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A new cave-dwelling cockroach from Western Australia (Blattaria: Nocticolidae)

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Abstract

A new cavernicolous cockroach, *Nocticola flabella* sp. nov. is described.

Introduction

Three species of *Nocticola,* namely *babindaensis* Roth, *australiensis* Roth, and one unnamed are found in Queensland, Australia (Roth 1988). In this paper I describe a new cavernicolous species of *Nocticola* from Western Australia. Most of the specimens were collected by Dr. W.F. Humphreys of the Western Australian Museum, Perth (WAMP) and sent to me by Dr. D.C.F. Rentz of CSIRO. I received one specimen from Dr. M.R. Gray of the Australian Museum, Sydney (AMSA).

In addition to describing the new taxon and providing a key to the Australian males of the genus, I am transferring *Paraloboptera rohini* Fernando to *Nocticola.*

Systematics

Nocticola flabella, sp. nov.

(Figures 1-8)

Holotype: ♂, Cape Range, Western Australia, Cave C118, 16.viii. 1988, Humphreys *et. al.,* Western Australian Museum, Reg. No. 88/2682.

Paratypes: Cape Range, Western Australia. WAMP: Cave C169, one ♀, 31.x.1987, R. Wood and M. East, W.A. Mus. Reg. No. 88/2683-4. The following were collected by Humphreys *et al.*: Cave C169, one nymph, 13.viii.1988, W.A. Reg. No. 88/2665; Cave C118, one nymph, 5.ix.1988, W.A. Mus. Reg. No. 88/2672; Cave C103, one ♀, 7.ix.1988, W.A. Mus. Reg. No. 88/2673-4, one ♀, 1 nymph (Area D), 15.viii.1988, W.A. Mus. Reg. No. 88/2667-8; Cave 167, one ♂, one ♀, 10.viii.1988, W.A. Mus. Reg. No. 88/2663-4. AMSA: Cave C126, one ♂, dark zone in litter soil floor, 19.ix.1988, S. Eberhard and M. Gray.

All specimens were originally preserved in alcohol and, except for the AMSA ♂, were cleared and mounted on slides in Permount. Figures 1-7 were drawn from slide mounted specimens.

The following information regarding the caves in which *N. flabella* was collected was kindly supplied by Dr. W.F. Humphreys:

C103 (Trionomo: 22°07′27″S 114°59′21″E). About 60 m deep with two vertical descents leading to some horizontal development where temperature was 23°C, 95% RH, and 38% soil water. Little litter in the caves and all contain many species of isopods and troglobitic millipedes.

C118 (not named: 22°09′21″S 113°59′27″E). A dry steam bed containing water-smoothed pebbles runs between mud-banks on cave floor before bifurcating to a lateral

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exit and two sump holes. Temperatures ranged from 17°C to 25.2°C with relative humidities varying from 63% to 100%. In addition to *N. flabella,* this cave contains large populations of earthworms, oniscoid isopods and white millipedes. At least 12 invertebrate species are present and small mammals have also been seen.

C167 (Spiral: 22°09′09″S 113°59′39″). Narrow pothole ends in a horizontal lead (walking height) which bifurcates. About 40 m deep and 30 m horizontal extent; at bottom 27°C, 100% RH, 0.5% CO_2. Troglobites are only found in the range at 12% soil water in mudbanks.

C169 (not named: 22°06′2″S 114°00′27″E). Narrow pothole perhaps 35 m deep opening into two chambers connected by a tiny hole into the chamber where *N. flabella* was found. Chamber was 28°C, 98% RH, soil moisture 26.8%, with almost no organic debris.

Diagnosis (see also key below)

Cavernicolous. Male: Eyes absent. Tegmina reduced, fan-shaped, hind wings absent. Anteroventral margin of front femur with a row of minute spines, terminal spines absent, pulvilli and arolia absent, tarsal claws symmetrical, minute. Abdominal terga unspecialized. Female: Eyes absent. Apterous.

Description

Male. Head exposed, eyes absent (Figure 1). Pronotum elongate, relatively narrow (Figure 1). Tegmina greatly reduced, fan-shaped, coriaceous, veins absent, surface with some minute spicules; hind wings absent (Figure 1). Legs very long, femurs uniformly slender; anteroventral margin of front femur with a row of minute spinules, terminal spines absent (Type C_0); pulvilli and arolia absent, tarsal claws minute, symmetrical (Figure 7). Abdominal terga unspecialised. Supraanal plate broad, sides weakly angled, corners broadly rounded, medial region of hind margin indented; right and left paraprocts similar, lightly sclerotized plates (Figure 3). Subgenital plate asymmetrical with hind margin concavely excavated, styles absent (Figures 4, 5; in Figure 4 the hind margin of the plate is weakly concave and flattened; in Figure 5 the mounting medium was thicker with less distortion of the plate). Genitalia as in Figure 4: genital hook on left side, other phallomeres complex. Colorless except for pale amber around the mouthparts, and darker amber tegmina (Figure 8).

Female. Apterous. Eyeless (Figure 2). Supraanal plate convexly rounded (Figure 6). Subgenital plate valvular.

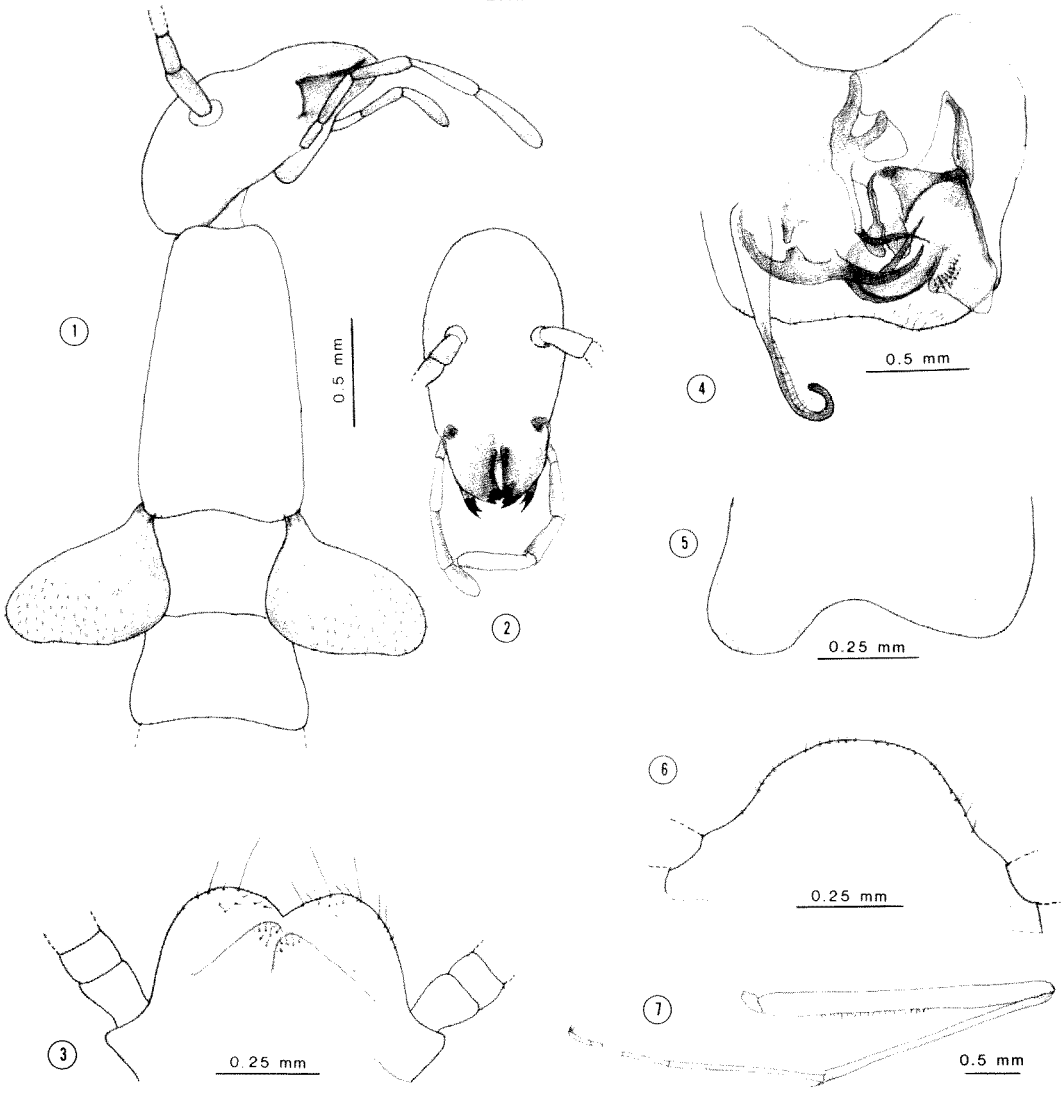
Measurements (mm) (♀ in parentheses). Length, 4.6-5.5 (4.1-5.7); pronotum length x width, 1.3 x 0.8 (0.9-1.2 x 1.0-1.4); tegmen length, 0.7-0.8.

Etymology

The specific name refers to the fan-shaped male tegmina.

Comments

Although males of *Nocticola* may have reduced tegmina, the fan-shape in *flabella* is unique for the known members of the genus. The absence of a male tergal gland places *flabella* in the *simoni*-species-group (Roth 1988).



Figures 1-7. *Nocticola flabella,* new species. 1, 5, ♂ holotype, 3, 4, ♂ paratype, 2. 6. 7, ♀ paratype. 1, Head (lateral view), thorax and tegmina (dorsal view); 2, Head (frontal view); 3, Supraanal plate and paraprocts (ventral view); 4, Subgenital plate and genitalia (dorsal view); 5, Distal part of subgenital plate (ventral view); 6, Supraanal plate (dorsal view); 7, Front leg (coxa not shown) (anterior view.)

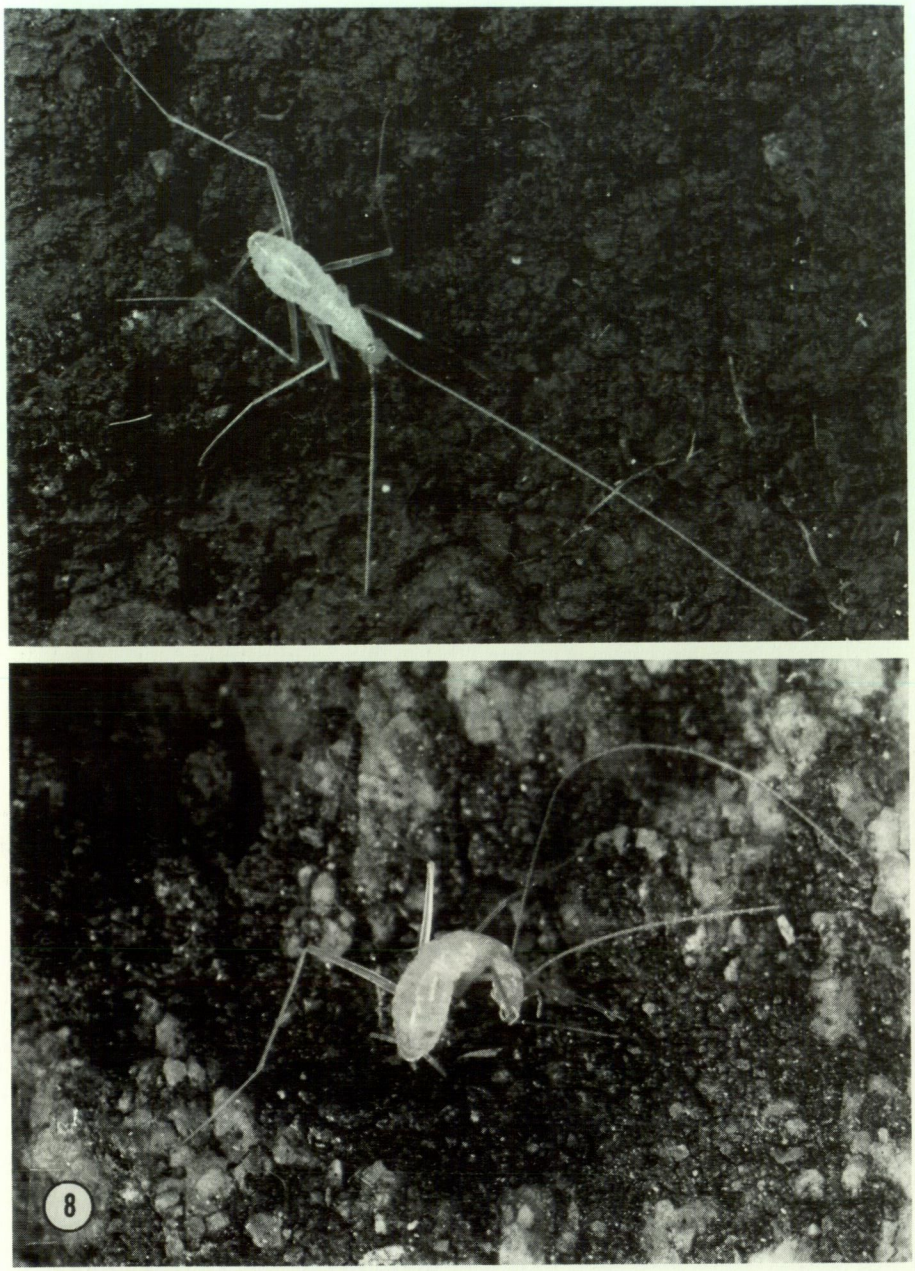


Figure 8. Two views of a living male *Nocticola flabella,* new species, the bottom figure shows the individua! cleaning its leg. (Courtesy of Western Australian Museum, through Dr. W.F. Humphreys).

Key to males of known Australian *Nocticola* species

1. Abdominal terga unspecialised 2
   Fourth abdominal tergum specialised 3
2. Tegmina greatly reduced in length, fan-shaped, hind wings absent. Eyes absent (cavernicolous) ..... *flabella*
   Tegmina and wings fully developed, Eyes normal. (epigean) ..... *babindaensis*
3. Specialisation on T4 non-setose, inverted V-shaped on postero-medial hind margin (cavernicolous) ..... *australiensis*
   Specialisation on T4 a large transverse depression filled with dark, recumbent setae (epigean): ..... unnamed

Nocticola rohini (Fernando), new combination

Paraloboptera rohini Fernando, 1957, p.7, pl.1-6, figures 1-18; 1962, p. 90, figures 14, 15; Princis, 1969, 1014 (sp. *incertae sedis*).

Although I was unsuccessful in obtaining Fernando's types, his excellent description and illustrations leave no doubt that *Paraloboptera rohini* is a *Nocticola*.

The male's tegmina are small lateral lobes, and hind wings are absent. Eyes are represented by a few ommatidia. There is only one style. An inverted-V-shaped gland with a small setal tuft is on the fourth abdominal tergum placing the species in the *uenoi*-species-group (Roth 1988). The female is apterous, and segments two and three of its cercus have three strong ventral spines or hooks. These have been noted on two proximal cercal segments of females of *Nocticola australiensis*, and *N. termitophila* Silvestri. Fernando described the ootheca which was still attached in the vertical position to the female; there are only four eggs and the keel and respiratory tubules are more like those found in the Blattellidae than the Polyphagidae.

Nocticola rohini was first taken in the jungle of Uraniya (Uva Province) in Sri Lanka, and is widely distributed on the island where it lives under stones and fallen tree trunks (Fernando 1962). This is the first record of *Nocticola* in Sri Lanka. Another nocticolid, *Cardacus willeyi* (Shelford) is also found on that island (Roth 1988: Table 1).

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