Description of Two New Surface Behaviors in the Antlion Vella americana Drury (Neuroptera: Myrmeleontidae)

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Description of two new surface behaviors in the antlion
Vella americana Drury (Neuroptera: Myrmeleontidae)

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Sand-dwelling antlions in central Florida are non-invasive, non-endemic organisms that nevertheless thrive in the Florida scrub, a rare xeric ecosystem with a remarkably high rate of endemism (Deyrup 1990). About 85% of pre-Columbian Florida scrub has been lost to development or conversion (Cradock 2008). The sand roads at Archbold Biological Station provide habitats for plant and animal species that ordinarily colonize gaps produced by fire or the allelopathic litter of Ceratiola ericoides Michx. (Ericaceae) (Menges et al. 2008). This human-facilitated environment supports a dense community of sand-dwelling antlions, including several species of pit-building Myrmeleon and surface-walking Brachynemurus (Stange 1980). While the charismatic pit-building species are frequent subjects of behavioral observation, the actively hunting genera are not well known. Sand roads at Archbold Biological Station therefore provide an opportunity to observe and collect larger numbers of antlion larvae than may be found in natural foliage gaps.

Vella americana (Drury) is an acanthaclisine antlion found in the southeastern United States and Mexico, and possibly the largest antlion in the Western Hemisphere (Miller & Stange 1985). Larval V. americana require deep, loose sand in order to conceal their defenseless bodies and enable them to burrow. This author has observed only backwards-wriggling movement in this species, with the muscular abdomen producing most of the force, and so it appears that V. americana cannot walk forward like the Brachynemurus that share its habitat. The habits and behaviors of V. americana have received little attention or study.

Live collection and in situ observation were conducted at Archbold Biological Station between Mar and Jul 2016. Thirteen V. americana were raised in captivity for 3 mo and at least 20 others were held captive for a few days at a time. As this species does not construct pit traps, individuals were located by following their burrow trails. In captivity, hunting V. americana lie in wait for prey to walk over their jaws, and often burrow towards and around mobile prey to better facilitate striking. After seizing prey, larvae quickly disappear beneath the surface. Larvae readily accepted any prey they could catch and submerge, including beetles, ants (Pogonomyrmex badius Latreille [Hymenoptera: Formicidae], Florida harvester ant), moths, myriapods, isopods, and arachnids.

Although larval V. americana display the flicking motion that is characteristic of pit-building Myrmeleon, they do not use this tactic to excavate pits (Fig. 1). Flicking serves several purposes for pit-building antlions, including excavating and maintaining traps, discarding debris, and directly striking prey to encourage pit wall collapse (Heinrich & Heinrich 1984). The occasional flicking and associated substrate tossing of V. americana does not serve to produce the excavation depth seen in

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Fig. 1. New surface behaviors of Vella americana. F1: First step of flick: V. americana exposes head at the surface. F2: Second step of flick: V. americana snaps its head upward, then quickly returns to position A. Flicking is often performed several times in succession before submerging. Substrate may be tossed but this is not always the case. S: A spyhop, in which V. americana orients vertically and remains very still with head and cervical area exposed. Body position is inferred based on flexibility of head and burrowing direction.
**Summary**

Two surface behaviors were described in the larva of the antlion *V. americana*. *Vella americana* were observed flicking in a similar manner to pit builders, but in a way that does not lead to pit construction. A new spyhop behavior also was observed in which a larva exposes its head and thorax above the sand and remains very still for some time. It is hypothesized that these behaviors assist larval *V. americana* in hunting and orientation. The flicking motion may attract the attention of certain prey species, and the spyhop exposes the larva’s stalked stemmata and multi-segmented antennae to increase sensitivity to prey or disturbance.

**Key Words:** flicking, Acanthaclisini, stemmata

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