

Rheopelopia ornata (Meigen): Description of the metamorphosis and ecology of a river inhabiting Tanypodinae-larva, new to the Dutch fauna (Diptera: Chironomidae)

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ABSTRACT. — Larvae and pupae of *Rheopelopia ornata* (Meigen) were collected in the rivers Rijn and Waal, while at their banks some imagines could be obtained. The morphology of the larva is described and some characteristics of the pupa and imago are given. The larval gut-contents has been studied and notes are made on the ecology of the larva and pupa.

Unknown Tanypodinae-larvae were collected from cobbles in the rivers Rijn and Waal in May 1981. At some of these sampling stations pupae and imagines were collected and identified as *Rheopelopia ornata*. The conspecificity of larva and pupa was confirmed by four pupae where the larval skin was still attached to their abdomens.

DESCRIPTION

Larva (fourth instar $n = 20$). — Living larva whitish-yellow with a yellow head. Preserved in alcohol (70%) the head however turns white. Length of body: 6.6 mm (4.6-8.0 mm). Head index I.C. (max. head width)/(max. head length) $\times 100 = 59$ (53-63). Head length = 0.774 mm (0.648-0.824 mm). Head width = 0.459 mm (0.405-0.486 mm). Antennal ratio A.R. (length of the basal antennal segment)/(total length of segments 2-5) = 3.75 ± 0.25 . Length of antenna = 0.342 mm (0.306-0.369 mm). The annular organ is situated on $70\% \pm 4\%$ of the length of the first antennal segment. The seta arising from the end of the first antennal segment is as long as the total of the segments 2-5 (fig. 5). The length of the maxillary palpus is 0.060 mm (fig. 3). The mandibel is brown apically with a small internal toothlet (fig. 2). The outer area of the mandibel bears two ridges medially. The glossa is concave and bears five teeth (fig. 1). The paraglossae are divided apically (fig. 1). The combs of the hypopharynx are formed by 25 teeth on either side. The inner teeth are reasonably large, the outer teeth are only visible under high magnification (750 \times) (fig. 1). The anal gills are long and slender, one third of the length of the posterior prolegs. Posterior prolegs with four brown claws at the inner side of the prolegs. Sometimes a fifth light-brown claw is present. The remainder of the claws are yellow (fig. 4).

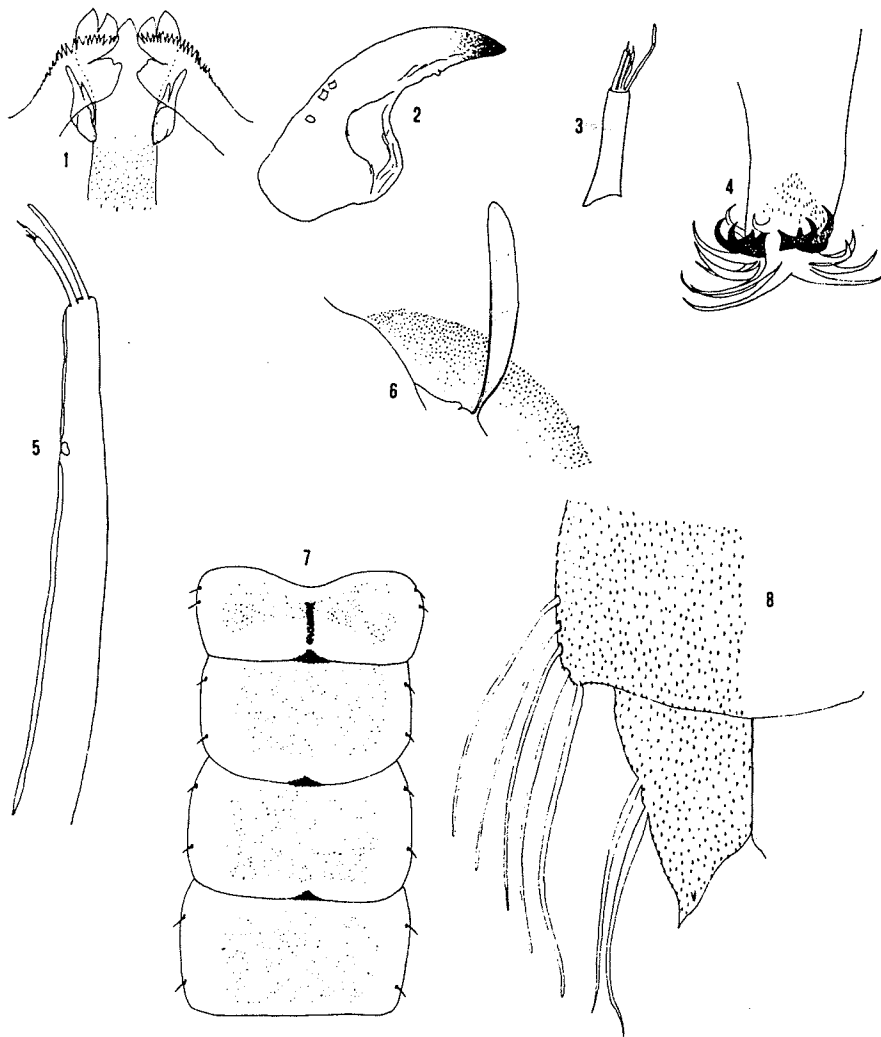
Pupa and exuvium ($n = 10$). — The thoracic horn is flat. The outer side is devoid of spinules, scales etc. The sieve plate is absent and the respiratory-chamber fills the horn completely (fig. 6). The horn reminds rather an Orthoclaadiinae-horn, than that of a Tanypodinae.

On the mesothorax a lot of small cones are visible on the dorsal side. These cones are diminishing in length towards the horns, while an additional pair of much bigger cones is present in the median-anal part of the mesothorax (fig. 6).

The abdominal segments are covered with small spines, only visible at a magnification of 400 \times or more. The segments I-VII bear two short lateral setae on each side. Segment VIII has five very long lateral, filamentous setae, being almost twice the length of the segment (fig. 7, 8). The anal segment has two pairs of lateral, filamentous setae, the basal one in the middle of the segment. The segment converges into a chitinous spine. At the inner side of the anal lobe, near the spine, an additional blunt cone is present (fig. 8).

Tergite I has medially, a cigar-shaped yellow patch. The tergites II-VII have a brown oral edge which is broadened medially to form a brown triangular patch (fig. 7).

Imago (male $n = 2$). — Antennal ratio (length ultimate segment)/(total length preceding segments) = 2.2. The maxillary palps are pale.



Figs. 1-8. *Rheopelopia ornata* (Meigen), larva 1-5, pupa 6-8: 1, glossa, paraglossae and hypopharynx; 2, mandible; 3, maxillary palpus; 4, claws on posterior proleg; 5, antenna; 6, meso-thorax and thoracic horn in lateral view; 7, segment I-IV in dorsal view; 8, anal and pre-anal segment, dorsal view.

Ante-pronotum, pre-episternum and postnotum are brown. Scutal stripes are yellow-orange. The two lateral stripes have a brown frontal and lateral fringe. The scutum and scutellum are whitish.

The wings have a white ground-colour with a dark crossband on two-thirds of the wing. This band diverts distally along the veins M and Cu1. Figure of the female wing in Goetghebuer (1936). The cross-veins are distinctly darkened.

All the femora have a narrow darkened band just before the distal end. The tibia and tarsi are unicolorous yellow. The third segment of the mid-tarsus has a distal group of strongly de-

veloped setae. The claws of all legs are strongly curved and in between two large pulvilli are present.

The abdomen has a white ground-colour. Segment I is entirely whitish. Segments II-VI have a brown basal band, about as wide as one-third of the length of the segment. Segment VII is almost entirely brown on the dorsal side and segment VIII has a wide brown dorsal band covering the oral half of the segment.

The gonocoxites of the hypopygium bear a basal lobe with a slender lateral outgrowth. Figures in Fittkau (1962) and Pinder (1978).

ECOLOGY OF THE LARVA AND PUPA

The larvae and pupae of *Rheopelopia ornata* have been collected on large cobbles exposed to the current of the river. The major part of these cobbles is covered with sponges and Bryozoa. Larvae and pupae occur among these colonies, but the larvae also move around in the sedimented sludge layer on top of the cobbles.

Because no chironomid fragments were found in the guts of 25 larvae, the larvae of *Rheopelopia ornata* do not seem to predate on chironomid-larvae like most Tanypodinae do. In most of the guts however, many chaetae of Naididae and Tubificidae (Oligochaeta) were discovered among sludge particles and fragments of diatom-scales. Probably the latter items are the food of the Oligochaeta.

A number of pre-pupal larvae and pupae was found in the sludge tubes of *Dicrotendipes nervosus* (Staeger). In this aspect *Rheopelopia ornata* differs from other Tanypodinae-pupae, which are moving freely in the water. This, combined with the remarkable deviation of the thoracic horn, may be seen as an adaptation to the strong current. Normally Tanypodinae-pupae are suspended on the water surface in order to take oxygen from the air. In the habitat of *Rheopelopia ornata* this is obviously impossible. The thoracic horn can be thought to be adapted to obtain oxygen from the water only. In this respect there is a similarity with the pupae of Orthocladiinae and Chironominae. The fact that the pupae are found in the tubes of other Chironomidae also confirms the hypothesis of an apneustic oxygen supply.

The larvae collected in May were all in their final instar, in August and September third and fourth instar larvae have been found. Imagines have so far only been collected from May to August.

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