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# Nocturnal feeding observation of a Seychelles Sucker-tailed Gecko, *Urocotyledon inexpectata* (Stejneger, 1893), on the nectar of Seychelles Pitcher Plant, *Nepenthes pervillei*

Markus A. Roesch[1,2,3,*], Joey Latsha[4], and Jennifer Appoo[5]

The Seychelles Sucker-tailed Gecko, *Urocotyledon inexpectata* (Stejneger, 1893), is a nocturnal gecko endemic to the Seychelles archipelago in the Western Indian Ocean (Gardner, 1985). *Urocotyledon inexpectata* is Seychelles' smallest gecko (mean snout-vent length 36.8 mm; Lobon-Rovira et al., 2022) and commonly known for having an adhesive pad under its tail tip (Cheke, 1984). Recent genetic analyses have revealed that *U. inexpectata* represents one of two cryptic species within this genus found in Seychelles, and its distribution is restricted to the southern group of granitic islands located on the Mahé continental plateau (Rocha et al., 2011; Lobon-Rovira et al., 2022). Despite its adaptability to various habitats, including under leaf litter, on native and exotic trees, on rocks, and on human habitation, and across a range of altitudes from sea level to 700 m (Gerlach, 2008), the ecology of *U. inexpectata* remains largely elusive and poorly studied. There are no population estimates (Rocha et al., 2011) and apart from one observation of a female feeding on a cricket (*Zarceus fallaciosus*; Gerlach, 1999), the diet of *U. inexpectata* is unknown. Here, we describe an observation and provide photographic evidence of *U. inexpectata* feeding on the extrafloral nectar of the carnivorous pitcher plant, *Nepenthes pervillei*.

The Seychelles endemic pitcher plant, *N. pervillei* is a woody, dioecious liana found growing on open granite and hill escarpments on Mahé and Silhouette islands, between 400 and 750 m above sea level (Hansen and Laboudallon, 2014). Adapted to feed on animal prey, *Nepenthes* plants possess bottled-shaped pitfall traps with a lid at the tips of their leaves, known as pitchers. *Nepenthes* pitchers secrete sugary nectar (Merbach et al., 2001) to lure arthropods, mainly insects, and contain acid proteinases for digesting prey (Miguel et al., 2018). To catch prey, pitchers of *N. pervillei* have slippery surfaces and a lid adapted to catapult insects into the pitcher during rainfall, a mechanism known as a springboard trapping (Chomicki et al., 2024).

Throughout its range, various mutualistic and non-mutualistic relationships have been documented between *Nepenthes* plants and vertebrates, involving small mammals, birds and frogs (Das and Haas, 2010; Grafe et al., 2011; Bauer et al., 2015). Interactions with reptiles have been documented in Madagascar, involving diurnal *Phelsuma* Gray, 1825 geckos and *N. madagascariensis*. The geckos establish territories on the plants, feeding on both the insects attracted to the pitchers and the nectar (Ratsirarson and Silander, 1996). In the Seychelles, day geckos of the genus *Phelsuma* were observed pollinating female *N. pervillei* flowers (Kaiser-Bunbury et al., 2017) and licking nectar from the pitcher's peristome (Kaiser-Bunbury, pers. obs.). There are also anecdotal records of small birds feeding on the nectar of *N. pervillei* (Hansen and Laboudallon, 2014). However, such interactions, particularly involving endemic reptiles, remain largely undocumented.

On 21 May 2024, three individuals of *U. inexpectata* were observed on *N. pervillei* pitchers at the summit of the Mt. Copolia on Mahé Island (-4.6476°S, 55.4581°E), at 493 m elevation. We first observed an adult, gravid female quickly retreating from a pitcher at 22:06 h, likely disturbed due to the bright torchlight, making it

[1] CIBIO Research Centre in Biodiversity and Genetic Resources, InBIO Associate Laboratory, University of Porto, Rua Padre Armando Quintas 7, 4485-661 Vairão, Portugal.
[2] Department of Biology, Faculty of Sciences, University of Porto, Rua do Campo Alegre s/n, 4169-007 Porto, Portugal.
[3] BIOPOLIS Program in Genomics, Biodiversity and Land Planning, Campus de Vairão, 4485-661 Vairão, Portugal.
[4] Seychelles Islands Foundation, La Ciotat building, Mont Fleuri, Victoria, PO Box 853, Seychelles.
[5] Université de La Réunion, Facultés des Sciences et Technologies, 15 Avenue René Cassin, 97744 Saint Denis Cedex 9, La Réunion, France.
[*] Corresponding author. E-mail: markus.roesch@cibio.up.pt

unclear whether it was feeding on nectar (Fig. 1A). A second, subadult, gecko was observed at 23:04 h on an adjacent pitcher of the same plant cluster. Approached under red light, the individual seemed undisturbed and was actively licking nectar from the underside of the pitcher lid (Fig. 1B, C). This activity lasted for about five minutes, during which the gecko's body remained positioned on the outside of the pitcher. After feeding, the individual retreated into nearby vegetation. Finally, a third, subadult, gecko was observed resting on another nearby pitcher of the same plant cluster at 23:18 h under red light, but without any feeding behaviour (Fig. 1D). All three individuals were on pitchers found 0.2–0.3 m from the ground. During all observations, the location was fully immersed in clouds, with an average wind speed of 5.5 m/s and wind gusts of up to 9 m/s. The average ambient temperature was 24 °C, and the average relative humidity was 96.5%.

Our observation provides an important account for the diet of *U. inexpectata*, and of a nocturnal reptile feeding on *Nepenthes* nectar. Nectar collection from pitchers is optimal when the surfaces are wet, making the nectar liquid. In the absence of rain, this occurs when the relative air humidity is high during cooler periods of the day, such as morning, evening and during the night (Bauer et al., 2015). The observed nectar-feeding activity of *U. inexpectata* was about five minutes. In contrast, mean visitation duration of small mammals on *N. lowii and N. rajah* pitchers in Malaysia was less than 35 seconds (Greenwood et al., 2011). The prolonged feeding time from our observation suggests *N. pervillei* could represent an important sugary food source for *U. inexpectata* found in this habitat. In Madagascar, *Phelsuma* geckos are part of *N. madagascariensis* micro-community (Ratsirarson and Silander, 1996). Studies quantifying the abundance of *U. inexpectata* in *N. pervillei* habitat, pitcher visitation rates, as well as the abundance of *N. pervillei* are needed to explore the relationship between the two species.

Our observation provides key information to understand evolutionary adaptions of *N. pervillei*. We observed *U. inexpectata* collecting nectar from the lower lid surface of the pitcher rather than the peristome. This behaviour parallels observations of *N. gracilis* in Brunei Darussalam, where vertebrates fed on nectar exclusively from the underside of the lid and not the peristome (Bauer et al., 2015). Interestingly, *N. pervillei* and *N. gracilis* are the two *Nepenthes* species known to employ the springboard trapping mechanism, where the lid catapults insects into the pitcher with raindrops (Chomicki et al., 2024). Hence, nectar production on the underside of the lid might be increased in these species.

Furthermore, our observation raises an interesting question on whether the relationship between *N. pervillei* and small reptiles, such as *U. inexpectata*, is mutualistic or commensal. In Malaysia, pitcher geometry of *N. lowii and N. rajah* are adapted to body sizes of small mammals, which deposit faecal droppings into the pitchers while harvesting nectar from the lid, providing nutrients for the plant (Clarke et al., 2009; Chin et al., 2010). In our observation, the gecko's body position did not indicate that its droppings could fall into the pitcher while nectar-feeding. However, geckos could provide nutrients to the plant through droppings that fall on other parts of the plant or on the surrounding soil (Bauer et al., 2015). Moreover, the geckos themselves could accidentally fall into the pitchers, becoming a food source for the plant, such as in New Guinea, where a dead *Lepidodactylus* cf. *lugubris* (Duméril & Biberon, 1836) was observed in the pitcher of *N. treubiana* (Nerz and Koch, 2018), and in China, where an unidentified lizard was found in the pitcher of *N. mirabilis* (Hua and Li, 2005). To determine whether *N. pervillei* derive benefits from nectar-feeding behaviour of *U. inexpectata*, further observations should be accompanied by morphological and nectar secretion measurements of *N. pervillei* pitchers.

Our account contributes to understanding *U. inexpectata* ecology and reveals an ecological relationship within one of Seychelles' unique habitats. Nectivorous reptiles and birds, also occur in *N. pervillei* habitat, and their interactions should be further explored. More importantly, conservation efforts are needed for both *U. inexpectata* and *N. pervillei*, which are restricted to only a few islands, to preserve and unravel the evolution of Seychelles' plant-animal associations.

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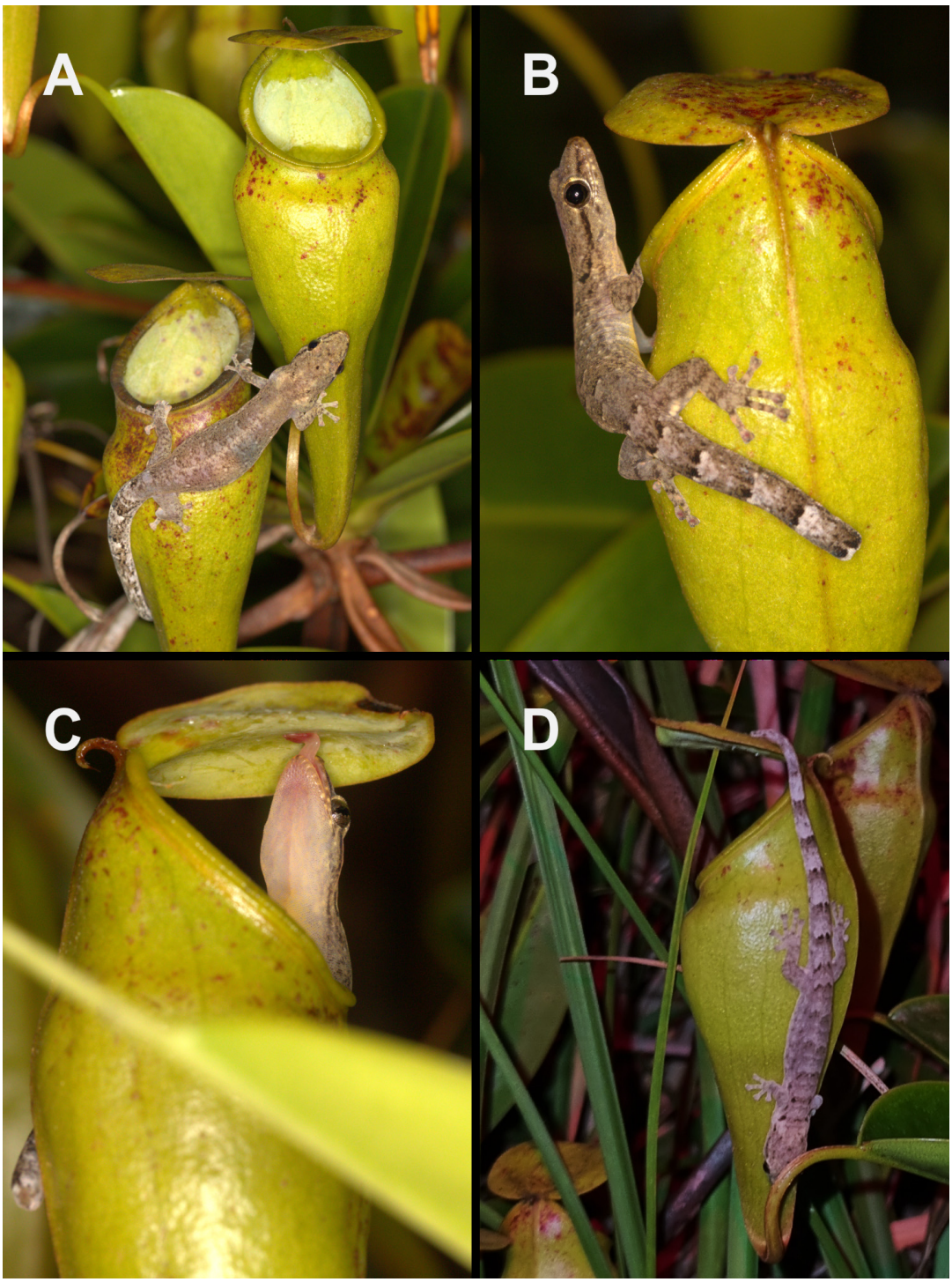


**Figure 1.** Seychelles Sucker-tailed Gecko, *Urocotyledon inexpectata*, observed on Seychelles pitcher plant, *Nepenthes pervillei*. (A) First individual: adult, gravid female on pitcher seconds before retreating into the nearby vegetation, (B) second individual: subadult gecko on pitcher, (C) subadult gecko feeding on the nectar from the underside of the pitcher lid, and (D) third individual: subadult gecko resting on pitcher. Photos by Markus A. Roesch

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