered glands to 2 by 1 mm, the lid blade with numerous small glands, margin irregular, sinuous. Upper pitchers gradually originating from tendril, with a wide tubular curve which expands rapidly at 1/2-3/4 overall height to form a broad bowl, which is sometimes shortly contracted immediately below the peristome; to 11 by 8 cm overall, ventral ridges parallel in lower curve, divergent above, mouth horizontal, straight, rising abrubtly at the rear and forming a 1-3 cm long, vertical, acuminate column, peristome flattened above, sharply curved at outer edge, broadest on inner surface, 0.2-0.4 cm broad at front 0.8 cm towards column, ribs 0.25-0.5 mm apart, fairly conspicuous, outer edge often sinuate immediately adjacent to column, inner edge entire; lid hastate, to 8 cm long, 1 cm broad in middle, 2.5 cm broad at base, basal lobes rounded, apex obtuse to abruptly rounded, margin sinuate; lower surface with basal appendage hook-shaped, to 8 mm long, apical appendage filiform, to 12 mm long; glandulation as in lids of lower pitchers; spur to 10 mm, inserted 10 mm from lid, bifurcate at tip or entire. Unopened pitchers laterally compressed, with a prominent bulge at the dorsal end with spur upright and bifurcation closed. Male inflorescence 30 by 2.5 cm;

peduncle 11 cm long, 3 mm diam. at base; partial peduncles 2-flowered at base, 1-flowered at apex, 30-40, c. 4 mm long; bracts absent; pedicels c. 10 mm long; tepals elliptic, c. 4 by 2 mm; androphore 4 mm long; anther head 1 by 1.5 mm. Fruit and seed unknown. Indumentum reddish brown, on all surfaces, including stem, underside of lid and leaf blade surfaces, of short tufted hairs to 0.05 mm long and simple hairs to 0.8 mm long, especially dense and longer on tendril, midrib, lid and spur where up to 1-2 mm long. Colour of leaves dark green, tendrils reddish, pitcher yellowish green or white below becoming blotched with red above, generally more darkly pigmented within, peristome with numerous narrow streaks of red and green, lid green above, with red blotches below; flowers red; indumentum maroon. [Cheek & Jebb (2001)].

Distribution: Sulawesi: apparently widely distributed in the mountains of the eastern arm of the central area. [Cheek & Jebb (2001)].

Habitat: Ridges in moss forest; 1500-2000 m. [Cheek & Jebb (2001)].

Notes: Closely related to *N. maxima* which also occurs in Sulawesi, but differing in the narrowly hastate lid (not ovate to elliptic) and in that the upper pitchers are strikingly infundibuliform — bowl-shaped in the upper half, arising abruptly from a narrowly cylindrical basal half. The remarkable pitcher appears to be a specialised trap, its relatively horizontal sides would probably make the capture of much of its prey difficult. The pitcher fluid is extremely viscous in cultivated specimens at Kew, interestingly this feature is also reported in *N. inermis,* a species with equally infundibulate upper pitchers from Sumatra (see there for a possible functional explanation).
Along with two other species (*N. hamata* and *N. glabrata*) the nomenclatural history of *N. eymae* involved almost simultaneous publication of two competing names. Kurata's publication of *N. eymae* preceded Turnbull & Middleton's *N. infundibuliformis* by just 4 days. Unfortunately the location of the proposed holotype (Kurata 102a), and series of isotypes (103, 104 & 105) was not stated (although the name is nonetheless valid under article 37 of the ICBN), and none of this material appears to have been deposited in a public institution. However, the holotype is illustrated in the original publication. Nor do the types proposed by Turnbull & Middleton appear to have been deposited at Bogor as stated. [Cheek & Jebb (2001)].

Etymology: The name Eyma is feminine, even though the collector was male, and the correct ending is therefore 'eymae'. [Cheek & Jebb (2001)].

***Nepenthes faizaliana* J.H.Adam & Wilcock in Blumea 36(1): 123. 1991. Sec. Cheek & Jebb (2001)**

Description: Terrestrial shrub or climber to 4 m tall. Stems terete, those of rosettes 0.3-0.4 cm diam., internodes 0.5-1.7 cm long; climbing stems 0.5-0.8 cm diam., internodes 1-5 cm long. Leaves coriaceous, petiolate; rosette leaves with blades oblanceolate, 8.5-11.5 by 4-4.5 cm, apex abruptly acute, base cuneate-decurrent; petiole 2.5-3.5 by 0.35 cm, canaliculate, clasping the stem by 1/2-2/3 its circumference; leaf blades of climbing stems lanceolate to oblong, 12-18 by 2.8-5 cm, apex acute-attenuate, base obtusely rounded; petiole 3.5-4.5 cm, canaliculate, clasping the stem for 1/2-2/3, rarely decurrent as two ridges to the node below. Longitudinal nerves 1 (or 2) on each side of the midrib close to the margin, moderately conspicuous above. Pennate nerves patent, inconspicuous. Lower pitchers subcylindrical, 9-10.5 cm long, slightly hipped: the lower half ellipsoid, 2.2 cm wide, the upper half cylindrical, 1.8 cm wide, with two fringed wings 2 mm wide, fringed elements 5 mm long, 1.5 mm apart; mouth oblique, concave, ovate, rising at the elongated apex into a column, peristome subcylindrical, 4 mm wide, with conspicuous ribs c. 0.2 mm high, 0.3-0.5 mm apart, outer edge entire, inner edge shallowly toothed near the column; lid orbicular, 2-2.1 by 1.9-2 cm, apex rounded, base cordate, lower surface with a laterally flattened, semi-circular or keel-like basal appendage up to 6-7 mm long, 1.5 mm tall, nectar glands 30-35 circular, narrowly bordered, 0.3-0.4 mm diam. scattered along the midrib; spur not seen. Upper pitchers narrowly infundibulate, rarely subcylindrical, 15-26 by 3.5-5.7 cm, lacking fringed wings, mouth slightly concave, column poorly defined; peristome cylindrical, 2-7 (-13) mm wide, ribs well defined 0.2-0.3 mm high, 0.5 mm apart, outer edge entire or, less usually, sinuate, with up to 3 lobes on each side, each lobe up to 0.4 cm long; lid orbicular, 3.5-4 by 4-4.2 cm, apex rounded or slightly emarginate, base deeply cordate, basal appendage semi-circular, laterally flattened, 5 by 5 mm, on a ridge 10-18 by 2-3 mm, nectar glands orbicular, slightly bordered, 0.2-0.5 mm diam. either densely covering the whole of the surface of the lower lid, or sparsely scattered apart from two arms diverging from the appendage towards the apex where densely spread, sometimes the apex with a cluster of larger elliptic or orbicular glands up to 1 mm long; spur stout, simple, 8-9 by 1.5-1.8 mm, apex rounded. Male inflorescence 48-60(-90) by 4-5 cm; peduncle 15-18 cm long, c. 4 mm diam. at the base; partial peduncles 1-flowered, to 20 mm long, bearing a patent filiform bract 0.5(-1.5) mm long, inserted 3-5 mm from the base; tepals patent, obovate, 3 by 2 mm; androphore 1.5 mm long; anther head 1 by 2 mm. Fruit with bract persisting, valves 24 mm long. Seed unknown. Indumentum of stems densely short-pubescent with dark red-brown, sometimes whitish, patent hairs 0.2-0.3 mm long, sometimes interspersed with hairs 0.5-1 mm long, extending to lower surface of the midrib, where less dense; lower surface of the leaf blade with sessile red glands, sometimes interspersed with hairs 0.2-0.3 mm long; pitcher, including upper lid, with same indumentum, but hairs much denser; lower surface of lid glabrous, or with patent simple or branched hairs 0.2-0.3 mm long; spur black sericeous; inflorescence with same indumentum as stem extending from peduncle base to lower

surface of tepals, androphore, and ovary. Colour of dried leaves brown below, pitchers pale green or yellowish white, splashed with red or purple, lid marbled in same colours; inflorescence dark red with red-brown tomentum, tepals dark brown, stamens yellow. [Cheek & Jebb (2001)].

Distribution: Borneo: Sarawak (Mulu National Park). [Cheek & Jebb (2001)].

Habitat: Scrub amongst limestone blocks; 600-1600 m. [Cheek & Jebb (2001)].

Notes: Although *N. faizaliana* was held by its authors to be closely related to *N. fusca* (their only specimen of *N. faizaliana* lacked a lid), it seems much closer to *N. stenophylla*, being distinguishable only in the inflorescences. Indeed, we formerly united *N. faizaliana* with *N. stenophylla* (Jebb & Cheek Blumea 42 (1997)). We are grateful to Charles Clarke (pers. comm., 1997) for suggesting the reassessment that leads us to resurrect this species here. *Nepenthes faizaliana* always has 1-flowered partial peduncles with bracts (vs. bractless, 2-flowered partial peduncles in *N. stenophylla*), on inflorescences twice as long, and with male partial peduncles also twice as long as those in *N. stenophylla*. Moreover, *N. faizaliana* is only known from three limestone peaks in the Mulu National Park of N Sarawak, whereas *N. stenophylla* is widespread on sandstone (rarely ultramafic) throughout N Borneo, including the Mulu National Park. It has been suggested that several vegetative characters can be used to distinguish the two species (Clarke in Nepenthes of Borneo (1997) 86). However, after lengthy examination of the eleven herbarium sheets available of *N. faizaliana*, we have found this not to be the case, nor have we found any other characters, besides those of the inflorescence and substrate, that allow us to recognise *N. faizaliana*. This is the only case that we know of in the genus of a species that is maintained purely on inflorescence characters.
Apart from the inflorescence, *N. faizaliana* shows a similar degree of variation to that seen in *N. stenophylla,* particularly in peristome diameter and lobing, lid nectar gland size and distribution, in whether the leaf base is sheathing or decurrent, and to a lesser extent, in indumentum length. Generally, *N. faizaliana* has a shorter and darker indumentum than that of *N. stenophylla,* but there is overlap. *Nepenthes faizaliana* is still a poorly known species, with only incomplete female inflorescence and infructescence available. The description of lower pitchers and rosette leaves is taken from S 30900 (Anderson), which appears not full grown. [Cheek & Jebb (2001)].

***Nepenthes flava* Wistuba, Nerz & A.Fleischm. in Blumea 52(1): 159 (-163, fig. 1). 2007. Sec. Wistuba, Nerz & al. (2007)**

Description: The plants grow as basal rosette only for a short time and start climbing early. climbing plants reach several metres in height.Stem almost round in cross section, c. 3 mm diam., green to dark red, internodes 2 –14 cm long, glabrous, only young developing parts sparsely covered by red-brown basally branched hairs 0.2 – 0.5 mm long. Leaves oblong to narrowly obovate, 7– 9 by 1.5 – 2.5 cm, yellowish green, with glabrous margins; lamina with three prominent longitudinal nerves and indistinct reticulate nerves. the leaf-base clasps 1/2 to 3/4 of the perimeter of the stem. Tendrils 18 – 24 cm long, with curl, widely curved near the pitcher; young developing pitchers and tendril tips densely covered by red-brown hairs 0.5 –1 mm long. Pitchers dimorphic, yellow to yellowish green in colour, rarely reddish, never spotted, peristome cream to light yellow, rarely red, occasionally with a few red stripes. Lower pitchers ovate-infundibulate, 4 –7 by 3 – 4 cm, with two fringed wings in the upper third of the pitcher, the wings 2 – 3 mm wide with filiform fringes c. 5 mm long; peristome cylindrical to slightly expanded, folded or crenellated on the outer edge, 8–10 mm wide and finely ribbed, the ribs 0.1– 0.2 mm apart; pitcher mouth round, slightly elongated to the back without a neck, or at most with just a slightly developed one; lid 2.5 – 3.5 by 1.5 – 2 cm, narrowly ovate, elongated to linear with a glandular crest at the base of the lower surface; spur unbranched, filiform, 3 – 4 mm long; nectar glands circular, 0.3 mm diam., scattered over the lower surface of the lid, but concentrated around the midrib and glandular crest. Upper pitchers tubular in the lower part, infundibulate in the upper part; pitchers originate abruptly from the hanging end of the tendril; peristome flattened, partially expanded, 5 –15 mm wide at both sides of the pitcher, outer margin distinctly crumpled, finely ribbed, the ribs 0.1– 0.3 mm apart; lid elongated, ovate-cordate to linear, slightly truncate at the apex, 3 – 4 by 1.8 – 2.5 cm, bearing a slightly developed crest at the base; spur unbranched, filiform, 3 – 4 mm long; nectar glands circular, 0.3 mm diam., scattered over the lower surface of the lid, concentrated around the midrib and glandular crest. Male inflorescence 6 –7 cm long, racemose, with 15 – 40 flowers; peduncle 3 – 4 cm long; pedicels 1-flowered, 4 – 6 mm long, usually with a basal bract of 2 – 3 mm length; tepals ovate, 2 – 3 by 1 mm, with nectar glands, tepal margins densely covered with short, curved red-brown hairs c. 0.2 mm long; androphore 3 mm long, anther head 1–1.5 mm diameter. All parts of the inflorescence yellow and covered by yellowish brown, short, branched hairs 0.5 –1 mm long. Female inflorescence 6 –7 cm long, racemose, with 15 – 25 flowers; peduncle 5 – 8 cm long; pedicels 1-flowered, 8 –11 mm long, usually with a basal bract of 3 – 4 mm length; tepals ovate, 2 – 3 by 1 mm, with nectar glands, tepal margins densely covered with short, curved red-brown hairs ca. 0.2 mm long; ovary 3 – 4 mm long, densely covered by red-brown hairs 0.5 –1 mm long. All parts of the inflorescence yellow and covered by yellowish brown, short, branched hairs 0.5 –1 mm long. Fruit and seed not seen. [Wistuba, Nerz & al. (2007)].

Distribution: Indonesia, Sumatra [Wistuba, Nerz & al. (2007)].

Habitat: Terrestrial in montane forests, between 1800 – 2200 m above sea level. In more open parts of the *Rhododendron– Leptospermum*-forest, where the trees and shrubs typically do not exceed 4 – 5 m in height. *Nepenthes flava* grows together with *N. mikei, N. ovata* Nerz & Wistuba, *N. rhombicaulis* Kurata and *N. spectabilis* Danser in this area. [Wistuba, Nerz & al. (2007)].

Etymology: The specific epithet 'flava' refers to the bright yellow colour of the upper pitchers and most of the lower pitchers. climbing plants especially give the impression of a mainly yellow plant. [Wistuba, Nerz & al. (2007)].

***Nepenthes fusca* Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 288, f. 6. 1928. Sec. Cheek & Jebb (2001)**

= *Nepenthes curtisii* subsp. *zakriana* J.H.Adam & Wilcock in Sarawak Mus. J. 50: 151 (f. XXII a & b). 1998. *Nepenthes zakriana* (J.H.Adam & Wilcock) J.H.Adam & Hafiza in Int. J. Bot. 2(4): 434 (-435, fig. 3, 4). 2006.

= *Nepenthes fusca* subsp. *kostermansiana* J.H.Adam & Wilcock ex Jebb & Cheek in Blumea 42(1): 41. 1997, nom. nud.

Description: Epiphytic shrub or climber in canopy, less usually terrestrial, stems to 3 m tall. Stems of rosettes terete, 0.8 mm diam., internodes 1 cm long; short stems terete, c. 4 mm diam., internodes 1-2 cm long; tall stems terete or 2-angled or 2-winged, 3-6(-10) mm diam., wings up to 3 mm wide, internodes 3-8.5(-12) cm long, with axillary buds 2-7 by 1.5 mm, 5-15 mm above the axil. Leaves petiolate, coriaceous; rosette leaves narrowly to broadly oblong-elliptic, 10-13.5 by 6-8.2 cm, apex obtuse to truncate, not peltate, base truncate to obtuse; leaves of short stems obovate or elliptic, 9-12.5 by 3.5-5 cm, apex obtuse, base attenuate-decurrent; petiole winged, 3-5 cm long, 7 mm wide including the wings, base sheathing and clasping the stem for 3/4 its circumference; leaves of long stems obovate, oblong-elliptic or lanceolate-elliptic, 6-13(-20) by 2.5-5(-6.5) cm, apex obtuse, rounded, emarginate or acute, base decurrent-attenuate, truncate, rounded or obtuse; petiole canaliculate, rarely winged, 2-6 cm long, 0.4 cm wide, clasping the petiole for 1/3-1/2 its circumference, sometimes decurrent to the node below as an arcuate or straight ridge or wing. Longitudinal nerves 2 or 3 on each side of the midrib in the outer 1/3, not very conspicuous. Pennate nerves patent, fairly numerous, reaching the longitudinal nerves, inconspicuous. Lower pitchers subcylindrical, lower half slightly ellipsoid, upper half slightly narrower, cylindrical, 10-13 by 2-3 cm, with two fringed wings 3-4 mm wide, fringed elements 4-8 mm long, 3-4 mm apart; mouth oblique, concave, ovate, rising at the rear to a short, tapered column, peristome cylindrical to flattened, 3 mm wide, ribs conspicuous, 0.2-0.5 mm apart, outer edge entire, inner edge lacking teeth; lid triangular-lanceolate, 2.7-3.2 by 1.7-1.8 cm, margin sinuate, usually with a basal and apical appendage, nectar glands as in the upper pitchers; spur filiform, 5 by 0.3 mm, apex acute. Upper pitchers subcylindrical to broadly infundibuliform, sometimes abruptly constricted at the mouth, 11-21.5(-30) by 2.5-7(-9) cm, without fringed wings, but with two ridges c. 1 mm wide; mouth ovate, oblique, strongly concave or L-shaped in side profile, the rear part held vertically, rarely slightly reflexed, to form an acute column up to 4 cm high; peristome cylindrical, 2-4 mm wide, or, especially in the column area, flattened, 4-11 (-21) mm wide, ribs as in lower pitchers, outer edge entire, or sinuate with 1-4 shallow lobes on each side, inner edge with inconspicuous, slightly curved teeth 0.3 mm long, with conspicuous nectar glands between them; lid raised from the horizontal, to erect, narrowly triangular-lanceolate, 2.5-5(-7) by 1-3 cm, apex rounded to obtuse, base truncate or cordate, margin involute and sinuate, lower surface with apical appendage filiform, 0-7 mm long, exserted, basal appendage semicircular, laterally flattened, 3-6 by 5-10 mm on ridge up to 10 mm high at the column apex, tapering towards the lid apex, nectar glands narrowly elliptic, 1-1.2 by 0.3 mm along the midrib keel, otherwise circular, thinly bordered, 0.2-0.5 mm diam., densely scattered or sometimes largely absent; spur 10-20 mm long, flattened, apex rounded. Male inflorescence 12.5-24 by 2.5-3.5 cm; peduncle 4.75-6(-12) cm long, 1.5-3.5 mm diam. at base; partial peduncles 2-flowered, (20-)50, 1.5-2(-5) mm long; bracts absent; pedicels (6-)8-11 mm long; tepals elliptic, 3.5-4 by 1.5-2 mm; androphore (1.5-)3-4 mm long; anther head 1-1.2 by 1.2-1.25 mm. Infructescence 28-44 by 6-9 cm, bearing 12-20(-60) fruits; peduncle 10-24 cm long, 3-5 mm diam. at base. Fruits with valves 18-22(-39) by 3-3.2 mm. Seeds filiform, 9.5-11.5(-20) by 0.2-0.4 mm. Indumentum of stems fairly densely and roughly pubescent with simple or branched, erect to forward- directed red brown to black hairs 0.3-0.5 mm long. Colour of the stems dark brown hairy, lower pitchers purplish black, lightly splashed with cream; upper pitchers pale green, usually lightly splashed at the top with red; flowers brown. [Cheek & Jebb (2001)].

Distribution: Borneo: Sarawak, Sabah, Brunei, and Kalimantan. [Cheek & Jebb (2001)].

Habitat: Mossy forest, ridge tops; 800-1500(-2500) m. [Cheek & Jebb (2001)].

Notes: *Nepenthes fusca* is immediately distinguished from the closely related Bornean species *N. faizaliana, N. pilosa, N. stenophylla*, and *N. veitchii* by the lids of the upper pitchers which are narrowly triangular and have involute margins. In lower and mid-pitchers the lids are more ovate, and often flat, and it is only in the upper pitchers that the species-specific characters are constantly found. The inflorescence of this species is also smaller and more delicate than the foregoing species. Danser in Bull. Jard. Bot. Buitenzorg III 9 (1928) 288 described *N. fusca* from the type specimen alone, and although upper pitchers are present on the two duplicates at Bogor, none have lids. Fortunately the isotypes at K and L have upper pitchers with the characteristic lid.

The glandular crest-like appendage at the base of the lid is always developed in this species, but the apical appendage may or may not be developed, and then usually only in upper pitchers. Whilst it was once argued that the presence of an apical appendage characterises *N. maxima,* we view that species as a closely related taxon distinguished from *N. fusca* by a broadly ovate lid. *Nepenthes maxima* occurs from Sulawesi to New Guinea, whilst *N. fusca* is restricted to Borneo.
Kostermans 21495 (K, L) represents an extreme variant of *N. fusca,* approaching *N. eymae* in appearance. We also include in *N. fusca* the recently described *N. curtisii* subsp. *zakriana* on the basis of the photographs that accompany the protologue (*N. curtisii* is a synonym of *N. maxima*).
Nepenthes fusca subsp. *apoensis* J.H.Adam & Wilcock, ined., based on Chai 35939, belongs to *N. stenophylla* by virtue of its sheathing leaf bases, rounded lids and indumentum. [Cheek & Jebb (2001)].

***Nepenthes gantungensis* S.McPherson, Cervancia, Chi.C.Lee, Jaunzems, Mey & A.S.Rob., in: McPherson, S., Carniv. Pl. Hab. 2: 1286 (-1295; figs. 750-758). 2010. Sec. McPherson (2010)**

Description: Terrestrial upright to scrambling and climbing unbranched shrub, to 4 m tall.
Stem: Cylindrical, 2.5-3.5 in diameter, internodes 2-20 cm long, compact in scrambling plants and elongated in climbing stems.
Leaves: Coriaceous, petiolate or sub-petiolate, lamina narrowly oblong, 20-40 cm long and 6-12 cm wide, apex acute or rounded, base shortly attenuate or obtuse, clasping the stem by two to three thirds of its circumference. Tendril to 40 cm long, coiling in upper pitchers.
Lower Pitchers: To 20 cm tall and 7 cm wide, wholly ovate or urceolate. Wings up to 12 mm wide, with narrow filaments to 10 mm long. Pitcher opening oblique, oval or circular, up to 6 cm wide, elevated towards the lid, elongated into a neck. Peristome cylindrical, occasionally slightly flattened, to 2 cm wide, ribs up to 2 mm high, spaced up to 2 mm apart, forming elongated teeth on the inner margin of the peristome up to 4 mm long. Inner surface entirely glandular. Peristome expanding below the lid and up to 3 cm wide. Lid elliptic, up to 6 cm long and 4.5 cm wide. No appendage or keel. Spur substantial, up to 9 mm long and 2 mm wide at base.
Upper Pitchers: Wholly infundibular or infundibular in the lower two thirds and cylindrical above, up to 25 cm tall, 7 cm wide, typically smaller. Wings absent, all other parts identical to the lower pitchers.
Inflorescence: A panicle. Male inflorescence to 60 cm long, 1 cm wide at base, rachis to 30 cm long. Female inflorescence to 50 cm long, 1 cm wide at base. Female inflorescence bears up to 150 flowers, densely arranged, rachis comprising the distal quarter of the scape. In both sexes, the inflorescence may consist entirely of 1-flowered pedicels, occasionally 2-flowered pedicels or a mix of both. Fruit up to 8 mm long, seeds filiform, c. 7 mm long, pale brown. *Nepenthes gantungensis* may flower both as a compact rosette plant bearing only lower pitchers, or as a climbing vine.
Indumentum: Present on underside of tendrils, consisting of simple, densely arranged, caducous reddish-copper hairs to 3 mm long. Hairs up to 2 mm in length scattered over young pitchers, and on the margins of the lamina. Hairs turning silver as they age.
Colour: All parts of the lamina and petiole may be pure green in shade, or reddish purple in direct sunlight. The lower and upper pitchers are mainly green or yellowish, except for the peristome, which is red, purple or brownish in the lower traps, or orangey red in the uppers. The interior of both pitcher types may be mottled with red or purple blotches, and the lid may be yellowish orange or flushed red. No plants were found to bear entirely red lower pitchers. [McPherson, Cervancia & al. (2010)].

Distribution: Philippines, Palawan, Brooks's Point, Mount Gantung [McPherson, Cervancia & al. (2010)].

Habitat: *Nepenthes gantungensis* grows mainly in low growing upper montane scrub above 1650 m on the summit and summit ridge. Etiolated climbing plants also grow in shrubby montane forest above 1600 m. When growing in shade, plants form a climbing stem to canopy level. Specimens growing on the exposed summit and summit ridge form stunted and compact growths, but flower profusely. They most vigorous populations grow in sheltered scrub, amongst boulders just below the summit. [McPherson, Cervancia & al. (2010)].

Etymology: The specific epithet was chosen to denote that this remarcable species is endemic to Mount Gantung. [McPherson, Cervancia & al. (2010)].

Conservation: Assessed aas CR (critically endangered) according to the World Conservation Union Red List Criteria B2a (IUCN 2001). [McPherson, Cervancia & al. (2010)].

***Nepenthes glabrata* J.R. Turnbull & A.T. Middleton in Reinwardtia 10(2): 107. 10.2.1984. Sec. Cheek & Jebb (2001)**

= *Nepenthes rubromaculata* Sh.Kurata in J. Insectiv. Pl. Soc. 35(2): 42. 6.2.1984.

Description: Terrestrial climber to 2-3 m tall. Climbing stems terete or slightly 2-ridged, 2-3 mm diam., internodes (2-)2.5-3 cm; stems of short shoots and rosettes not seen. Leaves chartaceous, sessile; rosette leaves linear or highly reduced, those of climbing stems narrowly oblong-ligulate or narrowly oblanceolate, 8.5-12 by 1.2-1.8(-3) cm, apex

acute, inconspicuously peltate, base slightly attenuate, clasping the stem by 1/3-1/2 its circumference, decurrent as very low ridges to the node below or ridges absent. Longitudinal nerves 1(-3) on each side of the midrib, about a third the distance from the margin, inconspicuous. Pennate nerves patent, soon branching, inconspicuous. Lower pitchers reported as globose. Upper pitchers shortly cylindrical to slightly infundibuliform, 7.4-14 by 2-3 cm, with two non-fringed wings 5-10 mm wide; mouth oblique, slightly concave, suborbicular; peristome cylindrical, 1-1.25(-2.5) mm diam., with indistinct ribs 0.1 mm high, 0.25-0.5 mm apart, outer edge entire, inner edge lacking teeth; lid orbicular, slightly broader than long, 2.7-2.8 by 2.6-3.1 cm, apex rounded to truncate, base truncate, venation palmate, the midrib branching and anastomosing with the lateral nerves c. 1 cm below the apex; lower surface lacking appendages, nectar glands scattered, inconspicuous, raised, bordered, circular pits 0.1-0.2 mm diam.; spur simple, slightly flattened, 5 by 0.5 mm, apex rounded. Male inflorescence racemose c. 20 by 1.5 cm; peduncle 7 cm long, 0.3 cm diam. at base; partial peduncles 1-flowered, c. 55; bracts absent; pedicels patent, 4-5(-8) mm long; tepals oblong, 2.5-3 by 1 mm, apex obtuse-rounded; androphore (1.5-)2 mm long; anther head 1-1.5 by 1.5 mm. Fruit unknown. Seed unknown. Indumentum absent from all parts except the spur and inflorescence; spur and rhachis to lower surface of tepals and lower half of androphore sparsely sericeous with white simple hairs 0.2 mm long. Colour of pitchers white with a few vertical red stripes; flowers red-green. [Cheek & Jebb (2001)].

Distribution: C Sulawesi. [Cheek & Jebb (2001)].

Habitat: In open, high forest; 1600-2000 m. [Cheek & Jebb (2001)].

Notes: Belongs to *Nepenthes* sect. *Tentaculatae* Cheek & Jebb. [Cheek & Jebb (2016)].

Notes: The affinities of *N. glabrata* are unclear, but appear to be with *N. muluensis* of Sarawak (and thus the *N. tentaculata group*, since Clarke in Nepenthes of Borneo (1997) 109 has revealed the tentaculate nature of the lower pitchers of *N. muluensis*). Both species share an unusual lid nervation pattern and have upper pitchers of similar size, shape, and coloration. The coloration of this species, with its red-streaked pitcher, is distinctive. Turnbull & Middleton in their protologue to this species (see above) describe a number of features not apparent from the scant material available to us: young plants are said to have extremely narrow leaves with small globose pitchers, and rosette leaves of mature plants are said to have greatly reduced or even an absence of a blade.
Turnbull & Middleton's material, including types of *N. glabrata*, was not found at Bogor in 1995 or 1996, and may never have been distributed. Kurata's *N. rubromaculata* is a later homonym of a horticultural hybrid described in 1891. The type repository is not stated, but is presumably the herbarium of the Nippon Dental College. The holotype is illustrated in the original publication on page 44. [Cheek & Jebb (2001)].

***Nepenthes glandulifera* Chi.C.Lee in Sandakania 15: 95 (-98; figs.). 2004. Sec. McPherson (2009)**

Description: Stems up to 3 m long, scrambling or climbing through surrounding vegetation.
The leaf is oblong or elliptic, up to 25 cm long and 9 cm wide. The apex of the leaf is abruptly contracted or rounded and sometimes acuminate. The base of the lamina is attenuate, petiolate and clasps the stem. The petiole is winged and up to 7 cm long. The lamina is bright green and shiny. The stem, midrib and tendril are yellow-green, orange, red or brown. Large, conspicuous, black nectar glands up to 2 mm across are present in great abundance on the stem, petiole, midrib and tendrils, and also occur on the exterior of the pitchers, especially towards the base, and on parts of the inflorescence. The glands secrete copious amounts of nectar which gives the plants a sweet smell. Except for the upper and lower surfaces of the leaf, all parts of the plant are densely covered with soft, yellow-brown hairs up to 9 mm long.
Lower pitchers are produced for a relatively brief period in the life cycle of this species, and generally only by seedlings and young plants prior to the production of a climbing stem. They are up to 13 cm tall and 3 cm wide, and are wholly cylindrical or narrowly infundibular. The bottom half of the lower pitcher is often slightly swollen. Wings up to 5 mm wide run down the front of the trap and are sparsely fringed with narrow filaments up to 8 mm long. The peristome is cylindrical, up to 6 mm wide and lined with fine ribs up to 0.2 mm high, spaced up to 0.3 mm apart. The peristome is of a consistent width around the margin of the pitcher opening. The lid is orbicular or very slightly ovate, with a cordate base, up to 3 cm wide, 2.8 cm long, and lacks a basal appendage. The spur is reduced to a small pubescent bump up to 2 mm long.
The exterior of the lower pitcher is yellow-green or flushed orange and typically mottled with long, dark purple or black blotches. The interior of the pitcher is light yellow or cream coloured, often marked with small purple flecks. The peristome is dark red or purple and the lid is yellow-orange and heavily striped with dark purple.
The upper pitchers are wholly infundibular, up to 19 cm tall and 5.5 cm wide. The wings are reduced to narrow ridges that run down the front of the trap or may be hardly discernible at all. The peristome is cylindrical, up to 15 mm wide and slightly expanded towards the sides and back of the pitcher opening. The peristome is lined with fine ribs up to 0.4 mm high, spaced up to 0.4 mm apart, and curves down into the pitcher opening for a few millimetres along its inner margin. The lid is up to 5 cm long and 5 cm wide, but otherwise is similar to that of the lower traps. The spur is reduced to a small pubescent bump up to 2 mm long.
The upper pitchers are bright yellow, frequently suffused orange and pink, and usually mottled with prominent,

long, dark red blotches. The peristome is pink, red or purple, often striped with bands of dark red or purple. The interior of the pitcher is light yellow or cream and decorated with angular, dark purple flecks. The lid is light yellow, tinged orange or pink, and heavily marked with dark red and purple flecks.
The inflorescence is a raceme, to 70 cm long by 5.5 cm at the widest point. The peduncle is up to 30 cm long and covered with scattered raised black glands, the rachis to 40 cm long. Flowers are borne on predominantly 2-flowered partial peduncles, to 7 mm long, with filiform bracts 8-11 mm long situated 1-3 mm from the base of each pedicel, pedicels to 13 mm long. Tepals are ovate, 6-7 mm long, and the anther head is borne on a column up to 3 mm long. Fruits are up to 35 mm long. [McPherson (2009)].

Distribution: Malaysia, Borneo, Sarawak, Hose Mountains, Gun Bato, Kapit Division. [Lee (2004)].

Habitat: Terrestrial in stunted, mossy, montane forest and scrub on ridge tops; 1100-1700 m a.s.l. [McPherson (2009)].

Notes: This species is most closely related to *N. pilosa* Dans. (sensu Jebb & Cheek 2001) by the nature of the indumentum, leaf shape, and stem. However, it differs from that species most significantly in that it lacks a hook-shaped basal lid appendage and by the presence of prominent bracts on the partial peduncles. Moreover, the pitchers of *N. glandulifera* are completely rounded in cross-section, whereas those of *N. pilosa* tend to be laterally compressed. The occurrence of *N. pilosa* (S 87432) on the same mountain without any apparent introgression between these taxa is also significant. A hybrid origin for *N. glandulifera* is doubtful as there are no possible parental species which would contribute to this combination of characteristics, nor indeed are there any species in Sarawak which possess such large intrafoliar bracts.
The very abundant large black glands which can be found on most surfaces of the plant (except on the leaves) are a conspicuous feature of this species (see Fig. 3). Plants in cultivation exude from these glands copious amounts of sticky nectar that accumulate on the petiole and outer surface of the pitcher. Living pitchers of *N. glandulifera* smell strongly of sweet nectar and this might aid in the attraction of insect prey. [Lee (2004)].

Etymology: The specific epithet is derived from the Latin glandis (gland) and ferre (to bear) and refers to the many large, black nectar glands taht punctuate almost all aerial surfaces of this plant. [McPherson (2009)].

***Nepenthes graciliflora* Elmer in Leafl. Philipp. Bot. 4: 1494. 1912. Sec. Cheek & Jebb (2013)**

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. [Cheek & Jebb (2013)].

Habitat: Not well recorded, mossy, submontane forest; (300 –) 800 – 1280 m a.s.l. [Cheek & Jebb (2013)].

Notes: *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 justification, 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.
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. [Cheek & Jebb (2013)].

Notes: This is the *Nepenthes* 'typical alata' of horticulture. [Cheek & Jebb (2013)].

***Nepenthes gracilis* Korth. in Verh. Nat. Gesch. Ned. Bezitt., Bot. 19: 22, t. 1 & 4. 1840. Sec. Cheek & Jebb (2001)**

= *Nepenthes angustifolia* Mast. in Gard. Chron. n.s. 16: 524. 1881.

= *Nepenthes gracilis* var. *arenaria* Ridl. ex Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 59. 1908.

= *Nepenthes gracilis* var. *elongata* Blume in Mus. Bot. Lugd.-Bat. 2: 10. 1852.

= *Nepenthes gracilis* var. *longinodis* Beck in Wiener Ill. Gart.-Zeitung 20: 190. 1895.

= *Nepenthes korthalsiana* Miq., Fl. Ned. Ind. 1(1): 1071. 1858.

= *Nepenthes laevis* Korth. ex Hook.f., in: de Candolle, A. L. P. P., Prodr. 17: 104. 1873.

= *Nepenthes laevis* Lindl. in Gard. Chron. 1848: 655. 1848.

= *Nepenthes teysmanniana* Miq., Fl. Ned. Ind. 1(1): 1073. 1858. *Nepenthes gracilis* var. *teysmanniana* (Miq.) Beck in Wiener Ill. Gart.-Zeitung 20: 190. 1895. *Nepenthes tupmanniana* Bonstedt in Parey Blumeng. 1: 663. 1931.

Description: Terrestrial climber 2(-5) m tall. Climbing stems triangular (1.5-)2-4(-5) mm diam., the corners rounded or with 2 wings, wings 1-2(-3.5) mm broad, internodes of climbing stems 2.5-9 cm long. Leaves chartaceous, sessile, leaves of the climbing stems nar-rowly lanceolate (6.5-)12-19 by (1-)1.5-2.8(-3.7) cm, apex acute, rarely acuminate, subpeltate, base narrowing only slightly, decurrent by (0.4-)1-4(-6) mm into stem wings; basal rosette leaves up to 3 cm long, otherwise as leaves of climbing stems. Longitudinal nerves 4-6 from the base, on each side of the midrib, usually confined to the outer 2/3. Pennate nerves numerous, usually ascending at 45° from the midrib, then descending. Lower pitchers ellipsoid in the basal half, gradually becoming slightly constricted towards the subcylindrical upper half (5.5-)8-10.5(-16.5) cm long, (1.7-)2.3-3.7 cm wide in the lower half, (1-)1.4-2.4 cm wide in the upper half, with two fringed wings 3-5 mm broad, the fringed elements 1-2.5 mm long, 0.5-2 mm apart; mouth ± ovate, concave, peristome cylindrical in section, c. 0.5 mm wide, without ribs, outer edge entire, inner edge minutely toothed; lid orbicular to ovate, 1-3 by 1-3 cm, lower surface without appendages, nectar glands sparse, few, (6-)20-30, large and thickly bordered, orbicular, dome-shaped, c. 0.4 mm diam., the central aperture pore-like, 0.1 mm diam.; spur simple, to 5 mm long. Upper pitchers as the lower, but subcylindrical and gradually and slightly constricted in the middle, (4.5-)7-14.5 cm long, (1.4-)1.8-4(-4.4) cm wide at the base, narrowing to (0.9-)1.5-2.9(-4) at the waist and flaring to (1-)2-4.3 cm at the mouth, with two ridges c. 0.1 cm broad, lacking fringed elements. Male inflorescence (9.5-)15-22(-30) by 2.5 cm; peduncle 1.2-5 cm long, 1.5 mm diam. at base; partial peduncles 1-flowered; bracts usually absent; pedicels 5-14 mm long; tepals ovate, 2.5-5 by 1.5-2.5 mm; androphore 0.7-1 mm long; anther head 0.7-1 by 1-1.5 mm. Fruit valves 14-27(-35) mm long. Seeds fusiform, papillate at the centre. Indumentum absent from stems and upper surface of leaves; lower leaf and pitchers with scattered red sessile glands 0.1 mm diam.; pitchers also with minute scurfy brown stellate hairs, particularly in a band immediately below the peristome; inflorescence completely covered, from base of peduncle to the pedicels and ovary in appressed, thick coppery, ± simple hairs 0.1-0.3 mm long. Colour of pitchers green, red, or green mottled with red, rarely black-purple. Flowers variously described as white, green, light red or brown. [Cheek & Jebb (2001)].

Distribution: Thailand, Sumatra, Peninsular Malaysia, Singapore, Borneo, Sulawesi. [Cheek & Jebb (2001)].

Habitat: Lowland peat-swamp forest, kerangas, podsol heath scrub, swamp edges or disturbed areas, e.g. roadsides; on poor soils, sometimes on sandstone or ultramafic soils; sea level to 800 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes gracilis* is a widespread, common and weedy species. *Nepenthes albomarginata* and particularly *N. reinwardtiana* have often been confused with *N. gracilis*. From *N. albomarginata, N. gracilis* is told apart by the triangular stems, the decurrent leaf bases which run down the stem ridges, and the absence of a white band of hairs below the peristome. From *N. reinwardtiana* it is distinguished by the slender, gracile pitchers, the shortly-toothed peristome (vs. untoothed), the absence of eye-spots, the lid with its few, large nectar glands and the 1-flowered partial peduncles (vs. 2-flowered).
Blume cites Jack's misapplication of the name *N. distillatoria* and Wallich's Cat. No. 2244 under his variety elongata. The former is not possible to certainly identify, whilst the Wallich herbarium at K comprises at least 5 sheets with *N. gracilis*, and on two of these are attached specimens of *N. albomarginata* also. Five further sheets of this number comprise specimens of *N. khasiana*. [Cheek & Jebb (2001)].

Nepenthes gracillima **Ridl. in J. Linn. Soc., Bot. 38: 320. 1908. Sec. Cheek & Jebb (2001)**

= *Nepenthes alba* Ridl., in:, Fl. Malay Pen. 3 3: 22. 1924.

Description: Terrestrial climber 1-5 m tall. Climbing stems sub-angular (-terete), 0.2-0.5 cm diam., internodes 0.5-1.5(-8) cm; axillary buds inconspicuous. Leaves thinly coriaceous, sessile, those of climbing stems lanceolate to oblanceolate, 5-10(-16) by 1-1.5 (-2) cm, apex acute, base cuneate, amplexicaul, clasping the stem for 1/2 its circumference, slightly auriculate, not decurrent; rosette leaves oblanceolate, 4-7 by 1-1.5 cm. Longitudinal nerves 0-3 on each side of midrib, in outer half of blade, fairly conspicuous. Pennate nerves inconspicuous. Lower pitchers infundibuliform below, cylindrical above, 5-10 by 1-3.5 cm with two fringed wings c. 2 mm broad, fringed elements to 3 mm long, 0.5-1.5 mm apart, otherwise as upper pitchers. Upper pitchers infundibuliform below, abruptly narrowing at 1/2-3/4 height and then cylindrical, but gradually broadening to mouth, 6-15(-17.5) by 0.9-2.8 cm, wings absent; mouth elliptic, oblique, concave; peristome slightly flattened in cross section, 1.5-3 mm wide; lid orbicular to broadly ovate, 1.2-2.3 by 1.2-2 cm, apex rounded, base cordate, lower surface lacking appendages, nectar glands circular, bordered, 0.4-0.5(-0.7) mm diam., more or less even-sized, sometimes interspersed with smaller glands 0.15-0.2 mm diam.; spur 2-3 mm long, flattened, unbranched, slightly curved. Male inflorescences 23-27 by 2-2.5 cm; peduncle 9-10 cm long, 1-1.5 mm diam.; partial peduncles 2-flowered at base, 1-flowered at apex, 50-65, 1-4 mm long; bract inserted between rhachis and apex, filiform, 2-6(-8) mm long, spreading; pedicels 4.5-7 mm long; tepals elliptic 3.5-4 by 2 mm; androphore c. 2.5 mm long; anther head c. 1.5 by 1.5 mm. Fruit valves c. 18 by 3 mm. Seed fusiform, 9-10 mm long, central body smooth. Indumentum of very short simple hairs, < 0.05 mm long, sparse or absent from stems and leaves; axils sparsely pubescent, pitcher including lid and inflorescence

likewise. Colour of lower pitchers deep purple to blackish green; upper pitchers pale green in lower part, becoming pale yellow to ivory-white above, with rose coloured markings throughout, rarely purple. [Cheek & Jebb (2001)].

Distribution: Peninsular Malaysia: the eastern mountain ranges, Banjaran Timur; G. Tahan and G. Tapis [Cheek & Jebb (2001)].

Habitat: Open areas or amongst scrub, on quartzitic soils or heavily weathered rock; 1300-2100 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes gracillima* can be distinguished from the closely related *N. ramispina* by its smaller size. The pitcher is not as attenuated, the spur is usually simple, the lid glands are larger, fewer and more uniform in size, and the whole plant is somewhat glabrescent. The coloration of the upper pitchers of *N. gracillima* is particularly striking: they are green in their lower part, becoming pale yellow to ivory-white in their upper parts, with rose coloured markings throughout. Kiew discussed the species on G. Tahan in some detail in Kiew in J. Wildlife and National Parks (Malaysia) 10 (1990) 34-37.

There has been confusion about the *Nepenthes* of upland Peninsular Malaysia: *N. gracillima, N. macfarlanei, N. ramispina*, and *N. sanguinea*. Danser in Bull. Jard. Bot. Buitenzorg III 9 (1928) 296 reduced *N. ramispina* to a synonym of *N. gracillima*. He regarded the delimitation of the remaining species as confused by hybrids. Amongst herbarium specimens, hybrids seem to be common, but this may be an artifact of collector selection of unusually large or different individuals. The ecology of the species is distinct (Kiew in J. Wildlife and National Parks (Malaysia) 10 (1990) 34-37). *Nepenthes gracillima* and *N. ramispina* are no doubt a closely related pair, but a distinct morphological disjunction correlates with the western and eastern mountain ranges of Peninsular Malaysia. Whilst we acknowledge that hybrids are to be found, nonetheless it is possible to key the majority of highland Peninsular Malaysia specimens as here.

Danser misidentified a specimen of *N. gracillima* (Ridley 16097) as belonging to *N. alata* (see there) (Kiew J. Wildlife and National Parks (Malaysia) 10 (1990) 34-37).

Ridley described *N. gracillima* from Mt Tahan collections in 1908 (see reference above). At the same time he identified other specimens collected on the same expedition as *N. bongso* Korth. In 1924 (Ridley in Fl. Malay Pen. 3 (1924) 22) he corrected this identification, and described the latter specimens as a new species: *N. alba*. He also (Ridley in Fl. Malay Pen. 3 (1924) 22) described *N. ramispina* from Mt Semangka in the Genting Highlands. Danser in Bull. Jard. Bot. Buitenzorg III 9 (1928) 296 reduced all these names to *N. gracillima*, but we have reinstated *N. ramispina* (Jebb & Cheek in Blumea 42 (1997) 66). Danser's illustration (in Bull. Jard. Bot. Buitenzorg III 9 (1928) f. 7) is of *N. ramispina*. [Cheek & Jebb (2001)].

***Nepenthes gymnamphora* Reinw. ex Nees in Ann. Sci. Nat. 3: 366, f. 1, t. 19 & 20. 1824. Sec. Cheek & Jebb (2001)**

– *Nepenthes melamphora* Reinw. ex Blume, Cat. Gew. Buitenzorg: 111. 1823, nom. nud.

= *Nepenthes gymnamphora* var. *haematamphora* Miq., Pl. Jungh.: 169. 1852. *Nepenthes melamphora* var. *haematamphora* (Miq.) Miq., Fl. Ned. Ind. 1(1): 1073. 1858.

= *Nepenthes melamphora* var. *lucida* Blume in Mus. Bot. Lugd.-Bat. 2: 8. 1852.

= *Nepenthes melamphora* var. *pubescens* Kuntze, Rev. Gen. Pl. 2: 562. 1891.

Description: Terrestrial climber to 15(-40) m tall. Stems terete, rarely slightly angular, those of climbing stems 4-7(-8) mm diam., internodes 1.5-10 cm long, axillary buds inconspicuous. Leaves thinly coriaceous, sessile or subpetiolate; rosette leaves usually highly reduced, narrowly oblong to oblanceolate-elliptic, 3-5 by 1-1.2 cm, apex acute, base sessile, clasping the stem for 1/2 its circumference, rarely the rosette leaves larger, 8.5-12 by 2.5-3.7 cm; short and climbing stem leaves narrowly elliptic, (10-)23-26 (-30) cm long, apex acute, base attenuate, (5-)7-12 mm wide, usually with a petiole-like part 4-5 cm long. Longitudinal nerves 3 or 4 on each side of the midrib in the outer 3/4, fairly conspicuous above. Pennate nerves oblique, highly branched, inconspicuous. Lower pitchers ellipsoid, the mouth occupying the upper 1/3-1/4, (3-)6-11.5 by (2.2-)4-4.5 cm, with two fringed wings 5-7 mm broad, fringed elements 3-5 mm long, c. 1 mm apart; mouth oblique, concave, raised at the rear into a short vertical column; peristome flattened, 6-7(-9) mm wide in the rear half of the mouth, 2-3 mm wide in the front half, ribs 0.5 mm apart, c. 0.1 mm high, the outer edge entire, the inner with curved teeth, 1-2(-3) mm long in the rear half of the mouth, absent in the front half; lid ovate, 3-4 by 2-3 cm, apex rounded, base cordate, lower surface lacking ap-pendages but with a raised midrib, nectar glands circular, bordered, 0.3 mm long, confined to the midline or widely scattered, the midline often with larger, elliptic glands 0.6 mm long; spur filiform, 4-5 mm long, entire. Upper pitchers subcylindrical, 6-10(-19) by 1.7-2.8(-4.5) cm, slightly inflated in the lower 1/3, rarely slightly infundibular, usually with two fringed wings 0.5-2 mm wide, fringed elements c. 4 mm long, 1 mm apart; mouth slightly oblique, concave; peristome subcylindrical, 1.5-2 mm wide, ribs 0.5 mm apart, outer edge entire, inner with teeth inconspicuous; lid elliptic or ovate, rarely orbicular, 2-2.5(-4.5) by 1.2-1.4(-5) cm, apex rounded, base cordate, lower surface often with a raised keel c. 1 mm long, at the base of the midline, nectar glands and spur as the lower pitchers. Male inflorescence 35-50 by 4 cm; peduncle 20-24 cm long, 3-4 mm diam. at base; partial peduncles 2-

flowered, c. 70, 2-5 mm long; bracts absent or occasional; pedicels 3-5 mm long; tepals elliptic, 4-6 by 2-3.2 mm; androphore 3.5-4 mm long; anther head 1.5-2 by 2 mm. Infructescence c. 30 by 5 cm; peduncle c. 19 cm long, 4 mm diam. at base; partial peduncles c. 40; fruits with valves 13 by 3 mm. Seeds filiform, 6-15 mm long. Indumentum of sessile glands c. 0.1 mm diam. on stems, lower surface of the leaf blade and outer surface of pitchers; patent simple pale brown or white hairs 0.1-0.3 mm long on very young stems, densely on leaf edges, sparsely on the lower midrib, and upper pitchers including spur, dense to sparse on lower pitchers; inflorescence from peduncle base to lower surface of the tepals pubescent with brown, inclined, simple hairs 0.5-0.6 mm long, androphore minutely puberulent. Colour of pitchers reddish green to purple. [Cheek & Jebb (2001)].

Distribution: W and C Java (one apparent record from Borneo, see Jebb & Cheek 1997: 92). [Cheek & Jebb (2001)].

Habitat: Forest; 1000-2750 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes gymnamphora* is the only Javanese montane species of the genus. It is most similar to *N. pectinata* of C Sumatra. *Nepenthes pectinata* is distinguished from *N. gymnamphora* by several characters; in overall architecture it differs in that the upper leaves rarely produce pitchers; the upper leaves are more gradually attenuated to their bases, with broadly winged and scarcely discernible petioles and are decurrent as wings for several cm on the stem, unlike the shortly amplexicaul base of leaves of *N. gymnamphora*; the pitchers have a more rounded, urceolate form, with a narrow mouth, and the peristome drawn out into a longer neck; *N. pectinata* usually has a denser indumentum, and the inner peristome margin has larger teeth than that of *N. gymnamphora*. [Cheek & Jebb (2001)].

***Nepenthes halmahera* Cheek in Blumea 59(3): 217 (216-219, fig. 1). 2015. Sec. Cheek (2015)**

Description: Terrestrial climber, 2 – 5 m tall. Stems terete. Rosette shoots not seen. Short shoots (Mahroji & Gushilman 211) 6 –7 mm diam, internodes c. 1.5 cm long, densely covered in red depressed- globose glands 0.05 mm diam, c. 5 –10 per mm2, hairs absent. Climbing stems 3 – 4(– 6) mm diam, internodes 1– 5.5(– 9) cm long, axillary buds not conspicuous, indumentum of sessile depressed-globose glands c. 0.03 mm diam mixed with very sparse simple golden-brown hairs 0.5 mm long, or hairs ab- sent. Leaves of short shoots elliptic to lanceolate, 16.5 – 22.5 by 4.3 – 6.2 cm, apex acute, base decurrent. Longitudinal nerves 6 –7 pairs, evenly scattered, inconspicuous, most visible on adaxial surface. Pennate nerves inconspicuous; margin glabrous or with sparse brown simple hairs 0.3 – 0.4 mm long, upper and lower surfaces entirely glabrous; or with appressed sparse hairs 0.5 – 0.75 mm long near the midrib of lower surface. Petiole canaliculate-winged, 2.7– 3.5 cm long, 0.5 cm deep, shortly sheathing the stem and clasping the stem its entire circumference. Leaves of climbing stems elliptic, 8 –15(–17) by 1.5 – 3.5(– 4.8) cm, apex acute, base decurrent. Longitudinal nerves 5 – 8 pairs, conspicuous only on younger leaves. Pennate nerves numerous, patent. Indumentum absent from upper and lower surfaces, except for sessile depressed- globose glands and for the distal midrib with a few short simple hairs, sometimes the lower midrib also with simple golden-brown hairs; margin glabrous or with sparse simple patent hairs c. 0.5 mm long. Petiole canaliculate-winged, 1.5 – 3.4 by 0.3 cm, base clasping the stem for the 2 /3s to the entire circumference, dilating abruptly as patent wings 2 mm wide around the stem, not or shortly decurrent by 0 – 5 mm, the margin with sparse patent simple hairs. Tendril 9 –10 cm long. Lower pitcher (short shoots) ellipsoid-cylindric, c. 11 by 3.6 cm, the ellipsoid base gradually constricting into the more slender cylindric upper portion, 2.2 cm wide at the mouth; fringed wings c. 1.2 cm apart, 0.7 cm wide at the pitcher base, fringed elements 1.5 – 2 mm long, 0.2 –1.1 mm apart; outer surface of pitcher 10 – 20 % covered in inconspicuous simple pale brown hairs 0.5 mm long, mixed with dense depressed-globose red glands 0.05 mm diam, 15 – 20 per mm2; mouth narrowly ovate, concave, strongly oblique, inner surface waxy, greenish white; peristome subcylindric, 1.5 – 2 mm wide, ribs 0.8 mm apart, weakly developed and differentiated, outer edge entire, inner edge with teeth inconspicuous, mainly concealed, 0.5 mm long, curved; column area not visible (due to specimen mounting); lid obovate-elliptic, c. 3 by 2.4 cm, apex rounded, base abruptly and inconspicuously cordate, upper surface with indumentum as outer pitcher, hairs short overall, but dense, longer, white and matted near the base; lower surface not visible (due to specimen mounting); spur bifurcate, stout, 1.5 mm wide at base, 2 mm long, branches 1 mm long, apices acute, indumentum as on lid base. Upper pitchers (climbing stems), green, ovoid-cylindric (5.8 –)8.2 –10.5(–11) by (2.2 –)2.4 – 3.3(– 3.9) cm, the basal ovoid portion extending (2.3 –)3.2 – 4.7(– 5) cm from the pitcher base, the 'hip' weakly developed, the upper cylindrical portion gradually contracting to the narrowest part 1.4 – 2.2(– 2.7) cm wide, just above the midpoint of the pitcher, then slightly dilating to (1.3 –)1.4 – 2.7(– 3) cm wide just below the peristome; wings reduced to ridges < 1 mm wide, 0.8 –1 cm apart; indumentum of outer surface 5 –10 % covered with golden-brown appressed acute simple hairs, 0.25(– 0.5) mm long, mixed with sessile red depressed-globose glands 0.03 mm diam; mouth ovate, concave, oblique, inner surface pale glaucous waxy greenish white, with red spots; column not developed; peristome cylin- drical-flattened in transverse section (1–)1.5 – 2.5(– 3.0) mm wide; ridges 0.3 – 0.35 mm apart, developed as low, blade-like wings 0.25 mm deep on the outer surface, ribs not prominent on the inner surface; the outer edge lacking lobes or with one ill-defined lobe, inner edge usually with teeth inconspicuous, oc- casionally (e.g. when distorted by pressing) with

0.1– 0.15 mm long curved teeth visible; lid ovate-elliptic (1.2 –)1.8 – 2.6(– 2.7) by 1.4 – 2(– 2.4) cm, apex rounded, base rounded and abruptly and shallowly cordate, upper surface with indumentum as outer pitcher, lower surface without appendages; nectar glands 25–30, scattered in the centre, especially along the base of the midline where linear-elliptic, otherwise elliptic or orbicular, 0.75 by 0.5 mm, thickly bordered, the borders glossy yellow, slightly raised, central aperture orbicular, 0.25 – 0.3 mm diam, dark brown; marginal 1–2 mm of lid lacking nectar glands, but with dense ses- sile red depressed-globose glands (10 –15 per mm2), becoming rapidly less dense away from the margin, and almost absent in the centre of the lid; marginal 0.5 mm with dense minute, bushy, branched hairs 0.07–0.08 mm long. Spur oblong, 1–1.2 by 1 mm, strongly dorsiventrally flattened and often recurved, apex rounded. Inflorescences terminal on main axis or (Bangun et al. 267, 637, 812, Phillipson et al. 6450, all MO) on short axillary spur shoots. Male inflorescences at least 2 – 3 on each flowering stem, separated from each other by 2 – 6 nodes, 9.8 –19 by (1.8 –)2 – 2.5(– 3) cm, peduncle (1.7–)3 – 4.7(– 5.5) cm long, (0.1–)0.15 cm diam at base; partial-peduncles 30 –74, 3 – 4(– 5)-flowered in the proximal 1/2 to 2 /3s, the distal part 2-flowered; bract filiform, patent (0.5 –)1– 2 mm long, rarely absent, inserted variably between base and apex; partial- peduncles 1– 5 mm long; partial-rhachis 0 – 2 mm long; pedi- cels 2.5 – 5(– 6) mm long; indumentum of appressed simple, golden-brown hairs 0.15 – 0.25(–1) mm long, mixed with ses- sile depressed-globose red glands 0.03 mm diam, covering c. 80 % of the peduncle when young, but at length glabrescent, rhachis and partial-peduncles 50 – 60 %, covered in hairs up to 0.5 mm long. Perianth tepals 4, green, drying brown, proximal 1/10th connate, elliptic-oblong, c. 2 by 1.75 mm, upper surface with 10 –15 nectar glands, confined to the proximal 1/ 3 to 1/2, orbicular to elliptic, minute, 0.02 – 0.03 mm long, sparse, separated by c. 0.25 mm, in dried material situated at apex of irregular convexities; distal part of tepal glabrous; margin with a fringe of patent hairs, lower surface 90 % covered by appressed simple golden hairs 0.1– 0.2 mm long; androphore 5 winged, drying black, 2 mm long, glabrous or with 1– 2 hairs; anther head subglobose, c. 1 by 1.1 mm, white; anthers 6, one apical, the remainder uniseriate. Female inflorescence as the male 12 –16 by 2.8 – 4.5 cm, peduncle 4 – 6 by 0.15 – 0.2 cm, partial-peduncles (3 –)4 – 5.5 mm long, 30 – 58, proximal half 2 – 3-flowered, distal half 1– 2-flowered; pedicels 3 – 5 mm long; tepals oblong 3 by 1.5 mm; ovary narrowly ovoid 4 – 5 by 1.5 mm, stigmas 3 – 4, bilobed, apices rounded. Infructescence 16 – 26 by 5 cm, peduncle 8 –11 by 0.25 cm; fruits fusiform 1.5 by 0.3 – 0.4 cm. Seeds filiform, 0.5 by 0.025 mm, pale yellow, central body dentate. [Cheek (2015)].

Distribution: Indonesia, North Maluku, Halmahera, Weda Bay Nickel Project. [Cheek (2015)].

Habitat: Open areas in lowland (rarely lower montane) forest on ultramafic substrate; 10 – 500(–760) m altitude. [Cheek (2015)].

Etymology: Named for the island of Halmahera on which it occurs, as a noun in apposition. [Cheek (2015)].

Conservation: Using the precautionary principle, this species is here assessed as Critically Endangered B2ab(iii) according to the Categories and Criterion of IUCN (2012). This is because although seven sites and at least that number of mature individuals are known for *N. halmahera*, resulting in an 'area of occupancy' (as defined in IUCN 2012) of 32 km² using the preferred IUCN standard of 4 km² grid cells, they all appear to be within a single 'threat-based' location in the sense of IUCN (2012). [Cheek (2015)].

***Nepenthes hamata* J.R. Turnbull & A.T. Middleton in Reinwardtia 10(2): 108. 10.2.1984. Sec. Cheek & Jebb (2001)**

= *Nepenthes dentata* Sh.Kurata in Gard. Bull. Singapore 36(2): 197 (-200, pl. 1, f. 1). 1984. *Nepenthes dentata* Sh.Kurata, Nepenthes of Mt Kinabalu, Sabah: 11. 1976, nom. nud.

Description: Terrestrial climber to several metres high. Stem terete or obtusely trigonous, climbing stem 4-5 mm diam., internode length 3.5-6 cm, stems of short stems and rosettes 2-3 mm diam., internodes 2-6 mm long. Leaves chartaceous, sessile, those of short stems and rosettes oblanceolate or oblong-elliptic, 6-7.5 by 1.7-2.5 cm, apex acute, not peltate, base amplexicaul, subperfoliate, more or less auriculate, not conspicuously decurrent; leaves of climbing stems oblong-elliptic, rarely lanceolate, 5-7(-15) by 1.8-2.5 cm, apex obtuse to acute, base decurrent by 0.5-1.5 cm. Longitudinal nerves 2(-4) on each side of the midrib, in the outer 1/2-1/3(-2/3). Pennate nerves patent, branching, inconspicuous. Lower pitchers narrowly ovoid, 7-11.5 cm tall, 2.1-3.2 cm wide at the base, diminishing gradually to 1.6-2.5 cm wide below the mouth; fringed wings 3 mm wide, fringe elements often in pairs, 2 mm apart, 5-10 mm long, branching dichotomously 1 or 2 times; mouth concave, highly oblique, elliptic, with a long tapered apex that becomes erect, or overarches the rest of the mouth; peristome cylindrical to slightly flattened, 1.5-3 mm wide (excluding teeth), ribs c. 3 mm apart, c. 20 on each side, exaggerated into falcate teeth c. 5 mm high, outer edge entire, teeth recurved, c. 2 mm from peristome to apex, inner edge recurved into the pitcher, c. 7 mm from pitcher rim to the tooth apex, teeth of column dagger-like, descending 10 by 2 mm; lid held horizontally, margins ascending, ovate, 3-3.8 by 1.8-2.8 cm, apex rounded, base subcordate, upper surface with up to 45 multicellular 'tentacles' on each side, c. 3 deep around the margin, each 6-8 mm long, often branched, arising from vein ends, lower surface lacking appendages, with sparse and inconspicuous shortly elliptic bordered pits 0.1-0.2 mm broad; spur fasciculate, 5-branched from the base, c. 9 mm long, each repeatedly branched along its length.

Upper pitchers subcylindrical, usually slightly ovoid in the lower 1/3, the upper 2/3 cylindrical, or gradually dilating slightly towards the mouth, 7-20 by (1.2-)2-4.5 cm, with fringed wings or with the wings reduced to ridges; peristome with teeth 12-16 by 2-3 mm high, 2.5-6 mm apart. Male inflorescence 8-15 cm long; peduncle 2.4-10 cm long; partial peduncles 1-flowered, c. 22; bracts absent; pedicels 10-15 by 0.1-0.3 mm; tepals elliptic, reflexed, 1.5-2.5 by 1-1.5 mm; androphore 1-2.5 mm long; anther head 0.6-0.8 by 0.8-1.4 mm. Infructescence 8.5 by c. 5 cm; peduncle 6.5 cm long, 2.25 mm diam. at base. Fruits c. 15; valves 19-20 by 3.5-4.5 mm. Seeds filiform, 8 by 0.4-0.6 mm. Indumentum of sessile red glands on stem, lower surface of leaves, outer surface of pitchers, upper and lower lid; outer pitcher arachnoid-tomentose with branched brown, often prostrate and crinkled hairs 0.3-1.5 mm long; inflorescence from peduncle to lower surface of tepals sparsely to moderately densely covered with appressed brown hairs c. 0.5 mm long; ovary densely hairy with golden-brown appressed hairs. Colour of pitchers pale green blotched/reticulated purplish red with mauve wings; peristome red or black, teeth black or greenish white; male flowers green, tepals becoming red. [Cheek & Jebb (2001)].

Distribution: Sulawesi: C Province (G. Lumut, G. Sojol, Mt Tambusisi, Mt Roroda Timbu, Tomongkobae Mts&G. Poka Pindjang). [Cheek & Jebb (2001)].

Habitat: On open ridge-tops, rooted in moss, climbing into trees; 1400-2500 m. [Cheek & Jebb (2001)].

Notes: Belongs to *Nepenthes* sect. *Tentaculatae* Cheek & Jebb [Cheek & Jebb (2016)].

Notes: This species is related to *N. tentaculata*. Amongst the most notable similarities are the presence of hair-like appendages (‘tentacles’) on the lid, the branched spur surrounded by other branching appendages, the lids of the lower pitchers often lacking glands, and the upper pitchers which may or may not bear fringed wings. The features which distinguish this species are the striking peristome, with plate-like teeth, but this only develops in the upper pitchers and is variable in the degree of development. It appears that the *N. tentaculata* group of species (*N. adnata, N. glabrata, N. hamata, N. muluensis*, and *N. tentaculata*) are all similar in their lower pitchers and leaves, in particular the presence of tentacles on the upper surface of the lid. Some specimens of *N. hamata* appear to be very close to *N. tentaculata*, and at present the seven or so collections available form something of a continuum. Kurata’s description and selected type represent an extreme form (as illustrated in his figure). The material selected by Turnbull & Middleton has not been located, but the description suggests it is somewhat of an intermediate between Kurata’s material of *N. hamata* and *N. tentaculata*. Rather than intermediates between species, however, this variation is more likely to be explained by the dimorphy of lower and upper pitchers. A similar case holds with *N. muluensis*, where the lower pitchers have only recently been discovered to show the typical facies of *N. tentaculata* (see there).

This species was first mentioned in a list by Kurata (Nepenthes of Kinabalu, Sabah (1976) 10) as *N. dentata* nom. nud., validated in a paper eight years later (Kurata, Gard. Bull. Sing. 36 (1984) 197). A few days before *N. dentata* was validated, however, the description of *N. hamata* appeared in a preprinting of Reinwardtia, with an effective publication date of 10 February 1984, gaining priority by 28 days. The effective publication date of these two names is open to debate. Whether the ‘preprinting’ fulfilled the condition of being ‘freely available (Art. 29)’ before the Kurata paper is hard to determine. It was certainly not deposited at libraries at either K or E prior to the accession of volume 36 of the Gardens’ Bulletin of Singapore which arrived at both libraries in June 1984. The Reinwardtia volume arrived in August 1985 (K) and November 1985 (E). Turnbull & Middleton published (Reinwardtia 10, 2 (1984)) three species names from their Sulawesi collections: *N. hamata, N. glabrata,* and *N. infundibuliformis*. None of these collections has been found at the herbaria they cite. [Cheek & Jebb (2001)].

***Nepenthes hamiguitanensis* Gronem., Wistuba, V.B.Heinrich, S.McPherson, Mey & V.B.Amoroso, in: McPherson, S., Carniv. Pl. Hab. 2: 1296 (-1305; figs. 759-766). 2010. Sec. Cheek & Jebb (2013)**

Description: Terrestrial climber, up to 4 m tall. Stem cylindrical, 8-10 mm diameter, internodes 4-7 cm.

Leaves of the climbing stem petiolate, lamina elliptic to oblong, 20-25 cm long and 6-9 cm wide, apex obtuse, base gradually attenuate to the canaliculate petiole. Petiole sessile, up to 9 cm long. Longitudinal nerves 3 on each side of the midrib; pennate nerves numerous, running obliquely to the margin. Tendril about as long as the leaf, mostly with curl.

Upper pitchers up to 20 cm tall and up to 9 cm wide, infundibular in the lower half, with a distinct hip around the middle, cylindrical to slightly infundibular towards the pitcher opening. Wings reduced to ribs throughout. Mouth oblique, 6-8 cm wide, elevated towards the lid, elongated into a neck. Peristome cylindric, sometimes slightly flattened, 1 cm wide, ribs 0.3 mm apart, teeth of the inner margin 1 mm long. Inner surface glandular in the lower half. Lid cordate, 5 cm wide, glands evenly distributed over the whole lower surface, distinct appendage near the peristome attachment. Spur bifurcated, 3-4 mm long.

Lower pitchers were observed only on seedling-plants at the type locality and are not included in the holotype.

Male inflorescence ca. 70 cm long, 3.5 cm wide, partial pedicels branched and 2-flowered, bracts absent. (Inflorescence measurements are based on data recorded at the type locality, 23.7.2008, owing to the absence of such material in CMU Herbarium.)

Indumentum present throughout, especially prominent at the leaf margins; consists of coarse, short light brown to white hairs.
Colour variable, pitchers usually creamy-white but also red-speckled on creamy ground. Peristome either in the same colour as the pitcher, dark-red or red-striped. [Gronemeyer, Wistuba & al. (2010)].

Distribution: Philippines, Mindanao Island, Mount Hamiguitan. [Gronemeyer, Wistuba & al. (2010)].

Habitat: *Nepenthes hamiguitanensis* grows exclusively in primary, intact mountain forest and forest margins between 1200 m and 1600 a.s.l. on the summit ridge. It is absent from the distinct bonsai field that stretches across the plateau below the summit ridge. The plants grow predominantly in partially shaded conditions and receive heavy rain regularly. Although Mt. Hamiguitan is an ultramafic mountain, *N. hamiguitanensis* does not necessarily grow on ultramafic soil as the forest underlayer is rich in humus. [Gronemeyer, Wistuba & al. (2010)].

Etymology: The species epithet was chosen to denote that this remarcable species is endemic to Mount Hamiguitan. [Gronemeyer, Wistuba & al. (2010)].

Conservation: Assessed as VU according to the World Conservation Union Red List cirteria. [Gronemeyer, Wistuba & al. (2010)].

***Nepenthes ×harryana* Burb. in Gard. Chron. n.s. 17: 56. 1882. Sec. Cheek & Jebb (2001)**

Hybrid parent formula: *Nepenthes edwardsiana* H.Low ex Hook.f. × *Nepenthes villosa* Hook.f. A naturally occurring hybrid. [Jebb & Cheek (1997)].

***Nepenthes hemsleyana* Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 61. 1908. Sec. Scharmann & Grafe (2013)**

= *Nepenthes baramensis* C.Clarke, J.A.Moran & Chi.C.Lee in Blumea 56(3): 230 (229-233; fig. 1). 2011.

– *Nepenthes rafflesiana* var. *elongata* Hort. in Kew Bull. 1897: 405. 1897, nom. nud.

= *Nepenthes rafflesiana* var. *subglandulosa* J.H.Adam & Hafiza in Int. J. Bot. 2(4): 348 (-349; fig. 23). 2006.

Description: Terrestrial climber to 6 m tall. Stems terete, up to 8 mm diam. Internodes 0.5 –1 cm on rosettes, 10 – 15 cm on climbing stems. Leaves of rosettes chartaceous to thin-coriaceous, petiolate, the petioles narrow, lacking wings and canaliculate, up to 12 cm long, sheathing the stem for up to 1/2 – 3/4 of its circumfer- ence, not decurrent. Leaf blades oblong, up to 30 cm long, base abruptly contracted into the petiole; apex obtuse, acuminate, tendril insertion simple. Longitudinal nerves 3 – 5 on each side of the midrib, pennate nerves spreading towards the margins, but often inconspicuous. Tendrils uncoiled, up to 35 cm long. Leaves of climbing stems similar to those of the rosettes but smaller; petioles up to 10 cm long, not winged, sheathing the stem and not decurrent; leaf blades arising gradually from the petiole, oblong, up to 18 cm long, apex acuminate, tendril insertion simple. Lower pitchers up to 20 cm high, up to 5 cm wide, thin-chartaceous, arising abruptly from the tendril, broadly ovoid in the lower 1/3 with a pronounced hip, cylindrical above, nar- rowing slightly towards the mouth. Inner surfaces of the ovoid portion below the hip glandular throughout, surfaces above the hip covered in a layer of wax crystals. Two fringed wings, up to 3 cm wide (widest at the base), bearing multicellular fringe elements up to 12 mm long, run from the bottom of the pitcher to the mouth at the front. Mouth round, oblique, concave, rising at the rear into a distinct neck. Peristome sub-cylindrical, up to 8 mm wide at the front and sides, up to 12 mm wide near the apex. Outer surface entire, inner surface with distinct teeth up to 5 mm long; ribs up to 1 mm apart, up to 0.5 mm wide. Lid broadly ovate, base cordate, up to 6 cm long, up to 5 cm wide, lacking appendages on the lower surface. Large, crater-like nectar glands, up to 0.5 mm wide, scattered sparsely to densely around the outer lower surfaces. Spur simple, up to 10 mm long. Upper pitchers 18 – 25 cm high, 3 – 5 cm wide, thin-chartaceous, arising very gradually from the hanging end of the tendril, narrowly infundibular in the lower 1/3, becoming noticeably broader towards the hip, which is located 1/2 – 2/3 of the way up the pitcher; cylindrical above the hip to the peristome. Mouth and peristome similar to the lower pitchers, the latter sometimes with a slight kink at the front. Glandular region covers the entire inner surface below the hip; cylindrical portion above the hip covered with wax crystals. Lid ovate, generally not cordate at the base, up to 6 cm long by 4 cm wide, no appendages on the lower surface. Large, crater-like nectar glands, up to 0.5 mm wide, scattered sparsely around the outer lower surfaces. Spur simple, up to 10 mm long. Male inflorescence a raceme, peduncle up to 12 cm, rachis up to 30 cm, partial peduncles 1-flowered, bracts usually absent, pedicels 12 –15 mm long, tepals elliptic, up to 7 by 5 mm; androphore 5 – 6 mm long, anther head 1.2 by 2 mm. Female inflorescence similar in structure to the male, peduncle up to 12 cm, rachis up to 20 cm, partial peduncles 1-flowered, lacking bracts. Valves of fruits 50 by 10 mm. Indumentum of stem, midribs, lower surface of the leaf blade and inflorescences from base of peduncle to lower surface of the tepals white or grey arachnoid; lower surface of leaf and outer surface of pitchers with minute grey stellate hairs. Other surfaces glabrous. Colour of the leaves and pitchers drying to light green or straw brown, stem white, flowers dark brown. Pitchers on living plants pure light green throughout, or green with red-purple specks on the outer surfaces and lid; peristome green throughout to striped with varying degrees of red and green. Stems whitish grey, leaves dull green. [Clarke, Moran & al. (2011)].

Distribution: Borneo: Baram district and Bintulu area of Sarawak, and Belait and Tutong districts of Brunei [Scharmann & Grafe (2013)].

Habitat: Terrestrial climber in peat swamp forest, kerangas and kerapah habitats, occasionally locally abundant in disturbed kerangas or along kerangas forest ecotones; below 200 metres a.s.l. [Clarke, Moran & al. (2011)].

Etymology: The specific epithet honours Kew botanist William Botting Hemsley (1843 –1924), who described *N. macfarlanei* Hemsl. in 1905. [Scharmann & Grafe (2013)].

***Nepenthes hirsuta* Hook.f., in: de Candolle, A. L. P. P., Prodr. 17: 99. 1873. Sec. Cheek & Jebb (2001)**

= *Nepenthes hirsuta* var. *glabrata* Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 50. 1908.

– *Nepenthes hirsuta* var. *typica* Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 50. 1908, nom. inval.

= *Nepenthes leptochila* Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 319 (428, f. 13). 1928.

Description: Terrestrial climber 1-4 m tall. Stem terete, 4-5(-8) mm diam., internodes of short stems 0.5-1 cm long, of climbing stems 2-4.5(-10) cm long. Leaves coriaceous, subsessile; leaves of short shoots and rosettes oblanceolate, 10-19 by 3-5.5 cm wide, the lowermost 1/8-1/10 narrowed to a winged, poorly defined petiole, leaf bases shortly sheathing, amplexicaul, encircling the entire stem circumference; leaves of climbing shoots narrowly elliptic, 18-27(-28.5) by 4-6 cm wide, tapering to an acute apex, the basal 1/5-1/6 (i.e. up to 4-5 cm long), usually narrowed to c. 1 cm wide and resembling a winged petiole, base sheathing, encircling c. 1/3 the stem circumference, upper-most leaves smaller, 6-10(-14) by 1.6(-3.2) cm, subsessile. Longitudinal nerves 3-5 on each side of the midrib in the outer half, conspicuous above and below. Pennate nerves numerous, held at ± 90° from the midrib, inconspicuous, not reaching the marginal nerve. Lower pitchers ovoid or ellipsoid, tapering into a shortly cylindrical upper part, 11-18 cm long, 5-6(-7.5) cm wide at the base, tapering to 2.5-4(-5) cm wide below the peristome, with two fringed wings 2.5-3(-6) mm broad, the fringed elements 3-6(-15) mm long, (1-)2-2.5(-3) mm; mouth ovate, apex long-acuminate, oblique; the peristome cylindrical to slightly flattened, 3-5(-15) mm wide, with pronounced ribs 0.25-0.5 mm apart, 0.1-0.2 mm high, outer edge rarely slightly sinuate in largest pitchers, inner surface with broad stiff, slightly forward curved teeth 0.3-1 (-2) mm long; column short and broad, the peristome teeth expanded in two protuberant ridges; lid broadly to narrowly ovate or elliptic, 2.5-4.5(-6.2) by 2.7-3.2 cm, apex rounded, base shallowly cordate, lower surface without appendages, with several large circular or elliptic crater-like glands along the midline 0.3-0.5 mm long and numerous smaller, circular ones 0.2-0.1 mm diam., towards the margin, absent at the edge; spur simple 4-15 mm long. Upper pitchers as the lower, but much less commonly produced, cylindrical, rarely ovoid-cylindrical or infundibuliform-cylindrical, 10-15.5 by 2.5-4.7 cm, with wings 0.5-4 mm wide, usually fringed, the fringed elements up to 13 mm long, 3-4 mm apart; peristome 2.5-5 mm wide; lid ovate or ovate-oblong, 2-4.7 by 1.8-2.7 cm. Male inflorescence (18-)22-25 by 3 cm; peduncle 10.5-12 cm, 2 mm diam. at base; partial peduncles 2-flowered, 35-65, 1-3 mm long, bract 0.25-0.5 mm long, inconspicuous; pedicels (4-)5-8 mm long; tepals elliptic, (3.75-)5-5.5 by 2-2.5 mm, apex rounded; androphore (3.5-)6 mm long; anther head 1.25 by 1.25 mm. Fruits with valves 35-42 by 3.5-4 mm. Seeds filiform, 25 by 0.25 mm. Indumentum of stems, lower surface of midribs and inflorescences densely, less usually feebly, substrigose to pilose, with fragile, but not caducous, brown, subappressed, stiff, simple (rarely a few 1-3-branched) hairs (0.5-)1-2 mm long, hair bases swollen; lower leaf blade with sessile red glands very sparsely scattered with patent simple hairs c. 0.5 mm long. Colour of lower pitchers green or grey-green splashed with red; upper pitchers always green; tepals red with black spots on inner surface; androphore maroon; anthers white. [Cheek & Jebb (2001)].

Distribution: Borneo: Sarawak, Brunei, Sabah, and Kalimantan. [Cheek & Jebb (2001)].

Habitat: Submontane forest, sometimes on ridgetops, often on sandstone; 500-1100 m. [Cheek & Jebb (2001)].

Notes: The page number 29 for the protologue in IPNI (acc. 2017-3-18) is wrong. [Berendsohn (2017+)].

Notes: *Nepenthes hirsuta*, on account of the shape of its pitchers and its conspicuous dark, pilose indumentum is likely to be mistaken for one of the Regiae (the *N. maxima* group of species). It can be distinguished by the subsessile, not strongly petiolate leaves and the lower surface of the lid, which lacks an appendage. *Nepenthes hirsuta* varies from long-hairy to short-hairy and densely to weakly hirsute, but some hairs are always present though they are brittle and easily removed by abrasion. Hairs are never found on the upper surface of herbarium specimens, for example. *Nepenthes leptochila* is a weakly hairy variant, but not glabrous as has been thought. Inspection of young shoots on the type number of *N. leptochila* at BO shows hair bases and a few remnant hairs on the stems.

Nepenthes hirsuta is widespread and common in northern Borneo, but its three seemingly close relatives have more restricted distributions. *Nepenthes macrovulgaris* is apparently confined to ultramafic soils in Sabah, *N. hispida* occurs on sandstone in Sarawak, near the border with Brunei and Sabah and *N. philippinensis* grows on ultramafic soils in Palawan. [Cheek & Jebb (2001)].

***Nepenthes hispida* Beck in Wiener Ill. Gart.-Zeitung 20: 187. 1895. Sec. Cheek & Jebb (2001)**

Description: Terrestrial climber to c. 5 m tall. Stem terete, 2-4 mm diam., internodes of climbing stems 2-4 cm long; internodes of short shoots 0.25-0.75 cm long. Leaves coriaceous, sessile, blade oblanceolate to oblong, sometimes narrowly so; leaves of short stems 7-12 by 1.6-2.8 cm; leaves of climbing shoots 7.5-28 by 1.8-3.3 cm, apex shortly acuminate to obtuse, often unequal, not peltate, base decurrent-amplexicaul, extending down the stem by 0.5-1 cm, and clasping it by 9/10 its diameter, the wings short, but 4-6 mm broad, and almost meeting opposite the axil. Longitudinal nerves 3 on each side of the midrib in the outer half, from the leaf base. Pennate nerves apparently few, patent, inconspicuous. Above each inflorescence, the first leaf of the shoot has an ovate blade, 2.5-4 by 0.7-1.3 cm, with an acute to obtuse apex, and lacks a tendril. Lower pitchers ovoid-ellipsoid in the lower half, the upper half subcylindrical, tapering slightly to the mouth, 5-8.5 cm long, 1.5-3 cm wide at the base, 1-1.8 cm wide at the mouth, with two fringed wings, 1-3 mm wide, fringed elements 1-2 mm long, 1-2 mm apart; mouth ovate, oblique, slightly concave; peristome rounded, 0.5-1.2 mm wide, not sinuate, ribs 0.25 mm apart, the inner margin with teeth 0.5-1 mm long; lid ovate-elliptic, 1.4-2.7 by 0.9-2 cm, apex rounded, base truncate to slightly cordate, lower surface lacking appendages, with numerous circular, crater-like glands 0.1-0.15 mm wide, those on the midline, larger, elliptic, to 0.35 mm long; spur c. 5 mm long, entire. Upper pitchers as the lower, but more cylindrical, 7-11.5 by 1.2-2.7 cm; wings sparsely fringed near mouth and to 2 mm broad, or lacking fringed elements, 0.4-0.5 mm broad; mouth, peristome, lid and spur as in lower pitchers. Male inflorescence 9-13 by 1.5 cm; peduncle 2.5-4 cm long; partial peduncles 2-flowered near base, but mostly 1-flowered, 0.5-3 mm long; bracts absent; tepals elliptic, c. 3.5 by 2 mm; staminal column 1.5-2 mm, anther head with anthers subglobular, 1-1.25 mm diam. Fruit valves 35-47 by 3-4 mm. Seeds not recorded. Indumentum as *N. hirsuta*, but denser and longer, of erect, slightly forward pointing, mostly simple, dark coppery, bristle-like hairs 1.5-4 mm long, persistent and highly conspicuous on the stem, tendril and peduncle, sparser on the lower leaf blade, and shorter and denser on the inflorescence, including the axis, lower tepal surface and staminal column. Upper leaf blade, midrib, upper tepal surface and fruit, glabrous. Colour of stems (when dried) purplish grey; pitchers glaucous green, flecked red, especially inside, peristome red or greenish; flowers red. [Cheek & Jebb (2001)].

Distribution: Borneo: NE Sarawak and Brunei. [Cheek & Jebb (2001)].

Habitat: Heath forest; 100-800 m. [Cheek & Jebb (2001)].

Notes: This species is closely related to *N. hirsuta*, but distinct in the amplexicaul-decurrent leaf base, and also in the pilose character of the indumentum, with dense bristle-like hairs 1.5-4 mm long (1-2 mm long in *N. hirsuta*) on purplish grey stems (brown in *N. hirsuta*). The male flowers have a staminal column only 1.5-2 mm long at anthesis (3.5-6 mm long in *N. hirsuta*). *Nepenthes hispida* appears to be common in the region surrounding the Lambir Hills of northern Sarawak, with one collection being known from nearby Brunei and the type from the Lawas River. It is also related to *N. macrovulgaris* and *N. philippinensis* which can be distinguished by being glabrous and lacking peristome teeth.

This name was long overlooked, partly because of difficulties with its typification. Beck cites the type as "Am Lawas River bei 2000 bis 3000 Fuss (Low)!" At Kew there is a collection with a printed label of F.W. Burbidge attached; however, there is also a larger, hand-written label: "N. species, Lawas River, 2000 to 3000 feet no flowering or seeding specimens seen." At Vienna (W) there is a duplicate of this sheet with details presumably transcribed from the Kew label. Beck probably saw the Kew material as well, and probably interpreted the handwriting as Low's. The specimens accord exactly to Beck's description in both dimensions and appearance. Macfarlane in Das Pflanzenreich 4, 3 (1908) 49 placed *N. hispida* as a synonym of *N. hirsuta*, under the var. *typica* which he described there. Under this variety he cites 3 collections '(Low!, Beccari!, Burbidge!)'. Since the former specimen is most likely the type of *N. hirsuta*, the varietal name is superfluous and illegitimate. The last named specimen, however, is in all likelihood the specimen we interpret here as Beck's 'Low' specimen. Danser in Bull. Jard. Bot. Buitenzorg III, 9 (1928) 309 was sceptical of Macfarlane's treatment of *N. hispida*, but did not see the type, and placed it as a questionable synonym of *N. hirsuta*. [Cheek & Jebb (2001)].

***Nepenthes holdenii* Mey, in: McPherson, S., Carniv. Pl. Hab. 2: 1310 (1306-1331; figs. 768-782). 2010. Sec. McPherson (2011)**

Description: Leaves coriaceous, sub-petiolate; lamina linear to linear lanceolate; long tendril. Upper pitchers infundibular; slightly sinuated peristome. Lid elliptic with a cordate base, not vaulted. Inflorescences male and female with 2-flowered partial peduncles, usually with bracts. Indumentum glabrous except on leaf axils, tendril and pitchers. [Mey (2010)].

Distribution: Cambodia, Pursat Province, Cardamom Mountains. [Mey (2010)].

Habitat: Pyrophyte. Inhabits the transitional zone between lowland evergreen forest and low montane evergreen forest. Grows on steep ridges in peaty soil, in bright to fully sun-exposed areas. 600-800 m above sea level. [Mey (2010)].

Notes: A member of the *N. thorelii* aggregate. [Mey (2010)].

***Nepenthes ×hookeriana* H.Low ex Mast. in Gard. Chron. n.s. 16: 812 (& 813, fig. 157). 1881. Sec. Cheek & Jebb (2001)**

= *Nepenthes ×excelsior* B.S.Williams in Garden Lond. 28: 463. 1885. *Nepenthes rafflesiana* var. *excelsior* (Lindl.) Beck in Wiener Ill. Gart.-Zeitung 20: 147. 1895.

– *Nepenthes hookeri* Alphand ex Hook.f., in: de Candolle, A. L. P. P., Prodr. 17: 96. 1873, nom. inval.

– *Nepenthes hookeriana* H.Low ex Lindl. in Gard. Chron. 1848: 87. 1848, nom. nud.

– *Nepenthes hookeriana* H.Low ex W.H.Baxter, Suppl. Hort. Brit.: 593. 1850, nom. nud.

– *Nepenthes hookeri* Alphand, Prom. de Paris: ic. s.n. 1867-1873, nom. nud.

– *Nepenthes loddigesii* W.H.Baxter, Suppl. Hort. Brit.: 593. 1850, nom. nud.

= *Nepenthes rafflesiana* var. *hookeriana* (Lindl.) Beck in Wiener Ill. Gart.-Zeitung 20: 147. 1895.

Description: In morphology *Nepenthes ×hookeriana* is intermediate between the parental species. The leaf blade exhibits the typical venation of *N. ampullaria,* with the longitudinal nerves in the outer 1/2 of the blade only, and a shortly petiolate base; the lower pitchers are urceolate with broad pitcher wings and a broad, rounded peristome, but this is not developed into the long apical neck of *N. rafflesiana;* the lid is oblong to oblong-ovate, with a blunt or notched apex, and two prominent lateral veins, the lid glands are distributed throughout, unlike those of *N. rafflesiana,* which are densest near the margins and absent from the centre. [Cheek & Jebb (2001)].

Distribution: Sumatra, Peninsular Malaysia, Singapore, Borneo. [Cheek & Jebb (2001)].

Habitat: Only found near populations of the two parents *N. ampullaria* and *N. rafflesiana*. [Cheek & Jebb (2001)].

Notes: *Nepenthes x hookeriana* Lindl. in the Gardeners' Chronicle is merely a name in a list of species, referring to the name in Low's book. Hugh Low, however, accidentally, or otherwise, had described what we know as *N. rafflesiana* as *Nepenthes x hookeriana* and vice versa in his book Sarawak, its Inhabitants and Productions (1848). Masters was the first author to note this in the Gardeners' Chronicle II (1881) 818, f. 157, where he gives the first full description and illustration of *Nepenthes x hookeriana*. However the species still effectively remained dubious taxonomically (even though its facies were well understood in horticultural circles), until Macfarlane's revision. Macfarlane (op. cit. 1908) cites several specimens, among them a Low collection from Sarawak, which would seem the most appropriate choice for a lectotype, but we have not been able to locate this specimen. *Nepenthes loddigesii* is included on the authority of Macfarlane, but no type material has been located.
Along with another naturally occurring hybrid, *Nepenthes ×trichocarpa,* this taxon is widespread, albeit scarce. The numbers of plants present in a given population are often small and they tend to be very localised. It is possible that hybrids can only survive in marginal or disturbed habitats, since the ecologies of the two parental species is not identical. Other hybrids such as *Nepenthes ×kinabaluensis* and *Nepenthes ×trusmadiensis* are highly restricted in their distribution, and their identification is not problematic on a Malesian scale. [Cheek & Jebb (2001)].

Notes: Some notes on nomenclature of *Nepenthes ×hookeriana*:
- Cheek & Jebb (2001) cite this hybrid with Lindley as the author, but see their note.
- H.Low in Sarawak: 68, 1848 publishes *N. hookeriana* as a new species, different from *N. rafflesiana,* but mixes up the two descriptions.
- *Nepenthes hookeriana* H.Low ex Lindl. in Gard. Chron. 1848: 87
is referring the name to Low but it does not cite *N. rafflesiana* and thus could be interpreted as following Low's erroneous description. So, since there is no direct reference to an earlier description, this is considered a nomen nudum.
- *Nepenthes hookeriana* H.Low ex W.H.Baxter, Suppl. Hort. Brit.: 593. 1850 is again referring the name to Low and cites *N. rafflesiana* in the same table. Still, as Low's error is not pointed out, this is another nomen nudum.
- *Nepenthes loddigesii* W.H.Baxter, Suppl. Hort. Brit.: 593. 1850 is another entry in the same table, without any diagnosis, not referring to an earlier description; another nomen nudum.
- *Nepenthes hookerii* Alphand, Prom. de Paris: ic. s.n. 1868.
(The last plate in section "Flore Ornamental, planches", see
http://gallica.bnf.fr/ark:/12148/bpt6k6276852z/f483.item.r=Nepenthes.langFR.zoom). Plate with name, no further data.
- *Nepenthes hookeri* Alphand ex Hook.f. in A.DC., Prodr. 17: 96. 1873 cites the former in synonymy – this does not validate the name. [Berendsohn (2017+)].

Hybrid parent formula: *N. ampullaria* × *N. rafflesiana.* [Macfarlane (1908)].

***Nepenthes hurrelliana* Cheek & A.L.Lamb in Sabah Parks Nature J. 6: 118 (-123; figs.). 2003. Sec. McPherson (2009)**

Description: Climbing branched stem up to 7 m long.
The lamina is elliptic or lanceolate, up to 35 cm long and 8 cm wide. The apex of the leaf is obtuse, rounded or

occasionally emarginate and the base if obtuse and petiolate. The petiole is up to 6 cm long and canaliculate. The lamina is green, and the stem, midrib and tendril are yellow-green. Most parts of the plant, including the upper surface of the leaves, the inflorescence and the pitchers, are lined with coarse, orange or brown hairs up to 5 mm long.

The lower pitchers are up to 28 cm tall and 7 cm wide and are narrowly infundibular throughout. Wings up to 10 mm wide run down the front of the pitcher and are sparsely fringed with narrow filaments up to 12 mm long. The peristome is up to 1.8 cm wide and flattened at the front of the characteristically horizontal pitcher opening, expanding to 6 cm wide at the sides and rear. The rear of the pitcher opening rises abruptly, being strongly elongated into a neck that may be inclined forwards. The inner margin of the peristome extends into the pitcher opening for several millimetres. In newly opened pitchers, the peristome is initially flared, but its outer margins curl backwards as the traps age and sometimes the peristome becomes slightly crenellated. The peristome is lined with ribs up to 2 mm high, spaced 3 mm apart. The ribs are elongated on the inner edge of the peristome and form downwards protruding teeth up to 3 mm long. Below the lid, the ribs form triangular teeth that are arranged in two rows, usually separated by a gap of a few millimetres. The lid is narrowly ovate, but often curls at the sides so that is appears triangular, much like *N. fusca*. A triangular, slightly hooked appendage up to 11 mm long is often present on the lower surface of the lid, close to the base; this appendage is unusual in *Nepenthes* in that it is often hairy. The spur is unbranched and up to 11 mm long.

The interior and exterior of the lower pitchers are olive green or yellowish, usually mottled with variable, dark red, purple or black blotches. The peristome is predominantly dark red or purple and is usually spectacularly striped with contrasting bands of yellow, green, orange, purple or black. The lid is yellow or orange and heavily mottled with small flecks of dark red or purple.

The upper pitchers are similar to the lower pitchers in all respects, except that they are narrower, particularly towards the bottom of the pitcher, up to 30 cm long, and the wings are reduced to prominent ridges. Colouration is also similar, but the pitcher walls are generally lighter and the accent marks more vivid. [McPherson (2009)].

Distribution: Borneo [McPherson (2009)].

Habitat: Epiphyte on mossy, upper montane forest trees, at altitudes of 1500-2400 m. [McPherson (2009)].

Notes: The upper pitchers of *N. hurrelliana* may appear similar to certain forms of *N. fusca,* but both the upper and lower pitchers, with particular references to the shape of the broad peristome, are nonetheless morphologically distinct from that species. The narrow, triangular lid and distinctive, hairy appendage also distinguish. *N. hurrelliana* from other closely related species, including *N. boschiana* and *N. faizaliana*. Young *N. hurrelliana* plants may be confused with *N. veitchii,* but leaf and pitcher morphology distinguish it from that species on close inspection. [McPherson (2009)].

Etymology: The specific epithet honours American botanist, Andy Hurrell who studied this plant on Mount Murud in 1995. [McPherson (2009)].

***Nepenthes inermis* Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 312, f. 10. 1928. Sec. Cheek & Jebb (2001)**

Description: Canopy epiphyte, climbing to at least 45 cm tall. Stems terete to rounded triangular, (2-)3-5 mm diam., internodes of climbing stems 3.5-5.5(-9.5) cm, axillary buds inconspicuous. Leaves thinly coriaceous, sessile, those of short stems and rosettes unknown, those of climbing stems oblanceolate-spathulate to oblong, (5-)6.5-8(-12) by 1-1.6(-2.5) cm, apex rounded-acute, margin slightly revolute, base attenuate, clasping the stem for half its circumference, not auriculate or decurrent. Longitudinal nerves 2 or 3 on each side of the midrib in the outer half from the leaf base, fairly conspicuous. Pennate nerves numerous, reticulate. Lower pitchers unknown. Upper pitchers originating gradually or abruptly from the end of the tendril, incurved with a 1-2 cm arc, infundibuliform 5.5(-9) cm long, lower 1/2-2/3 cylindrical to slightly infundibular, 3.75 cm tall, 1 cm wide; upper part abruptly flaring to 4.7(-5) cm wide at the lip; wings or ribs not apparent; mouth orbicular, horizontal, not forming a column for the lid; peristome barely differentiated from rim of pitcher mouth, 0.2 mm wide, lacking teeth or ribs; lid held arched over mouth, linear-oblong, 4.5-5 by 0.2-0.4 cm, lower surface lacking appendages, nectar glands crater-like, sparsely scattered at the margins, elliptic, 0.2 by 0.1 mm; spur linear, 3-4 mm long, reflexed, unbranched. Male inflorescence 17 cm long; peduncle 5 cm long, c. 1.5 mm diam. at base; partial peduncles c. 50, 1-flowered; pedicels 8 mm long at base (4 mm long at apex); bract inserted near the base, small and filiform; tepals oblong-lanceolate, acute, 3 by 1 mm; staminal column c. 4 mm long. Fruits and seeds unknown. Indumentum inconspicuous, puberulent, hairs erect, simple, 1-2 mm long, stems soon glabrescent, but hairs persisting in leaf axils and on pitcher lid, leaves and pitchers glabrous. Colour of pitchers yellowish green, drying blackish brown. [Cheek & Jebb (2001)].

Distribution: Sumatra. [Cheek & Jebb (2001)].

Habitat: Epiphytic in moss forest; 2300-2590 m (Hopkins et al. Carnivorous Plant Newsl. 19 (1990) 19-28). [Cheek & Jebb (2001)].

Notes: *Nepenthes inermis* is most likely to be confused with *N. dubia* or *N. bongso* which occur in the same general area of Sumatra and both of which can have similar proportions, indeed, all three species have been united by Tamin

& M. Hotta under the name *N. bongso*. *Nepenthes inermis* is easily recognised by the absence of a ridged or dilated peristome and by the linear-oblong lid that overarches the mouth.
This species remains poorly known, and as yet the lower pitchers have never been collected. The remarkable upper pitchers lack a peristome, and have a very narrow lid. The tendril may or may not be coiled, an unusual habit — in the majority of species they are always coiled in upper pitchers. The pitcher fluid is said to be extremely viscous, forming long stringy droplets when the pitcher is upset. An unrelated species, *N. eymae* shares the same combination of infundibulate pitcher, narrow lid and viscous pitcher fluid. It has been suggested, and demonstrated in greenhouse-grown plants, that the infundibuliform pitcher and the highly viscous pitcher fluid allows rainwater to be shed from the pitcher without diluting or washing away the partly-digested contents. The weight of rainwater causes the pitcher to overbalance, shedding the water from the broad mouth, whilst the narrow shape of the lower part of the pitcher, and the viscosity of the column of fluid that it contains, prevents mixing with the supernatant rainwater (Wistuba (1994)). A survey of 22 pitchers (under the name *N. bongso*) suggests that this species traps a very high proportion of dipterans (flies) compared to other Sumatran species surveyed (Kato et al. Trop. Ecol. 6 (1993) 11-25). [Cheek & Jebb (2001)].

***Nepenthes insignis* Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 314, f. 11. 1928. Sec. Cheek & Jebb (2001)**

Description: Epiphytic shrub or climber c. 80 cm tall. Stem triangular, 0.5-0.7 cm diam. Leaves thinly coriaceous, sessile, those of climbing stems linear-lanceolate to slightly spathulate, 20-35 by 4-6 cm, apex acute, base attenuate, decurrent into 2 wings descending 1/3-2/3 the length of the internode. Longitudinal nerves 4-6 on each side of the midrib in outer half of the lamina very conspicuous. Pennate nerves numerous, running obliquely, to margin. In the dry state only the longitudinal nerves are visible on the lower surface. Lower pitchers ovoid in the lower half, gradually becoming cylindrical in the upper half, to 16 cm high, 5 cm wide, with 2 narrow, sparsely denticulate wings; mouth oblique, fairly straight; peristome expanded, 6-12 mm broad, ribs 0.5-0.75 mm apart, conspicuous, outer edge conspicuously sinuate; lid suborbicular-ovate, rounded at the apex, rounded to cordate at the base, c. 5 by 4.5 cm, lower surface lacking appendages, with a distinct, thickened midline and 2 prominent lateral veins, nectar glands large, bordered, clustered about the veins; spur filiform, 5 mm long, acute, unbranched. Upper pitchers stout, infundibulate, sharply triangular in section at base, 16-30 by 5-8 cm, with 2 prominent ribs over the whole length, rarely with two fringed wings c. 2 mm broad; mouth oblique, straight and not concave; peristome expanded, widest at the sides, 0.8-3.5 cm broad, ribs 0.5-1 mm apart, c. 0.2 mm tall, conspicuous, outer edge sinuate, inner edge shortly and inconspicuously toothed; lid 4.5-7.5 by 4.5-7.5 cm, nectar glands dense, pit-like, transversely elliptic or orbicular, 0.6-1 mm long, absent from a 5 mm band along the midline, smaller and sparser in the marginal 1 cm; spur as lower pitcher. Male inflorescence 32-54 cm long; peduncle angular and grooved, 12-18 cm long, 5-7 mm diam.; partial peduncles nearly all 2-flowered; bracts absent; pedicels 17-22 mm long; tepals oblong, 4 mm long; androphore c. 5 mm long. Fruit and seed unknown. Indumentum absent from stems and leaves; young pitchers with short deciduous stellate hairs; inflorescence with spreading and stellate hairs from base of peduncle to lower surface of the tepals; androphore hairy at base. Colour of pitchers dark green in the lower half, yellow above with deep red spots; peristome reddish brown (Rischer Carnivorous Plant Newsl. 24 (1995) 75-77). [Cheek & Jebb (2001)].

Distribution: New Guinea: Irian Jaya, including Biak Island. [Cheek & Jebb (2001)].

Habitat: Canopy of lowland evergreen forest, rarely terrestrial on river banks; 80-850 m. [Cheek & Jebb (2001)].

Notes: The winged leaf base, decurrent down the stem, the broad peristome with toothed inner margin, and 2-flowered partial peduncles separate *N. insignis* from all others species in New Guinea. *Nepenthes insignis* belongs with a grouping characterised by their often epiphytic nature, sessile leaves, angular stems, often large pitchers with a broad, only slightly rounded peristome which often lacks a revolute outer margin, and a lid in which the glands are absent from the midline and often transversely elliptic. This group was named the Insignes by Danser in Bull. Jard. Bot. Buitenzorg III 9 (1928) 405 and includes *N. burkei, N. merrilliana N. northiana, N. sibuyanensis, N. ventricosa,* and possibly *N. bellii*.
Nepenthes insignis was only known from four collections with scanty field notes gathered many decades ago until its recent rediscovery (Rischer in Carnivorous Plant Newsl. 24 (1995) 75-77), from which the colour and habitat notes above are derived. [Cheek & Jebb (2001)].

***Nepenthes izumiae* C.Clarke, Troy Davis & Tamin in Blumea 48(1): 180. 2003. Sec. Clarke, Troy Davis & al. (2003)**

Description: Climber to 5 m. Stem cylindrical to angular, ≤ 0.8 cm in diameter, internodes ≤ 12 cm long on climbing stems, ≤ 1.0 cm on rosettes. Leaf blades of the rosettes and short shoots coriaceous, broadly lanceolate to spathulate, ≤ 25 cm long, ≤ 8 cm wide, sessile. Longitudinal veins 3 on each side of the midrib, pennate veins arising obliquely from the midrib, but difficult to distinguish. Leaf blade narrowed towards the base, but widening again at the point where it is attached to the stem, clasping the stem for 1/2 of its circumference. Tendrils ≤ 30 cm long, straight, very robust on rosettes produced by mature plants. Leaves of the climbing stems coriaceous, ≤ 20 cm long, ≤ 3 cm wide, ovate, apex rounded. Leaf blade narrows slightly towards the base, not becoming wider again at

the point of attachment to the stem. Base clasps the stem for approximately 1/2 of its circumference. Tendrils ≤ 25 cm long, less robust than those of rosettes, usually with a loop in the middle. On large lower pitchers, the insertion of the tendril is usually be sub-apical by 1– 2 mm, in which case the apex of the leaf blade is elongated and obtuse. Pitchers of the rosettes arising gradually from the end of the tendril, ≤ 30 cm high, ≤ 6 cm wide. Lower 1/4 infundibular, next 1/4 narrowly ovoid, upper 1/2 cylindrical and contacted above the ovoid part but lacking a distinct hip. Cylindrical upper portion widens slightly just below the mouth. Two wings (≤ 6 mm wide), bearing multi-cellular fringe elements (≤ 9 mm long) run from the top to the bottom of the pitcher at the front. Glandular region on the inner surface extends from the bottom of the pitcher to the top of the ovoid portion, digestive glands barely hooded, not significantly raised above the glandular surface of the pitcher wall, ≤ 150 cm2. Mouth of pitchers round, ≤ 6 cm in diameter, steeply oblique, almost vertical at the rear. Peristome ≤ 3 cm wide, widest just below the lid, narrowest at the front. Inner margin bearing pronounced, narrow teeth, ≤ 1 cm long. Ribs ≤ 4 mm apart, raised to 3 mm. Lid orbicular, very strongly cordate at the base, ≤ 8 cm in diameter, with a pronounced, hook-shaped appendage (≤ 1 cm long) on the lower surface, towards the base. Large nectar glands, ≤ 1 mm across occur on the spur and midline of the lower surface of the lid. The rest of the underside of the lid is virtually devoid of nectar glands. Spur simple, ≤ 1 cm long. Upper pitchers rarely produced, arising gradually from the tendril, widening very little throughout the curl, infundibular in the lower 1/3, contracted to a distinct hip, then cylindrical above; not widening towards the mouth; ≤ 15 cm high, ≤ 4 cm wide. Mouth round, oblique, elongated into a short neck at the apex. Peristome narrow and generally cylindrical (sometimes expanded slightly at the sides) ≤ 8 mm wide, ribs distinct, raised 0.5 mm, teeth distinct, ≤ 1.5 mm long. Glandular region on inner surface covers the lower portion below the hip. Wings reduced to ribs, multicel- lular fringe hairs absent. Lid sub-orbicular, ≤ 4 cm wide, same size as the pitcher mouth, cordate at the base, structure of glandular crest and distribution nectar glands the same as in the lower pitchers. Spur short and simple, ≤ 0.5 cm long. Female inflorescence a raceme, peduncle ≤ 10 cm, rachis ≤ 8 cm. Pedicels ≤ 1 cm long, bracts and bracteoles absent, sepals ovate, ≤ 6 mm long. Mature capsules ≤ 1.5 cm long. Male inflorescence unknown. Indumentum on immature tendrils comprised of soft, white and red-brown hairs, most which are caducous. Rosette leaves glabrous above and below, margins lined with simple, short, white hairs, about 50% of which are persistent. Leaves of climb- ing stem very sparsely covered with simple, short, white hairs on the upper surface; lower surface glabrous. Margins densely covered with short, simple, brown hairs when young; many of these are caducous, but some are retained towards the apex. Leaf axils covered with short, stellate, light brown hairs. Outer surfaces of lower pitchers and up- per surface of lid densely covered with red-brown stellate hairs; spur sparsely covered with downy, red, simple hairs. Mature tendrils sparsely covered with very short, simple white hairs. Outer surface of upper pitchers and upper surface of lid densely covered with very short, white, stellate hairs. Peduncle, rachis, pedicels and capsules of female inflorescence densely covered with short, brown, stellate hairs. [Clarke, Troy Davis & al. (2003)].

Distribution: Indonesia, Sumatra (Sumatra Barat, Bukit Barisan). [Clarke, Troy Davis & al. (2003)].

Habitat: Growing strictly as an epiphyte in upper montane forest above 1700 m above sea level. [Clarke, Troy Davis & al. (2003)].

Etymology: Named in honour of Izumi Davis, wife of T. Davis. [Clarke, Troy Davis & al. (2003)].

***Nepenthes jacquelineae* C.Clarke, Troy Davis & Tamin, Nepenthes Sumatra Penins. Malaysia: 146. 2001. Sec. Clarke (2001)**

Description: Stem: climbing, ≤ 5 m in length, ≤ 0.5 cm in diameter, internodes ≤ 10 cm long, cylindrical-angular.

Leaves of rosettes: coriaceous, sessile to sub-petiolate; lamina ovate-spathulate, ≤ 7 cm long, ≤ 3.5 cm wide, apex obtuse. Lamina contracted towards the base, which is simple, clasps the stem for 2/3 of its diameter and is not decurrent. Tendrils straight, ≤ 15 cm long. Longitudinal veins 3 on each side of the midrib, pennate veins arising obliquely from the midrib.

Leaves of the climbing stems: similar in shape to those of the rosettes, but larger, ≤ 20 cm long, ≤ 6 cm wide overall, with the contracted portion at the base ≤ 5 cm long. Appex acute to obtuse, longitudinal and pennate veins as in the rosette leaves. Tendrils ≤ 30 cm long, with a curl in the middle.

Rosettes and lower pitchers: arising abruptly from the tendril, which is usually inserted at the side of the pitcher, ≤ 6 cm high, ≤ 4 cm wide, infundibular throughout, not hipped, mouth horizontal. Inner surfaces glandular throughout, glands 0.3 mm wide, ovate, slightly raised or hooded, approximately 250 per sq. cm. Two wings, bearing multi-cellular fringe elements, may or may not be present on the front. If present, they are ≤ 3 mm wide and ≤ 1 cm long, extending down from the edge of the mouth. Multi-cellular fringe elements, if present, are ≤ 3 mm long. Peristome flattened and expanded, ≤ 1.0 cm wide (except at the front, where it is contracted to 1/2-2/3 of the width of the other parts), joined to the pitcher in the middle, the inner side incurved slightly, the outer side horizontal or inclined at an angle of approximately 45°. Ribs virtually indistinguishable, except at the front, where they are distinct but not significantly raised. Outer margin slightly, but very tightly, recurved. Inner margin almost entire, except at the front,

where short distinct teeth, ≤ 0.5 mm long are present. Lid ovate, ≤ 1 cm long, ≤ 0.8 cm wide, covering the mouth, contracted at the base, not cordate. Small, circular nectar glands (≤ 0.5 mm diameter) are concentrated towards the apex, near the midrib on the lower surface. A few very large, raised nectar glands (≤ 1.0 mm diameter) are also present on the lower surface of the lid, but are not concentrated in any particular area. Spur simple, flattened, ≤ 5 mm long, ≤ 1.5 mm wide.
Upper pitchers: arising gradually from the hanging end of the tendril, expanding very slightly throughout the curl, narrowly infundibular in the lower 1/4-1/3, widely infundibular throughout the upper 2/3-3/4, not hipped, mouth horizontal, ≤ 15 cm high, ≤ 10 cm wide. Inner surface glandular throughout, glands as in the rosette pitchers. Wings reduced to two simple ribs, never bearing multicellular fringe elements. Peristome flattened and expanded, ≤ 3.5 cm wide (except at the front, where it is contracted to 1/2-2/3 of the width of the other parts), joined to the pitcher in the middle, the inner side incurved slightly, the outer side horizontal. Ribs virtually indistinguishable, except at the front, where they are distinct but not significantly raised. Outer margin often undulating, and always slightly, but very tightly, recurved. Inner margin bearing short, distinct teeth, ≤ 0.5 mm long. Lid narrowly ovate, ≤ 5 cm long, ≤ 2 cm wide, positioned over the mouth, where it covers much of the orifice, contracted towards the base, not cordate. Small, circular nectar glands (≤ 0.5 mm diameter) are concentrated towards the apex, near the midrib on the lower surface. A few very large, raised nectar glands (≤ 1.5 mm diameter) are also present on the lower surface of the lid, but are not concentrated in any particular area. These glands are so large that they produce swellings on the upper surface of the lid. Spur simple, flattened, ≤ 1 cm long, ≤ 2 mm wide.
Male inflorescence: a raceme; peduncle ≤ 12 cm long, rachis ≤ 20 cm, bearing one- or two-flowered partial peduncles. The two-flowered partial peduncles occur on the lower 2/3 of the rachis, whereas the one-flowered ones occur towards the apex. All partial peduncles bear a long, filiform bract (≤ 1.5 cm long), which arises from the rachis, but is also joined to the base of the partial peduncle. Each two-flowered partial peduncle is ≤ 1.0 cm long below the branch, with each branch ≤ 0.8 cm long. Sepals ovate-lanceolate, ≤ 0.7 mm long, ≤ 0.4 cm wide. Column ≤ 0.4 cm long. Approximately 100 flowers are borne on each inflorescence.
Female inflorescence: similar in structure to the male; peduncles ≤ 20 cm long, rachis ≤ 10 cm. Mature fruits ≤ 2.5 cm long, approximately 60 flowers are borne on each inflorescence.
Indumentum: stem and leaves glabrous throughout, Outer surfaces of the pitcher and upper surfaces of the lid sparsely covered with short, white stellate hairs. Upper pitchers generally having fewer persistent hairs than the lower ones. Underside of peristome on outer surface with a dense covering of these hairs. Spur covered with simple, red-brown, downy hairs. Developing pitcher buds densely covered with soft, simple, downy red-brown hairs, but most of these are caducous, except on the spur. Peduncle and rachis glabrous or sparsely covered with short, brown, stellate hairs. Partial peduncles more densely covered with the same hairs, while the base of the column is very densely covered. The indumentum of the female inflorescence is generally a little denser throughout than that of the male. [Clarke (2001)].

Distribution: Malaysia, Sumatra Barat, Bukit Barisan Mountains. [McPherson (2011)].

Habitat: Epiphytic or terrestrial in mossy forest, 1700-2200 m a.s.l. [Clarke (2001)].

Etymology: For Jacqueline Clarke, wife of the first author, Charles Clarke. [McPherson (2009)].

***Nepenthes jamban* Chi.C.Lee, Hernawati & Akhriadi in Blumea 51(3): 563 (-565; fig. 1). 2006. Sec. Lee, Hernawati & al. (2006)**

Description: Terrestrial climber to c. 4 m tall. Stems of rosettes and short shoots cylindrical-angular, c. 3 mm diam., internodes 1–1.3 cm long. Climbing stems to 0.5 cm diam., internodes 1.8 – 5 cm long. Leaves of rosettes coriaceous, sessile, narrowly obovate to elliptic or slightly spathulate, apex acute, 9 –10.3 by 2.2 – 3 cm, clasping stem for 3/4 circumference; longitudinal veins 1 or 2 on each side of the midrib, located in the outer 1/4 of the lamina, pinnate veins arising obliquely from the midrib; tendrils straight, to 13 cm long. Leaves of climbing stems as those of rosettes, but lamina ovate to elliptic to slightly spathulate, usually contracted into a parallel-sided basal section, 7–11 by 2.6 – 3.3 cm, base clasping the stem for 1/2 – 2/3 of its circumference and not decurrent; tendrils with a curl in the middle, 15 – 24 cm long. Lower pitchers originating laterally from the tendril, 3.5 – 5.8 by 3.2 – 4.4 cm, cylindrical to narrowly infundibular in the lower third, rapidly becoming widely infundibular above, somewhat compressed laterally, not hipped, mouth almost horizontal; inner surface glandular throughout; wings usually present on the front of the pitcher, to 10 by 2 mm wide with fringe elements c. 3 mm long; peristome flattened, to 0.8 cm wide, joined to the pitcher in the outer third, the inner side slightly incurved; ribs c. 0.7 mm apart at front, closer and less pronounced towards lid; inner margin ending in teeth c. 0.5 mm long; spur usually simple, sometimes forked, inserted at base of lid, c. 4 mm long; lid narrowly obovate, 3.5 – 3.8 by 0.9 –1.3 cm, held horizontally over the mouth, with sides folded upwards at c. 120°, undersurface with scattered small red glands concentrated around the midrib and a few (c. 20 – 30) very large crater-like glands, c. 0.5 mm diam., present in the apical 1/4, which are visible on the upper surface of the lid as distinct swellings. Upper pitchers originating from the tendril at the rear of the pitcher, 7.5(–12) by 5.2 cm, expanding very gradually in the lower half and abruptly

becoming widely infundibular in the upper half, circular in cross section, not hipped, mouth horizontal and orbicular; inner surface glandular throughout; wings absent but present in lower half of pitcher as reduced ribs; peristome flattened, to 0.6 cm wide, joined to the pitcher in the outer third, ribs c. 1 mm apart and 0.5 mm tall; inner margin ending in teeth c. 1 mm long; spur usually simple, inserted at base of lid, to 3.5 mm long; lid as in lower pitchers but longer, to 4.8 by 0.9 cm, held over the mouth at an angle of c. 45°. Male inflorescence a raceme, 18 by 2 cm; peduncle to 4.2 – 6.5 cm long, rachis 8.2 –11.5 cm, pedicels 0.5 –1.4 cm long, each bearing a single flower, with a filiform bract 2 – 9 mm long inserted c. 1 mm from the base of the pedicel; sepals elliptical, c. 3.5 mm long; staminal column 1.5 – 3 mm long. Female inflorescence unknown. Ripe infructescence a raceme, peduncle 5 cm long, rachis 3 cm long, pedicels to 1.4 cm long, each bearing a single fruit, with a filiform bract c. 4 mm long inserted c. 2 mm from the base of the pedicel; fruit to 3 by 0.6 cm; seeds filiform, c. 2 cm long. Indumentum: all parts of the plant glabrous except for developing pitchers, tendrils, and inflorescence which are densely covered with short brownish grey hairs. Colour of living specimens: leaves light green above, pale green below, stems purplish red, inflorescence light green, lower pitchers yellowish orange to bright red with red peristome, upper pitchers bright yellow occasionally with red spots on inner surface and with yellow to orange peristome. [Lee, Hernawati & al. (2006)].

Distribution: Indonesia, Sumatra (Sumatera Utara, Bukit Barisan) [Lee, Hernawati & al. (2006)].

Habitat: Upper montane mossy forest and summit scrub vegetation, growing terrestrially. [Lee, Hernawati & al. (2006)].

Notes: This species represents another taxon in the primarily West Sumatran group which includes *N. dubia, N. inermis, N. jacquelineae,* and *N. tenuis*. With these species it shares common features including broadly infundibulate pitchers which are wholly glandular within, bracteate inflorescences, and sessile leaves. In addition, all these species have a highly viscous pitcher fluid, and it has been suggested that this may aid in the retention of insect prey, as mentioned by Clarke (2001).

The upper pitchers of *N. jamban* have been regularly observed to be filled with numerous large insect prey items including wasps and crickets and with very few small prey such as ants. Most upper pitchers also support large populations of living mosquito larvae.

Nepenthes jamban appears most closely related to *N. jacquelineae* with which it shares a similar growth habit and pitcher structure. Both of these species possess unusually large nectar glands on the undersurface of the pitcher lid which are so robust that they produce small bumps on the lid's upper surface. However, *N. jacquelineae* differs in having a more robust habit, a widely expanded smooth peristome, shorter and 2-flowered partial peduncles, and a wider pitcher lid.

At the type locality (currently the only known locality for this species), *N. jamban* is sympatric with *N. bongso, N. dubia, N. gymnamphora,* and *N. lingulata,* though no natural hybrids have been observed. The fact that the closely related *N. dubia* occurs in the same habitat with no apparent introgression is worthy of note as this is the first record of two sympatric taxa in this species group. [Lee, Hernawati & al. (2006)].

Etymology: The specific name refers to the word 'jamban' in Indonesian, due to the resemblance of the pitcher shape to a toilet receptacle. [Lee, Hernawati & al. (2006)].

***Nepenthes justinae* Gronem., Wistuba, Mey & V.B.Amoroso in Plants (Basel) 5(2) (23): 6 (-10, fig. 3, 4). 2016. Sec. Gronemeyer, Suarez & al. (2016)**

Description: The stem is up to 4 m long, cylindrical in transection, 5–8 mm in diameter. The average internode length is 6 cm (might be longer in climbing stems).

Leaves of the climbing stem are elliptic to ovate, 18 cm long and 11 cm wide, with 3 equally distributed longitudinal veins on each side of the midrib and numerous pinnate veins running obliquely towards the leaf margins. The apex of the lamina is acute, the base attenuate and forming a sessile, narrowly winged petiole of 6 cm in length. Pitchers are on tendrils being up to 21 cm long. The tendrils are curled and are covered with short, brown hairs, about 1 mm long.

Lower pitchers are bulbous in the lower ⅔ and slightly infundibulate in the upper ⅓. They are 9 cm long and 2.5 cm wide in the upper half and 3.5 cm wide in the lower half. The pitcher narrows slightly towards the opening. Wings run down the front of the trap, fringed with filaments up to 3 mm long and 2 mm apart. The pitcher opening is distinctively oblique, up to 2 cm wide and acuminates towards the lid. The peristome is slightly flattened, up to 0.5 cm wide, not crenelated and densely lined with ribs having very small conspicuous teeth at the margin. The peristome is elongated into a neck towards the lid, which is cordate and 1.5 × 2 cm wide. Nectar glands are monomorphic and large with the largest glands located in a cluster distally to the midline, smaller glands cover approx. 60% of the lid surface. A keel, 3 mm wide, is present on the underside of the lid. The spur is 3 mm long and bifid at the tip but not completely branched.

The exterior of the lower pitchers is creamy-yellow, with narrow purple blotches. The interior of the pitcher is uniformly greenish-white and sometimes lined with angular blotches of purple. The peristome is dark red and

unevenly yellow striped. The whole surface of the lower pitchers is covered with dense, very short brown hairs.
Upper pitchers are 17 cm long and 3.5 cm wide in the upper ⅔ and 4 cm wide in the lower ⅓. The lower ⅓ is separated by a distinct rim from the upper ⅔ of the pitcher. The pitcher narrows slightly towards the middle section before it widens towards the oblique pitcher opening; the latter being 2.5 cm wide. Wings run down the front of the trap, fringed with filaments up to 3 mm long and 4 mm apart. The wings are sometimes reduced to ribs. The peristome is slightly flattened, up to 1 cm wide, elongated into a short collar and densely lined with ribs having no visible teeth at the margin. The lid is cordate and 3 × 4 cm wide. A rounded appendage of 3 mm on a keel is present; the spur is 4 mm long, unbranched but is occasionally bifid at the tip. The nectar gland distribution, coloration and indumentum are consistent with the lower pitchers.
The female inflorescence is a panicle composed of a 40 cm-long scape and an additional 25 cm rachis. The partial peduncles are 2-flowered and 12 mm long. The pedicels are 10 mm long bearing flowers with 4 mm wide tepals. The male inflorescence is unknown.
NB: The given dimensions are based on the holotype specimen and of the specimens at ULM. The dimensions of the pitchers may be larger in all respects. At the type locality upper pitchers up to 25 cm large have been recorded. Dimensions of the female inflorescence were recorded from the specimen at ULM as the holotype does not contain inflorescences. [Gronemeyer, Suarez & al. (2016)].

Distribution: Philippines, Mindanao Island, Davao Oriental province, Mt. Hamiguitan. [Gronemeyer, Suarez & al. (2016)].

Etymology: The specific epithet honors Justina Yu, the mayor of the municipality of San Isidro, Davao Oriental Province, Mindanao Island. Due to Justina Yu's support and dedication, the Mount Hamiguitan Wild Life Sanctuary became a protected national park and was declared a UNESCO World Heritage Site in 2014. [Gronemeyer, Suarez & al. (2016)].

Conservation: As *N. justinae* is endemic to Mt. Hamiguitan, it is assessed here as vulnerable (VU) applying the IUCN Redlist criteria. [Gronemeyer, Suarez & al. (2016)].

***Nepenthes kampotiana* Lecomte in Notul. Syst. (Paris) 1: 62 (-63). 1909. Sec. Mey (2010)**

= *Nepenthes geoffrayi* Lecomte in Notul. Syst. (Paris) 1: 62. 1909.

Description: Leaves coriaceous, sub-petiolate; lamina linear to lanceolate; long tendril. Lower pitchers ovate in the lower third, narrowing above. Upper pitchers cylindrical with a bulbous base, to obovate. Peristome narrow, usually without stripes.
Lid orbicular with a cordate base, not vaulted. Inflorescence with solitary male and female flowers borne on pedicels. Indumentum absent except on leaf axils, tendril and pitchers. [Mey (2010)].

Distribution: Thailand, Trat Province; Cambodia, "Kampot" (Kampot Province?) [Mey (2010)].

Habitat: Pyrophyte. Inhabits seasonally inundated open savannahs and grasslands. [Mey (2010)].

Notes: A member of the *N. thorelii aggregate.* [Mey (2010)].

***Nepenthes kerrii* M.Catal. & Kruetr., Nepenthes Thailand.: 32 (fig. 1-5). 2010. Sec. Catalano (2010)**

Description: Terrestrial climber to 4 m tall. Stem terete, 3-5 mm in diameter, internodes 1.5-8.5 cm long. Leaves coriaceous, 0.5 mm thick, lamina obovate, 18-31 cm long, 1.5-3 cm wide, apex acuminate, base attenuate and sessile, clasping the stem by three quarters of its circumference; longitudinal veins 3 on each side of the midrib in distal quarter of the lamina, pinnate veins arising obliquely from midrib; tendrils terete, 10-30 cm long, 1-3 mm in diameter, coiling in upper pitchers. Lower pitchers 2-6 x 6-14 cm, ovate in the lower half and narrowing above or completely ovate, hip at the mid-section or in the upper half, barely visible; two alae, 3-8 mm wide, run down ventral exterior surface from mouth to tendril, fringed with narrow filaments; pitcher mouth oblique, oval; peristome cylindrical, 5-12 mm wide, teeth 0.5 mm long; lid round, 1.6-4.7 x 1.8-4.3 cm, as large as the mouth, with irregularly wavy margins, base slightly cordate, crateriform glands densely arranged and numerous, larger along the midrib, to 1 mm in diameter; spur 2-7 mm long, simple or branched; longitudinal veins 2-4 on each side of midrib. Upper pitchers 3 x 10-15 cm, tubulose; alae 1-4 mm wide, 4-6 mm distant; pitcher mouth oblique, orbicular or broadly ovate; peristome lobate, with a distinct column; lid as for lower pitchers. Male inflorescence a raceme, to 90 cm, peduncle 65 cm long, rachis 27 cm long with ca. 120 solitary flowers borne on pedicels 6-8 mm long, androphore to 1.5 mm; tepals round or elliptic, green or red, 2-3 x 3-4 mm. Female inflorescence as for male inflorescence, but rachis 20-25 cm long with solitary flowers borne on pedicels 1-2.3 cm long; tepals round or elliptic, green, 2-3 x 3-4 mm. Indumentum of brown hairs 0.1 mm long covering leaf axil and inflorescence. Colour: leaves light green; stem, midrib and tendril green to red; lower pitchers orange with red blotches, also present over the inner, non-glandular zone, peristome and lid orange to red; upper pitchers green to yellow, with red blotches over the inner, non-glandular zone, peristome yellow or red striped, lid green to yellow, often red on the underside. [Catalano (2010)].

Distribution: Southern Thailand, Tarutao Marine Park. [Catalano (2010)].

Habitat: In sandy soil, on open savannahs and grasslands, at 500 m. [Catalano (2010)].

Notes: *Nepenthes kerrii* is closely related to *N. andamana, N. bokorensis, N. suratensis* and *N. kongkandana*. It differs from *N. andamana* in having obovate leaves (vs. linear to lanceolate) and a persistent indumentum limited to leaf axils (vs. a caducous indumentum covering the upper part of plant). It differs from *N. bokorensis* in having a shorter androphore, obovate leaves (vs. linear to lanceolate) and an indumentum limited to leaf axils (vs. an indumentum of variable distribution). It differs from *N. suratensi*s in having obovate leaves (vs. linear to lanceolate) and a persistent indumentum limited to leaf axils (vs. a caducous indumentum covering the upper part of plant). It differs from *N. kongkandana* in having an indumentum of 0.1 mm limited to leaf axils (vs. an indumentum of 0.3 mm covering the whole plant), lower pitchers narrowly ovate (vs. lower pitchers tubular or slightly ventricose), with pitcher hip at the mid section or in the upper half (vs. a pitcher hip at the mid section or in the lower half) and with a tendril twice to three times longer than the pitcher (vs. a tendril as long as the pitcher), upper pitchers with a lobed, often striped peristome (vs. a peristome without lobes and stripes), with a distinct neck (vs. a peristome without a neck) and with a shorter distance between the frontal wings (4-6 mm vs. 10-12 mm). [Catalano (2010)].

***Nepenthes khasiana* Hook.f., in: de Candolle, A. L. P. P., Prodr. 17: 102. 1873. Sec. Jebb & Cheek (1997)**

= *Nepenthes rubra* Hort. ex Rafarin in Rev. Hort. [Paris] 1869: 270. 1869.

Description: Terrestrially scrambling and climbing branched stems up to 12 m long.

The lamina is linear, elliptic or narrowly oblong, up to 46 cm long and 10 cm wide. The apex of the leaf is acute or obtuse and the base is attenuate and sub-petiolate to petiolate. The petiole is winged, up to 13 cm long and 2.5 cm wide, and clasps the stem, often becoming strongly decurrent. The stem, midrib and tendril may be green, yellow, orange or red, especially in direct sunlight. The upper surface of the lamina is often dark green, whilst the lower surface is very pale.

A thin indumentum is found mainly on the midrib and veins on the underside of the lamina, the tendril, and the developing pitchers. Some hairs may also be found along the edges of the lamina. The hairs on seedling pitchers are long and uniseriate. Hairs on the inflorescence are up to 0.3 mm long and usually have basal branches. Simple to strongly branched hairs may be found on older parts of the plants. *Nepenthes khasiana* differs thus from the western outlying *Nepenthes* of Madagascar, the Seychelles, and Sri Lanka which usually only bear uniseriate hairs (Eric Schlosser, pers. comm.).

The lower pitchers are up to 12 cm tall and 4.5 cm wide. The bottom third to half of the trap is ovate and slightly swollen. The pitcher narrows above this part and becomes cylindrical towards the pitcher opening. Wings up to 1.2 cm wide run down the front of the pitcher and may be lined with narrow filaments up to 5 mm long, though such filaments are often lacking. The peristome is cylindrical, up to 5 mm wide, and of a constant width around the pitcher opening. The peristome is glossy, lined with fine ribs up to 0.5 mm high, spaced up to 0.5 mm apart, but the ribs themselves are often hardly discernible. A gap of a few millimetres is often present in the peristome at the rear of the pitcher opening, below the lid. The lid is elliptic or sub-orbicular, often with a cordate base, up to 4.5 cm long by 5 cm wide, and lacks an appendage. The spur is unbranched and up to 6 mm long.

The exterior of the lower pitchers is yellowish green or occasionally orangey pink, sometimes mottled with faint red or orange blotches. The interior of the pitcher is yellow, orange or pink and the peristome may be yellow, green, orange, pink or red. The lid is the same colour as the exterior of the pitcher, but often has a red underside. Some plants produce pitchers with a faint orange or reddish band a few millimetres wide on the outside of the pitcher, just below the peristome.

The upper pitchers are up to 21 cm tall and 5 cm wide. The bottom fifth to quarter of the pitcher is infundibular and variably swollen. The pitcher narrows above this part, often forming a faint hip, and becomes cylindrical towards the pitcher opening. The pitcher also often narrows slightly immediately below the peristome. Wings are reduced to narrow ridges that run down the flattened front face of the upper pitchers, and may be hardly discernible.

All other parts are similar to the lower pitchers, including colouration, although the complete underside of the lid is often suffused pure red. A reddish band a few millimetres wide, on the outside of the pitcher just below the peristome may be expressed, and often is lined with short hairs. [McPherson (2009)].

Distribution: India, Bengal: Jyntea and Khasia Mountains [Jebb & Cheek (1997)].

Habitat: Forest margins; 1000 m altitude. [Jebb & Cheek (1997)].

Habitat: Between 500 and 1500 m a.s.l. [McPherson (2009)].

Notes: The Wallich collection at Kew contains 8 sheets of No. 2244. Three of these consist of *N. gracilis,* of which 2 have mixtures of *N. albomarginata,* while 5 comprise *N. khasiana* from the Jyntea mountains. One of these latter has been annotated as the lectotype for the species.

This species is remarkable for its geographical remoteness from the remainder of the genus. [Jebb & Cheek (1997)].

Etymology: The specific epithet refers to the Khasi Hills region of Meghaloya State in Northern India, to which this species is endemic. [McPherson (2009)].

Conservation: Critically Endangered (CITES App. I) [McPherson (2009)].

***Nepenthes ×kinabaluensis* Sh.Kurata in J. Insectiv. Pl. Soc. 35(3): 65. 1984. Sec. Berendsohn (2017+)**

– *Nepenthes ×kinabaluensis* Sh.Kurata, Nepenthes of Mt Kinabalu, Sabah: 64, pl. 21. 1976, nom. nud.

– *Nepenthes ×kinabaluensis* Sh.Kurata ex J.H.Adam & Wilcock in Sarawak Mus. J. 50: 152. 1998, nom. illeg.

Description: Intermediate between *N. rajah* Hook.f. and *N. villosa* Hook.f.; whole plant covered by villose hairs; leaf peltate tipped; lid large, round; peristome broad wavy, with expanded teeth. [Cheek & Jebb (2001)].

Distribution: Borneo: Sabah (western slopes of Mt Kinabalu). [Cheek & Jebb (2001)].

Habitat: *Leptospermum/Dacrydium* forest on ultrabasic soils; 2420-3030 m (Phillipps & A.L. Lamb, Pitcher Plants of Borneo (1996) 95). [Cheek & Jebb (2001)].

Notes: Although long recognised as a hybrid, it has only recently been confirmed that this taxon comprises two large, self-sustaining and apparently true-breeding populations of several hundred individuals (A. Phillipps, pers. comm.). In contrast are the cases of *Nepenthes x hookeriana* and *Nepenthes x trichocarpa*, which although recorded from many sites where the parental species occur together, are found as isolated individuals and not as self-sustaining populations. In further support of species status for *Nepenthes x kinabaluensis*, J.H. Adam & Wilcock J. Trop. For. Sci. 10 4 (1992) 456-471 report that the pollen of the much rarer hybrid between *N. burbidgeae* and *N. rajah* produces largely sterile pollen whereas that of *Nepenthes x kinabaluensis* is almost 100% fertile and that plants of *N. rajah* are not to be found nearby. However, as there is no character that distinguishes this plant from its parents, we follow Kurata in Nepenthes of Borneo (1976) 64 in maintaining this taxon as a hybrid, rather than a species as advocated by J.H. Adam & Wilcock Sarawak Mus. J. (1998) 75-77. [Cheek & Jebb (2001)].

Notes: First described under *Nepenthes sp.* by Macfarlane (1914, p. 127). Cheek & Jebb (2001) cite this in their list of synonyms. [Berendsohn (2017+)].

Hybrid parent formula: *Nepenthes rajah* Hook.f. × *Nepenthes villosa* Hook.f. in Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 363. 1928 [Jebb & Cheek (1997)].

***Nepenthes kitanglad* Jebb & Cheek in Eur. J. Taxon. 69: 10, fig. 2. 2013. Sec. Cheek & Jebb (2013)**

Description: Epiphytic climber, probably 1 m tall or more. Short stems terete, 4–5 mm diam., internodes ca. 6 cm long, axillary buds not evident; surface glossy, appearing glabrous but with extremely sparse brown, simple hairs ca. 0.5 mm long, glabrescent. Climbing stems strongly 4-angular, 7–9 mm diam., internodes 11–12 cm long; indumentum as short stems. Leaves of short, and of climbing stems more or less identical, thickly papery; blade oblong-elliptic, 15.5–33 × 4.3–7 cm; apex acute, not peltate, tendril arising abruptly; base cuneate, decurrent to petiole; longitudinal nerves 3–4 pairs, conspicuous in the marginal half on the upper surface; pennate nerves arising at about 45° from the midrib, irregular, reticulate, branching in the marginal half; drying brown-black above, matt mid-brown below, appearing glabrous apart from margin but with indumentum as stem, densest on midrib but soon glabrescent; lower surface with sessile depressed-globose red-black glands ca. 0.05 mm diam.; margin densely fringed with soft fine orange-brown patent simple or bifurcate hairs 1 mm long. Petiole evenly winged along its length, 4–5 × 0.4–0.9 cm, wings patent; at base clasping the stem for ⅔ to ¾ of its circumference, decurrent diagonally as a narrow wing, in short stems 7 mm long, in climbing stems 18 mm long, and continuing as a ridge to the node below. Lower pitchers narrowly ovoid-cylindric, 12.5 cm tall, 5 cm broad, widest in the basal half, narrowing steadily to ca. 3 cm wide below the peristome; outer surface 10–25% covered in pale brown hairs of two types, (1) bushy brown hairs 0.1–0.25 mm long and wide, with 4–8 arms ascending from a short central axis, 7–12 per mm2, (2) long brown straight erect hairs 1.5–1.75 (–2.5) mm long, with 2–4 short branches ascending from along the length of the main axis, sparse; fringed wings, 2–4 mm wide, running 3–4 cm from peristome towards base of pitcher, then diminished to slender ridges, wings extended over the peristome by two foliose flaps 3–4 × 3–4 mm, fringed elements 4–5 mm long, 2.5 mm apart (1.5 mm apart on foliose flaps); mouth ovate-lanceolate, highly oblique, concave, ca. 4.1 × 2.8 cm; column developed, tapering towards lid ca. 9 mm long, 2.5 mm wide at midpoint; peristome subcylindric, 1 mm wide at front of pitcher to 3 mm wide at sides, ridges ca. 2.5 per mm, ridges 0.1 mm high, inner edge lacking conspicuous teeth or holes, outer edge not lobed. Lid narrowly ovate to rhombic 3.5 × 2.3 cm, apex rounded, base rounded to truncate, lower surface lacking a basal appendage, but with a low basal ridge 10 mm long, 0.5–1 mm high, extending from the junction with the peristome; nectar glands small and sparse, 6–8 on each side of the midline which mainly lacks glands, absent from basal ridge, nectar glands monomorphic, slightly perithecoid, orbicular or slightly elliptic, 0.25(–0.35) mm long, mixed with denser sessile depressed-globose, red-black glands, 0.05– 0.1 mm diam., 8 per mm2; marginal 2–3 mm of lower surface with minute stellate hairs densest near margin; upper surface with same indumentum as outer pitcher surface, but long hairs rarely seen. Spur not seen. Upper pitchers (tendril coiled) ovoid-cylindric, green, slightly maroon above, 21.5 × 6.5 cm, widest in the ovoid basal third, narrowing to ca. 5 cm wide in the cylindrical upper part; outer surface with same indumentum as lower pitcher; fringed wings reduced to ridges apart from two foliose flaps immediately below peristome, point of attachment 3–4 mm long, angular-elliptic, 9 × 6 mm, bearing fringes 2–7 mm long; mouth ovate-

lanceolate 7 × 4 cm, oblique, concave, the frontal part straight; column ca. 1.5 × 0.8 cm; peristome rounded-flattened, 1.75–5.5 mm wide, widest at sides, ca. 1.75 ridges per mm, ridges 0.1 mm high, inner edge lacking conspicuous teeth or holes, outer edge not lobed. Lid ovate-triangular, 5 × 3.8–4.2 cm, apex rounded, base truncate; lower surface with a weakly developed, convex basal appendage 1.5 mm high, arising from a low basal ridge 7 mm long; nectar glands ca. 16 on each side of the midline, sparsely scattered, more or less absent from midline, but present at appendage, nectar glands orbicular or slightly elliptic, slightly or strongly perithecoid, 0.25–0.5 × 0.25–0.45(–0.75) mm; sessile glands 0.05–0.1 mm diam., 8–20 per mm2; upper surface of lid with indumentum as outer surface of pitcher. Spur inserted 2 mm below junction of lid and pitcher, pointing downwards, terete, 17 × 0.9–1 mm, dilating to the 1.8 mm wide rhombic-acute apex, indumentum moderately dense of long patent simple hairs as on the pitcher outer surface. Male and female inflorescences unknown. [Cheek & Jebb (2013)].

Distribution: Philippines, Mindanao, Bukidnon Province, Mt Kitanglad [Cheek & Jebb (2013)].

Habitat: Epiphytic in mossy forest, geology volcanic, elevation 1800–2100 m. [Cheek & Jebb (2013)].

Etymology: Named, as a noun in apposition, for Mt Kitanglad, the type and only known locality of the species. [Cheek & Jebb (2013)].

Conservation: Assessed as Critically Endangered since it is known from only a single location, Mt Kitanglad, on an island which has seen extensive forest clearance for logging and agricultural expansion in recent years (McPherson 2009: 759). [Cheek & Jebb (2013)].

***Nepenthes klossii* Ridl. in Trans. Linn. Soc. London, Bot. 9(1): 140. 1916. Sec. Cheek & Jebb (2001)**

Description: Terrestrial shrub or climber (?) to unknown height. Stem triangular, c. 1 cm diam. with prominent axillary buds. Leaves coriaceous, petiolate, those of the climbing stems lanceolate to oblong-lanceolate, 18-25 by 6.5-9 cm, apex obtuse, base gradually or abruptly tapering; petiole winged, c. 6 cm long, wings 5 mm broad, clasping stem by about 1/2 its circumference, decurrent as two ridges to 1/2 way down the internode. Longitudinal nerves obscure, 3 or more on each side of the midrib, in the outer 1/3 or 1/4 of the leaf blade. Pennate nerves inconspicuous. Lower pitchers unknown. Upper pitchers abruptly originating from the tendril, infundibuliform in the lower part, cylindrical above, c. 20 by 5 cm, with two prominent ribs over the whole length, mouth suborbicular, oblique to vertical, facing forward, acuminate and nearly horizontal towards lid; peristome curved, 3-5 mm wide, ribs 0.3-0.7 mm apart, outer and inner edges entire; lid suborbicular, c. 5 by 5 cm, apex rounded, slightly cordate at the base, with 2 appendages on the under side, basal appendage laterally flattened, slightly recurved or triangular, c. 1 by 1 cm, glandular, inserted along a midline ridge 1-2 mm high that extends to the poorly defined, inconspicuous, non-glandular apical appendage, nectar glands orbicular, bordered, 0.4-0.7 mm diam., densely scattered, larger (2(-3) mm long) and longitudinally elliptic along the midline; spur entire, 8-10 mm long. Male inflorescences unknown. Infructescence c. 32 cm long; peduncle 18 cm long; partial peduncles 2-fruited (rarely 1- or 3-fruited); pedicels c. 8 mm long; tepals oblong, 3 by 1 mm. Fruit c. 15 mm long. Seeds unknown. Indumentum of orange-brown dense long, simple or slightly branched hairs to 1.5 mm long and of short spreading stellate hairs, densest on young parts, lower leaf blade, above and below midrib, pitcher and infructescence, including fruit. Colour of lid deep purple, remainder of pitcher probably reddish. [Cheek & Jebb (2001)].

Distribution: New Guinea: Irian Jaya (Nassau Mts and Wissel Lakes). [Cheek & Jebb (2001)].

Habitat: Unknown, possibly grassland; 1000-2000 m. [Cheek & Jebb (2001)].

Notes: The lid appendages, leaf venation and 2-flowered partial peduncles of *N. klossii* show that it is closely related to the highly variable *N. maxima*. Eyma's collection of this species from the Wissel Lakes area, indicate that *N. klossii* and *N. maxima* may well grow together (Eyma 4893 = *N. klossii*, Eyma 4894 = *N. maxima*). The distinction between the two species is slight, and lies in the denser pubescence, thicker leaf blade, and the forward-directed mouth of *N. klossii*, and, in the absence of the evidence of their sympatry we would be less inclined to recognise *N. klossii*.

Only three collections of this species have been made, the Kloss collections from the Nassau Mts, and Eyma's Wissel Lakes collection. Eyma's collection (4893) is undoubtedly a good match for Danser's specimen (Kloss s.n., BO) and shows features which are obscure on the Kloss specimen (due to the manner in which they have been pressed and mounted), notably the distinctive 'hooded' appearance of the pitcher mouth, and the presence of 2 crest-like appendages on the underside of the lid as opposed to the single crest observed by Danser. [Cheek & Jebb (2001)].

***Nepenthes kongkandana* M.Catal. & T.Kruetr. in AIPC Mag. 37: 10 (5-11, photogrs.). 2015. Sec. Catalano (2015)**

Description: Terrestrial climber to 2 m tall. Stem terete, 3-5 mm in diameter, internodes 1-8 cm long. Leaves coriaceous, lamina narrowly lanceolate to narrowly obovate, 10-30 cm long, 1.5-3 cm wide, apex acuminate or rarely acute, base attenuate and sessile, clasping the stem by three quarters of its circumference, decurrent for half to all of the internode's length; tendrils terete, 5-25 cm long and 1-2 mm in diameter in lower pitchers, 5-15 cm long

and 1-1.5 mm in diameter in upper pitchers, rarely coiling.
Lower pitchers 10-18 x 2-4 cm, narrowly ovate in the lower third or lower half and tubular above, slightly wider under the mouth, hip at the upper edge of the ovate part; two alae, 3-7 mm wide and 7-15 mm apart, run down ventral exterior surface from tendril to mouth, fringed with narrow filaments to 7 mm long; pitcher mouth oblique, ovate to triangular; peristome cylindrical or flattened, seldom lobed, 2-7 mm wide; lid orbicular to ovate or elliptic, horizontal to oblique, usually with wavy margins, smaller or larger than the mouth, 2-4.5 x 3-5.5 cm, base cordate for 1-3 mm, lower surface without appendages, crateriform glands densely arranged and numerous, larger at the base of midrib, to 1 mm; spur 1-6 mm long, simple; longitudinal veins 4 on each side of midrib.
Upper pitchers 10-20 x 1.5-2 cm, tubulose, slightly wider along the glandular zone and under the mouth, hip at the centre; alae 0-3 mm wide, mostly without filaments and 5-10 mm apart; pitcher mouth and peristome as for lower pitchers; lid as for lower pitchers but 2-3.5 x 2-3.5 cm.
Male inflorescence a raceme, to 120 cm, peduncle to 70 cm, rachis 15-50 cm, ca. 40-180 flowers borne on pedicels 3-6 mm long, androphore 1-2 mm long; tepals orbicular to broadly ovate, green when young, then red, 2-4 x 2-4 mm. Female inflorescence a raceme, to 100 cm, peduncle to 80 cm, rachis 13-20 cm, ca. 20-40 flowers borne on pedicels 2-10 mm long, tepals elliptic, green, 2-3 x 1-2 mm, ovary to 2 cm long.
Indumentum of silvery hairs, 0.3 mm long, covering leaves and stem, sometimes only present in the upper part of the plant (top 4-6 leaves).
Colour: leaves light to dark green; tendrils and stems green to red; lower pitchers green, orange or red and with dark red stripes outside, light green with or without purple blotches over the inner, non-glandular zone, peristome green, white or red; upper pitchers light green outside, light green or white and with or without purple blotches over the inner, non-glandular zone, peristome light green or white. [Catalano (2017)].

Distribution: Peninsular Thailand, provinces of Songkhla and Pattani. [Catalano (2015)].

Habitat: On mostly sandy soil, in savannas and scrubland, at sea level. [Catalano (2017)].

Notes: *Nepenthes kongkandana* belongs to the *N. thorelii* aggregate, a group spread in the strongly seasonal Indochina, with whose species it shares narrow decurrent leaves, a narrow rachis and an underground rootstock.
The differences between *N. kongkandana* and the aggregate species of continental Indochina are easy to spot. It differs from *N. smilesii* in the presence of narrowly obovate leaves with acuminate tips (vs. always linear to narrowly lanceolate and with acute tips) and in always having tubular upper pitchers (vs. often strongly obovate). These same differences exist with *N. kampotiana,* which also differs in being nearly always completely glabrous (vs. covered by a dense indumentum) and in having ovate to pyriform lower pitchers (vs. elongate, meaning narrowly ovate in the lower half and tubular above). It differs from *N. thorelii* in having tubular upper pitchers (vs. always obovate) and elongate lower pitchers (vs. ovate to sub-globose). It differs from *N. chang* and *N. holdenii* in having rachises with 1-flowered pedicels only (vs. male and/or female rachises with mostly 2-flowered partial peduncles) and elongate lower pitchers (vs. ovate to ellipsoidal). It differs from *N. bokorensis* in the presence of narrowly obovate leaves (vs. always linear to lanceolate), in having a longer leaf decurrency (1/2 to whole of the internode vs. 1/2 or less) and in lacking the typical large and vaulted lids of the Cambodian species.
N. kongkandana is more closely related to the other aggregate species of peninsular Thailand, and the differences with these can be subtle. It differs from *N. rosea* in having rachises with 1-flowered pedicels only (vs. male and female rachises with frequent or prevalent 2-flowered partial peduncles), a longer leaf decurrency (1/2 to whole of the internode vs. 1/2 or less), in the extension of the indumentum (0.3 mm hairs covering leaves and stem vs. 0.1 mm hairs over leaf margins and midrib only, many plants being entirely glabrous), in having more darkly colored lower pitchers (orange or red, with dark red stripes outside and purple blotches inside vs. orange or pink, with dark pink stripes outside and uniformly green or pink inside) and upper pitchers (with purple blotches inside vs. uniformly green, white or light pink), and in lacking the typical peduncle-borne rosettes. It differs from *N. suratensis* in the presence of narrowly obovate leaves (vs. always linear to narrowly lanceolate), in having elongate lower pitchers (vs. ovate or narrowly ovate), with a lower hip (centre to lower half vs. centre to absent) and without lid appendages (vs. lids with a small depression under the tip). It differs from *N. andamana* in the presence of narrowly obovate leaves (vs. always linear to narrowly lanceolate), in the extension of the indumentum (covering the whole leaf and stem surface vs. often only present along lamina and leaf base margins), in having more elongate lower pitchers (3.5-5.5 vs. 1.5-3.5 length/width ratio) and in the lid shape (horizontal to oblique, with wavy margins, smaller or larger than the mouth vs. horizontal to bent towards the mouth or vaulted, with straight margins, as large or larger than the mouth). It differs from *N. kerrii* in the presence of narrowly lanceolate leaves (vs. always narrowly obovate) and in the extension of the indumentum (covering the whole leaf and stem surface vs. only present on leaf axil). The shape variability of the pitchers of *N. kerrii* is poorly known, it seems they are morphologically close to those of *N. andamana* but more field studies are needed to support this observation. [Catalano (2017)].

Nepenthes krabiensis **Nuanlaong, Onsanit, Chusangr. & Suran in Thai Forest Bull., Bot. 44(2): 128 (-133, fig. 1-3). 2016. Sec. Nuanlaong, Onsanit & al. (2016)**

Description: Dioecious, glossy climbing herb, stems terete, 1.5–2.5 m long, 3.5–5 mm diam.; internodes 1.7–2.7 cm long; axillary buds present in the upper part of plant; green as the upper and brown as the lower. Indumentum of brown hairs, 0.1–0.2 mm long, present on leaf axils, tendrils, outer surface of pitchers, peduncles, rachis, sepals, androphore, and ovary; more inconspicuous on midrib (only 0.02–0.06 mm long); absent on lamina. Leaves glossy light-green in a rosette when young, green when mature; emerging from an orange-brown triangle lateral bud at the base of the midrib near the leaf attachment; coriaceous, lanceolate, apex acute, clasping the stem by three quarters of its circumference, decurrent for 1.4–2 cm of its length; pseudo-petiolate, alternate, dilating at the node, 2.2–4.2 × 12.4–19.3 cm, projecting along the stem as wings; longitudinal nerves 2–3 on each side of the midrib in outer third of lamina, inconspicuous pinnate nerves; midrib conspicuous; tendrils straight, terete, 2.0–2.5 mm diam., 10.5–15 cm long in lower pitchers and 1.5–2.5 mm diam., 8.0–11.5 cm long in upper pitchers, coiling. Lower pitchers green to orange with red stripes outside, red blotches over the inside, absent in glandular zone; green to orange or red peristome; lid green to red on the upper surface, green to yellow or orange on the lower surface, ca 3.5–5.2 × 12.1–19.5 cm; 50 to 60% ovate at the lower with digestive glandular at the inner surface, narrowing at the upper; conspicuous midsection hip with two fringed wings as 3–6 mm long, serrate to double serrate, along the length of the pitcher, 4.5–11 cm or run down ventral exterior surface from mouth to tendril, fringe elements 6–9 mm long; oblique ovate pitcher mouth rising toward the lid; peristome cylindrical or flattened, 1.0–1.6 cm wide, inner edge with teeth 0.5–1 mm, ridges 0.05 mm apart; broadly ovate lid, 3.6–5.3 × 3.7–6 cm, larger than mouth, sometime vaulted or bent towards the mouth, base cordate 2–4 mm, may or may not have appendage as a lower surface (14% vs. 86%, respectively); nectar glands numerous, elliptic, 0.25 mm diam. along the midrib, and with crateriform glands 0.13 mm diam. scattered over the lower surface of the lid; spur filiform, 3–8 mm long, with no branches. Upper pitchers light green, with red blotches over the inner surface, absent in glandular zone; peristome white, green to white or light green; lid light green; tendrils coiled; tubulose or narrowly to infundibular, 12–19 × 2–3 cm; hip comprising one third of the lower part; wings absent but with two conspicuous ribs from the mouth toward the tendrils; pitcher mouth ovate, less oblique than lower pitcher; peristome cylindrical to flattened, slightly raised at the front to form a triangular point, 0.5–1 cm wide, inner edge with teeth 0.5–1 mm, ridges 0.05 mm apart; lid broadly ovate, 3.6–5.3 × 3.7–6 cm, base cordate 2–4 mm, appendages absent; nectar glands similar to the lower pitcher; spur filiform, 1.5–5 mm long, no branches. Male inflorescences racemose, 58.6–62 cm long; petals green when young, red when old; peduncle 32–37 cm long, 2–4 mm diam., rachis 26.5–30 cm long; flowers 97–130, singly arranged, occasionally with 2-flowered partial peduncles, pedicels 0.9–1 cm long, bracts 3–4 mm long, present at the base or on the lower half of pedicel; flowers actinomorphic; tepals 4, ovate, 2.0–2.5 × 3.0–3.5 mm, cruciferous, valvate, densely covered with circular to elliptic nectarioles 0.01–0.02 mm diam.; androphore 4 mm long, anthers basifixed, anther head globular, 1.5–2.5 mm diam., anthers with 15–22 cells, dehiscence longitudinal; pollen in tetrads. Female inflorescences racemose, 47–63 cm long; green when young, green to yellow when old; peduncle 35.5–52 cm long, 2.5–4 mm diam., rachis 11.5–27.5 cm long; solitary flowers ca. 28–56 arise on pedicles, 0.7–1.2 cm long; bract absent; actinomorphic flower, tepals as males except: elliptic, 1.5–2 × 3.0–3.5 mm, nectarioles 0.01–0.03 mm diam.; stigma 2.0–2.5 mm diam.; ovary oblong, 4.5–6 mm long, superior with four syncarpous carpels; placentation axile. Infructescence similar to female inflorescence; sepals persistent; four valves, 1.4–2 cm long with septicidal capsule; seeds narrowly ovate, 3–5 mm long; 87–118 seeds per fruit. [Nuanlaong, Onsanit & al. (2016)].

Distribution: Southern Thailand, found only at Khao Pra-Bang Khram Wildlife Sanctuary, Krabi Province, Thailand [Nuanlaong, Onsanit & al. (2016)].

Habitat: On summit areas, in sandy or mool soil, often growing in limestone rock crevices, at 600–700 m above sea level. [Nuanlaong, Onsanit & al. (2016)].

Nepenthes kurata **Jebb & Cheek in Eur. J. Taxon. 69: 6. 2013. Sec. Cheek & Jebb (2014)**

= *Nepenthes alata* var. *ecristata* Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 72. 1908.

Description: Terrestrial shrub-climber, height unknown. Climbing stems terete to slightly angular, 4–6 mm diam.; internodes 30–50 mm long; axillary buds not evident; indumentum inconspicuous, persistent to the fifth internode from the apex, hairs translucent brown, simple or 2–3-armed from the base, hairs straight, variously angled from the horizontal, ca. 0.1 mm long, covering ca. 5% of the surface except the axils (100% coverage) surface brown-black, matt. Leaves of rosette shoots thinly coriaceous, blade narrowly elliptic, 8–9 × 2–2.5 cm; apex and base acute; longitudinal nerves 1–2 pairs, within 2 mm of the margin, moderately conspicuous on both surfaces; pennate nerves at 90° from the midrib, numerous and moderately conspicuous; upper surface drying glossy pale brown, lower surface matt, mid-brown. Leaves of climbing stems as the rosette leaves, but blades suboblong or oblong-lanceolate 10–12.5 × 3.2–3.8 cm; apex obtuse or acute; base obtuse; lower surface with sessile red glands ca. 0.5 mm diam.; midrib 40–60% covered in patent, brown, simple or basally bifurcate-trifurcate hairs 0.1–0.3(–0.5) mm long; margin fringed, in young leaves, with hairs 0.25 mm long, pale-brown, 1–4-armed from the base. Petiole winged-

canaliculate, 4–5 × 0.7 cm, wings patent; base clasping the stem for ⅓ to ½ its circumference, sometimes decurrent as an obtuse ridge to the node below. Lower pitchers unknown. Intermediate pitchers (tendrils uncoiled: Mearns & Hutchinson 4632) 12.5–17.2 cm long, ellipsoid in the basal third to half, 4–5.7 cm wide, constricted, more or less abruptly, 5–7.5 cm from the base into the subcylindrical upper part, 2.1–3 cm diam. dilating slightly towards the apex 3–4 cm diam.; outer surface strongly reticulated with raised nerves when dry, 2–5% covered in hairs of two types, (1) large erect hairs 0.3–0.75 mm long, with a single, major, curved arm, and 1–2 much smaller erect arms, and (2) minute, 3–6-armed stellate hairs 0.05–0.1 mm diam., which are more frequent, (ca. 4 per mm2); surface covered throughout (6–10 per mm2) with sessile, depressedglobose glands 0.1–0.2 mm diam.; fringed wings reduced to ridges except in the ca. 25 mm below the peristome, widening to 3 mm broad, with fringed elements 2.5 mm long, 2–5 mm apart; mouth oblique, suborbicular, ovate, 3–4.8 × 2.7–4.5 cm; apex with a column 9–10 mm long; peristome rounded to slightly flattened, 2–2.5 mm wide, more or less even in width, ribs 0.25–0.5 mm apart, conspicuous, about 0.1 mm high, outer edge lacking lobes, inner edge with very short teeth and conspicuous holes, teeth < 0.1 mm long. Lid much smaller than the mouth, ovate, or broadly ovate, 25–35 × 25–30 mm, apex rounded to obtuse, base rounded to truncate; lower surface with a low basal ridge ca. 1 mm high, 7–10 mm long, either lacking a protruding appendage entirely or with a modestly developed appendage 1–2 mm high; nectar glands only slightly dimorphic, (1) midline nectar glands sparse, longitudinally elliptic, 0.5–0.7 × 0.1–0.25 mm, with a thin marginal rim, (2) outside the midline nectar glands circular, sparse, < 1 per mm2, only 35–50 on each side of the midline, the largest scattered in the distal half, 0.5 mm diam., grading down to those of the marginal equatorial areas ca. 0.25 mm diam., and those at the attachment point with the peristome and the basal ridge and appendage, 0.15 mm diam.; sessile depressed-globose minute red glands 0.1–0.2 mm diam. are scattered over the surface at a density of 3–8 glands per mm2; minute inconspicuous stellate hairs ca. 0.075 mm diam. occur in an uneven, 0.5–1 mm wide band, near the margin widening to 1.5 mm wide at the lid apex. Spur unbranched, curving downwards, stout at base and tapering to a slender apex, ca. 5 mm long, with scattered long, subpatent hairs 0.3–0.7 mm long. Upper pitchers (tendril coiled, Gaerlan et al. in PPI 10914) resembling the intermediate pitchers, but fringed wings 1–2 mm wide, fringed elements 2.5 mm long, (2–)4–5 mm apart, dilating to 4.5 cm below the mouth; pitcher green, peristome maroon. Lid broadly ovate to suborbicular 32 × 35 mm, lower surface with a basal ridge 9–10 mm long, ca. 2 mm high, bearing a central, symmetrical, protruding appendage 2 × 3 mm; nectar glands denser, ca. 110 on each side of the midline. Male and female inflorescences and infructescences unknown. [Cheek & Jebb (2013)].

Distribution: Philippines, Mindanao [Cheek & Jebb (2013)].

Habitat: Evergreen forest, volcanic substrates. Elevation: ca. 1400 m. [Cheek & Jebb (2013)].

Notes: According to Gronemeyer et al 2016 in Plants 5(2), this should be treated as a synonym of *N. ramos*. [Berendsohn (2017+)].

Etymology: Named as a noun in apposition for Shigeo Kurata, whose book on the *Nepenthes* of Mount Kinabalu (Kurata 1976) inspired interest in the genus among its many readers, and whose descriptions of *Nepenthes* are models of detail, precision and clarity. [Cheek & Jebb (2013)].

Conservation: Assessed as Critically Endangered under Criterion D of IUCN (2012) since currently only two individuals, probably at a single location (as currently defined by IUCN) are known. [Cheek & Jebb (2013)].

***Nepenthes lamii* Jebb & Cheek in Blumea 42(1): 54. 1997. Sec. Robinson, Nerz & al. (2011)**

Description: [Description was emended after the exclusion of *N. monticola* from this taxon].
Stems upright to sub-scandent, often branching at the base, to ca. 45 cm tall, terete in cross section, up to 10 mm in diameter, internodes 0.3-0.8 cm long in juvenile rosettes, 0.7-2.5 cm long in mature shoots. The stem is invariably red, but may be dark, olive green suffused red in shadier conditions.
Leaves coriaceous, thick, broadly elliptic, to 5 cm long and 3 cm wide in juvenile rosettes, 18 cm long and 8 cm wide on mature shoots, lamina longitudinally folded to form a V-shape. Apex of lamina generally acute, base sessile, clasping the stem by ¾ its circumference, and decurrent for up to 1.5 cm, with broad, shortly attenuated wings. Longitudinal veins distinct, (2)3(-4) in outer 1/3 of lamina. Tendrils as long as or, more usually, longer than height of pitcher, 5-20 cm long, to 2.5 mm in diameter, never seen to coil, densely glandular, with glands up to 2 mm in diameter. The foliage is generally dark, olive green, the unfurling leaves often opening dark red, this colouration fading to green but often persisting on the adaxial surface, leaf margins and midrib.
Lower pitchers uncommon, being produced for a comparatively short period, entirely obovate and therefore narrowing slightly below the mouth, rarely with a slight hip ¾ of the way towards the pitcher opening, above the midsection, 3-8 cm tall and 1.5-4 cm wide. Wings reduced to ridges, very rarely up to 1 mm wide, fringe elements absent or very few towards pitcher opening. The pitcher opening is positioned at an oblique angle up to 45° from horizontal, slightly concave to straight in profile, almost perfectly orbicular, but occasionally to very broadly transversely elliptic, 1.2-3.4 cm across. The peristome is cylindric and may be slightly flattened towards the sides, 4-6 mm across, and of relatively uniform width, meeting the lid without forming a column. The peristome is striate, with ribs up to 0.2 mm high and 0.2 mm apart, with fine teeth on the inner margin to 0.1 mm long. The lid is

planiform or slightly longitudinally folded to give a shallow V-shape, orbicular with a rounded to very slightly retuse apex, up to 4 cm in diameter, lacking appendages, but with midrib forming a slightly thickened keel and numerous large, lipped glands 1-3 mm across. The spur is simple, filiform and up to 3 mm long. The pitcher exterior is generally dark red, with sparse, yellowish green speckling, if present at all. The pitcher interior is creamy white to pale green and sparsely to liberally speckled with red and purple. The peristome is usually dark red to blackish purple, less often yellowish green with red stripes.
Upper pitchers similar to lower pitchers, but narrowly infundibular towards the base and broadly obovate above, rarely with a slight hip just below the pitcher opening, generally ca. 12 cm tall and ca. 6 cm wide, but up to 20 cm tall and 9 cm wide. Wings reduced to prominent ridges. The pitcher opening is up to 5 cm across. The peristome is up to 12 mm across, and usually slightly wider just below the lid, with ribs up to 0.5 mm high and 0.3-0.6 mm apart, with teeth on the inner margin to 0.8 mm long, longest below the lid, and a variably sinuate outer margin. The lid is proportionally larger than in the lower pitchers, up to 6 cm in diameter. Pitcher colouration is similar to that of the lower pitchers, darkening with age.
Inflorescence a racemose panicle. Male inflorescence 8-25 cm long, to 5 mm in diameter, peduncle 6-8 cm long, rachis up to 18 cm long, with ca. 20-40 flowers borne on 1-flowered partial peduncles 1.5-5 mm long, lacking bracts. Tepals elliptic, with an acute apex, up to 3 mm long and 2.8 mm wide, androphore 0.5-1 mm long. Female inflorescence up to 18 cm long, peduncle up to 12 cm long, rachis 4.5-8 cm long, with ca. 10-25 densely arranged flowers borne on 1-flowered partial peduncles lacking bracts.
Indumentum of short, pale brown to golden hairs 0.2-0.4 mm long present on young foliage, particularly the tendrils, pitcher bud and inflorescences. Mature foliage is predominantly glabrous, though the indumentum may persist on the tendril and distal part of the midrib. [Robinson, Nerz & al. (2011)].

Distribution: Indonesia, New Guinea, Papua Province, West Papua, upper reaches of Doorman Top. [Robinson, Nerz & al. (2011)].

Habitat: Terrestrial; grows in rocky, largely inorganic and predominantly ultramafic substrates above the treeline at 3200-3250 m a.s.l. [Robinson, Nerz & al. (2011)].

Etymology: The species is named after Professor Herman Lam who made the first collections of this plant during the Van Overeem expedition to Mt. Doorman in 1920. [Jebb & Cheek (1997)].

***Nepenthes lavicola* Wistuba & Rischer in Carniv. Pl. Newslett. 25(4): 106 (-111, fig. 1-5). 1996. Sec. Cheek & Jebb (2001)**

Description: Terrestrial climber to 3 m tall. Stems of short shoots terete, 5 mm diam., internodes c. 5 mm long; climbing shoots terete with a groove beginning in each axil spreading to give a flattened side and so stem in part obscurely triangular, 4-7 mm diam., internodes 4-8 cm long, axillary buds inconspicuous. Leaves coriaceous, sessile or obscurely petiolate; short shoot leaves oblanceolate to oblanceolate-spathulate, 6.5-11.5 by 2-2.8 cm, apex acute to obtuse, base attenuate, clasping the stem for 1/2-2/3 its circumference and decurrent as wings for c. 3 mm; leaves of climbing stems narrowly oblong, rarely subpetiolate, 11-17 by 2-3.2 cm, apex obtuse, not peltate, base clasping the stem for 1/2-2/3 its circumference, decurrent and slightly amplexicaul as a straight wing c. 5 mm wide, 6-15 mm below the axil. Longitudinal nerves 4 or 5 (2 in the short-stem leaves) on each side of the midrib in the outer 1/2, inconspicuous. Pennate nerves oblique, inconspicuous. Lower pitchers broadly ovoid to globose, with a short subcylindrical apex, 4.5-6.5 by 3.5-4.2 cm, with two fringed wings 1.5-4 mm wide, fringed elements 3-5.5 mm long, 1.5-3 mm apart; mouth highly concave, horizontal at the front rising to the vertical, or overarching, at the rear; peristome subcylindrical, 3 mm wide, ribs 0.5 mm apart, 0.2 mm high, with intermediate striae, outer edge entire, inner edge with teeth c. 0.5 mm long, conspicuous only at the rear; lid orbicular, 2-2.2 by 2-2.1 cm, apex rounded, base cordate, lower surface lacking appendages, nectar glands 15-50 scattered along the midline, circular, narrowly bordered, 0.3-0.5 mm diam.; spur 3-5 mm long, tapering to a point, entire or forked within 1 mm of the apex. Upper pitchers narrowly infundibuliform or slightly ventricose in the lower half and cylindrical above (9-)12.5-15.5 by 3-3.4 cm, lacking fringed wings but with two ridges; mouth ovate, concave, oblique, rising from near horizontal to near vertical at the rear, peristome as in the lower pitcher, but slightly flattened and up to 8 mm wide in the rear half, c. 2 mm wide in the front; lid ovate, 3.2-3.8 by 2.4-2.9 cm, apex rounded, base cordate, lower surface lacking appendage or keel, nectar glands circular, narrowly bordered, c. 0.3 mm diam. in the centre, 0.2 mm diam. towards the margin, along the midline longitudinally elliptic, 0.4 mm long; spur tapered to a point, 5 by 0.75 mm, entire. Male inflorescence c. 38 by c. 3 cm; peduncle 18 cm long, 3 mm diam. at base; partial peduncles c. 60, 2-flowered (1-flowered towards the apex of the rhachis), 0-4 mm long; bract inserted near the base of the partial peduncle or on the rhachis adjoining, attenuate, 6-8 by 0.5 mm, apex acute; pedicels 5-8 mm long; tepals 4-5 by 2-2.5 mm; androphore (2-)3.5-4 mm long; anther head 1.5 by 1.75-2 mm. Infructescence 26.5 by 5.5 cm; peduncle erect, 19.5 cm long, c. 5 mm diam. at base; partial peduncles up to 40, 2-fruited; bracts 16-18 mm long. Fruits with valves 17-20 by 2-4 mm. Seeds filiform, 7 by 0.2 mm. Indumentum of sessile red glands c. 0.1 mm diam. on stems, upper and lower leaf surfaces and on pitchers; pale to mid-brown simple or sparsely branched hairs 0.2-0.3 mm long in patches

in the axils of the youngest leaves and in the stem grooves, hairs of this type also sparsely and inconspicuously scattered along the upper and lower leaf midrib, and scattered over the pitcher and upper lid including the spur where they are fine, greyer and arachnoid and mixed with minute white stellate hairs; inflorescence velvety with dull, pale brown patent hairs 0.1-0.3 mm long, present from peduncle base to lower tepals; androphore with scattered dull red-brown semi-patent hairs 0.3-0.5 mm long on the lower 2/3. Colour of pitchers dark brownish purple to almost black, rarely yellowish green with black spots, peristome yellowish green, sometimes with red stripes, mouth pale green in upper pitchers, spotted red in lower pitchers. Flower colour unknown. [Cheek & Jebb (2001)].

Distribution: Sumatra: C Aceh [Cheek & Jebb (2001)].

Habitat: Open slopes on old lava flow dating from 1856; 2000-2600 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes lavicola* seems most closely related to *N. spectabilis* in its elongated, slightly infundibuliform upper pitchers, in the ovate lid, in the similar nectar gland shape and distribution and in the stem and leaf morphology. However, *N. lavicola* has shorter upper pitchers with a mainly rounded, narrower (not flattened, broader) peristome which has more prominent ribs than in *N. spectabilis*, and in all these characters approaches *N. singalana*. *Nepenthes lavicola* is distinguished from *N. spectabilis* in being distinctly less hairy, in the short (3-5 mm rather than 10-22 mm long), pointed, sometimes bifurcate spur, in the shorter fruit valves (17-20 mm not c. 40 mm) and in the tendency to longer bracts (16-18 mm long in the female of *N. lavicola*).
Nepenthes lavicola together with *N. mikei* (the latter collected by Frey-Wyssling in the same area in 1930) are the most northerly, by about 120 km, of all Sumatran *Nepenthes*. *Nepenthes lavicola* is the only species of the genus recorded from lava. It is known to us only from the specimens cited, all gathered in a few adjoining hectares. Wistuba & Rischer suggest in their protologue (cited above) that it is likely to be found elsewhere on the G. Geuredong massif, e.g. also on G. Geuredong and G. Popandji. [Cheek & Jebb (2001)].

***Nepenthes leonardoi* S.McPherson, Bourke, Cervancia, Jaunzems & A.S.Rob. in Carniflora Australis 8(1): 5 (-19, fig. 1-11). 2011. Sec. McPherson, Bourke & al. (2011)**

Description: Terrestrial upright to scrambling or climbing unbranched shrub, to 4 m tall. Stem Cylindrical, 1.5-2.8 cm in diameter, internodes 1.5-18 cm long, compact in scrambling plants and elongated in climbing stems. Leaves: Coriaceous, petiolate or subpetiolate, lamina narrowly oblong, 15-50 cm long and 6-10 cm wide, apex usually acute or rounded, sometimes abruptly truncated, base shortly attenuate or obtuse, clasping the stem by two thirds its circumference to entirely. Tendril up to 130 cm long occasionally longer, particularly in lower pitchers, coiling in upper pitchers. Leaves of juvenile plants are commonly narrower to the base, developing a more oblong shape at submaturity. Tip of lamina occasionally meeting the tendril un equally on either side of midrib, one side up to 3 mm shorter than the other. Apex occasionally peltate, tendril emerging from the leaf up to 4 mm from the apex. Lower Pitchers: To 15 cm tall and 6 cm wide usually smaller, wholly ovate or urceolate, rarely globose. Wings up to 12 mm wide, with narrow filaments to 10 mm long. Pitcher opening oval or circular, up to 6 cm wide, elevated towards the lid and elongated into a prominent, narrow column. Peristome cylindrical, occasionally slightly flattened, to 2 cm wide, ribs to 2 mm high, spaced up to 2 mm apart, forming elongated teeth on the inner margin of the peristome up to 4 mm long. Inner surface glandular, usually only in lower two thirds of pitcher, or occasionally glandular throughout. Peristome expanding below the lid and up to 2.5 cm wide. Lid elliptic, up to 5.5 cm long and 3.5 cm wide. No appendage or keel. Spur up to 9 mm long and 3 mm wide at base, occasionally much smaller. Upper Pitchers: Wholly infundibular to infundibular in the lower quarter and cylindrical or rarely tubular above, up to 24 cm tall, 6 cm wide, typically much smaller. Wings absent, all other parts identical to the lower pitchers. Inflorescence: A panicle. Male inflorescence up to 50 cm long, although usually much smaller, particularly in exposed areas, 1 cm wide at base, rachis to 30 cm long. Female inflorescence up to 45 cm long, although usually much smaller, particularly in exposed areas, 1 cm wide at base. Vestigial leaf often present on inflorescence, below flowers. Inflorescence of both sexes up to c. 120 flowers, densely arranged, rachis comprising the distal quarter to half of scape, predominantly 1- flowered pedicels, but occasionally 2-flowered pedicels or a mix of both. Exposed plants exceptionally producing rigid inflorescences to 110cm long, with flowers present along distal 15% of inflorescence. Fruit to 8 mm long, seeds filiform, c. 7mm long, pale brown. *Nepenthes leonardoi* may flower both as a compact rosetted plant bearing only lower pitchers, or as a climbing vine. Male inflorescences have a distinctive, musty, sweet scent that is discernable up to 60 cm away. Scent of female inflorescence unknown. lndumentum: Consisting of simple, caduceus reddish-copper hairs to 2 mm long, usually shorter, sparsely present on all sides of the tendrils, and very sparsely along the margins of the lamina, underside of the midrib, and across the exterior surfaces of the pitchers. lndument of leaf margin and midrib are particularly conspicuous on developing (unfurling) leaves. Colour: All parts of the lamina and petiole may be pure green in shade, or reddish purple in direct sunlight. In a minority of plants, the lower surface of the leaf, and/or the stem may be pure red or reddish purple. Often the red stem colouration is discernable in young plants. The colouration of the lower and upper pitchers is very variable, and includes extremes not found in any documented *Nepenthes* of the Philippines. The exterior of the lower pitchers

are typically orangey red, usually lined with faint, dark purple blotches. The peristome is bright red, usually suffusing dark reddish purple as the foliage ages, and the lid is variably yellow or orange, often with variable red suffusion. The wings may be the same colour as the exterior of the pitcher, or may be yellowish-green. The upper pitchers are mostly pure yellowish green, except for the peristome, which may be orange or red and, in some strains, faint dark red blotches may be visible on the exterior of the pitcher. Both pitcher types may often be pure burgundy at one end of a continuous spectrum, to pure yellowish green at the other end. Strains with burgundy pitchers are observed much more commonly than in all other closely associated species. Uniquely, the upper pitchers of a minority of plants may appear practically black. Flash photography reveals this dark colouration results from highly concentrated purple pigmentation and the indumentum of brown hairs, which combine to make the pitchers appear intensely dark, especially when wet. [Heinrich, McPherson & al. (2009)].

Distribution: Philippines, Palawan Island, Schorn-carp Peak (Shumkat Peak, Shumkak Peak) [McPherson, Bourke & al. (2011)].

Habitat: Upper montane forest and upper montane scrub; 1300-1490 m a.s.l. [McPherson, Bourke & al. (2011)].

Etymology: The specific epithet leonardoi was chosen to honour Leonardo Co, a celebrated Filipino botanist who, along with members of his team, tragically was killed on November 15th, 2010 in the forests on Leyte Island. [McPherson, Bourke & al. (2011)].

Conservation: Assessed as CR (critically endangered) according to the World Conser- vation Union Red List Criteria B2a (IUCN 2001). [McPherson, Bourke & al. (2011)].

***Nepenthes leyte* Jebb & Cheek in Eur. J. Taxon. 69: 17, fig. 4. 2013. Sec. Cheek & Jebb (2013)**

Description: Terrestrial climber, height 2 m (probably), drying brown. Climbing stems subterete, 4–6 mm diam., with a slight ridge below the leaf bases; the axil with a shallow groove containing a spike-like bud 1–2 mm long, inserted 5–6 mm above the axil; internodes 3–7 cm long; surface with scattered redblack, depressed-globose, sessile raised glands 0.05–0.08 mm diam.; hairs absent, except in the axillary grooves which have white, moderately dense, basally branched hairs with arms erect, ca. 1 mm long. Rosette stems and leaves unknown. Leaves of climbing stems spirally inserted, thinly leathery; blade narrowly oblong-elliptic, 13.5–16 × 2.5–3.8 cm; apex acute, not peltate; base cuneate, abruptly decurrent to the petiole; longitudinal nerves 1 pair, moderately close to the margin, inconspicuous; pennate nerves numerous, conspicuously raised on both surfaces, more or less patent, irregular; both surfaces drying brown, subglossy above, matt below; midrib on both surfaces 5–10% covered with fine white-translucent simple or 3–5-armed stellate hairs, on the upper surface 0.2–0.3 mm diam., on the lower surface 0.1–0.2 mm diam., the leaf-blade otherwise glabrous, apart from sessile red-black glands as the stem, 0.05–0.1 mm diam., 2–6 per mm2. Petiole evenly winged along its length, the wings incurved (field notes); (2.5–)3–4.5 × 0.2–0.4 cm; clasping the stem for ½ its circumference, very shortly decurrent by 1–2 mm. Lower and intermediate pitchers unknown. Upper pitcher (tendril coiled) 12–15 × 4.5–5 cm; ovoid-ellipsoid in the lower half, upper half cylindrical, 3–3.5 cm diam., not constricted at any point; outer surface 10–30% covered in minute red stellate hairs, hairs ca. 0.1 mm diam., both sessile and shortly stalked, 4–6-armed, arms suberect or patent, density 3–5 per mm2, mixed with sessile red-black glands 0.05 mm diam. as the leaf-blade and stem, hairs denser on lid, and towards the peristome where they are mixed with sparse erect bushy-bristle hairs 0.2–0.3 mm long; “almost uniformly green with a few purple spots mainly on the ventricose base” (Argent et al. 99214); fringed wings are absent, reduced to inconspicuous ridges; mouth ovate, 4–4.5 × 3–3.5 cm, oblique, slightly concave, “glaucous green inside with just a few red spots”; peristome (1–)2–3(–5) mm wide, narrowly subcylindrical, rounded at the front, becoming slightly flattened and widest at the sides, towards the lid, ca. 4 ridges per mm, ridges 0.075–0.15 mm high, inner edge inconspicuous, holes and teeth not visible (unless dissected); outer edge not lobed; column weakly developed, ca. 7 × 3 mm. Lid ovate 3.2 × 2.9(–3.2) cm; apex shallowly retuse, the sinus 3–7 mm wide; base cordate, the sinus 4 mm deep, 8–15 mm wide; green; margin undulate; lower surface with convex basal appendage, 0.4–0.7 × 1–2 mm, arising from near the midpoint of the 5–6 × 0.5 mm long basal midline ridge; nectar glands slightly dimorphic, each with a different distribution: (type 1) moderately dense on the basal ridge and appendage and in a ca. 2 mm band each side (but not extending along midline), glands with raised borders, shortly elliptic, 0.1– 0.2(–0.3) mm long; (type 2) slightly larger, (0.1–)0.2–0.3 mm long, moderately dense, in bands 2–4 mm wide along the lid margins, 25–40 glands on each side, one sheet (atypical?) with a few additional large elliptic glands, 0.7 × 0.4 mm, bordered, very sparsely scattered between the margins; sessile red-black glands, as stem, leaf and outer pitcher surface, 0.005–0.01 mm diam., scattered over surface ca. 3 per mm2; marginal part of lower surface with a few minute stellate hairs. Spur inserted 2 mm below junction of lid and pitcher on ridge; simple, stout at base tapering to a long, acute apex; 7–9.5 × 0.5–0.7 mm; completely covered in long, grey appressed hairs, hairs (0.5–)0.7–1(–1.2) mm long. Upper surface of lid with two prominent nerves, nerves densely (80–90% cover) white hairy, hairs of two types: (1) basally 1–2-branched hairs 0.3–0.4 mm long, (2) minute 3–5-armed stellate hairs 0.1 mm diam.; remainder of lid surface with type (2) hairs, but indumentum 30–40% cover, and with sparse perithecoid nectar glands 0.25 mm long. Inflorescence and infructescence unknown. [Cheek & Jebb (2013)].

Distribution: Philippines, Visayas, Leyte. [Cheek & Jebb (2013)].

Habitat: Volcanic geology; "climbing on fallen tree in submontane mossy forest", elevation 900 m (Argent et al. 99214). [Cheek & Jebb (2013)].

Etymology: The specific epithet "leyte" is here used as a noun in apposition, to commemorate the island of that name, to which the species appears unique. [Cheek & Jebb (2013)].

Conservation: Assessed as Critically Endangered under Criterion D of IUCN (2012). [Cheek & Jebb (2013)].

***Nepenthes lingulata* Chi.C.Lee, Hernawati & Akhriadi in Blumea 51(3): 565 (-567; fig. 2). 2006. Sec. Lee, Hernawati & al. (2006)**

Description: Terrestrial or epiphytic climber to c. 5 m. Stems of rosettes and short shoots terete, to 0.4 cm diam., internodes 1 cm long. Climbing stems terete, to 4 mm diam., internodes 3.5 – 9 cm long. Leaves of rosettes coriaceous, sessile, lanceolate, apex acute, to 9.6 by 3 cm, clasping stem for 3/4 circumference, in live specimens the upper surface of lamina with a depressed longitudinal groove on either side of the midrib running the length of the leaf; longitudinal veins 2 on either side of the midrib; tendril straight, to 25 cm long. Leaves of climbing stems as those of rosettes but smaller, elliptical-ovate, 3.7– 4.8 by 1–2.1 cm; tendril to 14 cm long. Lower pitchers usually originating later ally from the tendril, to 28 by 4.5 cm, narrowly infundibular in basal half, constricting slightly to a cylindrical upper half, not distinctly hipped, mouth steeply oblique; inner surface glandular in the basal half, waxy portion extending from the constriction at the middle to the top of the pitcher; a pair of wings present on the front of the pitcher, to 2.5 mm wide, extending from the mouth to 2/3 or the entire length of the pitcher, with fringe elements to 1 cm long; mouth ovate, peristome flattened, to 3 cm wide, joined to the pitcher in the inner third; ribs c. 0.5 mm apart and less than 0.3 mm tall; inner margin ending in teeth c. 2 mm long; spur inserted 0.5 cm from base of lid, to 1.5 cm long, flattened and branched near the tip into up to 3 distinct points; lid broadly triangular, cordate at base, to 7.5 by 5.5 cm, undersurface completely devoid of nectar glands, with a single filiform appendage originating from the raised midrib c. 1 cm from the base of the lid, 2.2 – 4 cm long, curved about 90° towards the pitcher mouth, of which the apical 1 cm is covered with scattered raised nectar glands. Upper pitchers as the lower pitchers but smaller with the tendril originating from the rear of the pitcher, to 12.3 by 2 cm, with a distinct hip at the middle of the pitcher, wings reduced to ribs, fringe elements lacking; mouth ovate to rounded, peristome rounded to slightly flattened, to 0.4 cm wide, ribs c. 0.3 mm apart and less than 0.1 mm tall; lid to 2 by 2 cm. Male inflorescence a raceme, peduncle to 2.3 cm long, rachis 4 – 4.5 cm long, pedicels to 4 mm long, each bearing a single flower, bracts absent, sepals ovate c. 2 mm long, staminal column to 2.5 mm long. Female inflorescence a raceme, peduncle 5.5 cm long, rachis 3.5 cm long, pedicels c. 3 mm long, sepals ovate c. 5 mm long. Infructescence known from photograph only. Indumentum consisting of very dense long woolly grey-brown depressed hairs on the immature tendrils and outer surface of the pitcher, being caducous on the margins of the leaves; upper surface of lid and margins of lower surface of lid with scattered grey-brown stellate hairs. Colour of living specimens: leaves dark green above sometimes with purple edges and midrib, pale green below, stems of rosettes light green, climbing stems dark purple, inflorescence pale green, sepals light green to reddish purple, tendrils dark purple, outer surface of pitcher dark purplish black, peristome dark purple to black, interior of pitcher pale bluish green with purple spots. [Lee, Hernawati & al. (2006)].

Distribution: Indonesia, Sumatra (Sumatera Utara, Bukit Barisan) [Lee, Hernawati & al. (2006)].

Habitat: Upper montane mossy forest, growing both as an epiphyte and terrestrial. [Lee, Hernawati & al. (2006)].

Notes: This species appears most closely related to the recently described *N. izumiae,* but differs most obviously by the extremely long filiform lid appendage, as well as the triangular lid shape (vs orbicular in *N. izumiae*), the position of nectar glands, and the very dense long woolly indumentum.

Though numerous species of *Nepenthes* possess a glandular crest or small projection on the underside of the base of the pitcher lid, an apparently homologous structure throughout the genus, the extreme development of this appendage in *N. lingulata* is unique. In most species the presence of nectar glands on this organ indicates that it is a focal point for the attraction of insect prey, though usually nectar glands are also present elsewhere on the lid. In *N. lingulata,* the underside of the lid is completely devoid of nectar glands, the only such glands being found at the apical end of the appendage. Visiting insects are therefore enticed to the tip of this thin filament where they may find only a tenuous stance and perhaps lose their footing to fall into the pitcher fluid which is positioned directly below. A similar mechanism occurs in the Bornean

N. bicalcarata which has two thorns that provide a similar function, though these are a structure of the peristome rather than the lid. [Lee, Hernawati & al. (2006)].

Etymology: The specific name refers to the tongue-like shape of the lid appendage. [Lee, Hernawati & al. (2006)].

***Nepenthes longifolia* Nerz & Wistuba in Carniv. Pl. Newslett. 23(4): 105 (-106, fig. 3). 1994. Sec. Clarke (2001)**

– *Nepenthes rafflesiana* var. *longicirrhosa* Tamin & M. Hotta, in: Hotta, M., Divers. & Dynam. Pl. Life Sumatra: 93. 1986, nom. nud.

Description: Stems climbing, often up to 10 m; part with adult leaves cylindrical 5-6 mm thick. Leaves of the rosette and short shoots lanceolate, sometimes lanceolate-spatulate, up to 50 cm long, obtuse, gradually attenuate into a short at most 5 cm long petiole, laterally flattened sheath clasping the stem for about 2/3. Pennate nerves numerous, indistinct, reticulate. The longitudinal ones 3-4 each side, running parallel in the outer half of the leaf. Tendrils shorter or up to as long as the lamina, without curl. Pitchers of the rosette very shortly incurved from the hanging tendrils, ventricose in the lower part, cylindrical in the upper part, up to 12 cm high, up to 4-5 cm broad in the lower part, up to 2-3 cm broad in the upper part, with two fringed wings over nearly the whole length. The wings about 3-4 mm broad, the fringe- segments 5-6 mm long, 1-3 mm apart. Mouth oblique, elevated and acuminate towards the lid. Peristome flattened, 6 mm wide, distinctly raised and usually slightly crumpled in front up to 5 mm on the sides, the ribs 0,2 mm apart. The interior margin entire. Inner surface of the pitcher glandular in the ventricose part with 500 overarched glands/cm2 . Lid orbicular, 2-3 cm in diameter, the interior surface without appendages, with large round to ovate glands towards the midrib, glandless towards the margin. Spur non-branched, up to 1 cm long. Leaves of the climbing stems lanceolate up to 30 cm long, 4-5 cm broad, ending in a distinct 6-7 cm long petiole, decurrent in two narrow wings, 1-2 mm wide, over almost the whole length of the internode. Pennate nerves numerous, indistinct, reticulate. The longitudinal ones 3-4, on each side, running parallel in the outer half of the leaf. Tendrils shorter or up to as long as the lamina, often with curl. Pitchers of the climbing stem gradually originating from the hanging end of the tendril, incurved with a curve up to 4 cm wide, narrowly infundibuliform in the lower half, tubulose in the upper half, 18-25 cm high, 2,5-3,5 cm wide with two prominent ribs over the whole length. Mouth oblique, elevated and acuminate towards the lid. Peristome flattened up to 6 mm wide, distinctly raised and crumpled in front with 3 prominent folds, up to 5 mm on the sides, the ribs 0,2 mm apart. The interior margin entire. Inner surface of the pitcher glandular in the infundibulate part with 500 overarched glands/cm2. Lid orbicular, 2-3 cm in diameter, the interior surface without appendages, with large, round to orbicular glands towards the midrib, glandless towards the margin. Spur non-branched, up to 1 cm long. Male flower a raceme. Peduncle 15-20 cm long, about 3 mm thick at the base, 1 mm thick at the top, the axis 10-12 cm long, pedicels all of them two-flowered, without bract, up to 1-1,2 cm long. Tepals narrow elliptical 4-5 mm long. Staminal column 5 mm long, the anthers included. Female inflorescence unknown. Indumentum sparse, with stellate hairs. Margin of the leaves densely covered with red hairs. Colour ofherbarium specimen: leaves greenish brown, pitchers brown. Colour of living specimen: Leaves green, underside sometimes reddish, leaves of the rosette often with a red midrib. Lower pitchers brownish red, peristome usually green to reddish-green, innerside of the pitcher pale green, lid red. Pitcher of the climbing stem light green. [Nerz & Wistuba ("1994" [1995])].

Distribution: Sumatra - Sumatra Utara and Sumatra Barat [Clarke (2001)].

Habitat: Light submontane forest; 1000 m a.s.l. [Nerz & Wistuba ("1994" [1995])].

Notes: Jebb & Cheek (1997) and Cheek & Jebb (2001) treated *N. longifolia* Nerz & Wistuba as a synonym of *N. sumatrana*, but Clarke (2001) points to a number of differences that in his opinion justify to maintain them as separate species. [Clarke (2001)].

***Nepenthes lowii* Hook.f. in Trans. Linn. Soc. London 22: 420, t. 71. 1859. Sec. Cheek & Jebb (2001)**

Description: Terrestrial or epiphytic climber to 10 m tall. Stems terete or slightly ridged, 6-10 mm diam., internodes of climbing stems 3-7 cm long, axillary buds absent. Leaves coriaceous, petiolate; leaves of rosettes obovate, c. 7 by 4 cm, apex truncate to retuse, base cuneate; petiole to 2-3 cm long; leaves of short and climbing stems with blade narrowly oblong-lanceolate, 15-30 by 6-9 cm, apex rounded, base obtuse; petiole stout, canaliculate, 4-14 cm long, not auriculate, but slightly sheathed at the base, clasping the stem for 1/2-4/5 its circumference and sometimes with narrow, straight, decurrent ridges up to 10 mm long. Longitudinal nerves 2-4 on each side of the midrib in the outer 1/3, conspicuous. Pennate nerves inconspicuous. Lower pitchers rarely collected, subcylindrical, up to 13 by 4 cm, with two fringed wings in the upper 3/4, each 4-5 mm wide, fringed elements 3-5 mm long, 1-2 mm apart; mouth broadly ovate, oblique, concave, rising to the vertical near the lid to form a short column; peristome ± cylindrical, 2-3 mm wide, with well-defined ribs 1-1.5 mm apart, outer edge entire, inner edge long, flat, to 10 mm wide, with teeth 1-2 mm long; lid orbicular to ovate, c. 3.5 by 3.5 cm, lacking appendages, but with numerous patent, hair-like growths up to 10 mm long, nectar glands pit-like, c. 0.1 mm diam., situated at truncated ends of hair-like growths and on lid surface, often surrounded by dome-like, thick border c. 0.4 mm diam. Upper pitchers subwoody, 15-20(-28) cm high, the lower part globose or obliquely ovoid, 5-10 cm wide, held horizontally, with one side lowest, upper part curved upwards, then highly constricted before abruptly flaring out in the upper, infundibuliform part to about 6-12 cm wide at the mouth, wings reduced to ribs; mouth broadly ovate, oblique, straight; peristome reduced, detectable only as a line of corrugations 2 mm apart inside the rim; lid ovate-elliptic, 9-14 by 5.5-9 cm, apex rounded, base cordate, strongly keeled and vaulted and held erect, at c. 120° to the mouth, lower surface without appendages, but with numerous hair-like structures on the lower surface (see lower pitchers); spur unbranched, 14 mm long. Male inflorescence 15-37 cm long; peduncle 7-17 cm long, 0.3 cm diam. at base; partial peduncles 2-flowered, 0.5-4 mm long; bracts absent; pedicels 12-15 mm long; tepals elliptic, 4 by 3 mm; androphore 2-4 mm

long; anther head 0.7-1.5 by 1.7-2 mm. Fruit valves 17-27 by 3-4 mm. Seed fusiform, 12-14 mm long, central part smooth. Indumentum: pubescent with short brown stellate hairs, rarely persisting on mature parts apart from lower midrib and edge of leaf blade. Colour of pitcher dark green outside, dark red inside; inflorescence dark red. [Cheek & Jebb (2001)].

Distribution: Borneo: Sabah (Mts Kinabalu, Trus Madi), Sarawak (Hose Mts, G. Buli, Tama Abu range, Bario, Mt Murud, Mt Mulu), Brunei, and Kalimantan. [Cheek & Jebb (2001)].

Habitat: Mossy forest, ridge tops on sandstone, granite, ultramafic or limestone; 1600-2600 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes lowii* is distinguished from the similar *N. ephippiata* by its relatively smaller lid, with longer, slender bristles (6-7 by 0.5 mm tapering to a point) vs. the short, stout processes (3 by 2 mm tapering to a blunt 1 mm diam. apex) of the latter, and by its distinctive pitchers with their highly constricted waist, and the much reduced peristome which is still evident in the upper pitchers of *N. ephippiata*.
Nepenthes lowii is a singular species in the semi-woody, upper pitchers which have the lower part laterally reclined, lack a proper peristome and are extremely constricted at their midpoint. The lower pitchers are somewhat cylindrical and bear a well-developed peristome. The upper pitcher is green outside and a deep maroon red inside. The lid is relatively small, reflexed and has many long tapering bristles c. 6 mm in length. These bristles generate a white gelatinous exudate, although the composition and purpose is unknown (Phillipps, A. & A.L. Lamb Pitcher Plants of Borneo (1996) 98). Wistuba (1994) has suggested that the unusual pitcher shape may be an adaptation to prevent rainwater from diluting or leaching the pitcher contents below the narrow 'waist'. Some collectors have remarked on the ability of these pitchers to trap leaf litter 'a vegetarian pitcher plant' (Ed de Vogel, pers. comm.). The tree shrew *Tupaia montana* has often been referred to by collectors as 'licking' the underside of the lids (presumably ingesting the white exudate), or 'hunting for snails' on the underside of the lids (Smythies in Symposium on Ecological Research in Humid Tropics Vegetation (1965) 170-178). Clarke in Nepenthes of Borneo (1997) 96 speculates that *N. lowii* may benefit from trapping tree shrew excrement as well as fallen leaves, and found animal excrement accounting for a large part of the pitcher detritus at five of the seven sites from which he studied pitchers of this species. Perhaps ingestion of the lid exudate prompts defecation in *Tupaia*! The species can be locally common in undisturbed areas but suffers greatly from curious humans (Phillipps & Lamb l.c. 1996). [Cheek & Jebb (2001)].

***Nepenthes macfarlanei* Hemsl. in Proc. Linn. Soc. 117: 12. 1905. Sec. Cheek & Jebb (2001)**

Description: Terrestrial, sometimes epiphytic, climber to 3 m tall. Stems obtusely angular, 3.5-6.5 mm diam. Leaves coriaceous, sessile, blade oblong or narrowly elliptic-oblanceolate, apex rounded to acute, base cuneate, clasping the stem for 1/2-3/4 its circumference, auriculate, auricles 2-4 mm wide, shortly decurrent for 3-4 mm at an angle of 45°; basal rosette leaves not seen; leaves of short stems subspathulate, ± 15.5-35 by 1.8-4 cm; leaves of climbing stems shorter and more oblong, 4-10.5(-11.9) by 1.5-2.3(-2.7) cm. Longitudinal nerves 3 or 4 on each side of the midrib in the marginal 2/3 of the blade, obscure except in lower leaves. Pennate nerves numerous, at 50-90° from the midrib, overlapping the longitudinal nerves. Lower pitchers ovoid or broadly cylindrical and slightly ventricose, 13-15 by 6-8 cm, with two fringed wings 3-4 mm broad, fringed elements 5-7 mm long, 3-5 mm apart; mouth ovate, acute near lid, oblique, at ± 45° to the pitcher axis, concave; peristome flattened, 5-10 mm wide, ribs conspicuous, 0.5 mm apart, interspersed with 10 striae, outer edge not sinuate, inner edge with teeth 0.7-1.25 mm long; lid suborbicular, usually oblate, 5.5-5.7 by 5.7-7 cm, apex rounded, base ± deeply cordate, lower surface appendages absent, nectar glands numerous, round to elliptic, crater-like, 0.5-0.7 mm diam., each with a low, thin pale margin; spur flattened, 8-20 mm long, apex entire or divided into 2 or 3 lobes each c. 2 mm long. Upper pitchers as the lower but slightly infundibulate and abruptly contracted immediately below the peristome, rarely infundibulate in the lower half and constricted, then cylindrical in the upper, 9-14(-18) cm high, 1.8-2 cm wide at the base, 4-4.7 cm wide below the peristome, with two ribs < 1 mm wide; mouth horizontal at front, abruptly vertical at lid end; peristome flattened, 1-10 mm wide, ribs 0.3-0.6 mm apart, c. 0.5 mm high, outer edge entire, inner edge with teeth 1 mm long; lid broadly ovate, often broader than long, 2.4-5.5 by 2.7-5.5 cm, apex rounded, base cordate, lower surface with nectar glands crater-like, orbicular, (0.3-)0.4-0.6(-1.25) mm wide; spur ± 4 mm long. Male inflorescence 14-26 cm long; peduncle 8-13 cm long; partial peduncles 30-40, 2-flowered, 2-5 mm long; bracts 1.5-3 mm long; pedicels ± 6 mm long; tepals oblong, ± 4 by 2.5 mm; androphore 2-3 mm long; anther head 1-1.5 mm wide. Fruit valves 14.5-20 mm long. Seeds fusiform, ± 12 mm long, tuberculate at centre. Indumentum of stem and leaves lacking, except midrib and young stem with dense, stout, erect, white or red hairs, 0.2-0.3 mm long, sparsely branched; pitchers with appressed simple white or coppery hairs 1 mm long, or glabrous; inflorescence axis with appressed simple copper-coloured hairs. Colour of lower leaf brown when dry; pitchers pale green, often the upper half white or cream, mottled with red, sometimes the whole purplish red with darker blotches; inner surface waxy white with red blotches; lowers pale green, red or waxy brown [Cheek & Jebb (2001)].

Distribution: Peninsular Malaysia (Perak, Selangor, Kelantan, Terengganu, Pahang, Malaka). [Cheek & Jebb (2001)].

Habitat: Mountain ridges, usually in shady sites on mossy banks; 1000-2150 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes macfarlanei* is immediately recognisable by the presence of bristles on the underside of the lid, seen in no other species of Peninsular Malaysia. The upper pitchers are unusual in the way they are abruptly contracted at the mouth. Other features are that the peristome is flattened, and developed into a short column at the apex, the inner part of which is markedly toothed. The lower pitchers may be on tendrils up to 90 cm long.
Danser in Bull. Jard. Bot. Buitenzorg III, 9 (1928) 323 has already pointed out that some collections appear intermediate between *N. macfarlanei* and *N. gracillima* or *N. sanguinea* (see *N. gracillima* for notes). [Cheek & Jebb (2001)].

***Nepenthes macrophylla* (Marabini) Jebb & Cheek in Blumea 42(1): 58. 1997. Sec. Cheek & Jebb (2001)**

= *Nepenthes edwardsiana* subsp. *macrophylla* Marabini in Mitt. Bot. Staatssamml. Münch. 23: 427. 1987.

Description: As for *N. edwardsiana*, but leaf blade larger, to 35(-60) by 12(-20) cm. Upper pitchers semi-woody, shortly cylindrical, slightly constricted at the midpoint, 22-28 cm long, 6.5-8.5 cm wide at base and apex, 6-7 cm wide at midpoint; peristome ribs shallower, 1(-3) mm high, 5-8 mm apart; lid larger, 9-12 by 9-10.5 cm. Inflorescence 38-78 cm long; peduncle 15-23 cm long, 0.4 cm diam. at the base; partial peduncles 1-flowered, pedicels ± 250, 15-16 mm long; bracts 1-2 mm long, 1-5 mm from main axis; tepals elliptic, 5-6 by 3 mm; androphore 3-4 mm long; anther head 1.5-2 by 2-2.5 mm. Colour of pitcher suffused dull red, peristome glossy dark red, inner pitcher surface pale green, lid red above, green below, inflorescence dull reddish brown and green. [Cheek & Jebb (2001)].

Distribution: Borneo: Sabah (Mt Trus Madi); type collection only. [Cheek & Jebb (2001)].

Habitat: Moss forest, ridge-tops, probably on sandstone; 2200-2400 m. [Cheek & Jebb (2001)].

Notes: The leaves of *N. edwardsiana* reach a maximum size of about 20 by 6 cm, whilst the smaller blades of *N. macrophylla* start at 35 by 12 cm. It is also distinct from *N. edwardsiana*, by its shorter, more ventricose pitcher, which is narrowed in its upper 1/3, and by its relatively larger lid. [Cheek & Jebb (2001)].

***Nepenthes macrovulgaris* J.R. Turnbull & A.T. Middleton in Bot. J. Linn. Soc. 96: 352, f. 1 & 2. 1988. Sec. Cheek & Jebb (2001)**

– *Nepenthes macrovulgaris* Lowrie in Carniv. Pl. Newslett. 12(4): 88. 1983, nom. nud.

Description: Terrestrial climber to 6 m tall, but often sprawling on ground. Stems terete, 5-7(-9) mm diam.; short shoots with internodes 0.5-1 cm long, climbing shoots with internodes 3-5.5 cm long. Leaves chartaceous, subpetiolate; leaves of short stems with blade oblanceolate, 12-21 by 3-5 cm wide, apex acute to obtuse, base gradually attenuate into a poorly defined, winged leafstalk c. 1 cm wide, amplexicaul, clasping the stem for 3/4 its circumference, shortly decurrent, rarely sheathing; leaves of climbing stems with blade narrowly elliptic-oblong, 13-33.5 by 2.5-5 cm, apex acute, base cuneate, the lowermost 1/5-1/6, resembling a winged petiole 2-3.5 cm long, usually narrowed to 1-1.5 cm wide and encircling 1/2-1/3 the stem circumference, not sheathing or de-current. Longitudinal nerves 3 or 4 on each side of the midrib in the outer 1/2 or 1/3, conspicuous above and below. Pennate nerves numerous, arising at 45-60° from the midrib, becoming patent, not reaching the marginal vein. Lower pitchers ovoid and tapering into a shortly cylindrical upper part, or the whole ovoid or ellipsoid, 9-18 (-23) cm long, 3.8-7(-9) cm wide at the base, tapering to 2.5-4(-5) cm wide below the peristome, with two fringed wings 2.5-5(-8) mm broad, the fringed elements 3-6(-15) mm long; mouth ovate, apex long-acuminate, oblique, slightly convex; peristome cylindrical to slightly flattened, 1.5-7(-15) mm wide with pronounced ribs 0.3-0.5 mm apart, 0.1-0.2 mm high, outer edge often slightly sinuate in the largest pitchers, inner lacking teeth; column short and broad, the peristome forming two ridges; lid broadly to narrowly ovate or elliptic, 2.5-4.5(-5.5) by 1.7-4.5(-5) cm, apex rounded, base shallowly cordate, lower surface without appendages, nectar glands with several large circular or elliptic crater-like glands 0.3-0.7 mm long along the midrib and numerous smaller, circular ones 0.2-0.1 mm diam. scattered over the blade, smallest towards the margin, absent at the edge; spur dorsiventrally flattened, 4-7(-12) by 0.7-1 mm, divided by 1/3 its length into 2 (or 3) branches, rarely entire. Upper pitchers as the lower, but much more infrequent, less inflated, with reduced wings and generally smaller, ovoid at the base, cylindrical at the apex, 12-16 cm tall, c. 4 cm wide, the upper, cylindrical part 2.5-3 cm wide, wings 1-2 mm wide, usually fringed, fringed elements 2-5 mm long; peristome 1.5-5 mm wide, ribs 0.25 mm apart; outer edge entire, not sinuate; lid 1.5-4.5 by 1-3.8 cm. Male inflorescence 26-39(-51) by 3-4 cm; peduncle 8.5-16.5 cm long, 0.2-0.5 cm diam. at the base; partial peduncles 2-flowered, 48-84, 2-3(-5) mm long; bract 1.3-3(-8) mm long, conspicuous, inserted anywhere between base and apex; pedicels 8-1.1(-1.3) mm long; tepals elliptic, 4-5 by 2-3.5 mm, apex rounded; androphore 3-4(-5) mm long; anther head 1.5-2 by 1.5(-2) mm. Fruits with valves 20-25 by 3.5-4 mm. Seeds filiform, dimensions unrecorded. Indumentum absent from stems; lower leaf blade, outer pitcher, upper and lower lid and peduncle with sessile red glands, outer pitcher also very sparsely scattered with patent simple hairs c. 0.5 mm long; rhachis of inflorescence to the lower surface of the tepals moderately densely tomentose with appressed brown hairs c. 0.5 mm long. Colour of lower pitchers green or pinkish green, often splashed with red; peristome green with deep pink

stripes; inner surface of pitcher with a waxy bluish pink bloom with darker purple blotches; upper pitchers always green; tepals brown or yellowish green. [Cheek & Jebb (2001)].

Distribution: Borneo: Sabah. [Cheek & Jebb (2001)].

Habitat: Shrubberies, landslides or cliffs on ultramafic soils, often with *Casuarina*; 300-1200 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes* sp. Sh.Kurata, Nepenthes of Mt Kinabalu, Sabah: 76, f. 27. 1976 was cited in the synonym list for this species by Cheek and Jebb (2001). [Berendsohn (2017+)].

Notes: Most similar to *N. philippinensis*, *N. macrovulgaris* is also closely related to *N. hirsuta* and *N. hispida*, the four comprising the *N. hirsuta* group. It can be distinguished from the second two species by its toothless peristome margin, and its total lack of hairs on stems and leaves. The lower pitchers, often inflated, have a constriction immediately below the peristome, not unlike that of *N. macfarlanei*. *Nepenthes macrovulgaris* is confined to ultramafic soils.
Specimens of this species collected over the last two decades have often been incorrectly labelled *'N. hybrida'*. [Cheek & Jebb (2001)].

***Nepenthes madagascariensis* Poir., Encycl. 4(2): 459 (-460). 1798. Sec. Jebb & Cheek (1997)**

= *Nepenthes madagascariensis* var. *cylindrica* Dubard in Bull. Mus. Hist. Nat. 12: 63. 1906.

= *Nepenthes madagascariensis* var. *macrocarpa* Scott Elliott, Ann. Bot. (Oxford) 5: 376. 1891.

Description: Terrestrially growing upright on a stem up to 1.5 m tall, or scrambling, or climbing vines up to 9 m long.
The lamina is linear or elliptic, up to 28 cm long (rarely up to 40 cm) and 8 cm wide. 4-7 veins run parallel to the leaf margin. The apex of the leaf plate is acute or obtuse and the base is attenuate and petiolate. The petiole is winged up to 5 cm long (rarely up to 12 cm), and 1.5 cm wide. It clasps the stem, or is semi-amplexicaul, or slightly decurrent for one or two centimetres along the stem. The lamina is green, and the stem and midrib are light green or yellow. Lower pitchers are borne on green or reddish tendrils up to 38 cm long and 3 mm thick.
The apex of the leaf is acute or obtuse and the base is attenuate and petiolate. The petiole is winged, up to 12 cm long, clasps the stem and may be slightly decurrent. The lamina is green, and the stem, midrib and tendril are light green or yellow. The stems may be covered with a very fine indumentum of short hairs.
The stem and surface of the lamina are glabrous, the underside of the lamina, tendrils and immature upper pitchers are lined with light brown, unbranched, uniseriate (multicellular) hairs. This is especially obvious along the veins (also along the lateral veins of the lid). In older pitchers the upper side of the lid and the bottom two thirds of the pitcher are usually still covered with short (0.09 mm long) hairs that point upwards (towards the lid). All pitchers have a narrow zone just below the peristome with branched, arrested hairs 0.1-0.2 mm long. Similar hairs may be found along the periphery of the (otherwise glabrous) underside of the lid and have probably the function to seal the developing closed pitcher. Very dense red-brown indumentum is found on the younger parts of the inflorescence (pedicels, tepals, ovary), but the androphore of the male flower is completely glabrous.
The lower pitchers are up to 14 cm tall and 5.5 cm wide. The bottom half of the trap is ovate and variably swollen. The pitcher narrows above this part, often forming a faint hip, and becomes cylindrical towards the pitcher opening. Wings up to 1 cm wide, fringed with filaments up to 5 mm long, run down the front of the pitcher. The wings are often incurved towards one another. The peristome is up to 6 mm wide and is lined with fine ribs up to 0.4 mm high, spaced up to 0.5 mm apart. A distinct gap of a few millimetres is usually present in the peristome below the lid. The peristome is of a consistent width around the margin of the pitcher opening, except for at the very back; here, on both sides of the gap, the peristome is expanded, forming two short triangular points up to 8 mm long. The lid is orbicular, elliptic or ovate, up to 5.5 cm long by 5 cm wide, and lacks appendages. The underside of the lid is scattered with a number of large, circular nectar glands up to 3 mm in diameter. These glands secrete nectar profusely. The spur is up to 6 mm long and is unbranched.
The exterior of the lower pitcher is entirely reddish pink or reddish purple. The interior of pitcher is light pink to almost white, and the peristome may be yellow, green, orange or red. Both sides of the lid are the same colour as the pitcher exterior.
The upper pitchers are wholly, narrowly infundibular, up to 18 cm tall (rarely up to 25 cm) and 7 cm wide. The bottom half of the pitcher is typically exceptionally narrow. The wings are reduced to narrow ridges, but may be hardly discernible at all. The peristome is up to 9 mm wide and lined with fine ribs up to 0.6 mm high, spaced up to 0.5 mm apart. As in the lower pitchers a distinct gap of several millimetres is usually present in the peristome, below the lid. The strongly developed peristome is of a consistent width around the margin of the pitcher opening, but expands on both sides of the gap to form two abruptly terminated triangular points up to 1.5 cm long. The lid is orbicular, elliptic or ovate, up to 7 cm long and 6 cm wide, and lacks appendages. The underside of the lid is lined with 100-200 (maximum 300) circular, nectar glands. Those near the centre are open and very large (up to 1.5 mm in diameter), and secrete nectar profusely. The gland size and density decreases towards the side of the lid, but

around the outermost periphery, there are many small glands. The density of digestive glands on the interior of the pitcher is 240-400 cm2. The spur is up to 6 mm long and may be forked (Schmid-Hollinger, 1977) or unbranched (Stewart McPherson, pers. observ.).
The upper pitchers are usually entirely bright yellow, but in some plants the lower surface of the lid may be bright red and the peristome flushed orange or red. The tendril of the upper pitchers usually coils to gain purchase on surrounding objects, and has the same yellow or green colouration as the pitchers. [McPherson (2009)].

Distribution: Madagascar, east coast as far north as Masoala peninsula, commonest in south around Fort Dauphin. [Jebb & Cheek (1997)].

Habitat: Along the edges of swamps and in peaty /sandy soils; low altitudes. [Jebb & Cheek (1997)].

Notes: There are two species of *Nepenthes* in Madagascar. The second species, *N. masoalensis,* occurs immediately beyond the northernmost Iocality of the present species. *Nepenthes madagascariensis* is characterised by its wholly infundibuliform upper pitchers (vs. ventricose-tubular in *N. masoalensis*). Other differences are cited under *N. masoalensis*. [Jebb & Cheek (1997)].

***Nepenthes malimumuensis* Lagunday, Acma, Cabana, Sabas & V.B.Amoroso in Philippine J. Sci. 146(2): 160 (-161, fig. 1-2). 2017. Sec. Lagunday, Acma & al. (2017)**

Description: A terrestrial climbing vine. Stems up to 3 m long, glabrous, terete to triangular in transection, 1 to 1.5 cm in diameter; internodes are up to 5.8 cm in length. Leaves have winged petioles that are up to 8 cm long and 3 cm wide. They are broadly spathulate to ovate, rounded leaf apex and attenuate base. They are up to 54.5 cm long and 11.2 cm wide and with four or occasionally five nerves running on either side of the midrib.
Lower pitchers are wholly cylindrical or slightly swollen in the bottom and slightly funnel-shaped towards the opening. They are up to 38 cm long and 11 cm wide in the upper half. Wings with sinuate margin run down in front of the trap up to 2/3 of the pitcher anterior and continue basally as a ridge, fringed with filaments up to 1.2 cm long. The pitcher opening is ovate acuminating towards the lid. The peristome has teeth-like projections that are short and triangular with proximally sunken nectar glands in the semilunar depressions between the ribs with canals emptying into the inner pitcher wall. They are slightly flattened, tapering posteriorly forming a distinct vertically oriented neck, 4.4 to 5.5 cm wide, up to 2 mm space between ribs. Lids are ovate, up to 12 cm long and 10 cm wide. The lid appendage is reduced to a keel. The lid nectar glands are round to ovate large and smaller glands evenly distributed. The lid spur is filiform, pubescent and occasionally branched, 1.7 to 2 cm long and up to 1 mm in diameter. Tendrils are non-coiling, up to 40 cm long and 5 mm in diameter. The exterior of lower pitchers is olive drab green with blotches of garnet red or suffused with ruby red with a yellow green bottom depending on sunlight exposure. The interior of the pitcher is olive drab green with blotches of garnet red or entirely suffused with mahogany red.
Upper pitchers are funnel-shaped in the bottom third and tapers posteriorly towards the tendril becoming cylindrical above then slightly funnel-shaped towards the ovate opening, up to 37 cm long and 10.5 cm wide near the peristome; wings are reduced to ridges. The peristome morphology is consistent with the lower pitchers. The lid spur is filiform and unbranched, 1 to 2 cm long and up to 1 mm in diameter. The tendrils are coiling to non-coiling, up to 58 cm long and 5 mm in diameter. The nectar gland distribution, coloration and indumentum are consistent with the lower pitchers.
The male inflorescence observed in the type locality during the sampling was juvenile and was neither collected nor described in this paper.
The female inflorescence is a panicle composed of a 39 cm long scape up to 1 cm in diameter and an additional of up to 65 cm rachis. The partial peduncles are two- flowered and 12 mm long. The pedicels are up to 3.5 cm long and 1 mm in diameter bearing tetramerous narrow ovate petals that are up to 6 mm long and 2 mm wide with huge round to elongated nectar glands in the upper surface. The capsule bearing the seeds is 3 cm long and 5 mm wide. The seeds have filiform extensions and are up to 1.4 cm long and 1 mm wide.
The pitchers are composed of the digestive zone in the bottom and a waxy zone towards the opening.
The indumentum is a multicellular trichome with short pseudo-branches arising from the basal cell, glandular to non-glandular present in the tendril, pitcher exterior and inflorescence. [Lagunday, Acma & al. (2017)].

Habitat: Strictly terrestrial in a narrow altitude range at 1,000-1,020 m a.s.l. along the ultramafic ridge trails of Mt. Malimumu, in mixed dipterocarp forest mostly covered with gravel and rocks. [Lagunday, Acma & al. (2017)].

Etymology: The specific epithet denotes that N. malimumuensis was discovered from Mt. Malimumu. [Lagunday, Acma & al. (2017)].

Conservation: Classified as Critically Endangered [CR B1ab (i)]; extent of occurrence estimated to be less than 10 km². [Lagunday, Acma & al. (2017)].

Nepenthes manobo **Lagunday, Acma, Cabana, Sabas & V.B.Amoroso in Philippine J. Sci. 146(2): 161 (-164, fig. 3-4). 2017. Sec. Lagunday, Acma & al. (2017)**

Description: A terrestrial, climbing vine. Stems up to 5 m long, glabrous, terete to triangular in transection, up to 6 mm in diameter; internodes are up to 2.5 cm in length. Leaves are sessile, broadly linear, acute leaf apex with 3 nerves on either side of the midrib. They are up to 21 cm long and 3.6 cm wide.

Lower pitchers are up to 17 cm long, 3.5 to 6 cm wide in the lower half. The bottom half is bulbous or ovate forming a hip becoming cylindrical or slightly funnel-shaped towards the opening. Wings run down the entire front of the trap, fringed with filaments up to 4 mm long. The pitcher opening is oblique tapering posteriorly towards the lid. The peristome is ribbed, slightly flattened, tapering posteriorly forming a distinct vertically oriented neck, they are up to 1 cm wide and up to ca. 0.8 mm space between ribs. The peristome inner margin has teeth-like projections that are short and triangular with nectar glands that are proximally sunken in the semilunar depressions between the ribs with canals emptying into the inner pitcher walls.

The lid is ovate, with large and small round nectar glands evenly distributed in the lower lid surface. The lid is up to 5.6 cm long and 4.8 cm wide with an appendage reduced to a keel. The lid spur is filiform tapering towards the apex and occasionally branched up to 1.2 cm long and up to 1 mm in diameter. The tendrils are non-coiling, up to 25 cm long and 4 mm in diameter.

The exterior of the pitcher is entirely light coral red or khaki yellow and may have peach puff four brown blotches; bottom is khaki yellow with goldenrod brown blotches, becoming chocolate brown with sangria and brick red blotches as it matures.

Upper pitcher bottom half is slightly inflated tapering towards the tendril becoming cylindrical in the middle forming a hip becoming slightly funnel-shaped towards the ovate opening, up to 19.1 cm long and 5 cm wide in the lower half. The wings are reduced to ridges. The pitcher opening is oblique tapering towards the lid forming a distinct vertically oriented neck. The peristome is ribbed, cylindrical in transection, up to 1 cm wide and up to ca. 0.8 mm space between the ribs. The lid is orbicular to ovate, 2.4 to 5.8 cm long and 2.7 to 5 cm wide; appendage is reduced to a keel. The lid spur is filiform and unbranched, 4 to 5 mm long and up to 1 mm in diameter. The tendrils are coiling to non-coiling, up to 31 cm long and 3 mm in diameter. The nectar gland distribution, coloration and indumentum are consistent with the lower pitchers.

Male inflorescence is a panicle composed of a 4.5 cm long and 5 mm wide scape and an additional 23.5 cm rachis. The partial peduncles are two-flowered up to 4 mm long. The pedicels bearing the florets are up to 1.6 cm long. The petal is tetramerous, ovate, with huge round to elongated nectar glands in the upper surface, up to 5 mm long, and up to 3 mm wide. The pollen is round and trilete. The female inflorescence has not been observed during sampling.

The indumentum is a multicellular trichome, glandular to non-glandular which is present in the flower and sparse in the tendril, pitcher exterior and in the scape. [Lagunday, Acma & al. (2017)].

Habitat: Strictly terrestrial in a narrow altitude range at 1,000-1,020 m a.s.l. along the ultramafic ridge trails of Mt. Malimumu, in mixed dipterocarp forest mostly covered with gravel and rocks. [Lagunday, Acma & al. (2017)].

Etymology: The specific epithet was chosen to acknowledge the indigenous tribe of the manobo. *N. manobo* occurs in the ancestral territory of the manobo communities in the Pantaron range. [Lagunday, Acma & al. (2017)].

Conservation: Classified as Critically Endangered [CR B1ab (i)]; extent of occurrence estimated to be less than 10 km². [Lagunday, Acma & al. (2017)].

Nepenthes mantalingajanensis **Nerz & Wistuba in Taublatt 59(3): 17 (-25; photos). 2007. Sec. Nerz & Wistuba (2007)**

Description: Compact rosette or short, rigid, upright stem 30 or less - 60 cm tall.

The lamina is broadly lanceolate, up to 20 cm long and 6 cm wide. The apex of the leaf is acute or obtuse, rarely sub-peltate, the tendril emerging from the leaf up to 4 mm from the apex, and the base is attenuate, sub-petiolate to petiolate, and amplexicaul. Where present, the petiole is broad, up to 7 cm long, and canaliculate. The lamina is green and the stem and midrib are yellowish or light green. The tendril may be green, yellow, orange or red, is up to 30 cm, and may be slightly flattened in the upper surface towards the leaf. The leaves, tendrils and pitchers are predominantly glabrous, although brown, velveteen hairs may cover the spur (Alastair Robinson, pers. observ.).

The lower pitchers are up to 15 cm tall and 6.5 cm wide and are generally ovate or amphora shaped. Occasionally, particularly when buried in litter, the lower pitchers may be globose, or tub shaped, and up to 12 cm wide. The width of the pitcher often narrows very slightly, just below the peristome. Wings up to 8 mm wide, fringed with filaments up to 5 mm long run down the front of the pitcher, but these may be partly expressed or reduced entirely to narrow ridges. The peristome is loosely cylindrical and broad, up to 2 cm wide, and is expanded towards the sides and back of the pitcher opening. The peristome is lined with ribs up to 2 mm high, spaced up to 3 mm apart. The ribs are elongated on the inner edge of the peristome and form very narrow, incurved, needle-like teeth up to 5 mm long. The peristome is raised into a broad column at the rear of the pitcher opening, immediately below the lid. Here, the prominent teeth are arranged in two parallel rows that often diverge at the base of the lid to form a V-

shaped gap, reminiscent of *N. diatas* and *N. villosa*. The outer margin of the peristome is recurved and the inner margin extends into the pitcher opening for several millimetres, particularly below the lid. The lid is cordate with a rounded or pointed apex, up to 5 cm long by 4 cm wide, and lacks an appendage. The spur is narrow, branching occasionally, and up to 8 mm long.
The exterior of the lower pitchers is usually yellowish green or orange, but may be flushed red or brown, sometimes mottled with faint, red flecks. The interior of the pitcher is yellow or orange, often mottled with dark red, purple or brown blotches. The peristome may be yellow, orange, red or dark reddish-purple, often striped with bands of orange and red. The lid is usually pure yellow or orange, but is sometimes marked on both sides with red blotches and flecks. Occasionally, all parts of the pitcher may be pure yellow.
During my three days of observations of this species on Mount Mantalingahan, a study that took in hundreds of plants in three distinct habitat types, I was unable to observe a single *N. mantalingajanensis* with a climbing stem or upper pitchers. The original collection at Kew, specimen G. C. G. Argent & E. M. Romero 92114, also lacks upper pitchers, and it seems likely that upper pitchers are produced very rarely, or hardly at all; consequently it is not possible to present a description of them here. I observed that the pitchers of large, mature plants often tended to be narrower towards the base than those of juvenile plants, but in all of the *N. mantalingajanensis* plants observed, the tendril was attached to the front of the pitcher and matched the description of the lower pitchers presented above. It is likely that climbing stems and upper pitchers are produced, as suggested in the type description, but only very occasionally and probably by plants growing amidst tall vegetation or in dense shade, as observed in the related *N. deniana* and *N. mira*. This tendency to produce only lower pitchers suits the growing habit of this species, since the majority of *N. mantalingajanensis* plants grow amidst the short, scrubby, windswept vegetation of the summit ridge amongst rocks.
As the type description is based on cultivated material, field observations of the inflorescences are presented here for the sake of completeness (Alastair Robinson, pers. observ.). The inflorescence is a raceme, to 35 cm long by 3 cm at the widest point. The peduncle is up to 25 cm long and 5-8 mm in diameter at the base, the rachis to 16 cm long but considerably shorter in the female. Flowers are borne singly on pedicels up to 14 mm long, occasionally with a 1mm bract towards the base. Tepals are orbicular to ovate in the male, ovate-elliptic in the female, to 4 mm long, and the anther head is borne on a column up to 3 mm long. Fruits are up to 18 mm long and seed up to 6 mm long. The male flowers open yellow, maturing to dark red, thus the scape may be colour graduated from dark red below to yellow at the apex. A faint, sweet fragrance may be produced by the male inflorescence. [McPherson (2009)].

Distribution: Philippines, Palawan, Mount Mantalingajan [McPherson (2009)].

Habitat: Stunted upper montane forest and scrub, common on open slopes, usually in direct sunlight; 1700 - 2085 m. [McPherson (2009)].

Etymology: The specific epithet refers to Palawan's highest pead, Mount Mantalingahan (also spelt Mantalingajan), the type locality of the species. [McPherson (2009)].

***Nepenthes mapuluensis* J.H.Adam & Wilcock in Blumea 35(1): 265. 1990. Sec. Cheek & Jebb (2001)**

Description: Terrestrial shrub to at least 20 cm tall, possibly climbing. Stem terete, strongly flexuose, 5 mm diam., internodes of climbing stems 2.5-4 cm long, axillary buds hemispherical, 1 by 1 mm, inserted about 1 mm above the axil. Leaves coriaceous, subsessile, lanceolate-obovate 13-26 by 2-5.5 cm, apex acute to rounded, peltate, base attenuate, parallel sided and somewhat dilated and amplexicaul at the very base, clasping the stem for c. 1/2 its circumference. Longitudinal nerves 4 or 5 on each side of the midrib, in outer 2/3-3/4 of blade, arising from base, or some from lower part of midrib. Pennate nerves arising obliquely, curving towards margin. Lower pitchers ellipsoid throughout, and narrowest at mouth, or somewhat tubular in upper 1/2; 12-22 by 3.5-8 cm, fringed wings 2-8 mm broad, with fringe elements c. 3 mm long, 2-4 mm apart; mouth oblique, elliptic, straight; peristome rounded at front, somewhat broadened near rear, 3-22 mm wide, ribs 0.6-0.7 mm apart, 0.3 mm high, outer edge undulate, inner with teeth to 1.5 mm long; lid ovate to narrowly ovate, 4.5-9.2 by 3-5 cm, apex rounded, base abruptly attenuate to scarcely cordate, lower surface lacking appendages, with a prominent central ridge 1-2 mm high, nectar glands dense near base and along midline, obscurely rimmed, pit-like, longitudinally elliptic, 0.3 mm long, remaining surface glandless apart from a few orbicular glands 0.1-0.2 mm diam. near the midline; spur flattened, c. 10 by 1 mm, apex rounded. Upper pitchers ellipsoid in lower 1/2, constricted above and widening to mouth; to 19 by 5 cm; mouth ovate; peristome 4 mm wide, rounded at front, expanded near lid to 12 mm wide, ribs 0.3-0.5 mm apart, outer edge sinuate, inner with teeth to 2 mm long; wings fringed as in lower pitcher, but near mouth only. (Upper pitchers of Kostermans 14017, BO specimen ellipsoid below, tubular in upper 1/2; to 12 by 2 cm; peristome 1-2 mm wide, rounded, not expanded; wings absent). Male inflorescence 15-20 by c. 2.5 cm; peduncle 7.5 cm long, 1.5-2 mm diam. at base; partial peduncles 1-flowered; bracts absent; pedicels 6-7 mm long; tepals elliptic, c. 3 by 2.25 mm; androphore 2.25 mm long; anther head 1 by 1.25 mm. Indumentum densely puberulent of simple, patent hairs 0.1-0.2 mm long, present on stems and upper leaf surfaces (hairs brownish white) and on inflorescence (hairs red) from base of peduncle to lower surface of tepals; androphore glabrous; lower surface of leaves with sessile red glands c.

0.1 mm diam. Colour: leaves drying a characteristic grey-green above, and reddish brown below. Live pitchers pale green to white with black-purple specks to dark purple with greenish purple spots; peristome brown; wings brown. [Cheek & Jebb (2001)].

Distribution: Borneo: E Kalimantan (Sambaliung Range). [Cheek & Jebb (2001)].

Habitat: Limestone; 700-800 m. [Cheek & Jebb (2001)].

Notes: This species has a striking similarity to *N. northiana:* the reclined ellipsoid lower pitchers with a large oblique mouth, the expanded peristome with an undulate outer edge, the large vaulted narrowly ovate lid and the peltate leaf tips. However, these similarities may be purely superficial. *Nepenthes mapuluenis* differs particularly in the slender, terete, strongly flexuose, puberulent stems, smaller, puberulent leaves, auriculate, non-decurrent leaf base, pitcher lid with keeled midline bearing numerous longitudinally elliptic nectar glands, nectar glands otherwise absent, diminutive inflorescence with 1-flowered partial peduncles and pedicels comparatively truncated. The upper pitchers of *N. mapuluensis* are so incompletely known that a full comparison with those of *N. northiana* cannot be made at this stage. Like *N. northiana*, *N. mapuluensis* is only known from limestone. One collection comes from the type locality of *N. campanulata*.

The majority of the isotype material at Bogor exhibits very different upper pitchers from the remaining material, but the leaves match the remaining specimens, and we may presume that the species either shows an extreme dimorphy in shape of the upper pitchers, or that that material is a mixed collection with an unknown species.

In the protologue, J.H. Adam & Wilcock only cited the holotype and so apparently based their description on this alone. Two other collections at Leiden and Bogor (Kostermans 13821 and Geesink 9314) allow us to make the more complete description of *N. mapuluensis* above. The description in the protologue does not entirely match the specimen that it is based on, for example, the specimen concerned does not have angular or glabrous stems, nor do the other specimens of this species that we have examined. We have modified the description above accordingly. [Cheek & Jebb (2001)].

***Nepenthes maryae* Jebb & Cheek in Blumea 61: 60, fig. 1. 2016. Sec. Cheek & Jebb (2016)**

Description: Terrestrial climber to c. 2 m tall. Rosette and short stems unknown.Climbing stems terete, internodes (3.5–)4.5–5.5 cm long, (2.5–)4–5 mm diam, drying black, c. 50 % covered in persistent patent pale brown hairs 0.5–0.6 mm long, hairs simple, multicellular, mixed with sessile depressed globose glands drying black, 0.06 mm diam. Leaf blades of climbing stems coriaceous, sessile, lanceolate-oblong, (12.5–)14–17(–21.5) by 2.7–3.2 cm, apex acute, subpeltate, base perfoliate-adnate, decurrent by (0.9–)1.5–1.8 cm. Longitudinal nerves 2 pairs, in the marginal half, visible on both surfaces. Pennate nerves inconspicuous, irregular, patent to midrib, 5–8 mm apart. Indumentum of upper surface as the stem, but sometimes with a minute, inconspicuous branch 0.05 mm long, cover 5 %, hairs 0.3 mm long, midrib with 30–50 % cover, hairs 0.5 mm long; lower surface 50 % cover, hairs 0.3–0.5 mm long, denser on midrib. Tendrils (10 –)15 –17(– 20) cm long, densely patent hairy, indumentum as stem. Upper pitchers (tendrils coiled) cylindrical 11–15 by (1.7–)2–3 cm, green, slightly suffused with purplish red, wings running full length of pitchers, 3–5 mm wide, fringed only in upper 1/2–1/5, fringe elements 2–4 mm apart, 1–1.5 mm long, outer surface 2–50 % covered in a mixture of indumentum as stem, densest at pitcher base. Mouth rhombic, obtuse; straight, not concave, inner surface waxy white-grey; peristome 0.5–0.9 mm diam, ridges blade-like, in overall length to 1.8–2.5 mm diam, c. 1 mm high, 1–1.5 mm apart, column absent; lid elevated 45° above the horizontal, 90° above the mouth, ovate-elliptic 2.5–3.5 by 1.5–2 cm, lower surface without appendages, densely covered in orbicular and elliptic, thinly bordered nectar glands 0.2–0.25 mm diam, midline ridge at base with narrow elliptic nectar glands 0.6 by 0.06 mm, mixed with depressed globose glands 0.03 mm diam (drying black); hairs 2–7 per mm2, patent, copper-coloured, simple or inconspicuously branched (0.2–)0.3–0.6(–0.8) mm long; spur dorsiventrally flattened, oblong-acute, slightly recurved, 4–5 by 1.5 mm, flanked by 1–2 cylindrical appendages of same length. Male inflorescence c. 15 by 2.5 cm, peduncle c. 6 cm long, 2 mm diam at base, 50 % covered in mainly appressed copper-coloured hairs 0.2 mm long; rachis c. 9 cm long, with c. 80–84 partial peduncles, partial peduncles 1-flowered, 4–7.5 mm long, 0.5 mm wide; bracts present on pedicels of proximal c. 60 flowers, each 0.8–1 mm long, acute, inserted 0–2.5 mm from base of partial-peduncle; flower colour unknown; tepals 4, oblanceolate-obovate, 3.5–4 by 1.5–1.9 mm, apex rounded, outer surface 5 % covered in minute copper-coloured simple appressed hairs 0.05 mm long, densest on margins; adaxial surface with nectar glands occupying c. 50 % of surface, glands elliptic, c. 0.25 by 0.15 mm, cohering or up to 0.1 mm apart, thinly bordered, deeply sunken; androphore terete, 5 mm long, 0.3 mm wide, glabrous; anther head 1–1.5 by 1.5–1.75 mm, anthers 4, in a single whorl, head of androphore conspicuous, glabrous. Female inflorescence, infructescence and seed unknown. [Cheek & Jebb (2016)].

Distribution: Indonesia, Central Sulawesi [Cheek & Jebb (2016)].

Notes: Belongs to *Nepenthes* sect. *Tentaculatae* Cheek & Jebb [Cheek & Jebb (2016)].

***Nepenthes masoalensis* Schmid-Holl. in Bot. Jahrb. Syst. 97(4): 567. 1977. Sec. Jebb & Cheek (1997)**

Description: Scrambling or climbing stems up to 5 m long.

The lamina is linear, slightly lanceolate or elliptic, up to 30 cm long and 6 cm wide. 3-5 nerves run parallel to the leaf margin. The apex of the leaf is acute, the base is attenuate, sub-petiolate, 1 cm wide, clasps the stem and may become slightly decurrent (with narrow wings running one or two centimetres down the stem). The lower pitchers are borne on tendrils up to 70 cm long which allows them to dangle from climbing plants and rest upon ground, where insect prey is most abundant. Tendrils are up to 25 cm long where support for the upper pitchers is required, and they may coil up to three times around the branches of supporting vegetation. The lamina is green and the stem, midrib and tendril may be green, yellow or orange. The indumentum is comparable to that of *N. madagascariensis*.

The lower pitchers are up to 12 cm tall and 4.5 cm wide. The bottom half of the pitcher is ovate and swollen, sometimes becoming almost spherical. The pitcher narrows above this part, often forming a faint hip, and becomes cylindrical towards the pitcher opening. Wings up to 8 cm wide, fringed with filaments up to 3 mm long, run down the front of the pitcher. The wings are often incurved towards one another. The peristome is up to 5 mm wide and is lined with fine ribs up to 0.34 mm high, spaced up to 0.3 mm apart. A distinct gap of several millimetres is usually present in the peristome below the lid. The peristome is of a consistent width around the margin of the pitcher opening, except for at the very back. On both sides of the gap, the peristome is expanded to form two triangular points up to 8 mm long. The lid is orbicular, elliptic or ovate, up to 4.5 cm long by 4 cm wide. A pronounced keel is often present near the base of the lid; it may be almost triangular in shape and is normally a few millimetres deep. The underside of the lid is evenly and sparsely lined with 80-100 (maximum 150) large, circular nectar glands (up to 2 mm in diameter), with few glands near the periphery of the lid. The spur is up to 5 mm long, flattened and is sometimes forked (Eric Schlosser, pers. comm.).

The exterior of the lower pitcher is often reddish orange or reddish purple. The interior of pitcher is light pink or almost white, and the peristome may be yellow, green, orange or red. Both sides of the lid are the same colour as the pitcher exterior.

The upper pitchers are up to 19 cm tall and 5 cm wide. The bottom quarter to third of the pitcher is ovate and slightly swollen, and on the interior, there are 120-400 digestive glands per cm2. The pitcher narrows above this part, usually forming a distinct hip, and is cylindrical or very slightly infundibular towards the pitcher opening. The peristome is up to 8 mm wide, lined with fine ribs up to 0.25 mm high, spaced up to 0.3 mm apart. Much like *N. madagascariensis*, the peristome is expanded below the lid, and at that part may be up to 4 mm wide. All other parts are similar to the lower pitchers.

The upper pitchers are usually entirely bright yellow, but in some plants the lower surface of the lid may be bright red and the peristome flushed orange or red. Occasionally the cylindrical upper part of the pitcher may be reddish (Eric Schlosser, pers. comm.).

N. masoalensis flowers at the same time as for *N. madagascariensis* (September / October). The inflorescence is an elongated panicle, 20-50 cm long. The smooth peduncle is 8-10 cm long and 5 mm in diameter in male plants and up to 20 cm long and 8 mm thick in female plants. The first branching axis reaches 5-6 cm in length, decreasing to 1 cm long branches towards the apex. Crowded groups of 4 (in female plants) to 12 (in male plants) flowers are borne on pedicels without bracts. The tepals are oval, 2.5 mm long and 1.5-2.5 mm wide, and bear nectar glands. In female inflorescences tepals persist at the narrow base of the seed capsule and are 3-5 mm long and 2.5 mm wide. The capsule is ovoid or fusiform, 1-2 cm long, the valves are oval or lanceolate, 6 mm wide at the lower base. The light brown seed is 3-7 mm long, 0.75 mm thick, straight, the nucleus strongly transversely wrinkled, the wings get gradually thinner towards the end. [McPherson (2009)].

Distribution: Madagascar: Masoala peninsula, and Mt. Mbato region [Jebb & Cheek (1997)].

Habitat: Pandanus and Sphagnum swamp, mountain ridgetops, xerophytic veg- etation; 30-400 m altitude. [Schmid-Hollinger (1977)].

Notes: Closely related to *N. madagascariensis,* it differs in its upper pitchers being cy- lindrical or ventricose-tubular, not wholly infundibulate; the lid is rounded and never emarginate or broader than long; the leaves are scarcely petiolate, and the venation of this species is distinct in the way the pennate nerves are more distinct, and curve to an almost perpendicular arrangement, unlike those of *N. madagascariensis,* which are scarcely separable from the longitudinal nerves, in that they tend to curve towards the apex. [Jebb & Cheek (1997)].

***Nepenthes maxima* Reinw. ex Nees in Ann. Sci. Nat. 3: 369, t. 20, f. 2. 1824. Sec. Cheek & Jebb (2001)**

= *Nepenthes celebica* Hook.f., in: de Candolle, A. L. P. P., Prodr. 17: 100. 1873.

= *Nepenthes curtisii* Mast. in Gard. Chron. ser. 3 2: 681, f. 133. 1887.

= *Nepenthes curtisii* var. *superba* Hort.Veitch ex J.Marshall in Gard. Chron. ser. 3 14: 756. 1893. nom. subnud. *Nepenthes maxima* var. *superba* (Hort.Veitch ex J.Marshall) Veitch in J. Roy. Hort. Soc. 21: 238. 1897.

= *Nepenthes maxima* var. *minor* Macfarl., in: Gibbs, L. S., Fl. Arfak Mts.: 141. 1917.

= *Nepenthes oblanceolata* Ridl. in Trans. Linn. Soc. London, Bot. 9: 140. 1916.

Description: Terrestrial or epiphytic shrub or climber to 4 m tall. Climbing stems terete to triangular, 0.3-1 cm diam., often winged at two angles, occasionally with four, marked wings to 2.5 mm wide, internodes 5-12 cm long, axillary buds conspicuous, spike-like. Leaves chartaceous, petiolate; blade obovate to lanceolate, 15-30 by 2.5-7 cm, apex obtuse to acute, base attenuate, petiole canaliculate or narrowly winged, to 7 cm long, dilated at the base into an amplexicaul sheath which may be decurrent as two ridges or narrow wings for 1 cm or up to 2 internodes. Longitudinal nerves 1-3 on each side of the mid-rib, in the outer 1/3-1/4 of the blade, indistinct. (The leaf blade is occasionally strongly furrowed on its upper surface giving the impression of veins at regular spacing, the veins themselves are more apparent in dried specimens or when held against the light.) Pennate nerves numerous, not parallel, often branched, perpendicular near midrib, but irregular towards margin, indistinct. Lower pitchers narrowly ovoid, becoming cylindrical above, occasionally 'waisted', or the whole pitcher subcylindrical or cylindrical-ellipsoidal 8-20 by 2.2-5 cm, with 2 fringed wings up to 8 mm broad with fringed elements to 6 mm long, 1-4 mm apart; mouth ovate, concave, rising at the rear to a short, ill-defined column; peristome subcylindrical at the front, 2 to 5 mm wide, more flattened towards the lid, up to 15 mm wide, ribs 0.25-1 mm apart, conspicuous, outer edge entire or slightly sinuate, inner edge toothed; lid ovate, c. 2.5 by 2.5 cm, apex rounded, base cordate, lower surface usually with two appendages, basal appendage laterally flattened, often hooked towards base, apical appendage usually filiform, up to 12 mm long, rarely reduced to an inconspicuous swollen area, nectar glands sparsely scattered to fairly dense, orbicular, thinly bordered, 0.1-0.2(-0.4) mm diam., along the midline, sparsely scattered, larger, longitudinally elliptic, 0.5(-0.8) mm long, extending to appendages, where dense; spur filiform, entire, to 6 mm long. Upper pitchers abruptly or gradually originating from the tendril, narrowly infundibuliform, rarely tubular, or with an ovoid basal and cylindrical upper part, 6.2-19(-30) by 1.8-6(-8) cm, occasionally waisted, with 2 prominent ribs, occasionally with small fringed wings near the mouth, or rarely with wings as the lower pitchers; mouth ovate, acuminate and elongate towards the lid forming a column up to 3 cm tall; peristome flattened, up to 20 mm broad near the lid, ribs 0.25-0.5 mm apart, outer edge entire or irregularly sinuate, inner edge with teeth 1-2 mm long; lid elliptic to ovate, 2-5 by 3-6 cm long, apex obtuse, more or less cordate at base, lower surface with a laterally flattened, often hooked crest up to 8 mm long on the basal part of the midrib, and a filiform or dorsally flat-tened appendage near the tip, nectar glands as in lower pitchers, especially numerous and large on the two appendages; spur entire or shortly bifid, stout, 4-8 mm long. Male inflorescence 16-19(-40) by 2.5-3(-5) cm; peduncle 5.5-8(-14) cm long, 1.25-1.5 (-4) mm diam. at base; partial peduncles c. 85, mostly 2-flowered, 2-4(-5) mm long; bracts linear, recurved, c. 2.5 mm long, inserted 0-2 mm from base of partial peduncles; pedicel 6-9(-16) mm long; tepals elliptic, 3-4.5 by 1.5-2.5(-3.5) mm; androphore 2.5-4 mm long; anther head 1.25-1.5 by 1.5-2 mm. Indumentum variable, glabrous to densely pubescent with reddish brown hairs on stems, petioles, midrib, leaf margin, tendril and inflorescence from peduncle base to lower surface of the tepals, 0.2-0.3 mm long, androphore puberulent. Colour green to greenish white or yellowish green, usually mottled with red, peristome crimson; flowers dark red. [Cheek & Jebb (2001)].

Distribution: Sulawesi, Moluccas, New Guinea. [Cheek & Jebb (2001)].

Habitat: Epiphytic in mossy forest, or terrestrial in swamp grassland, on ridge tops, in open forest on white sand, in thin soils over rock or on metalliferous ultramafic soils; (600-)1200-2500 m. [Cheek & Jebb (2001)].

Notes: Within its natural range (Sulawesi to New Guinea), *N. maxima* is only likely to be confused with two other species: *N. klossii* and *N. eymae*. All have lids with two (rarely one) appendage (best seen in upper pitchers), well-defined petioles, leaves with irregular pennate nerves, spike-like axillary buds, 2-flowered partial peduncles and dense, long, patent indumentum. *Nepenthes eymae* of Sulawesi is distinguished by its more broadly infundibuliform upper pitchers and *N. klossii* of western New Guinea differs in its lateral pitcher mouth. *Nepenthes maxima* is also closely related to *N. fusca* of Borneo which is distinguished by the narrowly triangular lid of the upper pitchers. References to *N. maxima* occurring in Borneo are erroneous and usually refer to *N. fusca*. The foregoing species, united by the characters mentioned above, are all part of Danser's Regiae group in Bull. Jard. Bot. Buitenzorg III 9 (1928) 405 which we maintain, including *N. clipeata, N. faizaliana, N. pilosa, N. stenophylla,* and *N. truncata*.

Nepenthes maxima is a widespread and very variable species. The upper pitchers range greatly in form, from narrowly cylindrical to strongly infundibulate. In some populations the upper pitchers are winged along their entire length, resembling the rosette pitchers. In others the lower pitchers are ovoid throughout while the upper pitchers vary from slender and cylindrical to markedly infundibulate.

Nepenthes curtisii Mast. has been the subject of much enquiry and speculation as to its origin and identity. It was formerly thought to be based only on cultivated material grown from seed at Veitch's nurseries after collection by Curtis, according to the protologue, from Borneo. Accordingly, we lectoypified this name on cultivated material ex Veitch at K, citing it as "Curtis s.n. (K) cultivated ex Borneo" (Jebb & Cheek 1997). However, this material was pressed after publication of the species name and there is no evidence that it was seen by the name's author, nor that it had come from Curtis. This choice is overturned by the discovery of the specimen selected above to replace it as lectotype, namely Curtis 426 (K). We had passed over this specimen since the original field label, hastily written in

faint pencil, does not bear a collector's name, though a later annotation says "?Curtis". Nor are country or date indicated on the label. However, the original handwriting does match that in letters from Curtis in the archives at K and the locality indicated on the label is the colonial Dutch spelling prevalent in the 1880s for a mountain (G. Sopoetan = G. Soputan) in the northern arm of Sulawesi from which general area similar material of *N. maxima* is known. Curtis visited Sulawesi in 1881-1882 (TL-2). The citation of 'Borneo' in the protologue was probably a deliberate attempt by Veitch's to mislead rival nurseries: a common practice at that time, especially with orchids. This ruse has misled botanists for over a century. A third hand on the label of the specimen, identifying it as *N. curtisii* Mast. is that of Masters. Unfortunately Masters does not date his annotation. [Cheek & Jebb (2001)].

Nepenthes merrilliana **Macfarl. in Trans. Proc. Bot. Soc. Pennsylv. 3(3): 208, t. 1. 1911. Sec. McPherson (2009)**

≡ *Nepenthes merrillii* Elmer in Leafl. Philipp. Bot. 8: 2787. 1915.

Description: Scrambling or climbing branched stems up to 10 m long.

The lamina is linear or slightly lanceolate, up to 40 cm long and 7 cm wide. The apex of the leaf is acute or obtuse and the base is attenuate, clasps the stem and is slightly decurrent. The lamina often meets the tendril unequally on either side of the midrib, and one side may be up to 4 mm shorter than the other. The lamina is also often slightly broader on one side of the midrib than the other. The stem and tendril are green or yellow and the midrib is orange or red, particularly close to the stem. The lamina is green but young or developing leaves may be bright orangey-red or purple, gradually turning green as they age. Thus each plant usually bears two or three red leaves, and all remaining foliage is green. Exceptions were encountered on Dinagat, where a small population of plants was identified in which all parts of the foliage were pure red. In some populations of *N. merrilliana*, both on Dinagat and Mindanao, the lower surface of the leaves may be uniformly flushed red. The stems and leaves are glabrous, but the pitchers may be sparsely covered in minute hairs less than 1 mm long.

The lower pitchers are typically up to 35 cm tall and 14 cm wide, though sometimes larger, and are wholly, broadly cylindrical or ellipsoidal. In some populations, the lower half of the pitcher may be slightly swollen and expanded, and the upper half may taper towards the pitcher opening. Wings up to 24 mm wide, fringed with filaments up to 18 mm long, typically run down the front of the lower pitchers, but these wings are often reduced or only partly expressed. The peristome is loosely cylindrical, up to 3 cm wide, and is expanded towards the sides and back of the pitcher opening. The peristome is lined with ribs up to 2 mm high, spaced up to 3 mm apart. The ribs are elongated on the inner edge of the peristome to form narrow, needle-like teeth up to 1.5 mm long. The peristome is slightly raised and elongated just below the lid. The outer margin of the peristome is recurved and sometimes slightly crenellated, and the inner margin extends into the pitcher opening for several millimetres. A gap of a few millimetres is often present at the back of the peristome, below the lid. The lid is elliptic or ovate, up to 12 cm long and 7.5 cm wide, and lacks an appendage. The spur is unbranched and up to 16 mm long and 3 mm wide.

The lower pitchers of *N. merrilliana* are among the largest of all *Nepenthes*. The largest trap that I encountered was 42 cm long, 16 cm wide and had a total volume of 2.3 litres, but pitchers up to 45 cm long have been recorded (Volker Heinrich, pers. comm.), with volumes up to three litres (Geoff and Andrea Mansell, pers. comm.). This immense pitcher size may rival that of *N. rajah*, although on average, the pitchers of *N. merrilliana* are not quite as large. During my observations of *N. merrilliana* across Dinagat and Mindanao, during June and July 2007, and July 2008, it was evident that in all populations, the very largest pitchers had withered and died a few month earlier, suggesting that the production of the largest lower pitchers may be seasonal.

The lower pitchers are very variable in colouration. The exterior of the trap is usually yellowish green or orange, but may be flushed red, pink or brown, sometimes mottled with faint, dark red blotches. The interior of the pitcher is yellow or orange and usually lined heavily with small, dark purple or black flecks. The peristome may be dark red, brown or purple, and the lid is pure yellow, orange or red. In some populations, all parts of the pitcher may be yellowish green or pure red. An unusual colour form exists on Dinagat, in which the pitchers are consistently bright pink, with peristomes of bright yellow (Stewart McPherson, pers. observ.).

The upper pitchers are wholly infundibular, often broadly so, up to 35 cm tall and 14 cm wide. Wings are reduced to narrow ridges. All other parts are consistent with the lower pitchers. Colouration is comparable and similarly variable, but usually, the upper pitchers are entirely yellowish green.

The inflorescence is a raceme, to 50 cm long by 3.5 cm at the widest point. The peduncle is up to 15 cm long and up to 6 mm in diameter at the base, the rachis to 35 cm long. Flowers are mainly borne on loosely arranged 2-flowered partial peduncles lacking bracts, with pedicels to 15 mm long. Tepals are ovate-elliptic and 4 mm long and the anther head is borne on a column up to 5 mm long. Fruits are up to 18 mm long. [McPherson (2009)].

Distribution: Philippines, Mindanao and Dinigat [McPherson (2009)].

Habitat: Lowland heath forest, degraded or recovering secondary vegetation, logged lowland dipterocarp forest, on exposed, inland cliff and landslide areas, and in stunted, lower montane forest. [McPherson (2009)].

Notes: *N. surigaoensis* Elmer, a species that was treated as a synonym of *N. merrilliana* by Jebb & Cheek (1997) and Cheek & Jebb (2001) is here considered as a separate species. [Berendsohn (2017+)].

Notes: The large pitchers of *N. merrilliana* distinguish it from most other *Nepenthes*. Only *N. attenboroughii*, *N. insignis*, *N. rajah*, *N. truncata* and the giant variety of *N. rafflesiana* produce pitchers of comparable volume. Of these species, *N. merriliana* only bears similarity to *N. insignis*, but is easily distinguished from that species by its lower pitchers which are very distinct; those of *N. merrilliana* are broad and cylindrical, whereas those of *N. insignis* are comparatively narrow, often with a slender waist. [McPherson (2009)].

Etymology: The specific epithet honours American botanist, Dr. Elmer Merrill, who undertook extensive studies of the flora of the Philippines and the Asia-Pacific region during the first decades of the 20th century. [McPherson (2009)].

***Nepenthes micramphora* V.B.Heinrich, S.McPherson, Gronem. & V.B.Amoroso, in: McPherson, S., Pitcher Plants of the Old World 2: 1315 (713-719, 1314-1319; figs. 387-391, 739). 2009. Sec. Heinrich, McPherson & al. (2009)**

Description: Terrestrial climber, to 2 m tall. Stems cylindrical, to 3.5mm diameter, glabrous, internodes 2-15 mm. leaves sessile, coriaceous, glabrous, lanceolate-elliptic, 40-80 mm long x 7-1O mm wide, apex acute, base slightly attenuate, clasping the stem for 1/3 its circumference, not decurrent. Longitudinal veins 2-3 on each side of the midrib, pennate nerves numerous, running obliquely to the margin; tendril length 30 - 75 mm, diameter 0.5-1 mm, forming an S-shape 20 mm above pitcher base, or coiling around adjacent supports. Pitchers dimorphic, glabrous; lower pitchers almost cylindrical, infundibuliform towards the tendril, slightly waisted one third from the base, widening towards peristome, 25-41 mm long, 12-16 mm wide, with 2 fringed wings; wings 2-4 mm wide, fringe segments filiform, ca. 3 mm long, 2.5-3 mm apart; inner surface of the bottom third of pitcher glandular; peristome 0.8 mm wide, cylindric; mouth oblique; column 0.8-1.8 mm; operculum reniform, slightly wider in diametre than mouth, 15-20 mm long x 13-18 mm wide, held horizontally or slightly raised; spur filiform, 2-3 mm long, bifurcate; upper pitchers infundibuliform, with a waist of up to 8 mm wide below the peristome, 37-67 mm long x 9-20 mm wide; operculum of same diameter as mouth. Female inflorescence 250-350 x 6 mm at widest part; peduncle 80 mm long, 1 mm diameter; Pedicels 1-flowered, c. 20-40, 3-4 mm long, bracts absent; tepals ovate, 2-2.5 x 1-1.2 mm; Fruit valves 17-20 mm long. Seed unknown. Indumentum absent from stem and leaves; inflorescence conspicuouly ferruginous-tomentose, hairs simple, 0.1 mm long, tepals minutely tomentose. Colour of pitchers yellowish-green, with dense red speckles that may dominate the yellow base color in direct sunlight; peristome yellow, occasionally blushed red. Speckles of lower pitchers generally purple. Speckles of lower pitchers generally purple. Pitcher interior uniformly green to yellow. [Heinrich, McPherson & al. (2009)].

Distribution: Philippines, Mindanao, Mount Hamiguitan [Heinrich, McPherson & al. (2009)].

Habitat: Ultramafic substrates in exposed locations, 1100-1635 m a.s.l. [Heinrich, McPherson & al. (2009)].

***Nepenthes mikei* Salmon & Maulder in Carniv. Pl. Newslett. 24: 82. 1995. Sec. Cheek & Jebb (2001)**

= *Nepenthes angasanensis* Maulder, D.Schub., B.R.Salmon & B.Quinn in Carniv. Pl. Newslett. 28: 15, f. 1. 1999.

Description: Terrestrial climber to 3(-9) m tall. Stems terete or slightly 2-angular-ridged; rosette stem 2 mm diam., internodes 1-6 mm long; climbing stem slightly flexuose, (1.5-) 2-2.5(-3) mm diam., internodes (1.5-)3-5(-6.5) cm, axillary buds broadly conical, 0.5-1 by 1-1.5 mm, 2-4 mm above the axil. Leaves coriaceous, sessile, rosette leaves narrowly oblanceolate-elliptic, 3-7 by 0.6-1.3 cm, apex obtuse to acute, not peltate, base clasping the stem for 1/2 its circumference; leaves of climbing stems narrowly oblanceolate-oblong, 3.5-15 by 0.7-2.5 cm, apex acute, base clasping the stem for 1/2 the circumference, winged, the wings sometimes decurrent to the node below as two low ridges; rarely perfoliate-adnate. Longitudinal nerves 1-3 on each side of the midrib in the outer 1/3 of the blade, inconspicuous. Pennate nerves perpendicular, few, in-conspicuous. Lower pitchers ovoid in the lower half, cylindrical above, 3.5-11.5 by 0.9-2 cm, the upper part 3/4 the breadth of the lower, with two fringed wings 1-2 mm broad, fringed elements 2-3.5 mm long, 0.5-1 mm apart, mouth ovate, concave, oblique, peristome cylindrical, 0.75-1 mm wide, with inconspicuous ribs, outer and inner edges entire; lid elliptic or ovate, 0.8-2 by 0.6-1.8 cm, apex rounded, base rounded or shallowly cordate, lower lid lacking appendages, nectar glands inconspicuous, sparsely and evenly scattered, bordered, circular, 0.1 mm diam.; spur 2-6 branched, divided from the base or from about 1/2 its length, 4-6 mm long. Upper pitchers resembling the lower, but more contracted at the midpoint, to about 1/2 the diameter of the basal part, often widening slightly towards the mouth, 3.5-13 by 0.9-2 cm, lacking fringed wings; mouth strongly oblique, peristome 0.75-1.5 mm broad, ribs inconspicuous, 0.25-0.5 mm apart, outer edge entire, inner entire or shallowly toothed; lid 1.1-1.9(-3.8) by 0.8-1.3(-2.1) cm, nectar glands and spur as lower pitchers. Male inflorescence 3.8-15 by 1-1.8 cm; peduncle 1.5-3 cm long, 1 mm diam. at the base; partial peduncles c. 20(-45?), 1-flowered; pedicels 3-6 mm long; bracts absent; tepals oblong, 2-3 by 1 mm; androphore 1(-1.2) mm long; anther head 1 by 1 mm. Infructescence 5-9 by 4.5-5 cm; peduncle 1.5-5.2 cm long, 1.1-1.5 mm diam. at base; fruits 6-10, valves 1.7-2.2 by 0.2-0.3 cm. Seeds filiform, 10.5 by 0.5 mm. Indumentum ab-sent from stem apart from a cluster of white hairs around the axillary bud; leaves with sessile red glands 0.1 mm diam. on the lower surface, otherwise glabrous; pitchers, upper lid and spur sparsely covered with white appressed simple hairs c. 0.5 mm long;

inflorescence from base of peduncle to apex of pedicel sparsely (rarely densely) sericeous with the same hair type; lower tepals with minute white stellate hairs; ovary densely fawn sericeous; androphore glabrous. Colour of specimens black when dry; live stem purplish black; pitchers purplish black, splashed one part in ten with cream; tepals dirty purplish or brown. [Cheek & Jebb (2001)].

Distribution: Sumatra: Aceh & Sumatera Utara Provinces, Angasan to Lake Toba [Cheek & Jebb (2001)].

Habitat: Mossy forest and scrub, especially on ridges; 1100-2500 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes mikei* has long been confused with *N. tobaica* with which it looks extremely similar, but differs in the branched (not simple) spur and the 1-flowered (not 2-flowered) partial peduncles.
Van Steenis 8331A represents an exceptionally large specimen of this otherwise morphologically uniform species, and accounts for the higher figures in the dimensions given in the description above for pitcher and leaf. It may represent a hybrid with another species such as the sympatric *N. densiflora*.
The type material of *N. mikei*, on which the protologue description appears solely based, was cultivated in New Zealand from material collected by its authors on Mt Pangulubau in 1989.
Nepenthes angasanensis Maulder, D. Schubert, B. Salmon & B. Quinn was published (Salmon & Maulder, Carnivorous Plant Newsl. 28 (1999) 15) in the closing stages of this manuscript. The authors argue that specimens we assigned to this species in Blumea 42 (1997) 63 represent a separate taxon. We suspect that it may prove not distinct from *N. mikei* and here treat it as a synonym. [Cheek & Jebb (2001)].

Notes: First noted by Hopkins, Maulder, Maulder & Salmon (1990) in Carniv. Pl. Newslett. 19: 23 (f.) & 25. - http://legacy.carnivorousplants.org/cpn/articles/CPNv19n1_2p19_28.pdf. This was cited in the list of synonyms by Jebb & Cheek (2001). [Berendsohn (2017+)].

Etymology: Named for Mike Hopkins of New Zealand. [Cheek & Jebb (2001)].

***Nepenthes mindanaoensis* Sh.Kurata in J. Insectiv. Pl. Soc. 52(2): 32 (-34; fig. 2). 2001. Sec. Kurata (2001)**

Description: Climbing, strangling or trailing branched stems upt to 6 m long.
The lamina is elliptic or lanceolate, up to 25 cm long and 6 cm wide. The apex of the leaf is acute or narrowly obtuse, the base obtuse or rounded and always petiolate. The distinctive petiole is up to 10 cm long and tubulate to canaliculate. The petiole and leaf shape are the main characteristics distinguishing this species from *N. alata* and other closely related species. The lamina is often vivid green, the stem and tendrils may be yellow, green, orange or bright red, and the midrib is yellow or green. The tendrils, pitchers and undersides of the leaves are lined with short, orangey brown hairs up to 1.5 mm long. The margins of the leaves are often lined with soft brown hairs 3-5 mm long.
Lower pitchers are produced only briefly by young plants, prior to the production of a climbing stem. The lower traps are up to 15 cm tall and 3.5 cm wide. The bottom quarter to third of the pitcher is ovate or globose. Above this part, the width narrows, sometimes forming a slight hip, thereafter becoming cylindrical or infundibular towards the pitcher opening. Wings up to 10 mm wide, sparsely fringed with filaments up to 8 mm long, run down the front of the pitcher. The peristome is 3-10 mm wide, and is narrow and cylindrical at the front of the pitcher opening, but flattened and expanded at the sides and below the lid. The peristome is lined with ribs up to 0.5 mm high, spaced up to 0.65 mm apart, but these may be hardly discernable. The lid is elliptic or ovate, often with a cordate base, up to 4 cm long and 3 cm wide, occasionally with a small crest near its base. The spur is up to 12 mm long and is unbranched.
The exterior of the lower pitcher is usually yellowish green, but may be orange, pinkish, red or purple, occasionally mottled with faint, dark red or purple blotches. The interior of the pitcher is creamy white or yellowish green, rarely flecked with faint purple on the interior. The peristome may be pure yellow, orange, pink, red, or purple, and is often bright and vividly coloured. The lid is generally the same colour as the exterior of the pitcher, often decorated with dark red or purple flecks on its upper surface.
The upper pitchers are up to 26 cm tall and 6 cm wide. The bottom third to quarter of the trap is typically ovate and globose, sometimes almost entirely spherical. Above this part, the width of the pitcher narrows, sometimes forming a slight hip, and becoming cylindrical or infundibular towards the pitcher opening. Wings may be present as in the lower pitchers, reduced to narrow ridges, or entirely absent. All other parts are similar to the lower pitchers, except for the lid, which is up to 6 cm long and 5 cm wide.
The colouration of the upper pitchers is particularly striking and often very beautiful. The exterior of the pitcher may be creamy white, yellow, green, orange, pink, red or purple, and is typically mottled with dark red, dark purple or black blotches or stripes. The interior of the trap is creamy white or light yellow, often flecked with faint purple or black. The peristome may be bright yellow, orange, red, dark purple or black, rarely streaked with red or purple. The lid is generally the same colour as the exterior of the pitcher, often with dark red or purple flecks on its upper surface. Sometimes the lid is entirely purple or black.
Insufficient observations of *N. mindanaoensis* have been made to document the structure of its inflorescences. Generelly, the rachis of the female inflorescence seems to be longer than that of the male – one third of the total

length versus one quarter – with flowers more loosely arranged on longer pedicels. Further studies of the floral parts of this species are required. [McPherson (2009)].

Distribution: Philippines, Mindanao and Dinagat. [McPherson (2009)].

Habitat: In lowland heath forest, degraded or recovering secondary vegetation, on exposed cliffsides and landslide areas, in clearings in lowland dipterocarp forest and in lower montane forest; mostly at 0 - 800 m, occasionally up to 1400 m a.s.l. [McPherson (2009)].

Nepenthes minima **Cheek & Jebb in Blumea 61: 182. 2016. Sec. Cheek & Jebb (2016)**

Description: Pyrophytic dioecious, terrestrial subshrub 0.3–0.6 m tall. Stems annual, erect, arising from a fleshy-leathery, vertical underground rootstock c. 8 by 2 cm, the upper part densely covered in the carbonised bases of stems resulting from fires in previous dry seasons. Rosette and climbing stems unknown and probably not produced. Short stems terete or slightly rounded-angular 3–5 mm diam, internodes (3.2–)4.5–5.2(–6) cm long, indumentum a mixture of dendritic and stellate hairs 0.2–0.7 mm long, dull white to orange-grey, 50–80 % cover at stem apex, decreasing to 10 % cover at the fourth internode from the apex. Leaves petiolate, blades elliptic-oblong, (4.8–)5–9(–12.5) by (1.3–)1.8–2(–3.5) cm, apex acute, tendrils apical 7–10 cm long, base cuneate; longitudinal nerves 3 on each side of the midrib in the outer third of the blade, all arising from the proximal two-thirds of the blade midrib; pennate nerves irregular, patent;
indumentum inconspicuous, dull white simple (or inconspicuously branched), and 2–4-armed sessile hairs 0.15–0.3 mm long, mixed with sessile depressed-globose glands 0.05 mm diam, indumentum covering c. 10 % of both upper and lower surface of young leaves, glabrescent. Petiole canaliculate, (2–)3–5 cm long, 0.2 cm wide, 0.2 cm high, indumentum as the blade, but slightly denser, and longer (to 0.6 mm long). Lower pitcher not recorded. Intermediate pitchers infrequently produced in mature plants, narrowly infundibulate-cylindrical c. 9 cm long, c. 2 cm wide below peristome, c. 1.5 cm diam half way between base and apex, with two fringed wings running from the peristome, 9/10 the length of the way to the base of the pitchers; fringed wings 2 mm wide, fringe-elements 1–3 mm long, 2–3 mm apart; outer surface of pitcher with similar indumentum to that of the upper pitchers (see below); mouth narrowly ovate, concave, arising abruptly at the rear into a column, oblique, inner surface not recorded; peristome rounded, 3–4.5 mm wide, ribs 0.4 mm apart, 0.1 mm high, separated by c. 12 well-marked parallel ridges, outer edge entire, recurved, inner edge recurved and with teeth inconspicuous, column triangular, c. 18 by 7 mm at the base; lid narrowly ovate, c. 25 by 16 mm, apex acute, base rounded, upper and lower surface similar to the upper pitchers (see below), apical appendage c. 4 mm long; spur simple, 6 mm long, indumentum of short
black hairs. Upper pitchers (tendrils coiled, dorsal to pitcher), green, slightly curved along main axis, narrowly infundibuliform, rarely cylindrical (5–)6–10.5(–12) by 1.2–1.5(–2.05) cm, narrowing to 1–1.2 cm wide halfway between base and peristome, the 'hip' not developed, wings absent; indumentum of the outer surface 10–30 % covered in three types of indumentum, large 3–5-branched, dendritic hairs 0.2–0.5(–0.7) mm long, (2–)5(–7) per mm2; small 4-armed stellate hairs (rarely bifid or trifid) 0.1 mm diam, 1–6 per mm2; sessile depressed-globose glands 0.05 mm diam, 4–7 per mm2; mouth narrowly ovate, flat and oblique in the frontal half, slightly concave in the rear part, rising to form a weakly defined column, inner surface at mouth with upper exposed half waxy, the lower half glandular, glossy; peristome flattened-cylindric in transverse section, 3–4.5 mm wide, ridges 0.25–0.5 mm apart, developed as acute low ridges 0.2–0.25 mm high, outer edge revolute, entire, inner edge with teeth 0.2 mm long and broad, visible only at the base of the
column, the inner edge otherwise folded inwards; lid narrowly ovate, 1.8–2.8 by 0.8–1.2 mm, apex acutely rounded, base truncate and shortly and abruptly cordate, upper surface with indumentum as the outer pitcher surface, lower surface with both a basal and apical appendage arising from the midline ridge, basal appendage inconspicuous, laterally flattened, inequilaterally triangular, c. 1.5 mm long, c. 0.8 mm high with nectar glands sparse, apical appendage filiform-cylindrical (1–)2.8–4 by 0.25 mm, arising 0.4–0.5 mm before the lid apex, with 3–7 nectar glands concentrated at the apex, nectar glands absent from the midline of the lid (except the midline in the distal part often with 1–2 longitudinally elliptic nectar glands up to 0.7 by 0.3 mm and from the marginal 0.2–0.3 mm numerous, mostly ± monomorphic and uniformly dense, c. 12 per mm2, orbicular, 0.15–0.25(–0.3) mm diam, bordered, the borders covering 30–50 % of the surface area, the peripheral nectar glands at the smaller end of the size range, and sparser, sessile depressed-globose or 8-rayed glands scattered over the entire surface, c. 0.05 mm diam, marginal 0.1–0.2 mm of lid with dense bushy hairs 0.05–0.1 mm long; spur filiform, simple, inserted 3–4 mm below the lid, 6 mm long, indumentum of short patent, black hairs with 100 % cover. Female inflorescence (male unknown) erect 21.2–33 by 3 cm, indumentum a mixture of randomly orientated appressed white hairs 0.1–0.4 mm long and red depressed-globose glands 0.06 mm diam extending from peduncle to lower surface of tepals, peduncle 7.2–16 cm long, by 0.2 cm diam, glabrescent; rhachis 13–17 cm long, 50–80 % covered in indumentum; partial-peduncles 20–27, each 1-flowered, bracts absent, pedicels 0.3–0.6 cm long, about 50 % covered in indumentum. Female flowers with tepals (4–)5–6, narrowly oblong-elliptic 2.3–2.6 by 0.8–0.9 mm, apex rounded, upper surface with 15–20 longitudinally elliptic nectar glands, lower surface about 20 % covered in hairs; ovary bottle-shaped, 3.5 by 1.1 mm, 100 % covered in white appressed hairs 0.2–0.3 mm long; stigmas four, bifurcate,

basally united, forming a head 1 mm diam, drying glossy black. Fruit valves 4, 9.5 by 1.5 mm, with dense appressed hairs. Seeds filiform-fusiform, 4.4 by 0.11 mm, pale yellow, central portion smooth. [Cheek & Jebb (2016)].

Distribution: Indonesia, Sulawesi Tengah [Cheek & Jebb (2016)].

Notes: The species resembles a miniature form of *Nepenthes maxima* Reinw. ex Nees and has been circulating in horticultural circles as the cultivar *N. maxima* 'Lake Poso' (Evans 2009). [Cheek & Jebb (2016)].

***Nepenthes mira* Jebb & Cheek in Kew Bull. 53: 966. 1998. Sec. Cheek & Jebb (2001)**

Description: Terrestrial climber to 3 m tall. Stem terete, 8-14 mm diam., internodes 3-5 cm long on climbing part; axillary buds inconspicuous, in sunken pockets. Leaves chartaceous, petiolate; those of rosettes and short stems, unknown; those of climbing stems narrowly oblong, 35-50 by 8-10.5 cm, apex rounded, not peltate, base acute and abruptly decurrent into the petiole; petiole winged, 3.5-8 by 0.6 cm, wings ascending, 3-4 mm wide, petiole base clasping the stem by about 2/3 its circumference and decurrent down the internode for c. 8 mm. Longitudinal nerves 4(-6) on each side of the midrib in the outer half, conspicuous on both surfaces. Pennate nerves numerous, arising at 70-80° from the midrib, slightly ascending, then proceeding towards the margin, branching, becoming highly reticulate, fairly conspicuous on both surfaces. Lower pitchers shortly ellipsoid to globular, 26 by 13 cm, the lowest part of the mouth 14 cm from the base of the pitcher, mouth c. 11 cm diam., body of pitcher with two fringed wings in the upper half of the pitcher only, 5.5 cm by 7 mm, fringed elements 8-9 mm long, usually paired, the pairs 2.5-3 mm apart, mouth circular to broadly ovate, oblique, abruptly arising in the rear to provide a stout column almost 5 cm high by 1.5-3 cm wide, in transverse section an isosceles triangle, the long sides being formed by the extended peristome, the apex with two rows of teeth, each tooth up to 8 mm long; peristome very broad, gently rounded in the middle, ribs laterally flattened, papery, highly pronounced, 1-5 mm high, 2 mm apart, with c. 10 striae parallel to and intermediate between each pair of ribs, outer edge of peristome flattened, 0.5-1 cm wide, shallowly sinuate, with 2-4 shallow, pointed lobes on each side or more or less entire, the inner peristome surface flattened, 2.5-3 cm long, held close to the inner pitcher wall at the mouth but slowly diverging from the wall towards the base of the pitcher, so as to form a funnel and ter-minating in stout, straight teeth c. 7 mm long on the inner edge below the mouth or up to 8 mm long on the column; lid ovate-elliptic, 6.5 by 4.5 cm, apex rounded, base gently rounded to shallowly cordate, lower surface lacking appendages, glands dense and evenly spread over the lower surface, volcano-like, circular, less usually shortly elliptic, 0.15-0.2 mm diam., smallest towards the edge of the lid; spur erect, stout, c. 4 mm long, undivided. Upper pitchers cylindrical to funnel-shaped, 15.5 cm tall, c. 4 cm diam. in the lower half, gradually widening to c. 6 cm wide at the mouth, lacking wings, mouth circular, slightly oblique, column c. 3 cm high, peristome with ribs 0.5 mm high, c. 1 mm apart, outer edge of the peristome appressed to the pitcher wall, inner edge as the lower pitcher, but c. 1.5 cm long, teeth 3 mm long; lid ovate, 4.5 by 3 cm, apex rounded, base cordate; spur dorsiventrally flattened, 6.5 by 1.5 mm, divided into two acute parts for half its length. Inflorescences with unpleasant smell. Male inflorescence 61 cm long, 3 cm at widest point; peduncle 53 cm long, 5 mm wide at base; partial peduncles c. 35, evenly spaced, 2-flowered, lacking bracts, 5-7 mm long; pedicels 10-13 mm long; tepals elliptic, 4 by 1.75 mm; androphore 2.5-3 mm, anther head 1 by 1.1-1.25 mm. Fruit and seed unknown. Indumentum of red sessile glands densely and evenly spread on stem, upper and lower leaf surfaces and pitchers; youngest parts of stem, lower midrib, tendril, upper surface of the lid of the upper pitchers and the peduncle densely pubescent with numerous caducous, unequally 2-4-armed, pale reddish brown hairs, the arms ascending or decumbent, longest arms up to 1.5 mm long; pitchers with densely scattered simple stout red multicellular hairs, 0.2-0.4 mm long; partial peduncles, pedicels, the central area of the abaxial tepals, the carpels and androphore, more or less completely concealed by appressed coppery hairs 0.4 mm long. Colour of pitchers maroon, lightly speckled with darker purple or green, speckled dark red. Peristome purple, lid purple on greenish background. Flowers opening green, turning dark red. [Cheek & Jebb (2001)].

Distribution: Philippines: Palawan. [Cheek & Jebb (2001)].

Habitat: Submontane forest and grassland on unknown substrate; c. 1580 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes mira* falls within the *N. villosa* group, comprising four species, of which the remaining three are all found in Sabah, Borneo. These species are robust plants with stout stems reaching the 1-2 cm diameter range, with a villose indumentum that is usually caducous. The leaves are large, with well-defined, winged petioles. The pitchers are large (10 cm diam. or more in most specimens of all species), with unusual papery ribs 1-5 mm high, that are not reduced and indeed, are sometimes exaggerated, on the stout column. The pitcher lids lack appendages and the inflorescences are densely covered in coppery red hairs. Although *N. mira* has all these characters, it is unusual in occurring below 2000 m altitude, in having both upper and lower pitchers commonly expressed (in the other species, only one or the other are usually found), in the lower pitchers having lids only about half as long as the mouths and in possessing constantly 2-flowered partial peduncles.

'*Nepenthes* spec. Philippines II' of Rischer & Nerz (URL: http://joachim-nerz.de/ (02 May 2012 10:35 (2012)), represented by four pictures, with captions, taken in habitat, appears to fall within *N. mira*. Photographed in moss forest, it appears to differ from *N. mira* only in the lower pitcher having a less prominently toothed peristome

column and in the pitcher wings running from peristome to tendril. These differences seem compatible with infraspecific variation. However, their photographs of '*Nepenthes* spec. Philippines I' (l.c.) depicts non-climbing, shrubby plants in a grassland habitat and differ more significantly from the material available to us of *N. mira* in the smaller leaves with less conspicuous petioles and in the pitcher wings running from peristome to tendril. In some respects their 'spec. Philippines I' approaches the description of the mysterious *N. deaniana*. However, it might also represent a variant of *N. mira*. Without specimens it is difficult to reach a firm conclusion.
The earliest reference to *N. mira* may be that by Elmer Leafl. Philipp. Bot. 4 (1912) 1494-1496 at the end of his protologue for *N. graciliflora* (a synonym of *N. alata*), where he wrote: "recently the writer observed a large sterile species on Mount Pulgar of Palawan. Some of its pitchers were a foot long and six inches thick!" [Cheek & Jebb (2001)].

***Nepenthes mirabilis* (Lour.) Druce, Rep. Bot. Soc. Exch. Club Brit. Isles: 637. 1916. Sec. McPherson (2009)**
≡ *Phyllamphora mirabilis* Lour., Fl. Cochin. 2: 606. 1790. *Nepenthes phyllamphora* Willd., Sp. Pl. 4(2): 874. 1806.
= *Nepenthes albolineata* F.M.Bailey in Qld. Agric. J. 3(5): 355, t. 58 (as 'albo-lineata'). 1898.
= *Nepenthes alicae* F.M.Bailey in Qld. Agric. J. 3(5): 356, t. 60. 1898.
= *Nepenthes armbrustae* F.M.Bailey in Qld. Agric. J. 16(2): 191, t. 3. 1905.
= *Nepenthes bernaysii* F.M.Bailey in Proc. Linn. Soc. NSW 5: 185. 1881.
= *Nepenthes cholmondeleyi* F.M.Bailey in Qld. Agric. J. 7(5): 441, t. 59. 1900.
= *Nepenthes fimbriata* Blume in Mus. Bot. Lugd.-Bat. 2: 7. 1852.
= *Nepenthes fimbriata* var. *leptostachya* Blume in Mus. Bot. Lugd.-Bat. 2: 8. 1852.
= *Nepenthes garrawayae* F.M.Bailey in Qld. Agric. J. 16(2): 191, t. 4. 1905.
= *Nepenthes jardinei* F.M.Bailey in Qld. Agric. J. 1(3): 230, t. s.n. 1897.
= *Nepenthes kennedyana* F.Muell., Fragm. 5(pt. 37): 154. 1866.
= *Nepenthes kennedyi* Benth., Fl. Austr. 6: 40. 1873.
= *Nepenthes macrostachya* Blume in Mus. Bot. Lugd.-Bat. 2: 7. 1852.
= *Nepenthes moluccensis* Oken, Allg. Naturgesch. 3(2): 1368. 1841.
= *Nepenthes moorei* F.M.Bailey in Qld. Agric. J. 3(5): 355, t. 59. 1898.
= *Nepenthes obrieniana* Linden & Rodigas in Ill. Hort. 37: 109, t. 66 (as 'o'brieniana'). 1890.
= *Nepenthes pascoensis* F.M.Bailey in Qld. Agric. J. 16(2): 190, t. 2. 1905.
= *Nepenthes phyllamphora* var. *macrantha* Hook.f., in: de Candolle, A. L. P. P., Prodr. 17: 97. 1873.
= *Nepenthes phyllamphora* var. *pediculata* Lecomte in Fl. Gén. Indo-Chine 5: 52. 1910.
= *Nepenthes phyllamphora* var. *platyphylla* Blume in Mus. Bot. Lugd.-Bat. 2: 7. 1852.
= *Nepenthes tubulosa* Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 60. 1908.

Description: Scrambling or climbing branched stems up to 15 m long. The lamina is oblong to lanceolate, up to 30 cm long, 8 cm wide, and is thin and papery in texture. The apex of the leaf is acute, and the base is attenuate or obtuse and petiolate, particularly in mature plants. The petiole is up to 6 cm long and clasps the stem, but may on rare occasions be decurrent. The margin of the lamina is fimbriate, fringed with narrow filaments of variable length and frequency. In Thailand, populations of *N. mirabilis* occur in which these filaments are 5 mm long, emerging 3 mm apart along the edge of the lamina, whereas on the Cape York Peninsula, Australia, some populations of *N. mirabilis* hardly have any such filaments at all (Stewart McPherson, pers. observ.). The lamina is dull green, or reddish and the stem, midrib and tendril are green, yellow or red. According to Clarke (1999), most parts of the majority of mature *N. mirabilis* plants are glabrous, however I have observed plants that are sparsely lined with white or light yellow, deciduous hairs up to 2 mm long (also documented by Danser, 1928), and in many populations, a tomentose ribbon may be present below the peristome (Eric Schlosser, pers. comm.).
The pitchers of *N. mirabilis* usually have a short lifespan in comparison to most other species of *Nepenthes* Generally, each trap begins to wither 8 to 10 weeks after opening. Often only the top half of each pitcher initially withers and, for many weeks, the lower half remains alive and functional, presumably to allow the plants to continue to absorb water and nutrients contained within the pitcher without the expense of sustaining an entire living trap.
The lower traps of *N. mirabilis* are up to 16 cm tall and 5 cm wide. The bottom third to half of the pitcher is ovate and variably swollen. Above this part, the pitcher narrows, often forming a slight hip, and becomes cylindrical towards the pitcher opening. Wings up to 7 cm wide run down in front of the trap, and are usually lined with narrow filaments up to 6 mm long, though sometimes these filaments are absent. The peristome varies little in width around the almost circular pitcher opening. The peristome is flattened or nearly cylindrical and is very variable in width. It is usually less than 8 mm wide and lined with fine ribs up to 0.1 mm high, spaced up to 0.3 mm apart. A gap up to 3 mm wide is often present at the back of the peristome, immediately below the lid. The lid is circular or ovate, up to 5

cm long and 4 cm wide, and lacks an appendage. It is usually flat or slightly dome-shaped and often does not open very far above the pitcher opening. The spur is up to 5 mm long and may be branched or unbranched.
The colouration of the lower pitcher is extremely variable across the wide range of this species. Most *N. mirabilis* plants produce lower pitchers in which the exterior of the trap is pure yellow-green, yellow punctuated with red or purple flecks, or suffused reddish. The interior of the pitcher is usually pale yellow or yellow-green, sometimes with red, or purple flecks. The peristome may be pure yellow, orangey or red, often with a dark purple inner margin, and the lid is most often yellow, speckled with small purple flecks on the upper surface. More rarely, the lower pitchers may be entirely blood red or dark purple. Some varieties produce pitchers with a faint orange or red band a few millimetres wide just below the peristome on the outside of the pitcher. This band is often sparsely covered with short hairs.
The upper pitchers are up to 24 cm tall and 6 cm wide, but usually much smaller. The bottom fifth to two thirds of the pitcher is ovate and variably swollen. Above this part, the pitcher narrows, often forming a slight hip, and is cylindrical or slightly infundibular towards the pitcher opening. Wings are usually reduced to narrow ridges which run down the often flattened front of the pitcher, but they may be more strongly expressed on occasion. All other parts are similar to the lower pitchers.
The colouration of the upper pitchers is also extremely variable. Most often, the exterior of the upper traps is pure yellow or yellow marked with flecks of dark red or purple. The interior of the pitcher is pale yellow or yellow-green, sometimes with red or purple flecks. The peristome may be pure yellow, orangey or red, often with a dark purple inner margin, and the lid is most often yellow, with small purple flecks on the upper surface. Rarer varieties produce upper pitchers in which the exterior of the trap is pure scarlet, but the peristome a pure, brilliant yellow. In other populations, only the lower surface of the lid may be red, or in others still, the upper pitchers may be entirely dark red or purple. Populations of *N. mirabilis* plants that produce red coloured upper pitchers occur sporadically across the range of this species, but are rare overall. Occasionally, variants of red pitchered *N. mirabilis* may be observed in which the stem is bright red too.
The inflorescence is a raceme, to 45 cm long by 3 cm at the widest point. The peduncle is up to 15 cm long and 3 mm in diameter at the base, the rachis to 30 cm long. Flowers are borne predominantly on bractless pedicels up to 15 mm long, but 2-flowered partial peduncles are sometimes found in certain populations. Tepals broadly elliptic, 4-6 mm long, and the anther head is borne on a column up to 2-5 mm long. Fruits are approximately 25 mm long. [McPherson (2009)].

Distribution: Continental SE Asia from the S of China through Indochina to the S of Peninsular Malaysia, across the Sunda Islands to the Philippines and as far east as the Caroline Islands; Maluku Islands, New Guinea; NE of Queensland, Australia. [McPherson (2009)].

Habitat: In a wide variety of habitat types, in alkaline and acidic substrates, on pure sand, clay, laterite and peat, from 0 to 1500 m, generally found below 500 m a.s.l. [McPherson (2009)].

Notes: *N. rowannae* and *N. mirabilis* var. *echinostoma,* here considered as separate taxa, have been treated as synonyms of *N. mirabilis* by Jebb & Cheek (1997) and Cheek & Jebb (2001). [Berendsohn (2017+)].

***Nepenthes mirabilis* var. *echinostoma* J.H.Adam & Wilcock in Mal. Nat. J. 46: 81, f. 2. 1992. Sec. McPherson (2009)**

≡ *Nepenthes echinostoma* Hook.f., in: de Candolle, A. L. P. P., Prodr. 17: 95. 1873.

Description: Distinct from the typical form of this species in that it produces pitchers that have a greatly expanded peristome that may be up to 3 cm wide. The peristome is normally of an equal width all of the way around the pitcher opening, but may be raised towards the inner edge of the pitcher opening and flattened towards the outer edge. The peristome is lined with ribs up to 3 mm tall, spaced up to 2 mm apart. The ribs of the peristome are often splayed upwards, projecting up from the peristome at various angles, on both lower and upper pitchers. Plants and pitchers are often very large. [McPherson (2009)].

Distribution: Brunei; Malaysia, Sarawak. [McPherson (2009)].

***Nepenthes mirabilis* var. *globosa* M.Catal., Nepenthes Thailand.: 40 (fig. 1-5). 2010. Sec. McPherson (2011)**

Description: Lower pitchers round to oval, usually red; upper pitchers infundibular to obovate; top of the peristome of upper and lower pitchers ending with a short (1 cm) neck and a short (1.5 cm) crest pointing outwards; wings of lower pitchers 2-5 cm large, usually curling inwards; pitcher hip in the upper half of the pitcher or absent. [Catalano (2010)].

Distribution: Thailand, provinces of Trang and Phang-nga [Catalano (2010)].

Habitat: In sandy soil, on open savannahs and grasslands, at sea level. [Catalano (2010)].

***Nepenthes mirabilis* (Lour.) Druce var. *mirabilis* Sec. McPherson (2011)**

Distribution: Same as given for the species. [Berendsohn (2017+)].

Nepenthes mollis **Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 338, f. 14. 1928. Sec. Cheek & Jebb (2001)**

Description: Climber, probably terrestrial, height unknown. Stems terete or slightly angular or flattened, 6-9 mm diam., internodes 10-15 cm long, axillary buds 3-10 mm long, inserted 5-10 mm above the node; rosettes and short stems unknown. Leaves of climbing stems coriaceous, sessile, oblanceolate or oblanceolate-spathulate, 18-20 by 3.5-4.5 cm, apex acute, base attenuate, 2 cm wide, subperfoliate-adnate, decurrent as two attenuate wings for 4-6 cm to the node below, wings up to 1 cm wide. Longitudinal nerves indistinct. Pennate nerves oblique, soon curving towards the margin and forming one or rarely two longitudinal nerves near the margin. Lower and upper pitchers not known. Male inflorescence 22-27 cm long; peduncle 7.5 cm long, 4 mm diam. at base; partial peduncles 2-flowered; bracts absent; pedicels 12 mm long; tepals elliptic c. 4 mm long; androphore and anther head 4.5 mm long. Indumentum of stem velvety with dense coarse brown spreading hairs both short and branched and long and simple, up to 2 mm long; the same denser and longer on youngest stem, axils, leaf midrib below and basal part above; the same less dense, shorter and finer on the lower surface of the leaf blade; upper surface of blade densely hairy with short, white, simple hairs; peduncle and rhachis of inflorescence densely hirsute with red-brown hairs; pedicels lower tepals and androphore with short crisped hairs. Colour of herbarium specimen fallow-dun to ochra-ceous brown, the indumentum dark red-brown. [Cheek & Jebb (2001)].

Distribution: Borneo: W Kalimantan (G. Kemal). [Cheek & Jebb (2001)].

Habitat: Dense forest on steep slope; 1800 m. [Cheek & Jebb (2001)].

Notes: The description above is largely taken from that of Danser in Bull. Jard. Bot. Buitenzorg III, 9 (1928) 338. The combination in *N. mollis* of sessile, oblanceolate leaves which are decurrent as wings down the stem, the dense indumentum of simple and branched red hairs, the virtual absence of longitudinal nerves except for their development from the pennate nerves, and the 2-flowered, bractless partial peduncles distinguish it from all other species. It is possible that the only specimen known represents a hybrid between e.g. *N. fusca* and *N. hirsuta*. The type of *N. fusca* was collected from the same locality. The pitchers of *N. mollis* are completely unknown and it is likely that a visit to the type locality is needed before this cryptic taxon is elucidated fully. [Cheek & Jebb (2001)].

Nepenthes monticola **A.S.Rob., Wistuba, Nerz, M.Mansur & S.McPherson, in: McPherson, S., New Nepenthes 1: 543 (-553; figs. 483-491). 2011. Sec. Robinson, Nerz & al. (2011)**

Description: Stems generally up to 4 m tall, strongly climbing, angular in cross section, up to 6 mm in diameter, internodes up to 2 cm long in rosettes, up to 15 cm long in climbing stems. The stem is generally red in colour. Leaves of rosettes thinly coriaceous, lanceolate to linear, 7-12 cm long and 1.8-3 cm wide. Apex of lamina generally acuminate, with a sessile base, clasping the stem by up to ½ its circumference and slightly decurrent. Leaves of climbing stems similar, but more markedly linear, up to 15 cm long, with an attenuate base that becomes strongly decurrent for up to 2 cm, meeting as convergent wings on the opposite side. Longitudinal veins generally inconspicuous, 2(-3) in outer ¼ of lamina. Tendrils generally shorter than pitcher height, 5-12 cm long and uncoiled in rosettes, 10-20 cm long and strongly coiling in climbing stems, up to 2 mm in diameter and not glandular. The foliage is generally dark green, with a reddish midrib and pinkish to red colouration on the adaxial surface of the leaves.

Lower pitchers narrowly ovate in the lower half, narrowing to form a marked waist, cylindric above with a slight constriction below the pitcher opening, up to 12 cm tall and 3.5 cm wide. Wings narrow, to 4 mm wide, with fringe elements up to 7 mm long, spaced 1-3 mm apart. The pitcher opening is positioned at an oblique angle ca. 40° from horizontal, slightly concave in profile, orbicular to broadly ovate and up to 2.5 cm across. The peristome is cylindric, when narrow, to slightly flattened, 2-5 mm across, and of relatively uniform width, but occasionally widening slightly towards the sides and rear of the pitcher where it rises to meet the lid without forming an appreciable column. The peristome is striate, with fine ribs up to 0.1 mm high and 0.2 mm apart, with very fine, almost inconspicuous teeth on the inner margin. The lid is planiform to frequently concave, broadly elliptic with an obtuse to rounded apex and cordate base, up to 4 cm long and 3 cm wide, lacking appendages but with very numerous glands, up to 0.1 mm across, at a density of ca. 1400-2000 cm-². The spur is simple and 2-4 mm long. The pitcher exterior in generally yellowish green, liberally speckled or suffused with red, or entirely red with darker red blotching. The peristome is usually orange to red in colour and not generally striped.

Upper pitchers narrowly ovate in the basal 1/5-1/4, narrowing to form a slight hip and cylindrical above, becoming narrowly infundibular towards the pitcher opening, up to 18 cm tall and 5 cm wide, but usually smaller. The ventral surface is flattened, particularly from the midsection towards the tendril, and punctuated on either side by the wings, which are reduced to prominent ridges. The peristome is of a more uniform width than in the lower pitchers, slightly flattened and up to 5 mm across. The lid is similar to that of the lower pitchers, but proportionally larger, up to 5 cm long and 4 cm wide. The pitcher exterior ranges from pale, yellow with a reddish peristome to pure reddish, the former being much more common. The ventral ridges and the peristome often suffuse dark red with age.

Inflorescence a racemose panicle. Male inflorescence up to 20 cm long, 1.5-3 mm in diameter, peduncle 3-8 cm long, rachis up to 17 cm long, with ca. 65-80 flowers borne on 1-flowered partial peduncles up to 10 mm long,

lacking bracts. Tepals elliptic, with an acute apex, up to 3 mm long and 2 mm wide, androphore 1-1.5 mm long. Female inflorescence up to 14 cm long, 1.5-3 mm in diameter, peduncle up to 8 cm long, rachis 3-6 cm long, with ca. 15-20 flowers borne on 1-flowered partial peduncles up to 6 mm long, lacking bracts. Tepals narrowly elliptic, with an acute apex to obtuse apex, up to 2 mm long and 1 mm wide.
Indumentum generally absent, with very short, sparse, inconspicuous caducous black hairs 0.1-0.3 mm long sometimes present on the abaxial surface of the leaves, the pitcher exterior, tendrils and pitcher buds. [Robinson, Nerz & al. (2011)].

Distribution: Indonesia, New Guinea, West Papua, Papua Province, west central highlands. [Robinson, Nerz & al. (2011)].

Habitat: Terrestrial, occasionally epiphytic; favours bright conditions amongst stunted, mossy, upper montane vegetation 1400-2620 m a.s.l. [Robinson, Nerz & al. (2011)].

Etymology: The specific epithet is derived from the Latin *montanus* (mountain) and *-cola* (dweller), with reference to the high montane forest habitats from which this taxon is known. [Robinson, Nerz & al. (2011)].

***Nepenthes muluensis* M.Hotta in Acta Phytotax. Geobot. 22: 7, f. 2. 1966. Sec. Cheek & Jebb (2001)**

= *Nepenthes sarawakiensis* J.H.Adam & Wilcock in Sarawak Mus. J. 43: 291. 1992.

Description: Terrestrial climber 1-3 m tall. Rosette and short stems unknown, climbing stems slightly flexuose, terete or 2-ridged, (2-)3(-4) mm diam., internodes 1-2 cm long. Leaves thinly coriaceous, sessile, glossy above, those of rosettes with bases semi-amplexicaul, those of climbing stems narrowly oblanceolate-oblong to lanceolate-oblong, 4.2-6.5 by 1.1-1.7(-2) cm, apex acute to rounded, not peltate, base slightly attenuate, clasping the stem for 1/3-1/2 its circumference, not decurrent. Longitudinal nerves 3 or 4 on each side of the midrib, scattered fairly evenly, fairly conspicuous above and below. Pennate nerves numerous, patent, straight, fairly conspicuous above and below. Lower pitchers not seen but reported similar to those of *N. tentaculata* (Clarke in Nepenthes of Borneo (1997) 109). Upper pitchers subcylindrical, the basal 1/4 obcampanulate, gradually becoming slightly constricted in the middle and then dilating slightly at the mouth, (5.2-)6.8-8.5(-9) by (1.4-)1.6-2.2(-2.5) cm, with two narrow, non-fringed wings 0.3-0.7 mm wide; mouth elliptic to broadly elliptic, slightly concave, oblique, peristome rounded, 0.8-1 mm wide, ribs indistinct, c. 0.2 mm apart, outer edge entire, inner edge without teeth; lid orbicular to transversely elliptic, (1.1-)1.5-2.1 by (1.4-)1.7-2.4 cm, apex rounded to truncate, base cordate to truncate, lower sur-face lacking appendages, midrib forking 3-4 mm before the apex; nectar glands conspicuous, sparsely scattered over the whole surface, bordered, circular, 0.1-0.2 mm diam.; upper surface lacking tentacles; spur stout, entire, dorsiventrally flattened, unbranched, 2.5-3 by 1 mm, apex rounded. Male inflorescence 9.5 by c. 1.8 cm; peduncle 1.5 cm long, 1.5 mm wide at base; partial peduncles 1-flowered, bracts absent; pedicels c. 50, 4-6 mm long; tepals elliptic, 3-3.5 by 1.5 mm, apex obtuse; androphore 2-2.5 mm; anther head 1.5 by 1.5 mm. Infructescence c. 8 cm long, with 11-13 fruits. Fruit with valves elliptic, (13-)15-19 by 5.5-7 mm. Seeds c. 90 per fruit, fusiform, 10-12 by 0.6-1 mm. Indumentum of sessile red glands on stem and lower surface of blade; midrib conspicuously pubescent with erect orange-brown simple hairs c. 0.2 mm long; pitcher, including spur, glabrous; inflorescence from peduncle to lower surface of tepals and base of androphore with scattered appressed coppery simple hairs 0.1-0.2 mm long. Colour on drying matt black; live plants with stems black or dark red, “pitchers ranging from dark red to almost black, with cream blotching. Lid of pitcher creamy white, often tinged pink. Lip yellow. Flower pale green maturing brown. Fruit like two pyramids end to end, upper half yellowish, lower half red.” (Lewis 354). [Cheek & Jebb (2001)].

Distribution: Borneo: Sarawak (Mt Mulu, Mt Murud, Batu Lawi, and the Tama Abu Range). [Cheek & Jebb (2001)].

Habitat: Stunted montane forest or ericoid scrub on sandstone ridges; altitude 1750-2400 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes muluensis* is a distinct, slender species not easily confused in the climbing stems and upper pitchers with the only other small highland species in Borneo, *N. tentaculata*. *Nepenthes muluensis* differs in its non-perfoliate-adnate leaves, entire, short spur and orbicular to transversely elliptic lid. The lid and peristome are usually a delicate whitish green or white in colour, contrasting strikingly with the pitcher which is predominantly purple and only lightly blotched with white.
The lower pitchers are reported by Clarke in Nepenthes of Borneo (1997) 109, f. 37 & 73 as being almost identical with those of *N. tentaculata*, with bristles around the edge of the upper surface of the lid. Thus we conclude that the purported hybrid between *N. tentaculata* and *N. muluensis*, *N.sarawakiensis* from Mulu, is probably merely a young plant of *N. muluensis*. Whether the leaves of the short stems are perfoliate-adnate, as characteristic of that species group, is not reported, but this species pre-sumably belongs here. The few-flowered, diminutive, ebracteate raceme and the inconspicuously ridged peristome of *N. muluensis* are all characters seen in the *N. tentaculata* group. Unfortunately all specimens available to us show only the climbing stems and upper pitchers. This is also the case with *N. glabrata* of Sulawesi to which *N. muluensis* is extremely similar, sharing many unusual characters not otherwise seen in the *N. tentaculata* group, such as the plants being glabrous in most parts, in the white lid and white

and red pitcher, in the orbicular to transversely elliptic lid with its unusual nervation, the short, entire spur, the conspicuous bordered nectar glands and the androphore, being hairy at the base. *Nepenthes glabrata* differs in its pitchers being more broadly cylindrical, lacking a campanulate base and in having wings twice as broad as in *N. muluensis*. Its inflorescence indumentum is white, not coppery, and its spur is hairy. Moreover its leaves are twice as long as those of *N. muluensis* and with only 1 (not 3 or 4) pairs of longitudinal nerves.
Belongs to *Nepenthes* sect. *Tentaculatae* Cheek & Jebb. [Cheek & Jebb (2001)].

***Nepenthes murudensis* Culham ex Jebb & Cheek in Blumea 42(1): 66. 1997. Sec. Cheek & Jebb (2001)**

– *Nepenthes murudensis* Culham ex Phillipps & A.L. Lamb, Pitcher Plants of Borneo: 117, f. 63. 1996, nom. nud.

Description: Terrestrial climber to 5 m tall. Stem erect, strongly triangular, 4-5 mm diam., internodes 7-8 cm long, axillary buds rounded, projecting less than 1 mm c. 4 mm above the node. Leaves thickly coriaceous, sessile; oblong-elliptic, 4.5-8.6 by 1.5-3 cm, apex rounded to obtuse, base clasping the stem and adnate, decurrent to 2 cm below the node. Longitudinal nerves 4 or 5 on each side of the midrib, closer together near the margin, conspicuous above and below. Pennate nerves obscure. Lower pitchers unknown. Upper pitchers subcylindrical; 12-25 by 2-5 cm; the basal 1/5 swollen, ellipsoid, in the larger pitchers to 4-5 cm wide, the mouth about the same diameter, both tapering gradually to 2-2.5 cm at the centre of the pitcher; with two ridges to 0.1 cm broad lacking fringed elements; the inner pitcher surface glaucous; mouth ovate, oblique; peristome cylindrical to slightly flattened in section, 1.5-2 mm wide, with very low ribs 0.1-0.2 mm high, 0.4-0.5 mm apart, outer edge not sinuate, the inner edge appearing entire; lid ovate to obovate, 2.7-5.5 by 2-4 cm, apex rounded, base rounded-truncate, lower surface without appendages, nectar glands crater-like, small, rounded, with lumina c. 0.15 mm diam., 320-440 per cm2; spur simple, stout, blunt and slightly flattened, to 9 by 1.5 mm, or filiform with numerous branches, to 9 mm long, puberulent. Male inflorescence to 9 cm long; peduncle to 2.3 cm long; partial peduncles 1-flowered; bracts absent; pedicels 0.4-0.7 mm long; androphore to 2 mm long; anther head to 0.9 mm wide. Infructescence c. 11 cm long; peduncle c. 5 cm long; pedicels 4-7 mm; tepals oblong, 4-4.5 by 1 mm, inner surface densely covered in raised elliptic glands. Fruits with valves 14-22 by 3-4 mm. Seeds filiform, 10 by 1 mm. Indumentum of short dense pale brown velvety, erect 3-5-branched hairs 0.25-0.5 mm long; persisting on stems, midrib and inflorescence axis; leaf blade glabrous; pitcher inconspicuously hairy with scattered appressed, simple white hairs 0.1-0.3 mm long; lid subglabrous; fruit valves with strongly appressed white or brown hairs c. 0.5 mm long. Colour of stem and midribs black; pitchers green, sometimes suffused with red or with black streaks on the back side; inner surface pale green or almost white, glaucous; peristome green or bronze; fruits brown. [Cheek & Jebb (2001)].

Distribution: Borneo: Sarawak, known only from Gunung Murud (also known as Mt Murut). [Cheek & Jebb (2001)].

Habitat: Stunted scrub-forest, or moss forest on sandstone; 2200-2500 m. [Cheek & Jebb (2016)].

Notes: Belongs to *Nepenthes* sect. *Tentaculatae* Cheek & Jebb [Cheek & Jebb (2016)].

Notes: *Nepenthes murudensis* has been confused with the lower altitude *N. reinwardtiana* which it resembles in the shape of the upper pitchers, but differs in lacking the inner pitcher ‘eye-spots’ and visibly perforate inner peristome margin. The stem, leaf shape and aspects of the pitcher morphology and the small inflorescence are those of the variable and widespread *N. tentaculata* with which *N. murudensis* has also been confused. *Nepenthes tentaculata* differs from *N. murudensis* in being a much more slender species with multicellular hairs on an ovate lid. Both *N. reinwardtiana* and *N. tentaculata* have glabrous stems unlike the densely velvety hairy stem of *N. murudensis*.
As first indicated by Phillipps & A.L. Lamb [*Nepenthes reinwardtiana* x *N. tentaculata*?, Phillipps & A.L. Lamb, Nature Malaysiana 13, 4 (1988) 9.], this species is somewhat intermediate between *N. reinwardtiana* and *N. tentaculata*. Indeed, *N. murudensis* may have originated as a hybrid between these two species. With the former it shares a pitcher with a ventricose base, a narrow waist and flared mouth, with the latter it shares a broad adnate leaf, and a fasciculated spur with tentacle-like appendages. The relatively large pitchers combined with the small oblong leaves which clasp the stem distinguishes the species from all others. [Cheek & Jebb (2001)].

***Nepenthes naga* Akhriadi, Hernawati, Primaldhi & M.Hambali in Reinwardtia 12(5): 340 (-342; fig. 1). 2009. Sec. Akhriadi, Hernawati & al. (2009)**

Description: Epiphytic climber to ca. 5 m tall. Stem of rosette and lower parts cylindrical, ca. 1 cm in diameter, internodes ca. 0.7 cm length. Stem of upper parts climbing 100–200 cm, orbicular – quadrangular, ca. 0.8 cm in diameter, internodes 6.8–14.8 cm length, with a spine-like process above each nodes. Leaves of rosette and lower parts leathery coriaceous, sessile, spathulate – oblong, 21–27 by 6.0–7.8 cm, base decurrent for 2/3 of its diameter; midrib sunken above, triangular beneath; longitudinal veins 3 pairs at each side of the midrib, indistinct above and distinct beneath; pinnate veins indistinct at both surfaces, margin entire, apex slightly emarginated – rotundate; tendril inserted ca. 0.3 cm below the apex, 18.5–41.0 cm length. Leaves of upper parts similar to those of the rosette and the lower parts; but spathulate, 10.2–16.0 by 4.5–6.0 cm, decurrent along the stem for 1/2–3/4 of its diameter at the base, apex rotundate; tendril insertion apical, looped, 24.0–28.0 cm length. Rosette and lower pitchers ovoid to

narrowly ovoid at the base to glandular zone extended 1/2–3/4 pitchers high then narrowly cylindrical towards the mouth, 24.0–33.5 by 5.7–6.8 cm; two wings extended down from the edge of the mouth, 10.5–17.3 by 0.5 cm width, with fringed hairs 1.4–1.9 cm in length; mouth ovate, 6.7–8.4 by 2.4–3.7 cm, slightly necked, 45–60 slope; peristome expanded outwards 2.3–5.8 cm wide at each side, curved downward inside the pitcher 0.4–0.8 cm width, 0.5–0.8 cm width in front, with 6–9 lobes on each side, with 3 notches in front with 0.2–0.5 cm width; teeth distinct 0.05–0.1 cm length, 0.3–0.4 cm length at the neck; lid ovate, 7.3–8.5 by 5.0–7.2 cm, base cordate, midrib sunken–grooved above, raised beneath, longitudinal veins 4 or 5 pairs that insertion from the base, distinct above, indistinct beneath; margin undulate, apex rotun- date; 2 appendages along the midrib of the lid beneath, first appendage sharp like teeth 0.6–1.0 cm distance from the midrib base with 0.4–0.7 cm height; second appendage triangular dichotomous appendages like snake-tongue 1.2–2.3 cm distance inserted apically reach 1.0–1.4 by 0.3–0.5 cm, basal of dichotomous appendages 1.4–2.3 cm width; concentrated nectar gland on lid beneath surface along the midrib 0.01–0.05 cm in diameter, larger nectar gland concentrated at dichotomous appendages 0.05–0.1 cm in diameter; spur 0.3–0.6 cm distance below the lid base, 2.1–2.8 cm length, unbranched. Upper pitchers slightly infundibular at the base to glandular zone 1/3–3/4 pitcher high then cylindrical towards the mouth, 20.8–24.3 by 4.0–4.5 cm; wings reduced to rib; mouth ovate, 3.8–5.4 by 3.0–3.5 cm, necked, 45° slope; peristome expanded outwards 1.0–0.5 cm width on both sides, 0.2–0.3 cm width in front; 4–5 lobes each sides, 0–1 notched in front 0–0.2 cm length; teeth distinct 0.05 cm height, 0.1–0.13 cm height at the neck; lid ovate, 5.5–6.1 cm length, 4.3–5.5 cm width, base cordate; midrib grooved above, raised beneath; longitudinal veins 3–4 pairs, distinct above, indistinct beneath; margin undulate, apex rotundate; 2 appendage along the midrib of the lid beneath, first appendage sharp like teeth 0.5–0.6 cm distance from the midrib base with 0.1–0.3 cm height; second appendage triangular dichotomous like snake-tongue 1.1–1.3 cm distance inserted api- cally, each 1.3–1.5 cm length and 0.3–0.5 cm width each blade, basal of dichotomous appendages 1.4–1.5 cm width; concentrated nectar gland on lid beneath surface along the midrib 0.01–0.02 cm in diameter, bigger nectar gland concentrated at dichotomous appendages surface 0.05–0.1 cm in diameter; spur flattened, 1.0–1.4 cm length, 0.2 cm width, 0.4–0.6 cm distance below the lid base, 2 branched near the tip. Female flowers axillary in front of the leaf base, a raceme or a panicle, 14.5 cm length, peduncle 7 cm length, rachis 7.5 cm length, pedicel 0.3–0.5 cm length, pedicel branches 0.5–0.9 cm length; bracteole linear, 0.7–1.2 cm length; tepal linear 0.2–0.5 cm length. Fruit 0.3–1.0 cm length, 0.15–0.4 cm width. Male flowers not found. Indumen- tum of the rosette and lower parts glabrous. Indumentum of the upper parts similar to those of the rosette and lower parts including the female flowers. Colour of herbarium specimen stem blackish brown, leaves above greenish brown and brown beneath, pitchers dark brown in rosette and lower pitcher and bright brown in upper pitcher, lid greenish brown – brown above and dark brown beneath. Colour of living specimen leaves dark green above and pale green beneath, midrib pale green on both sides. Rosette and lower pitchers green – brownish green outside, glandular zone pale green inside, upper zone pale green with dark red blotches inside, mouth dark red – blackish brown; lid green with dark red blotches around the midrib then dark red spots to the margin above, green with dark blotches beneath, teeth-like appendage green on the base of lid beneath, dichotomous appendage dark red on the apical below of lid beneath. Upper pitchers similar to those of the rosette and the lower pitchers, but green at glandular zone outside and with pale dark red toward the mouth, mouth green with dark red lines, lid green – green with dark red spots above, pale green with dark red blotches beneath, dichotomous appendage green with dark red blotches. Fruit brown. [Akhriadi, Hernawati & al. (2009)].

Distribution: Indonesia, Sumatra, North Sumatra [Akhriadi, Hernawati & al. (2009)].

Habitat: Epiphytic in montane mossy forest at 1,500 to 2,000 m a.s.l. [Akhriadi, Hernawati & al. (2009)].

Etymology: The specific epithet naga refers to the dichotomous appendage like snake's tongue inserted sub-apically on the under surface of the lid. Local folklore also includes stories claiming that the habitat of this species was occupied by dragons (‘naga’), long ago. [Akhriadi, Hernawati & al. (2009)].

***Nepenthes nebularum* G.Mansell & W.Suarez in Carniv. Pl. Newslett. 45(4): 133 (131-139, frontisp., fig. 1-3). 2016. Sec. Mansell & Suarez (2016)**

Description: A short stemmed rosette to 60 cm diameter and up to 1.0 m long in low light, usually much shorter. Stems terete and up to 1.5 cm in diameter. Leaves of mature plants to 16.5 cm long by 15 cm wide, broadly truncate, apices cordate-truncate, tips decurrent to tendril, with sub- obtuse and cordate bases tapering down to the petiole. Longitudinal nerves conspicuous 4-6 on each side of midrib, not equidistant, closer together the further away they are from the midrib. Outermost veins not full length. Pennate nerves numerous web like, inconspicuous. Petioles shallowly canaliculate, from 12-15 cm long × 0.6-0.8 cm in diameter near stem. Bases clasping the stem tightly, the wings rolling evenly and tightly, one over the other, over the adaxial canal immediately after leaving the stem, continuing smoothly and tapering slightly to the leaf blade, where they adjoin together. Tendrils ‘D’ shaped in cross-section. At first glance, the tendril appears terete but on closer exami- nation, there are two raised ribs that run from the decurrent leaf tip and increase in size with the tendril thickness as they near the pitcher, where these continue and form the pitcher wings. Pitchers on mature plants are from 25-29 cm long × 7.5 cm at widest point, pubescent to

villous with two distinct types/lengths of ferruginous to golden hairs. Pitcher cylindrical in most part, wider in the upper half slightly constricted in the middle, becoming elliptical in the lower part as it tapers to the tendril attachment, with two prominent fringed wings running +/-parallel up the front of the pitcher and terminating just below the peristome edge. Wings ca. 1.5-1.7 cm with fringe elements from 1.2-1.5 cm long. Mouth horizontal at the front angling gradually up at about 30° and then steeply forming a narrow neck on the pitcher. Hip on pitcher rear at the back of the mouth. Peristome 6-7 cm wide approximately midway around mouth. Flatly rounded down following the rim of the mouth at the front with a pronounced raised triangular fold at the front of the mouth. Rest of peristome flat- tened and flared, gently curving on the outer edge between several undulations forming sharp folds. Coarse ribs – sharp inverted 'V' in section, ca. 2 mm high at 3 mm spacing on the outside edge of the peristome, closer together as they enter the mouth, terminating in sharp tooth like projections extending into the mouth several millimeters. Lid ca.7.5 × 5.5 cm, held approximately horizontal, deltoid-ovate. Front rounded, base cordate. Margins slightly undulate. Top surface covered in short, golden/ferruginous hairs. Noticeably, 2 prominent rows start together from the lid attachment point, curving outwards each side of the indent created from the keel below, and curve back in, nearly meeting, at the front of the lid. There is a slight domed portion near the rear of the lid over the basal appendage below. The lid lower surface has a raised keel running longitudinally. It has a raised vertically flattened, rounded appendage at the rear which is in the domed portion. From about half way along the lid length the keel widens and flattens and the front part forks into a raised, partially hollowed, semi-cone like appendage and tapers down to a stop several millimeters from the front of the lid. The lid is folded down between this apical appendage and creates a pleated recess which can also be seen on the top of the lid as an elongated V-shaped depression. Small, rimmed nectar glands present and numerous on basal appendage and around its base in the recessed area. Slightly larger similar glands sparse around appendage base and continuing sparsely along the keel to the apex of the lid. Lid also covered, +/- evenly spaced, and with minute recessed glands. These do not seem to be nectar glands. Keel, basal appendage recess, and apical appendage all cream/yellow colored, the rest of the lid underside purple/maroon. Spur simple sometimes bifurcating at tip, 2-3 cm long. Female inflorescence up to 120 cm long, 1-flowered in the lower part and then the rest is 2-flowered, no bracts. Peduncles ca. 50 per inflorescence. Male inflorescence ca. 80 cm long, two-flowered, no bracts. Indumentum: Ferruginous dendritic hairs dense on pitcher and tendril ca. 0.25-0.5 mm. Tendril, pitcher lower part, pitcher bud, midrib under leaf and petiole wings densely covered also in tufted (caespitose) ferruginous hairs, sparse on rest of pitcher, ca. 2-3 mm long. Although these hairs are tufted the longest one(s) extend to this length others in tuft are shorter. Short ferruginous/golden hairs are present in a row ca. 3-4 mm running along the inside edge of the lid lower surface, possibly dendritic in shape, 0.1 mm. Leaf upper surface has simple white hairs ca. 3 mm on entire surface. Sparse underneath blade. Leaf margin is edged with ferruginous hairs ca. 1-2 mm. [Mansell & Suarez (2016)].

Distribution: Philippines, known from two disjunct mountains in south-eastern Mindanao. [Mansell & Suarez (2016)].

Habitat: Mainly epiphytic on tall trees in sub-montane forests at altitudes to 1,800 m a.s.l. Sometimes lithophytic on cliff faces. [Mansell & Suarez (2016)].

Etymology: The name originates from the Latin word nebula, meaning clouds. Inflected in the case genitive, nebularum means "cloud loving" and "coming from the clouds". This is in reference to the habitat in which the plants are growing that is frequently covered in fog. [Mansell & Suarez (2016)].

Conservation: Proposed to be classified as 'Data Deficient' under IUCN. [Mansell & Suarez (2016)].

***Nepenthes negros* Jebb & Cheek in Nordic J. Bot. 31(5): 619. 2013. Sec. Cheek & Jebb (2013)**

= *Nepenthes alata* var. *biflora* Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 72. 1908.

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) X (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 X (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 X 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 mm2, mixed with smaller (2–)3–6-armed substellate hairs 0.15(–0.25) mm diameter, 7–9 per mm2; 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 X 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 not developed; lid orbicular, 2.2–4.3 X 2.5–4.0 cm, apex rounded to truncate, base slightly cordate; lower surface with basal appendage asymmetric, 2–4 X 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) X 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 sur- face 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 X 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 X 1.75 mm, ovary stipe 1 mm. Fruit valves 4, narrowly elliptic, 25.0 X 2.5 mm, outer surface patent-puberulent, hairs 0.05 mm long. [Cheek & Jebb (2013)].

Distribution: Philippines, Visayas, Biliran Island and Negros Island. [Cheek & Jebb (2013)].

Habitat: Submontane forest; 1350 m a.s.l. [Cheek & Jebb (2013)].

Etymology: The specific epithet is a noun in apposition. It signals the main home of this species, the Philippine Island of Negros. [Cheek & Jebb (2013)].

Conservation: Assessed as 'Critically Endangered' (CR) under criterion D of IUCN (2001). [Cheek & Jebb (2013)].

***Nepenthes neoguineensis* Macfarl. in Nova Guinea 8: 340, t. 67. 1910. Sec. Cheek & Jebb (2001)**

Description: Terrestrial climber to 10 m or more tall. Climbing stems 4-angular below internodes, rarely with 4 prominent wings, otherwise rounded, 0.3-0.6 cm diam., internodes 1-4 cm long; short stems and rosettes unknown. Leaves chartaceous, petiolate, leaf blades of climbing stems narrowly oblanceolate, 15-35 by 2.5-5(-8) cm, apex acute, base abruptly tapering to winged petiole, petiole 2-7 cm long, clasping the stem for 1/2 its circumference and decurrent down the stem with wings to 4 mm in breadth, 1-10 mm long. Longitudinal nerves 3 or 4 on each side of the midrib running in outer 1/3 of lamina, inconspicuous. Pennate nerves numerous, ascending obliquely and then curving towards the margin; irregularly reticulate in the outer 1/2 of the lamina. Lower pitchers ovoid, becoming cylindrical towards the mouth, but narrowest there, 14 by 4.5 cm, with prominent fringed wings to 10 mm broad, fringe elements to 3 mm long; mouth ovate, acuminate, oblique, straight; peristome flattened, to 8 mm broad, sloping inwards. Upper pitchers subcylindrical and curved over most of their length, gradually originating from the tendril, infundibulate in the lower part, becoming swollen at 2/5 its length, then slightly narrowed and barely widened again towards the mouth, to 24 by 5 cm, the fringed wings throughout the basal curve, often reaching close to the tendril, 5-8(-20) mm wide, fringed elements 3 mm long, 2-5 mm apart; mouth as in lower pitcher; peristome cylindrical or flattened, 1-3 mm broad, ribs 0.25-0.3 mm apart, outer edge entire, inner inconspicuously toothed; lid suborbicular, to 6 cm diam., apex truncate to emarginate, base rounded or cordate; lower surface lacking appendages, nectar glands orbicular, bordered, 0.2-0.3 mm diam., densest and largest about the 2 more prominent lateral veins; spur simple, dorsiventrally flattened, 2-5 mm long. Male inflorescence 35-50 cm long; peduncle 4-12 cm long, 2.5-4 mm diam. at the base; partial peduncles corymbose, (2-)4- or 5-flowered at base, to 5 cm long; bracts present or absent; tepals orbicular-elliptic, 4 mm long; androphore c. 3 mm long. Fruit and seed unknown. Indumentum very sparse, stems glabrous or, in the axils, brown-tomentose; leaves ciliate at the margin with sparingly branched, red-brown hairs 0.5 mm long or shortly hairy on the midrib when young, otherwise glabrous; pitchers densely stellately hairy when young, glabrescent except for a tomentose band below the peristome; lid as the pitcher; spur densely stellately hairy; inflorescence with short, brown or white stellate hairs, densely tomentose on pedicels, tepals and ovary, sparser on peduncle and rhachis, hairs 0.2-0.5 mm long, appressed. Colour of pitchers green. [Cheek & Jebb (2001)].

Distribution: New Guinea mainland and d'Entrecasteaux archipelago [Cheek & Jebb (2001)].

Habitat: River edge and river gravel bars, ridge crests, rarely open grassland or disturbed forest; sea level to 900(-1400) m. [Cheek & Jebb (2001)].

Notes: The curved, upper pitchers with broad, fringed wings which are widest at the base of the pitcher, and the corymbose partial peduncles are diagnostic of *N. neoguineensis*.

The type number has rather poorly developed inflorescences in which the partial peduncles are mostly 2-flowered, and 3-flowered near the base. The bract on the female partial peduncles is not always well developed. The upper pitchers may be strongly infundibulate (i.e. Cycloops Mts near Jayapura), approaching in appearance those of the closely allied *N. paniculata*. This latter species may be distinguished by its wholly infundibuliform upper pitchers (which are neither narrowed nor cylindrical towards the mouth) and the much reduced wings.

We are not certain that we have seen all the duplicates examined by the author of *N. neoguineensis*, since the sheets at Bogor and Kew do not appear to have been used in the production of the protologue plate. [Cheek & Jebb (2001)].

***Nepenthes nigra* Nerz, Wistuba, Chi.C.Lee, Bourke, U.Zimm. & S.McPherson, in: McPherson, S., New Nepenthes 1: 469 (468-491, fig. 401-427). 2011. Sec. McPherson (2011)**

Description: Stems climbing up to 5 m long. The stem of climbing plants is cylindrical or triangular in cross section, up to 12 mm in diameter, with internodes up to 8 cm long. The stem may be green, reddish or entirely black.

Leaves sessile lanceolate, up to 22 cm long and 4.5 cm wide, glabrous. Usually semi-amplexicaul in ground rosettes and wholly amplexicaul in climbing vines. Venation is indistinct. Tendrils are up to 8 cm long and uncoiled in ground rosettes, and up to 20 cm long and usually coiled in climbing vines. All parts of the lamina are yellowish green, except for the midrib, which is light yellow or reddish.

Lower pitcher ovate and inflated in the lower third to half, before narrowing to become cylindrical, slightly infundibular or slightly tapered towards the pitcher opening, up to 23 cm tall and 4.5 cm wide. Wings up to 18 mm wide fringed with narrow filaments up to 12 mm long, run down the front of the pitcher. The pitcher opening is set at an oblique angle and elongated below the lid. The peristome is cylindrical, though often flattened, and up to 4 mm wide. It is lined with thin, blade-like ribs up to 2 mm high and spaced up to 2 mm apart. The ribs are elongated on the inner margin to form narrow, needle-like teeth up to 4 mm long. The teeth are particularly long below the lid. The lid is cordate to ovate with an obtuse apex, up to 4 cm long and 3 cm wide. The lid lacks an appendage. The spur is filiform and up to 8 mm long. The upper surface of the pitcher lid is lined with narrow, occasionally branching filaments up to 2 cm long. The filaments generally emerge around the margins of the upper surface of the lid, and are often arranged in dense bundles close to the spur. The pitcher exterior is black or very dark brown, and variably mottled with small patches of dull green or yellow. In exceptional plants, the exterior of the pitcher may be entirely black. Often, the indumentum of the pitcher may cause the exterior surface to appear brown or orangey. The peristome is entirely black, although the blade-like ribs and teeth of the peristome are often yellowish green for several days after the pitcher opens, darkening with age. The interior of the pitcher and lower surface of the leaf are white or pale purple. The lower surface of the lid is yellowish green or reddish, and the upper surface is black or brown with small, yellowish green flecks.

Nepenthes nigra exhibits the tendency to produce large numbers of intermediate pitchers, which resemble lower and upper traps, but bear prominent wings and a tendril attachment from the back of the pitcher. Intermediate pitcher may be the predominant pitcher type produced prior to the development of a climbing stem. True lower pitchers are produced only very briefly by seedlings and young plants.

Upper pitchers are ovate in the lower quarter to third, before narrowing to become cylindrical towards the pitcher opening, up to 14 cm tall and 3.5 cm wide. The front of the pitcher is flat, broad, and lacks wings (in contrast to the intermediate pitchers). The pitcher opening is set at an oblique angle, and is slightly elongated below the lid. Filaments may be present on the upper surface of the lid, but usually in smaller numbers than in lower pitchers if expressed at all. The peristome is tightly cylindrical, up to 4 mm wide, and in contrast to the lower pitchers, lacks blade-like ridges, being instead lined with flat ribs up to 0.5 mm high, spaced up to 0.5 mm apart. The ribs may form teeth up to 0.5 mm long on the inner margin. All other parts are similar to the lower pitchers. The colouration of the upper pitchers is consistent with the lower traps, except that the peristome is often pure, yellowish green, becoming brown or black as it ages, and the interior of the pitcher is pale yellowish green or white.

Remarkably, the distinctive black colouration of the lower and upper pitchers of *Nepenthes nigra* seems to develop even in semi-shaded conditions and not as a consequence of intense sunlight. Even so, cultivated specimens often develop reddish brown pitchers.

Inflorescence is a racemose panicle, bearing up to 80 flowers. The peduncle is up to 35 cm long and 8 mm wide at its widest point. The partial peduncles are 1-flowered. The lowermost flowers may have bracts. Tepals are oblong to lanceolate. The androphore is usually 2-3 mm long as the flowers open, lengthening to 7 mm long as pollen is shed. The fruit are up to 2.5 cm long. Valves 3 to 5 mm wide, not strongly attenuate towards both ends. Seeds filiform, up to 15 mm long. All parts of the male inflorescence are pale yellowish green, except for the anther heads, which are

pinkish red prior to the shedding of pollen.
Indumentum of soft, orangey brown hairs up to 1.5 mm long covers the exterior of the pitchers, the upper surface of the lid, the tendrils and often the developing fruit. The leaves and stem are glabrous. [Nerz, Wistuba & al. (2011)].

Distribution: Indonesia, Sulawesi [Nerz, Wistuba & al. (2011)].

Habitat: Terrestrial in mossy montane forest, montane shrub and in small open clearings and on cliff sides, epiphytic in thick moss cushions on smaller cloud-forest trees; 1500-2700 m a.s.l. [Nerz, Wistuba & al. (2011)].

Notes: Belongs to *Nepenthes* sect. *Tentaculatae* Cheek & Jebb [Cheek & Jebb (2016)].

Etymology: The specific epithet is derived from the Latin *nigra* (black) and refers to the distinctive colouration of the pitchers and stem. [Nerz, Wistuba & al. (2011)].

***Nepenthes northiana* Hook.f. in Gard. Chron. n.s. 16: 717, t. 144. 1881. Sec. Cheek & Jebb (2001)**

= *Nepenthes decurrens* Macfarl. in Kew Bull. 1925(1): 35. 1925.

= *Nepenthes nordtiana* Boerl. in Handl. 3(1): 54. 1900.

= *Nepenthes northiana* var. *pulchra* Hort. ex Macfarl. in Bail. Std. Cycl. Hort. 4: 2129. 1922.

= *Nepenthes spuria* Beck in Wiener Ill. Gart.-Zeitung 20: 187. 1895.

Description: Terrestrial shrub or climber, 1-4 m tall. Stems 4-6-angular-rounded, 1-2.2 cm diam., with 4 wings, each c. 5 mm wide, decurrent from the leaf base above and abruptly uniting above the axil below, and on the same side of the stem; short shoots with internodes c. 1 cm long, wings forming a saddle-like shape; climbing shoots with internodes 7-8 cm long. Leaves coriaceous, sessile to weakly petiolate; leaves of short shoots long-elliptic to spathulate, 20-59 by 7-11 cm, apex acute with tendril peltate by several mm, base attenuate, forming an ill-defined, winged petiolar area 2-4.5 cm wide, clasping the stem for 1/2 its circumference, the wings decurrent, initially sheathing, then patent; leaves of climbing stems narrowly oblong-elliptic to ligulate, 37-60 by 4.4-6.5(-9) cm. Longitudinal nerves 3 (or 4) on each side of the midrib in the outer half, prominent above and below. Pennate nerves patent, straight, little branched, conspicuous above and below. Lower pitchers recumbent, ellipsoid, 14-36 by 5.8-12.5 cm, with two fringed wings 5-10 mm wide, the fimbriae 5-7 mm long, 2-4 mm apart; the mouth oblique, slightly concave, narrowly ovate; peristome flattened, with ribs 0.2-0.3(-0.5) mm high, 0.7-1 mm apart, 5 or 6 striae between each ridge, outer edge of peristome 12-40 mm broad, gradually widening towards the lid, dentate, folded into 12-16 shallow teeth 3-7 mm long, inner edge appressed to pitcher wall, 5-10 mm wide, the margin with falcate teeth 1 mm long; column absent; lid as large or larger than mouth, held at 45° elevation from mouth, narrowly elliptic, 5.5-15 by 3.2-5 cm, apex rounded, base cordate, lower surface lacking appendages, midrib raised, glands restricted to a thickened area about half the width of the lid and running nearly its length, absent from the midrib, circular or transversely elliptic, bordered, black, 0.2-0.3 mm diam.; spur c. 5 mm long, entire. Upper pitchers cylindrical-infundibulate, 20-36 by 6-8 cm, fringed wings running the length of the pitcher, 3-4 mm wide, fimbriae 3-7 mm long; peristome rounded, 2.5-4 cm wide in the widest part, ribs to 1 mm high; lid 7-9 by 3-4 cm. Male inflorescence c. 145 by c. 10 cm; peduncle 33 cm long, 7 mm diam. at base; partial peduncles 2-flowered, 7-22 mm long; bracts 2-3 mm long, absent in some inflorescences; pedicels 17-35 mm long; tepals ovate, 3.5-4 by 2.5-3 mm; androphore 1-3 mm long; anther head 1.5-2 by 2-3.5 mm. Infructescence c. 103 cm long; peduncle 46 cm long, 1 cm wide at base, with a pulvinus c. 1.5 cm wide; partial peduncles 4-5 cm long; pedicels 2.8-3.2 cm. Fruits with valves 25-28 by 3.5-4 mm. Seeds fili-form, 8 by 0.3 mm (probably immature). Indumentum of sessile red glands on lower surface of leaf blade and outer pitcher and lid intermixed, on the outer pitcher, with simple, patent red hairs 0.5 mm long; partial peduncles to lower surface of tepals and ovary fairly densely covered in coppery coloured, 1 or 2 branched appressed hairs 0.3 mm long. Colour of the pitcher yellow or pale green marbled red; peristome red often striped yellow and green; lid pale green suffused with olive. [Cheek & Jebb (2001)].

Distribution: Borneo: Sarawak (near Bau). [Cheek & Jebb (2001)].

Habitat: Bare or lightly wooded limestone cliff faces and slopes with permanent water seepages; 40-800 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes northiana* is restricted to limestone in a small area of Sarawak. It is not likely to be confused with any other species in Sarawak on account of the very large, ovoid, recumbent lower pitchers with a broad, sinuate peristome protected by a narrowly elliptic lid. *Nepenthes mapulensis*, which occurs also on limestone, on the opposite side of Borneo, shares these characters, but is immediately distinguished by its terete, puberulent, flexuose stems which lack the unusual saddle-shaped ridges seen on the short stems of *N. northiana*.
Nepenthes decurrens, based on a specimen with only upper pitchers, was possibly described because, at that time, the only specimens of *N. northiana* available to Macfarlane had lower pitchers. *Nepenthes northiana* is only known from the Bau region near Kuching, whereas the type of *N. decurrens* was said to have been collected at Baram. If the Baram referred to is the Baram River, some 500 km to the north-east, it seems astonishing the species has not been recollected there or found in the other limestone areas in between. Hewitt's numbering system provides no positive clue, but it is of note that a specimen of *Trevesia burckii* Boerl. (Araliaceae) at K also bears the number

Hewitt 100, and was collected on Mt Poi near Kuching.
Beck based his *N. spuria* on part of Hooker's original protologue of *N. northiana*. He regarded the English text and f. 144 to represent a separate species. There seems no justification for this.
This species came to the attention of the world through a painting by Marianne North. When this was seen by the nurseryman Harry Veitch, he arranged for his collector Charles Curtis to obtain the plant for his London nurseries from whence Hooker described it from live plants and dried pitchers.
Plants of this species growing in open rocky places will flower freely as non-climbing shrubs, lacking upper pitchers. However, in lightly wooded areas, upper pitchers, as well as lower, are abundantly produced (pers. obs.). [Cheek & Jebb (2001)].

***Nepenthes orbiculata* M.Catal. & Kruetr. in AIPC Mag. 50: 40. 2018. Sec. Catalano (2018)**

Description: Upright shrub, adult plants can grow up to 1.5 m tall but the species is mostly found at the rosette stage, with scrambling stems up to 50 cm long. Stems terete, 5-10 mm in diameter. Leaves chartaceous, lamina lanceolate, to 25 cm long, 3-8 cm wide, with or without fimbriate margins, apex acute or acuminate, base subpetiolate to petiolate, semiamplexicaul; longitudinal veins 3 on each side of the midrib, pinnate veins numerous; tendrils terete, up to 25 cm long, two to four times the pitcher's length, 2 mm in diameter. Lower pitchers 8-12 cm long, 5-7 cm wide, ovoid to ellipsoid, a hip corresponding to the edge of the glandular zone runs horizontally along the base of the peristome on the front of the pitcher and about 2 cm below the lid's base at the back; body length/mouth length: 1.7-3.3, body length/width: 1.6-2.3; two alae, 1-3 cm wide, run down ventral exterior sur- face from mouth to tendril, fringed with narrow filaments 2-10 mm long; pitcher mouth oblique, oval to broadly oval, acute towards the lid; peristome flattened, 8-10 mm wide, teeth 0.5-1 mm long, ribs to 1 mm wide; lid orbicular to elliptic, 3-5 cm long, 2.5-5 cm wide, 2/3-3/3 as large as the mouth, slightly cordate at base, 2 main longitudinal veins and 4-8 smaller radiating veins on each side of midrib, numerous crateriform glands to 1 mm in diameter densely arranged along the sides of midrib, rare or absent along the centre; a glandular boss about 2 mm long and 1 mm wide is present on the lid's lower surface, close to the apex; spur 5-10 mm long, simple or rarely branched. Upper pitchers 10-15 cm long, 4-7 cm wide, obconic to obovoid; alae 1-20 mm wide; mouth, peristome and lid as for lower pitchers. Indumentum: plants can be glabrous or entirely covered by an arachnoid indumentum. Colour: leaves and midrib green to red, stem and tendril red; lower pitchers bright to dark red outside, often with light green to white hues especially in the upper part, light green to white inside, peristome entirely red or light green to white along the outer margin and red along the inner margin, lid green to red; upper pitchers light green outside and inside, peristome light red or green along the outer margin and red along the inner margin, lid green. [Catalano (2018)].

Distribution: Peninsular Thailand, Phang Nga Province. [Catalano (2018)].

Habitat: In sandy soil, in savannahs and grasslands, at sea level. [Catalano (2018)].

Notes: Putative relatives: *N. orbiculata* is closely related to *N. mirabilis*, but the two are easily told apart by the shape of the lower pitchers (globose in the former, elongate in the latter) and by the position of the pitcher hip (just below the lid in the former, at the centre or in the lower half in the latter). *Nepenthes orbiculata* is also closely related to *N. mirabilis* var. *globosa*, and telling them apart can be tricky: the former always has globose lower pitchers with a hip just below the lid, the latter can have that same kind of pitcher but also more elongated ones, with lower hips; the former is a low shrub, 50-150 cm long, the latter can climb up to 5 m; the former is sympatric with *N. mirabilis*, the latter isn't.
The glandular boss under the lid's tip is always present in *N. orbiculata* and *N. mirabilis* var. *globosa* and it's very common in *N. mirabilis*. All three taxa can have leaves with fimbriate margins and be glabrous.
Nepenthes growers have often pointed out the presence of a rhizome in *N. orbiculata*. We did observe an underground stem in the latter, which lead us to examine and compare the root systems of the three taxa, to then find out that they are too variable to draw any line of separation.
Nepenthes growers should take into account that a specimen of *N. orbiculata* that is immature, etiolated or introgressed with *N. mirabilis* has pitchers with lower hips, so it becomes even more difficult to distinguish from a specimen of *N. mirabilis* var. *globosa*. [Catalano (2018)].

Notes: At the only two known locations, just a few kilometres one from the other, this species is sympatric with *N. andamana* and *N. mirabilis*. Although the hybrid *N. andamana* x *mirabilis* is the most common, representing up to one third of the local *Nepenthes* population, the hybrids between *N. orbiculata* and the other two taxa are also frequent. In these very diverse colonies, *N. orbiculata* occupies a somehow intermediate niche: *N. mirabilis* grows along the edge between the forest and the savannah, *N. andamana* in the savannah, and *N. orbiculata* in the waterlogged spots of the savannah; near ponds or streams, *N. mirabilis* grows 0-1 m from the water, *N. orbiculata* 2-3 m from the water and *N. andamana* from 0 m from the water onwards. The inflorescence of this species has been rarely observed in the wild and it's mostly known from photos and cultivated specimens, but it doesn't seem to differ from the ones of *N. mirabilis* and *N. mirabilis* var. *globosa*. [Catalano (2018)].

***Nepenthes ovata* Nerz & Wistuba in Carniv. Pl. Newslett. 23(4): 108 (-111, fig. 4). 1994. Sec. Cheek & Jebb (2001)**

Description: Epiphytic, rarely terrestrial shrub or climber to 1 m tall. Stem terete, climbing stem 4-6 mm diam., internodes 4-15 cm, axillary buds barely visible. Leaves thinly coriaceous, sessile, those of rosettes oblanceolate-spathulate, 10-15 by 2-3 cm, apex shortly acuminate, base attenuate, 1-1.5 cm wide; leaves of climbing stems oblanceolate-spathulate, 5-16.5 by 2.5-3.5(-5.7) cm, apex acuminate, barely peltate, base attenuate, 1.2-1.4 cm wide, clasping the stem for 9/10 its circumference, decurrent for 3-7 mm down stem, wings 2-4 mm wide. Longitudinal nerves 3 on each side of the midrib in the outer 1/2, fairly conspicuous. Pennate nerves, arising obliquely, then patent, straight, inconspicuous. Lower pitchers broadly ellipsoid, 10-15(-25) by 5-8(-9) cm, the upper half mostly occupied by the mouth; with two fringed wings 2-5 mm wide, fringed elements 3-10 mm long, 1-5 mm apart; mouth ovate, oblique, highly concave, the rear elevated to form a conspicuous vertical or overhanging column; peristome mostly flat, in the front half of the pitcher 3-8 mm broad, in the rear half of the pitcher, including the column, 15-25(-40) mm wide, the ribs c. 1.5 mm apart, c. 1 mm high, papery, striate, outer edge of the peristome with 8-11 shallow lobes 1-10 mm long, inner edge with conspicuous teeth, at the rear half of the mouth, teeth 1-7 mm long, projecting outwards from the column, in the front half of the mouth teeth inconspicuous or to 3 mm long; lid elliptic, 5.5-7 by 4.5-6 cm, apex rounded, base shallowly cordate, lower surface with a laterally flattened symmetrical or recurved appendage 2-5 mm high, 5-9 mm long, 5-13 mm from the base of the lid on a keel 10-25 mm long, 1-2 mm high, running along the midline, nectar glands circular, 0.1-0.2 mm diam. with a thin raised border, fairly dense on the appendage and along the basal 2/3 of the midline in a band 0.5-1.5 mm wide on each side of the keel, otherwise absent, the keel with a few large elliptic glands up to 0.3 mm long; spur 8-9 mm long, entire or divided into two arms for half its length. Upper pitchers infundibuliform, 12-18 by 4.8-6 cm, the base 1.5-2 cm wide, slightly contacted at the mouth, with two ridges; mouth as in the lower pitchers, but peristome and column reduced, peristome c. 3 mm wide in the front half, c. 14 mm wide in the rear half, inner edge with teeth curved, c. 3 mm wide in the rear, 1 mm long in the front half; lid broadly ovate, 32 by 33 mm, apex truncate to shal-lowly retuse, base truncate to shallowly cordate, lower surface and spur as the lower pitcher. Male inflorescence reported as 9 cm long; peduncle 4 cm long, 2 mm diam. at base; partial peduncles 1-flowered; bracts basal, filiform, c. 5 mm long; pedicels 5 mm long; tepals, ovate-lanceolate, 3 by 2 mm; androphore c. 3 mm long. Indumentum of sessile glands 0.1 mm diam. on stem, upper and lower surface of leaf, outer pitcher and lid; pitcher, including lid and spur, puberulous with sparsely scattered white simple hairs c. 0.5 mm long. Colour of lower pitchers, including the lid, green, inner pitcher green mottled red, peristome brilliant scarlet; upper pitchers yellow, peristome red with yellow stripes. [Cheek & Jebb (2001)].

Distribution: Sumatra (N): Mt Pangulubao, Mt Sipualai [Cheek & Jebb (2001)].

Habitat: Epiphytic in open, wet mossy forest; 1800 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes ovata* is easily distinguished from all other Sumatran species by its conspicuous, laterally flattened, sometimes hooked, basal lid appendage. It appears confined to the Lake Toba area. Its upper pitchers are most similar in shape to those of *N. bongso* which occurs in a disjunct area to the south.
The description above is partly taken from the protologue. [Cheek & Jebb (2001)].

Notes: First noted by Hopkins, Maulder, Maulder & Salmon in Carniv. Pl. Newslett. 19: 21 & 25. 1990. - http://legacy.carnivorousplants.org/cpn/articles/CPNv19n1_2p19_28.pdf. This was cited in the list of synonyms by Jebb & Cheek (2001). [Berendsohn (2017+)].

***Nepenthes palawanensis* S.McPherson, Cervancia, Chi.C.Lee, Jaunzems, Mey & A.S.Rob., in: McPherson, S., Carniv. Pl. Hab. 2: 1332 (-1339; figs. 783-789). 2010. Sec. McPherson (2011)**

Description: Terrestrial upright to scrambling unbranched shrub, to 1 m tall.
Stem: Cylindrical, 2.5-3.5 cm in diameter, internodes 2.3-4.5 cm long. Climbing stems unknown.
Leaves: Petiolate, lamina elliptic to oblong, 20-45 cm long and 6-15 cm wide, apex obtuse or occasionally retuse, not peltate, base shortly attenuate, sessile or sub-petiolate, amplexicaul, clasping the stem by two thirds to four-fifths its circumference, decurrent along internode for 2-3 cm. Tendril to 60 cm long, uncoiled.
Lower Pitchers: up to 34 cm tall and 13 cm wide, infundibular in the lower half, cylindrical towards the pitcher opening with little to no constriction. Wings variable, up to 19 mm wide with narrow filaments up to 16 mm long, or reduced to ribs throughout. Pitcher opening oblique, oval or circular, up to 14 cm wide, elevated towards the lid, elongated into a neck. Peristome cylindrical, occasionally slightly flattened, to 24 mm wide, ribs up to 3 mm high, spaced up to 3 mm apart, forming elongated teeth on the inner margin of the peristome up to 6 mm long. Inner surface glandular. Peristome expanding below the lid and up to 3 cm wide. Lid held horizontally, elliptic, with a cordate base, 14 cm long and 6.5 cm wide. No appendage or keel. Spur substantial, up to 14 mm long and up to 5 mm wide at base.
Upper Pitchers: Unknown from type locality.
Inflorescence: A raceme. Male inflorescence up to 70 cm long, 1 cm wide at base, with unusual, ciliate, decurrent

bract-like outgrowths of the rachis. Pedicels one-flowered, occasionally two-flowered at base. Female inflorescence up to 115 cm long, 1 cm wide at base. Pedicels one-flowered, occasionally two-flowered at base. Fruit to 8 mm long, seeds filiform, c. 7 mm long, pale brown.
Indumentum: Present on underside of midrib, floral organs and leaf margins, consisting of simple, densely arranged, caducous hairs to 1 mm long, reddish-copper in colour, changing to silvery white. Hairs up to 4 mm long on tendrils.

Colour: Foliage green with dark red or purple colouration present on the adaxial surface of the midrib. Pitchers may be green, mottled red or purple on the interior and exterior, with bands of purple or black on the peristome; or, the pitchers may be entirely orangey-red on the exterior, yellowish green with dark purple blotches on the interior, and the peristome striped with bands of colour. [McPherson, Cervancia & al. (2010)].

Distribution: Philippines, Palawan, Sultan Peak; 1100 - 1236 m a.s.l. [McPherson, Cervancia & al. (2010)].

Habitat: *Nepenthes palawanensis* grows exclusively in exposed areas of upper montane scrub above 1100 m on the summit and summit ridge of Sultan Peak. It is absent from the shrubby, montane forest that covers the slopes of the mountain below the summit region and does not occur in dense vegetation over 1 m high on the summit. All populations occur in exposed, sunny habitat. [McPherson, Cervancia & al. (2010)].

Etymology: The species epithet commemorates the fact that this spectacular species is endemic to Palawan. [McPherson, Cervancia & al. (2010)].

***Nepenthes paniculata* Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 344, f. 15. 1928. Sec. Cheek & Jebb (2001)**

Description: Terrestrial (probably) climber to 7 m tall. Stems terete 0.5-1 cm diam., internodes 3-10 cm long, rosette and short shoots unknown. Leaves coriaceous, petiolate, those of climbing stems with blade narrowly elliptic or lanceolate, 20-30 by 4-7 cm, apex acuminate, base gradually attenuate into a narrowly winged petiole 3-9 cm long, base of petiole a semi-amplexicaul sheath, not decurrent. Longitudinal nerves 3 or 4 on each side, in outer 1/3 of the lamina. Pennate nerves numerous, running obliquely to margin and there forming an irregular network. Lower pitchers unknown. Upper pitchers gradually originating from the tendril, wholly infundibuliform, 8-11 by 3-5 cm, with 2 prominent ribs, occasionally narrowly winged in the upper part, wings fringed; mouth suborbicular, straight, oblique; peristome flattened 4-10 mm broad, ribs 0.5-1 mm apart, outer edge entire, inner conspicuously toothed; lid suborbicular, 4-4.5 by 4.5-5 cm, apex rounded, base cordate, lower surface lacking appendages but with thickened midline, nectar glands small, orbicular, bordered, scattered over the entire surface apart from the margin; spur entire, 3 mm long, apex acute. Male inflorescence c. 30 cm long; peduncle c. 10 cm long, 3 mm diam. at base; partial peduncles 5-flowered at base, c. 3 cm; bracts absent; tepals orbicular-elliptic, 2.5-3.5 mm long; staminal column and anther head c. 2 mm long. Fruit and seed unknown. Indumentum mostly absent; pitchers sparsely brown tomentose when young, glabrous when mature; as is the inflorescence, indumentum persisting only on the pedicels and tepals. Colour of stems and leaves light green, pitchers yellowish green, peristome dark green, inner pitcher with violet spots, lid yellowish green suffused with red below and with violet spots below; peduncle green with a red hue; tepals light green at first, later dark red; androphore light green. [Cheek & Jebb (2001)].

Distribution: New Guinea: Irian Jaya (Doorman). [Cheek & Jebb (2001)].

Habitat: Mossy forest on ridge top; 1460 m. [Cheek & Jebb (2001)].

Notes: This species is closely related to *N. neoguineensis* and the means of distinguishing them are slight: the partial panicles of the inflorescence are not corymbiform; the upper pitchers are wholly infundibulate, and not narrowed at the mouth, and have much reduced wings; the peristome is broader, more rounded, and has more widely spaced ribs (0.6-1 mm vs. 0.25-0.35 mm); the numerous, large (0.5 mm), lipped glands are present on the upper surface of the leaf sheaths, and scattered along the upper sides of midrib (absent in *N. neoguineensis*).
Nepenthes paniculata is only known from the type number and more collections and observations are needed. The description above is largely taken from that of Danser in Bull. Jard. Bot. Buitenzorg III 9 (1928) 344. [Cheek & Jebb (2001)].

***Nepenthes pantaronensis* Gieray, Gronem., Wistuba, Marwinski, Micheler, Coritico & V.B.Amoroso in Plants (Basel) 3(2): 286 (-289, fig. 1). 2014. Sec. Cheek & Jebb (2001)**

Description: The stem is up to 3 m long, cylindrical in the cross-section, 0.9–1 cm in diameter, with internodes up to 13 cm long.
Leaves of the basal stem are linear to oblong, up to 28 cm long and 5 cm wide, with two longitudinal veins on each side of the midrib and numerous pinnate veins running obliquely towards the leaf margins. The apex of the lamina is acute, the base attenuate and forming a canaliculate petiole that is strongly decurrent down the full length of the internode. The tendrils are up to 34 cm long and mostly coiled. All parts of the foliage may be yellowish green.
Leaves of the climbing stem form a broad-winged petiole that is also strongly decurrent. In all other respects, they are consistent with the leaves of the basal stem.

Lower pitchers are up to 35 cm tall and 6 cm wide, though usually smaller. The bottom quarter to third of the pitcher is variably inflated, sometimes to the extent that the basal part is bulbous. Above the broad lower section, the pitcher narrows, becoming cylindrical or very slightly infundibular towards the pitcher opening. Wings are usually reduced to ribs, although occasionally, some fringes are present below the pitcher opening. The pitcher opening is oblique and up to 5 cm wide. The peristome is flattened, up to 2.5 cm wide and particularly broad around the sides and below the lid. The peristome is lined with ribs up to 2 mm high, spaced up to 2 mm apart. The ribs are elongated on the inner edge of the peristome to form narrow teeth up to 3 mm long. The lid is ovate, up to 7 cm long and 6 cm wide, with glands densely and evenly distributed over the lower surface. A prominent, triangular, hooked and keeled appendage up to 5 mm long is present on the underside of the lid. The spur is unbranched and up to 5 mm long. The exterior of the lower pitchers is greenish or slightly orange, with narrow orange-red blotches. The interior of the pitcher is white or light yellowish green, lined with small, angular blotches of purple-red. The peristome is red, variably striped with bands of yellow, orange and purple. The lower and upper surface of the lid is bright red.
Upper pitchers are up to 40 cm long and 5 cm wide, though usually smaller. The bottom fifth to quarter of the trap is inflated and bulbous, narrowing above this part before becoming cylindrical towards the pitcher opening. Some of the upper pitchers are narrower above the bottom fifth to quarter of the trap, while others are almost cylindrical with almost no narrowing. Wings are indiscernible. The peristome is up to 1 cm wide, cylindrical or slightly flattened, lined with ribs up to 1 mm high, spaced up to 1 mm apart. In all other aspects, including coloration and color variability, the upper pitchers are consistent with the lower ones, although some upper pitchers are entirely green with no blotches.
The inflorescence is a panicle, up to 29 cm long, composed of a 19.5 cm-long scape and an additional 9.5 cm rachis bearing pedicels evenly scattered along its length. The pedicels are about 2 cm long, branched and one- or two-flowered. Bracts are absent.
Indumentum is present across the foliage, inflorescence and pitchers, consisting of orangey brown hairs up to 1 mm long. [Gronemeyer, Coritico & al. (2014)].

Distribution: Philippines, Mindanao Island, Bukidnon Province, Pantaron mountain range. [Gronemeyer, Coritico & al. (2014)].

Habitat: Epiphytic on high trees in lower montane forest. [Gronemeyer, Coritico & al. (2014)].

Etymology: The specific epithet denotes that *N. pantaronensis* was discovered in the Pantaron mountain range. [Gronemeyer, Coritico & al. (2014)].

Conservation: Assessed as NT (near threatened). [Gronemeyer, Coritico & al. (2014)].

***Nepenthes papuana* Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 346, f. 16. 1928. Sec. Cheek & Jebb (2001)**

Description: Terrestrial climber to several m tall. Climbing stems terete, 5-7 mm diam., internodes 5-7 cm long. Leaves thinly coriaceous, sessile or weakly petiolate, those of climbing stems lanceolate or narrowly elliptic, 15-30 by 2.5-5 cm, apex acute, base attenuate into a weakly formed petiole up to 4 cm long, semi-amplexicaul at base, not sheathing or decurrent. Longitudinal nerves 4-6 on each side of the midrib, running parallel in the outer 2/3 of the lamina, highly conspicuous. Pennate nerves running obliquely towards the margin, and there irregularly reticulate, inconspicuous. Lower pitchers, of the rosettes, obliquely ovoid in the lower part, gradually narrowed towards the mouth, 3-6 by 1.25-2.5 cm, 1-1.75 cm broad at the mouth, with 2 fringed wings over the whole length, 2-4 mm broad, fringe elements 1-2 mm long, 0.5 mm apart; mouth ovate, oblique, slightly concave; peristome cylindrical, 1-2 mm wide, ribs 0.5 mm apart, outer edge entire, inner edge conspicuously toothed; lid suborbicular 1-2 by 1-2 cm, apex round, base slightly cordate, lower surface lacking appendages, nectar glands densest in centre, absent from base of lid and marginal 2 mm, minute, orbicular, thinly bordered or volcano-like, 0.1-0.2 mm diam.; spur entire, dorsiventrally flattened, surrounded by filiform appendages. Upper pitchers subcylindrical, basal 1/3 slightly ventricose, upper 2/3 tubular or slightly attenuate and dilated at the mouth, 12-15 by 2.5-3 cm, with 2 narrow wings 1-3 mm wide, fringed or not, fringe elements up to 3 mm long, up to 2 mm apart; mouth broadly ovate, oblique, straight; peristome slightly flattened, 1-2 mm wide, ribs 0.5 mm apart, outer edge entire, inner toothed; lid orbicular, 2.5-3.5 by 2.25-3.25 cm, lower surface lacking appendages, nectar glands densely set near base of midrib, as lower pitcher. Male inflorescence c. 25 cm long; peduncles c. 6 cm long, 2 mm diam. at base; partial peduncles 1-flowered; bracts absent; pedicels 5-10(-15) mm long; tepals suborbicular 3 by 2.5 mm; androphore 3-4 mm long including the anther head. Fruit with valves lanceolate, 25-35 by 3-5 mm. Seeds filiform 12-15 mm long, centre transversely wrinkled. Indumentum absent from stem; leaf with midrib densely and shortly brown tomentose, leaf margin densely brown velvety hairy; pitchers densely and shortly stellately hairy when young, more sparse later; inflorescences densely brown tomentose when young, more sparse later, androphore sparsely hairy, fruit densely hairy. Colour of upper pitchers green, mouth and lid with red spots; lower pitchers more densely red spotted. Dried specimens a characteristic reddish brown colour. [Cheek & Jebb (2001)].

Distribution: New Guinea: southern Irian Jaya (Fakfak to Balim Valley). [Cheek & Jebb (2001)].

Habitat: Forest edges and forest on white sand soils; 250-900 m. [Cheek & Jebb (2016)].

Notes: *Nepenthes papuana* has subcylindrical upper pitchers with a somewhat narrow peristome and resembles *N. mirabilis* in general appearance. It differs in its more leathery leaf blades with somewhat indistinct pennate nerves, the blades of lower rosette pitchers lack the fimbriate margin of this latter species, while the upper pitchers have blades with a pubescent margin below. *Nepenthes papuana* might also be confused with, and is possibly most closely related to *N. neoguineensis*. The latter differs mainly in the paniculate inflorescence, the conspicuous pennate nerves and the curved upper pitchers with wings broadest at the base, towards the tendril.
Ridley incorrectly identified the first known material of this species, from the Wollaston expedition, as *N. neoguineensis* Macfarl. [Cheek & Jebb (2001)].

Nepenthes parvula **Gary W.Wilson & S.Venter in Phytotaxa 277(2): 200 (-203, fig. 1, 3). 2016. Sec. Wilson & Venter (2016)**

Description: Erect subshrub 0.35(–0.50) m tall. Stems circular in cross section (diameter 2.5–5.0 mm), internodes 0.5–5.0 mm long at base and 2.0–10.0 mm near apex; indumentum tomentose with white-coloured simple hairs and dark-coloured stellate hairs. Lower leaves coriaceous, sessile, linear-lanceolate, 10–25 × 5–10 mm, slightly to moderately arched, apex attenuate-acute, base contracting gradually towards the petiole, clasping the stem for 2/3 of its circumference, margin sparsely fimbriate; longitudinal nerves 4–6 per side, evenly spaced; pennate nerves rectangular with longitudinal nerves. Tendril straight, 5–10 mm long, about 0.8 mm in diameter, insertion simple; indumentum as stem. Upper leaves coriaceous, sessile, linear-lanceolate, 30–90 × 7–14 mm, moderately arched, V-shaped in cross section, apex attenuate-acute, base contracting gradually towards the petiole, clasping the stem for 2/3 of its circumference, margin entire (rarely slightly fimbriate); longitudinal nerves 3–4 on each side of the midrib, on outer 3/5 of blade, pennate nerves rectangular with longitudinal nerves, except between the outermost nerve and margin where they are at 45°. Tendril kinked (sometimes coiled) 30–60 mm long, 0.8–1.0 mm diam., insertion simple; indumentum as stem. Lower pitchers ovoid, 15–30 × 5–10 mm, constriction below midpoint, nectar gland density 900–1200 per cm2; alae extend length of pitcher but reducing towards the base, fimbriate in upper portion, fimbriae 0.4–1.2 mm long; mouth oblique and subovate; peristome subcylindrical to slightly flattened, 0.4–1.2 mm broad, ribs 0.05–0.2 mm apart, 0.05–0.10 mm high, outer margin entire, revolute, inner margin dentate, teeth slightly curved; lid sub-orbicular, 5–14 × 3.2–13.0 mm, flat, no appendage, apex rounded; crateriform glands evenly distributed; spur straight, simple (sometimes bifurcate or multiple), 1.0–3.5 mm long. Upper pitchers cylindrical, 35–60 × 10–15 mm, constriction below midpoint, nectar gland density 1200–1500 per cm2; alae reduced to ridges with an entire margin, 0.1–0.3 mm wide; mouth oblique and subovate; peristome subcylindrical to slightly flattened, 1–2 mm broad, ribs 0.15–0.4 mm apart, 0.05–0.15 mm high, outer margin entire, revolute, inner margin dentate, teeth slightly curved, 0.1 mm long; lid sub-orbicular, 10–20 × 10–15 mm, vaulted, lower surface consistently deep red in colour, no appendage, apex rounded (sometimes slightly indented); crateriform glands evenly distributed, 250–300 per cm2, suborbicular 0.15-
0.20 mm, with a thin marginal rim; spur straight, simple (sometimes bifurcate), 2.5–6.0 mm long. Male inflorescence a raceme, up to 100 mm long, peduncle 25–50 mm long; bracts absent; rhachis 25–50 mm long, indumentum dense except on adaxial surface of tepals and staminal column, hairs simple, white; up to 50 flowers, 1(–3)-flowered, pedicel 2.5–5.0 mm long, no bracteole; tepals 2.0–3.5 × 1.0–2.5 mm, nectar glands on red-coloured adaxial surface of tepals; staminal column 0.8–1.3 mm long, anther-head about 1.5 mm in diameter. Female inflorescence up to 100 mm long, peduncle 40–60 mm long, bracts absent; rhachis 40–60 mm long; up to 35 flowers, partial-peduncle 1-flowered, 3-locular, pedicel 2.5–5.0 mm long, no bracteoles; tepals 2.5–3.0 × 1.5 mm, nectar glands on red-coloured adaxial surface of tepals, indumentum dense except on adaxial surface of tepals and stigma surface, hairs simple, white; capsule 3.5–6.0 mm long and seeds 2.7–3.5 mm long. [Wilson & Venter (2016)].

Distribution: Australia, Queensland, Cape York [Wilson & Venter (2016)].

Habitat: Freshwater swamps, at 0–30 m a.s.l. Regional Ecosystem 3.3.64a “Palustrine wetland (e.g. vegetated swamp)". [Wilson & Venter (2016)].

Etymology: The epithet parvula refers to the small size of mature plants. [Wilson & Venter (2016)].

Conservation: Conservation Status of Vulnerable under the criterion B1a+B2a of IUCN (2015) is proposed. [Wilson & Venter (2016)].

Nepenthes pectinata **Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 350, f. 17a, b, d. 1928. Sec. Cheek & Jebb (2001)**

= *Nepenthes melamphora* var. *tomentella* Becc., Malesia 3: 13. 1886.

– *Nepenthes rosulata* Tamin & M. Hotta, in: Hotta, M., Divers. & Dynam. Pl. Life Sumatra: 95, f. 4. 1986, nom. nud.

= *Nepenthes xiphioides* Salmon & Maulder in Carniv. Pl. Newslett. 24: 78, f. 1 & 2. 1995.

Description: Terrestrial climber to 4 m tall. Stems terete to 1 cm diam. Leaves thinly coriaceous, more or less sessile; those of climbing stems elliptic-spathulate to oblong, 15-27 by 3-6 cm, apex acute to acuminate, base cuneate or broadly winged, clasping the stem and decurrent for 1-3 cm. Longitudinal nerves 3 or 4 on each side of the midrib, scattered throughout lamina, innermost arising from midrib. Pennate nerves numerous, arising obtusely and forming a net-like pattern with the longitudinal nerves. (Leaves of ro-settes usually highly reduced, sometimes as small as 3 by 0.7 cm, triangular in outline, dilated at the base, and clasping the stem, sometimes forming a sheath, with penninervous venation only, only the largest ones with the beginning of longitudinal veins).
Lower pitchers ellipsoid-urceolate, narrowing towards mouth, 6-16 by 2-6.5 cm, with 2 fringed wings 2-5 mm wide, fringe elements 2-4 mm long; mouth ovate, acute to acuminate towards lid, slightly concave, oblique; peristome rounded at front, expanded towards sides and narrowing towards lid, 2-12 mm wide, with prominent, papery, thin ribs 0.8-2 mm apart, 0.5-1.5 mm high, outer edge entire, inner with teeth 2-4 mm long; lid ovate 2-7.3 by 1.5-5.3 cm, apex rounded, base truncate to cordate, lower surface lacking appendages, nectar glands few, prominently lipped, 0.1-0.5 mm wide, near midline and towards base of lid only, absent from margin; spur filiform or flattened, rarely many branched, 1-4 mm long.
Upper pitchers apparently only produced rarely, or (?) only in some populations (e.g. G. Malintang), somewhat ventricose in lower half, tubular above; 7-22 by 1.5-4.5 cm, with two fringed wings to 0.5 cm wide, fringe ele-ments to 0.6 cm long; peristome expanded towards lid, to 2.5 cm wide, outer edge entire, inner with teeth to 1 cm long; lid broadly ovate, lower surface lacking appendages, nectar glands numerous near midline, largest in centre of lid, to 0.8 mm wide.
Male inflorescence similar to that of *N. gymnamphora* to 50 cm long; partial peduncles 2-flowered near base, 1-flowered above, with a filiform bract near base, rarely wholly 1-flowered, to 0.5 mm long; pedicels to 1.5 mm long; tepals to 5 by 2.5 mm; androphore to 5 mm long; anther head to 1.5 mm wide.
Indumentum densely brown tomentose on young pitchers, hairs stellate, c. 0.1 mm wide; leaf margin often with dense brown indumentum on lower surface; inflorescence axis and pedicels densely pubescent. Colour of lower pitchers green, densely blotched with maroon. [Cheek & Jebb (2001)].

Distribution: C Sumatra. [Cheek & Jebb (2001)].

Habitat: Undisturbed dense forest, hill dipterocarp forest or wet mossy forest on ridge tops; 950-2750 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes pectinata* is very closely related to the Javanese *N. gymnamphora*. They differ in that the leaves of *N. pectinata* are more gradually attenuate to the base, and decurrent down the stem, the margin of the blade is usually densely pubescent below, and the whole plant is generally more tomentose. The peristome teeth of the lower pitchers of *N. pectinata* are longer than those of *N. gymnamphora*. Upper pitchers are not often produced, whereas they are regularly found in *N. gymnamphora*. *Nepenthes pectinata* can be distinguished from *N. bongso* and *N. singalana* by its large upper leaf blades which are decurrent down the stem; from *N. bongso* it is further distinguished by its long peristome teeth and because its upper pitchers, when produced, are subcylindrical, not infundibulate.
Authors prior to Danser usually treated the Sumatran *N. pectinata* only as a variety of the Javanese *N. gymnamphora*. Danser described *N. pectinata* from mixed material based on *N. pectinata* and *N. singalana*. Schlauer & Nerz Blumea 39 (1994) 139-142 were the first authors to recognise this and lectotypified with a specimen of *N. pectinata* (which they recognised as *N. gymnamphora*). Tamin & M. Hotta in Diversity & Dynamics of Plant Life in Sumatra (1986) did not recognise the presence of *N. pectinata* (or *N. gymnamphora*) in Sumatra, referring the majority of collections to *N. singalana*, and establishing the invalid name *N. rosulat*a for specimens of *N. pectinata* from G. Gadut and G. Talang. [Cheek & Jebb (2001)].

Nepenthes peltata **Sh.Kurata in J. Insectiv. Pl. Soc. 59(1): 12 (-17; fig. 1; photogrs. 1-10). 2008. Sec. McPherson (2009)**

Description: Stem short, rigid to 1 m hight, occasionally scrambling and to 3 m long.
The lamina is oblong, up to 50 cm long and 9 cm wide. The leaf apex is rounded and the leaf base is abruptly contracted and petiolate. The leaf tip is strongly peltate, the tendril emerging up to 27 mm from the apex of the leaf. The petiole is up to 7 cm long, and is canaliculate. The petiole is reduced or absent in seedlings and juvenile plants. The leaves are generally flat, but the margins may be variably upturned. They are also very distinctive because the upper surface of the leaf is dark green, and the lower surface is usually, though not always, dark red. The midrib is yellow or light green, and the stem, petioles and tendrils may be yellow, green, orange or reddish. The stem, petioles, tendrils, and lower surface of the leaves are lined with coarse, long, brown hairs. These hairs may be absent or sparsely scattered over the upper surface of the leaves and pitchers.
The lower pitchers are variable in size and shape. They are up to 28 cm tall and 16 cm wide, and may be wholly ovate, ellipsoidal, or urceolate. Wings up to 10 mm wide, fringed with filaments up to 9 mm long, run down the front of the lower pitchers. The peristome is loosely cylindrical, up to 2 cm wide, and expanded towards the sides

and back of th pitcher opening. The peristome is lined with ribs upt to 1.5 mm high, spaced up to 2 mm apart. Sometimes the ribs are elongated on the inner edge of the peristome to form teeth up to 1 mm long, but such teeth are often lacking. The peristome is slightly raised at the back of the pitcher opening, immediately below lid. The outer margin of the peristome is recurves and often crenellated. The inner edge of the peristome extends into the pitcher opening for several millimetres, particularly below the lid. The lid is elliptic or ovate, up to 8 cm long and 6 cm wide. A well-formed appendage is generally lacking, but a pronounced keel, somewhat triangular in shape, may sometimes be present; if so, this keel is apparent close to the base of the lid and may extend downwards for a few millimetres. Many large, conspicuous nectar glands up to 3 mm wide are distributed across the underside of the lid. The spur is narrow, unbranched, up to 12 mm long and is often hairy.
The colouration of the lower pitchers is exceptionally variable. The exterior may be yellow, orange, pink, red or purple, mottled with dark purple or black blotches. The interior of the trap is light yellow or green, often faintly flecked with dark red or purple. The peristome may be bright yellow, orange, red, or purple, often striped with variable bands of yellow, orange or red. The lid may be yellow, orange, red or dark reddish purple, and is often decorated with dark red, purple or black blotches and flecks.
The inflorescence is a raceme, to 75 cm long by 3.5 cm at the widest point, but up to 6.5 cm wide in the female. The peduncle is up to 46 cm long and up to 9 mm in diameter at the base, the rachis to 20 cm long. Flowers are borne on predominantly 2-flowered partial peduncles up to 3 mm long, with a narrow bract 4-7 mm long towards the base, on pedicels to 14 mm long. Tepals are ovate with an acute apex and up to 4 mm long. The anther head is borne on a column up to 4 mm long. Fruits are 20 mm long and seeds approximately 4 mm long. [McPherson (2009)].

Distribution: Philippines, Mindanao, Mount Hamiguitan [McPherson (2009)].

Habitat: Terrestrially in mossy, upper montane forest, amongst degraded or recovering secondary vegetation, on exposed cliffsides and lanslide areas, and alongside stunted scrub on ridge tops; 865 - 1635 m a.s.l. [McPherson (2009)].

***Nepenthes pervillei* Blume in Mus. Bot. Lugd.-Bat. 2: 10. 1852. Sec. Jebb & Cheek (1997)**

≡ *Anurosperma pervillei* (Blume) Hallier f. in Beih. Bot. Centralbl., Abt. 2 39(2): 162, in obs. 1921.

= *Nepenthes wardii* E.P.Wright in Trans. Roy. Irish Acad. 24: 576, t. 29, 30. 1869.

Description: Stems climbing and scrambling, to 8 m long.
Juvenile plants form compact rosettes with many leaves that slowly increase in successive size, each with a very long lower-pitcher-bearing tendril. Maturing plants form stems up to 8 m long that climb and scramble trough surrounding vegetation, and bear leaves with coiling tendrils that fasten to surrounding objects (mainly branches) for support. The foliage of such stems rarely produce pitchers, but spaced along the lengthy internodes are compact aerial rosettes with sessile leaves. These rosettes bear distinct upper pitchers attached at the end of short and robust, bent (but never twining) tendrils. Some rosettes continue to grow and eventually form stems (causing the plant to branch), and repeated branching can cause established *N. pervillei* plants to cover the ground or the canopy with a dense carpet of pitchers. Sometimes differing pitcher colouration enables the observer to account masses of pitchers to just a few large plants growing next to each other.
The transition from juvenile plants with lower pitchers to adult plants forming climbing stems is abrupt, and rarely observed since pitchers of the climbing shoots are suppressed and so intermediate pitchers are generally not produced. Sometimes one or two greatly reduced, very small upper pitchers develop as a climbing stem is produced - these traps are similar to upper pitchers, but more slender and attached to twining tendrils.
The lamina is elliptic or oblong, up to 29 cm long and 6 cm wide. The apex of the leaf is rounded or obtuse and the base is attenuate, clasps the stem and may be slightly decurrent. The appressed blades of developing leaves simply open like a book to reveal the upper surface of the leaf, whereas in all other species of *Nepenthes*, the blades of developing leaves unfurl laterally, being initially curled in towards the midrib (Alastair Robinson, pers. comm.). The lamina has a very shiny surface and is dark or bright green. The stem may be yellow, green or (most usually) bright red. The midrib and tendril are yellow or orange. Most parts of the foliage appear predominantly glabrous, however, young and small (developing) pitchers, as well as the lower part of open traps and the part of the inflorescence may be lined with uniseriate hairs similar to those found on *N. distillatoria* and *N. madagascariensis*.
The lower pitchers are up to 12 cm tall and 4 cm wide. The bottom third to half of the pitcher is ovate and variably swollen, sometimes becoming almost spherical. The pitcher narrows above this part, often forming a faint hip, and becomes cylindrical or slightly infundibular towards the pitcher opening. Wings up to 8 mm wide, fringed with filaments up to 4 mm long, run down the front of the lower pitcher and are often positioned close to one another. The peristome is glossy, up to 6 mm wide, and is lined with fine ribs up to 1 mm high, spaced up to 0.5 mm apart. These ribs are often hardly discernible. There is often a gap of a few millimetres at the back of the peristome, below the lid. The lid is sub-orbicular, flat, up to 5.5 cm in diameter, lacks an appendage, and bears 30-100 nectar glands on the lower surface. The spur is up to 7 mm long and is usually forked.
The exterior of the lower pitcher is entirely reddish orange or reddish purple. The interior of the pitcher is light pink

or almost white, and the peristome may be yellow, green, orange or red. Both sides of the lid are the same colour as the pitcher exterior.
The upper pitchers are borne on extremely short, rigid tendrils, often just a few centimetres long. The tendrils never coil or twine, but may be S-shaped. The pitcher opening of the upper traps always points away from the apical bud. Old pitchers usually turn downwards when dying (perhaps serving to release the nutrients and fluid in the traps into the soil). The dead upper pitchers are long lasting, and clothe the stem before detaching (Eric Schlosser, pers. comm.). The upper pitchers are up to 16 cm long and 4.5 cm wide. The bottom third to half of the pitcher is infundibular and variably inflated, and on the interior surface, is lined with digestive glands. Above this part, the width of the pitcher narrows (with a distinct hip) and becomes cylindrical or infundibular towards the pitcher opening. The relative proportions of the pitchers vary considerably between different plants and populations. Sometimes the upper, infundibular part of the pitcher is reduced to only one quarter of the length of the trap, whereas in other individuals it may be greatly lengthened. Usually the width of the pitcher narrows and is cylindrical immediately below the peristome. The peristome is up to 3 mm wide, and is lined with fine ribs up to 1 mm high, spaced up to 0.5 mm apart. Wings are consistently reduced to narrow ridges that run down the front of the trap or are not discernible at all. The lower surface of the lid is evenly lined with 100-200 nectar glands. Larger glands are found in the centre of the lid, but all glands are grown over by the epidermis leaving only a tiny exit hole for the nectar. The digestive glands at the bottom of the pitcher are located right next to the inner surface and their density is 400-600 cm². The density reduces higher up the pitcher, at which point they are almost covered.
The upper pitchers are usually coloured, and typically pure yellow or yellowish green, suffusing orange or reddish as they age. The lid may be the same colour as the pitcher, or its lower surface may be pure bright red.
The inflorescence is a loose panicle, 40 cm long, branches with up to 12 male or up to 5 female flowers. The peduncle is up to 18 cm long and up to 3.5 mm in diameter at the base, the rachis is up to 25 cm long. The tepals, which are fused at the base and occasionally number 3 instead of 4, are ovate with an acute apex and 3-4 mm long. The anther head is borne on a short column usually less than 2 mm long. The fruits are approximately 8-14 mm long and atypical of *Nepenthes* in that they are obconic (not attenuate towards both ends) and open with three valves (not four). The seeds are characteristically short, black in colour and ovoid or truncate in form. The distinctive seed of *N. pervillei* lack wings, are only 2-4 mm in length, and are carried poorly in the wind. This distinctive seed structure is a clear adaption towards inselberg habitat, as it reduces the likelihood that seed is blown far from the plants and lost at sea. [McPherson (2009)].

Distribution: Seychelles, Mahé and Silhouette [Jebb & Cheek (1997)].

Habitat: Amidst dense but low growing scrub on granitic outcrops and hillsides, usually in strong or direct sunlight; 350 - 750 m a.s.l. [McPherson (2009)].

Etymology: The specific epithet honours French plant collector Auguste Pervillé who visited the Seychelles in 1841 and was among the first naturalists to make detailed observations of this plant. [McPherson (2009)].

***Nepenthes petiolata* Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 353, f. 18. 1928. Sec. Cheek & Jebb (2001)**

Description: Terrestrial climber to at least 1 m tall. Stem shape and diam. unknown. Leaves thinly chartaceous, petiolate, blade elliptic-oblong, 10-15 by 3-5.5 cm, apex acute, base cuneate, tapering into the petiole; petiole 5.5-6 by 0.3-0.5 cm, subcanaliculate, wing 1-2 mm wide, clasping the stem for 2/3 its diameter and sheathing. Longitudinal nerves 3 or 4 each side of the midrib in the marginal third, conspicuous. Pennate nerves normal or slightly oblique, branching before reaching the longitudinal nerves, branches reaching the margin. Intermediate pitchers only known, subcylindrical, the lower half slightly dilated, the upper half shortly cylindrical, 7-13 by 2-4 cm; with two fringed wings in the upper 2/3, the wings to 3 mm broad, the fringed elements c. 4 mm long, c. 3 mm apart; the mouth ovate-acuminate, concave, oblique, rising gradually from the front to form a broad, vertical column for the lid at the rear; peristome flattened to 9(-15) mm broad near the lid, ribs 1(-2) mm apart, high, outer edge slightly sinuate, inner edge long-dentate; lid broadly ovate to broadly elliptic, 3.5 by 3 cm, apex rounded, base rounded, then abruptly and inconspicuously cordate at the spur; lower surface lacking appendages or barely carinate at the base, nectar glands scattered, inconspicuous, thinly bordered, longitudinally elliptic, or orbicular, c. 0.2 mm diam.; spur unknown. Inflorescence unknown. Fruit and seed unknown. Indumentum of leaf margin ciliate, hairs 0.8 mm long, tendril, pitcher and midrib villose to puberulent with hairs 0.4 mm long. Colour of pitchers olive and maroon, mouth maroon, peristome crimson. [Cheek & Jebb (2001)].

Distribution: Philippines: Mindanao (Agusan&Surigao Provinces). [Cheek & Jebb (2001)].

Habitat: Montane or submontane forest including *Agathis* and Oak, possibly on ultramafic soils; 1500 m. [Cheek & Jebb (2001)].

Notes: Characterised by its slender pitchers which lack appendages on the lower surface, by its thin, deeply flanged peristome ribs, with long flattened teeth, and also by the petiolate leaves. *Nepenthes petiolata* is unlikely to be confused with any other Mindanaoan species. *Nepenthes mira* is probably the most similar Philippine species but differs in the broadly ellipsoid lower pitchers and infundibuliform upper pitchers.

This species is only known from three incomplete specimens. No fertile material is known. The affinities of this species are unclear and more collections are needed if this is to be rectified. [Cheek & Jebb (2001)].

***Nepenthes philippinensis* Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 43. 1908. Sec. Cheek & Jebb (2001)**

= *Nepenthes wilkiei* Jebb & Cheek in Kew Bull. 53: 966. 1998.

Description: Terrestrial climber to 10 m tall. Stem terete, 3.5-5 mm diam., internodes 2-5 cm long on climbing part; axillary buds inconspicuous. Leaves chartaceous, sessile, those of climbing stems oblanceolate-ligulate 14-28 by 1.7-3.6 cm, apex acute, base more or less parallel-sided, clasping the stem by a 1/3-1/2 its circumference, then decurrent in two wings, each 3 mm wide, extending 2-3 cm below the node, sometimes converging to only 4 mm apart on the opposite side to the leaf blade. Leaves of short stems and rosettes oblong-spathulate, up to 16 by 3.2 cm. Longitudinal nerves 4 or 5 on each side of the midrib, in the outer half of the blade, conspicuous. Pennate nerves numerous, at 45° from the midrib, branching sporadically, proceeding more or less straight to the margin, conspicuous on the upper surface. Lower pitchers ovoid in the lower 1/2-2/3, cylindrical towards the mouth, 8.5-16 by 3.5-8.5 cm (the cylindrical portion 2.2-3.8 cm wide), with two fringed wings each 2-4 mm broad with fringed elements 3-7 mm long, 2-4 mm apart; mouth oblique, ovate, 3-5 by 1.5-2.5 cm; peristome rounded, 1.5-2 mm wide in the front, or more usually unevenly flattened, 2.5-8.5 mm wide at the sides of the mouth, ribs 0.3-0.5 mm apart, conspicuous, about 0.1 mm high, outer edge with one or two shallow lobes, inner edge lacking teeth; lid broadly ovate to suborbicular, 2.6-3.7 by 2.5-3.2 cm, apex rounded or truncate, slightly retuse, usually with a slight fold, base slightly cordate; lower surface lacking appendages, glands sparsely scattered, absent from the midrib area (in a band c. 6 mm wide) and the marginal 2 mm, shortly elliptic or circular, crater-like, 0.2-0.3 mm long; spur unbranched, straight or curved, 3-4(-5) by 0.8 mm. Upper pitchers subcylindrical, slightly inflated in lower third, 18 by 4 cm (2.9 cm wide in the upper part), with two ridges 0.1-0.2 cm broad, lacking wings with fringed elements, otherwise as the lower pitchers. Male inflorescence 67 cm long; peduncle 18 cm long; partial peduncles c. 130, 2-flowered, 2.5-3(-4) mm long; bracts absent; pedicels 5-9 mm long; tepals 3-3.5 by 2-3 mm; androphore 3-4 mm long; anther head 1.25(-1.75) mm wide. Fruits and seeds unknown. Indumentum of sessile glands on lower surface of leaves and on exterior of pitchers; exterior of pitchers with scattered, unequally 2-5 armed red hairs 0.1-0.4 mm tall; inflorescence and lower surface of tepals pubescent with dull red-brown erect hairs 0.1-0.2 mm long. Colour of stems pale greyish brown with white waxy bloom; petioles red or green; pitchers green, speckled maroon in lower half, maroon speckled green in upper half; peristome maroon, inside of pitcher and lid green speckled maroon or entirely red, sometimes the whole pitcher maroon; flowers brown. [Cheek & Jebb (2001)].

Distribution: Philippines: Palawan. [Cheek & Jebb (2001)].

Habitat: Scrub on ultramafic soils; 25-520 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes philippinensis* is an addition to the *N. hirsuta* group (Jebb & Cheek in Blumea 42 (1997) 7), previously thought to be confined to Borneo and centred in the north-east of that island. Of the species in that group, *N. philippinensis* is most closely related to *N. macrovulgaris*, a species confined to Sabah and, like *N. philippinensis*, apparently restricted to ultramafic areas. The species of this group are all low altitude species (only *N. macrovulgaris* sometimes occurs above 1100 m) with a well-developed rosetted, non-climbing phase (in some species, e.g. *N. hirsuta*, the climbing stems usually have few, and rather diminutive upper pitchers compared with the lower pitchers of the rosettes). In all species of the *N. hirsuta* group, both lower and upper pitchers are 'hipped', i.e. with an ovoid base and a cylindrical apex; the upper pitchers are never infundibuliform. The pitchers have oblique mouths, held at 45° from the vertical, lack a column, and have a cylindrical peristome c. 5 mm wide with a tendency, usually seen in some of the lower pitchers of most plants, to be slightly flattened with 1-3 shallow lobes at each side. Their lids lack appendages and their inflorescences have 2-flowered partial peduncles usually bearing small filiform bracts.

Nepenthes philippinensis Macfarl. has long been passed over. It was originally published without an illustration and the type was destroyed at PNH. No duplicate of the type has been located. On the basis of the description, it was ascribed to synonymy under *N. alata Blanco* (Jebb & Cheek in Blumea 42 (1997) 15) to which it is superficially similar though it lacks a lid appendage. However, a duplicate of the only other specimen cited in the protologue, Curran 3896, has now been located. Examination of the lid shows the characteristic gland distribution and slightly retuse apex of *N. wilkiei* and there is no doubt that the type of the latter is conspecific with Curran 3896.

The earliest illustration that we have traced for this species is Mann Carnivorous Plant Newsl. 27 (1998) f. 5 . According to Mendum and Wilkie (pers. comm.) Mann's description of the site at which he discovered in October 1996 "an unknown species from Palawan Island" is identical to the site at which they collected the type of *N. wilkiei* climbing on trees of *Gymnostoma*. Mann's figure 5 matches their material closely. [Cheek & Jebb (2001)].

***Nepenthes pilosa* Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 355, f. 19. 1928. Sec. Cheek & Jebb (2001)**

Description: Terrestrial or epiphytic climber 2-3 m tall. Climbing stems terete, 6-9 mm diam. Leaves coriaceous, petiolate; leaf blades of climbing stems oblong to elliptic, (10-)18-24.5(-30) by (4.5-)6.6-8.5 cm, apex obtuse to truncate, base obtuse; petiole 2.5-7 cm long, wings 3-4 mm wide, clasping the entire stem, forming a laterally flattened sheath. Longitudinal nerves 3 on each side of the midrib in the outer 1/3, conspicuous. Pennate nerves indistinct. Lower pitchers not known. Upper pitchers slightly infundibulate or cylindrical, laterally compressed, 16-24 by 5-6.5(-9) cm, wings absent, with two ventral ridges; mouth ovate, oblique, concave, rising to the vertical at the rear, forming a short column; peristome mostly cylindrical, sometimes slightly sinuous, 4-6(-10) mm broad at the front, ribs (0.15-)0.3-0.5 mm apart, outer margin entire, inner edge obscurely dentate, teeth 0.3-0.5 mm long with subapical aperture; lid orbicular, 4.2-6 (-8.2) by 4.2-6.5(-8.7) cm, apex rounded, base cordate, lower surface lacking an apical appendage, basal appendage strongly hooked towards the base, laterally flattened, c. 7 mm high, 10 mm long; spur c. 14 mm long, unbranched. Inflorescence known only from fruiting fragment, partial peduncles 2-flowered. A single male flower with pedicel 10 mm long; tepals oblong 5 by 3 mm; androphore 3 mm long; anther head 1.25 by 1.25 mm. Fruit valves c. 30 mm long. Seed fusiform, 13-14 mm long, smooth. Indumentum densely villose, the hairs 4-6 mm long, soft, golden to rust coloured on all surfaces apart from upper leaf blade and inside of pitcher, sparingly hairy on outer pitcher. Colour of outer pitcher pale or yellowish green, peristome sometimes with red streaks. [Cheek & Jebb (2001)].

Distribution: Borneo: Kalimantan, Sabah, and Sarawak. [Cheek & Jebb (2001)].

Habitat: Mossy forest on sandstone; (1000-)1600-1800 m. [Cheek & Jebb (2001)].

Notes: [Move to Typification] The pitcher of the type specimen at BO is badly damaged, and the lid has lost the diagnostic apex of the basal crest. For this reason we propose the epitype above. The illustration in the protologue indicates that the pitcher of the type was not entirely representative of *N. pilosa* in shape, but this seems within the bounds of infraspecific variation. [Cheek & Jebb (2001)].

Notes: *Nepenthes pilosa* is one of the Bornean species of the *N. maxima* group. It is similar and sometimes confused with *N. stenophylla*, but has laterally compressed yellowish green pitchers which lack red or white blotching, with a strongly hooked basal lid appendage and uniformly longer, denser indumentum. *Nepenthes pilosa* is widespread throughout Borneo, but rare and incompletely studied: only six collections are known to us. These vary widely in their pitcher proportions. Clarke in Nepenthes of Borneo (1997) 115 reports on the ecology of *N. pilosa*. [Cheek & Jebb (2001)].

***Nepenthes pitopangii* Chi.C.Lee, S.McPherson, Bourke & M.Mansur in Gard. Bull. Singapore 61(1): 95 (-99; fig. 1). 2009. Sec. Lee, McPherson & al. (2009)**

Description: Terrestrial climber to ca 2 m tall. Climbing stems cylindrical to slightly triangular in cross-section, particularly towards the developing shoot, 3-5 mm diam., internodes (4.1-) 6.4-9 cm long. Leaves of the climbing stems chartaceous, sessile, lanceolate, apex acute, (10.1)11.5-14.4 (15.6) cm long, (2)2.5-2.9 (3.4) cm wide; base clasping stem for about 2/3 its circumference; longitudinal veins 3-4 on each side of the midrib, pennate nerves inconspicuous; tendrils with a curl in the middle, 24-25 cm long. Rosette pitchers unknown. Upper pitchers wholly infundibuliform, 3.8-4.5 cm high, 3.3-3.7 cm wide, slightly contracted just below the mouth; pitcher mouth horizontal in front and slightly elevated towards the lid attachment; peristome cylindrical, 1-3 mm wide, with distinct ribs, ca 0.45 mm apart, each rib terminating in a blunt rounded tooth on the inner margin; interior of pitcher without waxy zone, glandless immediately below peristome (ca 4 mm), otherwise evenly covered with glands ca 200 per cm2, yellow in color above pitcher fluid, black in color where immersed; lid suborbicular, 2.9 by 2.8 cm, held horizontally over pitcher mouth, sides somewhat raised, lower surface without appendages, evenly distributed with small crater-like rimmed glands; spur simple, ca 1.5 mm long. Male inflorescence (measurements taken from living specimens) a raceme, 37 by 2.5 cm; peduncle 18 cm long, 0.3 cm diam. at base, pedicels 7-9 (-11) mm long, each bearing a single flower, bracts usually absent but occasionally towards base of inflorescence pedicels with small filiform bract, ca 0.5 mm long inserted at about half the length of the pedicel, tepals elliptic, ca 2 mm long, staminal column 2.5-3.0 mm long. Female inflorescence and fruit unknown. Indumentum absent on all parts of plant except for the developing pitcher and tip of the tendril, which are covered with caducous silver-brown hairs. Color of living specimens: leaves light green with red margins and red midrib on upper and lower surface; stems dark red to purple with green spots; tendril red; upper pitchers pale yellow with orange-red stripes, interior if pitcher and underside of lid pale yellow; peristome orange-red. [Lee, McPherson & al. (2009)].

Distribution: Indonesia, Central Sulawesi, Lore Lindu National Park. [Lee, McPherson & al. (2009)].

Habitat: Secondary vegetation in submontane forest at an altitude of 1800 m. [Lee, McPherson & al. (2009)].

Notes: Belongs to *Nepenthes* sect. *Tentaculatae* Cheek & Jebb [Cheek & Jebb (2016)].

Etymology: This species is named for Dr. Rahmadanil Pitopang, curator of the herbarium of Universitas Tadulako, who has studied the flora of Central Sulawesi for over 18 years. [Lee, McPherson & al. (2009)].

Conservation: IUCN Red List classification of "data deficient" (DD) proposed. [Lee, McPherson & al. (2009)].

***Nepenthes platychila* Chi.C.Lee in Gard. Bull. Singapore 54(2): 257 (-261, fig. 1). 2002. Sec. Lee (2002)**

Description: Terrestrial or epiphytic climber to 4 m tall. Indumentum present on all parts, very dense on stems, tendrils, young pitchers and inflorescence, consisting of red-brown hairs 0.5-1 mm long, branched at the base; upper surface of leaf lamina fairly densely pubescent with short white stellate hairs 0.1-0.3 mm long. Climbing stems terete, 5-8 mm diam., internodes 6.5-8.5 cm long, axillary buds spike-like. Leaves of the climbing stems coriaceous, blade oblong-elliptic, 10.5-18 by 3.8-4.6 cm, dark greyish-green occasionally purple-green, upper pitchers light-green with abundant red streaks, peristome yellowish-green with numerous purple-red streaks of varying width, apex usually obtuse, occasionally sub-peltate, base clasping the stem for 1/2-2/3 its circumference and decurrent for more than half the internode, gradually attenuate into the winged petiole; longitudinal veins 2 or 3 on each side of the midrib, pennate veins reticulate and inconspicuous. Lower pitchers unknown. Upper pitchers narrowly infundibular in lower half, broadly infundibular in upper half; 12.5-16.5 by 5.1-6.5 cm; ventral ridges indistinct; mouth sub-orbicular to slightly ovate, horizontal in front and elevated towards lid; peristome flattened and expanded, to 3.3 cm wide, ribs indistinct; inner surface glandular throughout; spur inserted 1 mm from base of lid, 2 mm long; lid ovate or orbicular-ovate, rounded or slightly cordate at base, to 4.8 x 4.4 cm, lower surface without appendages, often slightly keeled in the basal part of the midrib, with scattered small crater-like glands most abundant on either side of the midrib. Bracts absent. Male inflorescence: peduncle 8 cm long, rachis 23 cm long; partial peduncles 2-flowered, to 4 mm below the branch, with each branch to 12 mm long; sepals ovate-elliptic, 3-4 mm long; staminal column 4-5 mm long. Female inflorescence not seen. Infructescence similar in structure to the male inflorescence, bearing up to c. 100 fruits; peduncle to 12.5 cm long, rachis to 16 cm long; mature fruits 3.5-4.5 cm long. [Lee (2002)].

Distribution: Malaysia, Borneo, Sarawak, Kapit Division, Hose Mountains, Gunung Bukit Batu and Bukit Sindap. [Lee (2002)].

Habitat: Growing epiphytically in moss forest or terrestrially on steep sandstone slopes among *Dicranopteris* and *Dipteris* ferns, 900-1400 m a.s.l. [Lee (2002)].

***Nepenthes pulchra* Gronem., S.McPherson, Coritico, Micheler, Marwinski & V.B.Amoroso, in: McPherson, S., New Nepenthes 1: 425 (-439; figs. 368-381). 2011. Sec. Gronemeyer, McPherson & al. (2011)**

Description: Stems up to 5 m long, cylindrical in cross section, 6 mm diameter, internodes up to 6 cm long.
Leaves of the climbing stem are linear, up to 28 cm long and 5 cm wide, with 3 or 4 longitudinal veins on each side of the midrib and numerous pennate veins running obliquely towards the leaf margins. The apex of the lamina is acute, the base attenuate and forming a broad, winged petiole that is strongly decurrent. The wings of the petiole are up to 3 cm wide and run down the full length of the internode in a distinctive fashion, and often continue partway down the previous internode. The result is that the stem is sequentially punctuated by ribbon-like wings, up to 1.5 cm wide at the leaf axil, that taper over the length of the internode. The tendrils are up to 25 cm long, and mostly coiled. All parts of the foliage may be yellowish green, or suffused pinkish red. The midrib and tendril may be pure red.
Lower pitchers up to 35 cm tall and 6 cm wide, though usually smaller. The bottom quarter to third of the pitcher is variably inflated, often to the extent that the basal part is bulbous. Above the broad lower section, the pitcher narrows, becoming cylindrical or very slightly infundibular towards the pitcher opening. Wings up to 8 mm wide, fringed with filaments up to 10 mm long run down the front of the trap. The pitcher opening is angled obliquely and up to 5 cm wide. The peristome is flattened, up to 2.5 cm wide, and particularly broad around the sides and below he lid. The peristome is lined with ribs up to 2 mm high, spaced up to 2 mm apart. The ribs are elongated on the inner edge of the peristome to form narrow teeth up to 3 mm long. The lid is ovate, up to 7 cm long and 6 cm wide, with glands evenly distributed over the lower surface. A rounded, triangular appendage up to 5 mm long is present on the underside of the lid, close to the point of attachment with the pitcher opening. The spur is unbranched and up to 5 mm long. The exterior of the lower pitchers is pure red, with narrow blotches of yellowish green or reddish purple and blotches of purplish black. The colouration of the foliage darkens as it ages. The interior of the pitcher is white or light yellowish green, lined with small, angular blotches of purple. The peristome is red, variably striped with bands of yellow, orange and purple. The lower surface of the lid is bright red, and the upper surface is dark reed. In a minority of specimens, the exterior of the pitcher may be consistently yellowish orange, or dark purple. In these cases, all parts of the foliage are morphologically identical to typical *N. pulchra*.
Upper pitchers up to 42 cm long and 7 cm wide, though usually smaller. The bottom fifth to quarter of the trap is inflated and ovate to near spherical, narrowing above this part before becoming infundibular towards the pitcher opening. Wings are indiscernible, though intermediate pitchers bearing wings are produced in abundance. The peristome is up to 3 cm wide, lined with ribs up to 2.5 mm high, spaced up to 1.5 mm apart. In all other aspects, including colouration and colour variability, the upper plants are consistent with the lower traps.
Inflorescence a racemose panicle, up to 45 cm long, bearing branched 2-flowered partial peduncles lacking bracts.

Fruits are up to 3 cm long.
Indumentum sparse, present across the foliage and inflorescence, consisting of orangey brown hairs up to 1 mm long. The indumentum is especially conspicuous along the margins of the lamina, and on the stems of young plants. [Gronemeyer, McPherson & al. (2011)].

Distribution: Philippines, Mindanao Island, Bukidnon Province, Mount Kiamo [Gronemeyer, McPherson & al. (2011)].

Habitat: Strictly terrestrial in clearings and montane scrub on ultramafic soil, usually exposed to strong or direct sunlight; 1300-1800 m a.s.l. [Gronemeyer, Coritico & al. (2014)].

***Nepenthes ×pyriformis* Sh.Kurata in J. Insectiv. Pl. Soc. 52(2): 30 (-32; fig. 1). 2001. Sec. Clarke (2001)**

Distribution: Indonesia, West Sumatra, Gunung Talang [Clarke (2001)].

Notes: These plants were placed within *N. dubia* by Jebb & Cheek (1997), due to their striking similarity to that species. However, this hybrid bears some subtle, but important differences from *N. dubia*. [Clarke (2001)].

Hybrid parent formula: *N. inermis* × *N. talangensis* [Clarke (2001)].

***Nepenthes rafflesiana* Jack ex Hook. in Comp. Bot. Mag. 1: 270 (-271). 1835. Sec. Clarke, Moran & al. (2011)**

= *Nepenthes hookeriana* H.Low, Sarawak: 68. 1848.

= *Nepenthes hookeriana* H.Low ex Becc., Malesia 3: 3. 1886.

= *Nepenthes rafflesiana* var. *alata* J.H.Adam & Wilcock in Mal. Nat. J. 44: 32, t. 2. 1990.

= *Nepenthes rafflesiana* var. *ambigua* Beck in Wiener Ill. Gart.-Zeitung 20: 147. 1895.

= *Nepenthes rafflesiana* var. *glaberrima* Hook.f., in: de Candolle, A. L. P. P., Prodr. 17: 97. 1873.

= *Nepenthes rafflesiana* var. *insignis* Mast. in Gard. Chron. n.s. 18: 424, f. 69. 1882.

= *Nepenthes rafflesiana* var. *minor* Becc., Malesia 3: 3, 11, t. 1: 2. 1886.

= *Nepenthes rafflesiana* var. *nigro-purpurea* Mast. in Gard. Chron. n.s. 18: 424, f. 70. 1882.

= *Nepenthes rafflesiana* var. *nivea* Hook.f., in: de Candolle, A. L. P. P., Prodr. 17: 97. 1873.

= *Nepenthes rafflesiana* var. *typica* Beck in Wiener Ill. Gart.-Zeitung 20: 146. 1895.

= *Nepenthes raflesea* Hort., Hort., Rev. Hortic. 1869: 130. 1869.

= *Nepenthes sanderiana* Burb. in Flora & Sylva 2: 113. 1904.

Notes: See Clarke & al. 2011 and Scharmann & Grafe (2013) for the circumscription of *N. rafflesiana* as opposed to *N. hemsleyana* [Berendsohn (2017+)].

***Nepenthes rajah* Hook.f. in Trans. Linn. Soc. London 22: 421, t. 72. 1859. Sec. Cheek & Jebb (2001)**

Description: Terrestrial shrub up to 2 m tall, sometimes scrambling. Stems terete, 15-30 mm diam. Leaves coriaceous, petiolate; blade oblong, 20-50(-80) by 9-13(-15) cm, apex rounded, peltate: midrib detaching to form tendril up to 3.2 cm from the apex, base obtuse; petiole canaliculate, 3.5-14 cm long, 1-2 cm deep, base sheathing and clasping the stem for c. 3/4 its circumference, not decurrent or auriculate. Longitudinal nerves 3(-5) each side of the midrib in the outer half. Pennate nerves numerous, running obliquely to the margin, conspicuous. Lower pitchers subellipsoid, 20-35 by 11-18 cm, with two fringed wings, 4-9 mm wide, the fringed elements c. 4 mm long, c. 2 mm apart; mouth broadly elliptic, flat, oblique at 45° from the horizontal; peristome rounded or slightly flattened, 25-35 mm wide, slightly widest towards the lid, ribs 1.5-5 mm apart, with at least 10 striae in between, inner edge dentate, teeth 3-5 mm long, outer edge with 5 or 6 folds per side, each protruding up to 1-1.5 cm; lid larger than the mouth, vaulted, oblong to obovate, 15-20 by 10-13 cm, apex truncate to rounded, base truncate-cordate, lower surface lacking appendages but with a robust keel-like midrib in the basal half, nectar glands minute, crater-like c. 0.1 mm diam; spur stout, 10 mm long. Upper pitchers rarely produced, as the lower, but infundibulate, not ellipsoid, lacking fringed elements to the reduced, ridge-like wings. Male inflorescence 60-85 cm long, peduncle 28-34 cm long, 0.6-0.7 cm diam.; partial peduncles c. 100, 9-15 mm long, 2-flowered; bracts absent; pedicels 6-9 mm long; tepals elliptic, 4-5 by 2.5 mm; androphore 2-3 mm long; anther head 1 mm long, 1.5-2 mm wide. Fruits with valves 20 mm long. Seeds unknown. Indumentum of brown spreading hairs on stem when young, absent from leaves apart from the brown woolly margin; outer lid and pitcher surface with appressed, brown simple hairs c. 0.5 mm long, glabrescent. Inflorescence, particularly the partial peduncles and pedicels, lower tepal surface and androphore, densely covered in the same hair type; infructescence with hairs persisting on fruit valves. Colour of pitchers purplish red, peristome dark purple, inner surface of pitcher and lower surface of lid green or yellow. Flowers dull greenish white, flushed maroon outside. [Cheek & Jebb (2001)].

Distribution: Borneo: Sabah (Mt Kinabalu&Mt Tambuyukon). [Cheek & Jebb (2001)].

Habitat: Open sites in mossy forest, on ridges or landslips, restricted to ultramafic soils; 1500-2650 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes rajah* is renowned as the largest pitchered of all pitcher plants (though less well known species such as *N. merrilliana* and *N. truncata* may bear equally voluminous pitchers) and for trapping rats. The peltate leaf blade tip, oversized and vaulted lid, as well as its overall large size, make this a very distinct species. The inner peristome wall is elaborated to form three layers; these are interconnected by a series of staggered cross-walls, creating two rows of box-like compartments. [Cheek & Jebb (2001)].

***Nepenthes ramispina* Ridl. in J. Fed. Mal. States Mus. 4: 59. 1909. Sec. Cheek & Jebb (2001)**

= *Nepenthes gracillima* var. *major* Ridl., in:, Fl. Malay Pen. 3 3: 22. 1924.

Description: Terrestrial climber to 5 m tall. Stem terete, 0.3-0.6 cm diam. Leaves coriaceous, sessile, obovate-oblong, to 16 by 3.1 cm, apex acute to rounded, base clasping at least half stem, auriculate. Longitudinal nerves (0 or) 1-3 (or 4) on each side of the midrib in the outer half. Pennate nerves irregular. Lower pitchers shortly cylindric, 5-10 by 1-2.5 cm; slightly ventricose in lower half, cylindric and somewhat narrowed in the upper half, with two fringed wings, 0.3 cm wide, fringe elements to 0.5 cm long. Upper pitchers long cylindric, to 18(-24) by 2.5 cm, basal half gradually infundibulate, upper half gradually narrowing but broadening again at mouth, and usually broadest there; wings usually absent, or very much reduced; mouth ovate, oblique, slightly concave; peristome cylindrical, 0.5-1 mm wide, ribs 0.25 mm apart, inconspicuous, outer and inner edge entire; lid orbicular, often slightly broader than long, c. 3.2 by 3.8 cm, apex rounded, base cordate, lower surface lacking appendages, nectar glands circular, not bordered, 0.1-0.3 mm diam.; larger and denser near centre where 0.4 mm diam.; spur somewhat flattened at base, with 3-7 branches above, 3-10 mm long. Male inflorescence 20-36 by 1.8-2.8 cm; peduncle 8-11 cm long, 1.5-2 mm diam. at base; partial peduncles 1-flowered, rarely 2-flowered at base, c. 60; bracts filiform, (1-)2-3 mm long, spreading, inserted 0-2 mm from base of pedicel; pedicel 8-10.5 mm long; tepals elliptic, c. 4.5 by 2 mm; androphore 2.5-3 mm long; anther head 1.5-2 by 1.5-2 mm. Fruit valves 20 by 3 mm. Seed fusiform, 12 mm long, central body tuberculate. Indumentum on stems sparingly tomentose, upper and lower surface of midrib tomentose, hairs branched, 0.3-0.5 mm long; other parts subglabrous. Colour of lower pitchers maroon-green to deep blackish green, inner surface glaucous pale green; upper pitchers either purple-green throughout, peristome deep red or pale green, or pale green throughout, inner surface of pitcher glaucous pale green. [Cheek & Jebb (2001)].

Distribution: Peninsular Malaysia: the western mountain ranges, Banjaran Titiwangsa [Cheek & Jebb (2001)].

Notes: *Nepenthes ramispina* is closely similar to *N. gracillima*. It can be diagnosed by its larger habit, broader, oblong-obovate leaves, the more slender and longer upper pitchers with long, fasciculated spurs (vs. simple and < 3 mm), the glands on the underside of the lid which are numerous, unbordered, and range from 0.1 mm near the margin to 0.4 mm wide near the middle (vs. lipped and evenly sized from 0.4-0.6 mm), and the pubescent stem and midrib (vs. glabrous to sparsely pubescent).
This species was synonymised with *N. gracillima* Ridl. by Danser, but we reinstated it in 1997 (Jebb & Cheek, Blumea 42 (1997) 77). The illustration of *N. gracillima* in Danser Bull. Jard. Bot. Buitenzorg III 9 (1928) f. 7 is of *N. ramispina*. From the other Peninsular Malaysian species it can be distinguished by its cylindrical, pubescent stems, slender pitchers and branched spur. [Cheek & Jebb (2001)].

***Nepenthes ramos* Jebb & Cheek in Willdenowia 43(1): 108 (-112, fig. 1). 2013. Sec. Cheek & Jebb (2013)**

Description: Terrestrial climber, height unknown; stems terete, 6–8 mm in diam.; internodes 22–60 mm long; axillary buds spike-like, 3–5 mm long, inserted 4–8 mm above axil, indumentum persistent (to at least 5th internode from stem apex), of bright white hairs covering surface, of two types: simple erect curled hairs 0.5–1 mm long, and stellate 3–6-armed appressed hairs 0.25–0.5 mm in diam. Leaves spirally inserted, coria - ceous; leaf blade narrowly elliptic-oblong or narrowly oblong, 13.5–22 × 3.0–3.7 cm, base obtuse-acute, decur - rent into petiole, apex acute; longitudinal nerves 2 pairs, within 6–7 mm from margin, moderately conspicuous; pennate nerves inconspicuous to obscure; upper sur - face glossy, soon glabrous; lower surface drying brown, c. 40 % covered with white hairs of two types, as stem: simple patent hairs 1–1.5 mm long, c. 1 per mm², and stellate hairs 0.25–0.5 mm in diam., 3–5 per mm²; sessile glands drying black, c. 0.1 mm in diam., 5–8 per mm²; midrib densely pubescent. Petiole winged-canaliculate, (3.8–)4.5–10 × 0.3–0.4(–0.5) cm; wings erect proxi - mal to stem but patent in distal part towards leaf blade, clasping stem for c. ½ its circumference, decurrent as a low ridge for 0.5–1 cm. Lower and intermediate pitchers unknown. Upper pitchers (tendrils coiled) subcylindric, (12.5–)14–20 × 3.8–4.5 cm, ± equally wide at base and apex, gradually constricting midway to 2.8–3.3 cm wide; outer surface sparsely and inconspicuously c. 10 % cov - ered with dull red-black hairs of two types: curved simple hairs 1–1.5 mm long, 0–3 per mm², and shortly stipitate 3–6-armed bushy stellate hairs 0.05–0.15 mm in diam., c. 10 per mm²; fringed wings absent, reduced to ridges running length of pitcher; mouth ovate, oblique, 4–5.2 × 3.2–5 cm; peri stome cylindric-flattened, c. 3 mm wide at front, c. 5 mm wide at sides, c. 3.5 ridges per mm, ridges c. 0.1 mm high, inner edge without conspicuous teeth at margin but with holes visible at column, outer edge not lobed; column short, not strongly developed; lid ovate, 4.3–5.1 × 4.1–4.7(–5) cm, base cordate, sinus c. 5 mm deep, apex rounded; lower surface of lid with basal ap - pendage well-developed, slightly hooked, 2–3 × 2–3 mm, situated about middle of a ridge 7–10 mm long and 1–2

mm high; nectar glands strongly dimorphic, mostly absent from midline, except distal part with a cluster of 15–25 large longitudinally elliptic raised perithecoid glands 1.25–1.6 × 0.7–0.8 mm, central lacunae c. 0.5 × 0.25 mm, about same number of these nectar glands also scattered thinly throughout distal half of lid, among dense smaller circular volcano-like nectar glands which cover 30–40 % of lower lid surface, these 0.3–0.6 mm in diam., 1–3 per mm²; upper surface of lid with same in - dumentum as outer pitcher; spur inserted c. 5 mm below junction of lid and pitcher, unbranched, cylindric, 9–13 × c. 1 mm, surface with dense white appressed simple and stellate hairs, apex rounded. Male inflorescence with peduncle 32.5–36 cm long, 4–5 mm diam. at base, indu - mentum as stem; rachis 39–40 cm long, bearing c. 320 partial peduncles evenly scattered along its length; par - tial peduncles 0.1–4 mm long, 2-flowered from base to apex of inflorescence; bracts inserted midway along partial peduncle, patent, filamentous, 1–1.5 mm long; pedicels not strongly divergent, 11–16 mm long; rachis to lower surface of tepals densely pubescent with white mainly appressed simple hairs c. 0.5 mm long together with stellate hairs covering 60–80 % of surface. Tepals 4, elliptic, c. 4 × 3 mm, apex obtuse; lower surface com - pletely covered with translucent pale brown papillae mixed with bright white simple hairs c. 0.2 mm long (covering c. 20 % of surface); upper surface with 6–10 elliptic nectar glands, drying black, glabrous apart from hairs at base. Androphore 4–5 mm long, glabrous, but base surrounded by dense patent red-brown hairs. An ¬ ther head white, ovoid, c. 2 × 1.5 mm. Female inflores - cence as male but pe duncle (18–)24–36 cm long; rachis 7–19 cm long, bearing 20–50 partial peduncles; partial peduncles 5–10 mm long; pedicels 8–9 mm long; tepals c. 4 × 1.5 mm, enlarging in fruit; ovary sessile, ovoid, c. 4 × 2 mm, densely white and brown hairy; stigmas 4. Infructescences (slightly immature) as female inflores - cences. Fruit valves 4, narrowly oblong, c. 18 × 4 mm, outer surface moderately densely appressed silky bronze hairy. Seeds pale brown, filamentous, c. 9 mm long; seed body central, c. 2 × 0.5 mm. [Cheek & Jebb (2013)].

Distribution: Philippines, Mindanao, Surigao Province [Cheek & Jebb (2013)].

Notes: A species belonging to the *Nepenthes ramos* Group. [Cheek & Jebb (2013)].

***Nepenthes reinwardtiana* Miq., Pl. Jungh.: 168. 1852. Sec. Cheek & Jebb (2001)**

≡ *Nepenthes reinwardtii* Hook.f. in Trans. Linn. Soc. London 22: 422. 1859.

= *Nepenthes naquiyuddinii* J.H.Adam & Hafiza in Int. J. Bot. 2(4): 431 (-433; figs. 1-2). 2006.

= *Nepenthes reinwardtiana* var. *samarindaiensis* J.H.Adam & Wilcock in Edinb. J. Bot. 50: 103. 1993.

Description: Terrestrial or epiphytic shrub or climber 2-8(-20) m tall. Stem triangular, rarely ± rounded, 3-7.5 mm diam., the corners rounded or 2 with wings up to 3 mm broad. Leaves chartaceous, sessile; basal rosette leaves not known; climbing leaves with blade narrowly elliptic to rectangular, or slightly oblanceolate (8-)11-25(-28) cm by 1.1-3.1(-4.5) cm, apex acute, base distinctly attenuate for 4-5 cm, or narrowing slightly at the stem, decurrent as wings by up to 8.5 cm, rarely only slightly decurrent, clasping the stem for 1/2 its circumference. Longitudinal nerves 1 or 2 (or 3) on each side of the midrib, usually in the outer third, ascending from the midrib. Pennate nerves, ascending from the midrib, sometimes extending into longitudinal nerves, inconspicuous. Lower pitchers rarely collected, ellipsoid in the basal half, gradually becoming slightly constricted towards the subcylindrical upper half, up to 11 by 4 cm, 3 cm wide at the apex, with two fringed wings, the mouth ± ovate, oblique, peristome ± cylindrical in section, 0.5-1(-1.25) mm wide, without ribs, the inner edge with a row of minute, deeply sunken hollow glands, not dentate; lid ovate-shortly elliptic, up to 3.9 by 3.7 cm, apex rounded, base truncate, lower surface without appendages, nectar glands thickly to thinly bordered, fairly dense, evenly sized and spread, orbicular, 0.15-0.2(-0.3) mm diam.; spur simple, to 3 mm long. Upper pitchers as the lower but slightly ventricose, 9-19.5(-31) cm long, 3.2-4.8(-6.8) cm wide at the base, 1.8-3.4(-4.1) wide at the waist, 2-5.7(-6.2) cm wide at the mouth; with two ridges to 0.1 cm broad lacking fringing elements; the inner pitcher surface glaucous, usually with 2 (rarely 0, 1, or 3) conspicuous darker eye-like dots 1(-5) mm wide set symmetrically c. 1 cm apart on the dorsal wall of the pitcher more or less level with the front of the peristome; lid 2.1-5.2 (-7.8) by 2.1-4.7(-6.5) cm. Male inflorescence 20-38 cm long; peduncle 2.8-10 cm long, 3 mm diam. at base; partial peduncles 2-flowered, 0.2-1 cm long; bracts absent; pedicels 1-1.5 cm long; tepals ± elliptic 3.5-4 by 2.5 mm; androphore 0.25-0.3 mm long; anther head 0.7-1 by 1.5 mm. Fruits with valves 28-40 mm long. Seeds fusiform, 18-20 mm long, minutely tuberculate at the centre. Indumentum absent from the stem and leaves, rarely present on the pitcher just below the peristome; inflorescence covered, sometimes only sparsely, with appressed brownish hairs c. 0.2 mm long that extend from the rhachis to the lower surface of the tepals, the androphore and the ovary; fruit glabrous. Colour of pitcher light green, rarely suffused red or with red spots; flowers reddish black. [Cheek & Jebb (2001)].

Distribution: Sumatra and Borneo. [Cheek & Jebb (2001)].

Habitat: Lowland peat-swamp forest or high altitude ridges (sandstone or limestone) or more rarely moss forest, occasionally on ultrabasic soils; 0-1450(-2100) m. Often growing epiphytically. [Cheek & Jebb (2001)].

Notes: *Nepenthes reinwardtiana* is unusual in the ‘eye-spots’, which contrast strongly against the back of the glaucous inner pitcher wall. In some populations there may be pitchers with one, three or no eye-spots (Phillipps &

A.L. Lamb, Pitcher Plants of Borneo (1996) 135). Similar spots have been reported, but only as single pitchers on odd plants, in *N. sanguinea*, *N. stenophylla,* and *N. tentaculata* (Clarke in Nepenthes of Borneo (1997) 126). *Nepenthes reinwardtiana* is sometimes confused with *N. gracilis*, with which it shares sharply triangular stems and decurrent, sessile leaf bases. *Nepenthes reinwardtiana* can be distinguished by its leaves with 1-3 (vs. 4-6) pairs of longitudinal nerves, by the inner peristome which lacks teeth and has instead a prominent row of glandular pits. Furthermore, *N. reinwardtiana* has the base of the lid truncate and not cordate, and bears numerous small nectar glands (those of *N. gracilis* are few and large) and the partial peduncles are 2-flowered (vs. 1-flowered). Phillipps & A.L. Lamb Pitcher Plants of Borneo (1996) 135report that red pitchers seem to be found only on plants growing on ultrabasic, sandy heath or podsolic soils.

J.H. Adam & Wilcock base their variety *samarindaiensis* on specimens with rounded stems and non-decurrent leaf bases found in E Kalimantan. As indicated by J.H. Adam & Wilcock, Edinb. J. Bot. 50 (1993) 91, reports of this species in Peninsular Malaysia are based on the misidentification of specimens or misinterpretation of localities from collecting notes. [Cheek & Jebb (2001)].

***Nepenthes rhombicaulis* Sh.Kurata in Gard. Bull. Singapore 26(2): 229, f. 1. 1973. Sec. Cheek & Jebb (2001)**

– *Nepenthes rhombicaulis* Sh.Kurata in The Heredity 26(10): 44. 1972, nom. nud.

Description: Terrestrial climber to 20 m tall. Climbing stem 4-angled, 5-10 mm diam.; short shoots and rosettes present. Leaves sessile, those of rosettes and short shoots scattered, lanceolate, several cm long; those of climbing shoots lanceolate, 12-22 by 3-4 cm, apex subpeltate to emarginate, the base clasping the stem by 1/2-2/3 its circumference, not decurrent or sheathing. Longitudinal nerves 2 or 3 on each side of the midrib in the outer 1/4 of the blade, innermost vein arising from 1/3-1/2 way along midrib. Pennate nerves oblique. Lower pitchers ventricose in the lower half, cylindrical in the upper part, 6-12 by 2.5-3.5 cm, with two fringed wings; mouth orbicular, oblique; peristome subcylindrical, 3-5 mm broad, ribs c. 0.5 mm apart, outer edge expanded and undulate, inner toothed; lid elliptic-oblong or ovate, 2.5 by 1.7-2.5 cm broad, apex rounded, base truncate, lower surface with an appendage near the apex, nectar glands bordered, c. 0.15 mm diam.; spur divided to the base with two filiform branches, c. 5 mm long. Upper pitchers unknown. Inflorescence 30-40 cm long; peduncle 15-20 cm long; partial peduncles 2-flowered, length unknown; bracts absent (not mentioned or figured in the protologue); pedicels 10-15 mm long; tepals elliptic, 4 by 3 mm; androphore 4 mm long. Fruits fusiform, valves lanceolate 20-25 by 5 mm. Indumentum of stem glabrous, with prominent glands; leaf margin reddish brown hairy; pitchers sparsely pubescent; lower surface of tepals, and fruit valves minutely pubescent. Colour of lower pitchers red or pale green with purple spots, peristome red. [Cheek & Jebb (2001)].

Distribution: N Sumatra: G. Pangulubao [Cheek & Jebb (2001)].

Habitat: Subalpine forest; altitude unknown. [Cheek & Jebb (2001)].

Notes: The description above is largely taken from the protologue. *Nepenthes rhombicaulis* is extremely poorly known although reported in the protologue as being ‘common’ on the mountains surrounding Lake Toba. Only the type collection exists. Subsequent purported field observations (Hopkins et al. Carnivorous Plant Newsl. 19 (1990) 19-28Schmid-Hollinger Carnivorous Plant Newsl. 23 (1994) 62-63) have not been supported by voucher specimens and their descriptions and photographs do not appear to match the type. The combination of a sharply 4-angled stem, absence of upper pitchers and presence of an apical appendage on the lower surface of the lower pitcher lid (not seen in the SING specimen) is unique: each are individually unusual characters within the genus. [Cheek & Jebb (2001)].

***Nepenthes rigidifolia* Akhriadi, Hernawati & Tamin in Reinwardtia 12(2): 141 (-144; fig. 1). 2004. Sec. Akhriadi, Hernawati & al. (2004)**

Description: Stem of the rosette and lower part: rosette 30 cm length, cylindrical, 0.8 cm in diam., internodes 0.5 cm long. Stem of the middle part: similar to those of the rosette and the lower part, but erect 100─150 cm length, 1─1.3 in diam., internodes 1.2─2.1 cm long. Stem of the upper part: similar to those of the rosette and the middle parts, but climbing 100─200 cm, 0.6─1.1 cm in diam., internodes 3.2─5.1 cm long, sometimes having a spine-like on node above.

Leaves of the rosette and the lower pitcher: thick and stiff coriaceous, sessile, ovate or spathulate-oblong, 8.5─10 cm long, 3.5─4 cm broad; gradually attenuate towards the base, clasping and decurrent the stem for 2/3 its diameter; midrib flattened above and raised beneath; longitudinal veins 2 each sides of the midrib, distinct above and indistinct beneath; pinnate veins distinct above and indistinct beneath; apex obtuse-rounded; margin entire; tendril insertion sub-apical and having a wide 0.3─0.4 cm from the apex, 11.5─13 cm long. Leaves of the middle part: similar to those of the rosette and the middle part, but spathulate-oblong, 19.1─20.8 cm long, 7─7.6 cm broad; longitudinal veins 4 each sides of the midrib; tendril have wide 0.5─0.9 cm from the apex, having a loop-like, 23.6─27.2 cm long. Leaves of the upper part: similar to those of the rosette and the middle parts, but 17.8─20.2 cm long, 5.6─7.8 cm broad, clasps the stem for ½─2/3 its diameter; midrib sunken or flattened above; longitudinal veins 3─4 each sides of the midrib, distinct above and rather distinct beneath; apex obtuse-acute; tendril have a wide 0.4─0.6 cm

from the apex, having a loop-like or not, 27.2─32.1 cm long.
Rosette and lower pitchers: broad ovoid, 9.6─15 cm high, 4.4─6.4 cm wide, contracted 0.2─0.9 cm wide at the base; glandular zone extended ½ of the pitcher high from base, ovoid then broad ovoid at the upper; two wings 0.1─0.2 cm broad that extended down from the edge of the mouth to 1.5─2 cm the mouth below, with fringed hairs 0.3─0.5 cm wide; mouth oblique, elliptic-ovate, having neck, 3.8─6.7 long, 2.6─4.7 cm broad; peristome expanded outwards 0.6─2.1 cm broad besides, 2 lobes each sides, contracted in front to 0.7 cm broad then having a notched in front 1.1 cm long, innerside incurved, teeth 0.05─0.1 cm long; lid elliptic-ovate, 4─5.2 x 2.5─3.5 cm, base cordate, apex acute-obtuse, longitudinal veins 3 each sides; concentrated nectar gland on beneath surface at the lip middle, circular-slightly ovate, ≤ 0.01 cm in diam.; spur 0.3─1.2 cm long, insertion 0.2 cm sub-apical of the neck, trifid then insertion one 0.3 cm long sub-apical of the spur. Middle pitchers: all other parts similar to those of rosette and lower pitcher, but 17.1─20.4 cm high, 7.8─8.5 cm wide, glandular zone slightly infundibular and expanded broad ovoid at the middle then slightly ovoid at the upper; wings slightly reduced to ribs 0.1 cm broad without fringed hairs; peristome expanded outwards 2.1─2.9 cm broad besides, contracted in front to 1.9─2.4 cm broad then having a notched in front 2.4─2.8 cm long; teeth 0.05─0.1 cm long; lid ovate, 7.1─7.7 cm long, 4.5─5.2 cm broad with nectar gland ≤ 0.01 in diam.; spur 1.2-1.6 cm long, insertion one 0.2─0.3 cm long sub-apical of the neck.
Upper pitchers: all other parts similar to those of middle pitchers, but 20.7─21.1 cm long, 7.2─9.4 cm broad; mouth expanded outwards 2.2─4.4 cm broad besides, 4 lobes each sides contracted in front to 0.9 cm broad then having a notched in front 3.9─4.7 cm long; lid 5.9─7.9 cm long, 3.9─5.6 cm broad, nectar gland beneath circular or slightly ovate ≤ 0.01 cm in diam.; spur 1─1.6 cm long, 2 branches that a branch with bifid, insertion one 0.3─0.4 cm long sub-apical of the neck.
Male flowers: a raceme, rachis 3.9 cm long, peduncle 4.2 cm long; bractea 0.9 cm long, 0.4 cm broad at the middle; peduncle branch 0.4─0.5 cm long, pedicels 0.5─0.6 cm long, 2-flowered; bracteole filiform, 0.1─0.2 cm long near the base; tepal ovate-oblong, 0.4─0.5 cm long, 0.2─0.3 cm broad; filament 0.4 cm long, staminal column 0.1 cm in diam. Female flower: not found.
Indumentum of the rosette and the middle part: tendril pubescent near the pitcher base, buds of the pitcher densely pubescent, glandular zone of the pitcher pubescent and densely pubescent on the upper, wings with fringed hairs pubescent. Indumentum of the upper part: tendril densely pubescent near the pitcher base, buds of the pitcher tomentose, developing pitcher tomentose, lid glabrous or pubescent especially at developing pitcher. Peduncle slightly pubescent; peduncle branches, pedicels, bracteole, tepal, filament densely pubescens.
Colour of Herbarium Specimen: Stem blackish, leaves above young brown and dark brown beneath, pitcher blackish brown with dark brownish blotches, lid blackish. Colour of living specimen: Stem green, leaves green, pitcher blackish brown with greenish white blotches, peristome blackish for rosette and dark reddish orange for upper, lid black with greenish blotches. [Akhriadi, Hernawati & al. (2004)].

Distribution: North Sumatra [Akhriadi, Hernawati & al. (2004)].

Habitat: Terestrially in lower montane forest at about 1000─1500 m a.s.l. [Akhriadi, Hernawati & al. (2004)].

Etymology: The specific epithet rigidifolia refers to stiff coriaceous texture of this species leaves. [Akhriadi, Hernawati & al. (2004)].

***Nepenthes robcantleyi* Cheek in Nordic J. Bot. 29(preprint): 2, (1-5, fig.). 2011. Sec. Cheek ("2011" [2012])**

Description: Terrestrial shrub (probably also epiphytic) 0.5-1.0 m tall, not known to climb. Stem terete, ca 2 cm in diameter, internodes 1.5-2.5 cm long, each leaf base slightly sheathing the one above, axillary buds not conspicuous.

Leaves thickly leathery, petiolate; those of short stems oblong-elliptic in outline 25.0-28.55 x23.0-26.5 cm (largest leaves of each specimen), apex truncate with acumen 2-3 x2-3 cm, not peltate, base cordate, sinus 2.1-3.2 cm deep; petiole pseudo-terete, canaliculate- winged, the wings folding over the adaxial canal, 22-23 cm long, 0.8-1.0 cm wide in upper half, 2 cm wide near stem, petiole base sheathing the stem for 3/5 its circumference, and 3-5 cm of its length. Longitudinal nerves 2-4 on each side of the midrib, conspicuous. Pennate nerves inconspicuous, tendril of longer, intermediate pitchers lacking coils, stout, 7 mm in diameter. Lower pitchers rarely seen, plants rapidly producing intermediate pitchers. Intermediate pitchers broadly cylindrical, ca 33.0 x9.5 cm, slightly broader at the base 8-9 cm wide, narrowest below the peristome 7.8-8.5 cm wide, with two fringed wings ca 10 mm wide, fringed elements 10-12 mm long, 3-4 mm apart; mouth obcordate, horizontal in front, centre rising by 1(-3) cm, abruptly concave behind, rising into a long column terminating ca 12 cm above the front of the mouth; peristome gently curved in section, ca 2 cm wide at front, 5 cm in centre, 6-9(-10) cm wide below the column, column ca 4 cm long, the ribs ca 1.5 mm apart, 1.0-1.5 mm deep, outer edge of peristome slightly undulate, inner edge with teeth 3-4 mm long, those along the central seam ca 2 mm long, splayed out from the plane of the peristome by ca 458; lid held9horizontally on a short cylindrical stipe ca 5 x3 mm; broadly ovate to suborbicular ca 9.5 x9.5 cm, apex rounded, base shallowly, then abruptly cordate, sinus 2 cm wide, 5-8 mm deep, upper surface with ovate boss ca 4 x3 cm, raised 1 cm, immediately above the basal appendage on the lower surface; lower surface with a laterally

flattened more or less semicircular basal appendage ca 4 mm high, 13 mm long, arising from a keel 3-5 mm high, ca 2.5 cm long, continuing towards the apex as a raised midrib terminating in a small cylindrical terminal appendage ca 3 mm wide, projecting from the surface ca 2 mm, placed 7 mm from the apex; lid nectar glands restricted to the ovate boss (concave) area ca 4 x3 cm around the basal appendage; glands dense, orbicular, dome-volcano-like 0.15 mm in diameter. Within a 5 mm radius of the base of the appendage, otherwise transversely elliptic 0.3-0.5 mm wide; remainder of lid with minute thinly scattered red depressed globose glands ca 0.05 mm diameter; spur entire, stout, ca 12 x1.5 mm, apex truncate-concave. Upper pitchers (lacking fringed wings, with tendrils coiled) not formed.

Female inflorescence 140 cm long, peduncle 97 cm long; partial-peduncles ca 35 per inflorescence, (0 -)17-55 mm apart on rhachis, 19-28 mm long, two-flowered, bracts filiform-linear, 4-6 mm long, patent-reflexed, inserted on partial-peduncles 4-10 mm from base; bracts atypically longer at base of inflorescence; pedicels 20-33 mm long; sepals dull pale green, four, oblong-elliptic, 6-8 x3-4 mm, elongating as flower ages, patent-reflexed; ovary ellipsoid, 3 x9 mm. Male inflorescence 2.13 m long; peduncle 97 cm long; partial-peduncles 100-130, (0-)6-8 mm apart, two-flowered, lacking bracts, 5-12 mm long; pedicels 30-36 mm long; tepals green with red base becoming purple with age, elliptic, 4-6 x3-4 mm; androphore dull red, becoming bright red with age, 5-6 mm long, anther head bright yellow, 1-2 x2-3 mm. Fully-formed fruit and seed not seen. Indumentum of red-brown dendritic hairs ca 0.5 mm long, dense on leaf-buds, sparse on lower surface of blade, upper part of pitcher, very sparse on inflorescence. Peristome dark red or black, inner margin pale green, upper surface of lid dark red or black, pitcher outer surface suffused with same colour, inner pitcher, viewed through peristome, bright green with purple patches, pitcher wings sometimes bright green; lower surface of lid bright green or dark red in outer parts, pale green along midrib and around basal appendage. [Cheek ("2011" [2012])].

Distribution: Philippines, Mindanao [Cheek ("2011" [2012])].

Habitat: Submontane evergreen forest; ca 1800 m a.s.l. [Cheek ("2011" [2012])].

Etymology: Named after Robert Cantley of Borneo Exotics who first discovered this species in the wild, grew plants to maturity from seed, and multiplied them for distribution and future re-introduction to the wild. The name *N. cantleyi* although not legitimately validated, has been used already for a hybrid *Nepenthes* and for this reason, to avoid confusion, has not been adopted for this species. [Cheek ("2011" [2012])].

Conservation: *N. robcantleyi* is assessed as 'Critically Endangered' (CR) A2c+B1ab(iii)+2ab(iii)+C1+D using the criteria of IUCN (2001). [Cheek ("2011" [2012])].

***Nepenthes rosea* M. Catal. & T. Kruetr. in AIPC Mag. 36: 30 (24-31, photogrs.). 2014. Sec. Catalano (2014)**

Description: Terrestrial climber to 4 m tall. Stem terete, 3-4 mm in diameter, internodes 1-3 cm long, dormant buds to 3 mm long often present at leaf axil. Leaves coriaceous, lamina lanceolate, sometimes obovate in plants growing in shade, 10-24 cm long, 1.5-3.5 cm wide, apex acute to acuminate, base attenuate and sessile, clasping the stem by two thirds of its circumference, decurrent for 2-5 mm of its length; tendrils terete, 6-17 cm long, 1-1.5 mm in diameter, coiling in upper pitchers. Lower pitchers 8-15 x 3-4.5 cm, ovate in the lower third or lower half and tubular above, hip at the upper edge of the ovate part; two alae, 1-6 mm wide, run down ventral exterior surface from tendril to mouth, fringed with narrow filaments to 5 mm long; pitcher mouth oblique, ovate to triangular; peristome cylindrical, 2-5 mm wide, teeth to 1 mm long, ribs to 1 mm wide; lid orbicular to slightly ovate, flat, 2.5-4.5 x 3-4.5 cm, base cordate for 1-3 mm, lower surface without appendages, crateriform glands densely arranged and numerous, larger at the base of midrib, to 0.5-1 mm; spur 3-5 mm long, simple or rarely branched; longitudinal veins 3-4 on each side of midrib. Upper pitchers 11-18 x 1.5-3.5 cm, tubulose, slightly wider at the hip and under the mouth; alae 0.5 mm wide, without filaments; pitcher mouth oblique, triangular or more rarely slightly ovate; peristome cylindrical, 2-3 mm wide, without visible teeth and ribs to 0.8 mm wide; lid as for lower pitchers but 2-2.8 cm long and 2.1-2.9 cm wide, base cordate for 1-2 mm and spur 1-3 mm long. Male inflorescence a raceme, 40-50 cm, peduncle 25-30 cm long, rachis 10-25 cm long, ca. 25-90 flowers borne on pedicels 2-3 mm long, 2-flowered partial peduncles can be absent, present in the lowest part of the rachis or cover it all, androphore 1.5-2 mm long; tepals elliptic, green when young, then red, 3-3.5 x 2-3 mm; a bract, 0.5-2 mm long, can be present on some flowers; a different kind of bract, shaped like a miniature leaf and hosting a single flower, can be present 5-15 cm from the base of the rachis; a rosette can be present along the central part of the peduncle. Female inflorescence a raceme, 20-50 cm, peduncle 8-30 cm long, rachis 12-20 cm long, ca. 18-42 flowers borne on pedicels 3-8 mm long, tepals elliptic, green, 3 x 1.5-2 mm; 2-flowered partial peduncles, flower bracts, peduncle bracts and peduncle-borne rosettes as for male inflorescence. Indumentum of white hairs, 0.1 mm long, covering inflorescence and often leaf margins and midrib. Colour: leaves light to dark green; tendrils and stems green to light red; lower pitchers green to light pink, with dark pink stripes outside and uniformly green to dark pink over the inner, non-glandular zone, peristome green, white or light pink; upper pitchers light green outside, uniformly green, white or light pink over the inner, non-glandular zone, peristome green, white or light pink; lid green to pink. [Catalano (2014)].

Distribution: "Peninsular Thailand, Krabi Province" [Catalano (2014)].

Notes: *Nepenthes rosea* belongs to the *N. thorelii* aggregate, a group spread in the strongly seasonal Indochina, with whose species it shares narrow decurrent leaves, a narrow rachis and an underground rootstock. It differs from all the other species of the aggregate in having a smaller stem (up to 4 mm vs. up to 5-9 mm in diameter). It differs from all of them except *N. bokorensis* in having a shorter leaf decurrency (1/6-1/2 of the internode vs. 1/2-whole). These two characteristics, together with the delicate color of the pitchers, give to *N. rosea* a somewhat gracile look, especially evident in the tallest plants. It also differs from all the species of the aggregate except *N. chang* and *N. holdenii* in the frequent presence of 2-flowered partial peduncles. It differs from *N. smilesii, N. kampotiana, N. holdenii* and *N. chang,* all members of the aggregate endemic of continental Indochina, in the presence of acuminate leaf tips, commonly found in the species of peninsular Thailand (*N. kerrii, N. andamana* and *N. suratensis*). A unique but not consistent feature is the rosette that can grow out of the peduncle, seen in about one third of the three hundred plants that we observed in the wild. [Catalano (2014)].

***Nepenthes rowanae* F.M.Bailey in Qld. Agric. J. 1(3): 231, t. s.n. 1897. Sec. Clarke & Kruger (2005)**

Description: Subscandent shrub. Stems initially erect, then scrambling, occasionally to a height of 2m, ≤ 4m long, ≤ 12mm in diameter, internodes ≤ 3cm, cylindrical. Leaves coriaceous, petiolate; blade lanceolate, ≤ 40cm long, ≤ 10cm wide, gradually contracted towards the petiole, very gradually tapering at the apex, apex rounded and slightly peltate. Midrib arced throughout in a crescent-like manner from the base to the apex of the blade. Petiole ≤ 10cm long, attachment to the stem simple, clasping the stem for half of its circumference, the margins decurrent along the stem for 1/2-2/3 of the internode. Tendrils straight, ≤ 60cm long. Longitudinal veins 5-6 on each side of the midrib, pennate veins distinct, running almost straight to the margin from the midrib. Leaf blade has 3-4 longitudinal furrows running throughout its length. Lower pitchers arising abruptly from the end of the tendril, base very broad (to flat in some specimens), pitcher cup broadly ovoid, ≤ 20cm high, ≤ 15cm wide, with a distinct hip in the upper half of the pitcher (often in the upper 1/4). Pitcher contracted from the hip to the peristome, mouth horizontal, rising steeply at the rear, neck absent. Inner surface of pitcher glandular beneath the hip, glands ovate and recessed, 0.01mm wide, ≤ 3600 glands/cm2. Two wings, often bearing multi-cellular fringe elements over part of their length, extend from just beneath the peristome towards the base of the pitcher. In many mature plants, the wings only extend half-way down the pitcher and rather than possessing fringe elements throughout, they are flattened and expanded, being T-shaped in cross section. Multi- cellular fringe elements, when present, ≤ 5mm long. Peristome ovate in cross-section, except at the rear of the pitcher, where it becomes flattened and expanded, ≤ 20mm wide, the opposite ends often overlapping beneath the lid. Ribs distinct and raised, ≤ 0.5mm apart, ≤ 1mm high. Teeth distinct but short, ≤ 1mm long in most parts, ≤ 3mm long near the apex. Ribs at the front of the pitcher, between the wings, often distinct and raised, ≤ 2mm apart, ≤ 3mm high. Lid ovate, strongly cordate at the base, often indented at the apex, ≤ 8cm long, ≤ 7cm wide, often with two barely- distinguishable keels. Lower surface densely covered with nectar glands, circular to oval in shape, slightly raised.
Glands towards the margins circular, c.0.2mm wide, those near the centre ovate, 0.5 x 0.25mm. Spur simple, usually bent, ≤ 6mm long. Upper pitchers infrequently produced, similar in shape and structure to the lower ones, but more infundibular towards the base, with the hip located immediately below the peristome, wings reduced to ribs and the lid more ovate, ≤ 15cm high, ≤ 8cm wide. Inflorescence a cylindrical raceme, peduncle ≤ 20cm long, rachis ≤ 40cm, angular to cylindrical ≤ 8mm wide. The rachis is occasionally subtended by a filiform bract, ≤ 15mm long. Pedicels ≤ 15mm long, lacking bracteoles. Sepals elliptical, ≤ 7mm long. Female inflorescences generally shorter than the males. Fruits ≤ 25mm long, seeds filiform, usually about 15mm long. Indumentum thin and dense on all young parts of the plant except the upper surfaces of the leaf blades, the hairs being long, mostly simple and white in colour. Most hairs are caducous, but a dense covering is retained on the outer surface of the pitcher rim, just beneath the peristome, and on the pedicels. Pitchers generally deep red throughout, but occasionally forms with green pitchers have been observed in the field. [Clarke & Kruger (2005)].

Distribution: Australia, Queensland, Cape York Peninsula, Somerset [Clarke & Kruger (2005)].

Habitat: Open, wet areas among banksias, pandans and sedges, growing in peat and/or sandy substrates, 0-10m a.s.l. [Clarke & Kruger (2005)].

Etymology: Named in honour of [Mariam] Ellis Rowan (1848-1922), an outstanding botanical illustrator of Australasian plants. [Clarke & Kruger (2005)].

Conservation: According to the IUCN guidelines (Anon. 1994), a category of Low Risk--Conservation Dependent is proposed. [Clarke & Kruger (2005)].

***Nepenthes samar* Jebb & Cheek in Blumea 58(1): 82 (-84, fig. 1). 2013. Sec. Cheek & Jebb (2013)**

Description: Terrestrial shrub-climber, probably to several metres high, stems quadrangular, not winged, 5 –7(– 9) mm diam, internodes of climbing stems (2.5 –)3 – 8 cm long, axillary buds not seen, indumentum of red, flattened glands 0.05 mm diam, very young growth with thinly scattered simple appressed hairs 0.5 mm long, soon glabrescent, surface matt, green. Leaves of rosette and short stems not known, leaves of climbing stems spirally

inserted, papery, matt, linear-oblong 22 – 32 by 2.8 – 3.2 cm, apex attenuate, not peltate, base steadily attenuate in the proximal 5 cm, subpetiolate, the base 0.6 – 0.8 cm broad, clasping the stem for 1/3 its circumference and decurrent as a wing 0.8 –1 by 0.1– 0.3 cm, continuing down the stem as a ridge, longitudinal nerves 5 – 6 pairs, evenly distributed, conspicuous on upper surface; pennate nerves numerous, arising at 45° from the midrib, branching, conspicuous, upper surface glabrous, lower surface with indumentum as the stem. Lower and intermediate pitchers not seen. Upper pitchers (tendrils coiled), cylindric or narrowly infundibuliform, 12 – 25 by 4 – 6(– 8) cm; outer surface with minute red globose glands 0.05 mm, c. 10 per mm2 and sparse appressed simple hairs 0.2 – 0.9 mm long; minute, short-armed dendritic erect hairs 0.1 mm long below the peristome; green, spotted red, with peristome red. Fringed wings absent, reduced to ridges running the length of the pitcher. Mouth ovate, oblique, concave, 4 – 8 by 6 cm, peri- stome rounded, 6 –14 mm wide, 0.8 –1.4 ridges per mm, ridges 0.1– 0.25 mm high, inner edge not revolute, but directed to base of pitcher, teeth minute, alternating with holes, plainly visible, teeth broader than long, 0.12 – 0.4 by 0.25 – 0.5 mm; outer edge shallowly lobed, or not; column not strongly developed; lid broadly elliptic, (3 –)6 –7 by 4.7– 6.5 cm, apex rounded to truncate, base rounded or shortly and abruptly cordate; lower surface lacking basal appendage, with a shallow midline ridge 3 – 4 mm wide, c. 1 mm high; nectar glands sunken, sparse, transversely elliptic or orbicular, 0.25 – 0.4 by 0.25 –0.7(– 0.9) mm, borders thin, slightly raised, or absent, 40 – 50 glands on each side of the midline, mainly absent from the central c. 8 mm band; minute red glands flush with surface, 0.05 – 0.07 mm diam, evenly scattered, dense, 5 –10 mm per mm2; upper surface of lid with indumentum as outer pitcher. Spur cylindric,c. 10 mm, apex acute, hirsute. Male and female inflorescence unknown. Infructescence (with persistent sepals) with peduncle 17 cm long, 5 mm diam indumentum at base covering 30 – 40 % of surface; simple hairs, 0.15 – 0.25 mm long, glossy, copper-coloured, mixed with minute red glands 0.05 mm diam; rhachis 29 cm long, bearing c. 100 partial-peduncles, 2-flowered (mainly at base of inflorescence) to 1-flowered (mainly at apex of inflorescence) partial-peduncles in ratio of 1 : 2; partial-peduncles (when 2-flowered) 7– 9 mm long; bracts absent; pedicel 7–10 mm long, indumentum 80 – 90 % cover. Tepals 4, oblong, 2 – 3.5 by 1–1.7 mm, apex obtuse, lower surface glabrous apart from papillae, margin with short multicellular hairs, upper surface with nectar glands, glabrous. Fruit 25 – 28 mm long, glossy brown, dehiscing in 4 valves c. 3 mm wide, indumentum as pedicels but very sparse (2 %). Seeds 12 by 0.35 mm, minutely papillate, embryonic area central, 1.75 by 0.35 mm, with two or more tuberculate lines, pale brown. [Cheek & Jebb (2013)].

Distribution: Philippines, Visayas, Samar [Cheek & Jebb (2013)].

Habitat: Lowland Dipterocarp forest over ultramafics; low elevation. [Cheek & Jebb (2013)].

Etymology: Named as a noun in apposition for the island of Samar. [Cheek & Jebb (2013)].

Conservation: *Nepenthes samar* is assessed as Critically Endangered under IUCN (2001), Criterion D. [Cheek & Jebb (2013)].

***Nepenthes sanguinea* Lindl. in Gard. Chron. 1849: 580, cum icon. 1849. Sec. Cheek & Jebb (2001)**

= *Nepenthes pumila* Griff., Not. Pl. Asiat. 4: 349. 1854.

Description: Terrestrial climber to at least 6 m tall. Stems obtusely angular, rarely rounded, 5-9 mm diam. Leaves coriaceous, sessile, leaves at base of the climbing stems largest, thinnest and long-spathulate, up to 20 by 5.2 cm, apex obtuse to slightly acuminate, base spathulate or cuneate, clasping the stem for 1/2-2/3 its diam., decurrent for 3-4 mm at 45°, auriculate, the lobes 3-6 mm long, rarely not auriculate; towards the stem apex the leaves are shorter, oblong, 10-15.5 by 2.1-3.4 cm, and more auriculate at the base; leaves of the basal rosettes mostly oblanceolate-spathulate, 7-8.5 by c. 2.5 cm. Longitudinal nerves 3 (or 4) on each side of the midrib in the outer half, obscure in the upper stem leaves. Pennate nerves numerous, c. 80° from the midrib, overlapping the innermost longitudinal nerves, obscure in the upper stem leaves. Lower pitchers ± broadly, rarely narrowly ellipsoid in the basal 2/3 or 1/2, gradually becoming constricted to-wards the subcylindrical upper half, sometimes ± broadly subcylindrical overall, 13-21.5(-26.5) cm long, 5.5-8.5 cm wide in the basal part, 3.5-6.7(-8.2) cm wide in the upper part, with two fringed wings 2-4 mm broad, fringed elements 4-6 mm long, c. 4 mm apart, mouth ovate, acuminate towards the lid, oblique, at 45° to the pitcher axis, concave; peristome flattened (3-)8-14(-15) mm wide, ribs 1 mm apart, each interspersed with 10-12 striae, outer margin usually markedly sinuate where the peristome is widest, inner edge lacking teeth; lid broadly elliptic-ovate, 3.2-6.5 by 2.8-4.5 cm, apex rounded, base truncate to shallowly cordate, appendages absent, nectar glands scattered, concentrated along distal part of midline, orbicular, thickly bordered, 0.2-0.5 mm diam., along midline sometimes longitudinally elliptic, c. 0.8 mm long; spur simple or branched, up to 17 mm long; rosette pitchers smaller and more slender in pro-portion than the lower pitchers, peristome not usually sinuate. Upper pitchers as the lower, but either subcylindrical, 13-27.5 cm long, or very narrowly infundibular, flaring gradually from the base where 1.3-2.2(-2.6) cm wide, to the peristome where 2.6-4.5 cm wide, or slightly hipped, constricted slightly but abruptly above the basal third where 4-4.7 cm wide to a slightly narrower upper cylindrical portion 3.5-4.5 cm wide, lacking fringed elements, but with two ridges up to 1 mm wide; peristome narrower, not always sinuate, ribs 0.3 mm apart, with 5 or 6 striae. Male inflorescence 35-65 cm long; peduncle (9-)11.5-23(-27) cm long; partial peduncles 2- (or 3-)flowered, (1-) 6-10 mm long; bracts usually present, 4-5 mm long;

pedicels 7-20 mm long; tepals elliptic 3 by 1.5(-2) mm long; androphore (1.5-)2-3 mm long; anther head 1-1.25 mm wide. Fruits with valves 20-25 mm long. Seeds fusiform, 10 mm long, rugose in centre. Indumentum of scattered sessile, red globular glands 0.1 mm diam. on most parts; stem glabrescent, with short white erect simple hairs, rarely 3-branched; leaves glabrescent above, below as the stems; pitchers with erect simple to 4-branched coppery hairs or with a mixture of long simple and sparsely branched hairs and short 5 or 6 armed hairs; inflorescence with appressed simple translucent hairs from peduncle to fruit valves. Colour either all green or with pitchers suffused and spotted with red-brown, inner surface blotched with red; peristome green, striped red; rarely the whole outer surface vivid red, the peristome yellow, and the inner surface lacking red pigment. Lower surface of the leaves drying brown below. [Cheek & Jebb (2001)].

Distribution: Thailand, Peninsular Malaysia. [Cheek & Jebb (2001)].

Habitat: Mountain ridges amongst scrub of *Dacrydium* and *Rhododendron*; 900-1800 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes sanguinea* is distinguished from *N. macfarlanei* in the more or less sharply 3-angled, glabrescent stems, the lower lid surface either lacking or possessing very few hairs, the pitchers not abruptly contracted below the peristome, and the inner edge of the peristome lacking teeth. It is not likely that *N. sanguinea* would be confused with the other montane species of Peninsular Malaysia (*N. ramispina* and *N. gracillima*) since these are much smaller species with more slender pitchers. [Cheek & Jebb (2001)].

***Nepenthes saranganiensis* Sh.Kurata in J. Insectiv. Pl. Soc. 54(2): 41 (-44, fig. 1, photogr. 1-7, cover). 2003. Sec. McPherson (2009)**

Description: Strict epiphyte. The lamina is linear or occasionally spathulate, especially in young plants, up to 30 cm long and 7 cm wide. The apex of the leaf is acute or obtuse and the base is attenuate, petiolate and strongly decurrent. The petiole is winged and up to 3 cm wide. The wings of the petiole run down the full length of the internode in a distinctive fashion, and often continue partway down the previous internode. The result is that the stem is sequentially punctuated by ribbon-like wings, up to 1.5 cm wide at the leaf axil, that taper over the length of the internode below. Kurata (2003) notes that often the decurrent wings "confluent together at (up to) 2 internodes below the leaf base, forming (Ц shaped) saddles on the stem". The lamina is green, and the stem, midrib und tendril may be yellow or green. Most parts of the foliage are glabrous.

The morphology of the pitchers is very similar to *N. alata*. The lower pitchers are up to 18 cm tall and 4.5 cm wide. The bottom quarter to third of the trap is ovate and variably swollen. Above this part, the width of the pitcher narrows, sometimes forming a slight hip, and becomes cylindrical or infundibular towards the pitcher opening. Wings up to 12 mm wide, fringed with filaments up to 10 mm long, usually run down the front of the pitcher, but these may be partly expressed or reduced entirely to narrow ridges. The peristome is up to 11 mm wide, loosely cylindrical or slightly flattened, and is usually of a consistent width around the pitcher opening, sometimes narrowing slightly towards the front. The peristome is lined with ribs up to 0.5 mm high, spaced up to 0.5 mm apart, but these may be hardly discernable. The lid is elliptic or sub-orbicular, up to 5 cm long and 4.5 cm wide. Insufficient observations have been made to comment definitively on the appendage or spur structure, but *N. saranganiensis* plants which I observed lacked any kind of appendage and had an unbranched spur up to 6 mm long. The exterior of the lower pitcher is usually yellowish green, but may be orange, pinkish, red or purple, often faintly blotched with red. The interior is creamy white, light, yellowish green or light red, often faintly flecked with red or purple. The peristome may be light yellow, green, orange, pink, red, or purple, and is often striped with bands of red, purple or black. The lid is generally the same colour as the exterior of the pitcher, but the lower surface may be marked with red or purple flecks or, rarely, is entirely red.

The upper pitchers are up to 32 cm tall and 5.5 cm wide. The bottom quarter or fifth of the pitcher is ovate and swollen. Above this part, the width of the pitcher narrows, sometimes forming a slight hip, and becomes cylindrical or infundibular towards the pitcher opening. Wings are usually reduced to narrow ridges that run down the front of the pitcher, or are hardly discernible at all. Sometimes, the wings may be party expressed immediately below the peristome. All other parts are similar to the lower pitchers.

The exterior of the upper pitchers is yellow, green or orange, often heavily blotched with red. The interior of the trap is light yellowish green, often faintly flecked dark red or purple. The peristome may be light yellow, green, orange, pink, red, or purple, and is often striped with bands of red, purple or black. The lid is generally the same colour as the exterior of the pitcher, but the lower surface may be flecked with red or purple, or, rarely, is entirely red.

Insufficient observations of *N. saranganiensis* have been made to document the structure of its inflorescence. Further studies of the floral parts of this species are required. [McPherson (2009)].

Distribution: Philippines, Mindanao [McPherson (2009)].

Habitat: As epiphyte on the mossy branches of tall, lower montane trees, 1800-2100 m a.s.l. [McPherson (2009)].

Etymology: The specific epithet refers to the fact that this taxon was first discovered in Sarangani Province, southern Mindanao. [McPherson (2009)].

***Nepenthes* ×*sharifah-hapsahii* J.H.Adam & Hafiza in Int. J. Bot. 3(1): 72. 2007. Sec. Cheek & Jebb (2001)**

– *Nepenthes* ×*ghazallyana* J.H.Adam in J. Trop. Forest Sci. 5(1): 22. 1992, nom. nud.

Distribution: Malaysia, Borneo, Sabah, Sandakan, Telupid. [Cheek & Jebb (2001)].

Hybrid parent formula: *Nepenthes gracilis* Korth. × *N. mirabilis* [Jebb & Cheek (1997)].

***Nepenthes sibuyanensis* Nerz in Carniv. Pl. Newslett. 27(1): 18 (-23, fig. 1, 2, frontisp.). 1998. Sec. Cheek & Jebb (2001)**

Description: Terrestrial shrub or climber 0.7-2 m tall. Stems terete or 3- or 4-angled, 0.8-0.9 cm diam., internodes 1-5 cm long in climbing stem. Leaves thinly to thickly coriaceous, sessile, linear-lanceolate, linear-oblong or slightly spathulate, 10-21 by 2.4-3.8(-5) cm, apex acute to rounded, often slightly peltate, base gradually or barely attenuate to the stem, decurrent as narrow wings 2-3 mm wide for 2/3, to a whole internode and converging towards the opposite surface of the stem. Longitudinal nerves 5 or 6 on each side of the midrib, in the outer 1/2-2/3 of the blade. Pennate nerves not conspicuous. Lower and upper pitchers apparently similar, shortly ovoid-cylindrical, to 20(-25) by 12(-15) cm, fringed wings 2-3 mm wide in the upper 2/3 of the lower pitchers on-ly, absent in the upper pitchers; mouth ovate to suborbicular, horizontal to slightly oblique, abruptly rising at the rear into a short, broad neck c. 2 by 2 cm; peristome slightly rounded, 20-30 mm broad, the ribs 1 mm high, 2 mm apart, outer margin undulate, with 6-8 shallow lobes; inner margin recurved, bearing teeth 3-4(-5) mm long and up to 5 times as long as broad; lid held over and parallel with mouth, ovate, 8-10.5 by 6.5-7.1 cm, apex rounded or obtuse, base shallowly cordate; lower surface lacking appendages, glands few, absent from the midline, the central area and the marginal area, 35-60 in total, sparsely scattered, pit-like, transversely elliptic, 0.8-2.1 mm long; spur filiform, 2-3 by 0.5 mm. Male inflorescence c. 32 cm long, c. 3 cm at the widest point; peduncle 18 cm long, 0.6 cm diam. at the base; partial peduncles 1-flowered; bracts highly reduced; pedicels 12-14 mm long at the base of the inflorescence; tepals oblong, 3 mm long, obtuse; androphore c. 5 mm long. Fruit 18-22 by 3-4 mm. Seeds filiform, 8 mm long. Indumentum of sessile red glands 0.1 mm present only on the densely appressed stellate-hairy inflorescence; androphore puberulent. Colour of pitchers green or yellowish to dull orange or pink with a few red blotches 5-10 mm diam. in the upper third; peristome bright glossy red to purplish black; lid yellowish orange or pale green suffused with pink above. [Cheek & Jebb (2001)].

Distribution: Philippines: Sibuyan Island. [Cheek & Jebb (2001)].

Habitat: Open grassy slopes among Dipteris conjugata and high grasses with small shrubs, probably on ultramafic soils, 1350-1800 m. Flowering: Oct. 1996. [Cheek & Jebb (2001)].

Notes: *Nepenthes sibuyanensis* is closely similar and seems very closely related to *N. ventricosa*, a species fairly widespread in Luzon, and to *N. burkei*, endemic to Mindoro. The differences are given in the key, the most conspicuous being the larger pitchers which lack any sign of constriction at the midpoint. These three species form part of the Insignes group.

The above description is taken partly from the protologue, in which the description of the upper and lower pitchers are united. Figures given in brackets in the description are taken from dimensions given by the collector of the type in a detailed article on the discovery of this species (Mann Carnivorous Plant Newsl. 27 (1998) 6). Apparently nearly sympatric with *N. argentii*, from which it is inferred that the shrubby grassland habitat of *N. sibuyanensis* is also induced by ultramafic soils. Known only from five collections (P. Mann & T. Smith 015001-015004, L n.v.) collected at the type locality on 5 October 1996 and Argent & Reynoso 89128 (E n.v., K, PNH n.v.). [Cheek & Jebb (2001)].

***Nepenthes singalana* Becc., Malesia 3: 12 (& 4 & t. 3). 1886. Sec. Cheek & Jebb (2001)**

= *Nepenthes junghuhnii* Macfarl. ex Ridl. in J. Fed. Mal. States Mus. 8(4): 79. 1917.

Description: Terrestrial climber to ?4 m tall. Climbing stems obscurely 4-angular, (2.5-)3-6(-7) mm diam., internodes 5-13.5(-16) cm long, axillary buds inconspicuous; short stems, and those of rosettes, terete, c. 5 mm diam., internodes c. 1.5 cm long.

Leaves coriaceous, sessile or weakly petiolate; leaves of climbing stems narrowly oblong-oblanceolate, oblanceolate or oblanceolate-spathulate, 7-21 by 1.9-2.8(-3.8) cm, apex acute to obtuse, not usually peltate, base attenuate, sometimes with a poorly defined winged petiole c. 1.5 cm wide, clasping the stem for 1/2 its circumference, rarely slightly auriculate, decurrent down the stem as two low ridges almost to the node below; rosette and short stem leaves oblanceolate to subspathulate, c. 17 by 3.5 cm. Longitudinal nerves 3 (or 4) on each side of the midrib in the outer 1/2-3/4, fairly conspicuous on the lower surface. Pennate nerves inconspicuous.

Lower pitchers not seen, intermediate pitchers slender, obovoid in the lower 2/5, upper 3/5 subcylindrical, 13-18 cm tall, 3.4-3.9 cm wide in the lower part, c. 3 cm wide in the upper part, with two fringed wings in the upper part, c. 4 mm wide, fringed elements 7 mm long, 1.5 mm apart, mouth ovate, oblique, concave, raised in the rear part to form a slender vertical or overarching column c. 2.5 cm tall, peristome cylindrical in the front half, in the rear half flattened, c. 5 mm wide, ribs 0.3-0.5 mm high, 1-1.5 mm apart, outer edge entire, inner entire in the front half, the

rear half with teeth c. 5 mm long extending up the column and protruding; lid orbicular, c. 4 by 5 cm, apex rounded, base cordate, lower surface lacking appendages or keel, nectar glands thinly bordered, circular or shortly elliptic, 0.2-0.3 mm diam., scattered sparsely and evenly over the whole surface; spur c. 3 by 0.5 mm, flattened, bifurcate at apex.
Upper pitchers obovoid in lower 2/5-1/2, upper part cylindrical or narrowly infundibuliform, (7.2-)10-15(-20) cm tall, (1.8-) 2.5-4.5(-5.5) cm wide in the lower part, 1.8-4(-5) cm wide in the upper part, lacking fringed wings, but with two inconspicuous ridges, mouth suborbicular, horizontal or slightly oblique, straight in the front part, concave at the rear and rising to form a short, poorly defined vertical column, peristome subcylindrical to slightly flattened, 1.5-2 mm wide in smaller pitchers, flattened, 4-6 mm wide in larger pitchers, ribs 0.3-0.5 mm high, 0.5-1.25(-1.5) mm apart, outer edge entire, inner edge entire apart from 2-8 toothed ribs on each side near the column, column weakly toothed; lid orbicular, (1.7-) 2.7-4.2(-5.2) by (1.9-)3-4.2(-4.8) cm, lower surface as the lower pitchers, nectar glands (0.1-)0.3-0.5 mm; spur flattened, 3-4.5 by 0.5 mm, apex bifurcate or rounded.
Male inflorescence 10-15 by 1.8-2 cm; peduncle 2.5-5 cm long, 1-1.5 mm diam. at base; partial peduncles 1-flowered, 30-40; pedicels c. 7 mm long; bracts filiform 1.5-5 mm long; tepals 4-5 by 2.25 mm; androphore 2 mm long; anther head 1.5 by 2 mm. Infructescence 12-15.5 by 4-5 cm; peduncle 7.5-8 cm long, 2-2.5 mm diam. at base; pedicels c. 14 mm long; fruit valves c. 21 mm long (immature). Seeds unknown.
Indumentum of stems, lower surface of leaf and outer pitcher with sessile red glands 0.1 mm diam.; axils with pubescent patches 2-6 mm long of patent brown, sometimes mixed with white, stellate, branched and simple hairs 0.1-0.3 mm long, also present on pitcher lid; spur glabrous; inflorescence sparingly hairy with patent or appressed white or pale brown simple hairs 0.1-0.2 mm long from base of peduncle to apex of pedicels; tepals glabrous below; androphore glabrous; ovary densely fawn sericeous.
Colour of lower pitchers purplish red; upper pitchers reddish green streaked dull blood red, inner pale green blotched crimson, peristome dull blood red. [Cheek & Jebb (2001)].

Distribution: Sumatra: Mt Ophir (S. Barat) to G. Dempo (S. Selatan) [Cheek & Jebb (2001)].

Habitat: Montane forest; 1900-2800 m. [Cheek & Jebb (2001)].

Notes: Together with *N. spectabilis*, *N. singalana* is one of the most widespread and commonly collected of all montane Sumatran species of *Nepenthes*. Specimens of *N. diatas*, *N. pectinata*, and *N. spathulata* can be mistaken for this species. *Nepenthes diatas* has broader, more robust, rigid upper pitchers, with teeth conspicuous around the inner edge of the peristome rather than being restricted to near the column. *Nepenthes pectinata* has a larger, lanceolate leaf with a decurrent base, and the lid glands are usually sparser and restricted to the basal part of the midline. *Nepenthes spathulata* has sharply 4-angled stems in the climbing phase, and the peristome is greatly expanded at the sides. [Cheek & Jebb (2001)].

***Nepenthes smilesii* Hemsl. in Bull. Misc. Inform. Kew 1895(100-101): 116. 1895. Sec. Mey (2010)**

= *Nepenthes anamensis* Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 39. 1908.

Description: Leaves coriaceous, subpetiolate; lamina narrowly linear to lanceolate, short tendril. Lower pitchers often cylindrical with a swollen base; peristome narrow, usually without stripes. Upper pitchers, cylindrical with a swollen base, to infundibular. Lid usually elliptic with a cordate base, not vaulted. Inflorescence with male and female flowers borne solitary on pedicels. Indumentum, the whole plant is covered with hairs. [Mey (2010)].

Distribution: Cambodia, Laos, Thailand and Vietnam [Mey (2010)].

Habitat: Pyrophyte. Usually found in seasonally wet habitats such as open sandy savannahs and grasslands. In Kirirom National Park, *Nepenthes smilesii* grows in clearings among pine trees. Sea level (Kampot) and between 500 and 1000 m a.s.l. [Mey (2010)].

Notes: A member of the *N. thorelii aggregate.* [Mey (2010)].

***Nepenthes spathulata* Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 13: 465. 1935. Sec. Cheek & Jebb (2001)**

Description: Terrestrial or epiphytic shrub or climber to 1-2 m tall. Stems of short shoots terete or slightly angular, 0.8 cm diam., internodes 1-2 cm long; climbing stems strongly 4-angular, 0.5-0.8 cm diam., internodes 2.5-8 cm long, axillary buds conical, 1 by 1 mm, 3 mm above the axil. Leaves coriaceous, sessile or petiolate; leaves of rosettes and short stems petiolate, blades spathulate-obovate, 17-25 by 5-7 cm, apex rounded, slightly emarginate or obtuse, barely peltate, base attenuate into a 4-7 cm long, petiolar portion, 0.8-1 cm wide, sheathing the stem and clasping it by 4/5 its circumference; leaves of climbing shoots sessile oblanceolate-oblong or spathulate-elliptic to spathulate (8-)10.5-18(-22) by (1.5-)3-4(-4.6) cm, apex acute, base gradually attenuate, or abruptly contracted into a subpetiolate oblong 3-4.5 by 1.5-2 cm, clasping the stem by 1/2 its circumference, the base more or less auriculate, the auricles nearly meeting on the opposite side of the stem. Longitudinal nerves 2 or 3 on each side of the midrib in the outer 2/3-1/2, fairly conspicuous. Pennate nerves inconspicuous. Lower pitchers ovoid-cylindrical, 16-19 by 5-6 cm, tapering to 3.5-4.5 cm wide at the mouth, with two fringed wings 3-6 mm wide, fringed elements 3-7 mm long, 1-3 mm apart; mouth narrowly ovate, oblique, concave, rising at the rear into a column; peristome flattened, 3-4 mm

wide in the front half of the mouth, 2-3.5 cm wide in the rear half, ribs c. 0.7 mm high, 1 mm apart, outer edge with 3-6 shallow lobes on each side in the rear half, more or less entire in the front half, inner edge with teeth 3-5 mm long in the rear half, inconspicuous in the front half; lid ovate, (4.9-)6-6.5 by 3.8-5 cm, apex rounded, base truncate or shallowly cordate, the lower surface lacking appendages, but sometimes with a low keel along the midline, nectar glands circular or shortly elliptic (to elliptic on the midline), narrowly bordered, 0.4-0.8 mm diam., usually confined to the midline, rarely scattered over the entire surface; spur dorsiventrally flattened, 10 by 1 mm, divided by 3-8 mm into 3-6 branches. Upper pitchers either subcylindrical, slightly constricted in the middle, or, with the lower half broadly to narrowly ellipsoid and the upper half cylindrical, (10-)16-23.5 cm tall, (4-)5-6(-8.5) cm broad in the lower half, (2.5-)3-4(-5.5) cm broad in the upper half, with two unfringed narrow wings or prominent ridges 1-2 mm wide running the length of the pitchers; mouth less concave and oblique than the lower pitchers; peristome narrower, (0.5-)1-1.6 cm wide in the upper half, ribs shallower, 0.1-0.3 mm high, outer margin shallowly lobed; lid as the lower pitcher, but 5-5.5 by 4-4.5 cm, keel absent, nectar glands 0.3-0.6 mm diam.; spur unknown. Male inflorescences 14-24 by 2.5-3 cm; peduncle 6-6.5 cm long, 2-3 mm diam. at the base; partial peduncles 40-60, 1-flowered; bract filiform, 1.5-2.5(-5) mm long; pedicels 9-10 mm long; tepals oblong-elliptic, 4-5.5 by 2.5-3 mm; androphore 3-4 mm long; anther head 1.5 by 1.75 mm. Infructescences held horizontally, 16-25 by 3.5-7 cm; peduncle 11-15 cm long, 3.5-4.5 mm diam. at the base; fruits all held erect, 20-40. Fruit with valves 20-24 by 3-3.5 mm. Seed 11-15 by 0.5-0.75 mm. Indumentum of stems, lower leaf blade and pitcher with sessile red glands c. 0.1 mm diam.; pitcher matted or sparsely puberulent with simple or branched pale brown or white hairs 0.2-0.5 mm long; spur lightly white sericeous; inflorescence sericeous with fine white simple hairs 0.3-0.5(-0.7) mm long, sparse on peduncle, dense on rhachis to lower tepals; ovary golden with dense sericeous hairs; androphore glabrous. Colour of lower surface of leaf blade, orange-brown when dry; live pitchers green or green spotted light purple or red, with scarlet peristome. [Cheek & Jebb (2001)].

Distribution: S Sumatra. [Cheek & Jebb (2001)].

Habitat: Forest or open slopes; 1550-2200 m. [Cheek & Jebb (2001)].

Notes: Although closely related to *N. singalana, N. spathulata* can be distinguished by the sharply angular stems (although collections of *N. singalana* overlap in this character), the greatly expanded peristome, in which the ribs are not as tall and papery as those in *N. singalana,* in the lid which is ovate (vs. orbicular-cordate in *N. singalana*), and the lid glands which are fewer, and generally densest and largest near the midline of the lid (vs. evenly distributed in *N. singalana*) in a manner similar to those of *N. gymnamphora* and *N. pectinata*. Danser considered these latter two species as the most closely allied species to *N. spathulata,* but we see a closer affinity with *N. ovata*.
Nepenthes spathulata shows one of the more extreme examples of leaf dimorphy in the genus. The leaf blades of the rosettes/short stems are strikingly broad and spathulate with a distinct petiole and sheathing base around the terete stem, whereas the leaves of the longer stems are sessile and almost ligulate, auriculate at the base and clasping the markedly quadrangular stem. [Cheek & Jebb (2001)].

***Nepenthes spectabilis* Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 373, f. 21. 1928. Sec. Cheek & Jebb (2001)**

Description: Terrestrial climber 2-3 m tall. Rosette and short stems more or less unknown; climbing stems terete, but with a groove above each axil extending 1 or 2 nodes towards the stem apex, sometimes rounded-quadrangular, 5(-7) mm diam., internodes 3.5-7(-10) cm, axillary buds inconspicuous. Leaves coriaceous, subpetiolate; leaves of climbing stems narrowly oblong or oblong-oblanceolate, 15-24(-30) by 3.4-5.4 cm, apex acute or slightly acuminate, almost peltate, base more or less abruptly contracted into a broad, winged petiole 2-7 by 1.1-1.5 cm, clasping the stem for 1/2-3/4 its diameter and de-current down the stem for 0.5-2.4(-4.5) cm as a wing c. 4 mm wide. Longitudinal nerves 3-6 on each side in the outer 1/3-1/2, fairly conspicuous. Pennate nerves oblique, much branched, fairly conspicuous. Lower pitchers poorly known, ovoid to narrowly ovoid, 11-15 by 3.2-6 cm, with two fringed wings 2-5 mm wide, fringed elements 4-10 mm long, 1-3 mm apart; mouth oblique, slightly concave, peristome flattened, up to 4 mm wide at the front, 12 mm wide in the rear half, ribs 1 mm apart, 0.1 mm high, outer edge entire, reflexed, inner edge with teeth 2 mm long; lid ovate, 3.2-5 by 2.2-3.8 cm, apex rounded, base truncate, lower surface lacking appendages, nectar glands densely packed, extending to within 2-3(-10) mm of the margin, along the midline 0.4-0.5 mm diam., sometimes elliptic, narrowly bordered, rarely sunken, towards the margin 0.1-0.2 mm diam., sometimes crater-like; spur 10-16 by 1 mm, apex rounded, unbranched. Upper pitchers narrowly infundibuliform to narrowly cylindrical, 17-28 by 3.2-4.5 cm, lacking fringed wings or with two fringed wings in the upper half, wings c. 1.5 mm wide, fringed elements 5-7 mm long, 1-2 mm apart; mouth concave, horizontal at the front, gradually rising to the vertical in the rear where extended into a slender column, peristome flattened 4-14 mm wide in the rear half, c. 2 mm wide at the front, ribs 0.5 mm apart, 0.1 mm high, outer surface reflexed, more or less entire, rarely sinuate, inner edge with teeth c. 1.5 mm long, conspicuous only in the rear half; lid 3.5-5.5 by 3.2-5 cm, apex rounded, base shallowly cordate, lower surface usually with a keel 7-16 by 1-1.5 mm high, nectar glands as in the lower pitchers; spur as in lower pitchers, 11-22 by 1-1.5 mm. Male inflorescence 21-33 by 2.5-3.5 cm;

peduncle 10-15.5 cm long, 3-4 mm diam. at the base; partial peduncles 25-60, 2-flowered, often mixed with 1-flowered, 0-2(-2.5) mm long; bracts inserted near the base, sometimes displaced onto the rhachis, ligulate, (1.5-)4-8 mm long, apex attenuate; pedicels 6-8.5 mm long; tepals 4-6 by 2-3 mm; androphore 3.5-4.5 mm long; anther head 1.5-1.75 by 1.5-2 mm. Infructescence 23-29 by 9-11 cm; peduncle (9.5-)15-19 cm long, (2-)5-6 mm diam. at the base; partial peduncles c. 40, 2-fruited. Fruits with valves 41-45 by 3.5-4.5 mm. Seeds 18-20 by 0.4-0.6 mm. Indumentum: densely tomentose with erect, dull coppery red simple or sparsely branched, 0.3-0.7 mm long hairs, persisting usually only on the first internode and in lower internodes only in axillary patches 5-18 mm above the axil; the same indumentum, 0.2-0.3 mm long, also on the midribs above and below, rarely on the edge of the leaf blade, and on the pitchers, where up to 1 mm long; inflorescence with similar indumentum 0.3-0.4 mm long, rarely with indumentum sparse, white, 0.1-0.2 mm long; androphore puberulent along whole length; lower surface of leaf blade with sessile glands 0.1 mm diam. Colour of stems purple; upper pitchers purplish brown or purplish red with cream spots or stripes; male flowers yellowish green or brown, androphore reddish, anther head yellow. [Cheek & Jebb (2001)].

Distribution: N Sumatra: Aceh to Lake Toba [Cheek & Jebb (2001)].

Habitat: Open mossy forest or sub-alpine shrubberies; 1450-2000 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes spectabilis* is not easily confused with any other Sumatran montane species apart from *N. lavicola*. In both species the upper pitchers are narrowly infundibuliform to narrowly cylindrical and have a predominantly dark purple-brown colour. *Nepenthes spectabilis* differs from *N. lavicola* in its broader peristome with less prominent ribs, much longer spur (10-22 mm long compared to less than 6 mm long) and in its overall denser indumentum of reddish brown hairs, particularly in the axils of the leaves, on the underside of the midrib, and on the pitcher spur and inflorescence, but sparse elsewhere. [Cheek & Jebb (2001)].

Nepenthes stenophylla **Mast. in Gard. Chron. ser. 3 8: 240. 1890. Sec. Cheek & Jebb (2001)**

= *Nepenthes boschiana* var. *lowii* Hook.f., in: de Candolle, A. L. P. P., Prodr. 17: 98. 1873. *Nepenthes maxima* var. *lowii* (Hook.f.) Becc., Malesia 3: 3, 10. 1886.

= *Nepenthes fallax* Beck in Wiener Ill. Gart.-Zeitung 20: 191. 1895.

– *Nepenthes fusca* subsp. *apoensis* J.H.Adam & Wilcock ex Jebb & Cheek in Blumea 42(1): 82. 1997, nom. nud.

= *Nepenthes sandakanensis* J.H.Adam & Wilcock in Sarawak Mus. J. 50: 156, f. XXIIc. 1998.

= *Nepenthes sandakanensis* var. *eglandulosa* J.H.Adam & Wilcock in Sarawak Mus. J. 50: 158. 1998.

= *Nepenthes sandakanensis* var. *ferruginea* J.H.Adam & Wilcock in Sarawak Mus. J. 50: 158. 1998.

Description: Terrestrial climber (sometimes epiphytic?) to 10 m tall. Stem terete (less usually ridged or winged), 6-11 mm diam. Leaves coriaceous, petiolate (indistinctly so in rosette leaves); leaf blade lanceolate or oblong-lanceolate, (8.5-)15-23 by (3.5-)4-9 cm, apex rounded or acute, rarely peltate, base obtuse to decurrent; petiole 4-7.5 cm long, canaliculate, sheathed at base, less usually decurrent with two wings 1-2 mm wide descending as curved ridges to the internode below. Longitudinal nerves 2 or 3 on each side of the midrib in the outer 1/4, inconspicuous. Pennate nerves numerous, indistinct. Lower pitchers rarely collected, cylindrical, slightly waisted and narrowing c. 2/3 from the base, 10-18 by 3-4 cm, with two fringed wings 6 mm wide, fringed elements 4-6 mm long, 2-4 mm apart; mouth ovate, oblique, concave, rising to the vertical at the rear, forming a short column; peristome cylindrical, rarely slightly flattened, 2-3 mm broad in front, 3-5 mm broad near the lid, ribs 0.2-0.3 mm apart, with a conspicuous gland between each rib, outer margin entire, inner edge obscurely dentate, teeth 0.5 mm long; lid ovate to circular, 3-5 cm diam., apex rounded, base cordate, lower surface with a laterally flattened, semicircular basal appendage, apical appendage absent; nectar glands scattered throughout, orbicular, narrowly bordered, 0.1-0.15 mm diam., a few larger glands 0.2-0.4 mm diam. near margin and on appendage and often in a small aggregation near the apex; spur 5-15 mm long, unbranched. Upper pitchers as the lower, but cylindrical to very narrowly infundibuliform, 15-25 by 3-6 (-7.5) cm, wings reduced to ridges but often with scattered fringed elements 4.5 mm long; peristome 2-3 mm broad and slightly raised in front, 4-7(-9) mm broad at rear, ribs 0.2-0.5 mm apart, teeth 0.5 mm long, outer edge entire, rarely slightly sinuate; lid orbicular, usually slightly broader than long, 3-5.5(-8) by 5-6(-7.5) cm, apex slightly retuse or rounded, base cordate; basal appendage semi-orbicular, 3-8 by 3-5 mm high, nectar glands orbicular, thinly to thickly bordered, 0.2-0.35(-0.5) mm diam. Male inflorescence 18.5-35 cm long; peduncle 10-11 cm long; partial peduncles to c. 140 (male), 2-flowered, 5 mm long; bracts absent; pedicels 3-8 mm long; tepals elliptic 4-5 by 1.5-3 mm; androphore 5 mm long; anther head 1-1.5 by 1-1.5 mm. Fruit valves 18-35 mm long. Seed fusiform, 8-18 mm long, central body tuberculate. Indumentum coppery hirsute, of dense short, branched hairs c. 0.5 mm long mixed with scattered long simple hairs 2-3(-4) mm long, on stems (glabrescent), petioles, tendrils and pitchers; lower surface of leaf with only scattered simple hairs 2-3 mm long; pitcher lid appendage and adjacent surface puberulent. Colour of outer pitcher and lid cream to yellow to pale green, splashed with red; peristome yellowish with dark red stripes. Lower leaf blade drying dark brown. [Cheek & Jebb (2001)].

Distribution: Borneo: Sarawak, Brunei, Sabah, and Kalimantan. [Cheek & Jebb (2001)].

Habitat: Open bushy areas or montane forest, usually on ridge tops, usually on sandstone; sometimes in heath forest; 1000-2600 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes stenophylla* is distinguishable from other Bornean allies of *N. maxima* by the lid which is more or less orbicular, with a cordate base, and the semi-circular crest near the base of the lid. The majority of the lid glands are small (0.1-0.15 mm) and dispersed throughout the underside of the lid, but scattered among these are a few larger (0.2-0.4 mm), prominently lipped glands, which are present near the margin and on the basal crest, and often in a small aggregation near the apex. The peristome lacks teeth along its inner margin, although a conspicuous gland is present between each rib. *Nepenthes pilosa* is apparently closely related to *N. stenophylla* (for differences see there) but is especially similar to *N. faizaliana* (see there also).
At Kew there is a specimen from Veitch & Sons annotated in Masters handwriting "*N. stenophylla* Masters Type specimen! Presented 1890." It can be argued that since this, the type specimen, has only intermediate and not upper pitchers, there is ambiguity as to the species involved. However, a plate published a few years later of older plants of the same origin showed the distinctive upper pitchers, removing this doubt, as far as we are concerned. Not all agree, and J.H. Adam & Wilcock in Sarawak Mus. J. 50 (1998) 156 imply that the type of *N. stenophylla* is specifically different from the taxon usually referred to under this name, since they cite *N. stenophylla* sensu Danser in Bull. Jard. Bot. Buitenzorg III, 9 (1928) as a synonym of their newly described *N. sandakanensis*. Clearly, it is undesirable to change the name of this well-known and common montane species. In order to buttress the application of the name *N. stenophylla* to this species, we therefore here propose the epitype nominated above which has the virtue of being available in several herbaria, fertile, and representative of this common ridge-top species in northern Sarawak and Sabah. [Cheek & Jebb (2001)].

***Nepenthes sumagaya* Cheek in Pl. Carnivora 36(2): 45. 2014. Sec. Cheek (2014)**

– *Nepenthes amabilis* Wistuba, Gronem., Micheler, Marwinski, Gieray, Coritico & V.B.Amoroso in Plants (Basel) 3(2): 295 (-297, fig. 4). 2014, nom. illeg.

Description: The stems are often very short. Plants start to grow upright at a young age and are supported by surrounding vegetation, mostly low shrubs. The stem of short plants is green and often almost without any significant internodes. Occasionally, in more shady locations and where the stems can scramble along other plants as support, plants develop climbing stems that reach 2–3 m in length. These vines are almost round in the cross-section, 8 mm in diameter, green to dark red and with internodes that are 10–15 cm long.
Leaves of the vines and short stems are broadly spathulate-ovate, 10 cm long and 3.5 cm wide, with a broad, winged and 1 cm-wide petiole. The leaves are green with yellowish to reddish midribs. The leaf attachment is decurrent, running 1–3 cm down the stem. One to two longitudinal nerves run parallel to the midrib in the outer half of the lamina. Pitchers are attached to tendrils up to 13 cm long.
Lower pitchers of rosette plants are unknown; plants with lower pitchers could not be identified with certainty at the type locality.
Upper pitchers of short and climbing stems are 10–15 cm high, approximately 3 cm wide, mostly cylindrical, slightly infundibular in the lower third and distinctly contracted in the region below the peristome. The bottom fifth is often slightly ventricose with a slight waist above. The pitcher wings are reduced to ribs. Only occasionally in some pitchers, approximately 5 mm-wide wings bearing two or three fringes measuring approximately 5 mm in length are visible close to the peristome. The peristome is cylindrical and approximately 4 mm wide. The spur on the pitcher lid is unbranched, filiform and 3 mm long. The pitcher mouth is round, slightly elevated at the front and elongated towards the back with a slightly developed neck. The lids are 3 cm long, 3.5 cm wide, orbicular, sometimes with a small appendage near the base of the lid, which is mostly reduced to a keel. The glands are evenly distributed across the lower surface of the lid. The exterior of the upper pitchers is yellowish green to orange, unevenly suffused with red or with red blotches. The interior of the pitcher is whitish with numerous purple blotches that often shine through the pitcher wall. The peristome is yellowish green with numerous red stripes. The lid is yellowish with numerous red blotches.
The inflorescence is a panicle composed of a 15 cm-long scape and an additional 15 cm rachis bearing two-flowered, 20 mm-long pedicels. The anther column is up to 14 mm and the ovary 5 mm long, containing ripe seeds; the tepals are up to 7 mm long and ovate.
A prominent indumentum is present across the foliage, the inflorescence, especially the margins of young leaves, and pitchers, consisting of brownish hair up to 1 mm long. [Gronemeyer, Coritico & al. (2014)].

Habitat: Terrestrially in lower and upper montane forest in mossy and open substrate. [Gronemeyer, Coritico & al. (2014)].

Etymology: Supposedly referring to the type locality, Mount Sumagaya. [Berendsohn (2017+)].

Conservation: As no comprehensive data about the distribution of this taxon have been recorded, it is classified here as EN (endangered). [Gronemeyer, Coritico & al. (2014)].

***Nepenthes sumatrana* (Miq.) Beck in Wiener Ill. Gart.-Zeitung 20: 149. 1895. Sec. Clarke (2001)**

≡ *Nepenthes boschiana* var. *sumatrana* Miq., Fl. Ned. Ind. 1(1): 1074. 1858. *Nepenthes maxima* var. *sumatrana* (Miq.) Becc., Malesia 3: 3. 1886.

– *Nepenthes spinosa* Tamin & M. Hotta, in: Hotta, M., Divers. & Dynam. Pl. Life Sumatra: 103, f. 7 & 8. 1986, nom. nud.

Description: Climbing or scrambling branched stem up to 18 m long.

The lamina is oblong or lanceolate, occasionally ovate in young plants, up to 55 cm long and 9 cm wide. The apex of the leaf is acute, obtuse, rounded or emarginate, and the base is attenuate, petiolate and clasps the stem, sometimes becoming decurrent. The petiole is narrowly winged and up to 8 cm long. The lamina is green, the tendril and midrib are yellow, green or reddish in strong sunlight. The stem is yellow, green or grey. Most parts of mature plants are sparsely covered with grey or brown hairs. The margins of the leaves are fringed with short, reddish brown hairs. The hairs readily detach, and mature plants may sometimes appear predominantly glabrous.

Nepenthes sumatrana is unusual among *Nepenthes* in that it produces two types of lower pitchers. Seedlings and juvenile plants first produce pitchers that are wholly ovate, or ovate in the bottom half and cylindrical above. These traps are up to 14 cm tall and 6 cm wide, and have broad wings up to 10 mm wide, fringed with narrow filaments up to 6 mm long. The peristome is loosely cylindrical, up to 8 mm wide, and lined with fine ribs up to 0.3 mm high, spaced up to 0.3 mm apart. The front of the peristome is typically raised to form a short ridge. The peristome may be of a constant width around the pitcher opening, or is expanded at the sides and back. The lid is orbicular or ovate, with a cordate base, lacks an appendage, and often has wavy margins. The spur is unbranched and up to 15 mm long.

As plants develop, they soon produce a vine and upper pitchers. If offshoots and basal rosettes develop from the rootstock, they bear the second type of lower pitcher. These are up to 20 cm tall and 10 cm wide, and are ovate or cylindrical, with a distinct hip and slight constriction just below the peristome. Wings up to 12 mm wide, fringed with filaments up to 10 mm long, run down the front of the pitchers. The peristome is up to 14 mm wide, but in all other respects, these pitchers are consistent with the lower pitchers found on young plants.

The colouration of both types of lower pitcher is very variable. The exterior may be yellow, orange, flesh pink, bright pink or red, sometimes mottled with blotches of dark red or purple. The interior is creamy white or yellow, often punctuated by large, angular, dark red or purple blotches. The peristome is yellow, orange or red, striped with bands of dark red or purple. The lid is the same colour as the exterior of the pitcher, but often has a lighter lower surface.

The upper pitchers are wholly infundibular, up to 30 cm tall and 15 cm wide. The shape, size and relative proportions of the traps vary greatly, and some are evenly funnel shaped whilst others are elongated. The base of the pitcher curves abruptly backwards, especially where it emerges from the tendril. The pitcher usually narrows abruptly just below the peristome, forming a distinct hip. The wings are reduced to narrow ridges. The peristome is cylindrical, up to 10 mm wide, and is lined with fine ribs up to 0.3 mm high, spaced up to 0.3 mm apart. The peristome is often abruptly raised at the front of the pitcher opening to form a short, broad ridge. All other parts are similar to the lower pitchers. Nectar is secreted profusely on the lower surface of the lid, and upper pitchers may have a sweet fragrance.

The exterior of the upper pitchers may be yellow, orange, or red. The interior is creamy white, light yellow or orange, often blotched with dark red or purple. The peristome is yellow, green, orange, red or purple, and often striped with light yellow, light green or bright red.

The inflorescence is a raceme, to 90 cm long. The peduncle is up to 20 cm long and the rachis to 70 cm long. Female inflorescences have a longer peduncle, to 30 cm, and a shorter rachis, usually less than 40 cm long. Flowers are borne on 1- or 2-flowered partial peduncles 5-8 mm long, sometimes with a bract, the pedicels up to 8 mm long. Tepals are ovate and up to 6 mm long. Fruits are up to 56 mm long and the seeds to 26 mm long. [McPherson (2009)].

Distribution: Indonesia, North and West Sumatra [McPherson (2009)].

Habitat: In humid, undisturbed lowland dipterocarp forest on steep cliffsides and the slopes of hills and ridges, amidst shrubs and trees in dappled shade. [McPherson (2009)].

Notes: Jebb & Cheek (1997) and Cheek & Jebb (2001) included *N. longifolia* Nerz & Wistuba in this species, but Clarke (2001) points to a number of differences that justify to maintain them as separate species. [Clarke (2001)].

***Nepenthes suratensis* M.Catal., Nepenthes Thailand.: 36 (fig. 1-6). 2010. Sec. Catalano (2010)**

Description: Terrestrial climber to 3 m tall. Stem terete, 3-5 mm in diameter, internodes 5.5-6.5 cm long. Leaves coriaceous, 0.5 mm thick, lamina lanceolate, 13-35 cm long, 2-4 cm wide, apex acute to narrowly acuminate, base attenuate and sessile, clasping the stem by three quarters of its circumference; longitudinal veins 3 on each side of the midrib in distal quarter of the lamina, pinnate veins arising obliquely from midrib; tendrils terete, 10-24 cm long, 1-2 mm in diameter, coiling in upper pitchers. Lower pitchers 9-15 x 4-5 cm, ovate in the lower half and narrowing

above or completely ovate, hip at the mid-section to absent in completely ovate pitchers; two alae, 3-12 mm wide, run down ventral exterior surface from mouth to tendril, fringed with narrow filaments; pitcher mouth oblique, smoothly triangular; peristome flattened, 4-10 mm wide, teeth 0.5-1 mm long; lid broadly to narrowly ovate, 3-4.5 x 2-3.5 cm, as large as or smaller than the mouth, with irregularly wavy margins, base slightly cordate, lower surface with a small depression towards the tip, crateriform glands densely arranged and numerous, larger along the midrib, 0.5-1 mm in diameter; spur 3-5 mm long, simple; longitu- dinal veins 4-6 on each side of midrib. Upper pitchers 12-18 x 2.5-3 cm, tubulose or narrowly infundibular; alae 0-3 mm wide; pitcher mouth oblique, smoothly triangular; peristome and lid as for lower pitchers. Male inflorescence a raceme, to 70 cm, peduncle 50 cm long, rachis 20 cm long with ca. 180 solitary flowers borne on pedicels 3-8 mm long, androphore to 3 mm; tepals elliptic, green with red margins, 3-5 x 2-3 mm; a bract, to 1.5 mm long, is often present at the base or lower half of the pedicel. Female inflorescence as for male inflorescence, but rachis 10-15 cm long with solitary flowers borne on pedicels 4-10 mm long; tepals elliptic, green, 3-4 x 1.5-2 mm; bracts absent or greatly reduced in size and number. Indumentum of orange or brown hairs 0.1-0.3 mm long covering inflorescence, leaves and stem; indumen- tum caducous, absent in the lower part of plant. Colour: leaves light green; stem, midrib and tendril green to red; lower pitchers green to orange with red stripes or completely red, with red blotches over the inner, non-glandular zone, peristome green to orange or red, lid orange to red, marked by fine red stripes; upper pitchers green to yellow, with red blotches over the inner, non-glandular zone, peristome and lid green to yellow. [Catalano (2010)].

Distribution: Southern Thailand, coastal Suratthani Province. [Catalano (2010)].

Habitat: In sandy soil, on open savannahs and grasslands, at sea level. [Catalano (2010)].

Notes: *Nepenthes suratensis* is closely related to *N. kongkandana, N. bokorensis, N. kerrii* and *N. andamana*. It differs from *N. kongkandana* in having linear to lanceolate leaves (vs. obovate) and a caducous indumentum covering the upper part of plant (vs. a persistent indumentum covering the whole plant).

It differs from *N. bokorensis* in having bracteate pedicels (vs. abracteate), a caducous indumentum covering the upper part of plant (vs. a persistent indumentum of variable distribution), narrower leaves (2-4 cm vs. 7-8 cm) and a thinner peristome (10 mm vs. 20 mm).

It differs from *N. kerrii* in having linear to lanceolate leaves (vs. obovate) and a caducous indumentum covering the upper part of plant (vs. a persistent indumentum limited to leaf axils).

It differs from *N. andamana* in having green flowers with red margins (vs. red flowers), a longer androphore (3 mm vs. 1 mm), flower bracts that are bent inwards (vs. bracts that are bent outwards), a caducous indumentum, to 0.3 mm long, covering the upper part of the plant (vs. a caducous indumentum, 0.8 mm long, that is limited to the tips and bases of the upper stem leaves), a more variable glandular zone (1/3 to 2/3 vs. 1/2 of lower pitcher length), wider wings in upper pitchers (0-3 mm vs. 0-1 mm) and lower pitchers (up to 12 mm vs. up to 6 mm), lids that are smaller than the mouth, broadly to narrowly ovate, with wavy margins and with a small depression under the tip (vs. larger than the mouth, orbicular to broadly ovate, with straight margins and with no depression), a shorter spur (3-5 mm vs. 5-7 mm), a triangular mouth, as large as 1/3-1/2 of the lower pitcher (vs. ovate mouth, as large as 1/4 of the lower pitcher), greenish upper pitchers without peristome lobes (vs. whitish upper pitchers with peristome slightly lobed on outer margin) and a flattened peristome (vs. cylindrical). [Catalano (2010)].

***Nepenthes surigaoensis* Elmer in Leafl. Philipp. Bot. 8: 2785 (-2787). 1915. Sec. McPherson (2009)**

Description: Climbing or scrambling occosionally branced stem up to 5 m long.

The lamina is linear or slightly lanceolate, up to 40 cm long and 5 cm wide. The apex of the leaf is acute or obtuse, the base is slightly attenuate, with a winged petiole that becomes strongly decurrent. Much like *N. merrilliana*, the tip of the lamina often meets the tendril unequally on either side of the midrib; one side may be up to 4 mm shorter than the other. The lamina may also be slightly broader on one side of the midrib than on the other. The stem and tendril are green or yellow and the midrib is green, yellow or very light orange (particularly close to the stem). The lamina is green, including when young which possibly distinguishes this species from *N. merrilliana* (Volker Heinrich, pers. comm.). In most mature *N. surigaoensis* plants on Mount Masay, the pitchers and tendrils are usually lined with coarse orange or brown hairs up to 1.8 mm long. It is not known whether this indumentum is a consistent characteristic of this species, but is has been identified in all specimens observed thus far. Most other parts of the foliage are predominantly glabrous.

The lower pitchers are wholly cylindrical or ellipsoidal, generally up to 16 cm tall and 7.5 cm wide, although exceptionally robust pitchers may rarely be 24 cm tall and 9 cm wide. In some plants, the bottom half of the pitcher may be slightly swollen and expanded, and the top half may gradually taper towards the pitcher opening. Wings up to 20 mm wide, fringed with filaments up to 16 mm long, run down the front of the lower pitchers. The peristome is loosely cylindrical, up to 2.5 cm wide, and is expanded towards the sides and back of the pitcher opening. The peristome is lined with ribs up to 1.5 mm high, spaced up to 2 mm apart. The ribs are elongated on the inner edge of the peristome to form very narrow, needle-like teeth up to 2.5 mm long. The peristome is slightly raised and elongated into a short column just below the lid. The outer margin of the peristome is recurved and sometimes

slightly crenellated, and the inner margin extends into the pitcher opening for several millimetres. A gap of a few millimetres is often present at the rear of the peristome, below the lid. The lid is elliptic or ovate, up to 8 cm long, 6 cm wide, and lacks an appendage. The spur is unbranched and up 22 mm long. The exterior of the lower pitchers is typically yellow, green or light orange, but may suffuse pure red as the pitchers age. The interior of the trap is yellow or orange, often marked with prominent, angular, red, purple or black blotches. The peristome is usually yellow or green, but may turn orange, red or purple with age. The lid is generally the same colour as the exterior of the pitcher. Lower pitchers are borne on extremely long tendrils up to 120 cm in length.
The upper pitchers are up to 15 cm tall and 6.5 cm wide, but usually smaller. The bottom third to half of the pitcher is broadly infundibular, becoming cylindrical and slightly swollen above. Wings up to 15 mm wide, fringed with filaments up to 13 mm long, run down the front of the upper pitchers. All other parts are consistent with the lower pitchers, except that the peristome is not usually crenellated. The upper pitchers are generally yellowish green, but may be faintly blotched with red or purple on the interior of the trap.
The inflorescence is a raceme, to 40 cm long by 6 cm at the widest point. The peduncle is up to 18 cm long, the rachis to 25 cm long. Flowers are borne on predominantly 2-flowered partial peduncles to 8 mm, the first flowers with narrow bracts, on pedicels to 16 mm long. Tepals are oblong, 5 mm long, and may be of unequal width. The anther head is borne on a column up to 6 mm long and 1 mm in diameter. [McPherson (2009)].

Distribution: Philippines, Mindanao [McPherson (2009)].

Habitat: Terrestrial in shady, lower montane forest, from 800 - 1200 (-1700) m a.s.l. [McPherson (2009)].

Etymology: The specific epithet refers to the Surigao Peninsula in northern Mindanao, from where this species was first collected. [McPherson (2009)].

***Nepenthes talaandig* Gronem., Coritico, Wistuba, Micheler, Marwinski, Gieray & V.B.Amoroso in Plants (Basel) 3(2): 292 (-294, fig. 3). 2014. Sec. Cheek & Jebb (2001)**

Description: The stem is up to 8 m long, cylindrical in the cross-section and 7–8 mm in diameter. The internode length is 3.5–6 cm.
Leaves of the climbing stem are elliptic, up to 35 cm long and 4.5 cm wide, with four equally distributed longitudinal veins on each side of the midrib and numerous pinnate veins running obliquely towards the leaf margins. The apex of the lamina is acute, the base attenuate and forming a narrow-winged petiole 6 cm in length that clasps one third of the stem. Pitchers are on tendrils 16–20 cm long.
Lower pitchers are bulbous or ovate, 10 cm tall and 5 cm wide. The pitcher narrows slightly towards the opening. Wings are up to 7 mm wide, fringed with filaments up to 7 mm long and run down the front of the trap. The pitcher opening is at a prominent angle, up to 3.5 cm wide and acuminates towards the lid. The peristome is flattened, up to 1.5 cm wide and crenellated. It extends into a neck towards the lid and is densely lined with ribs approximately 1 mm high. The lid is ovate to cordate, up to 5.5 cm long and 5 cm wide, with glands evenly distributed across the lower surface. A rounded, triangular appendage up to 3 mm long, sitting on a keel, is present on the underside of the lid. The spur is branched and up to 6 mm long. The exterior of the lower pitchers is rusty red to violet, with narrow blotches of reddish purple. The interior of the pitcher is white and sometimes lined with angular blotches of purple. The peristome is dark red and not striped.
Rosette pitchers, which are squatter and considerably smaller than the lower pitchers, have been observed in situ on young plants. In all other respects, they resemble the lower pitchers.
Upper pitchers are slender, around 20 cm long and 7 cm wide. The bottom third of the trap is slightly inflated. The pitcher narrows towards a cylindrical middle section before it widens towards the oblique pitcher opening; the latter being 4.5 cm wide. Wings are reduced to ribs throughout. The peristome is not crenellated, is cylindrical to flattened, up to 1.2 cm wide and extends into a short neck. The color of the peristome is yellow with discrete stripes of red. The lid is ovate to orbicular with a diameter of 4 cm. A prominent triangular appendage of 2.5 mm on a keel is present; the spur is 6 mm long and branched. The upper pitchers are colored yellowish-green, often with red speckles or blotches. The pitcher interior is cream-colored without blotches.
The inflorescence is a panicle, composed of a rachis up to 40 cm long sitting on a 20-cm scape.
It bears branched two-flowered partial peduncles 5 mm long. Bracts are present.
Indumentum is sparse, if present at all. [Gronemeyer, Coritico & al. (2014)].

Distribution: Philippines, Mindanao Island, Bukidnon Province, Pantaron mountain range. [Gronemeyer, Coritico & al. (2014)].

Habitat: Most observed populations occur terrestrially on ultramafic soil in clearings and on bright ridges in lower montane forest, at altitudes around 1,000 m. [Gronemeyer, Coritico & al. (2014)].

Etymology: The specific epithet was chosen to acknowledge the indigenous tribe of the Talaandig. *N. talaandig* occurs on the ancestral territory of the Talaandig communities of east Bukidnon. [Gronemeyer, Coritico & al. (2014)].

Conservation: Assessed as VU (vulnerable) according to the IUCN Red List criteria. [Gronemeyer, Coritico & al. (2014)].

***Nepenthes talangensis* Nerz & Wistuba in Carniv. Pl. Newslett. 23(4): 101, f. 1. 1994. Sec. Nerz & Wistuba ("1994" [1995])**

Description: Plants usually growing as rosettes and only rarely climbing. Climbing stems reaching up to 2-3 m high, the part with adult leaves 6-10 mm thick, cylindrical to obtusely angular, internodes 0.5-10 cm long, leaves of the rosettes and climbing stems thick, coriaceous sessile, lanceolate-spathulate, about 10-15 cm long, up to 3 cm broad, apically acute or obtuse, attenuate towards the base, leaves clasping the stem, not decurrent; Pennate nerves, irregularly reticulate, on each side several (10-15) originating irregularly from the midrib, longitudinal nerves running parallel in the outer 1/3 part of the lamina. Tendrils usually without curl, once to twice as long as the lamina. Pitchers of the rossettes originating with a short curve, 5 mm wide from the hanging end of the tendril, thick- coriaceous, widely infundibuliform, 8-12 cm high, 3-5 cm wide, somewhat contracted below the mouth, with 2 fringed wings. The wings 2-5 mm wide, the fringe segments 3-10 mm long, 0,5-1,0 mm apart; mouth almost horizontal in front, elevated towards the lid and elongated into a short neck. Peristome flattened, 8-15 mm wide, the ribs 1/3-1 mm apart, the teeth of the inner margin 2-3 times as long as broad. Innerside of the pitcher wholly glandular with a glandless triangle below the lid. Large slightly overarched glands, 300/cm2. in the lower part of the pitcher, smaller ones, 500/cm2 in the upper part. Lid broadly ovate, undulate at the margin. Lower surface without appendage, with rather large glands, especially near the midrib, glandless near the margin. Three prominent nerves on each side of the midrib. Spur broad and flattened, 2-5 mm long, branched, inserted close to the lid. Pitchers of the climbing stems originating with a short curve, 5 mm wide from the hanging end of the tendril, thick- coriaceous, tubulous to narrow infundibuliform in the lower half, ovate in the upper half, 8-12 cm high, 3-5 cm wide, somewhat contracted below the mouth, with 2 prominent ribs; mouth almost horizontal in front, elevated towards the lid and elongated into a short neck. Peristome flattened, 8-15mm wide, the ribs 1/3-1 mm apart, the teeth of the inner margin 2-3 times as long as broad. Interior surface of the pitcher wholly glandular with a glandless triangle blow the lid. Large, slightly overarched glands, 300/cm2 in the lower part of the pitcher, smaller ones, 500/cm2 in the upper part. Lid broadly ovate, undulate at the margin. Lower surface without appendage, with rather large glands, especially near the midrib, glandless near the margin. Three prominent nerves on each side of the midrib. Spur broad and flattened, 2-5 mm long, branched, inserted close to the lid. Male inflorescence a raceme, the peduncle 4-5 mm long, 1-1,5 mm thick, the axis 6-8 cm long, obtusely angular, the pedicels all of them 1 flowered, the lower ones 10 mm long, the upper ones a little shorter, almost all of them with a filiform bract, up to 4 mm long. Tepals elliptical to oblong, 4 mm long. Staminal column, the anthers included, 3-4 mm long. Female inflorescence unknown. Indumentum on the vegetative part very sparse with non branched hairs, margin of the leaves, densely covered with non branched hairs. Indumentum of inflorescence very sparse. Colour of herbarium specimens: Brown to dark-brown. Colour of living specimens: Vegetative parts light green, leaves with white hair at the margins, pitchers yellowish-white with numerous dark red spots. Peristome yellow or red, lid yellowish white with numerous red spots. [Nerz & Wistuba ("1994" [1995])].

Distribution: Indonesia: West Sumatra, Gunung Talang [Nerz & Wistuba ("1994" [1995])].

Habitat: In alpine regions above the tree-zone, 2200-2600 m a.s.l. [Nerz & Wistuba ("1994" [1995])].

Notes: Cheek & Jebb (2001) state that "specimens from Mt Talang have been distinguished as *N. talangensis*, which may well merit recognition on the basis of photographs we have seen. However, we have not yet viewed the type specimens and for the meantime are leaving it as a synonym of *N. bongso*. [Berendsohn (2017+)].

Notes: Danser, according to data given in his monograph of 1928, examined material of this species (Bunnemeijer 2552 (L); Bunnemeijer 5398 (L); Bunnemeijer 6740 (BO)). Erroneously he placed these specimens under *Nepenthes bongso*. Recent field studies of *Nepenthes talangensis* at G. Talang by Nerz in 1986 and of *Nepenthes bongso* at G. Singgalang by Mr. and Mrs. DeWitte in 1993 (pers. com.) showed clearly that both are distinct species. This was also confirmed by the studies of available herbarium-material of *Nepenthes talangensis* (The Bunnemeijer specimens cited above) and herbarium-material of *Nepenthes bongso* (the type). [Nerz & Wistuba ("1994" [1995])].

***Nepenthes tayninhensis* M.Catal. & Kruetr. in AIPC Mag. 46: 22, fig. 2017. Sec. Catalano (2017)**

Description: Terrestrial climber, stem terete, leaves linear to narrowly lanceolate, with apex acute, acuminate or subobtuse. Lower pitchers ovate, subglobose or ellipsoid, upper pitchers obovate or infundibulate. Inflorescence a raceme, solitary flowers borne on pedicels, tepals elliptic. Indumentum of fine hairs covering the whole plant. [Catalano (2017)].

Distribution: Southern Vietnam, Tay Ninh Province. [Catalano (2017)].

Habitat: In sandy soil, on open savannahs and grasslands, at sea level. [Catalano (2017)].

Notes: *N. tayninhensis* is closely related to *N. smilesii* and *N. thorelii*. It differs from *N. smilesii* for having leaves with apex acute, acuminate or subobtuse (vs always acute), squat lower pitchers (vs elongate), and always obovate

or infundibulate upper pitchers (vs tubulose or obovate). It differs from *N. thorelii* for having leaves with apex acute, acuminate or subobtuse (vs always acute), always obovate or infundibulate upper pitchers (vs tubulose or obovate), and an indumentum of fine hairs covering the whole plant (vs hair only present on pitchers, tendrils, inflorescence and occasionally along abaxial surface of leaf midrib). [Catalano (2017)].

***Nepenthes tboli* Jebb & Cheek in Blumea 59: 149, fig. 2. 2014. Sec. Cheek & Jebb (2014)**

Description: Terrestrial shrub or climber to at least 0.5 m tall. Rosette and climbing stems unknown. Short stems terete, 0.4–0.6 cm diam. Leaves spirally inserted, internodes 1.5 – 2.6 cm long, epidermis drying black, wrinkled, moderately densely covered in red sessile globose glands 0.05 mm diam; very young stems c. 50 % covered in red-brown, curved-erect, simple or 2(–3)-armed hairs 0.1 mm tall, concentrated in and near leaf axils; older stems with hairs 0.1–0.25 mm long c. 5 % covered and appearing glabrous. Leaf blades oblong-elliptic, 11–16 by 2.8–3.5 cm; apex attenuate, base decurrent; longitudinal and pennate nerves not conspicuous, barely visible only on lower surface, longitudinal nerves 5–10 pairs, oblique, arising at intervals along midrib as pennate nerves, arching upwards before running along and adjacent to margin for 0.5–1 cm; indumentum absent from upper surface, except leaf edge which is densely hairy, hairs 2–3-branched from the base or from the main axis, 0.25–0.75 mm long; lower surface with red, sessile, globose glands c. 0.5 mm diam, c. 4 per mm2; midrib moderately densely hairy, c. 50 % cover, hairs simple, or basally bi- or trifurcate 0.5–0.7 mm long, mixed with shrubby, multi-armed hairs 0.25 mm diam. Petioles with patent wings, 4.5–6 by 0.6–0.9 cm, margin with white, sparsely branched, patent hairs 0.25–0.5 mm long; base clasping the stem for 1/2–2/3 its circumference, shallowly winged, subauriculate. Lower and intermediate pitchers unknown. Upper pitchers (tendril coiled) narrowly subcylindrical, 11.5–17.5 by 3.5–4 cm; broadest at base, gradually tapering to 2.5–3 cm wide at the centre, gradually dilating towards apex, to c. 3.5 cm wide below the peristome; fringed wings absent, reduced to ridges; outer surface minutely and sparsely puberulent, c. 5 % covered with erect red hairs, c. 7 per mm2, hairs bifurcate at base or apex, or bushy, sessile, 0.15 mm long, or (c. 1 in 20 hairs) 3 mm long, patent, with 2–3 short lateral branches. Mouth ovate, 3–5.3 by 3.7–4 cm, oblique; peristome subcylindric, 2–2.5 mm wide, ridges 0.15–0.2 mm high, 0.3 mm apart, outer edge tightly inrolled, not lobed, inner edge slightly incurved, teeth absent, perforated with holes, mostly clearly visible near the weakly developed column. Lid ovate or ovate-elliptic; 3–3.8 by 2.4–3.4 cm; apex retuse, sinus 1–2 mm deep, base shallowly and broadly cordate or rounded; lower surface with a forwarddirected pocket, 1–2 mm long, 2.5 mm wide, set back 2–3 mm from the midline apex, the pocket sides continued to apex by two ridges; mouth of pocket and marginal 2–3 mm of the lid, minutely stellate-hairy, lacking nectar glands, the hairs c. 0.1 mm diam with (2–)3–4(–5) short, thick arms, covering c. 50 % of the surface at the edge itself, giving it a grey, shaggy appearance; basal appendage conspicuous, semi-circular to oblong, asymmetric, 1.5–2 by 2 mm, arising abruptly from a ridge 6 mm long, 1.25 mm high; nectar glands trimorphic, segregated:

1. Large, elliptic-oblong, thinly bordered nectar glands 1–1.25 by 0.6–1 mm, 15–20 in number, present in a band 6 mm wide, along the midline between basal ridge and apex, sparse; smaller such glands 0.3–0.35 by 0.25 mm sparsely scattered in the distal half outside the midline and in the proximal half inside the margin, throughout the lid mixed with small sessile red globose glands c. 0.05 mm diam, c. 10 per mm2;
2. small, circular, thickly rimmed (perithecoid) nectar glands, (0.15–)0.25 mm diam, confined to the basal appendage and to two curved elliptic areas on each side of the midline in the proximal half, glands very dense, 13 per mm2 on the appendage and abutting each other there;
3. small, deeply sunk borderless, circular glands 0.1–0.2 mm diam, c. 5 per mm2 present in a small area at the junction with the peristome.

Spur simple, needle-like, tapering to a point, 10 by 0.3 mm, erect; indumentum as outer pitcher surface. Male inflorescence known from incomplete portion, rhachis 2.5 mm diam, c. 50 % covered by mainly appressed white, heterogenous hairs: bristle-like hairs 1–2-armed from base, 0.1–0.2 mm long; vermicular, septate hairs c. 0.2 mm long, and by erect, minute simple hairs 0.05 mm long; partial-peduncles 3 per mm length of rhachis, lacking bracts, 2-flowered, (1–)2 mm long; pedicels divaricate, (8–)9–11 mm long; sepals 'yellow-green', 4, elliptic, c. 0.6 by 0.4 mm, apex obtuse, inner surface densely covered in nectar glands, margin densely felted in rust-red papillae; outer surface c. 40 % covered in white appressed hairs 0.1 mm long; androphore 3 mm long, basal 1/3 – 2/3 with patent white hairs 0.1 mm long, distal part glabrous; anther-head subglobose, wider than long, 1.5 by 1.75 mm, anther thecae c. 15, uniseriate, dull yellow. Infructescence peduncle 25–26 cm long, 0.4–0.6 cm diam at base, very sparsely puberulent; rhachis 12–13 cm long, indumentum as midrib of leaf, c. 60 % of surface covered; partial-peduncles 30–36; 7–10 mm long, 2-flowered; bracts absent; pedicels 8–12 mm long, indumentum as midrib, c. 100 % cover; tepals 4, ovate-oblong 5–6 by 2.5 mm, outer surface with white appressed hairs c. 0.1 mm long, c. 5 % cover, absent from base; inner surface with large elliptic glands. Fruit valves 4, narrowly linear-elliptic, 2.5–3.6 by 0.2–0.3 cm, pale brown, 60 % covered by curved red hairs c. 0.4 mm long. Seeds pale brown, filiform, 14 mm long, seed body 1.25 by 0.3–0.4 mm, deeply corrugated. [Cheek & Jebb (2014)].

Distribution: Philippines, Mindanao, S Cotabato Province, T'boli, Lake Parker [Cheek & Jebb (2014)].

Habitat: Open grassland, 1463 m. [Cheek & Jebb (2014)].

Etymology: Named, as a noun in apposition, for the T'boli people and area from whence the type specimen derives. [Cheek & Jebb (2014)].

Conservation: *N. tboli* is assessed as Critically Endangered under criterion D of IUCN (2012) since it is currently known only from one or two mature individuals at the type locality which is threatened by plantation agriculture and tourism developments (Google Earth data). [Cheek & Jebb (2014)].

***Nepenthes tenax* C.Clarke & R.Kruger in Austrobayleya 7(2): 319 (-324; fig. 1). 2006. Sec. McPherson (2009)**

Description: Monopodial shrub, new stems generally arising from the rootstock after the main stem dies. Indumentum: all young parts of the plant sparsely to densely covered with short simple and stellate hairs, most of which are caducous. Stems terete, up to 0.5 (-1) m long, 2-6 mm thick, internodes 8-10 mm long. Rosette leaves sessile, very narrowly linear, up to 60 mm long and 8 mm wide, margins more or less parallel throughout, contracting gradually; apex acute; base slightly widened, clasping the stem for two-thirds of its circumference; tendrils up to 25 mm. Leaf blades of the erect stems subpetiolate, lanceolate, up to 110 mm long and 25 mm wide, the margins held close together so that the blade forms a highly pronounced "V-shape" in cross section; longitudinal veins 3 or 4 on each side of the mid-rib, often indistinct on dried specimens, pennate veins forming a densely branched network arising from the midrib and spreading towards the margins; apex acute; base clasping the stem for half to two-thirds of its circumference, not decurrent. Tendrils up to 60 mm long, highly tensile, with a tight curl (or occasionally a pronounced kink) in the middle, insertion simple. Upper two- thirds of the aerial pitchers held above the leaf blade. Rosette pitchers rarely produced, ovoid to infundibular in the lower third, cylindrical above, up to 55 mm high and 10 mm wide; two wings, up to 2 mm wide, bearing multicellular fringe elements (up to 2 mm long) that run from the peristome to the lower quarter of the pitcher. Tendril insertion at the front or side. Mouth round, oblique throughout, peristome cylindrical, up to 2 mm wide, ribs distinct but minute, teeth distinct, but very short (up to 0.2 mm long). Inner surface glandular in the portion below the hip, glands round, recessed in the upper portion, up to 0.1 mm wide, c. 1500 per cm2• Lid wider than the pitcher mouth and held close to the peristome, resulting in a narrow opening to the pitcher, broadly ovate, indented at the apex, no appendages. Spur simple or bifid, up to 2 mm long. Aerial pitchers infundibular throughout, with or (more commonly) without a hip about one quarter of the way up from the bottom, up to 110 mm high and 20 mm wide, broadest at the mouth. Wings reduced to ribs and lacking multi-cellular fringe elements. Tendril joins the pitcher at the rear, but is generally positioned so that the apex of the leaf blade is pressed against the side of the pitcher in the lower quarter. Inner surface glandular in the lower one-quarter to one-third, glands as in the lower pitchers. Mouth round, oblique throughout, peristome cylindrical, up to 2 mm wide, ribs distinct but minute, up to 0.3 mm wide, teeth distinct but short, up to 0.4 mm long. Lid ovate, indented at the apex, no appendages, considerably broader than the mouth and positioned close to the peristome, so that the opening of the pitcher is very narrow. Glands on the underside of the lid ovate, up to 0.2 mm long, c. 100 per cm2 near the centre. Towards the margins, the glands are smaller (up to 0.1 mm long) and somewhat more numerous (up to 150 per cm2). Inflorescence a raceme, peduncle up to 80 mm long, rachis up to 80 mm long. Pedicels (or, occasionally, two-flowered partial peduncles) up to 8 mm long, lacking bracteoles, sepals ovate, up to 4 mm long; column of male flowers :s; 4 mm long. Mature fruits up to 12 mm long. [Clarke & Kruger (2006)].

Distribution: Australia, Queensland, northern Cape York peninsula. [Clarke & Kruger (2006)].

Habitat: Biogeographic region: CYP. Apparently confined to open sandy substrates or saturated peat in the lower portions of swamps on floodplains. The surrounding habitat is described by Fox et al. (2001) as open heath, Type Cl5. [Clarke & Kruger (2006)].

Etymology: The Latin, tenax, means tenacious and refers to the ability of this species to produce stems and pitchers that remain upright in open areas, despite regular exposure to strong winds and without the support of surrounding objects or plants, a characteristic that is not observed in other *Nepenthaceae.* [Clarke & Kruger (2006)].

Conservation: According to the IUCN guidelines (IUCN 2001), a category of LR(cd) (= lower risk, conservation dependent) is proposed, as all known populations occur within protected areas. [Clarke & Kruger (2006)].

***Nepenthes tentaculata* Hook.f., in: de Candolle, A. L. P. P., Prodr. 17: 101. 1873. Sec. Cheek & Jebb (2001)**

= *Nepenthes tentaculata* var. *imberbis* Becc., Malesia 3: 13. 1886.

= *Nepenthes tentaculata* var. *tomentosa* Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 43. 1908.

Description: Terrestrial climber to 4 m tall, but often climbing only rarely and existing largely as gregarious rosettes c. 10 cm tall arising from creeping stems. Stems sharply to rounded 4-angular, (1.5-)2-3(-6) mm diam., internodes in rosette shoots c. 0.6 cm; climbing stems with internodes 2.5-4.5(-7) cm long, often with conical axillary buds 1.5 by 1.5 mm inserted 3-3.5 mm above the axil. Leaves chartaceous, sessile, those of rosettes and short stems elliptic-oblong or oblanceolate-oblong, 6-11 by 1.5-2 cm, apex acute often inconspicuously peltate, base amplexicaul, subperfoliate, shortly decurrent down the stem by 0.3-0.6 cm; leaves of climbing stems lanceolate, oblanceolate-spathulate or oblong, (4.5-)6-9(-17) by (1.5-)1.8-2.5(-2.8) cm, base perfoliate or subperfoliate,

decurrent down the stem by (0.1-)1.5-1.8(-2.5) cm. Longitudinal nerves 2 (or 3) on each side of the midrib, usually in the outer third, prominent above and below. Pennate nerves sparse, patent, branching and anastomosing, inconspicuous. Lower pitchers ovoid or broadly subcylindrical, 4.5-10(-12) by 1.5-4.2 cm, with two fringed wings 2.5-4 mm wide, fringed elements filiform, 3-5 mm long, 1-1.5 mm apart; mouth concave, narrowly ovate-rhombic, peristome cylindrical, 0.75-1.5(-3) mm diam., ribs 0.1(-0.2) mm high, 0.25-0.5 mm apart, outer edge not sinuate, inner edge entire; column absent; lid ovate to elliptic-rhombic, 1.7-4 by 1-2 cm, apex rounded, base rounded or shallowly cordate, upper surface bearing up to 24 'tentacles' i.e. thick multicellular simple hairs 3-5(-10) mm long as extensions of the nerves from the marginal 5 mm, lower surface lacking appendages, midrib pronounced as a low keel c. 0.1 mm high, nectar glands absent or sparse and inconspicuous, circular, bordered, 0.1-0.2 mm wide; spur a fascicle of 4-7 branches 5-10 mm long, each usually dichotomously branched about 1/3 the length from the apex. Upper pitchers cylindrical or with a narrowly ovoid base tapering gradually to a cylindrical apex, (5.5-)6.5-8.5(-13.5) by 1.5-2.2(-3) cm, usually with fringed wings 3.5-5 mm wide, fringed elements 3-5 mm long, 2.5-3 mm apart; mouth in the larger pitchers sinusoidal from the side view: the front and rear parts much more steeply sloping than at the middle. Male inflorescence patent, 5-12 (-14.5) by c. 0.7 cm; peduncle (0-)2-4.5 cm long, 0.75-1.5 mm wide at the base; partial peduncles 30-40(-50), 1-flowered; bracts absent; pedicels 2-3.5(-8) mm, often curved; tepals oblong, 1.75-3 by 1-1.5 mm, apex obtuse; androphore 0.5-1.5 (-2.5) mm long; anther head 0.5-1 by 0.75-1.5 mm. Infructescence 1-6(-11) by 4-5 cm; peduncle 1.2-4.2 cm long bearing 5-10 fruits; fruits with valves 20-32 by 4-6.5 mm. Seeds fusiform, 14-16 by 0.7-0.8 mm. Indumentum of sessile red glands on stems, lower leaf blade, outer pitcher, upper and lower lid, and peduncle; rhachis, pedicels and lower tepals moderately densely hairy with rusty or coppery appressed simple hairs c. 0.2 mm long; upper surface of lid with 'tentacles'. Colour of stems purple to green, leaves glossy dark green, sometimes suffused with purple; pitchers usually brownish purple, sometimes flecked with dark purple; peristome pale green or purplish black; mouth waxy green or pale purple; lid as pitcher; inflorescence yellowish green. [Cheek & Jebb (2001)].

Distribution: Borneo, Sulawesi. [Cheek & Jebb (2001)].

Habitat: Moss forest, often in Sphagnum beds or on peaty soils (but also on sand and ultramafic substrates); (800-)1200-2100(-2550) m. [Cheek & Jebb (2001)].

Notes: Belongs to *Nepenthes* sect. *Tentaculatae* Cheek & Jebb [Cheek & Jebb (2016)].

Notes: *Nepenthes tentaculata* is the most ubiquitous montane *Nepenthes* in Borneo, occurring on most mountains there. This diminutive species is recognised by the perfoliate-adnate leaves, the tentacles on the upper surface of the lid, the rhombic pitcher mouth and the fasciculate pitcher spur. These characters are all shared by a group of apparently related species in which the multicellular 'tentacles' and a fasciculate spur are conspicuous in the lower pitchers but absent in the upper pitchers, viz.: *N. adnata*, *N. glabrata*, *N. hamata*, *N. muluensis*, and *N. murudensis*.

In Sulawesi *N. tentaculata* can be distinguished from the extremely closely related *N. hamata* by the lack of dramatically large, falcate peristome ribs. The Sulawesi specimens of *N. tentaculata* tend to have longer, more lanceolate leaves. In addition the lids tend to be less frequently tentaculate, and the inflorescence is longer (17.5 cm vs. 13 cm). A robust variant of *N. tentaculata* which lacks lid tentacles occurs on ultramafic areas at Mt Kinabalu. More work is needed to elucidate whether these plants warrant specific status.
Hooker's protologue cites both a Lobb and Beccari specimen from Sarawak. The former, Lobb 83 was collected at 2700 ft in Sarawak, matching the altitude range (2500-3000 ft) given by Hooker in the protologue and for that reason was elected as lectotype. [Cheek & Jebb (2001)].

Nepenthes tenuis **Nerz & Wistuba in Carniv. Pl. Newslett. 23(4): 104, f. 2. 1994. Sec. Clarke (2001)**

Description: Stems climbing, slender, the climbing part of the stem angular to rhomboid, 2-3 mm thick, the internodes 5-6,5 cm long. Rosettes and basal part of the stem unknown.
Leaves of the climbing stems scattered, thin- coriaceous, sessile, lanceolate 5-6 cm long, 1-1,5 cm broad, acute, attenuate at the base, clasping the stem for 2/3 without sheath. Nervation indistinct, the pennate nerves oblique, irregularly reticulate, the longitudinal ones about 3 on both sides originating from the basal 1/3 part of the midrib running parallel in the outer 1/2 of the lamina. Tendrils 1,5 x as long as the lamina, 0,5-1 mm thick, usually without curl. Indumentum sparse.
Pitchers of the climbing stems gradually originating from the hanging end of the tendril incurved with a 10 mm wide curve, widely infundibuliform, contracted under the mouth 2,5-4,5 cm high, 1,5-2,5 cm wide. 2 prominent ribs, 3-5 mm apart without fringes. Mouth ovate, almost horizontal, peristome flattened 6 mm wide, the ribs 1/8 mm apart. Inner surface of the pitcher with numerous small glands, about 600-800 on 1 cm2. Lid narrow-elliptic 1,5-2,5 cm long, 0,5-0,8 cm wide with 2 prominent nerves, one on each side of the midrib. Glands evenly distributed on the underside of the lid. Spur unbranched, up to 1 mm long inserted close to the lid.
Colour of herbarium specimens: dark brown. Colour of living specimens: pitchers with red-brown dots, peristome dark red-brownish. [Nerz & Wistuba ("1994" [1995])].

Distribution: Indonesia, Sumatra, Sumatera Barat Province [Clarke (2001)].

Habitat: On a ridge at 1000 m altitude. [Nerz & Wistuba ("1994" [1995])].

Notes: Cheek & Jebb (2001) treat this as a synonym of *Nepenthes dubia* [Berendsohn (2017+)].

***Nepenthes thai* Cheek in Kew Bull. 64(2): 321 (323-325; fig. 2). 2009. Sec. Cheek & Jebb (2009)**

Description: Terrestrial climber 3 - 5 m tall. Rosette stems unknown. Short stems terete, matt, 5 - 7 mm diam., internodes 0.5 - 1.5 cm long, axillary buds absent. Leaves not petiolate, coriaceous, narrowly oblanceolate or narrowly oblong and subspatulate, pseudopetiolate, dilating at the node, 11.5 - 29 x 2.7 - 6 cm, the pseudopetiole, if present, 1.2 - 7 x c. 1.2 cm, blade apex broadly acute, peltate, the tendril departing 0.5 - 1 mm from the apex, base decurrent down the stem for 3 - 12 mm at an angle of c. 45° to the main axis, clasping the stem for ¾ - 5/6 of its circumference, projecting from the stem as wings 3 - 7 mm wide. Longitudinal nerves 5 - 7 cm each side of the midrib in the outer 2/3 conspicuous. Pennate nerves arising at c. 45° from the midrib, forming a reticulum with the longitudinal nerves, moderately conspicuous. Lower pitchers ovoid-cylindric, 8 - 11 x 3 - 4.4 cm, ovoid portion about 2/3 of the total length, thick-textured, cylindric portion 1.8 - 3.75 cm wide membranous, strongly wrinkled when dry with two fringed wings extending the length of the pitcher 3 - 4 mm wide, fringed elements 2 - 5 mm long, 6 - 8 per cm; mouth concave in profile, gradually rising over 2 - 4.5 cm from front to rear, column not distinct; peristome with outer edge entire, rarely sinuate, front part of the mouth with peristome subcylindrical, 1.2 - 1.5 mm wide, side of mouth with peristome flattened 2.5 - 4 mm wide; rear of mouth with peristome abruptly dilated to 7 - 9 mm wide at junction with the lid; ridges weakly but distinctly pronounced, 0.25 -0.35 mm apart, c. 0.1 mm high, the inner edge generally lacking visible teeth. Lid elliptic, 2.5 - 4.5 x 2.25 - 2.6 cm, apex rounded, base rounded, lower surface lacking distinct appendages, but with a low keel along the midline, nectar glands sparse, elliptic, c. 0.5 mm long, along the keel, otherwise densely scattered (c. 480 per cm2) over the lower surface of the lid, crater-like, circular, 0.2 - 0.3 mm diam., decreasing slightly in size towards the margin, all but absent from marginal 2 mm. Spur flattened, 4.5 - 6 mm long, divided to the base into two equal or unequal arms, apices of branches entire or bifurcate. Intermediate pitchers not seen. Climbing stems as the short stems, but 4 - 5 mm diam., internodes 1.5 - 3.0 cm long. Leaves narrowly oblong-elliptic and spatulate/ pseudopetiolate, 12.5 - 18 x 2.5 - 4 cm, pseudopetiolar part 2.5 - 3 cm long, 1.0 - 1.6 cm wide, dilating at the nod e to c. 1.7 cm wide, blade apex either peltate or with the tendril attached to the apex, clasping the stem for ¾ of its circumference. Upper pitchers freely produced, resembling the lower pitchers but tendrils coiled, (7.5 -) 12 - 14 x (1.5 -) 3.8 - 4.2 cm, lower half narrowly infundibular, base curved upward 2 - 2.5 cm to meet the tendril, junction abrupt or gradual, upper half of pitcher cylindrical, (1.2 -) 2.2 - 2.6 cm wide, wings absent; peristome at front and side of mouth (0.5 -) 2 - 4 (- 7) mm wide; teeth in conspicuous, obscured by curvature of inner peristome, when visible (0.1 -) 0.3 - 0.4 mm long, peristome ridges (0.15 -) 0.3 - 0.5 mm apart, each ridge separated by c. 5 microscopic lines. Lid ovate-elliptic (1 -) 2.5 - 3.5 x (1.4 -) 2 - 2.4 cm, apex rounded or slightly emarginate, base rounded to slightly cordate, lower surface lacking a well-developed keel or appendages, but sometimes with a slight keel (drying artefact?) terminating in a hairy area up to 2 mm long, raised up to 1 mm; nectar glands circular, scattered evenly over the lid, or with the midrib area bearing only a few sparse elliptic glands twice as long as the circular glands. Spur flattened 5 - 6 x 0.7 mm, apex rounded entire to 4-lacinate, inserted c. 4 mm below the peristome-lid junction. Male inflorescences often two per stem, borne at intervals of c. 5 internodes, 29 - 41 cm long; peduncle 7 - 10 (- 13) cm long, 3 mm diam. at base, often terminating with a variably shaped bract, sometimes foliose, to 9 x 4 mm; partial-peduncles (37-) 60 - 100), 2-flowered, 2 - 4 mm long; bracts absent; pedicels 5 - 9 mm long; tepals elliptic 2 - 2.5 x 1.5 mm; androphore c. 2 mm long; anther head 0.75 x 1.2 mm, anthers 5 - 8. Female inflorescences, infructescences and seed not seen. Indumentum absent from stems, apart from sessile red glands c. 0.05 mm diam. which extend to the lower surface of the leaf-blades (c. 960 – 1600 per mm2) and exterior of pitchers. Leaf blades with 10 - 30 appressed white hairs, best viewed in the unfurled leaf, but persisting, highly inconspicuous; blade apex sometimes moderately densely hairy, hairs sometimes extending along tendril to the pitcher, hairs white or grey, simple, 0.25 - 0.5 mm long. Pitcher exterior with sparse red-brown and branched white simple hairs, c. 0.1 x 0.1 mm extending to the lid (rarely glabrous) and marginal 0.1 - 0.2 mm and apex of the lower lid. Spur with hairs as the inflorescence. Inflorescence with dense grey hairs, partly appressed hairs 0.12 - 0.25 mm long, sparse on peduncle, dense, concealing surface, on rhachis, partial-peduncles, pedicels and outer surface of tepals, extending to inner surface margin, and androphores (rarely absent from the androphores), tepal nectar glands elliptic, 0.12 x 0.05 mm. Colour on drying of short stems matt mid brown, climbing stems purple-black; leaves and pitchers pale grey-brown; live flowers recorded as red to brown (Puudjaa 260). [Cheek & Jebb (2009)].

Distribution: Peninsular Thailand [Cheek & Jebb (2009)].

Conservation: Assessed as Endangered (EN B2 ab(iii)) using the criteria of IUCN (2001). [Cheek & Jebb (2009)].

***Nepenthes thorelii* Lecomte in Notul. Syst. (Paris) 1: 63. 1909. Sec. Mey (2011)**

Description: Terrestrial shrub with large perennial rootstock producing annual shoots in the wet season. Rootstock irregularly branched to 2 cm thick. Stem erect, to 40 cm high, terete, 0.4---0.8 cm in diameter. Leaves linear lanceolate to narrowly obovate; 12-26 x 1.8-3 cm; apex acute to acurninate; base amplexicaul inserted atan acute angle, and decurrent to stem for 1-2.5 cm, ultimately rounded, these basal wings almost meeting on opposite side of stem; longitudinal veins 2-4 on each side of midrib, arising from along the midrib; pennate nerves numerous curving towards the apex. Lower pitchers ovoid; to 11.5 x 4.5 cm; wings broad, 5-8 mm, with fringe elements 2-5 mm, c. 2 mm apart; the mouth ovate-triangular, obligue, concave; peristome rounded at front, 2-4 mm across, towards lid to 7 mm across, ribs 0.25-0.4 mm apart, the inner margin with rounded teeth 0.2-0.5 mm long; spur simple, 2-4 mm; lid ovate to rounded, 2-3.5 x 2-2.8 cm, the glands prominently lipped, dense and numerous near base ofmidline, 0.3-0.7 mm across there, c. 0.15 mm across towards margin and not so dense. Upper pitcher borne on uncoiled tendril; obovate, narrowed to- wards mouth; to 12.5 x 4.5 cm; wings narrow, 1-1.5 mm broad, with very sparse (3-7 mm apart) acuminate fringe elements 1-1.5 mm long; mouth obligue, concave; peristome rounded, 3-5 mm across, outer margin regularly sinuate; lid as in lower pitcher. Inflorescence a raceme; 8-18 cm long; borne on a tall erect rhachis 50-70 cm long; partial peduncles 1-flowered pedicels 3-6 mm long, with or without a short bract. Indumentum of simple or branched hairs 0.3-0.4 mm long. Colour of pitchers light green with reddish markings, lid reddish, indumentum white. [Jebb & Cheek (1997)].

Distribution: Vietnam, Tay Ninh Province [Mey (2011)].

Habitat: Seasonally dry savannah grassland; sea level to 200 m. [Jebb & Cheek (1997)].

Notes: There are problems with the delimitation of this species, *N. anamensis* and *N. smilesii*. All three species share narrow linear leaves with clasping leaf bases. The limits of variation of these two species is not yet understood, and *N. anamensis* may occupy similar habitats to *N. thorelii*. *Nepenthes thorelii* appears to be a plant of seasonally dry grassland, surviving as a dormant rootstock during the dry season when tires bum out the above ground vegetation. Besides its perennating habit, *N. thorelii* is characterised by the non-coiling tendrils of the upper pitchers, and its tall inflorescence, which rises over a metre above the ground. [Jebb & Cheek (1997)].

Etymology: The specific epithet honours French botanist, Clovis Thorel, who collected the first herbarium specimen of this plant from Ti-tinh, Vietnam. [Mey (2011)].

***Nepenthes tobaica* Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 382, f. 23. 1928. Sec. Cheek & Jebb (2001)**

Description: Terrestrial climber to 5 m tall. Stem ± terete or rounded-triangular, 0.15-0.4 cm diam., usually zigzagging slightly, with prominent axillary buds 0.5-1 mm long, basal rosettes unknown. Leaves coriaceous, sessile, often reflexed; leaves of climbing stems narrowly elliptic or oblanceolate (4-)5.5-14 by 0.7-1.9 cm, apex acute, the basal third often distinctly constricted, c. 3.5 mm wide, clasping the stem for 2/3 its circumference, very shortly and obliquely decurrent, and slightly auriculate, the auricles reflexed. Longitudinal and pennate nerves inconspicuous. Lower pitchers very rarely collected, ± ellipsoid in the lower half, gradually tapering to the cylindrical upper half, c. 8.5 cm long, 2.7 cm wide at the base, 2.1 cm wide at the apex, with 2 fringed wings to c. 5 mm broad, the fringed elements to 0.4 cm; mouth ± ovate, oblique, peristome cylindrical, 0.5-0.75(-1.2) mm wide, with fine, raised ribs, outer edge entire, inner without teeth; lid broadly elliptic, c. 1.9 by 1.7 cm, apex rounded, base slightly cordate to truncate, lower surface lacking appendages, nectar glands numerous, dense over whole surface, minute, volcano-like or thickly bordered, 0.1-0.15 mm diam.; spur simple, unbranched, to 4 mm long. Upper pitchers as lower pitchers but very slightly ventricose, (4.5-)6-9.7(-13) cm long, 1.3-2.2 cm wide at the base, narrowing slightly to (0.5-)1.2-2.1 cm wide at the waist and expanding to (7.5-)1.5-2.5 cm at the mouth, with two ridges to c. 0.1 cm broad, lacking fringed elements. Male inflorescence 15-30 cm long; peduncle 7-14 cm long; partial peduncles 2-flowered, 4.5-6.4 mm long; bracts rarely present; pedicels 5.5-11 mm long; tepals 3-3.5 by 2-2.5 mm; androphore 2-2.5 mm; anther head 1 by 1-1.25 mm. Fruit with valves 16-35 mm long. Seeds fusiform, minutely tuberculate in the centre. Indumentum absent from the stems apart from distinct tufts of white hairs in the leaf axils; leaves glabrous when expanded, slightly hairy in bud; inflorescence with appressed stiff white hairs often sparse, extending to the androphore; ovary with sparse coppery hairs. Colour of stems light green to dark brown; pitchers light green or yellowish green with red parts; rarely wholly red or green; staminal column light green. [Cheek & Jebb (2001)].

Distribution: Sumatra: Lake Toba to G. Leuser [Cheek & Jebb (2001)].

Habitat: Montane forest edges, amongst Leptospermum/Rhodomyrtus and in the scrub of old clearings; 950-2750 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes tobaica* was long confused with *N. mikei*. The last can be distinguished by its fasciculate or branched pitcher spurs, its broader peristome (2.5 mm vs. 0.5-1 mm wide) and its shorter inflorescence (7-15 cm vs. 15-35 cm) with 1-flowered, not 2-flowered, partial peduncles. *Nepenthes tobaica* is sometimes also confused with *N. reinwardtiana* but can be distinguished by the absence of pitcher ‘eye-spots’, the presence of tufts of white hairs

in the leaf axils, and the rounded stem with non-decurrent leaf bases.
Of the three duplicates of Lörzing 6573, the sheet with both male and female inflorescences is the lectotype. The Lörzing number '6802' in Danser in Bull. Jard. Bot. Buitenzorg III, 9 (1928) 384 is an error for 8602, as shown in the caption to f. 23 (1928). [Cheek & Jebb (2001)].

***Nepenthes tomoriana* Danser in Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 384, f. 24. 1928. Sec. Cheek & Jebb (2001)**

Description: Terrestrial climber to 5 m tall. Stems terete, those of rosettes 3-4 mm diam., internodes c. 10 mm long; short shoots c. 5 mm diam., internodes c. 6 cm long; climbing stems 3.5-5 mm diam., internodes 2.5-6.3 cm long, axillary buds broadly conical, 0.5 mm long, 0.6-1.2 cm above the axil. Leaves chartaceous, weakly petiolate to subsessile, clasping the stem for half its circumference, not sheathing; rosette leaves oblanceolate, 7-9 by 1.8-2.7 cm, apex obtuse, not peltate, base attenuate-decurrent, 0.2-0.4 cm wide; short stem leaves weakly petiolate, narrowly oblong-lanceolate, 18-22 by 3.5-4.5 cm, apex acute, base attenuate, petiole 4-6.5 by 0.5 cm, winged; leaves of climbing shoots subsessile to weakly petiolate, narrowly oblong-ligulate to narrowly oblanceolate- elliptic, 10-12 by 1.5-3 cm, apex acute, base attenuate, subsessile or with a broadly winged petiole 4-7 by 0.6-0.7 cm. Longitudinal nerves 4 (or 5) on each side of the midrib in the outer 3/4, conspicuous above. Pennate nerves arising obliquely from the midrib, becoming more or less patent at junction with longitudinal nerves, reaching the margin, conspicuous above. Lower pitchers of rosettes ellipsoid, 5-8.5 cm tall, 2.5-4.5 cm broad, with two fringed wings 5-8 mm broad, fringed elements clustered in 2s, 3s or 4s, 6-7 mm long, groups c. 1 mm apart; mouth ovate, oblique, concave, column ill-defined, peristome rounded, 2 mm wide, ribs fairly conspicuous, 0.5 mm apart, with striae in between, outer edge entire, revolute, inner edge parallel to the pitcher wall, c. 4 mm long, with teeth 0.5 mm long; lid orbicular to transversely elliptic, 1.6-2.2 by 2-2.5 cm, apex rounded to truncate, base cordate, lower surface lacking appendages, nectar glands orbicular, sunken, not bordered, 0.1(-0.2) mm diam., evenly scattered over the lid; spur entire, 4-6 by 0.75 mm, apex rounded. Lower pitchers of short stems elliptic-subcylindrical, 11.5-12.5 by 4.5-5.5 cm, wings up to 8 mm broad, abruptly arrested 2 cm from the base; mouth with a short, toothed column c. 7 mm tall, peristome 5 mm broad; lid 3.5 by 3.7 cm. Upper pitchers subcylindrical, slightly infundibuliform to 'hipped': lower half slightly ellipsoid, upper half cylindrical, (6-)7.5-9 by (1.5-)2-2.4(-2.6) cm, lacking fringed wings, but with two ridges, highly pronounced and subwing-like in the lower half; mouth orbicular, slightly oblique and concave, column absent; peristome cylindrical, 1-2 mm broad, ribs inconspicuous, 0.3 mm apart, the outer edge entire, inner with teeth inconspicuous; lid (1.2-)1.5-1.8(-2) by (1.6-) 2-2.5 cm, lower surface lacking appendages, with nectar glands circular, sunken or bor-dered, 0.1-0.2 mm diam.; spur 2-3 mm long. Male inflorescence 24-38 by 3.5-4 cm; peduncle 7-14 cm long, 2 mm diam. at base; partial peduncles 30-35, 3- or 4-flowered, 7-10(-14) mm long with bract at apex; bract patent, 2-3.5 mm long; partial-rhachis up to 3 mm long; pedicels 3.5-5 mm long; tepals obovate, 3-3.5 by 2.5-3 mm; androphore 1-1.5 mm long; anther head 1 by 1.4 mm. Infructescence 30-43 by 6.5-7.5 cm; peduncle 10-14 cm long, 4 mm diam. at base; valves 15-18 by 2.5-4 mm. Seed fusiform, 14 by 0.4 mm. Indumentum absent from stem and leaf apart from sessile red glands 0.1 mm diam.; pitcher inconspicuously puberulous with minute orange-brown stellate hairs 0.1-0.2 mm diam., tendril and inflorescence bearing pitcher indumentum admixed with patent, simple hairs 0.5 mm long. Colour of leaves when dry brown below. Live pitchers pale green, with red blotches on the inside and on the peristome, lid with purple blotches; male flowers with green tepals; ovary brown; flowers murky red, orange-brown or green. [Cheek & Jebb (2001)].

Distribution: C Sulawesi. [Cheek & Jebb (2001)].

Habitat: Open scrub-land on ultramafic soils, occasionally in mangrove swamps; sea level to 400 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes tomoriana* is unlikely to be confused with any other species within its range. It is the only paniculate species (i.e. partial peduncles bearing more than two flowers) known from Sulawesi. It is distinguished from the similar *N. danseri* of Waigeo Island, by the more numerous and smaller lid glands, and the presence of a bract on the partial peduncles.
The lower pitchers, rosette and short stem leaves of this species have only recently been discovered (Kofman 112, 113), and show remarkable similarities with those of *N. bellii* of Mindanao: the globular shape of the pitcher which dries a characteristic red-brown, the broad wings with fringed elements grouped in clusters, the inner edge of the peristome descending parallel to the pitcher wall and terminating in small, straight teeth, the orbicular to transversely elliptic lid which lacks a midrib, and a lower surface with a ceramic luster and very small, deeply sunken, sparsely scattered nectar glands are held in common by both species. *Nepenthes bellii* may have derived from the eastern paniculate group of species despite having 1-flowered partial peduncles. [Cheek & Jebb (2001)].

***Nepenthes treubiana* Warb., in: Engler, A., Bot. Jahrb. Syst. 13: 318. 1891. Sec. Cheek & Jebb (2001)**

Description: Terrestrial climber 6-9 m tall. Climbing stem terete 0.8-1.3 cm diam., sometimes ridged or winged, internodes c. 8 cm long, axillary buds not seen. Leaves chartaceous, petiolate, those of climbing stems lanceolate, elliptic or oblong, 30-39 by 7-12 cm; apex acute or rounded, sometimes peltate by < 1 mm, base attenuate or obtuse,

petiole short, 7-15 by c. 1 cm, narrowly winged, these wings running down stem, to 0.3 cm broad, 5 cm long or petiole clasping stem by 1/3 its circumference and stem completely unwinged. Longitudinal nerves 3-7, some arising from midrib, running in outer 2/3 of blade, conspicuous. Pennate nerves numerous, oblique initially, then curving towards margin, reticulate in outer part of blade. Lower pitchers urceolate-globose, to 20 by 10 cm, fringed wings to 1.9 cm broad, fringe elements 0.3-0.5 cm long, dense; peristome rounded, to 1.5 cm wide, ribs 0.3-0.5 mm apart, outer margin entire, inner margin with teeth to 0.3 mm long, 1.5 mm long towards lid; lid orbicular, to 8 cm, apex rounded, base slightly cordate, lower surface lacking appendages, nectar glands dense throughout, thinly bordered or pit-like, shallow, orbicular, 0.2-0.4 mm diam.; spur simple. Upper pitchers infundibulate or broadly infundibulate, constricted at the mouth, (11-) 14-24 by 6-7.5(-9) cm, broadest 2/3 from base and then narrowing gradually to the mouth by 1.5-3 cm, rarely dilating at the mouth; wings in lower half 0.3-1 cm wide, unfringed, upper half with ridges, or the whole pitcher with ridges only; mouth subelliptic, almost horizontal, slightly or highly concave, the rear half rising to form a column; peristome rounded, 4-12 mm wide, ends at lid folding outwards forming two obtuse angles c. 2 cm long, ribs 0.5 mm apart, 0.3 mm high, conspicuous, outer edge entire, inner with teeth 0.5 mm long, decreasing to 0.3 mm long near lid; lid suborbicular(-elliptic), 5-6.3 by 5.2-6.5 cm, apex rounded to slightly retuse, base shallowly cordate to rounded, lower surface lacking appendages, glossy, nectar glands scattered over whole surface or absent from the central area, orbicular, pit-like, 0.2 mm diam.; spur filiform, c. 9 mm long, entire or shortly bifid. Male inflorescence c. 40 by c. 5 cm; peduncle c. 11 cm long, 0.7 cm diam. at base; partial peduncles c. 80, 1- or 2-flowered, 0.5-0.7(-2.5) cm long, bracts inserted along length; bracts filiform, patent, 1-2 mm long; pedicels 14-22 mm long; tepals 5-6 by 3-3.5 mm; androphore 3.5-5 mm long; anther head 1.5 by 1.5 mm. Fruit with stipe 2-3 mm long; valves 18-19 by 3.5 mm. Seed fusiform, 7-9 mm long. Indumentum generally sparse, simple on leaf margins and tendrils, stellate on pitcher surface and leaf underside, 0.15-0.3 mm wide, especially dense beneath blade margin; inflorescence brown puberulous with stellate hairs 0.1-0.2 mm diam. Colour of pitchers and flowers not known. [Cheek & Jebb (2001)].

Distribution: W New Guinea: Sorong, Misool Islands [Cheek & Jebb (2001)].

Habitat: Margin of *Agathis* or coastal forest; 0-500 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes treubiana* is unlikely to be confused with any other lowland species of *Nepenthes* in the island of New Guinea (*N. ampullaria, N. insignis, N. mirabilis, N. neoguineensis*, and *N. papuana*). None of these species has the combination of markedly petiolate, large leaf blades (30-39 by 7-12 cm) conspicuously stellate hairy below and strongly infundibuliform upper pitchers. *Nepenthes treubiana* is similar to and was formerly united with *N. sumatrana* from Sumatra. *Nepenthes treubiana* differs by having teeth on the inner margin of the peristome (vs. peristome entire), the densely hairy leaf margin, and relatively uniform lid glands, 0.2-0.4 mm diam. (vs. 0.2-0.7 mm diam. in *N. sumatrana*), evenly spread throughout the lid surface or absent from the centre (vs. largest along the midline and smaller elsewhere). *Nepenthes treubiana* is also similar to *N. rafflesiana* of Borneo, Sumatra and Peninsular Malaysia, but differs in lacking the characteristic long white arachnoid hairs of that species. [Cheek & Jebb (2001)].

***Nepenthes ×trichocarpa* Miq., Fl. Ned. Ind. 1(1): 1072. 1858. Sec. Cheek & Jebb (2001)**

= *Nepenthes trichocarpa* var. *erythrosticta* Miq. in J. Bot. Neerl. 1(3): 276. 1862.

Description: *Nepenthes trichocarpa* has sessile leaves which exhibit *N. ampullaria*-like venation, texture and hairiness, whilst the angular stem, with sub-decurrent leaf bases and the lid with its few, broad-bordered glands are similar to those of *N. gracilis*. The pitchers are characteristically barrel-shaped and slightly constricted at the mouth. [Cheek & Jebb (2001)].

Distribution: Rare but widespread in Sumatra, Peninsular Malaysia, Singapore, Borneo. [Cheek & Jebb (2001)].

Habitat: Nearly always in mixed populations of *N. ampullaria* and *N. gracilis*, its putative parents; sea level to 800 m. [Cheek & Jebb (2001)].

Notes: Holttum was the first to suggest that this species was a hybrid between *N. ampullaria* and *N. gracilis*. As with *N.hookeriana* this supposition is based upon the fact that it only occurs in mixed populations of the parent species.

At Bogor several duplicates of Teijsmann's Sibolga collections exist; of these one duplicate of 532 represents *N.trichocarpa,* the remaining 2 sheets are *N. gracilis*. Of 533, one fragmented sheet may be *N. gracilis,* while the two other sheets are annotated *N. trichocarpa var. erythrosticta,* characterised by its larger size. Danser (1928) states that the number 532 represents authentic specimens of the var. *erythrosticta,* however. Without viewing the Utrecht specimens it is impossible to be certain of Miquel's designation, since Teijsmann's collections are mixed, and Miquel refers to no numbers in his protologues. [Cheek & Jebb (2001)].

Hybrid parent formula: *N. ampullaria* × *N. gracilis* [Jebb & Cheek (1997)].

Nepenthes truncata **Macfarl. in Trans. Proc. Bot. Soc. Pennsylv. 3(3): 209, t. 2. 1911. Sec. Cheek & Jebb (2001)**

Description: Terrestrial shrub to at least 1 m tall, probably not climbing. Stems terete, 1.5-3 cm diam. Leaves thickly coriaceous, strongly petiolate, blade of short stems subrectangular to obtriangular, widest at the apex, to 45 by 22 cm, several cm wider at the apex than the base, apex ± deeply emarginate or retuse, base truncate to shallowly cordate, margin ± undulate; petiole to 27 cm long, stout, canaliculate-winged, wing 1.8 cm wide at the base, amplexicaul, clasping the stem for its whole circumference, sheathed, not auriculate or decurrent. Longitudinal nerves 5 on each side of the midrib, ± equidistant, conspicuous. Pennate nerves numerous, initially at a steep angle with the midrib, then at 90°, overlapping the longitudinal nerves, conspicuous. Lower pitchers poorly known, but with two fringed wings. Upper pitchers cylindrical, up to 30 by 10 cm, wings absent, mouth ovate, oblique, slightly concave, sometimes the front protruding in a triangle upwards; peristome flattened, up to 6 cm wide, with coarse ribs 1 mm apart, outer markedly sinuate, inner surface dentate; lid ovate to subtriangular, up to c. 9.5 by 6.5 cm, apex acute to rounded, base cordate, lower surface with rounded basal appendage c. 13 mm high, 12 mm wide, midline with a keel c. 1 mm high extending to lid apex, nectar glands very sparsely scattered (c. 100 per lid), longitudinally elliptic, bordered, 0.3-0.6 mm long, mixed with sessile red glands c. 0.1 mm diam.; spur 10-12 mm long. Inflorescence incompletely known, length unknown, peduncle to 30 by 1 cm, partial peduncles 2-flowered, 7 mm long; bracts absent; pedicels 18-30 mm long, tepals elliptic-ovate, 5 by 3 mm, androphore 6 mm long, anther head 1.25 mm wide. Fruit valve 2.5-3.8 cm long. Seed unknown. Indumentum absent from stem and leaves excepting the leaf margin which densely fringed with red, branched hairs c. 0.8 mm long; pitcher ferruginously villose; inflorescence densely covered in short, 3- or 4-armed white hairs. Colour of pitcher green, excepting peristome which is red, striped green. [Cheek & Jebb (2001)].

Distribution: Philippines: Mindanao (Surigao & Agusan Provinces). [Cheek & Jebb (2001)].

Habitat: Open mountainside, probably on ultramafic substrate; 230-600 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes truncata* is not likely to be confused with any other species on account of its strikingly truncate to deeply notched leaf blade apex, large size and lid with a basal glandular crest. The species appears to be very restricted in distribution, being found only in the highly ultramafic north-eastern corner of Mindanao as are *N. bellii, N. merrilliana*, and *N. petiolata*. *Nepenthes truncata* shows affinities to the *N. maxima* group in its strongly petiolate leaves, appendaged pitcher lid, 2-flowered partial peduncles and the venation of the leaf blade. *Nepenthes truncata* is still only known from a few fragmentary collections.
Macfarlane cites two collections in the protologue, one (Bolster 270) comprising a small, juvenile leaf, the other (Allen 191), which is illustrated, a large mature leaf. Although we have not been able to see the PENN material, this latter specimen seems the most appropriate for lectotypification. [Cheek & Jebb (2001)].

Nepenthes ×trusmadiensis **Marabini in Mitt. Bot. Staatssamml. Münch. 19: 449. 1983. Sec. Cheek & Jebb (2001)**

Description: Upper pitchers with the form of *N. lowii*, with constricted middle, and a broadening mouth, but with a large peristome, and a very large lid lacking bristles below. The outer surface is predominantly green, and the inner surface deep red as in *N. lowii*. [Cheek & Jebb (2001)].

Distribution: Borneo: Sabah (Mt Trus Madi). [Cheek & Jebb (2001)].

Notes: This natural hybrid between *N. macrophylla* and *N. lowii* was said to be frequent on the summit of Mt Trus Madi in Sabah. However, recent visitors to the mountain suggest that their may be only a solitary, although somewhat large individual (Martin Sands, pers. comm.). It is of note that no equivalent hybrids have been found on Mt Kinabalu, where the closely related *N. edwardsiana* is to be found growing with *N. lowii*. [Cheek & Jebb (2001)].

Hybrid parent formula: *Nepenthes lowii* × *Nepenthes macrophylla* [Cheek & Jebb (2001)].

Nepenthes ultra **Jebb & Cheek in Blumea 58: 241, fig. 1. 2013. Sec. Cheek & Jebb (2013)**

Description: Terrestrial climber reaching 1.5 m tall, drying yellow-green. Stems with slight decurrent ridges from leaf bases, (4–)5–6 mm diam, internodes 1.5–2.7 cm long, axillary buds rounded, c. 1 mm long, inserted 6 mm above the axil, indumentum absent, glabrous, rarely with caducous sparse simple hairs at stem apex. Rosette stems unknown apart from a single leaf. Leaf of rosette stem leathery, elliptic 7.5 by 2 cm, apex acute, base decurrent to petiole, veins obscure, glabrous; petiole 2 by 0.4 cm, winged. Leaves of climbing stems spirally inserted, papery, blade narrowly oblong (10–)12.5–23.5 by (2.5–)2.8–3.9 cm, apex acute, not peltate, tendril arising abruptly, base acute to obtuse, abruptly decurrent to petiole, longitudinal nerves (2–)3(–4) pairs, conspicuous in the marginal half; pennate nerves arising at about 45° from the midrib, both surfaces matt, drying dull yellow-green above, brown below, glabrous apart from scattered red-black, bun-like raised glands 0.05 mm diam. Petiole evenly winged along its length, 4.2–5.5(–7) by (0.2–)0.4–0.7(–1) cm, clasping the stem for 1/3–1/2 its circumference, decurrent as low, rounded ridges. Lower pitcher 6.5 cm tall, 3.5 cm broad, ovoid in the lower half, upper cylindrical part 2 cm broad.

Outer surface with indumentum as upper pitchers, with two fringed wings up to 4 mm broad running from base to apex of pitcher, fringed elements 1–4 mm long, c. 1.5 mm apart, mouth ovate, highly concave, oblique, peristome cylindrical 2–3 mm diam, with inconspicuous ribs 0.3 mm apart, inner edge with teeth 0.1 mm long, alternating with perforations; lid ovate, 2.6 by 2.1 cm, apex and base rounded. Intermediate pitcher (tendril at side, uncoiled) 10 by 4 cm, ellipsoid in the lower 5 cm, upper half cylindrical, 2.5–2.7 cm diam. Outer surface with indumentum as upper pitchers, with two fringed wings 1 mm broad extending from apex of pitcher 1.5–3 cm towards base, fringed elements 2.5 mm long, 2–3 mm apart, mouth ovate, oblique, 2.7 by 2.8 cm, column not formed, peristome cylindrical, 2 mm wide at front of mouth, 3.5 mm wide at sides, ribs inconspicuous; lid elliptic, 2.8 by 2 cm, rounded at base and apex, lower surface of lid as upper pitcher, nectar glands c. 0.2 mm diam; spur c. 5 mm long, unbranched. Upper pitchers subcylindric, greenish white with some red markings, (11.5–)12.5–16 by 3.2–4.3 cm, slightly wider in the basal and upper halves (subequal) gradually narrowing slightly midway to 3–3.5 cm. Outer surface sparsely, minutely and inconspicuously stellate hairy; hairs covering 10–15 % of the surface, evenly spread, 3–5- armed, 0.06–0.1(–0.15) mm diam, central part of hairs red, arms translucent, suberect; bushy hairs rare, c. 0.3 mm diam; sessile bun-shaped glands not seen; perithecoid nectar glands sparsely scattered, 0.25 mm diam the aperture 0.05 mm wide; fringed wings absent, reduced to ridges c. 1 mm wide running the length of the pitcher; mouth ovate 4–4.5 by 3.5 cm, oblique, the frontal part sometimes straight, or slightly raised, striped red; peristome rounded to flattened, 2–5 mm wide, widest at the sides, c. 4.5 ridges per mm, ridges 0.1 mm high, inner edge lacking conspicuous teeth, outer edge not or only slightly lobed; column not developed; lid orbicular or ovate (2.6–)2.9–3(–3.2) by (2.4–)2.8 by 3.5 cm, apex rounded, truncate or emarginate, base rounded to cordate; lower surface with basal appendage slightly developed, projecting 1.5–2 mm from the lid as a convex protrusion from a laterally flattened midline ridge 10–12 mm long; nectar glands monomorphic, not markedly perithecoidal, with short walls, more or less uniformally dense and minute over the appendage and lower surface, 5–9 glands per mm², orbicular to elliptic, c. 0.15 mm diam; upper surface of lid with indumentum as the outer pitcher. Spur inserted 1.5–2 mm below junction of lid and pitcher on 3 mm long ridge with simple hairs; spur appressed to upper pitcher, simple, stout at base tapering to acute apex, 1.75–3.5 by (0.25–)0.5–0.6 mm, densely long hairy, hairs grey, simple, subspreading 0.5 mm long. Male inflorescence with peduncle (8–)16–17.5 cm long, 0.25–0.4 cm diam at base, glabrous; rachis 39–61 cm long, bearing c. 140 partial-peduncles scattered along its length, partial-peduncles 1-flowered, bracts absent, partial-peduncle/ pedicel (10–)15(–18) mm long. Tepals 4, obovate, 3(–3.5) by 2.5(–3) mm, apex rounded, margin densely hairy with moniliform hairs, upper surface with elliptic nectar glands, live colour not recorded. Androphore (2–)4 mm long, proximal half with scattered stellate hairs; anther head subglobose 0.6 by 1 mm. Female inflorescence unknown except in immature and mature fruit. Infructescence peduncle 21–21.5 cm long, 0.3–0.5 cm diam at base, glabrous apart from red sessile glands; rachis 24–34 cm long, red sessile glands and sparse white appressed hairs, bearing 48–100 partial-peduncles scattered along its length, partial-peduncles 1-flowered/fruited, bracts absent, partial-peduncle/pedicel 22–28 mm long, with sparse white appressed hairs 0.25 mm long covering about 10 % of the surface. Tepals 4, oblong, c. 4 by 1.5 mm. Fruit valves ligulate, c. 31 by 2 mm, indumentum as rachis, hairs 0.1 mm long covering c. 20 % of the surface. Seed 16 mm long, pale brown, seed body central, 2 by 0.4 mm. [Cheek & Jebb (2013)].

Distribution: Philippines, Luzon [Cheek & Jebb (2013)].

***Nepenthes undulatifolia* Nerz, Wistuba, U.Zimm., Chi.C.Lee, Pirade & Pitopang, in: McPherson, S., New Nepenthes 1: 493 (492-505; figs. 428-444). 2011. Sec. Nerz, Wistuba & al. (2011)**

Description: Terrestrial or epiphytic climber to ca. 3 m tall. Stems of the short shoots cylindrical, to 8 mm in diameter, internodes 0.8-1.4 cm long, axillary buds inconspicuous. Climbing stems obtusely trigonous and twisted, to 6 mm in diameter, internodes 5.8-10.3 cm long, axillary buds spike-like, ca. 2 mm long. The stems are yellowish green to purple.

Leaves of the short shoots sessile, oblong to spathulate, 12.2-15.3cm long, 4.5-5.3 cm wide, lamina undulating with minutely wavy margins, base cordate and clasping the stem for more than ¾ its circumference, longitudinal nerves 2-3, arising from reticulate; apex rounded and peltate, with tendril originating 0.5-2.6 cm from the apex of the lamina, straight, 24.5-31.0 cm long. The upper surface of lamina is dark green, the lower surface is a lighter shade of yellowish green. The midrib is light yellowish green.

Leaves of the climbing stems as those of the short shoots but lanceolate, 11.4-12.7 cm long, 4-5 cm wide; tendril originating 0.9.-1.4 cm from the apex of the lamina, ca. 17-20 cm long, coiled once or twice in the middle. The colouration of the leaves of the climbing stems is identical to that of the leaves of short shoots.

Lower pitchers urceolate to slightly ovate, 5.3-9.5 cm tall and 3.8-5.7 cm wide, with two fringed wings extending from half to the full length of the pitcher, to 5 mm wide, fringed elements to 13mm long,; mouth orbiculate, inclined at ca. 30 degrees to the horizontal; peristome sub-cylindrical, to 2 cm wide, ribs 1.5-2 mm apart, the interior margin terminating in teeth 1-2 mm long; lid orbiculate to slightly ovate with a cordate base, 5.2-5.7 cm long, 4.6-5.5 cm wide, lower surface lacking appendages and evenly covered with small nectar glands; spur consisting of a simple, central appendage 1-2 mm long, with multiple occasionally branching appendages to either side at the base of the lid

to 13 mm long. The lower pitchers may be dark purple or pale, yellowish green with purple spots, often with a purple peristome.
Upper pitchers abruptly originating from the tendril, arising from a curve 5-10 mm wide, broadly infundibular and contracted just below the mouth, 7.1-9 cm tall, 5.8-6.2 cm wide, lacking fringed wings but with two prominent ridges; mouth orbiculate, horizontal in front and slightly elevated at base of lid; peristome flattened, to 6 mm wide, ribs ca. 1 mm apart, inner edge with no pitcher wholly glandular except for ca. 1 cm band immediately below peristome; lid sub-orbiculate to ovate, 4.5-6.8 cm long, 4-6.4 cm wide, lover surface lacking appendages and evenly covered with small nectar glands; spur consisting of a simple, central appendage 2-6 mm long and two lateral appendages to either side at the base of the lid ca. 0.5-1.5 mm long. The upper pitchers are pale yellowish green, with orangey-red highlights across the peristome and lower surface of the lid.
Male inflorescence a racemose panicle, 26.5 cm long; peduncle 4.3 cm long, 0.5 cm in diameter at base; partial peduncles ca. 200, 7-9 mm long, each bearing a single flower, bracts absent; tepals ovate, 5 mm long and 2 mm wide; androphore 3 mm long; anther head orbicular, up to 2 mm in diameter.
Female inflorescence as male, but 14.2 cm long; peduncle 7.5 cm long, 0.4. cm in diameter at base; partial peduncles ca. 55, 5-6 mm long; tepals ovate, 4 mm long and 2 mm wide; ovaries ca. 4 mm long.
Indumentum consisting of soft, white, simple and somewhat adpressed hairs present on most parts except upper surface of lamina, densest on stem near internodes, lower surface of leaf, midrib, and on inflorescence, becoming less dense on climbing stems. [Nerz, Wistuba & al. (2011)].

Distribution: Indonesia, Sulawesi Tenggara. [Nerz, Wistuba & al. (2011)].

Habitat: Mossy forest and open landslips on steep ridges at approx. 1800 m a.s.l. [Nerz, Wistuba & al. (2011)].

Notes: Belongs to *Nepenthes* sect. *Tentaculatae* Cheek & Jebb [Cheek & Jebb (2016)].

Etymology: The species epithet refers to the undulating shape of the lamina, a distinctive characteristic of this species. [Nerz, Wistuba & al. (2011)].

***Nepenthes veitchii* Hook.f. in Trans. Linn. Soc. London 22: 421. 1859. Sec. Cheek & Jebb (2001)**

= *Nepenthes lanata* Hort. ex Mast. in Gard. Chron. n.s. 17: 178. 1882. *Nepenthes lanata* Hort. ex Linden in Ill. Hort. 23: t. 261. 1876, nom. inval. *Nepenthes lanata* Mast. in Gard. Chron. 1872: 542. 1872, nom. nud.

– *Nepenthes veitchii* var. *striata* Veitch in Gard. Chron. ser. 3 12: 561. 1892, nom. nud.

Description: Epiphytic or terrestrial climber (rarely a shrub) 0.5-6(-10) m tall, climbing by means of the clasping, distichous leaf blades. Stem often flexuose, ± terete, rarely 2-ridged, 4-10 mm diam. Leaves coriaceous, petiolate, obovate to oblanceolate, rarely suborbicular (10-)14-25 by 4-10 cm, apex truncate to retuse, rarely acute, base cuneate to ob-tuse; petiole to 5 cm long, canaliculate, sheathing the stem, not auriculate, but rarely with two decurrent wings reaching the node below. Longitudinal nerves 2-4 on each side of the midrib in the outer half, often inconspicuous. Pennate nerves slightly oblique, faint near margin, inconspicuous. Lower pitchers broadly cylindrical, broadest near the middle, 15-28 by 4-10 cm, with two fringed wings 4-5 mm wide, fringed elements 5-7 mm long, 3-4 mm apart; mouth ovate, horizontal in front, abruptly concave behind, rising into a long, broad, stout column terminating c. 9 cm above the front of the mouth; peristome flattened, 4-15 mm wide at front, 10-80 mm wide near lid, the ribs 0.5-1 mm apart, outer edge undulate, inner edge with teeth 2-4 mm long; lid held towards vertical, at obtuse angle with mouth, narrowly ovate or elliptic, 3-9 by 1.75-5 cm, apex acute to rounded, base rounded, with a laterally flattened asymmetrical appendage c. 6 mm high, 20 mm long on the lower surface near the peristome and often a smaller one at the apex, glands dense, crater-like, orbicular, c. 0.2 mm diam., on the appendages elliptic, 1.75 mm long; spur entire, slender, 3-14 mm long, inconspicuous. Upper pitchers as the lower, to 30 by 8.5 cm, with two fringed wings 5-10 mm wide, fringed elements c. 10 mm long, 2-7 mm apart. Male inflorescence 17-45 cm long; peduncle 14-27 cm long; partial peduncles c. 50, 2- (or 3-)flowered, 0.5-2 mm long; bracts absent; pedicels 9-14 mm long; tepals elliptic, 4 by 1.5 mm; androphore 2.5-4 mm long; anther head 1 by 1.5 mm. Fruit long and slender, valves 35(-40) by 2-2.5 mm. Seed fusiform, c. 18 mm long, central part tuberculate. Indumentum dense, spreading, of simple, coppery hairs 3 mm long, on stem, lower leaf, tendril and pitcher, including lower surface of lid when young, becoming sparser, in places glabrous, when mature. Colour of pitcher golden yellow or green, rarely splashed with red, peristome striped red and yellow or all green, yellow or brown. [Cheek & Jebb (2001)].

Distribution: Borneo: C Sarawak, Brunei, Sabah, rarely in Kalimantan. [Cheek & Jebb (2001)].

Habitat: Lowland dipterocarp forest, especially near rivers, 55-500 m; moss forest on mountain ridges;750-1800 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes veitchii* is immediately recognisable from its close relative *N. fusca* by the very broad, flattened peristome and the dense, hispid hairs. Possibly unique in the genus in climbing by means of distichous clasping leaf blades. There ap-pears to be a lowland form of *N. veitchii* with long, narrow, spathulate leaves, a narrow lid, and a golden yellow peristome, which is often found near streams or rivers, and a highland form, with abruptly

rectangular-elliptic blades, a rounded lid, and usually a green and red streaked (but sometimes yellow) peristome, which is commonly found on ridge tops. But morphological intermediates occur. *Nepenthes veitchii* is variable in life-form, apparently starting as a terrestrial shrub, then climbing, the stem dying below and the plant becoming epiphytic, reaching up to 30 m into tree crowns (pers. obs.). Part of the *N. maxima* complex.
William Hooker published (Hooker in Bot. Mag. (1858) t. 5080) the first description of *N. veitchii* basing it on a Lobb collection from Sarawak, taking it to be the then incompletely known *N. villosa* Hook.f. which had been published without knowledge of the pitchers. His error was realised by his son Joseph who applied a new name to this plant (*N. veitchii* Hook.f., Trans. Linn. Soc. 22 (1859) 421), citing a Lobb specimen from 1000 ft and a Low specimen from G. Mulu at 3000 ft. The former specimen at Kew is the lectotype. It was previously identified as *N. villosa* in pencil, and this has been partly rubbed out, presumably indicating that it was the specimen mistaken by William. [Cheek & Jebb (2001)].

Notes: Jebb & Cheek (1997) and Cheek & Jebb (2001) state that this is a nomen nudum, but it is accompanied by a detailed description - needs to be looked at more closely. [Berendsohn (2017+)].

***Nepenthes ventricosa* Blanco, Fl. Filip.: 807. 1837. Sec. Cheek & Jebb (2001)**

Description: Climber, sometimes epiphytic, to at least 2 m tall. Stems winged to strongly triangular, 3.5-9 mm diam. Leaves chartaceous to thinly coriaceous, sessile, rosette leaves unknown, stem leaves with blade oblanceolate or narrowly oblong, 15-25 by 2-3 cm, apex acute, inconspicuously peltate, base gradually tapered, clasping the stem for 2/3 its circumference, decurrent, prominently winged to the node below or for only ± 1 cm. Longitudinal nerves 3-6 on each side of the midrib, evenly scattered. Pennate nerves oblique, obscure. Lower pitchers rare, as the upper but with tendril in front. Upper pitchers hourglass-shaped, 9-16 by 3-8 cm, basal half obliquely ellipsoid, apical half broadly infundibular, up to twice as broad as basal portion, waist constriction central, 1/2-1/3 the width of the base or apex, fringed wings absent, reduced to ridges < 1 mm wide; mouth circular to shortly elliptic, horizontal or slightly oblique, straight; peristome broad, subcylindrical, 10-25 mm wide, ribs coarse, 1-2 mm apart, outer edge with 4-6 slight undulations on each side, each protruding 3-4 mm, inner edge shortly dentate; lid membranous, narrowly elliptic, 4-6 by 1.8-2.25 cm, apex rounded, base rounded, lower surface lacking appendages, nectar glands absent from a band c. 6 mm wide along the midline, pit-like or slightly bordered, mostly orbicular 0.4-0.5 mm diam., less usually transversely elliptic, 0.8 mm long; spur flattened, 9 mm long, entire. Male inflorescence 28-60 cm long; peduncle 11-21 cm long; partial peduncles 70-180, 1-flowered; bracts absent; pedicels 5-10 mm long; tepals elliptic, 2-3.5 by 1.5 mm; androphore 3-3.5 mm long; anther head 1.5 mm wide. Fruit valves 25-32 mm long. Seed unknown. Indumentum absent from stems and leaves; pitchers with inconspicuous appressed scattered, simple reddish hairs 0.5 mm long; inflorescence as the pitchers, but densely hairy. Colour of pitchers uniformly creamish white, peristome red, inner surface yellowish. [Cheek & Jebb (2001)].

Distribution: Philippines: Luzon. [Cheek & Jebb (2001)].

Habitat: Low mossy oak forest; 1200-1500 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes ventricosa* is unlikely to be confused with the only other Luzon *Nepenthes, N. alata*. The angular stems and white, hourglass-shaped, upper pitchers of *N. ventricosa* make it easily distinguished. *Nepenthes ventricosa* is closely related to *N. burkei* of Mindoro and *N. sibuyanensis* of Sibuyan, but neither have the white, highly constricted pitchers of *N. ventricosa*.
Blanco's types were destroyed at PNH, but duplicates may exist elsewhere (see notes under *N. alata*). [Cheek & Jebb (2001)].

***Nepenthes vieillardii* Hook.f., in: de Candolle, A. L. P. P., Prodr. 17: 104 (-105). 1873. Sec. Jebb & Cheek (1997)**

= *Nepenthes humilis* S.Moore in J. Linn. Soc., Bot. 45: 380. 1921. *Nepenthes vieillardii* var. *humilis* (S.Moore) Guillaumin in Mém. Mus. Natl. Hist. Nat., B, Bot. 15: 24. 1964.

= *Nepenthes montrouzierii* Dubard in Bull. Mus. Hist. Nat. 12: 66. 1906. *Nepenthes vieillardii* var. *montrouzieri* (Dubard) Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 49. 1908.

= *Nepenthes neocaledonica* F.Muell. ex Heckel in Ann. Fac. Sci. Marseille 1: 9. 1892.

= *Nepenthes vieillardii* var. *deplanchei* Dubard in Bull. Mus. Hist. Nat. 12: 66. 1906.

= *Nepenthes vieillardii* var. *minima* Guillaumin in Mém. Mus. Natl. Hist. Nat., B, Bot. 4: 61. 1953.

Description: Terrestrial, climbing or scrambling branched stems up to 8 m long.
The lamina is linear or oblong, up to 35 cm long and 8 cm wide. The apex of the leaf is obtuse or rounded and the base is attenuate, sometimes sub-petiolate, and variably decurrent. The lamina may be green, dark green or purple, but developing leaves may be bright orangey red as they emerge, gradually turning green as they age. The stem, midrib and tendril are green, yellow or occasionally orange or red. Most parts of mature plants may be densely lined with soft, short white hairs which may be branched or clustered. The morphology and colouration of both upper and

lower pitchers is extremely variable (Jacques Besnard, pers. comm.).
The lower pitchers are up to 17 cm long and 6 cm wide. The bottom half of the pitcher is ovate and swollen, sometimes becoming almost spherical. The pitcher narrows above this part, often forming a very distinct hip, and becomes cylindrical or slightly infundibular towards the pitcher opening. Wings up to 18 mm wide, fingered with narrow filaments up to 7 mm long, run down the front of the pitcher. The wings are often broad and expanded at the bottom of the pitcher opening. The peristome is cylindrical, glossy, up to 5 mm wide and lined with ribs up to 0.3 mm high, spaced up to 0.4 mm apart, but these ribs may be indiscernible. The peristome is of a constant width around the pitcher opening, but may be slightly narrowed below the lid. Here, a gap of several millimetres is often present. The lid is sub-orbicular, occasionally ovate or elliptic, up to 5 cm long, 5 cm wide, and lacks an appendage. The exterior of the lower pitchers is typically red, darkening to dark red, reddish brown, purple or almost black as the traps age. The interior of the pitcher may be white, cream coloured, pale pink, red or purple. The peristome may be yellow, green, orange, red, purple or black. The lid is the same colour as the exterior of the pitcher, occasionally with a bright red underside. The lower pitchers of young plants may be entirely yellowish green or orange.
The upper pitchers are up to 21 cm tall, 5 cm wide, and vary greatly in shape, size and relative proportions. They may be wholly infundibular, but also ovate and swollen in the bottom quarter to three quarters, abruptly narrowed to form a hip above, and cylindrical or infundibular towards the pitcher opening. Wings are reduced to narrow ridged, but are often hardly discernible. All other plants are similar to the lower pitchers.
The exterior of the upper pitchers is typically light yellowish green, but may be pink or pale orange. The interior of the trap is light yellow or occasionally light pink or orange, often mottled with faint red or pink blotches. The peristome is orange, pink or red and both sided of the lid are usually yellowish green. In some plants, the upper pitchers are entirely yellowish green.
The inflorescence is a raceme, to 35 cm long. The peduncle is up to 10 cm long and the rachis to 25 cm long. Flowers are borne singly on robust bractless pedicles up to 6 mm long. Tepals are oblong to sub-orbicular and up to 5 mm long. Fruits are 8-20 mm long, seed generally 9 mm long. [McPherson (2009)].

Distribution: New Caledonia and Île des Pins. [McPherson (2009)].

Habitat: Terrestrial; on the margins of pine forsest, in upland grassy meadows, among degraded or recovering secondary vegetation, in logged lowland forest, and also on bare substrate on exposed cliffsides, landslide areas and roadside embankments. Sea level to 850 m a.s.l. Lateritic substrate, developed on ultrabasic rock types. [McPherson (2009)].

Etymology: The specific epithet honours French plant collector, Eugène Vieillard, who travelled to New Caledonia in 1862 and was among the first naturalists to make detailed observation of this species. [McPherson (2009)].

***Nepenthes villosa* Hook.f., in: Hooker, W.J., Icon. Pl. 9: t. 888. 1852. Sec. Cheek & Jebb (2001)**

Description: Terrestrial shrub, not known to climb, 0.6(-1.5) m tall. Stem terete, 6-10 mm diam., often at length prostrate. Leaves coriaceous, petiolate; blade elliptic or oblong, 10-20 by 5-10 cm, apex emarginate, base obtuse; petiole canaliculate, 4-12 cm long, clasping the stem for up to 4/5 its circumference, sheathing, not auriculate or decurrent. Longitudinal nerves 1-3 on each side of the midrib in the outer third, conspicuous. Pennate nerves numerous, arising at 45° from the midrib, reaching the outer longitudinal nerve, conspicuous. Lower pitchers broadly ellipsoidal, 5-16 by 5-12 cm with two fringed wings in the upper 1/3 or 1/2, the wings 5-12 mm wide, fringed elements 2.5-8 mm long, 1-4 mm apart; mouth subcircular, almost horizontal, then abruptly rising to the vertical in the rear to provide a stout column 2-3.5 cm high; peristome rounded, 6-12 mm broad, ribs 3-10 mm apart and 4-6 mm high, outer surface entire, never sinuate, inner surface with teeth 7-12 mm long, in two distinct ranks, strikingly protruding up the column; lid suborbicular 5-12 by 5-12 cm, apex rounded, base conspicuously cordate, lower surface lacking appendages, glands very dense, circular, 0.1-0.3 mm diam.; spur stout, entire, c. 10 mm long. Upper pitchers rarely seen, as the lower pitchers, but ovoid to infundibulate, 10-18 by 5-12 cm. Male inflorescence 35-70 cm long; peduncle 20-50 cm long; partial peduncles 1-flowered, c. 100; pedicels 9-15 mm long; bracts absent; tepals elliptic, 5-7 by 2-3 mm; androphore 2-2.5 mm long; anther head 1-1.5 by 1.5-2 mm. Fruit not seen. Seed not seen. Indumentum villose, hairs simple, 3-4 mm long, red-brown, densely covering all parts of the plant, persistent on lower leaf and leaf edge, tendril and pitcher. Colour of outer pitcher and lid yellow, suffused with pink or red, inner white or pale green, indumentum brown. [Cheek & Jebb (2001)].

Distribution: Borneo: Sabah (Mt Kinabalu and Mt Tambuyukon). [Cheek & Jebb (2001)].

Habitat: Mossy forest with Dacrydium and Leptospermum, or amongst boulders, shrubs and grass; ultramafic substrates; 2400-3200 m. [Cheek & Jebb (2001)].

Notes: *Nepenthes villosa* is closely related and sometimes confused with *N. edwardsiana* (which also occurs on Mt Kinabalu) and *N. macrophylla*. It overlaps slightly in altitudinal range with *N. edwardsiana* but is found in a different habitat (Phillipps & A.L. Lamb, Pitcher Plants of Borneo (1996) 149). *Nepenthes edwardsiana* is easily distinguished by its more elongated, less hairy pitchers which are slightly constricted about the middle. Intermediate taxa can be ascribed to the hybrid *N.harryana* Burb. *Nepenthes villosa* differs from both *N. edwardsiana* and *N.*

macrophylla in its emarginate leaf blade, long villose tendril, and in its ellipsoid, villose pitcher which lacks any narrowing at its middle. The recently described *N. mira* of Palawan also seems to be a part of the *N. villosa* group. *Nepenthes edwardsiana* and *N. villosa* were united by Danser Bull. Jard. Bot. Buitenzorg III 9 (1928). Macfarlane reinstated them in Das Pflanzenreich 4, 3 (1908). [Cheek & Jebb (2001)].

***Nepenthes viridis* Micheler, Gronem., Wistuba, Marwinski, W.Suarez & V.B.Amoroso in Taublatt 76(2): 4 (-14, fig., photgrs.). 2013. Sec. Micheler, Gronemeyer & al. (2013)**

Description: [The original description in German by Micheler & al. (2013) was translated and partly emended in Wikipedia, as follows.]
Stem up to 4 m long and 9 mm thick, circular in cross section and up to 9 mm in diameter. Internodes up to 10 cm long.
Leaves: Young plants have fimbriate laminae (leaf blades) up to 10 cm long. Laminae borne on older rosette plants are lanceolate to elliptic and up to 25 cm long by 3.5–4 cm wide. They differ from those of younger plants in lacking fimbriae. One to two longitudinal veins are present on either side of the midrib. The laminar apex is acute. The petiole is canaliculate, semi-amplexicaul, and slightly decurrent down the stem. Tendrils reach 15 cm in length and bear numerous extrafloral nectaries. The leaves of climbing stems are similar, but are separated by longer internodes. They are long and narrow, sometimes reaching almost three times the pitcher height, at least in plants from Samar.
In young plants with fimbriate leaves, the pitchers reach 10 cm in height. They have well-developed fringed wings up to 2 mm wide, which run the length of the pitcher cup and bear filaments 2–3 mm long. The peristome is up to 1–2 mm wide. The pitcher lid or operculum is almost perfectly round and reaches 1.5 cm in width. It has a basal keel about 1.5 mm wide.
Rosette and lower pitchers are bulbous in the basal third, becoming cylindrical above and having a slight constriction in the middle. They are up to 16.5 cm high by 4 cm wide. The pitcher opening is up to 3 cm wide. The peristome is cylindrical and up to 5–7 mm wide. The fringed wings are restricted to the upper half of the pitcher cup, the lower parts being reduced to a pair of ribs. The fringe elements are spaced several millimetres apart and the longest (≤1.3 cm) are found in the upper third of the pitcher, near the peristome. The lid is round to slightly cordate (heart-shaped). It is distinctly domed and has a diameter of up to 3.5 cm. On the underside of the lid, the basal keel is 7–8 mm long and 3 mm high. A branched spur 2–3 mm long is inserted near the base of the lid.
Upper pitchers are ovoid in the basal third and cylindrical above, expanding rapidly just below the peristome. They are similar in size to their terrestrial counterparts, reaching 18 cm in length by 2.4 cm in width. The peristome is cylindrical to slightly flattened and around 5 mm wide. It is often raised at the front, where it is notched or wavy. The pitcher opening is up to 3.6 cm in diameter. The wings are reduced to ribs and lack filaments altogether. The lid is oval to cordate and, as in lower pitchers, heavily domed. It measures around 3.8 by 3.2 cm and has a basal keel on its lower surface. The keel is similarly sized to that of lower pitchers: 7–8 mm long by 3 mm high. The spur is up to 4 mm long.
In the wild, both lower and upper pitchers are predominantly yellowish-green, even when growing exposed to direct sunlight, though in some plants the wing vestiges of the upper pitchers may be slightly reddish. The inner surface visible through the pitcher opening is near-white.
Nepenthes viridis has a racemose inflorescence up to 60 cm long, of which the rachis (the flower-bearing portion) constitutes up to 50 cm, the remainder being a short peduncle. The flowers are mostly borne on two-flowered partial peduncles, which are up to 2.5 cm long.
[https://en.wikipedia.org/w/index.php?title=Nepenthes_viridis&oldid=834553633 accessed 30 aug 2018].

Distribution: Philippines, Samar and Dinagat islands [Micheler, Gronemeyer & al. (2013)].

Etymology: From latin viridis, green - the pitchers of *N. viridis* are yellowish-green in colour throughout. [Micheler, Gronemeyer & al. (2013)].

***Nepenthes vogelii* Schuit. & de Vogel in Blumea 47(3): 537 (-540, fig. 1). 2002.**

Description: Stem climbing, slender, terete, c. 4 mm diam., intemodes 3-7.5 cm long. lndumentum red-brown, consisting of dense, short, branched hairs c. 0.2 mm long mixed with scattered, longer, basally branched hairs c. 0.5-0.8 mm long, on stems, petioles, tendrils and pitchers, longer hairs on the pitchers appressed; surfaces of leaf blade only with scattered simple hairs c. 0.5 mm long, with longer hairs, to c. 1 mm long, present along the margins. Leaves coriaceous, petiolate; petiole canaliculate, 2.5-3.5 cm by 5-7 mm, at the base decurrent on the stem for 5-7 mm, this part slightly wing-like dilated; leaf blade oblong to narrowly obovate-oblong, 8-12.5 by 2.4-4.3 cm, base cuneate, apex slightly oblique, acute; longitudinal nerves 2 on each side of the midrib close to the outer margin, inconspicuous, arising from pennate nerves in basal third, pennate nerves numerous, patent, curved, inconspicuous. Tendrils about as long as the combined petiole and leaf blade, with a coil near the middle. Pitchers, including the lid, greenish cream with deep dull red-purple blotches, peristome light yellow with many red stripes. Lower pitchers cylindrical, gradually tapering to the base, at c. 1/3 above the base with a very slightly thickened annular zone,

broadly and weakly constricted in the middle, only slightly widened towards the mouth, 9-9.5 by 1.3-1.5 cm, near the mouth with or without two very short fringed wings, the wings 1-7 mm long, c. 1.5 mm wide, the fringe segments 2-3 mm long, 0.1-1.5 mm apart; mouth broadly ovate, elevated towards the lid; peristome flattened-semicylindrical, c. 2 mm wide in front, c. 3 mm wide at the back, finely ribbed, the ribs c. 0.3 mm apart, inner margin denticulate, with a gland between adjacent teeth, outer margin entire; lid orbicular, 1.2-1.5 by 1.5-1.6 cm, base cordate, apex broadly rounded, both surfaces without appendages, nectar glands of the lower surface absent in the centre or almost so, scattered elsewhere, orbicular, rimmed, c. 0.13 mm across; spur 2-3.5 mm long, at 2.5-3 mm below the lid, unbranched. Upper pitchers infundibuliform, gradually tapering to a long narrow base, 7.5-9 by 2.5-2.7 cm, without wings but with two somewhat prominent ridges; peristome flattened, 4-5 mm wide in front, 5-7 mm wide at the back, finely ribbed, the ribs c. 0.25 mm apart, inner margin weakly obtusely denticulate, eglandular, outer margin entire; lid ovate, 2-2.6 by 1.5-1.9 cm, base cordate, apex obtuse, both surfaces without appendages, nectar glands of the lower surface absent in the centre or almost so, scattered elsewhere, orbicular to elliptic, rimmed, 0.14-0.2 mm across; spur 3-5 mm long, at 2-4 mm below the lid, unbranched. Male inflorescence 12.5 cm long, racemose, c. 50-flowered; peduncle 4.5 cm long; pedicels 1-flowered, 6-10 mm long, bracts absent; tepals elliptic, c. 2.6 by 1 mm; androphore 2.3 mm long, anther head c. 1.3 by 1.6 mm. Female inflorescence, fruit and seed not seen. [Schuiteman & de Vogel (2002)].

Distribution: Malaysia, Borneo, Sarawak, Kelabit Highlands [Schuiteman & de Vogel (2002)].

Habitat: Terrestrial in moss in wet kerangas forest on white sand, 1000 m a.s.l. [Schuiteman & de Vogel (2002)].

Etymology: This species is named after Mr. Art Vogel, greenhouse manager of the Leiden Hortus Botanicus, who co-discovered and successfully cultivated this species. [Schuiteman & de Vogel (2002)].

***Nepenthes weda* Cheek in Blumea 59(3): 221 (-223, fig. 2, 3). 2015. Sec. Cheek (2015)**

Description: Terrestrial climber 2 – 4 m tall. Stems terete. Short shoots 4–6 mm diam, internodes 1.3 – 2 cm long, glabrous. Climbing stems 6 – 9 mm diam, internodes 10.5 –14 cm long, axillary buds conical, 2 –7 mm long, inserted 8 –13 mm above the axil, hairs golden-brown, multicellular, simple, sparse, appressed, 0.5 mm long, mixed with sessile depressed-globose red glands 0.05 – 0.1 mm diam. Horizontal stems, subterranean, bearing vertical rosette shoots along their length, 4 – 6 mm diam, internodes 1.2 – 4.5 cm long, surface irregularly ridged, corky, glabrous. Leaves petiolate, coriaceous; leaves of nanophyll rosette shoots 3 – 6, with blades slender linear-oblong, 20 – 22 by 2.4 – 6 mm, apex acute, tendril 65 – 85 mm long, base attenuate, petiole canaliculate 6 –10 by 2 mm, base shortly sheathing and clasp- ing the stem by its whole circumference; nerves not conspicu- ous; both surfaces with scattered glossy pale brown, mainly straight, simple hairs 0.2 – 0.5 mm long, dense along the adaxial midrib groove, mixed with a few sessile depressed-globose red glands 0.05 mm diam. Leaves of short shoots with blades el- liptic-oblong (10.5 –)15.2 – 25.5 by (2.8 –)4.1– 5.8(–7) cm, apex slightly acuminate, base acute, longitudinal nerves 10 –11 pairs, more or less evenly spread through the lamina, most con- spicuous on the lower surface. Pennate nerves numerous, conspicuous above, almost patent, reaching the marginal nerve; margin densely dark brown hairy, hairs simple 0.3 – 0.6 mm long; upper surface of blade glabrous apart from the densely pubescent midrib, hairs appressed, yellow-brown, 0.5(– 0.7) mm long, acute; lower surface with similar hairs covering 20 –100 % of midrib, hairs 0.75 –1 mm long, red-black or yellow mixed with sessile red glands 0.05 mm diam; inner 1/3 of lamina sparsely hairy, hairs 0.5 –1.25 mm long, mixed with sessile red glands, outer 2/3 glabrous or very sparsely hairy. Petiole canaliculate, (1.8 –)3.5 – 6 cm long, (0.2 –)0.4 – 0.5 cm wide, the wings of the basal 1–1.5 cm more or less abruptly dilated by c. 5 mm, perfoliate and decurrent for c. 5 mm down the stem, indumentum as in blade in herbarium specimens the dilated wing appearing as a sheath around the stem (artefact of pressing). Leaves of climbing stems with blade very nar- rowly elliptic, 20 – 23.5 by 4 – 4.5 cm, apex rounded-obtuse, base acute-cuneate. Longitudinal and pennate nerves as in the leaves of the short stems; leaf margin indumentum dense, brown, hairs simple, 0.5 –1 mm long. Upper surface of blade glossy, glabrescent, initially 10 % covered with simple ap- pressed hairs 0.25– 0.6 mm long, mixed with sessile depressed- globose red glands 0.05 mm diam. Lower surface 5 –10 % covered in persistent patent pale brown hairs (0.5 –)0.75(–1) mm long, and glands as upper surface. Petiole canaliculate, 5 –7, 0.4 – 0.5 cm, base perfoliate-decurrent, clasping the stem for 3/4 its diameter, then decurrent as wings 1– 2 mm wide for 1.8 – 2.7(– 4) cm, finally the wings uniting; indumentum as blade. Pitchers of nanophylll rosette shoots placed on ground in leaf litter, matt dark red to red-brown, broadly subcylindric, 4.2 – 6.5 cm long, 2.5 – 3.5 cm wide at base, tapering gradually to 1.6 – 3 cm wide below peristome; fringed wings 1.2 –1.5 cm apart, (2 –)7–11 mm broad, fringed elements (1–)1.8 – 2.8 mm long, densely clustered, arranged in 3 – 4 radiating planes, 0.15 mm apart towards peristome, or more evenly spread, 0.8 mm apart in dissection of the wings; indumentum of moderately dense patent simple pale brown hairs, 0.5 mm long, c. 15 – 20 per mm2, mixed with red sessile depressed-globose glands 0.03 mm diam at the same density. Mouth orbicular-ovate, slightly broader than long, oblique, slightly concave, column ill-defined, peristome brown-green, rounded in transverse sec- tion, 1–1.6 mm wide, ribs more or less conspicuous, 0.4 – 0.55 mm apart, raised either slightly and inconspicuously or as a short slender wing 0.1 mm high, ribs separated by 12 –15 faint striae; outer edge entire, more or less revolute, inner edge

ex- tended into conspicuous narrowly triangular, papery teeth 2– 2.4 mm long; lid orbicular, 1.2 –1.9 cm diam, apex rounded-emar- ginate, base rounded and minutely cordate apex of upper surface with a circular indentation 1– 2 mm diam base with 1– 3 submarginal tentacles 1– 2 mm long; lower surface matt pale yellow, with a corresponding raised, cup-shaped structure, 2 by 1 mm, inset 0.5 mm from apex, the interior densely hairy, otherwise appendages absent, nectar glands absent from midline and margin, 1– 3 on each side of the midline, longitu- dinally elliptic, thickly bordered, domed, glossy yellow, 0.8 –1.1 by 0.3 – 0.8 mm, the central aperture dark glossy brown, elliptic 0.25 – 0.5 by 0.25 mm, sometimes reduced to a minute pore at slit. Depressed-globose sessile red glands 0.05 mm diam and simple pale brown hairs 0.2 mm long, scattered thinly in the marginal 2 – 3 mm of the lid, the central portion lacking indu- mentum completely; marginal 0.6 mm of lid densely hairy, hairs bushy, erect, 0.1 mm long, with 1– 3 basal branches; spur en- tire or trifid, conical, 0.5 –1.5 mm long, densely appressed hairy. Lower pitchers (of short stems) brownish maroon, narrowly ovoid-cylindric, 11.3 – 20.2 cm tall, 4.7– 6 cm wide a the basal, ovoid portion, gradually constricting from a point ('the hip') 6 –7 cm from the base, narrowest below the peristome, 3.6 – 4.6 cm wide; fringed wings 1.5 – 2.2 cm apart, 0.9 –1.4(– 2.8) cm broad, involute, fringed elements 1– 2(– 3.5) mm long, dense, 0.3 mm apart near the peristome, more widely spaced, c. 1– 2 mm apart towards the pitcher base; indumentum of appressed, simple, multicellular, glossy pale brown or red hairs, 0.3 – 0.6 mm long, covering 10– 25 % of the surface; mouth ovate, strongly oblique, straight or very slightly concave, inner surface waxy white with purple blotches, column ill-defined; peristome flattened to rounded green or red, 4 –7 mm wide, ribs conspicuous, 0.8 –1.1 mm apart, abruptly raised as wings 0.5 mm high, ribs sepa- rated by striae; outer edge more or less entire, revolute, inner edge extended into conspicuous, narrowly triangular, papery teeth 2 – 3 mm long; lid elliptic 3.4 – 5.9 by 3 – 4.1 cm, apex rounded, base rounded and minutely cordate; upper surface with indumentum as outer pitcher, sometimes with 3 – 4 multicel- lular tentacles 2 mm long, hairy, inserted near the spur (Mah- roji 70), purple brown; lower surface with 25 – 30 thickly bor- dered, flattened nectar glands (0.6 –)0.75 –1.5 mm long, borders glossy, pale yellow, central aperture purple brown 0.2 – 0.5 mm diam, spur 2 – 3 mm long, dorsiventrally flat, stout, entire, apex rounded, or (Mahroji 70) fasciculate, with 3 basal, equal branches 1 mm long, densely hairy, hairs 0.25 – 0.5 mm. Upper pitchers of climbing stems dark red or yellow-green, more or less tinged and mottled red-brown (Phillipson et al. 6417) ovoid- cylindric, 24 – 25 cm tall, the basal ovoid portion 10 by 6 cm, constricted to c. 4 cm wide above, dilating gradually to c. 5 cm wide below the peristome; wings reduced to two ridges, c. 2 cm apart; indumentum of appressed simple acute hairs as lower pitchers but less dense, and glabrescent in the mature pitcher; mouth ovate, oblique, straight or slightly concave, inner surface waxy white, mottled red, column ill-defined, peristome rounded-flattened in transverse section, 3.5 – 5.5 mm wide, ribs conspicuous, 1–1.5 mm apart, abruptly raised as wings 0.2 – 0.3 mm high, ribs separated by striae; outer edge entire, revolute; inner edge extended into concealed, inconspicuous curved teeth 1.5 mm long; lid leathery, elliptic, 6.2 by 4 cm, apex and base rounded, upper surface with indumentum as outer pitcher, lower surface without basal appendage, but with a small sub- apical appendage 4 – 5 mm long, aligned along the midline, set back 4 mm from the apex, proximal part of appendage bilater- ally flattened, convex, semi-circular, 2 by 2 mm, distal part apically flattened, raised 1 mm above the surface, with a central bordered flattened longitudinally elliptic nectar gland c. 1 by 0.5 mm; nectar glands resembling that of the appendage, otherwise scattered on surface except for a midline band c. 5 mm wide at base of lid, widening to 8 mm wide at the subapical appendage; 10 –15 nectar glands on each side, orbicular or longitudinally elliptic, orbicular glands 0.5 –1.25 mm diam with a central glossy brown centre exposed by an aperture up to 0.5 mm diam in the glossy pale yellow border, elliptic glands 0.75 by 0.5 – 0.6 mm, larger glands flanking the midline band, smaller glands scattered towards margin, mixed with sparse sessile depressed-globose red glands 0.1 mm diam, marginal 1– 2 mm with scattered bushy hairs 0.1 mm diam, surface white, with streaks of red radiating from the basal attachment, nectar glands pale brown in life (Phillipson 6417); spur dorsiventrally flattened, 2 – 3 by 1 mm, recurved from above half its length, apex rounded, surface minutely densely papillate, papillae translucent, 0.01 mm long. Male inflorescence 44.5 – 48 by 4.5 – 5 cm; peduncle 14 –18.5 by 0.3 – 0.4 cm at base; partial- peduncles 65 –70, 4-flowered in proximal half, the distal 4/5ths 3-flowered, the distal most 1/5th 2-flowered; bract filiform, re- flexed, 1– 4 mm long, inserted c. 2 mm above base; partial- peduncle (3 –)5(–7) mm long; partial-rhachis 3 – 5 mm long; pedicels 8 –10(–12) mm long 90 % covered in pale brown appressed simples hairs 0.25 mm long, extending to partial- peduncles, rhachis and peduncle, where covering only c. 20 % of surface. Tepals 4, divided by 9 /10, lobes ovate-elliptic, 4 – 4.2(– 4.5) by 3 – 3.5 mm, apex rounded, upper surface col- oured green, distal half and marginal 0.5 mm with dense ap- pressed simple brown hairs 0.1– 0.2 mm long; proximal part glabrous, with minute elliptic-bordered nectar glands 0.05 mm long, c. 0.15 mm apart, at an apex of irregular raised tubercles, black (dried material). Lower surface with dense appressed golden-brown hairs 0.1– 0.125 mm long, 90 % cover, andro- phore terete 2.5– 3.5 mm long, 0.5– 0.6 mm wide, with scattered simple golden-brown hairs 0.2 mm long; anther head white, subglobose, 1.5 –1.6 mm diam, anthers 8 in a single whorl. Female inflorescence, fruit and seed unknown. [Cheek (2015)].

Distribution: Indonesia, Central Halmahera, Bukit Limber of Weda Bay. [Cheek (2015)].

Habitat: Lower montane forest on ultramafic substrate; 415 –1014 m altitude. [Cheek (2015)].

Etymology: Named as a noun in apposition, for Weda Bay in Halmahera, Indonesia, the base of the Weda Bay Nickel Project surveys for which led to the discovery of this species. [Cheek (2015)].

Conservation: Since on current evidence a single location is known with an area of occupancy estimated as 12 km2 (using the 4 km2 cells currently favoured by IUCN (2012), and with a similar extent of occurrence, N. weda is here assessed as CR B1+B2a,b(iii), that is Critically Endangered. [Cheek (2015)].

***Nepenthes zygon* Jebb & Cheek in Blumea 59: 151, fig. 3. 2014. Sec. Cheek & Jebb (2014)**

= *Nepenthes alata* var. *ecristata* Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 72. 1908.

Description: Terrestrial climber 2–3 m tall, possibly sometimes rooting on bases of stunted trees in cloud forest. Stem terete, 5.5–9.5 mm diam. Rosette and short stems not well-developed. Climbing stems with internodes (2.8–)5–12 cm long, axillary buds filiform 5(–7) by 0.9 mm long, inserted 6–9 mm above the axil, indumentum of patent brown 'dagger hairs' (Kurata 2003) 0.2 – 0.5(– 0.8) mm long, very sparse to 20 – 30 % surface coverage, denser in leaf axils; sessile red depressed-globose glands 0.05 mm diam, scattered throughout. Leaves thinly coriaceous, petiolate. Rosette leaves oblanceolate, 14–18 by 4–4.5 cm. Leaves of climbing stems narrowly oblong-elliptic, 21–24(–30) by 2.8–5.5(–7) cm; apex acute, not peltate; base decurrent to petiole; longitudinal nerves 1–2 pairs, 2–10 mm from the margin, arising from the midrib of the blade, conspicuous above; pennate nerves numerous, patent, conspicuous above; midrib upper surface 20–30 % covered in a mixture of dark brown simple or 'dagger hairs' 0.06–1 mm long and white, (2–)3–6-armed bushy to substellate hairs 0.2–0.25 mm diam, margin densely shortly hairy with same hairs, blade otherwise mainly lacking hairs except thinly scattered white hairs; sessile, red depressed-globose glands 0.05 mm diam scattered throughout; lower surface with midrib 10–20 % covered in dark brown 'dagger hairs' 0.5–0.6 mm long, mixed with substellate pale brown bushy hairs arising from a dark red base, 4–6-armed, 0.15–0.2 mm diam, extending very sparsely to the blade (i.e. Elmer 14248) or moderately densely c. 3 hairs mm2; margin densely ciliate with hairs as in upper surface of midrib. Petiole winged, broadly U- or V-shaped in section, (6–)7–10 by 0.6–1(–2) cm. Lower pitchers (tendril not coiled) ellipsoid-cylindric, 9–14 by 2.5–5 cm, widest in the ellipsoid lower half, upper half cylindric 1.5–2.5 cm wide; fringed wings present from base to peristome, wings 3–4 mm wide, fringe elements 4–5 mm long, (2–)3–5.5 mm apart; outer surface 30–50 % covered in minute (3–)4-armed stellate hairs 0.1 mm diam, mixed with sparser (c. 5 % cover) hairs 0.75–1.3 mm long superficially simple but bearing 1–2 short side branches from the central axis. Mouth ovate-elliptic, 2.5–4 by 1.7–2 cm, oblique, not, or only weakly concave, column not present; peristome cylindric 2–4 mm diam, even in width throughout, ribs 0.5–0.6 mm apart, raised 0.4 mm, in life the inner edge appears to be without teeth or holes, which can be found on dissection, outer edge not lobed. Lid orbicular-elliptic, 2–2.5 by 1.8–2.9 cm, apex rounded, base slightly cordate; basal ridge and appendage absent in the smaller pitchers (c. 10 cm tall), resembling those of the upper pitchers in the larger (c. 15 cm tall) pitchers; nectar glands and indumentum resembling those of upper pitchers but sparser. Spur triangular c. 2.5 by 1.5 mm, tapering from base to rounded apex; densely covered in brown bushy and 'dagger hairs' 0.3–1 mm long. Upper pitchers (tendril coiled) ellipsoid-cylindric (9–)16–25 by (2.6–)4–5.5 cm, widest in the basal ellipsoid, 7–8 cm long portion, above cylindric narrowed to (1.8–)2.5–3(–3.5) cm diam; indumentum as lower pitchers, colour when live with basal, swollen part of pitcher green (drying brown), overlain with white waxy layer, cylindrical part with faint to well-marked longitudinal red-purple stripes and flecks, inner pitcher surface waxy green (drying pale purple), spotted with purple; fringed wings present only immediately below the peristome (0.6 –)1.7– 3.5 cm long, widest at the peristome where (1–)2.5–7.5 mm wide, fringed elements 3–6 mm long, 1.5–3 mm apart, the uppermost longest and raised above the peristome; mouth ovate, 3.5 – 5 by 2.5 – 3.3 cm, oblique, slightly concave, column weakly developed; peristome subcylindric (flattened only before the pitcher is fully opened Fig. 3b) (1.5–)2–3(–5) mm broad, ribs 0.3 mm apart, about 0.01 mm high, outer margin entire, revolute, inner margin without conspicuous teeth, revolute (edge with holes visible only when dissected, (Fig 3q), green or red and green in colour; lid ovate (2.2 –)3.3 – 4.5(– 4.9) by 2.5 – 4(– 4.6) cm, apex rounded or slightly retuse, base cordate, the sinus 1–1.5 cm wide, 5 mm deep, lower surface with a basal ridge 1.5 cm long, rising gradually to 0.5–1 mm high, tapering to the extremities, and bearing in the centre a convex or recurved-hooked appendage (Fig. 3n) projecting 3–4 mm from the lid surface, 4–7 mm long; nectar glands are of two types and mostly confined to two approximately lanceolate areas, which are joined at the basal ridge, nectar glands being largely absent from a marginal band 5–8 mm wide and from the distal half of the midline; they are thinly scattered on the basal appendage; type 1: nectar glands (90 % of the total c. 1 per mm2) are small, thinly bordered, orbicular or elliptic, 0.1–0.2 mm in length; type 2: nectar glands are similar in appearance, but much sparser and larger 0.5–0.6(–0.7) mm long; sessile red-black depressed-globose glands 0.05 mm diam, c. 3 per mm2 are scattered over the whole of the lower surface; marginal 2–3 mm 50 % covered in stalked bushy brown hairs 0.1–0.2 mm diam, several occurring towards the centre of the lid, 8–10 mm from the edge; spur simple, filiform, 5–9 mm long, 0.5 mm wide, apex obtuse, densely covered in appressed hairs 0.5–1 mm long. Male inflorescence c. 47 by 3.5 cm, indumentum moderately dense, covering 40–50 % of the surface, hairs pale brown, a mixture of 'dagger hairs' 0.5–1 mm long, and 2–4-armed bushy hairs 0.2–0.25 mm long; peduncle c. 27 by 0.3 cm; rhachis c. 20 cm long, with partial-peduncles 75–80, 2-flowered (1-flowered at apex); bracts recurved or patent, filamentous, c. 3 mm long, acute,

inserted along the length of the partial-peduncles; partial-peduncles 4–6 mm long; pedicels c. 15 mm long, indumentum covering 30–50 % of the surface, hairs bushy, 1–3-armed, erect, 0.2–0.5 mm long; tepals 4, elliptic, 6 by 4 mm, outer surface 50–60 % covered in a mixture of simple, acute hairs 0.15–0.25 mm long, and sessile mucilaginous papillae 0.005 mm diam, inner surface densely covered in elliptic nectar glands; staminal column 5 mm long, moderately densely hairy along its length, hairs 0.1 mm long, more or less patent, red-brown, simple or with a basal branch; anther-head subglobose, 2.5 mm diam. Female inflorescences, infrutescences and seed unknown. [Cheek & Jebb (2014)].

Distribution: Philippines, NE Mindanao, Mts Masay and Pasian [Cheek & Jebb (2014)].

Habitat: Submontane mossy forest along ridges, thought to be non-ultramafic, 1500 –1875 m a.s.l. [Cheek & Jebb (2014)].

Conservation: *N. zygon* is here assessed as Critically Endangered under IUCN (2012), criterion D based on less than 50 individuals (in fact two) being known from the wild with certainty. [Cheek & Jebb (2014)].

Nepenthes excluded names

***Nepenthes* ×*amesiana* H.J.Veitch ex Anon. in Gard. Chron. ser. 3 14: 756. 1893, nom. nud. Sec. IPNI (1999+)**

Notes: "Messrs. Jas. Veitch and Sons, Chelsea, staged a number of *Nepenthes* with good pitchers. *N. Amesiana* from *N. Rafflesiana x N. Hookeriana*, was awarded a First-class Certificate; the pitcher is green and marked prettilv with red." [Anonymous (1893)].

Hybrid parent formula: *"N. Rafflesiana x N. Hookeriana"* [Anonymous (1893)].

***Nepenthes ampullacea* Jack, Numer. List [Wallich]: n. 2243. 1830, nom. nud. Sec. Berendsohn (2017+)**

***Nepenthes* ×*balfouriana* Hort.Veitch ex Mast. in Gard. Chron. ser. 3 26: 90 (91, fig.39). 1899, nom. inval. Sec. IPNI (1999+)**

Hybrid parent formula: "The present pitcher is the ontcome of cross between N. mixta x, Mast., and N. Mastersiana x, Veitch; N. mixta, Mast., is itself a hybrid between N. Curtisii and N. Northiana, Hook.f., and N. Mastersiana x is the result of a cross between N. sanguinea and N. Khasyana.- so t hat the present plant is the descendant of four distinct species." [Masters (1899)].

***Nepenthes* ×*cincta* Mast. in Gard. Chron. n.s. 21: 576. 1884. Sec. Cheek & Jebb (2001)**

Distribution: Borneo: Sarawak (near Bau).

Notes: Described from material grown from seed collected by David Burke in Sarawak, a collector for J. Veitch and Co. As Masters states in the original description, it is in all likelihood a natural hybrid between N. albomarginata and N. northiana. [Cheek & Jebb (2001)].

Hybrid parent formula: N. albomarginata × N. northiana.

***Nepenthes* ×*coccinea* Hort.Williams ex Anon. in Gard. Chron. n.s. 18: 169, fig. 29. 1882, nom. inval. Sec. IPNI (1999+)**

***Nepenthes compacta* Hort. ex L.Gentil, Pl. Cult. Serres Jard. Bot. Brux.: 127. 1907, nom. nud.**

***Nepenthes cristata* Brongn. in Ann. Sci. Nat. 1: 48. 1824. Sec. Cheek & Jebb (2001)**

Notes: A nonsense species based on mixed types, comprising N. alata and N. madagascariensis. [Cheek & Jebb (2001)].

***Nepenthes cuneata* Hort.Veitch ex Anon. in Gard. Chron. n.s. 4: 368. 1875, nom. subnud. Sec. Berendsohn (2017+)**

***Nepenthes distillatoria* Aucl. ex Steud., Nomencl. Bot. 2: 190. 1841. Sec. IPNI (1999+)**

Notes: Misapplied name for *N. mirabilis* (Lour.) Druce.

***Nepenthes distillatoria* Bréon in Belgique Hort. 5: 196. 1855. Sec. IPNI (1999+)**

Notes: A misapplication for N. madagascariensis Poir. [Jebb & Cheek (1997)].

***Nepenthes distillatoria* Graham in Edinb. N. Phil. Journ. 1827: 371. 1827. Sec. IPNI (1999+)**

Notes: Misapplied name for *N. khasiana* Hook.f.

***Nepenthes* ×*dominyana* Hort.Veitch ex T.Moore & Mast. in Gard. Chron. 1862: 504. 1862, nom. subnud. Sec. IPNI (1999+)**

Hybrid parent formula: "... between *N. rafflesiana* and an imported unnamed species ..." [Moore & Masters (1862)].

***Nepenthes* ×*dormanniana* Hort.Williams ex Mast. in Gard. Chron. n.s. 17: 525 (fig. 81). 1882, nom. inval. Sec. IPNI (1999+)**

Notes: [Carnivorous Plant Database (acc. 12 apr 2017)]: *Nepenthes dormanniana* {Hort.Williams ex W.Robinson}]

P: Garden Lond.17:483 (1880). T: ex cult. S.Amboy, N.J., US, (?K).
S: =[[*Nepenthes mirabilis* {(Lour.) Rafarin}] * [[*Nepenthes gracilis* {Korth.}] * [*Nepenthes khasiana* {Hook.f.}]]].

***Nepenthes* ×*edinensis* W.E.Dixon in Gard. Chron. ser. 3 3: 170. 1888, nom. subnud.**

Notes: In IPNI (acc. 17 Mar 2017) sub *N. edinensis* "R.Linds." in Gard. Chron. (1888) i. "470". [IPNI (1999+)].

Hybrid parent formula: "The parents were N. Rafflesiana and N. Chelsoni x" [Dixon (1888)].

***Nepenthes* ×*ferrugineomarginata* Sh.Kurata in J. Insectiv. Pl. Soc. 33(2): 35. 1982, nom. inval. Sec. IPNI (1999+)**

Hybrid parent formula: A natural hybrid between *N. albomarginata* and *N. reinwardtiana*. [McPherson & Robinson (2012)].

***Nepenthes gymnamphora* Reinw. & Nees ex Miq., Pl. Jungh.: 169. 1852. Sec. IPNI (1999+)**

Notes: Misapplied name for *N. pectinata* Danser.

***Nepenthes* ×*hookerae* Hort. ex Beck in Wiener Ill. Gart.-Zeitung 20: 222. 1895, nom. inval.**

***Nepenthes kookeriana* Hort.Low ex Becc., Malesia 3: 3. 1886. Sec. IPNI (1999+)**

***Nepenthes* ×*kuchingensis* Sh.Kurata in J. Insectiv. Pl. Soc. 33(2): 36. 1982, nom. inval.**

***Nepenthes* ×*lecouflei* Kusak. in Carniv. Pl. Newslett. 12(1): 6. 1983, nom. inval.**

Hybrid parent formula: "*Nepenthes thorelli* × *Nepenthes mirabilis* Druce" [IPNI (1999+)].

***Nepenthes lindleyana* H.Low ex W.H.Baxter, Suppl. Hort. Brit.: 593. 1850, nom. nud. Sec. Cheek & Jebb (2001)**

Notes: Without original material, we have been unable to identify this taxon. [Cheek & Jebb (2001)].

***Nepenthes* ×*mixta* Hort.Veitch ex Anon. in Gard. Chron. ser. 3 13: 46, fig. 9. 1893, nom. superfl. Sec. Cheek & Jebb (2001)**

***Nepenthes* ×*morganiana* auct. Sec. Berendsohn (2017+)**

***Nepenthes neglecta* Macfarl., in: Engler, A., Pflanzenr. IV. 111 (Heft 36): 58. 1908. Sec. Cheek & Jebb (2001)**

Notes: This name is probably referable to *N. gracili*s as detailed by Jebb & Cheek in Blumea 42 (1997) 93. [Cheek & Jebb (2001)].

***Nepenthes nigropurpurea sphalm.* in Gard. Chron. n.s. 18: 429. 1882, nom. nud. Sec. Berendsohn (2017+)**

***Nepenthes phyllamphora* Hook.f. & Thomson ex Hook.f., in: de Candolle, A. L. P. P., Prodr. 17: 102. 1873. Sec. IPNI (1999+)**

Notes: Missapplied name for *N. khasiana* Hook.f.

***Nepenthes phyllamphora* Reinw. ex Miq., Fl. Ned. Ind. 1(1): 1. 1858. Sec. IPNI (1999+)**

Notes: Misapplied name for *N. gymnamphora* Nees.

***Nepenthes villosa* Hook. in Bot. Mag. 84 (= ser. 3 v. 14): tab. 5080. 1858. Sec. Berendsohn (2017+)**

***Nepenthes vittata* Hort. ex Beck Sec. Berendsohn (2017+)**

Nepenthes excluded original spellings

Nepenthes alisaputraiana

Nepenthes eymai

Nepenthes glabratus

Nepenthes hamatus

Nepenthes longinodis* (for *Nepenthes gracilis* var. *longinodis)

Nepenthes published artificial hybrids

***Nepenthes* ×*amabilis* B.S.Williams ex G.Nicholson, Ill. Dict. Gard. 9: 571. 1888.**

= *Nepenthes* ×*amabilis* B.S.Williams, Cat. New Pl.: 26. 1886.

Hybrid parent formula: *N. hookeri* and *N. rafflesiana*.

***Nepenthes* ×*atrosanguinea* B.S.Williams ex Anon., Gard. Chron. n.s. 17: 826, fig. 125. 1882.**

Hybrid parent formula: "a garden hybrid of American origin, probably a corss between *N. sedeni* and *N. rubra*".

***Nepenthes* ×*chelsonii* Hort.Veitch ex Mast. in Gard. Chron. 1872: 542. 1872.**

Hybrid parent formula: "This form is a metis or cross between *N. Rafflesiana* (= *N. Hookeri*), which was the male parent, and x *N. Dominii*, the female parent, the latter being itself a hybrid between two species." [Masters (1872)].

***Nepenthes* ×*courtii* Hort.Veitch ex Mast. in Gard. Chron. n.s. 16: 844, fig. 160. 1881.**

Hybrid parent formula: "It was raised from the seed of an unnamed Bornean species fertilised by the pollen of *N. Dominiix*, the latter being itself a hybrid between *N. Rafflesiana* and the same undetermined Bornean species. It is a matter for regret that no means exist now of ascertaining what this Bornean species was, but as it was made use of in several of Messrs. Veitch's crosses we may in time be able to detect the progenitor in the characters of its descendants. All we can say at present is a mere guess that the unknown plant may have been *N. lanata*, concerning which plant we shall have more to say at another time." [Masters (1881)].

***Nepenthes* ×*cylindrica* Veitch ex A.H.K. in Gard. Chron. ser. 3 2: 521, fig. 103. 1887.**

Hybrid parent formula: " ... raised ... from *N. Veitchii*, pollen parent, and *N. hirsuta glabrescens* (*N. zeylanica rubra*, hort.), seed parent."

***Nepenthes* ×*dicksoniana* R.Linds. ex Anon. in Gard. Chron. ser. 3 4: 543 (-544, 541, f. 78). 1888. Sec. IPNI (1999+)**

Hybrid parent formula: *N. rafflesiana x N. veitchii* [artificial hybrid] [Anonymous (1888)].

***Nepenthes* ×*dominii* Hort.Veitch ex Mast. in Gard. Chron. 1872: 542. 1872. Sec. IPNI (1999+)**

Hybrid parent formula: "This form is stated to have been the result of the fertilisation of the female flowers of *N. Rafflesiana* with the pollen of an undetermined species from Borneo." [Masters (1872)].

***Nepenthes* ×*hybrida* Hort.Veitch ex Mast. in Gard. Chron. 1872: 542. 1872.**

Notes: Specimens of *Nepenthes macrovulgaris* J.R.Turnbull & A.T.Middleton have often been incorrectly labelled *"N. hybrida"* over the two decades prior to 1997. [Jebb & Cheek (1997)].

Hybrid parent formula: "This form, and the succeeding one [*N. hybrida maculata* Hort.Veitch] are stated to have originated from seeds taken from the same capsule. The male parent of both is stated to have been *N. Khasyana*, the female an unknown species from Borneo." [Masters (1872)].

***Nepenthes* ×*intermedia* H.J.Veitch in Gard. Chron. n.s. 3: 551. 1875.**

Hybrid parent formula: "Hybrida inter *N. Rafflesianam* foem. et sp. Borneenem indeterminatam." [Masters (1882)].

***Nepenthes* ×*lawrenciana* Hort.Williams ex Mast. in Gard. Chron. n.s. 14: 40, f. 8. 1880.**

Hybrid parent formula: *N. hookeri* x *N. phyllamphora* [artificial hybrid] [Masters (1880)].

***Nepenthes* ×*maculata* H.J.Veitch in Gard. Chron. 1866: 432. 1866.**

Hybrid parent formula: "between *N. distillatoria* and a new unnamed spotted Bornean species." [Veitch (1866)].

***Nepenthes* ×*mastersiana* Hort.Veitch ex Mast. in Gard. Chron. n.s. 16: 748, fig. 148. 1881.**

Hybrid parent formula: "This is a hybrid raised by Mr. Court in Messrs. Veitch's establishment between *N. sanguinea* as the seed-parent and *N. Khasyana*, the *distillatoria* of gardens, as the pollen-parent." [Masters (1881)].

***Nepenthes* ×*morganiana* Hort.Veitch ex G.F.Wilson in Gard. Chron. n.s. 16: 381. 1881. Sec. IPNI (1999+)**

Notes: IPNI (acc. 12 apr 2017): *Nepenthes* ×*morganiana* hort. in Gard. Chron. (1891) II. 381. - Apparently incorrect. [Berendsohn (2017+)].

Hybrid parent formula: Original assignation: `*N. hookeri* × *N.phyllamphora* [artificial hybrid] [Wilson (1881)].

***Nepenthes* ×*northisii* Hort.Veitch ex Anon. in Gard. Chron. ser. 3 12: 561. 1892. Sec. IPNI (1999+)**

Hybrid parent formula: Original publication: *N. northiana* × *N. curtisii* [artificial hybrid].

***Nepenthes* ×*outramiana* B.S.Williams ex Anon. in Gard. Chron. n.s. 12: 505. 1879.**

Hybrid parent formula: *N. sedeni* x *N. hookeri* [artificial hybrid] [Anonymous (1879)].

***Nepenthes* ×*paradisae* Hort. ex Beck in Wiener Ill. Gart.-Zeitung 20: 222. 1895.**

Hybrid parent formula: *N. Hookeri* x ? [artificial hybrid] [Beck von Mannagetta und Lerchenau (1895)].

***Nepenthes* ×*ratcliffiana* Hort.Veitch ex Mast. in Gard. Chron. n.s. 17: 178, fig. 28. 1882.**

Hybrid parent formula: "This is stated to be a hybrid between *N. phyllamphora* and *N. Hookeri*, ..." [Masters (1882)].

***Nepenthes* ×*robusta* Hort.Williams ex Mast. in Gard. Chron. n.s. 14: 40, f. 11. 1880.**

Hybrid parent formula: *N. hookeri x N. phyllamphora* [artificial hybrid] [Masters (1880)].

***Nepenthes* ×*rubromaculata* Hort.Veitch ex Mast. in Gard. Chron. n.s. 17: 143 (fig. 24). 1882. Sec. IPNI (1999+)**

Hybrid parent formula: "*N. hybrida* and a Bornean spceis not identified at the time (probably *N. lanata*)" [Masters (1882)].

***Nepenthes* ×*rufescens* Hort.Veitch ex Anon. in Gard. Chron. ser. 3 4: 609, fig. 95. 1888. Sec. IPNI (1999+)**

Hybrid parent formula: "This is stated to be a cross between *N. Courtii* x out of *N. zeylanica rubra. N. Courtii* itself is a cross between an unnamed Bornean species and N. Dominiana x, this latter being also a cross *between N. Rafflesiana* and the same undetermined Bornean species; so that our present plant is very much crossed, and combines the blood, if one may so say, of three species and of two hybrids." [Anonymous (1888)].

***Nepenthes* ×*sedeni* Hort.Veitch ex Mast. in Gard. Chron. 1872: 542. 1872. Sec. IPNI (1999+)**

Hybrid parent formula: "This form is stated to have been raised from the pollen of *N. Khasyana* (= *distillatoria* of gardens) applied to the female flower of an undetermined species." [Masters (1872)].

***Nepenthes* ×*superba* Hort. ex Dean in Fl. Mag. n.s. 10: t. 434. 1881.**

Hybrid parent formula: "This is a very distinct and handsome Pitcher plant; one of several fine hybrids that have been produced of late years. In its general habit it resembles *N. Hookeri*, but the pitchers are intermediate between that variety and *N. Sedeni*." [Dean (1881)].

***Nepenthes* ×*tiveyi* H.J.Veitch ex Mast. in Gard. Chron. ser. 3 22: 187. 1897. Sec. IPNI (1999+)**

– *Nepenthes* ×*tiveyi* Hort. ex Anon. in Rev. Hort. Belge Étrangère 31: 108. 1905, nom. illeg.

Hybrid parent formula: "One new hybrid was shown, named *N. Tiveyi*, obtained from a cross between *N. veitchii* [male] and *N. Curtsii superba* [female]".

Hybrid parent formula: "Le *Nepenthes Tiveyi* es un nouvel hybride provenant d'un croisement entre le *N. Veitchii* et le *N. Curtisii superba*. Cette variété se distingue par les dimensions extraordinaires de ses urnes que atteignent 0.40 de longueur." [Anonymous (1905)].

***Nepenthes* ×*williamsii* Hort.Williams ex Mast. in Gard. Chron. n.s. 14: 40, f. 9. 1880.**

Hybrid parent formula: *N. sedenii* x *N. Hookeri* [artificial hybrid] [Masters (1880)].

***Nepenthes* ×*wrigleyana* Hort.Veitch ex Mast. in Gard. Chron. n.s. 17: 143, fig. 23. 1882.**

Hybrid parent formula: Original publication: *N. phyllamphora* x *N. hookeri* [artificial hybrid] [Masters (1882)].

Nepenthes unresolved IPNI records

***Nepenthes balfouriana* Hort. ex Anon. in Gard. Chron. ser. 3 36: 97. 1904. Sec. IPNI (1999+)**

***Nepenthes* ×*deslogesii* Hort. ex Anon. in Jard. 1905: 136. 1905. Sec. IPNI (1999+)**

***Nepenthes* ×*findlayana* Hort.Williams, Cat.: 23, fig. 1886. Sec. IPNI (1999+)**
Notes: Nomenclatural reference not verified (not found 20 Mar 2017). [Berendsohn (2017+)].

***Nepenthes* ×*formosa* Hort.Veitch ex Anon., Cat.: 8. 1895. Sec. IPNI (1999+)**
Notes: Nomenclatural reference not veryfied (not found, 20 Mar 2017) [Berendsohn (2017+)].

***Nepenthes* ×*henryana* G.Nicholson, Ill. Dict. Gard. 4: 572. 1887. Sec. IPNI (1999+)**
Notes: Nomenclatural reference not verified ("Illustrated Dictionary of Gardening, a Practical and Scientific Encyclopaedia of Horticulture for Gardeners and Botanists" vol. 4 p 572 not found on-line). [Berendsohn (2017+)].

***Nepenthes* ×*hibberdii* Williams, The Garden: 218. 1885. Sec. IPNI (1999+)**
Notes: Nom. reference not clear. [Berendsohn (2017+)].

***Nepenthes maxima* f. *undulata* Sh.Kurata, Atsumi & Y.Komatsu in J. Insectiv. Pl. Soc. 36(2): 49. 1985. Sec. IPNI (1999+)**

***Nepenthes vallierae* Hort. ex Anon. in Jard. 1905: 136. 1905. Sec. IPNI (1999+)**

***Nepenthes zeylanica* V.J.Chapman in Ceylon J. Sci., Sect. A. Bot. 12: 221. 1947. Sec. IPNI (1999+)**

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