

TRICHOGRAMMA SP. (HYMENOPTERA: TRICHOGRAMMATIDAE) AN EGG PARASITOID
OF *STRYMON ACIS BARTRAMI* (LYCAENIDAE)

Additional key words: *Anaea*, population regulation, endangered species

Bartram's scrub-hairstreak, *Strymon acis bartrami* (Comstock & Huntington) (Lycaenidae), occurs locally within the pine rocklands of southern Florida and the lower Florida Keys (Minno and 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 and Salvato 2010). Hennessey and Habeck (1991) and Worth et al. (1996) described many aspects of *S. a. bartrami* natural history. Salvato and Hennessey (2004), Salvato and Salvato (2008, 2010), and Salvato et al. (2012) also discussed *S. a. bartrami* ecology and provided a review of known parasites and predators for the species. However, no egg parasitoids have been recorded for *S. a. bartrami*.

On 11 March 2017 Erica H. Henry and Benjamin D. Plier observed a *S. a. bartrami* oviposit a single egg on the flower raceme of *Croton linearis* Jacq. (Euphorbiaceae), the subspecies larval hostplant, within the Long Pine Key region of Everglades National Park (Miami-Dade County, Florida). Four days later on 15 March 2017 they noted that the egg had darkened in color (Fig. 1). Salvato and Hennessey (2003) indicated that eggs of the endangered Florida leafwing (*Anaea troglodyta floralis* F. Johnson and Comstock [Nymphalidae]), which also occurs within Long Pine Key and uses *C. linearis* as hostplant, turn black after being parasitized by *Trichogramma* Westward wasps. Therefore, on 17 March 2017, after photographing the

observation in the field, the *S. a. bartrami* egg was subsequently collected by MHS in order to identify any possible parasitoids.

The *S. a. bartrami* egg was maintained in a 20-gram glass vial and monitored daily until 24 March 2017 when several minute parasitic wasps ($n = 7$) emerged (Fig. 2). After photographing the wasps they were preserved 95 percent ethanol and sent to Dr. Richard Stouthamer (University of California, Riverside) who identified them as *Trichogramma* sp. near *pretiosum*. Pinto (1999) described *T. sp. near pretiosum* from specimens collected in Long Pine Key and Naranja, Florida, designating it as Florida species E until further taxonomic studies are conducted. The gene sequences for Florida species E have been placed on GenBank (accession number: MF796677) (R. Stouthamer, pers. comm.).

Hennessey and Habeck (1991) identified *T. sp. near pretiosum* as a key mortality factor towards *Anaea t. floralis* eggs, noting an average parasitism rate of 66 percent (based on a sample size of 50 eggs) within Long Pine Key, and elsewhere in its historic range. Conversely, initial studies by EHH and BDP within Long Pine Key during 2017 suggest parasitism rates for *S. a. bartrami* eggs are much lower (10 percent, sample size 126 eggs). Little is known regarding the distribution, host preference and natural history of *Trichogramma* sp. near *pretiosum*. However, the similar *T. pretiosum* Riley occurs worldwide and has been



FIG. 1. A *Strymon acis bartrami* egg, parasitized by *Trichogramma* sp., near *pretiosum* (Florida species E) photographed on 17 March 2017 in Long Pine Key, Everglades National Park (Miami-Dade County, Florida) (Photo Credit: H. L. Salvato).



FIG. 2. Three *Trichogramma* sp., near *pretiosum* (Florida species E) wasps, photographed on 24 March 2017 shortly after emergence from a *Strymon acis bartrami* egg (Photo Credit: H. L. Salvato).

documented as an egg parasitoid on over lepidopteran 240 host species (Pinto 1999), including lycaenids (*Brephidium exilis* [Boisduval], *Strymon melinus* Hübner). Additional studies may help to better determine the influence of *Trichogramma* sp. near *pretiosum* on the ecology of *S. a. bartrami* and other butterflies within southern Florida.

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