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Never have so many new tropical pitcher plants (*Nepenthes*) been discovered as during the three years since the publication of the first complete monograph of the genus in 2009. Among them are eighteen new species, two revised species, one new variety, and two new but incompletely diagnosed taxa from across Borneo, Indochina, New Guinea, the Philippines and Sulawesi. The newly discovered plants include many of largest, most extraordinary and colourful carnivorous plants ever found. This work documents and depicts all of the new *Nepenthes* in spectacular detail, and in many cases for the very first time.



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Nepenthes ceciliae, a new pitcher plant species from Mount Kiamo, Mindanao

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A new species of *Nepenthes* L., *N. ceciliae*, is described and illustrated from Mindanao, Philippines. This diminutive new taxon occurs on the ultramafic soils of Mount Kiamo, where it grows terrestrially alongside other *Nepenthes* taxa from which it is distinct. A comparative table provides a reference of diagnostic features alongside those of near related taxa.

Nepenthes ceciliae Gronem., Coritico, Micheler, Marwinski, Acil & V.B. Amoroso, *sp. nov.*

Folia mediocria petiolata, lamina linearis, 16 x 2.5 cm, nervis longitudinalibus utrinque 2, basi valde attenuata, petiolus 4 cm longus. Ascidia dimorphia. Ascidia rosularum 10 cm longa, cylindrica, parte inferiore parvi turgidus, peristomio plano, 1 cm lato. Ascidia superiora 10 cm longa, infundibuliformia, peristomio cylindrico, 3 mm lato. Opercluo cordato, facie inferiore prope basin appendice lateraliter applanta. Inflorescentia racemus parvus, 32 cm longa, pedicellis 2-floris.

Figure 354 (facing page). The dainty upper pitchers of *Nepenthes ceciliae*.

TYPE: Philippines, Mindanao Island, Bukidnon Province, Mount Kiamo, trail from Barangay Kibalabag (Malaybalay City) below the summit, 1792 m, 16.05.2011. *F. Coritico* & *V. Amoroso* CMUH00007378, Central Mindanao University Herbarium, Musuan, Bukidnon, Philippines (holotype, CMUH).

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.

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 (Figures 354 and 355).

Lower pitchers cylindrical, with the lower third variably inflated and often ovate, up to 10 cm long and 3 cm wide (Figures 356, 357 and 358). 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.

Figure 355 (facing page). A botanical illustration of *Nepenthes ceciliae* showing (A) basal rosette, (B) lower pitcher, (C) lamina of a climbing vine, (D) upper pitcher, (E) leaf base and attachment to stem, (F) male inflorescence and (G) male flower.



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 cm wide and wholly infundibular (Figures 359, 360 and 361). 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 (Figures 362 and 363). Fruits to 2 cm long (Figure 364).

Indumentum absent on all parts of the foliage and inflorescence.

DISTRIBUTION: *Nepenthes ceciliae* is known only from the south facing ridge of Mount Kiamo and the opposite limb ascending north of Kibalabag (Volker Heinrich, pers. comms.). The surrounding peaks are remote and unexplored for *Nepenthes*, and so a wider distribution might be anticipated for this plant.

ECOLOGY: *Nepenthes ceciliae* grows terrestrially on ultramafic soils at altitudes from 1500–1880 m (Figures 365 and 366). It mostly occurs in open, upper montane habitats, scrambling across the ground or climbing amidst sparse vegetation, or forming short, self supporting scrubby



Figure 356 (above). A small rosette of *Nepenthes ceciliae* growing terrestrially on Mount Kiamo.



Figure 357 (above). A typical lower pitcher of *Nepenthes ceciliae*. Note morphological differences to *N. alata*.



Figure 358 (above). The lower pitcher of a darker colour variant of *Nepenthes ceciliae*.



Figure 359 (above). A typical, pale green *Nepenthes ceciliae* upper pitcher.



Figure 360 (above). The upper pitcher of a *Nepenthes ceciliae* colour variant.



Figure 361 (above). *Nepenthes ceciliae* plants typically produce many pitchers that persist on the plants concurrently.



Figure 362 (above). The female inflorescence of *Nepenthes ceciliae*.



Figure 363 (above). The male inflorescence of *Nepenthes ceciliae*.



Figure 364 (above). Flowering specimens of *Nepenthes ceciliae* growing on the steep slopes of Mount Kiamo amidst stunted montane vegetation.



Figure 365 (above). *Nepenthes ceciliae* plants climbing over supporting vegetation. The species forms significant colonies where it occurs.



Figure 366 (above). A dense stand of *Nepenthes ceciliae* plants growing close to the ground.

bushes. Most known stands occur in direct sunlight, and under these conditions it may produce branched stems up to 3 m long.

Isolated specimens of *Nepenthes ceciliae* may be found in shady, upper montane forest, although growth tends to be weak and most plants appear etiolated and sterile. In such habitat, the stem climbs and scrambles through the surrounding vegetation, and may attain a maximum length of 2 m.

Nepenthes ceciliae grows sympatrically with *N. pulchra*, and isolated specimens of *N. merrilliana* and *N. truncata*, all of which can be found at similar altitudes on Mount Kiamo. Scattered stands of *Nepenthes alata* are present at lower elevations. Natural hybrids with *N. pulchra* occur widely on the upper slopes of the mountain.

TAXONOMIC AFFINITIES: *Nepenthes ceciliae* bears closest superficial similarity to *N. alata*, *N. copelandii* and *N. micramphora*, and appears to be allied to this group of related Philippine-endemic species. In particular, the infundibular upper pitchers of *Nepenthes ceciliae* resemble those of *N. copelandii*, however they differ in relative proportions and overall size (see Table 11). In all respects, mature *Nepenthes ceciliae* plants are generally smaller than mature *N. copelandii* specimens, and they bear gracile, linear leaves with winged petioles. In contrast, *Nepenthes copelandii* produces much broader, robust leaves with canaliculate petioles. The lid of *Nepenthes copelandii* generally lacks an appendage, whereas an appendage is present on the lids of both the lower and upper pitchers of *N. ceciliae*. Additionally, *N. ceciliae* grows terrestrially in open habitats, whereas *N. copelandii* usually grows as an epiphyte in montane vegetation.

Clear similarities are also apparent between *Nepenthes alata* and *N. ceciliae*, but these two species are distinguished by way of their upper pitchers; those of *N. ceciliae* are smaller and wholly infundibular, whereas the upper pitchers of *N. alata* are partly cylindrical. The inflorescences of *N. ceciliae* are 2-flowered, whereas those of *N. alata* are usually 1-flowered. Finally, *N. ceciliae* has not been recorded as an epiphyte, unlike *N. alata*.

The foliar morphology of *Nepenthes ceciliae* may appear superficially similar to that of *N. micramphora* in many respects, but the two plants are unlikely

to be confused due to their profoundly different size, and differing lid and leaf morphology (Table 11).

Although *Nepenthes ceciliae* grows with *N. pulchra* on Mount Kiamo, these two plants are unlikely to be confused owing to their very different morphology, size and colouration.

Putative hybrids involving *Nepenthes ceciliae* and *N. pulchra* occur abundantly on the upper slopes of Mount Kiamo, but are easily discerned owing to their intermediate morphology and colouration.

Table 11 (below). A comparison of *Nepenthes ceciliae* with closely related species. Observations of *N. alata*, *N. copelandii* and *N. micramphora* based on McPherson (2009).

	<i>Nepenthes ceciliae</i>	<i>Nepenthes alata</i>	<i>Nepenthes copelandii</i>	<i>Nepenthes micramphora</i>
Lower pitchers	Cylindrical, lower third variably broad, up to 10 cm long, 3 cm wide. Produced frequently	Cylindrical, up to 18 cm long, 4.5 cm wide. Produced frequently	Cylindrical, up to 26 cm long, 5.5 cm wide. Produced frequently	Cylindrical, up to 41 mm long and 16 mm wide. Produced very rarely
Upper pitchers	Wholly infundibular, 10 cm long, 4 cm wide	Very variable, although usually cylindrical, with a swollen or ovate base. Up to 23 cm long, 5 cm wide	Wholly infundibular, funnel shaped, 12 cm long, 4.5 cm wide	Infundibular with a waist below the peristome, up to 67 mm long, 20 mm wide
Lid	Cordate, with 2 mm long appendage that is consistently present.	Elliptic or sub-orbicular. Triangular appendage up to 10 mm long often present, but may be reduced or absent	Elliptic to ovate, no appendage or rudimentary	Reniform, no appendage
Leaf	16 cm long, 2.5 cm wide, winged petiole	Up to 33 cm long and 7 cm wide. Base attenuate, sessile or petiolate, winged and sometimes slightly decurrent	20 cm long, 5 cm wide, canaliculate petiole	8 cm long and 1 cm wide. Base attenuate and sessile
Stem Habitat	Up to 3 m, climbing Terrestrial in exposed locations and alongside scrub, predominantly in direct sunlight or light shade	Up to 12 m, climbing Versatile, including terrestrial and epiphytic habitats, in shady and open areas	Up to 10 m, climbing Epiphyte in mossy, lower and upper montane forest	Up to 2 m, climbing Terrestrial in exposed locations and alongside scrub, predominantly in direct sunlight or light shade

CONSERVATION STATUS: Stands of *Nepenthes ceciliae* on Mount Kiamo are extensive, remote and little visited (Figure 367). Although located close to Malaybalay City, Mount Kiamo is difficult to access. All visitors must register in Kibalabag before entering the area. Unfortunately members of local communities do ascend the mountain to collect great quantities of *Nepenthes*, including *N. ceciliae*, to sell in flower markets and garden shows during annual fiestas and provincial celebrations. This form of collection represents the main threat to *N. ceciliae* and the other *Nepenthes* of Mount Kiamo. Further exploration of the surrounding peaks is required to establish the full range of this plant, but on the basis of current understanding, *N. ceciliae* should be considered vulnerable.



Figure 367 (above). Upper pitcher of *Nepenthes ceciliae* grasping adjacent vegetation for support.