The orchid *Myrmecophila tibicinis* as a refuge for *Scinax staufferi* (Cope, 1865), on Isla de Utila, Honduras

Scinax staufferi (Cope, 1865), Stauffer's Long-nosed Treefrog, is widely distributed from Mexico to Costa Rica. On the Honduran Isla de Utila it was detected in 2005 (McCranie et al. 2005). This frog species is classified as Least Concern by the IUCN Red List of Threatened Species, yet is noted to have severely fragmented populations throughout its range (Santos-Barrera et al. 2010). On Utila, the species has been observed within various habitat types, including broad-leaf forest, neo-tropical savanna, freshwater swamp forest, grassland and some disturbed vegetated habitats alongside temporary freshwater bodies. More than two-thirds of Utila's surface is covered by swamp forests and mangroves, predominantly consisting of vegetation tolerant to the influence of brackish or salt water (Fickert & Gruninger 2010). Due to the relative lack of permanent freshwater on the island, it previously remained unknown where *S. staufferi* resides during the dry season. Presumably, the reproductive cycle of this species on Utila is limited to the one distinct rainy season, which lasts from approximately October to January (Pasachnik et al. 2012).

The present note documents the first observations of *S. staufferi* utilizing the epiphytic orchid *Myrmecophila tibicinis* Rolfe, 1917, as refuge sites. In Central America, it is common for many amphibians to associate with epiphytic Bromeliads (Dunn 1937). However, to the best of the authors' knowledge there have been no previously published observations associating anurans to microhabitats created by epiphytic Orchidaceae.

On February 27, 2018, at 17:25 h, the authors retrieved four large orchids that were felled from a mature mango tree (*Mangifera* sp.). The orchids (*M. tibicinis*) had previously grown on multiple large limbs ca. 5 – 8 m above ground, yet were felled owing to expansion and development of the road to Pumpkin Hill, which was previously reported to have negative impacts on the native biodiversity (Brown et al. 2017). Whilst collecting the orchids with the intention to reattach them to suitable sites, the authors encountered at least eight individuals of *S. staufferi* (Fig 1.) emerging simultaneously from within the distinct tubular pseudobulbs of *M. tibicinis*. Five of these individuals were successfully captured to prevent further disruption whilst moving the orchids, also providing the opportunity to measure and gain basic morphological information on *S. staufferi* from Isla de Utila. The Snout-vent-length of the captured individuals ranged from 14-17 mm, whilst the body mass was between 0.3 – 0.5 g, consistent with reports of mainland populations (Köhler 2011). At ca. 20:00 h, the individuals were released back on the orchids, which had been reattached to trees at the Kanahau Utila Research and Conservation Facility (16.119383° N, 86.884989° W, WGS84 datum). Opportunistic weekly surveys of the relocation site were conducted from March until November 2018. These regular visits consistently found individuals of *S. staufferi* active at night on the leaves of orchids until late September.

Myrmecophila tibicinis is an epiphytic species which occurs in low nutrient and open canopy habitats distributed from southern Mexico through most of Central America (Dressler 1981). On Utila, this orchid is relatively common and well distributed throughout broad-leaf, mangrove and swamp forest habitats (pers. observ.).

Fig. 1: *Scinax staufferi* (COPE, 1865), *in situ* next to an ant (*Crematogaster* sp.) sitting on a leaf of the epiphytic orchid, *Myrmecophila tibicinis* ROLFE, 1917, on Isla de Utila, Honduras.

Fig. 2: On Isla de Utila, Honduras, different sized openings in the pseudobulbs of the epiphytic orchid *Myrmecophila tibicinis* ROLFE, 1917, provide home and refuge to symbiotic ants (*Crematogaster* sp.), other invertebrates and *Scinax staufferi* (COPE, 1865).

Each *M. tibicinis* plant can possess up to 30 to 40 tubular hollow pseudobulbs with openings of various size (Fig 2.) that serve as entrances to nesting sites for several species of symbiotic ants of the genus *Crematogaster* (DRESSLER 1982; RICO-GRAY et al. 1989). This epiphyte associates with ants in several ways, providing physical protection and provisioning of moisture (DAVIDSON & EPSTEIN 1989). The hollow pseudobulbs of *M. tibicinis* create microhabitats exploited by a diverse invertebrate community (pers. observ.). On Utila, it appears that both the created refuge and associated food source is utilized by the hylid *S. staufferi*, whereby the orchids provide a regulated microclimate and resident insect prey source for the frogs. Utila has limited freshwater sources (FICKERT & GRUNINGER 2010), suggesting that this insular *S. staufferi* population was driven to explore different habitats that can provide protection, food and moisture during lengthy periods of drought. The reported observations were made at the start of the dry season, continuing post-relocation until the beginning of the rainy season (i.e., February – September). This timespan suggests that *S. staufferi* seek refuge within damp microhabitats (such as orchid havens) during the island's dry period, before migrating to reproduce in seasonally available freshwater habitats. Though the strength and frequency they associate with *M. tibicinis* is unknown, the authors believe that whenever naturally accessible, these orchids can serve as important food and moisture reservoirs for *S. staufferi* on Utila.

Many of the natural habitats on Utila are substantially threatened due to development, and furthermore many of the few existing freshwater sources are overexploited and unregulated (pers. observ.). Even though *S. staufferi* has a fairly large distribution, the comparatively tough climatoligical circumstances under which this species occurs on Utila could potentially mean that these island populations are severely fragmented and under threat.

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