

Papéis Avulsos de Zoologia

HYALOMYODES BRASILIENSIS TOWNSEND (DIPTERA, TACHINIDAE), A PARASITE OF THE INTRODUCED PEST LAGRIA VILLOSA FABRICIUS (COLEOPTERA, LAGRIIDAE)

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ABSTRACT

The tachinid Hyalomyodes brasiliensis Townsend emerged in the laboratory from adults of the lagriid Lagria villosa Fabricius, a recently introduced agricultural pest in Brazil. This tachinid is known to parasitize species of Chrysomelidae, Meloidae and Pyrrhocoridae, in addition to this new record for Lagriidae. Descriptions of immature stages of the parasite are given. Hyalomyodes argentinensis Blanchard is here regarded as synonym of H. brasiliensis.

Lagria villosa Fabricius, 1781 (Coleoptera, Lagriidae) a native from Africa, was first recorded in Brazil in the state of Espírito Santo, in March-April 1975 (Pacheco *et al.*, 1976). There is evidence that the beetle probably entered this country on trash of a ship originating from Africa, docked somewhere in Rio de Janeiro at a date shortly prior to 1972.

The beetle is omnivorous, feeding on a wide range of field crops and vegetables; in recent years it caused serious damages to both cultivated and native plants. The numerical increase in the infested area has been incredible, and the pest is now (1977) rapidly spreading throughout Rio de Janeiro, Espírito Santo, Minas Gerais, São Paulo and northern Paraná. The adults and larvae may survive on dry organic matter during dry seasons; during the rainy season adults prefer the green parts of plants.

Free from its natural enemies, the increase of *L. villosa* has been enormous, also due to an acceleration of development in a new and apparently ideal environment. Under these circumstances the necessity for an attempt at control by biological methods is evident.

On September 1977, Dr. Angelo Pires do Prado, Department of Parasitology, Universidade Estadual de Campinas, São Paulo, found a large dipterous larva "occupying a large part of the abdomen of an adult of *Lagria villosa*". He sent me this material for examination with the remains of the host; on dissecting this, I found a third

instar larva very similar to that described by Thompson (1954) as *Hyalomyodes triangulifera* (sic). Early in October 1977, Dr. Cleide Costa, Museu de Zoologia, USP, while studying the life-history of *Lagria villosa* in the laboratory, collected a few adults at the backyard of a residence in downtown São Paulo. Five dipterous larvae emerged from these beetles and were held alive in jars. All maggots pupated; four small flies emerged and proved to be a rare tachinid, *Hyalomyodes brasiliensis* Townsend.

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Systematic position of *Hyalomyodes brasiliensis* Townsend

The genus *Hyalomyodes* Townsend was placed by Townsend (1936) in the superfamily Oestroidea, family Gymnosomatidae, tribe Strongygastrini. Sabrosky & Arnaud (1955) and Guimarães (1971), following Townsend, placed this genus in the subfamily Phasiinae, tribe Strongygastrini. The Phasiinae are a biologically homogeneous group, as they parasitize Hemiptera (although not the only Tachinidae that do so). The group is morphologically heterogeneous and this renders the subfamily difficult to define on external adult characters. An excessive splitting of the New World Phasiinae has been proposed by Townsend, with fifteen tribes. Verbeke (1962), in his classic study of the male genitalia of Tachinidae, proposed the new subfamily Dufouriinae, a group which is often parasitic on adult insects, mainly Coleoptera. This group could be related to the Phasiinae through such genera as *Hyalomyodes*, parasites of beetles, and *Strongygaster*, which attacks flying ants. Crosskey (1976) maintained the Dufouriinae as a distinct group, based on certain features of the male genitalia, and to some extent on the beetle host, that suggest that the true affinities of this group are with the Proseninae-Tachininae rather than with the Phasiinae. Crosskey's concept of the Dufouriinae corresponds approximately to the tribe Dufouriini as recognized by Emden (1945, 1954), except for not treating this groups as a tribe of Phasiinae.

It is probable that *Hyalomyodes* is most closely related to Dufouriinae than to Phasiinae; but based on the present knowledge of Neotropical Tachinidae, it cannot legitimately be assigned to any particular subfamily.

Hyalomyodes Townsend includes 5 species in New World. Two nominal species: *brasiliensis* Townsend and *argentinensis* Blanchard occur in the Neotropical Region. The latter is virtually impossible to be distinguished from *brasiliensis* and is here considered as conspecific.

Hyalomyodes brasiliensis Townsend

(Figs. 1-7)

Hyalomyodes brasiliensis Townsend, 1929: 370. Type-locality, Brazil, São Paulo, Itaquaquecetuba; Mendes, 1938: 216 (distr., hosts); Guimarães, 1971: 18.

Hyalomyodes argentinensis Blanchard, 1942: 358, fig. 9. Type-locality, Argentina, Buenos Aires; Parker *et al.*, 1950: 20 (host); Guimarães, 1971: 18. N. SYN.

Male: Total length 3.5-4.0 mm

Small species, color black. Body short and broad; abdomen rounded; wings hyaline, cell R_5 petiolate. Mesonotum and abdomen with a fascia of bright golden pollen.

Head black subhemispherical, silvery pollinose; front at vertex 0.10 of head width. Frontalia brown. Parafrontalia and parafacialia equibroad, silvery pollinose, each about one-fourth as wide as frontalia. Proclinate orbitals absent in both sexes. Ocellars weak and proclinate. Frontals 11, extending to middle of first antennal segment. Vibrissae on oral margin. Gena narrow, about 0.04 of eye height. Antennae black, third segment subtruncate at apex, about twice as long as second, not reaching the level of the vibrissae. Palpi subcylindric, pale yellow.

Thorax black. Prescutum with a median spot when viewed from behind, incised on each side at suture by a triangular fascia of bright golden pollen; scutum with a broad rectangular black area on disc, the rest covered by dense bright golden pollen. Scutellum triangular, black, dusted with a thin cinnamon pollen. Apicals strong and decussate; laterals, 2; discals, 2. Acrostichals, 3:3; dorsocentrals, 2:3. Sternopleurals, 2. Pleura with a rather uniform, thin, whitish or subsilvery pollen. Legs black. Wings hyaline, longer than abdomen. Cell R_5 petiolate in wing tip, with the stalk as long as *m-cu*; lower calypter large testaceous.

Abdomen black, rounded ovate, wider than thorax, bright golden pollinose except for a broad triangular spot on sides of abdominal T_3 and T_4 ; $T_1 + 2$ excavated, black with a pair of small median marginals; T_3 with a pair of median marginals; T_4 and T_5 with a row of marginals.

Third instar larva (figs. 3 and 5).

Body length 3.5 mm.

Metapneustic. Cuticle transparent, smooth. Cephalopharyngeal sclerite (fig. 3) presenting three articulations; oral sclerite small, not strongly curved, tapering to a moderately acute point; hypostomal sclerite elongate, not fused with pharyngeal sclerite; pharyngeal sclerite with a well developed dorsal wing, prolonged forward. Posterior spiracles (fig. 5), semioval in outline, slightly protuberant, well pigmented on middle, with three circular respiratory openings. From the ventral slit and covering it at the base there is a transparent acute horn.

Puparium (fig. 7)

Size, Length 3.5 — 4.0 mm; width 1.5 mm.

Brown to light red. Posterior spiracle shining black, narrowly, separated at the base, slightly raised above surface and located just above the longitudinal axis. Each stigmal plate with three indistinct yellowish slits. Anal opening small, not far below the spiracles.

Material examined. 4 males, São Paulo. Oct. 1977, Cleide Costa (reared from *Lagria villosa* in laboratory); 1 male, Sapucaí-mirim, Cidade Azul, Minas Gerais, 1400 m, Nov. 1953, L. Travassos F.^o, M. Kuhlmann, C. Gans & S. Medeiros.

H. argentinensis Blanchard from Buenos Aires, Argentina, reared from *Epicauta adspersa* Klug (Meloidae) is indistinguishable, from the description, of *H. brasiliensis* Townsend and is here regarded as a synonym.

BIOLOGY

According to Sabrosky & Braun (1970), the known hosts of the Nearctic *Hyalomyodes triangulifer* are beetles of the families Chrysomelidae, Curculionidae, Alleculidae, Coccinellidae, Elateridae, Lampyridae and sometimes representatives of other orders (Hemiptera, Dermaptera and Lepidoptera).

In the Neotropical Region, *Hyalomyodes brasiliensis* has been reared from the Pyrrhocoridae genus *Dysdercus* (Mendes, 1938). Since *H. argentinensis* is probably synonymous, the taxonomic and ecological range of the host list is therefore wider, including beetles of the families Chrysomelidae and Meloidae (Parker *et al.*, 1950; Blanchard, 1942).

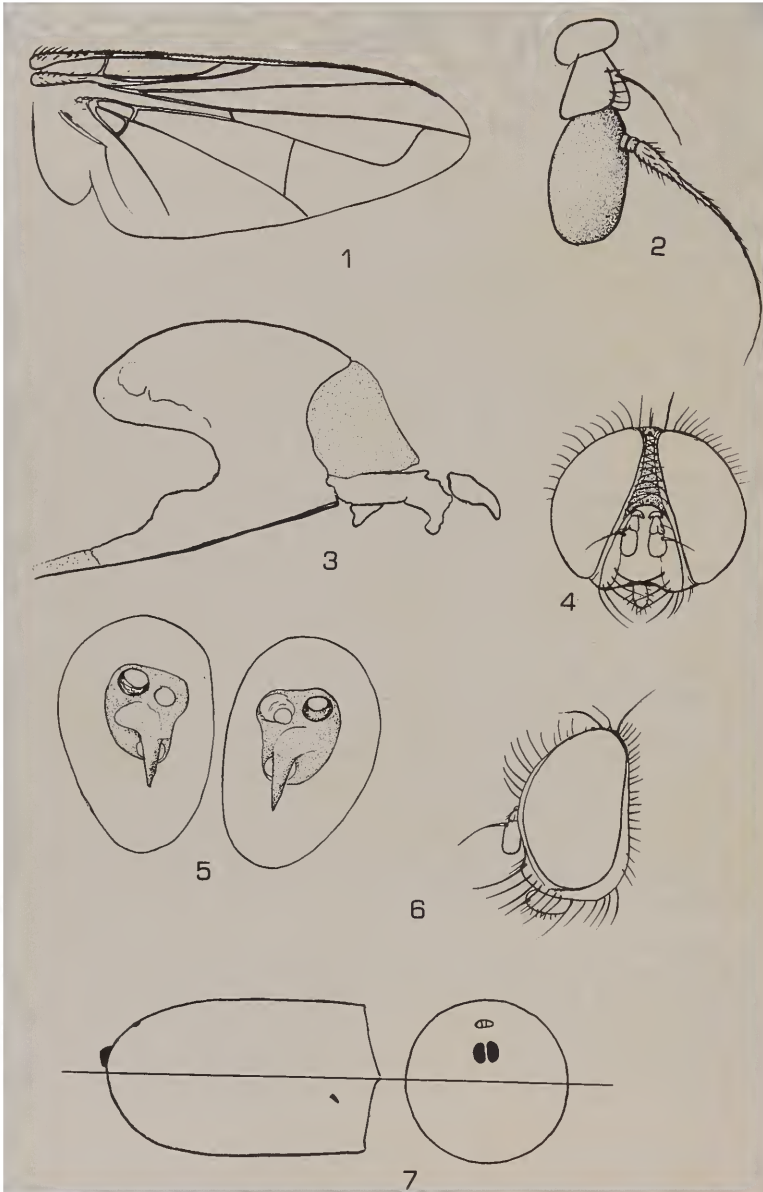
In all records *Hyalomyodes* specimens were reared from adult hosts and it seems probable that this is the stage ordinarily attacked. Thompson (1954) reviewed the life-history of *H. triangulifera* (sic), describing in detail all larval stages and puparium. According to him females of *Hyalomyodes* have no piercing ovipositor and deposit larvae ready to hatch in a thin-walled egg; it is fairly safe to infer that they place them on the body of the host. How the larva gets into the host's body is unknown. Townsend (1936) stated that both *Hyalomyodes* and *Clistomorpha* deposit naked maggots "... apparently guiding them into the mouth of an abdominal or thoracic spiracles during flight of the host, for which purpose the five hypopygial lobes or lips are well adapted". This statement was evidently based on examination of dead specimens. If tachinid larvae actually enter the host through the spiracles is not known. Thompson (1954) states that a delicate larva like the first stage of *triagulifer* could hardly get through the armature that protects the entrance of the tracheal system, and that, since the primary larva has a mouth-hook well adapted for piercing and a good equipment of cuticular spines, it could penetrate the body wall of a coleopterous larva or the dorsal abdominal surface of an adult.

Berry & Parker (1950), studying the biology of the Dufouriini *Campogaster exigua*, parasite of the weevil *Sitona* in Europe, observed that this species apparently deposits a larva on the external surface of the weevil, between the head and thorax, or between the first and second thoracic segments. Judging from the type of ovipositor found in *Hyalomyodes*, unadapted for piercing, a similar method of larviposition could be inferred for *Hyalomyodes brasiliensis*.

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Hyalomyodes brasiliensis Townsend, ♂. Fig. 1, wing; fig. 2, antenna; fig. 3, cephalopharyngeal apparatus, larva III; fig. 4, head, frontal view; fig. 5, posterior spiracles, larva III; fig. 6, head, lateral view; fig. 7, puparium.