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CHETOGENA SCUTELLARIS (DIPTERA: TACHINIDAE), AN ENDOPARASITE OF LARVAL STRYMON ACIS BARTRAMI (LYCAENIDAE)

Additional key words: parasitoid, population regulation, threatened species

The Bartram's hairstreak, Strymon acis bartrami (Comstock & Huntington) (Lycaenidae), occurs locally within the pine rocklands of southern Florida and the lower Florida Keys (Minno & Emmel 1993; Smith et al. 1994), where it is endemic. Due in large part to habitat loss, S. a. bartrami populations have declined considerably during the last several decades (Salvato & Salvato 2010). In response to this, S. a. bartrami was listed as candidate species for federal protection in 2006. Hennessey and Habeck (1991) and Worth et al. (1996) described many aspects of S. a. bartrami natural history. Salvato and Hennessey (2004) and Salvato and Salvato (2008, 2010) also discussed S. a. bartrami ecology and provided a review of known parasites and predators for the species. Although larval parasites have been recorded for other lycaenids throughout the New World (Arnaud 1978; Stireman & Singer 2003a, 2003b), little has been reported for S. a. bartrami. To our knowledge, the only observation of S. a. bartrami larval parasitism was provided by Hennessey and Habeck (1991) who collected a single unspecified braconid wasp from a late instar larva on Big Pine Key, Florida. Tracking the fate of late instar S. a. bartrami larvae is difficult due to the fact that this species tends to pupate in ground litter (Worth et al. 1996; Salvato & Hennessey 2004).

On 11 December 2010 MHS and HLS observed eggs (n=2) of a parasitoid fly (Diptera: Tachinidae) attached to the cuticle of a late instar $S.\ a.\ bartrami$ larva (Fig. 1) in the Long Pine Key region of the Everglades National Park (Miami-Dade County, Florida). The $S.\ a.\ bartrami$ larva was encountered on pineland croton, $Croton\ linearis\ Jacq.$ (Euphorbiaceae), the only known host plant for the species. After photographing the observation in the field, the parasitized larva was subsequently collected. Within approximately 72 h of the initial observation the white egg casings dropped off the larva, exposing dark spots (necrosis) on the cuticle.

The *S. a. bartrami* larva was maintained in a screen mesh cage and provided fresh food plants. MHS and HLS have successfully reared numerous *S. a. bartrami* larvae under these conditions over 15 years of research on this species. However this *S. a. bartrami* larva, which behaved lethargically in the field and laboratory, fed only minimally until 15 December 2010, when it became moribund while attempting to pupate. Five

days later on 20 December 2010 a tachinid larva emerged from the *S. a. bartrami* larva. The tachinid larva was placed in a small plastic cup containing a layer of soil in which it quickly pupated. An adult fly emerged on 6 January 2011.

The adult fly (Fig. 2) was pinned and sent to JOS who examined and identified it as a female *Chetogena scutellaris* (Wulp). Often, a male *Chetogena* specimen is required to determine the particular species, as females in this genus can be nearly indistinguishable (Parchami-



Fig. 1. A late-instar *Strymon acis bartrami* larva with eggs of *Chetogena scutellaris* attached to its cuticle on 11 December 2010 in Long Pine Key, Everglades National Park (Miami-Dade County, Florida) (Photo Credit: H. L. Salvato).

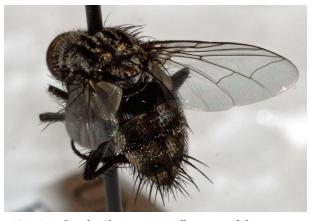


FIG. 2. A female *Chetogena scutellaris* reared from a moribund late-instar *Strymon acis bartrami* larva (Photo Credit: H. L. Salvato).

Araghi 2008). However, this individual possessed several characteristics typical of female *C. scutellaris*, including yellow-golden parafrontals, a "trident" pattern of pruinescence on the abdominal tergites, and the apex of tergite 5 reddish (Aldrich & Webber 1924).

Chetogena scutellaris is a generalist endoparasite that preys on a variety of insect groups, including several families of Lepidoptera (Arnaud 1978; Sourakov & Mitchell 2002; Stireman & Singer 2003a, 2003b; Janzen & Hallwachs 2009) in Florida, Arizona and throughout the Americas. However, Chetogena has not previously been reported to parasitize lycaenids, despite a wide diversity of host records. Chetogena scutellaris has been consistently documented in Long Pine Key as a parasitoid of Anaea troglodyta floridalis F. Johnson & Comstock (Nymphalidae) (Salvato et al. 2009). Strymon acis bartrami and A. t. floridalis both use the host-plant C. linearis exclusively, with their larvae occasionally encountered feeding on the same individual plant (Salvato & Salvato 2008). As a result, it is possible that there may be some spillover of Chetogena parasitism from A. t. floridalis to S. a. bartrami. Additional studies may help to better determine the influence of Chetogena parasitism on S. a. bartrami larval ecology.

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