

Short Communication

Occurrence of parasitism in *Lagriavillosa* F. (1783) (Coleoptera; Polyphaga; Tenebrionidae) in the Northwestern Parana State, Brazil

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Abstract: Were found larvae, pupae, and adults of the parasitoid *Strongygaster* Macquart, 1834 (Diptera; Tachinidae; Strongygastrini) considered to be the second largest family of Diptera that endoparasite arthropods especially insects in larval phase. This work describes the first occurrence of parasitoids associated with the beetle *Lagriavillosa* F. (1783) (Coleoptera; Polyphaga; Tenebrionidae) in the Northwestern region of the Parana State, Brazil. Because of feeding habits, the larvae associated with the abdominal and intestinal contents of *L. villosa* may be ingested in the form of eggs with the decaying organic matter present in the soil.

Keywords: Behaviour; parasites; natural biological control; beetle.

COMMUNICATION

Lagria villosa is an insect from the African Continent that was introduced into Brazil; its entry is first recorded in the State of Espírito Santo [1] It was initially cited in the family Lagriidae, but after a review done it was placed in the family Tenebrionidae [2, 3]. The specimen considered a potential pest because of its omnivorous habits and consumption of many varieties of cultivars in large amounts [4, 5] seems to prefer decayed organic matter present in the soil [6].

Adults of *L. villosa* sampled at the Horto Didático of the Departamento de Agronomia da Universidade Estadual de Maringá, PR, Brazil. (S 23° 24'; W 51° 56') between June 2011 to December 2012 were kept in glass box with the following dimensions: 60 x 40 x 30 cm containing *Allium fistulosum* with which they were associated in the places sampled. They remained in laboratory conditions at 25 ± 1°C; R.H. of 70 ± 10% and photoperiod of 14:12(L:D) until they were subjected to ether vapours for dissection. Voucher specimens of *L. villosa* and *Strongygaster* have been deposited at DBC Universidade Estadual de Maringá. With the help of tweezers, and pins, adults of *L. villosa* were placed in a Petri dish containing physiological solution for insects (1.8 gNaCl; 1.88 gKCl; 0.16 gCaCl; 0.004 g of NaHCO₃; 100 ml of distilled H₂O) for examination under a stereomicroscope and covered ventrally following the analyses of the abdominal and digestive contents. After the isolation of the material in slides, they were carried for total mounting with Toluidine Blue, pH 4.0, and observations were made through light microscopy (CARL ZEISS, Jena, Germany) and documentations were done through photomicroscopy (Olympus CX31/ Nikon Coolpix L1).

Larvae of parasitoids under development were present in the abdominal cavity of adults of *L.*

villosa, (Figs. 1 A and B) Some of the parasitoids were collected from the abdominal contents and kept in PVC boxes under laboratory conditions for the obtention of pupae (Figs. 1 C and D) and adults (Figs. 1 E and H).

Based on the morphological analyses, the parasitoids found to belong to the genus *Strongygaster* sp. Macquart, 1834 (= *Hyalomyodes* sp.) [7] (Diptera; Tachinidae; Strongygastrini) [8-10].

Tachinidae is the second largest family of Diptera, summarising almost 10.000 species described in the entire world [8, 10-12]. At the larval phase, they are endoparasites of other arthropods, varying from scorpions and centipedes to some orders of insects such as Lepidoptera, Coleoptera, and Hemiptera [12-17]. This family presents vast potential for use in biological control programs, especially in agriculture [18].

The occurrence of *Strongygaster triangulifer* (Loew) is reported upon adult beetles of *Harmonia axyridis* (Pallas) (Coleoptera; Coccinellidae) in North Carolina (USA) [19]. The first occurrence of this kind of parasitism affirmed that *S. triangulifer* is widely distributed in North America, parasitizing insects of the orders Coleoptera, Lepidoptera, Dermaptera, and Hemiptera [20].

According Wood DMet al.; [21] *Strongygaster* presents oviposition (egg laying) on beetles and ants; the adult tachinidae fly to many places, resting in foliage while they hosts eat the flowers, in the case of females who fly in search of hosts. Some are specific species, others have two- or three different hosts and parasitism can take place through the eggs laid directly inside the host or in foliage that will be consumed by the host.

As regards the parasitism of *Strongygaster* in *L. villosa*, we can conclude that it probably occurs

through the ingestion of the eggs by larvae beetle placed in the food with dead organic matter in the soil.

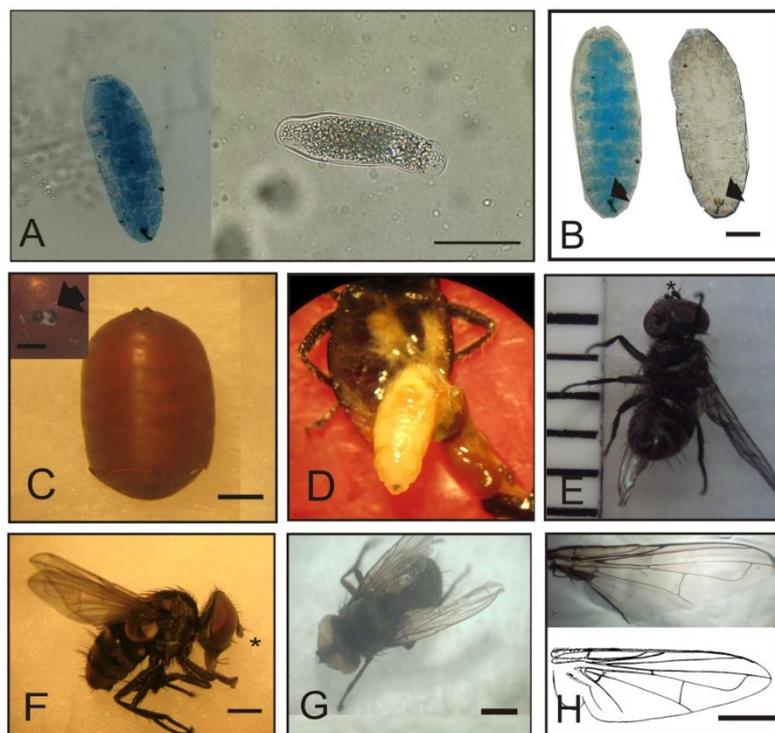


Fig. 1: Development of *Strongygaster* sp. (A) beginning of the larval phase, bar= 1mm; (B) third larval stage, arrowhead indicating the cephalo-pharyngeal apparatus, bar=1mm; (C) pupa, posterior spiracles pointed by the arrowhead, bar=1mm; distinguished at the superior region (left), the spiracles bar=0,5 mm; (D) larva emerging from *L. villosa* abdomen, bar=1mm; (E) adult (*)antennae, 16x; (F) adult (*) head details, wide eye occupying the entire lateral side of the head; reduced genata a narrow band less than one-tenth height of head bar=1mm; (G) head, thorax, and abdomen (dorsal) bar=1mm; (H) wing hyaline longer than the abdomen, cell r_5 petiolate in wing tip, with the stalk as long as m-cu; lower calypter large testaceous, bar = 1mm.

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