

**Morphology of the last instar larva of
Trypoxylon (Trypargilum) aestivale Richards,
 1934, with notes on preys and parasitoids
 (Hymenoptera: Crabronidae)**

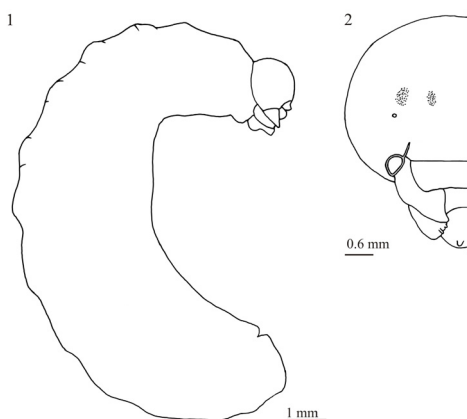
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Abstract: The last instar larva of *Trypoxylon (Trypargilum) aestivale* Richards, 1934 is described and illustrated based on specimens collected in the southeastern Brazil. Some characters useful in the systematic of *Trypoxylon* and related genera are discussed. The following species of spiders of the family Araneidae are reported as prey: *Araneus uniformis* (Keyserling, 1879), *Parawixia* sp., and two species of *Eustala*. *Melittobia* sp. (Hymenoptera: Eulophidae) and *Anchieta fumosella* (Westwood, 1867) (Neuroptera: Mantispidae) are reported as parasitoids.

Key words: larvae, taxonomy, wasp, *Melittobia*, Mantispidae

Introduction

The large and worldwide distributed genus *Trypoxylon* Latreille, 1796 comprises spider-hunting wasps, which construct mud nest or use pre-existent cavities for nesting (RICHARDS 1934; BOHART & MENKE 1976). Because of the behaviour of several species in the genus of nesting in human habitations these wasps are quite conspicuous. Even so, larvae of only a few species of *Trypoxylon* have been described (e.g. EVANS 1957, 1959; IIDA 1969; ASÍS et al. 1994; BUYS 2003, 2005) and the larval morphology is still poorly known. Herein the last instar larva of *Trypoxylon (Trypargilum) aestivale* Richards, 1934 is described and some characters useful in the systematics of the genus are remarked. Moreover, species of preys and parasitoids of the wasp are reported.

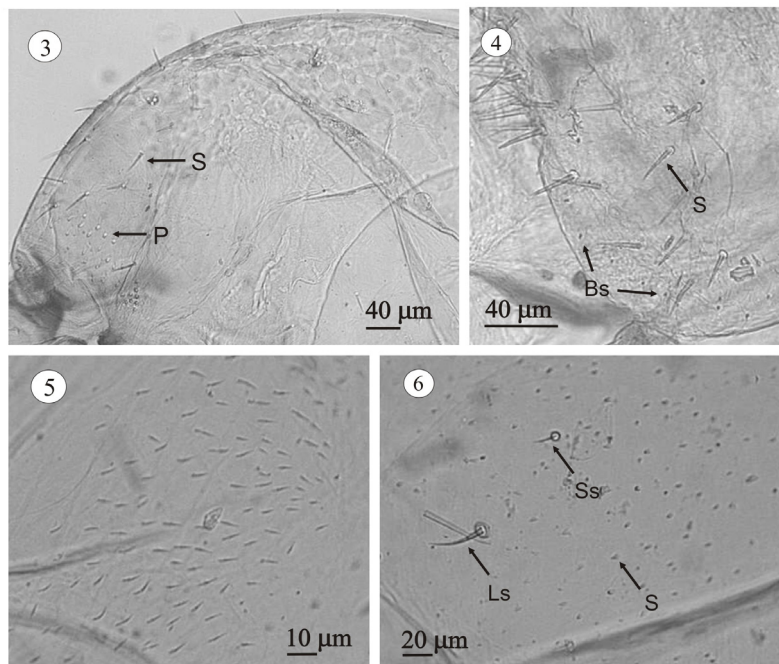


Figs. 1–2: Last instar larva of *Trypoxylon aestivale*. (1) Body, lateral view; (2) head, frontal view.

Material and Methods

One mud nest of *T. aestivale* with three last instar larvae was collected in the surroundings of the Parque Estadual de Nova Baden, Municipality of Lambari, Minas Gerais State, southeastern Brazil (05/III/2003). This area is covered with tropical Atlantic rain forest. In order to study the larval morphology, the head and the body of two larvae were separately heated in KOH (10%) for about 15 minutes to eliminate the soft tissues and mounted on glass slides with glycerine. One larva was prepared for studying by scanning electron microscopy following the usual techniques, and was examined with a JEOL 5310 scanning microscope. The terminology follows EVANS & LIN (1956) with modifications. The measurements put in the description were taken using light microscope. The width of the setae was measured at the base. The number of punctures and setae on the genal areas respectively on the left side of the head and on the right side of the head was put in the description separated by a slash.

The wasp's larvae, as well its parasitoids, are deposited in the entomological collection of the Museu Nacional – Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; the preys were deposited in the arachnological collection of that same institution. Adult wasps reared from the collected nest were deposited in the Museu de Zoologia da Universidade de São Paulo, SP, Brazil.



Figs. 3–6: Last instar larva of *Trypoxylon aestivale* (optical microscopy). (3) head, frontal view, showing cephalic rugosity on coronal area, punctures (P) and setae (S) on genal area; (4) labrum, frontal view (Bs = basiconic sencila, S = seta); (5) integument of the body, showing elongated spines; (6) integument of the body, showing short spines (S), small setae (Ss) and large setae (Ls).

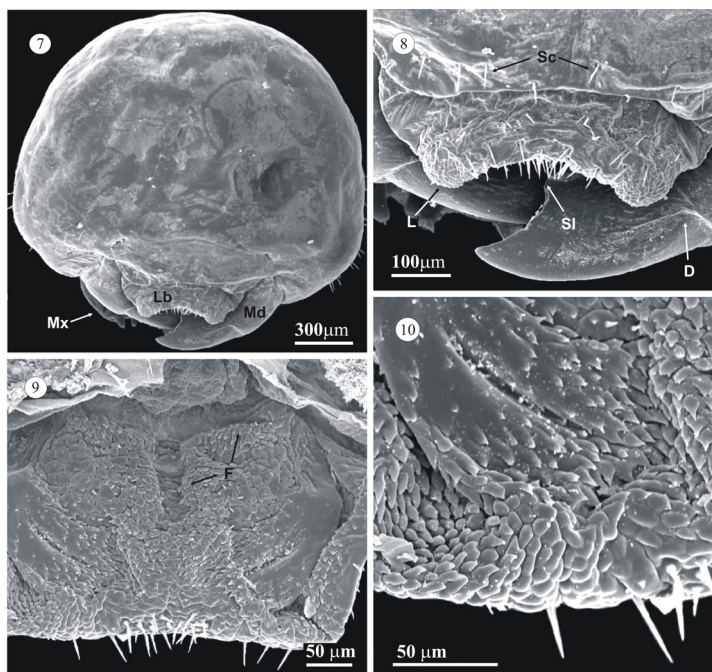
Results and discussion

Trypoxylon (Trypargilum) aestivale Richards, 1934

Last instar larva
(Figs. 1–10)

Head capsule: Length 1.4 mm; width 1.8 mm. Genal areas prominent (Figs. 2, 7). Coronal suture indistinct. Parietal bands unpigmented. Antennal orbits unpigmented, inconspicuous; about 50 μ m in diameter; with three sensilla. One pair of concavities near to the antennal orbits; another pair the frontal area, integument of the concavities brownish (Fig 2).

Cephalic rugosity (small convexities on the integument of the coronal area of the head) strong (Fig. 3). Coronal area with 10 punctures (7–10 μm in diameter) and four setae (45–55 μm long and about 5 μm wide). Frontal area with five punctures (about 6 μm in diameter) and seven setae (45–47 μm long and about 5 μm wide). Clypeal area with 21 punctures (about 8 μm in diameter) and a few setae (35–48 μm long and 2.5–5 μm wide). Genal areas with 28/29 punctures (5–8 μm in diameter) and 12/12 setae (45–55 μm long and 5 μm in diameter). Pleurostoma partially pigmented, especially in the points of articulations with the mandibles; anterior tentorial arms unpigmented; hypostoma brown.



Figs. 7–10: Last instar larva of *Trypoxylon aestivale* (scanning electron microscopy). (7) Head, frontal view (Lb = labrum; Md = mandible; Mx = maxilla); (8) labrum and clypeal area, frontal view (Sc = clypeal setae; Sl = crowd of setae on the central marginal portion of the labrum; L = rounded lateral angle of the labrum; N = notch in the outer portion of the mandible); (9) epipharynx, frontal view (F = furrows); (10) epipharynx, close up in frontal view, showing spines.

Mouthparts: Labrum somewhat protuding medially; height 350 μm ; width 650 μm ; lateral angles rounded, roughened apically (Figs. 7, 8); without punctures; with 38 setae (35–41 μm long and 4–5 μm wide), a crowd of setae on the median apical portion (Figs. 4, 8); about 20 basiconic sensilla (about 5 μm long and 2–3 μm wide) roughly aligned near the apical and lateral margins (Fig. 4). Epipharynx without pigmented areas; with short flattened spines on marginal, lateral and central portions up to 8 μm long and 8 μm wide (Figs. 9, 10); all the spines directed to the apex (Figs. 9, 10); a median and a transversal furrow in the superior portion (Fig. 9); basiconic sensilla near the median portion. Hypopharynx strongly papillose. Mandibles pigmented, especially in apical portions and in mandibular articulations; with five teeth; 620 μm long; one seta on the base (40 μm long and 5 μm wide); strongly roughened on the superior portion; with a median notch on the outer portion. Maxillae without pigmented areas; apical portion not papillose; with about four setae (40–53 μm long and 5 μm wide); short spines basally on the inner, ventral and lateral portions; lacinial area sparsely with spines, about 5 μm long, an angular lobe distinct; maxillary palpi pigmented, larger on the base and slightly tapering toward the apex, which is truncate, 75 μm long, 50 μm wide; galeae pigmented; approximately cylindrical; 38 μm long, 20 μm wide. Labium 460 μm wide; dorsal portion with two areas with spines, up to 13 μm long; ventral portion with eight setae (about 45 μm long and 2 μm wide); labial palpi pigmented; conic; 63 μm long, 38 μm wide; spinnerets apically truncate, slightly longer than the labial palpi.

Body: White. Length 1.5 cm; width 3.5 mm. Approximately cylindrical, curved (Fig. 1). Intersegmental lines distinct. Pleural lobes developed, rounded, isolated; smaller on segments TII and TIII, absent on segment AX. Integument with small setae (up to 20 μm long and about 2 μm wide) and large setae (40–68 μm long and about 5 μm wide) (Fig. 6), the two kinds of setae without a detectable regular pattern of distribution; areas with elongated spines (10–12 μm long and about 1–2 μm wide) and areas with short spines (up to 5 μm long and about 2.5–3 μm wide) (Figs. 4, 5). Spiracles pigmented; 110 μm in diameter on segment TII, the others with 80–95 μm in diameter; peritreme distinct; polygonal sculptures weakly distinct on the atrium; opening to the subatrium not armed with spines. Anus ventral.

Taxonomic remarks

The examined larvae of *T. aestivale* have the following remarkable features that were not reported in other larvae of the genus nor in those of closely related genera: (1) a median notch in the outer portion of the mandible; (2) furrows in the superior portion of the epipharynx; (3) two types of setae and (4) two types of spines on the integument of the body. EVANS (1957, 1959) reported spines on integument in larvae of *T. texense* Saussure, 1887 and *T. johannis* Richards, 1934, but he did not comment on different types of spines.

Besides the above mentioned features, the larva of *T. aestivale* can be differentiated from other larvae of *Trypargilum* in (1) having the first thoracic spiracles larger than the others corporal spiracles, feature also observed in larvae of *T. tridentatum* Packard, 1867 and *T. rubrocinctum* Packard, 1867 by EVANS (1957, 1959), and in (2) bearing sensilla on the epipharynx and (3) labrum. Sensilla on the epipharynx were reported only in the larvae of *T. texense* (EVANS 1959) and *T. albitarse* (BUYS 2005), on the other hand, pores have been reported in the epipharynx of the major of the known larvae of *Trypargilum* (EVANS 1957, 1959). BUYS (2005) suggested that it is necessary to have caution in considering the presence of pores in the epipharynx of larvae *Trypoxylon*, since small basiconic sensilla are easily confounded with pores. After examining other larvae of *Trypoxylon* and larvae of other Crabronidae and Sphecidae (BUYS in preparation), I think it is more likely that sensilla are widely present on epipharynx of larvae of *Trypoxylon* and that the report of pores have been an artefact of the observations by EVANS (1957, 1959). In the same way, among larvae of *Trypargilum*, sensilla on labrum were previously found only in *T. albitarse* (BUYS 2005), but it seems quite probable that this structure is common on the labrum of larvae of the group and had been confounded with punctures in previous studies.

The number and distribution of setae on the head, especially on the genal areas, could be useful to distinguish larvae of different species or groups of species in the genus *Trypoxylon*. However, dates concerning these features are scarce in the literature and do not allow a comparative discussion. It seems useful to put the number of setae in distinct portions of the head in further descriptions of larvae of *Trypoxylon* and related genera.

Notes on preys and parasitoids

The collected nest bore the following species of Araneidae spiders as prey: *Eustala* sp.1 (MNRJ3911: five mature males, two immature males, 29 females, three young specimens, and four fragmented specimens); *Eustala* sp.2 (MNRJ3912: two females); *Araneus uniformis* (Keyserling, 1879) (MNRJ3913: two females); and *Parawixia* sp. (one fragmented immature male). About 130 specimens of *Melittobia* sp. (Hymenoptera: Eulophidae) were reared from one wasp's cocoon, suggesting that this parasitoid developed polyembryonically consuming the pupa or the prepupa of the host. Pupae of *Anchieta fumosella* (Westwood, 1867) (Neuroptera: Mantispidae) were found inside three cocoons of the wasp. Mantispids are not commonly reported as parasitoids of spheciform wasps. The genus *Plega* Navás, 1928, which is closely related to *Anchieta* Navás (PENNY & COSTA, 1983; LAMBKIN, 1986), is known as parasitoid of Hymenoptera (SMITH 1863; LINSLEY & MACSWAIN 1955) and other insects (WOGLUM 1935), but until now hosts of *Anchieta* were unknown.

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References

- ASÍS, J. D., TORMOS, J. & GAYUBO, S. F. (1994): Biological observations on *Trypoxylon attenuatum* and description of its mature larvae and its natural enemy *Trichysis cyanea* (Hymenoptera: Sphecidae, Chrysididae). – Journal of Kansas Entomological Society **67**(2):199–207.
- BOHART, R. M. & MENKE, A. S. (1976): Sphecidae wasps of the world – a generic revision. – University of California Press, Berkeley, 665 pp.
- BUYS, S. C. (2003): Last instar larva of *Trypoxylon* (*Trypoxylon*) *maidli* Richards, 1934 (Hymenoptera, Crabronidae), with notes on one nest. – Revista Brasileira de Zoologia **20**(3):447–449.

- BUYS, S. C. (2005): Description of the last instar larva of *Trypoxylon* (*Trypargilum*) *albitarse* Fabricius (Hymenoptera, Crabronidae) from Brazil. – Revista Brasileira de Zoologia **22**(3):696–698.
- EVANS, H. E. (1957): Studies on the larvae of digger wasps (Hymenoptera, Sphecidae) Part III: Philanthinae, Trypoxylinae, and Crabroninae. – Transactions of the American Entomological Society **83**:79–117 + pls IX to XX.
- EVANS, H. E. (1959): Studies on the larvae of digger wasps (Hymenoptera, Sphecidae) Part V: Conclusion. – Transactions of the American Entomological Society **85**:137–191 + pls XVIII – XXIV.
- EVANS, H. E. & LIN, C. S. (1956): Studies on the larvae of digger wasps (Hymenoptera, Sphecidae) Part I: Sphecinae. – Transactions of the American Entomological Society **81**: 131–153 + pls. I–VIII.
- IIDA, T. (1969): Contributions to the knowledge on the sphecid larvae in Japan (Hymenoptera). Part I. – Kontyû **37** (3): 272–279.
- LAMBKIN, K. J. (1986): A revision of the Australian Mantispidae (Insecta: Neuroptera) with contribution to the classification of the family I. – General and Depanicinae. – Australian Journal of Zoology, supplementary series no. **116**:1–142.
- LINSLEY, E. G. & MACSWAIN, J. W. (1955): Two new species of *Plega* from Mexico (Neuroptera, Mantispidae). – Pan-Pac Entomologist **31**(1):15–19.
- PENNY D. N. & COSTA, C. A. (1983): Mantispidéos do Brasil (Neuroptera: Mantispidae). – Acta Amazônica **13**(3–4):601–687.
- RICHARDS, O. W. (1934): The American species of the genus *Trypoxylon*. – Transactions of the Royal Entomological Society of London **82**:173–360.
- SMITH, F. (1863): Description of Brazilian honey bees belonging to the genera *Melipona* and *Trigona*, which were exhibited, together with samples of their honey and wax, in the Brazilian Court of the International Exhibition of 1862. – Transactions of the Entomological Society of London **1**(3):497–512.

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