

## RESEARCH NOTE

### ON *SOFANAPIS ANTILLANCA* (ARANEAE, ANAPIDAE) AS A KLEPTOPARASITE OF AUSTRROCHILINE SPIDERS (ARANEAE, AUSTRROCHILIDAE)

Kleptoparasitic habits are well known in certain spiders, notably some mysmenids and members of the theridiid genus *Argyrodes* Simon 1864 (Elgar 1993). Members of the Dictynidae, Heteropodidae, Oonopidae, Salticidae, and Symphytognathidae have also been recorded as kleptoparasites of web-building spiders (Elgar 1993, table 1). We present here the first evidence of kleptoparasitism in the Anapidae, as well as the first report of a kleptoparasite associated with the primitive and relictual spider subfamily Austrochilinae.

Austrochilines comprise two genera, *Austrochilus* Gertsch & Zapfe 1955 and *Thaida* Karsch 1880, restricted to the temperate forests of Chile and adjacent Argentina. They build conspicuous, large (about 50–120 cm long), horizontal, aerial webs, consisting of a single layer of threads forming an irregular net (Forster et al. 1987; Zapfe 1955). The cribellate, whitish threads make the web easily visible. The horizontal net gradually bends into a concavity, forming a funnel that goes far back into log cracks, tree roots, or rocks, ending in a retreat where the spider rests during the day. At night, the spider hangs under its web and can be seen combing cribellate silk, or feeding. Large prey items, up to the spider's body size, are wrapped with silk before being eaten.

The retreats of adult females often contain much silk and several egg cases (Forster et al. 1987). The web is repaired when damaged; and the newly constructed patches, with bluish cribellate threads, are clearly discernible from the old portions, with powdered threads. Silk accumulation and web repair indicate that the web is persistent, a frequent characteristic of the hosts of kleptoparasites (Elgar 1993).

*Sofanapis antillanca* Platnick & Forster 1989 are very small spiders that were previously collected either by pyrethrin-fogging in

logs, or in Berlese samples of leaf litter and moss (Platnick & Forster 1989). During recent field work, we found some specimens on austrochiline webs, and after a systematic examination of webs, found evidence of kleptoparasitic behavior in these anapids. During the day, individuals of *S. antillanca* were collected on austrochilid webs (of both *Austrochilus* and *Thaida* species), hanging from threads, rather deep in the mouth of the funnel, but still visible with a headlamp. At night, when the host is on its web, the anapids were mostly concentrated around the opening of the funnel, closer to the horizontal web. They hang from the host web's threads (Fig. 1), or more often, from an irregular mesh made of extremely fine threads. That mesh is presumably constructed by the *Sofanapis*, as it has not been found in non-infested webs. A web of an adult female of *Thaida peculiaris* Karsch 1880 observed at Aguas Calientes in the Parque Nacional Puyehue, Osorno, Region X (Los Lagos), Chile, was found to host several specimens of *S. antillanca*, and in that web the thin (anapid) net was particularly dense. No orbwebs were found on any host web, nor was any insect found caught in the presumed anapid silk. Consequently, it seems that *S. antillanca* does not construct its own web for prey capture. The type specimens of *S. antillanca*, collected by pyrethrin fogging inside a rotten tree trunk (Platnick & Forster 1989), may actually have come from an austrochilid web.

A few hosts were observed while they were feeding. We found several *S. antillanca* walking on the prey, some of them around the host's mouth (Figs. 3–4). In those cases, although visibility was far from ideal, there was no evidence that the anapids were feeding from the fluids exposed by the chewing of the austrochiline. In another situation, where a host was feeding on a tipulid crane-fly, an in-



Figures 1–4.—*Sofanapis antillanca* on webs of austrochilines. 1, Female walking on host web, from Chepu; 2, Austrochiline and *S. antillanca* feeding on a tipulid, from Contulmo (arrow points to the anapid feeding on the tipulid's leg); 3, Austrochiline and *S. antillanca* feeding on a beetle, from Contulmo (arrows point to the four anapids); 4, Same, closer view.

dividual of *S. antillanca* was seen feeding directly from the insect's leg (Fig. 2). On another occasion, a specimen of *S. antillanca* was observed feeding alone on a small mosquito caught in an araneid web (also in the Parque Nacional Puyehue). This observation suggests that the anapid might have some ability to locate prey in the host's web, independent of the movements of the host, and that *S. antillanca* is not adapted to kleptoparasitism to the extreme condition of total depen-

dence on the host (as apparently occurs with *Curimagua bayano* Forster & Platnick 1977, a symphytognathid with reduced mouthparts, Vollrath 1978). Moreover, the presence of occasional individuals of *S. antillanca* on webs of araneids and hahniids (in the Monumento Natural Contulmo in Arauco, Region VIII, Chile), as well as in Berlese samples of leaf litter and moss, indicates that these spiders are not obligately associated with austrochilines. However, the particularly high density of *S.*

*antillanca* collected on austrochiline webs suggests a special association with these hosts.

Austrochilines are common in extremely to moderately moist forests of central and southern Chile and adjacent Argentina. However, the kleptoparasitic anapids were found only in the most humid localities. In addition to the Puyehue and Contulmo localities noted above, *Sofanapis* have been taken from austrochiline webs at the following localities in Chile: Caleta La Arena in Llanquihue, and 15 km S of Chepu in Chiloé (both in Region X). Several intense but fruitless searches were performed in less humid localities, in both Chile and Argentina.

**Material examined.**—(Most austrochilines were either juveniles or were not collected together with its kleptoparasites): **CHILE:** *Región IX:* Cautín, Monumento Natural Contulmo, elev. 340 m, 38°01'S, 73°11'W, 13 February 1992 (N. Platnick, P. Goloboff, M. Ramírez) 4♀ *S. antillanca* (Figs. 3, 4, AMNH); 18 November 1993 (N. Platnick, K. Catley, M. Ramírez, T. Allen) 1♂ *S. antillanca* (Fig. 2, AMNH). *Región X (Los Lagos):* Osorno, P. Nac. Puyehue, Aguas Calientes, 12 February 1992 (Platnick, Goloboff, Ramírez) many ♂♀ *S. antillanca* on a web of a female *Thaida peculiaris* Karsch (AMNH). Llanquihue, Caleta La Arena, 30 January 1991 (M. Ramírez) 2♂3♀ 2juv *S. antillanca* on a web of a subadult ♂ austrochiline (MACN); same data, 2♀ 1 juv on uncollected austrochiline's web. Chiloé, Chepu, 15 km S de Chepu, 3 February 1991

(M. Ramírez) 1♂6♀ 1juv, on uncollected austrochiline's web (Fig. 1, MACN).

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