

**DESCRIPTION OF THE LARVA OF
PROTONEURA ROMANAE MEURGEY
FROM THE WEST INDIES
(ZYGOPTERA: PROTONEURIDAE)**

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The larva from Guadeloupe is described, illustrated for the first time, and compared to the other described larvae. Additional notes on ecology are also given.

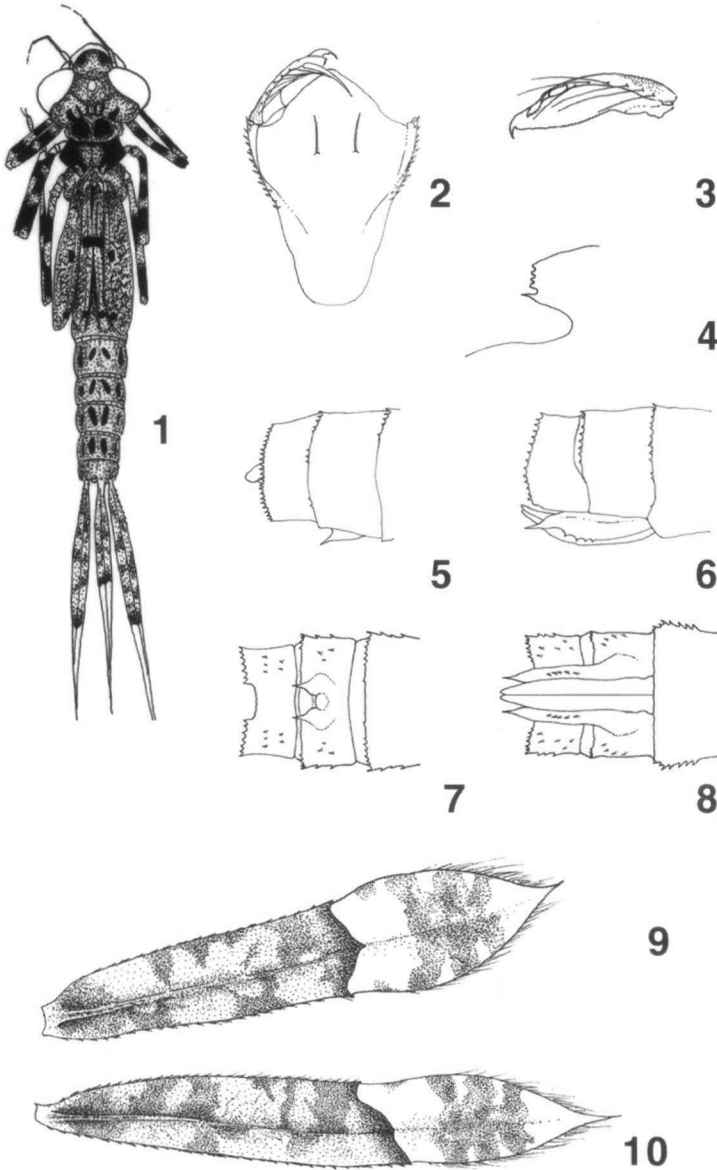
INTRODUCTION

The recently described *Protoneura romanae* Meurgey from Guadeloupe is currently restricted to Guadeloupe (French West Indies) and seems to be present on Montserrat, 70 km N of Guadeloupe (DONNELLY, 2007). As an uncommon endemic, this species is in need of further studies, notably to point out its distribution and ecological requirements. The Parc National de Guadeloupe and the Nantes Museum of Natural History financed a three weeks mission in June 2007, which allowed describing larval habitats and to determine the conservation status of *P. romanae*. In the present paper, I describe and illustrate the final larval instar of *P. romanae*, based on specimens from Guadeloupe, and give additional notes on the ecology.

***PROTONEURA ROMANAE* MEURGEY**

Figures 1-10

M a t e r i a l. – 48 last instar larvae (17 reared). GUADELOUPE: Basse-Terre, ravine Boudoute, 14-III-2007, F. Meurgey leg.; Basse-Terre, Sofaïa, rivière Sale, F. Meurgey leg. All material is deposited in the Natural History Museum of Nantes (France).



Figs 1-10. *Protoneura romanae*, last larval instar: - (1) general aspect, dorsal view; - (2) prementum, dorsal view; - (3) right palpal lobe, movable hook omitted, dorsal view; - (4) female gonapophyses, lateral view; cerci omitted; - (5, 7) male gonapophyses and cerci, lateral view; - (6, 8) female gonapophyses and cerci, lateral view; - (9) central lamella, lateral view; - (10) lateral lamella, lateral view.

DESCRIPTION. – **H e a d.** – Trapezoidal, widest at eye level, larger than prothorax (Fig. 1). Posterior lobes prominent, fringed with a row of 10-12 small, strong setae. Occipital margin strongly concave. Prementum (Fig. 2) short, trapezoidal. Prementum-mentum articulation reaching the inferior margin of procoxae. Margins sinuate with 15-20 strong setae on the distal half. Ligula prominent, strongly convex and finely serrated, unclft. Premental setae one on each side. Labial palps each with 6 setae (rarely 5), movable hook long, slender and curved, longer than palpal setae (Fig. 3). Distal margin of palp with a long sinuous medial hook and a short, almost square and four-toothed lobe (Fig. 4). Antennae seven segmented, ringed with black and white on antenomeres 2-5, third antenomere the longest.

T h o r a x. – Pronotum quadrangular with a black spot on each side. Thorax dark, marked with four whitish spots on each side. Wing pads parallel, translucent, each with a median and anapical black spot. Inner wing pads reaching the end of abdominal segment 5. Legs white, each with three dark bands on femora and tibiae, 1 on each tarsal segment.

A b d o m e n. – Cylindrical, brown to yellowish, segments 1-8 with each two black lateral spots and two dorsal black spots. Lateral carina of segment 7-10 each with a row of strong spines, lateral carina of segment 6 with a row of small setae, remainder segments bare. Female gonapophyses surpassing distal end of segment 10, and outer ones denticulate (Figs 6, 8). Male gonapophyses and cerci as in Figures 5 and 7. Caudal lamellae (Figs 9, 10) lanceolate, planate except for the midrib, and terminally acute. Lateral lamellae about six times as long as wide, with a strong, S-shaped nodus ending in a small spine, located at 0.80 of its length. Dorsal carina with approximately 20-26 setae, ventral carina with approximately 40-52 setae. Central lamella about five times as long as its maximum wide; nodus located at 0.75 of its length, triangular and ending in an acute spine on each side. Dorsal carina with approximately 29-30 setae, ventral carina with approx. 31-33 setae. Basal portion of the lamellae strongly sclerotized, patterned with black transverse spots. Distal portion paler, whitish with a distinct dark XX-shaped mark.

Early stages do not present the characteristic XX black pattern on caudal lamellae.

M e a s u r e m e n t s (mm; females N = 33, males N = 12). – Total length without caudal lamellae, females and males: 9.8-10.1; – inner wing pads, females and males: 3.9-4.0; – abdomen length without caudal lamellae, females and males: 6.0-7.2; – central caudal lamellae, females and males: 4.4-4.8; – lateral caudal lamellae, females and males: 4.8-5.0.

DIAGNOSIS. – The larva of *Protoneura romanae* is close to that of *P. ailsa* Donnelly. It differs from *P. ailsa* by the following set of criteria: (1) greater size, with body length (including lamellae) comprised between 14.6 and 15.1 mm (11.3 and 12.6 in *P. ailsa*); – (2) labial palps with 6 setae (5 in *P. ailsa*); – (3) median lobe of labial palp almost square bearing four teeth (truncate and serrulated in *P. ailsa*); – (4) male gonapophyse directed downward (parallel to the 9th segment in *P. ailsa*); – (5) distal end of caudal lamellae with a distinct black XX-shaped

mark (always white and unspotted in *P. ailsa*); – (6) nodus of central lamella triangular in form (trapezoidal in *P. ailsa*).

Larvae of *P. romanae* also differ from *P. capillaris* Rambur in having 6 palpal setae (5 in *P. capillaris*), and by the shape of caudal lamellae.

ECOLOGICAL NOTES. – *Protoneura romanae* is an uncommon species in Guadeloupe, observed mainly in forested areas of Basse-Terre and in few flooded forests on the west coast of Grande-Terre. On Basse-Terre, adults can be seen flying along shaded banks of montane rivers and streams between 150 and 700 meters altitude. On Grande-Terre, a few, isolated, small populations were found in bloodwood forests (*Pterocarpus officinalis*) at sea level.

Males present a strong territorial behaviour consisting in patrolling a 2-3 m long territory with the head turned facing the streambank. Mating takes place while in flight until the tandem pair reaches a suitable oviposition site. The tandem pair skirts the banks, never more than 15 cm above the water, stopping on dead floating debris, like fallen branches, leaves, or flower petals. The oviposition begins as soon as the female choses a good site. The male always stays on the female, beating wings constantly. Eggs are laid in floating dead leaves or small branches. This can take more than half an hour to be completed.

Larval habitat consists of calm areas of montane rivers and streams under the overhanging vegetation. The typical habitat consists of dead branches of a fast flowing mountain river or stream in rain forest, with at least one abrupt bank colonized by spikemoss (*Selaginella* sp.) or ferns. In these types of habitats, water depth exceeds one meter and the substrate is constituted by dead leaves and rocks. Larvae are found clinging on liana or other plant roots, and sometimes on the underside of leaves. Emergence takes place during the day, between 10:00 a.m. and 16:00 p.m. The larva climbs on rocks, plants or roots but always in the shadiest part of the support. The maximum height observed was 5 cm from the water level. Teneral stay a long time beside their exuviae, about one hour and then rapidly fly into the canopy.

Flooded bloodwood forest is endangered in the French West Indies, due to a high anthropogenic pressure and resulting in forest fragmentation. The low dispersal capability of *P. romanae* does not allow a good genetic exchange between distant forests, and we are now face to a high risk of extirpation of the Grande-Terre populations.

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