



Description of the larva of *Oxelytrum erythrurum* (Blanchard, 1849) (Coleoptera: Silphidae)

A. OLIVA

Laboratorio de Entomologia forense, Museo argentino de Ciencias naturales, Av. A. Gallardo 470, C1405DJR, Buenos Aires, Argentina (e-mail: aoliva@macn.gov.ar).

Abstract

The larva of *Oxelytrum erythrurum* is described and figured. This larva differs from those of described species of Nearctic genera in the distribution of setae on the maxillary palpiger, in the shape of the ventral shields on the abdominal segments, in the length ratio between the second and third antennal segment and of the first and second urogomphial segments and in the shape of the lateral processes of the dorsal plates. No larvae of Neotropical Silphidae had been described up to date.

Keywords: Forensic entomology, Neotropical fauna.

Introduction

The small but widespread family Silphidae (Coleoptera: Staphyliniformia) includes many species associated with carrion; hence the English trivial name "carrion beetles". The position of the family in the Order Coleoptera is discussed by NEWTON & THAYER (1992) and by HANSEN (1997). DORSEY (1940) describes and figures the larvae of six Nearctic species of *Silpha* (Silphidae: Silphinae). PETERSON (1960) takes up DORSEY's data for two of the six species but does not, as far as I could ascertain, add any new information. Later authors restricted the name *Silpha* to Old World species, and the six American species treated by DORSEY were assigned to five genera (PECK & ANDERSON, 1985).

Two genera of Silphidae are known to occur in Argentina, *Nicrophorus* (Silphidae Nicrophorinae) and *Oxelytrum* (Silphidae Silphinae). The later alone has relevance in forensic entomology. No larvae of Neotropical species of Silphidae have been described before (PECK & ANDERSON, 1985).

Only *Oxelytrum erythrurum* (Blanchard, 1840) has been found in the province of Buenos Aires (including Buenos Aires city itself) in forensic cases and in field experiments to study cadaveric faunal succession, always in rural or semirural

conditions (OLIVA, 2001). Field experiments in the province of Buenos Aires (CENTENO *et al.*, 2002) showed appearance of adults as early as the first two days on dead pigs exposed in a roofed cage and from day 11th onward on pigs in an unroofed cage. The early arriving adults may feed on the carcass, but most certainly they prey on the blowflies that come to lay their eggs, as well as on the eggs themselves and newborn larvae (V. Trigo, unpublished data). The larvae of Nearctic Silphidae Silphinae do not attack fly larvae, but feed on cadaveric tissues and on occasion show cannibalism; there is no parental care (DORSEY, 1940). PAYNE & KING (1970) (working with pigs as bait) observed adults of several species feeding on maggots. Larvae of Silphidae appeared after most dipterous larvae had left the remains; however, they did not actually observe them feeding on carrion.

On human bodies, adults have been gathered by officials at the scene 8-12 days after death; adults together with young larvae are found around 12-18 days after death, and the larger larvae 18-30 days after death. There appears to be little doubt that the larvae of *Oxelytrum* are necrophagous. They might feed on corpse exudates rather than on tissues, since they are found under the body, in areas with liquefaction

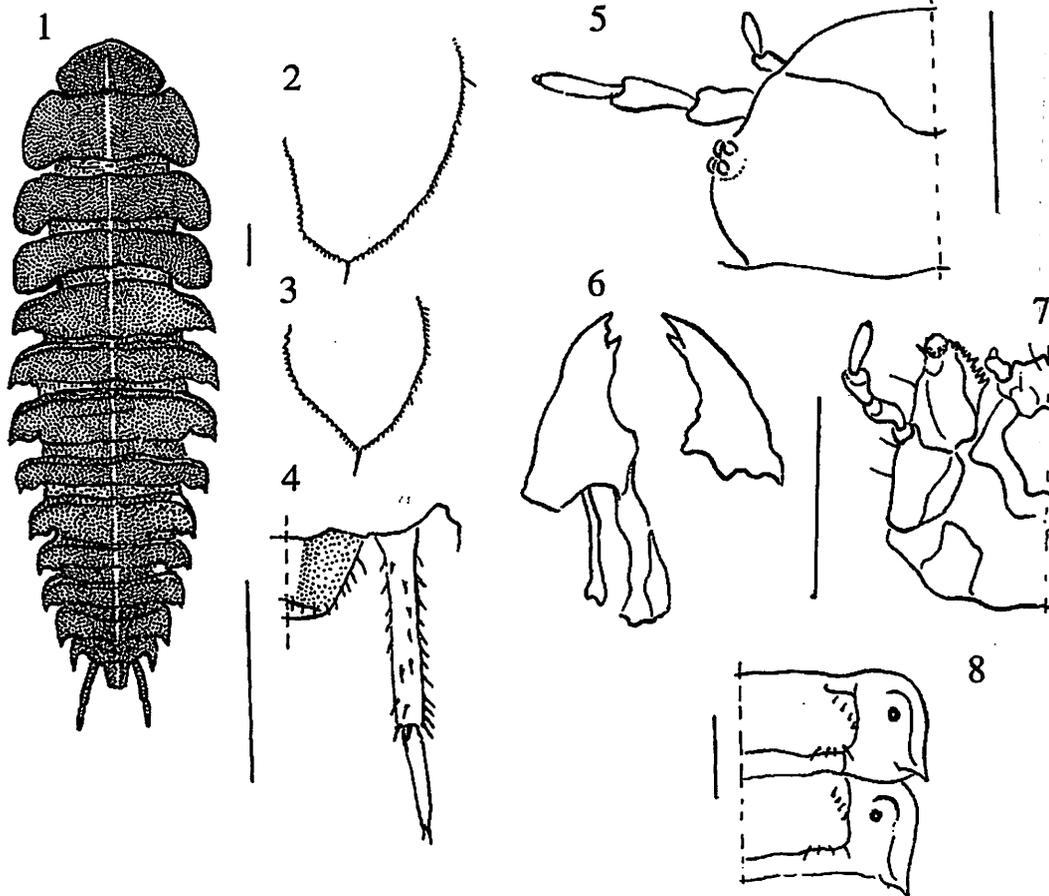


Fig. 1: *Oxelytron erythrurum*, mature larva in dorsal view, 10 ×. Fig. 2: Detail of posterolateral angle of mesothoracic tergite, 50 ×. Fig. 3: idem of first abdominal tergite. Fig. 4: detail of ninth abdominal segment with urogomphi and tenth segment, 50 ×. Fig. 5: left side of cephalic capsule, showing antennae, 50 ×. Fig. 6: mandibles, 50 ×. Fig. 7: left maxilla with maxillary palpus and left side of labium, 50 ×. Fig. 8: third and fourth abdominal segments in ventral view, showing subquadrangular ventral plates and annular spiracles with circular openings, 20 ×. Scalebars = 1 mm.

of tissues, where the underlying soil shows evidence of percolation of fluids (Oliva, pers. obs.).

Generic characters for *Silpha* (DORSEY, 1940) may be applied to the whole subfamily Silphinae, as far as present information goes. They include, among others: body campodeiform; head broader than long; mandible with broad base tapering to incisor lobe with two acute teeth; clypeofrontal suture distinct only at lateral margin; clypeolabral suture distinct; labrum bilobed; dorsal ocelli four, arranged round a small rounded mound; ventral ocelli two, on ventral surface of the head; maxillae with mala and stipes fused, galea with rounded brush-like tip; spiracles annular, the mesothoracic spiracle about twice the size of other spiracles; dorsal shields of thoracic segments with u-shaped posterolateral

angles, those of abdominal segments with posterior angles acute; legs gradually increasing in length from first to third, spinose; coxa grooved, trochanter small, femur about equal in length to coxa, tibia slightly shorter than femur, tarsungulus long, strong, with two small lateral spines. These characters are based on the six species described by DORSEY (1940), which, as it was said before, belong to five different genera (PECK & ANDERSON, 1985).

The species treated by DORSEY are:

Necrophila americana (L., 1759) (sub *Silpha americana* L.)

Oicoeptoma rugulosum (Portevin, 1903) (sub *Silpha inequalis* Fab.)

O. noveboracensis (Forster, 1771) (sub *Silpha noveboracensis* Forst.)

Heterosilpha ramosa (Say, 1823) (sub *Silpha*

ramosa Say)

Thanatophilus lapponicus (Herbst, 1793) (sub *Silpha lapponica* Hbst)

Necrodes surinamensis (F., 1775) (sub *Silpha surinamensis* Fab.)

The material of *Oxyelytron erythrurum* examined is of the same basic type as the figured species of Silphidae Silphinae (DORSEY, 1940; PETERSON, 1960; HANSEN, 1997). A few characters have been found to differ. It remains to ascertain whether these character have a generic or a specific value.

Material examined

Argentina: Buenos Aires province: Tandil, 21/XI/2003, under a dead pig set as bait for sarcosaprophagous insects at the Facultad de Ciencias Veterinarias (UNC); in the collection of the Laboratorio de Entomología forense. Larva found along with an adult of *O. erythrurum*. This specimen has been used for habitus and gross detail drawings, as better fixated and preserved than the remaining material. Five specimens form the general collection of the Museo argentino de Ciencias naturales (MACN), dry-mounted, labelled "Bs. Aires", "6327", one of which was used for drawing mouthparts. A series from a forensic case (Buenos Aires: San Isidro 30-IX-2000, PMI estimated 45 days).

The drawings were made with a camera lucida in a Zeiss stereomicroscope. The mouthpieces, cephalic capsule and legs were dissected out of the second specimen after treatment with hot NaOH and rinsing in water with acetic acid. They were mounted afterwards in a vinyl-based medium for drawing.

Description of the larva of *Oxyelytron erythrurum* (Blanchard, 1849)

Length of figured specimen 17,5 mm; no rearing has been completed, but larvae of this species certainly surpass 20 mm in length. Campodeiform, depressed (fig. 1). General colour light yellowish brown, darker on the more sclerotized plates, with narrow median light stripe along the whole body, excepting the anterior half of the head. Cephalic capsule dark reddish brown. Dry-preserved specimens (not unusual in old collections) take on an uniform dark reddish brown.

Head prognathous, rounded, somewhat broader than long; suture apparent. Antennae 3-segmented, with apical segment subulate, hardly shorter than the precedent one (fig. 5). Mandibles

strong, curved, without molar area, incisor lobe ending in two acute teeth; asymmetrical, right mandible without any cutting edge, left mandible with small cutting edge between the two teeth (fig. 6). I did not find any traces of the setae mentioned by DORSEY (1940). Maxillary palpiger small but distinct. Maxillae as described by DORSEY (1940), but with a single seta anterior to base of palpus and two posterior, the first of these inserted at the very base (fig. 7). Maxillary palpi 3-segmented; first segment convex in its anterior outline, second shorter than first, thickened towards apex, third subulate, a little longer than the precedent segment (fig. 7). Labial palpi two-segmented, not extending beyond glossae; second segment minute (fig. 7). Stemmata as described by DORSEY (1940) for the genus *Silpha*.

Dorsal shields of thoracic segments with posterior angles produced into broad, blunt processes directed outwards and backwards (fig. 2). Dorsal shields of abdominal segments with leaf-shaped processes, the apices pointing outwards and backward in an angle of approximately 45 degrees to the longitudinal axis of the body (fig. 3). Margins of thoracic and abdominal dorsal processes minutely serrate, each with a short seta directed outwards and backwards, in the abdominal segments placed at the apex of the leaf-shaped process (fig. 2, 3). Ventral shields of abdomen subquadrangular, not produced backwards (fig. 8). Urogomphi (fig. 4) with two subcylindrical segments, the first long, subcylindrical, slightly concave along its inner face; the second one a little less than half the length of the first. Measures on specimen figured: urogomphus 1.7 mm, basal segment 1.2 mm, apical segment 0.5 mm. Length of urogomphi distinctly greater than length of tenth abdominal segment. Spiracles as described by DORSEY (1940) except that the mesothoracic spiracle is the only one to have a kidney-shaped opening, those on abdominal segments having a circular opening. Legs as described by Dorsey (1940) for the genus.

The larva of *Oxyelytron erythrurum* differs from those of the Nearctic species described by DORSEY (1940) as follows. From all of them, by the more robust mandibles (fig. 6), by the ventral abdominal shields subquadrangular, with posterior angles not produced (fig. 8) and by the second segment of the urogomphi about half the length of the first (fig. 4). From *Heterosilpha ramosa* by the antenna with the third segment slightly shorter than the second, by the right

mandible without an incissor edge, and by the long, two-segmented urogomphi. From *Oicoeptoma rugulosum* and *O. noveboracensis* by the dorsal shields of the ninth abdominal segment with much larger projections and by the urogomphi much longer than the tenth abdominal segment. From *Necrodes surinamensis* by the antennae with third segment only a little shorter than the second, and by the dorsal shields of the ninth abdominal segment with much larger projections. From *Necrophila americana* by the maxillary stipes bearing one seta anterior to palpus and two posterior, the maxillary palpus with a basal segment convex at its anterior outline (drawings by DORSEY show basal segments slightly concave in front), the labial palpi not extending beyond the labial glossae, the ventral shields of abdominal sternites not produced at the posterior angles, the abdominal spiracles with circular openings and the longer urogomphi. From *Thanatophilus lapponicus* by the right mandible without an incissor edge.

DORSEY (1940) has illustrated sometimes the right, sometimes left mandible; he does not mention any asymmetry of these mouthparts. If the mandibles are symmetrical in the species he treated, then the asymmetry in *Oxelytron* might be a generical character.

Acknowledgements

I thank the Facultad de Ciencias Veterinarias (Universidad del Centro de la Provincia de Buenos Aires) for the use of their grounds and instalations to perform field studies of cadaveric faunal succession; Dr Osvaldo R. Di Iorio for procuring a copy of the PECK & ANDERSON paper, and Verónica Trigo for communicating unpublished data.

This paper was written by the author as a Career Researcher of the CONICET (Consejo argentino de Investigaciones Científicas y Tecnológicas).

References

- CENTENO, N., M. MALDONADO and A. OLIVA. 2002. Seasonal patterns of Arthropods occurring on sheltered and unsheltered pig carcasses in Buenos Aires province (Argentina). *Forensic Science International* 126 (2002): 63-70.
- DORSEY, C.K. 1940. A comparative study of the larvae of six species of *Silpha* (Coleoptera, Silphidae). *Annals of the entomological Society of America* 33(1): 120-139.
- HANSEN, M. 1997. Phylogeny and classification of the staphyliniform beetle families (Coleoptera). *Biologiske Skrifter* 48: 1-339.
- NEWTON, A.F. & M.K. THAYER. 1992. Current classification and family-group names in Staphyliniformia (Coleoptera). *Fieldiana entomologica* (n.s.) 67: 1-92.
- OLIVA, A. 2001. Insects of forensic significance in Argentina. *Forensic Science International, Forensic Entomology Special Issue* (Ed. M. Benecke) 120 (2001): 145-154.
- PAYNE, J. A. & E. W. KING; 1970; Coleoptera associated with pig carrion; *Entomologist's Monthly Magazine*; 105 : 224-232
- PECK, S. B. and R. S. ANDERSON. 1985. Taxonomy, phylogeny and biogeography of the carrion beetles of Latin America (Coleoptera: Silphidae). *Quaestiones Entomologicae* 21: 247-317.
- PETERSON, A. 1960. *Larvae of Insects. Part II. Coleoptera, Diptera, Neuroptera, Siphonaptera, Mecoptera, Trichoptera*. Columbus, Ohio.