Nepenthes argentii on Sibuyan Island

Vlastik Rybka[1], Romana Rybková[1] and Robert Cantley[2]
[1]Prague Botanical Garden • Nádvorní 134• Praha 7, 170 00 • Czech Republic • rybkavlastik@hotmail.com
[2]Borneo Exotics • 262 B5 Millagahawatta • Hokanadara Road • Thalawathugoda • Sri Lanka

Keywords: travelogue: *Nepenthes argentii*, *N. sibuyanensis*, Philippines.

Sibuyan is one of the less known of the seven thousand islands that comprise the Philippines. It became more prominent among botanists at the end of the 1990s, when two new and interesting species of *Nepenthes* were described from the island: *N. sibuyanensis* (Nerz *et al.*, 1998) and *N. argentii* (Jebb & Cheek, 1997).

Although Sibuyan lies in the heart of the Philippines (north of Panay; 12° north latitude), it is secluded from other islands—the nearest are Tablas and Romblon, and together with these it creates an autonomous province surrounded by the Sibuyan Sea. Sibuyan is only 445 km^2 in area. The 47000 humans on the island are concentrated in the nine coastal villages, at elevations up to 100 meters. Their food is based mainly on agriculture and fishery.

Interior to its narrow (5 km) flat coast, a steep mountain massif rises to a peak of 2058 meters on Guiting-Guiting. The climate is tropical, monsoonal, and the temperatures on the coast almost never fall below 20°C, although it is colder at the higher elevations (in January, during our visit, the temperature at 1500 m a.s.l. dropped to 13-15°C at night). Strong rains last from November through January; milder rains occur during the rest of the year. The mountainous interior's unique altitudinal zonation of vegetation is largely intact, and in February 1996 the Philippine government declared 160 km^2—e.g. approximately one third of the territory of the whole island of it to be protected natural area.

We set out for the peak Guiting-Guiting on the second of January, 2001. There were not many remnants of original vegetation between the villages; most of the trees serve for local usage purposes. At the beginning of the ascent a barely discernable path coils through the forested slope, upon which grows relatively undamaged lowland woods. Our packs were heavy (we had to carry our drinking water) and as the path became very steep, our feet sunk into the red, slippery soil. At about 400 m a.s.l. we saw our first *Nepenthes*: seedlings, young plants with basal rosettes, and stems of older plants climbing on the trees to the height of 5 m. According to the literature, this is *Nepenthes alata*, a species mentioned by almost all the botanist visitors to Sibuyan. However, there are some doubts whether it really is *N. alata*, for it lacks the typical appendage on the lower surface of the pitcher lid (Mann, 1998). The plants we observed did not have the lid appendage. It is obvious that the *N. alata* complex deserves more detailed observation.

At approximately 500 m a.s.l. the forest becomes submontane, and interesting plant genera such as the conifer *Falcatifolium falciforme* (Podocarpaceae) increase in number. Between 800 m and 1000 m 2-3 m tall thick and impenetrable bamboo thickets dominate. Above 1000 m the conifers *Dacrydium beccarii* and *Phyllocladus hypophyllus* (both Podocarpaceae) appear and at this place we located the endemic *N. sibuyanensis*. The species was described firstly by J. Nerz (1998), although it had been originally collected in the eighties by Argent. To our knowledge, there exist only six records of this plant in herbaria (cf. Cheek & Jebb, 2001). *Nepenthes sibuyanensis* is a robust *Nepenthes* from the group *Insignes*, the colour and shape of the traps make it distinct from *N. ventricosa* and *N. burkei*. *Nepenthes sibuyanensis* has the largest pitchers of this trio, reaching up to 20 cm. The colour of the traps varies from yellow-green with red spots to almost dark red (facing sun). The lower pitchers have an ovoid shape and a remarkably long ten-

dril which tends to plunge the pitchers into the substrate, presumably to increase their chance to ensnare a victim, and in open areas it also helps to plants to stabilize them in strong winds. We saw upper pitchers only once—there is no mention of them in the species description—and they were narrowly infundibuliform. Being a mountainous species that occurs from 1200-1800 m a.s.l., it does not grow to a great height, and plants above 1 m tall are rather exceptional. *Nepenthes sibuyanensis* grows mostly in shrubby formations outside the borders of woods and on open grassy spots exposed to wind and fog. At its lower elevations, it always occurs on exposed rocky points where no tall trees grow.

About 1200 m a mountainous misty forest (dominated by *Lithocarpus* and *Castanopsis*) grows with crooked stems, richly covered by mosses, *Selaginella*, ferns and a number of miniature orchids. Thick shrubby vegetation dominates at 1500 m above sea level with the majority of the family Melastomataceae, Ericaceae, Rubiaceae, Myristicaceae, Goodeniaceae and Dilleniaceae. The only prominently protruding and sparsely growing wood species is *Dacrydium beccarii*. Inflorescences and infructescence of *N. sibuyanensis* protrude above the level of shrubbery; it abounds here. On a slightly trodden path we found a great number of seedlings struggling to survive under the dense shrub canopy. High humidity, recurring mists and rainfalls, strong streaming winds, and ultramafic soils characterise this area.

The peaks of Guiting-Guiting are a host for another, even more challenging species—*Nepenthes argentii*—named after the British botanist Argent who discovered it in 1989. Jebb & Cheek described it in 1997 on the basis of Argent's collection and aroused a great interest among the botanists and growers of carnivorous plants, in part because it is the smallest known *Nepenthes* in the world. When mature, the rosettes have the maximum average diameter of only 10 cm, and the stem typically grows to only 30 cm long. The traps average 4.5 cm tall and 2.5 cm wide. The species produces striking, rusty haired, straight tendrils and a specially prolonged peristome, which reaches to the lid in a Y-shape, neither of which is shared by any other known *Nepenthes*. *Nepenthes argentii* only grows around the peak of Guiting-Guiting at 1400-1900 m a.s.l. According to Argent's notes, it grows in the shade of tiny shrubs, and the traps descend into the accompanying grassy vegetation. Only the inflorescence protrudes over the shrubbery. Argent writes also about the capability of the species to stay above the slowly accumulating layer of organic material. Cheek & Jebb (2001) compare this behaviour to *Drosera rotundifolia*, which similarly keeps itself on the surface of peat mosses.

From our observations we conclude that *N. argentii* is almost an obligate petrophyte growing in the rock crevices or among boulders, where it may avoid the surrounding low vegetation. We encountered the most vigorous individuals in such environments and we conclude that it is their optimal growing place. This requires further study. We did not find any plants under the shrubs, but cannot exclude the possibility of having missed them. *Nepenthes argentii* is not very frequent and the whole population consists of some hundreds of plants—the only ones in the world! We counted 14 rosettes in the largest group, but whether it was an individual plant or more plants in one bunch, we are not sure. Most of the plants consisted of an individual rosette usually with very low stems; the maximal measured height was 25 cm.

The upper parts of Guiting-Guiting (1600-1770 m a.s.l.) mark the borders of the range of *N. sibuyanensis*. Here *N. sibuyanensis* occupies places similar to those occupied by *N. argentii*—in the cracks of boulders and in the short alpine vegetation. The plants are more exposed to radiation and have much more full coloured traps.

While January was a month of vigorous seed production for *N. sibuyanensis*, it was not the case for *N. argentii*. We found only two old infructescences, so the species probably mostly flowers during the summer months. (Argent and Reynoso collected the type specimen, with an inflorescence, in August; Jebb & Cheek, 1997). Because of the interest in this plant by hobbyists, and its small population, *N. argentii* may be threatened by collecting. Its primary protection for survival is afforded by its distant habitat that is so difficult to access. (Fortunately, this plant is being successfully propagated in-vitro and beautiful specimens are being sold by at least one carnivorous plant nursery.)

Like with so many other montane species, the cultivation of *N. argentii* is not likely to be

Figure 1: Guiting-Guiting looks rather rocky but there is quite dense vegetation on it; fogs and rains are very common features there. Photograph by Vlastik Rybka.

Figure 2: The largest population of *N. argentii* that we observed. Photograph by Vlastik Rybka.

easy. It will certainly demand low temperatures with daily maxima not exceeding 25°C, high humidity, and above all excellent drainage. These assumptions are now being tested in the Prague Botanical Garden. The first two bought plants we cultivated in a sealed cultivation chamber at an almost constant temperature of 20°C, and artificial lighting. Three months later we moved them, along with three newly acquired plants, to our new greenhouse where the temperatures are cooled to 12-20°C, and the air is actively circulated through the greenhouse. A fog system keeps the humidity high. The growth rate of plants is roughly one leaf per month and in December 2003 they started to produce their first pitchers. Still, the species remains extremely difficult in cultivation. It requires high amounts of light and suffers visibly during the short days of winter. The substrate must be well drainaged, we use mixture of peat, chark coal, Styrofoam and vermiculite.

Nepenthes sibuyanensis and *N. argentii* share an interesting feature expressed in the shapes of their seeds. While most *Nepenthes* species have filiform seeds with long papery ends which facilitate wind transportation (Cheek & Jebb 2001; Clarke 2001), both of the upland species on Sibuyan have more cylindrical, robust seeds lacking appendages. This shape prevents the seed from being blown away from suitable habitat by the continuous, stiff breezes, but allows the transfer of the seeds for short distances by water (i.e. rainfall and streamlets). Similar shape adaptations are seen on *Nepenthes pervillei* (an island adapted species from the inselbergs of Seychelles; Fleischmann *et al.*, 1996), and also on *N. northiana* (a Bornean species adapted to growing on steep calcareous walls). Other *Nepenthes* growing on small isolated locations may have similarly modified seeds, but we have not found references to species with seeds that are shaped differently from the normal filiform mode.

In our experience, seeds of *N. sibuyanensis* germinate in enclosed plastic boxes after three weeks at 22-24°C, under 12 hours of artificial lighting. The first true (non-cotyledonous) leaves appeared two months after germination. The leaves of our plants reach 2-5 cm long, and all bear small traps within one year. According to our experiences it is one of the easiest montane *Nepenthes* to grow; it survives summer temperatures over 30°C, and endured short exposures to temperatures as high as 40°C without any damage. During a winter heating failure it was exposed to temperatures as low as 2°C, and responded only by producing a tiny amount of reddening in the leaves.

The island Sibuyan, along with Palawan, is probably the most preserved and the most botanically interesting of the islands of the Philippines. When we consider the latest descriptions of *Nepenthes*, how many as yet not described species of the less popular, noncarnivorous plant groups are still hidden on the slopes of Guiting-Guiting? Unfortunately because of the uneasy political situation on the Philippines and because of the hard accessibility of the island this question will remain unanswered for at least the near term.

References:

Clarke, C. 2001. *Nepenthes* of Sumatra. Natural History Publications. Borneo.

Fleischmann K., Porembski S, Biedinger N. and Barthlott W. 1996. Inselbergs in the sea: vegetation of granite outcrops on the islands of Mahé, Praslin and Silhouette (Seychelles). Bulletin of the Geobotanical Institute ETH. 62, 61-74.

Jebb, M. and Cheek, M. 1998. Skeletal revision of the *Nepenthes*. Blumea 42, 1-106

Cheek, M. and Jebb, M. 2001. Flora Malesiana, Series I - Seed plants. Vol. 15. National Herbarium Nederland.

Mann, P. 1998. A trip to the Philippines. Carniv. Pl. Newslett. 27, 6-11.

Nerz, J., Mann, P., Alt, T. and Smith T. 1998. *Nepenthes sibuyanensis*, a new *Nepenthes* from Sibuyan, a remote island of the Philippines. Carniv. Pl. Newslett. 27, 18-23.