ANTROCEPHALUS MITYS (HYMENOPTERA: CHALCIDIDAE) IN LABORATORY CULTURES OF TENEBRI MOLITOR (COLEOPTERA: TENEBRIONIDAE), AND POSSIBLE ROLE IN BIOLOGICAL CONTROL OF EPHESTIA CAUTELLA (LEPIDOPTERA: PYRALIDAE)

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Adequate food sources are shortcomings for mass rearing predators (Molina-Rugama et al. 1998; Silva et al. 2009) and parasitoids (Pratissoli et al. 2004a; Soares et al. 2007). The yellow mealworm, Tenebrio molitor L. (Coleoptera: Tenebrionidae), is used to feed captive mammals, birds, reptiles, amphibians because this mealworm is easy to propagate, harvest and feed (Klasing et al. 2000; Zanuncio et al. 2008). Also pupae of T. molitor are an alternative prey for laboratory mass rearing Neotropical predatory and parasitoid insects with low costs and labor requirements (Zanuncio et al. 2008; Bortoli et al. 2011).

Ephestia spp. (Lepidoptera: Pyralidae) species are worldwide pests of stored grains and by-products, and they feed on wheat flour or meal (Ammouneh et al. 2011), the main food substrate of T. molitor larvae and adults. Ephestia spp. moths are generally managed by fogging with insecticides in storage units (Scholler & Flinn 2000). However, public health concerns regarding pesticide residues in food mandate alternative strategies, such as biological control, to manage these insects (Scholler 1998). Natural enemies frequently parasitize immature Coleoptera and Lepidoptera in stored product systems (Toews & Subramanyam 2004), but their biological and ecological functions and applications have not been studied adequately (Pikart et al. 2011).

Some chalcids of the genus, Antrocephalus spp. (Hymenoptera: Chalcididae) were recently found on our T. molitor rearing facilities parasitizing Ephestia cautella (Walker) pupae and identified by the fourth author as Antrocephalus mitys (Walker). This species originated in the old world (Delvare & Arias-Penna 2006) and was accidentally introduced into Brazil (Boucek 1988). Antrocephalus spp. are natural enemies of stored product moth pests such as Corcyra cephalonica Stainton (Lepidoptera: Pyralidae) (Sastry & Appanna 1960; Gates 1993; Konishi et al. 2004), Opisina arenosella Walker (Lepidoptera: Xylocryptinae) (Abdurahiman et al. 1983; Mohandas & Abdurahiman 1992, 1995) and Galleria mellonella L. (Lepidoptera: Pyralidae) (Subba Rao 1955).

Antrocephalus mitys males and females were collected manually with a vacuum flask (150 mL) from the mealworm laboratory colony in the Insectary (Universidade Federal de Viçosa/UFV) in Viçosa, Minas Gerais State, Brazil at 25 ± 2 °C, 60 ± 10% RH and 10:14 h L:D.

Detailed morphological descriptions of A. mitys adults were made with aid of a Sony DSC-W70 Cyber-shot (7.2 megapixels) digital camera in macro mode using magnifications of up to 20 × with the lens of the camera directly coupled to the ocular of a stereomicroscope.

Each of 10 pairs of A. mitys adults and larvae were made with aid of a Sony DSC-W70 Cyber-shot (7.2 megapixels) digital camera in macro mode using magnifications of up to 20 × with the lens of the camera directly coupled to the ocular of a stereomicroscope.

To observe the behavior of A. mitys adults, 10 individuals were maintained in plastic trays (30 × 15 cm) with abundant wheat flour and healthy