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FORCIPOMYIA (*MICROHELEA*) *FULIGINOSA* (MEIGEN) (DIPTERA: CERATOPOGONIDAE), AN ECTOPARASITE OF LARVAL *ANAEA TROGLODYTA FLORIDALIS* (NYMPHALIDAE)

The Florida leafwing, *Anaea troglodyta floridalis* F. Johnson and Comstock (Nymphalidae), occurs locally within the pine rocklands of southern Florida and the lower Florida Keys (Minno & Emmel 1993; Smith *et al* 1994). Hennessey and Habeck (1991) and Worth *et al* (1996) described many aspects of *A. t. floridalis* natural history. Salvato & Hennessey (2003) also discussed *A. t. floridalis* ecology and provided a review of known parasites and predators for the species. Although several larval parasites have been mentioned for *Anaea* Hübner (DeVries 1987) and similar genera (Muyshondt 1974a, 1974b; Caldas 1996) throughout tropical America, little has been reported for *A. t. floridalis* larvae.

On 19 January 2008 MHS and HLS observed a female biting midge (Diptera: Ceratopogonidae) attached to the cuticle of an early instar *A. t. floridalis* larva (Figure 1) in the Long Pine Key region of Everglades National Park (Miami-Dade County, Florida). After photographing the observation in the field, the midge and larva were collected together. The midge was encountered on the *A. t. floridalis* larva at 1200 h and it remained feeding and in the same position on the larva throughout collection and transport home (3 h). At approximately 2300 h on 19 January 2008 the midge detached itself from the larva, however, both midge and larva were maintained within the same mesh-screened cage for an additional 24 h. After initial detachment, no further midge-larval interactions were observed.

FIG. 1. An early instar Anaea troglodyta floridalis larva being attacked by a female biting midge, Forcipomyia (Microhelea) fuliginosa on 19 January 2008 in Long Pine Key, Everglades National Park (Miami-Dade County, Florida) (Photo Credit: H. L. Salvato).

The midge was preserved in 100% ethanol and sent to WLG who cleared it in phenol-alcohol, dissected and mounted it onto a microscope slide and identified it as *Forcipomyia (Microhelea) fuliginosa* (Meigen). *Forcipomyia (M.) fuliginosa* is a cosmopolitan ectoparasite that preys on a variety of insect groups, including Lepidoptera (Wirth 1956, 1972a; Lane 1984). In Florida, *Phoebis sennae* L. (Pieridae) (Suzanne Koptur, pers. comm.) and *Erinnyis ello* L. (Sphingidae) (Knab 1914; Wirth 1956, 1972b; Borkent & Wirth 1997) larvae have been previously identified as hosts of *F. (M.) fuliginosa*. After identification, the *F. (M.) fuliginosa* specimen was deposited into the South Florida Collection Management Center at Everglades National Park.

The *A. t. floridalis* larva was maintained in a screen mesh cage and provided fresh food plants (*Croton linearis*, the only known hostplant for the species). MHS and HLS have successfully reared numerous *A. t. floridalis* larvae under these conditions over 11 years of research on this species. However the *A. t. floridalis* larva, which behaved lethargically in the field and laboratory, fed only minimally until dying at approximately 48 h after its discovery. In some instances, the role of *F. (M.) fuliginosa* as ectoparasites of Lepidopteron larvae is sub-lethal (Sevastopulo 1973; Young 1983). However, Wirth (1972) and Koptur (pers. comm.) have indicated that instances of larval death noted in the literature may be the result of *F. (M.) fuliginosa* vectoring microbes during feeding. Given the widespread distribution of *F. (M.) fuliginosa* in Florida (Wilkening *et al*. 1985; Hribar & Grogan 2005), the role of this ectoparasitic biting midge on the natural history of *A. t. floridalis* and other Lepidoptera requires further examination.

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