Chetogena scutellaris (Diptera: Tachinidae), an Endoparasite of Larval Strymon acis bartrami (Lycaenidae)

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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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