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A New Species of *Prosopistoma* (Ephemeroptera: Prosopistomatidae) from Australia

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I.C. CAMPBELL and M.D. HUBBARD: A New Species of *Prosopistoma* (Ephemeroptera: Prosopistomatidae) from Australia.

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The nymph, female subimago and egg of *Prosopistoma pearsonorum* sp. n. are described from localities in far north Queensland, Australia. This is believed to be the only species of *Prosopistoma* known from Australia, the previous record of *P. sedlaceki* Peters being a misidentification.

Keywords: Ephemeroptera, Prosopistomatidae, *Prosopistoma*, Australia, Queensland.

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INTRODUCTION

The mayfly family Prosopistomatidae was first recorded from Australia by Pearson and Penridge (1979). They collected a total of five larvae from four coastal rivers in far north Queensland which they recorded as *Prosopistoma sedlaceki* Peters, although they were uncertain of the correctness of the identification (Richard Pearson pers. commun.). Following further collecting in the same region in 1987–8 one of us (ICC) collected larvae of *Prosopistoma* at several additional sites in far north Queensland, as well as female subimagines at a site on the Mitchell River. Although Pearson and Penridge's original material could not be located it would appear that only one species of *Prosopistoma* occurs in the region, and that it is a new species, distinct from *P. sedlaceki* which is known only as nymphs from New Guinea.

METHODS

Material was prepared by the methods suggested by Edmunds et al. (1976) except for the eggs which were critical point dried before gold coating for scanning electron microscopy. Drawings were prepared with the aid of a microprojector. Morphological terms and conventions are consistent with those used by Peters (1967). All types were collected by I. Campbell and are preserved in alcohol with wings, legs and nymphal mouthparts of several specimens mounted on slides. Type material has been lodged in the Museum of Victoria, Melbourne.

Prosopistoma pearsonorum sp. n.

Prosopistoma sedlaceki: Pearson and Penridge, 1979: 362 (misidentification); Campbell, 1988: 6 (misidentification); Campbell, 1990: 151 (stated not this species, but new). *Prosopistoma* "undescribed species": Peters and Campbell, 1991: 293, fig. 16.14a (nymph).

Material Examined. Holotype nymph, 6 paratype nymphs (two dissected with mouthparts and legs on slides) Mitchell River (16°31'S, 144°55'E) 27 January 1988, 15 T subimagines same locality 11 May 1988.

Mature Nymph. General colour light brown with dark brown pattern on the anterior 2/3 of mesonotum (Fig. 1). Width of head 2.4 × length; antennae 5–segmented, segment II equal in length to segments III–V. Labrum (Fig. 2) with lateral margins broad, truncate; outer canine of mandible (Figs. 3, 4) with 3 apical teeth, inner tooth largest, serrated at about half length, inner canine with 3 apical teeth, inner tooth largest with one large and 2 small serrations near base, 2 pairs of long hairs arising near base of inner tooth; segment II of maxillary palpi (Fig. 5) 1.5 × length of segment I, and almost 4 × length of segment III, 2 long, unserrated hairs arising from base of apical spines of galea–lacinea. Segment II of labial palpi (Fig. 6) 0.75 × length of segment I, segment III 0.5 × length of segment II. Maximum width of mesonotum slightly longer than length measured along medial suture, shape as in Fig. 1. Inner margin of prothoracic tibiae with 2 or 3 coarsely serrated spines distally (Fig. 13). Six abdominal gills, posterolateral projections on abdominal segments VII–IX broad, truncate, progressively broader posteriorly (Fig. 7). Head and body length 4.5 mm.

Female subimago. General colour brown, length 8.5–9.0 mm; mesonotum patterned in dark brown (Fig. 8) and about as wide as long, produced posteriorly to a point; wings (Figs. 9–10) grey. Legs (Fig. 11) not well developed, with tarsi reduced and delicate. Tergite of abdominal segment VI slightly shorter than tergites VII and VIII combined, tergites VII and VIII with acute posterolateral spines. Sternites IX and X produced posteriorly, with sternite X divided posteriorly (Fig. 12). Cerci and terminal filament short, subequal and emerging from a chamber formed by what appear to be the epiproct and paraprocts.

Egg. Size *ca* 150 × 100 μm. Micropyle funnelform, structures which we interpret as knob–terminated coiled threads (*sensu* Koss and Edmunds 1974) almost perfectly evenly dispersed, each surrounded by a floret of tubercles, the chorion between these structures densely tuberculate (Fig. 14).

Etymology: Named for Barbara and Richard Pearson in gratitude for the roast pork.

Comments. This species may be distinguished from all other species of *Prosopistoma* in the nymph by the following combination of characters: posterolateral projections of abdominal tergites VII–IX broad and truncate, dark pigmentation absent from posterior 1/3 of mesonotum and lateral margins of labrum truncate. It may be distinguished from the nymph of *P. sedlaceki* by inner tooth of right canine largest (instead of smallest), segment II of labial palpi shorter that

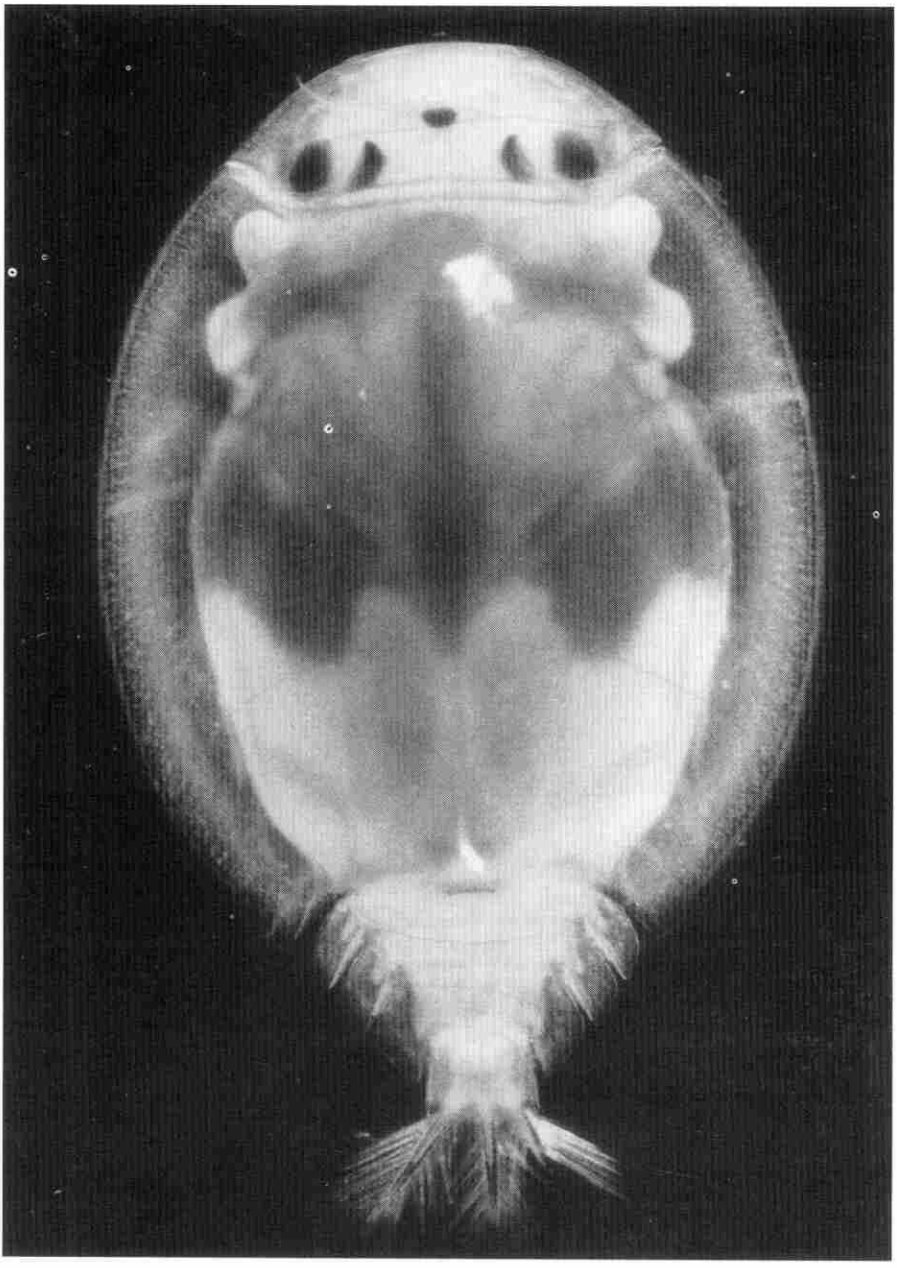
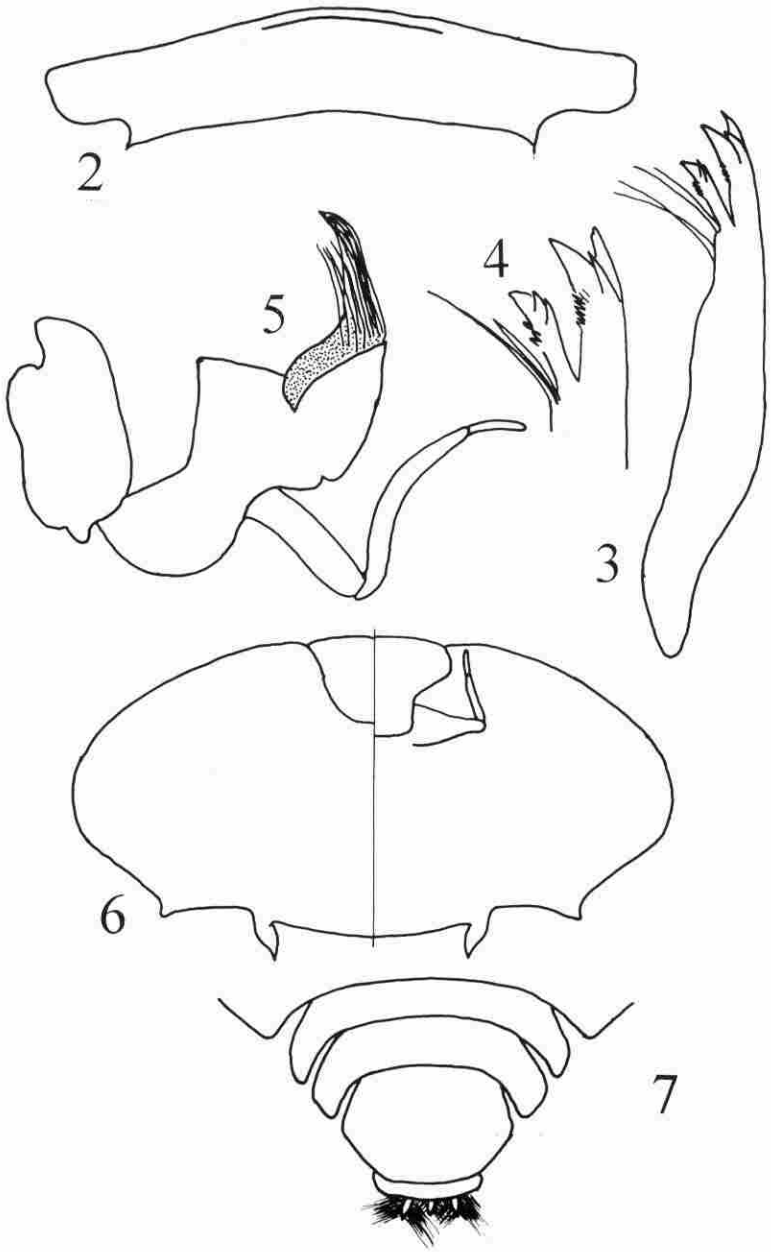
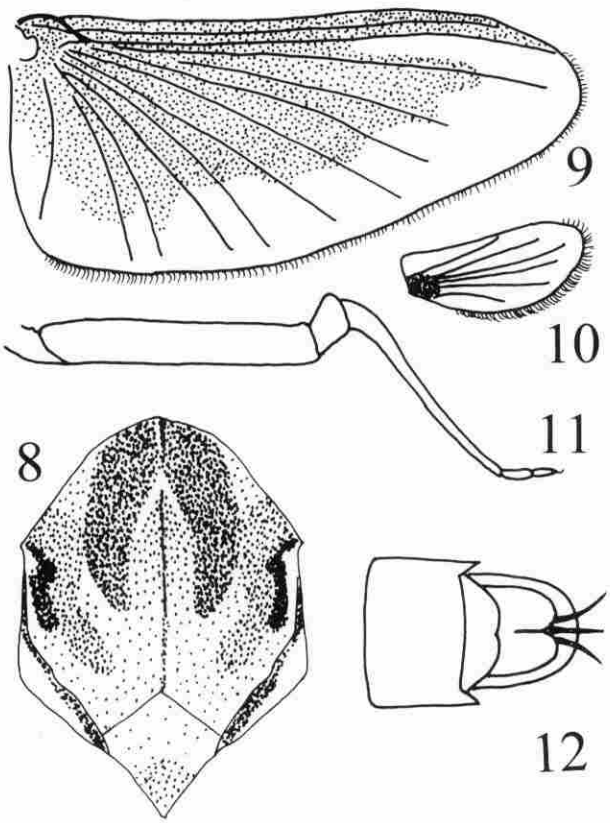


Fig. 1. *Prosopistoma pearsonorum* sp. n., dorsal view of mature nymph.



Figs. 2–7. *Prosopistoma pearsonorum* sp. n. nymph, dorsal view of labrum (2), right mandible (3), enlargement of canine of right mandible (4), right maxilla (5), labium with ventral surface on right (6), dorsal view of abdominal tergites (7).



Figs. 8–12. *Prosopistoma pearsonorum* sp. n., subimago, mesonotum (8), forewing (9), hindwing (10), foreleg (11), ventral view of terminal abdominal sternites (12).

segment I (vs. subequal in length), and segment III 1/2 length of segment II (vs. 1/3 length). Because only two other species of *Prosopistoma* are known from females, presentation of a useful differentiation in that stage is difficult. The egg differs from that described for *P. africanum* by Koss and Edmunds (1974) in having knob-terminated coiled threads which are absent in the African species, and a funnelform rather than a tagenoform micropyle.

Nymphs were collected on large boulders in fast current downstream of a pipe through a culvert at a locality known locally as "Cooktown Crossing". Subimagines were collected at a light just prior to dawn. In spite of quite intensive efforts no male imagines or subimagines were collected, and no nymphs collected appeared to be developing male characters; it is likely that the species is parthenogenetic.

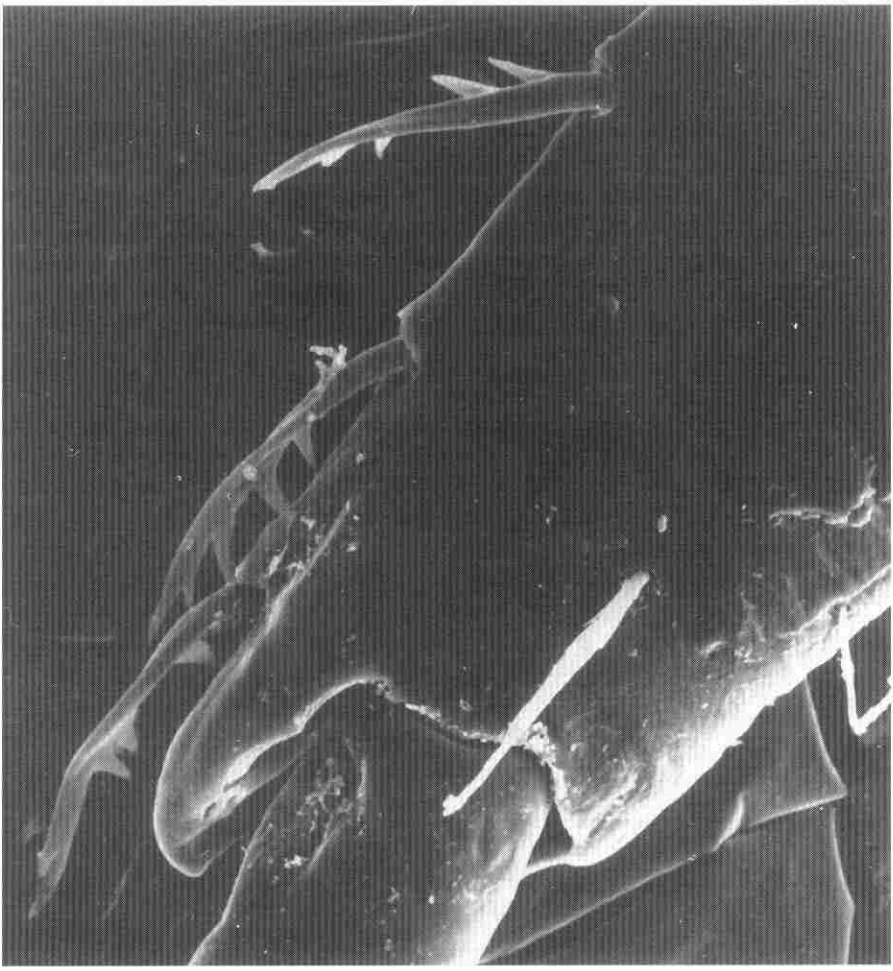


Fig. 13. *Prosopistoma pearsonorum* sp. n., scanning electron micrograph of distal tip of nymphal fore-tibia.

ACKNOWLEDGEMENTS

Part of this work was carried out while the senior author was on study leave at the Zoology Department, James Cook University; he is extremely grateful to Prof. Rhonda Jones and Dr Richard Pearson for the use of facilities during that period. Dr Richard Rowe and Mr Paul Clayton assisted with field work. The photograph of the nymph was taken by Mr Zolly Florian, James Cook University and the SEM of the egg by Ms Gunta Jaudzems, Monash University.

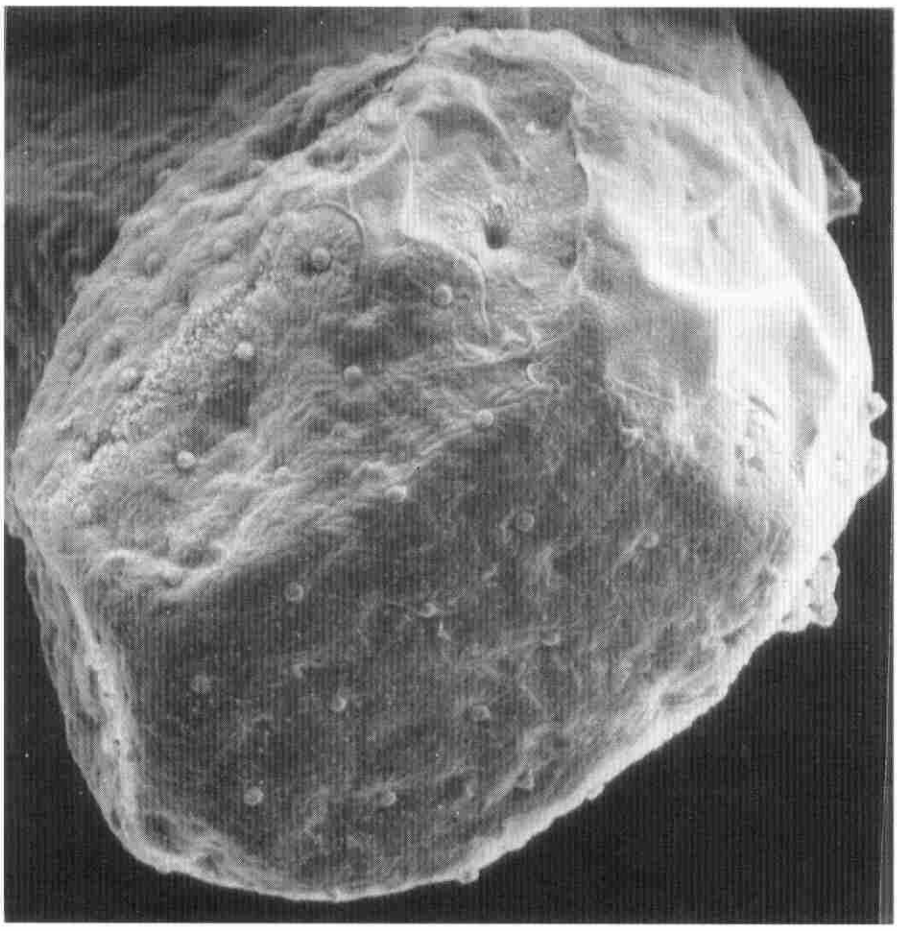


Fig. 14. *Prosopistoma pearsonorum* sp. n., scanning electron micrograph of egg dissected from subimago. The flattened facies occur because of the packing of the eggs inside the abdomen. The chorionic structures are partly obscured on the upper right area of this egg by mucus.

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