

DESCRIPTION OF LARVA AND PUPA OF
PARACALAIS PROSECTUS (CANDÈZE)
(ELATERIDAE, AGRYPNINAE, HEMIRHIPINI)

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ABSTRACT. Larva and pupa of *Paracalais prosectus* (Candèze, 1857) from Eastern Australia are described and illustrated. Larvae were collected under bark of decayed log of *Pinus ellioti*, together with Cerambycidae larva. Up to now, only the larva of *Paracalais gibboni* (Newman, 1857) was described.

KEY WORDS. Immature stages, larva, *Paracalais*, pupa

The genus *Paracalais* Neboiss, 1967, is formed by 21 Australian species. The adults are recognized especially by integument covered by dense whitish, yellowish or greyish scale-like setae intermingled by darker ones, pubescence of pronotum forming two small eye-like spots; third antennal segment transverse with spiniform appendix and 4th longer than two anterior together; third elytral interstice raised near base forming a dentiform tubercle. The unique larva described in the genus was *Paracalais gibboni* (Newman, 1857).

FROGGATT (1925) briefly described and illustrated the larva, pupa and adult of *Paracalais prosectus* (Candèze, 1857) emphasizing the habits of the larva and adult. In 1926 he presented the life history of this species.

NEBOISS (1967) studied the material described by FROGGATT (1925) as *P. prosectus* and verified that the correct identification for that material was *P. gibboni* (Newman, 1857). Based on the adult illustration (FROGGATT 1925: fig. 6) we agree with the first.

The description of larva and pupa of *P. prosectus* are presented. Firstly the last larval exuvia (reared) and one larva are studied, both identified as *P. prosectus*, and after, one larva associate with two adults of this same species.

The description and illustrations were based on the larva associate with the two adults, except those of antenna and maxillolabial complex, partially broken in the former. The unique pupa studied was identified based on the last larval exuvia. All material studied belongs to Forestry Commission of New South Wales, Sydney, Australia.

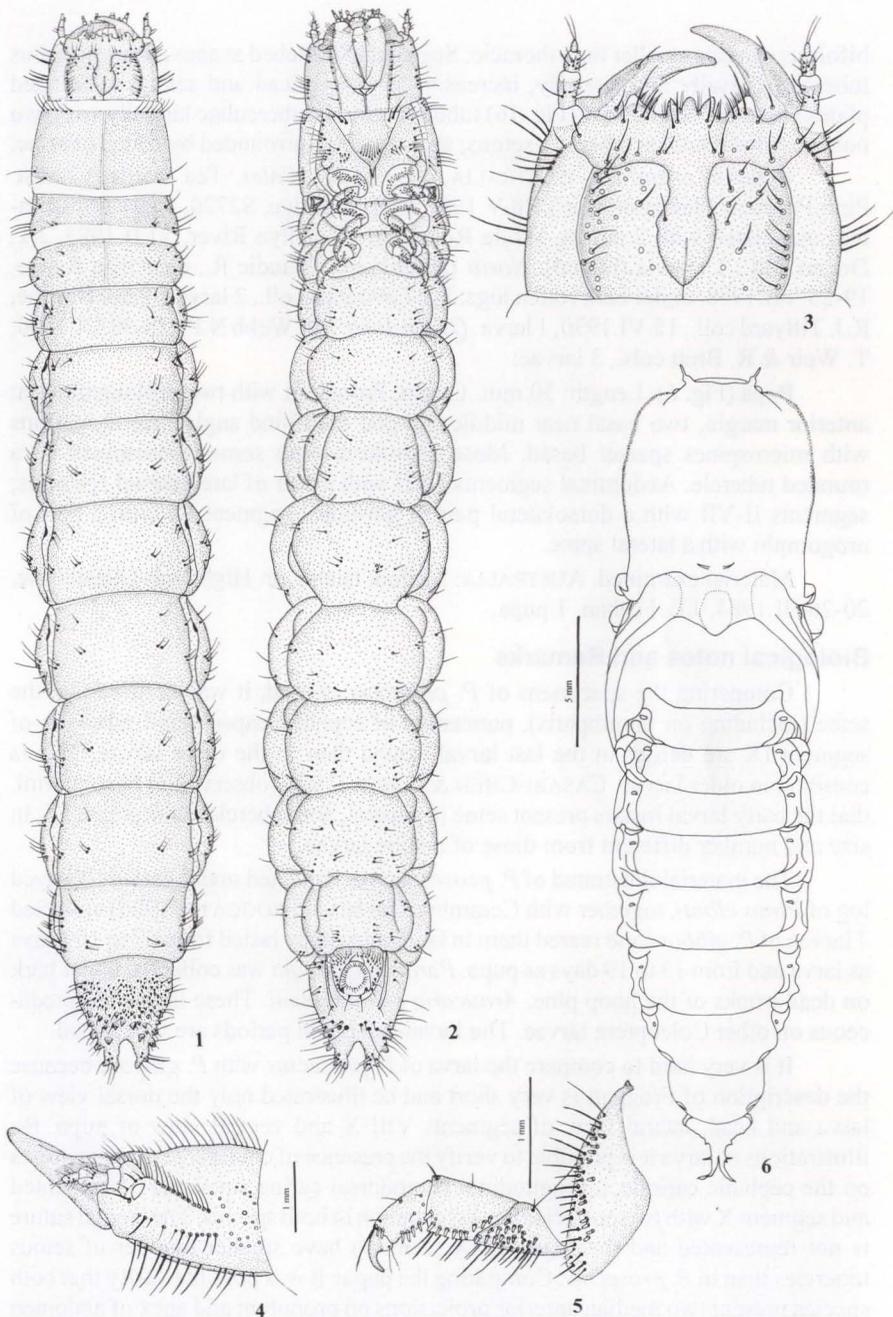
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Descriptions

Larva. Length: 40 mm; width of pronotum: 5 mm. Body dorsoventrally flattened. Yellow almost orange with black head, pronotum (except anterior and basal bands), anterior region of mesonotum, prosternum (except fore angles) and legs dark reddish-brown; anterior half of metasternum and segment VIII slightly orange (Figs. 1, 2).

Head prognathous (Figs 3, 4), deeply pigmented, heavily sclerotized, depressed, coarse punctate and setous dorsally; longitudinal dorsal ridge parallel lateral margins, setous internally; an inclined longitudinal dorsoventral and a short lateral setous groove; longitudinal ventral ridge parallel hypostoma, setous externally. Coronal suture long, extending between frontal arms. Endocarina absent. Frontal suture lyre-shaped. One subelliptical stemma laterally placed at base of each antenna. Nasal tridentate dorsally with a tuft of setae each side of each tooth; a transverse ventral carina with two setae near middle (Fig. 14). Paranasal lobes well developed, clear distally, marginate by fringe of yellowish thin setae; an irregular row with 3 longer and darker setae at distal border of darker area; each half with 13 setae inserted in coarse punctures and 1 pair near the narrower area. Antenna (Figs 7, 8) 3-segmented; basal segment bearing 8 setae (3 broken); 2nd bearing 13 (3 broken); apex of 2nd segment with a small and a tiny membranous cupuliform appendix; distal segment shorter with 2 long setae and several sensoria at apex. Mandibles (Figs 12, 13) very raised dorsally near acetabulum; two dorsal setae: one lateral near base and one lateromedian; penicillus formed by short setae. Maxilla (Figs 9, 15): stipites elongate, membranous distally; ventral region with lateral setae near proximal margin and a tuft near anterior border of darker area; dorsal region with a setous lateral area near apex and two triangular sclerites with short setae. Galea palpiform and 2-segmented; segments elongate; distal segment with a membranous rounded sensorial appendix and three setae at apex; lacinia densely setous, covered dorsally by ramified and simple setae. Maxillary palp setous and 3-segmented; distal segment with some dorsal setae peg-like in groove near base (Fig. 11); cardines elongate, each with one short seta and 1 sensory pore near base. Labium: prementum transverse, pentagonal, membranous at distal half; each side bearing 2 setae and some sensorial pores near middle and 1 seta near base; postmentum elongate, subtriangular, membranous distally; two setae each side near distal border of darker area and 2 near base; ligula membranous, dorsally bearing 2 distal setae and several sensory pores. Labial palp 2-segmented, more setous dorsally, distal segment with dorsal setae peg-like in groove near base (Fig. 10).

Pronotum longer than meso- and metanotum together at median line; a transverse lateroanterior band of setae not reaching middle; two laterodorsal setae each side near base. Prosternum with two setae near each fore angle and a basal group; prothoracic tergum bearing longer setae near lateroanterior margin and some basal shorter near procoxa. Each side of meso- and metanotum with 7 setae. Mesosternum with a lateroanterior pair of well developed biforous spiracle with one seta near internal border. Legs (Fig. 5) stout; coxa, trochanter, femur and tibia with stout and hairy setae; tarsungulus bearing 2 basal setae. Each side of abdominal segments I-VIII bearing 6-8 dorsal and 7 lateral setae; a pair of laterodorsal anterior



Figs 1-6. *Paracalais prosectus*. (1-5) Larva: (1-2) habitus dorsal, ventral; (3-4) head dorsal, lateral; (5) metathoracic leg; (6) Pupa dorsal. Figures 1, 2, 6; 3, 4 respectively to same scale; figures 1-5: N.S.W.: Tea Gardens; figure 6: Norfolk Island.

biforous spiracle smaller than thoracic. Segment IX notched at apex, bearing setous tubercles dorsally and laterally, increasing in size apicad and setous sclerotized plates ventrally. Segment X (Fig. 16) tubular, ventral, tuberculate laterally with two posterior distal hooks; tubercles setous; anal opening surrounded by fringe of setae.

Material examined. AUSTRALIA, *New South Wales*: Tea Gardens (Aust. Pine-Products Plantation Nat.), 28.V.1987, R.H. Eldridge, S2720, 1 larva (illustrated) associated with 2 adults; White Rock For. Pk. Allyn River, 21.II.1983, J.T. Doyen coll., 1 exuvia (reared). *North Queensland*: Claudie R., near Iron Range, 19-25.VII.1978, under bark rotten logs, F.J. Lawrence coll., 2 larvae; Lake Barrine, R.J. Tillyard coll., 15.VI.1930, 1 larva. *Queensland*: Mt. Webb N.P., 28-30.IX.1980, T. Weir & R. Brett cols., 3 larvae.

Pupa (Fig. 6). Length: 30 mm. Cream. Pronotum with two prolongations at anterior margin, two basal near middle and one each hind angle; lateral margins with microspines sparser basad. Meso-pterotheca with some microspines on a rounded tubercle. Abdominal segments I-VII with a pair of laterodorsal spiracles; segments II-VII with a dorsolateral pair of gin-traps; segment IX with a pair of urogomphi with a lateral spine.

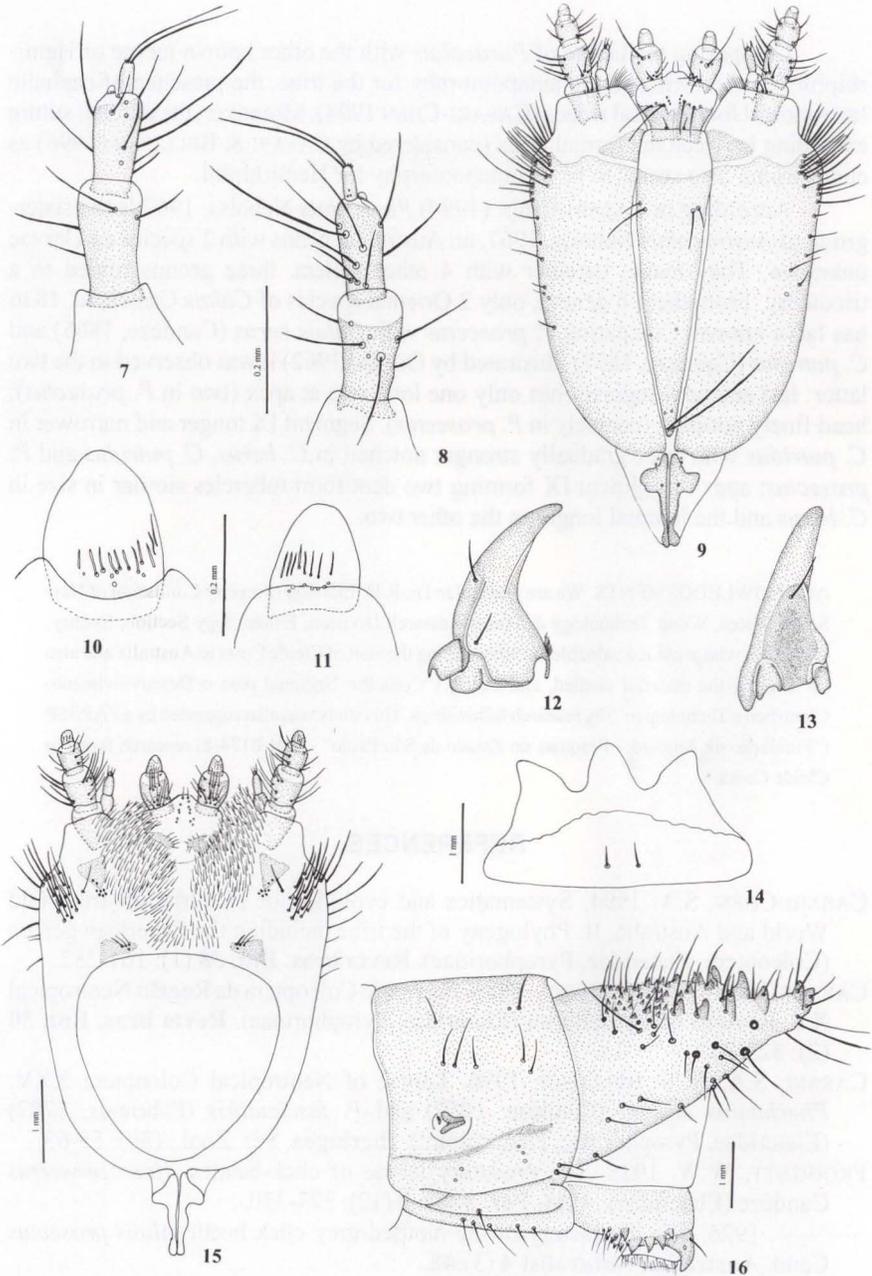
Material examined. AUSTRALIA: Norfolk Island, nr. Highlands Guesthouse, 20-26.III.1984, J.E. Feehan, 1 pupa.

Biological notes and Remarks

Comparing the specimens of *P. prosectus* studied, it was verified that the setae (including on mouthparts), punctation of cephalic capsule and tubercles of segment IX are denser in the last larval exuvia than in the other larvae. This is common in older larvae. CASARI-CHEN & COSTA (1986) observed in Pyrophorini, that the early larval instars present setae in general, and tubercles of segment IX, in size and number different from those of mature larvae.

The material illustrated of *P. prosectus* was collected under bark of decayed log of *Pinus ellioti*, together with Cerambycidae larva. FROGGATT (1926) collected 7 larvae of *P. gibboni* and reared them in laboratory; they lasted from 67 to 109 days as larva and from 13 to 19 days as pupa. *Paracalis gibboni* was collected under bark on dead trunks of the hoop pine, *Araucaria cunninghami*. These larvae are predaceous on other Coleoptera larvae. The larval and pupal periods are very broad.

It is very hard to compare the larva of *P. prosectus* with *P. gibboni* because the description of Froggatt is very short and he illustrated only the dorsal view of larva and head, lateral view of segments VIII-X and ventral view of pupa. By illustrations of larva it is possible to verify the presence of coarsely setous punctures on the cephalic capsule, a longitudinal laterodorsal carina, antennae 3-segmented and segment X with two posterior hooks, common in both species. The frontal suture is not represented and the segment IX seems to have smaller number of setous tubercles than in *P. prosectus*. Comparing the pupae it was possible verify that both species present two median anterior projections on pronotum and apex of abdomen with one pair of urogomphi each with lateral spine. It is not possible to verify if *P. gibboni* has the two other pairs of smaller projections at base of pronotum, present in *P. prosectus*.



Figs 7-16. Larva of *Paracalais prosectus*, larva. (7-8) Antena ventral, dorsal; (9, 15) maxillae and labium ventral, dorsal; (10-11) distal segment of palp labial, maxillar (dorsal); (12-13) mandible dorsal, laterosternal; (14) nasal ventral; (16) VIII-X abdominal segments lateral. Figures 7, 8; 9, 15; 10, 11; 12-14, respectively to same scale. Figures 7, 8: N.Q., Claudie R., nr Iron Range; figures 9-11, 15: N.Q.: Lake Barine; figures 12-14, 16: N.S.W., Tea Garden.

Comparing the larvae of *Paracalais* with the other known larvae of Hemirhipini, it is confirmed the autapomorphy for the tribe, the presence of cephalic laterodorsal longitudinal ridges (CASARI-CHEN 1994). Moreover, the coronal suture extending between the frontal arms (considered by CASARI & BELLUSCI (1996) as endocarina), also seems to be an autapomorphy for Hemirhipini.

According to CASARI-CHEN (1994) *Paracalais* Neboiss, 1967 is the sister-group of *Austrocalais* Neboiss, 1967, an Australian genus with 2 species and larvae unknown. They make, together with 4 other genera, three groups joined in a tricotomy. From these 6 genera, only 2 Oriental species of *Calais* Castelnau, 1836 has larva known. Comparing *P. prosectus* with *Calais berus* (Candèze, 1865) and *C. putridus* (Candèze, 1857) illustrated by OHIRA (1962) it was observed in the two latter: last antennal segment has only one long seta at apex (two in *P. prosectus*); head finely punctate (coarsely in *P. prosectus*). Segment IX longer and narrower in *C. putridus* with apex gradually stronger notched in *C. berus*, *C. putridus* and *P. prosectus*; apex of segment IX forming two dentiform tubercles similar in size in *C. berus* and the internal longer in the other two.

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