New species and records of cockroaches from Western Australia (Blattaria)

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Abstract Three new species of cockroaches from Western Australia are described, namely *Hensassurea humphreysi* (Blattellidae) and two cavernicolous taxa, *Nocticola brooksi* (Nocticolidae) and *Neotenopteryx wynnei* (Blattellidae). A few new records of some Western Australian Blattidae: Polyzosteriinae, and Blattellidae are given.

INTRODUCTION
This paper presents the results of a study of some cockroaches that were sent to me for identification by Dr W.F. Humphreys of the Western Australian Museum. It was expanded to include a few specimens from other museums but I have generally restricted the work to species found in Western Australia.

Specimens were borrowed from the following museums through the courtesy of their curators or collection managers: ANIC = Australian National Insect Collection, Canberra, ACT, Australia; Dr David Rentz. MCZ = Museum of Comparative Zoology, Harvard University, Cambridge, MA, U.S.A. NMV = Museum of Victoria, Melbourne, Victoria, Australia; Ms Catriona McPhee. NTM = Northern Territory Museum, Darwin. PMYU = Peabody Museum of Natural History, Yale University, New Haven, CT, U.S.A.; Dr Charles Remington. WAM = Western Australian Museum, Perth, Western Australia; Dr W.F. Humphreys.

SYSTEMATICS

Family Nocticolidae Bruner

Genus *Nocticola* Bolivar

*Nocticola* Bolivar: Roth, 1988: 298 (diagnosis).

Remarks
There are three described Australian species of *Nocticola* of which two, namely *australiensis* Roth (cavernicolous) and *babindaensis* Roth (epigean) are from Queensland (Roth 1988: 302, 303), and *flabella* Roth (cavernicolous) is from Western Australia (Roth 1991a: 17). Two additional species have been found in Western Australia, one of which is described and named below.
Figure 1  *Nocticola brooksi* sp. nov., paratypes from north Kimberley caves. A–D, male: A, head, pronotum, and tegmina (dorsal; the head is extended forward); B, front leg (anterior surface); C, supraanal plate (dorsal); D, subgenital plate (top) and genitalia (bottom) (dorsal); E, female, supraanal plate (dorsal).


**Diagnosis**
Cavernicolous. Male: Eyes represented by a few minute black ommatidia (however, see female, below). Tegmina reduced, reaching to about the first abdominal tergum, membranous, with veins reduced, setose, hind wings absent. Front femur Type C, pulvilli and arolia absent, tarsal claws simple, symmetrical, minute. Abdominal terga unspecialized. Styli absent. Female: Eyes as in male,
except in Cutta Cutta Cave specimens which completely lack ommatidia. Apterous. Hind margin of supraanal plate distinctly, concavely excavated.

Description

Male
Head exposed, eyes represented by a few minute, black ommatidia located behind the antennal socket (these black dots disappear when the specimen is treated with KOH and cleared in slide preparation). Pronotum suboval (Figure 1A). Tegmina greatly reduced reaching only to about the first abdominal tergum, membranous, 5 setose veins present (Figure 1A). Hind wings absent. Legs with femora not uniformly slender, tapering distad, anterocentral margin of front femur with a row of minute piliform spinules terminating in a stout spine (Type C), pulvilli and arolia absent, tarsal claws minute, simple, symmetrical (Figure 1B). Abdominal terga unspecialized. Supraanal plate transverse, hind margin shallowly, concavely excavated (Figure 1C). Subgenital plate with hind margin weakly uneven, styli absent (Figure 1D, top). Genitalia as in Figure 1D, bottom; genital hook on the left side. Colouration, yellowish.

Female
Eyes with a few dark ommatidia as in males, these completely absent from Cutta Cutta Cave females. Apterous. Hind margin of supraanal plate deeply concavely excavated (Figure 1E).

Nymphs
The immatures are white. All stages including what are probably first instars have the minute black ommatidia, but these are lacking from Cutta Cutta Cave specimens. The hind margin of the supraanal plates of both sexes are not distinctly excavated and appear to be convexly rounded.

Measurements (mm) (♀ in parentheses)
Length, 4.3 (4.8-5.7); pronotum length x width, 1.3 x 1.5-1.6 (1.4-1.7 x 1.7-2.0); tegmen length, 1.1-1.5.

Etymology
The species is dedicated to Mr R. Darren Brooks who collected the holotype.

Remarks
The absence of a male tergal gland places brooksi in the simoni-species-group (Roth 1988). This new species keys to couplet 2 in the key to male Australian Nocticola (Roth 1991a: 21), where it can be separated from N. flabella by differences in the shape and texture of the reduced tegmina and shape of the supraanal plate. The females can be separated by differences in the shapes of the supraanal plates.

It is interesting that nymphs and adult females (males were not collected) from Cutta Cutta Cave all lack the few minute ommatidia that are found in adult males, females, and nymphs from all other localities. The reason for this complete loss of eyes in the Cutta Cutta Cave is unknown. Humphreys (personal communication) speculates that "eye" retention in Nocticola may be connected with the openness of the cave system where light is intermittent. The Cutta Cutta Cave is totally dark.

The following information regarding the three distinct cave areas in which brooksi was collected was kindly supplied by Dr W.F. Humphreys:

Cutta Cutta Cave (8K-1) is a fully developed cave system with some depth. It is totally dark, except where it is lit as a tourist cave, and connects to permanent water in a joint controlled phreatic system.

Caves in the Ningbing Ranges (prefix KNI-) are part of a Devonian reef complex. For the most part they are grike developments which are frequently open to the surface so that there is intermittent light. Although this is not the case in some caves (e.g., KNI-19 and KNI-41), these populations are probably in continuity with those inhabiting the more open systems. The specimens were collected in the dry season so that the more open systems had become too dry to retain their populations – only the deeper recesses of the grike developments and the proper caves were still moist enough to have cavernicolous populations.

The Tunnel (KO-1) is in the Oscar Range which is part of a Devonian reef system that is separated by 550 km from a similar system in the Ningbing Ranges. It is a minor stream that cuts through the reef in a massive tunnel, but a minor side passage was humid.

Nocticola sp.

Material Examined

Remarks
All specimens are small (length about 4 mm or
less), white, eyeless, and lack tegmina and wings; in one specimen the posterior corners of the mesonotum are produced and appear to be nymphal tegminal pads which suggests that it is an immature male. Adult males of *Nocticola* may have fully developed tegmina and wings or their tegmina may be variably reduced and wings variably reduced or completely absent. Adult females are apterus. It is likely that the above specimens represent an undescribed species but adult males are needed to adequately describe a species in this genus.

**Family Blattellidae**

**Subfamily Blattellinae**

**Genus Hensaussurea** Princis


**Remarks**

There are 11 previously described species of *Hensaussurea*, all found in the southern half of Australia (Roth 1991b, fig. 45). Four species occur in Western Australia and of these at least three occur in the southwestern corner of the state. The new species, *humphreysi* described below also occurs in the southwestern part of Western Australia.

*Hensaussurea humphreysi* sp. nov.

Figures 2A–D

**Material Examined**

**Holotype**

δ, Perth, Kings Park, Western Australia, Australia, flight intercept-trough trap, ANIC 1047, January–February 1985, G.P. Hall (ANIC).

**Paratypes**

**Australia:** Western Australia: 3 δ δ, same data as holotype, 3 δ δ (1 with terminalia slide 351), 1 η, 5 nymphs (1 δ each in WAM and MCZ, remainder in ANIC).

All specimens were originally preserved in alcohol and then pinned; colour may have been altered by the fluid.

**Description**

**Male**

Head hidden under pronotum (Figure 2B). Interocular space about the same as distance between antenral sockets (Figure 2A). Pronotum subparabolic (Figure 2B). Tegmina reduced to lateral pads, completely separated from the mesonotum, and reaching to or slightly beyond hind margin of the mesonotum. Hind wings absent (Figure 2B). Front femur Type B2, with four large proximal spines; pulvilli present on four proximal tarsomeres, tarsal claws symmetrical, simple, arolia present. Abdominal terga unspecialized. Supraanal plate trigonal, apex with a shallow U-shaped excavation forming two small lobes, and a few short setae on either side of the excavation; paraprocts dissimilar, both with spinelike processes (Figures 2B, C). Subgenital plate with strongly dissimilar styli, the right one elongated with a few large spines along the margins, the spinelike apex directed towards the left and reaching the much smaller, cylindrical left style (Figure 2D). Genitalia as in Figure 2D: hook on the left side, with a preapical incision; median phallic plate distally enlarged, tapering to an acute apex; right phallic plate with two principal sclerites one of them a large cleft structure; overlying the right phallic plate is a membrane bearing four spines. Colour pale with dark markings: Head with pale occiput, a dark brown longitudinal band extending from the vertex to the lighter clypeus, labrum lighter brown, cheeks white (Figure 2A). Pronotal disk with a light brown macula on distal half, surrounded by a dark brown band, lateral and anterior borders white; the lateral pale borders of the pronotum continue on the tegmina and metanotum, and more narrowly on the abdominal terga; the mesonotum has two and metanotum four brown dots. The lateral pale margins of the abdominal terga are succeeded mesad by a dark brown longitudinal band, then by a large light brown middle zone (Figure 2B). Abdominal sterna brown, lateral margins pale. Cerci dorsally with two black basal segments, the remainder white, ventrally the cercomeres are dark brown on basal halves, and pale distally. Legs pale, without markings.

**Female**

Supraanal plate with apex shallowly excavated. Abdominal terga dark brown except for pale lateral borders, and a pale macula on either side of the midline on segments 1 and 2; supraanal plate with a white macula on distomedial region.

**Nymph**

The nymph resembles the adult (the colour pattern may differ only slightly) except for the complete absence of tegmina.

**Measurements (mm) (in parentheses)**

Length, 6.0–6.3 (ca. 6.0); pronotum length x width, 1.8–2.1 x 2.6–2.9 (2.1 x 3.0); tegmen length x width, 1.0–1.4 x 0.4–0.7 (1.0 x 0.6); interocular width, 0.6–0.7 (0.7).
Figure 2  *Hensaussurea humphreysi* sp. nov. A, B, ♂ holotype, head and habitus respectively; C, D, ♂ paratype: C, supraanal plate and paraprocts (ventral); D, subgenital plate and genitalia (dorsal).
Remarks
The strongly dissimilar male styli places H. humphreysi in the tricolor-species-group. The species keys out to couplet 4 (Roth 1991b: 626) where it can be separated from H. halmaturina Shelford (halmaturina-species-group) by the dissimilar styli, and colour pattern differences.

Etymology
The species is dedicated to Dr W.F. Humphreys, senior curator at the Western Australian Museum, who has sent me many cockroach specimens from Western Australia.

Hensaussurea pedestris Princis

Material Examined

Hensaussurea peniculus Roth
Hensaussurea peniculus Roth, 1991b, 631, figs. 49 (male and female).

Material Examined
Australia: Western Australia: Cape Range Peninsula, Site TL-4, pitfall traps, 22°06’S, 114°00’E, 17 May–3 June 1990, J.M. Waldock (WAM).

Measurements (mm)
Length, 7.0; pronotum length x width, 2.0 x 2.6 (sides deflexed); tegmen length x width, 1.3 x 0.9.

Remarks
The colour of this female differs somewhat from the unique female paratype. The pro- and mesonotum are yellowish and have a narrow dark brown transverse band on their hind margins. The first six abdominal terga are infuscated laterally, and segments seven to ten are yellowish and yellowish-white. Cerci are yellow on both surfaces. The specimen is slightly smaller than the paratype.

Paratemnopteryx sp. 1
Paratemnopteryx sp. 1 Roth, 1990: 580, figs 26A–C (male and female).

Material Examined
Australia: Western Australia: 1♀, Eneabba region, Cave E-22, 1 June 1991, C. Rippon (WAM); 1♂, Cape Range Peninsula, Cave C-79, 22°06’S, 14°00’E, 27 June 1989, W.F. Humphreys, R. Wood, CR’89 #3205 (WAM).

Remarks
This unnamed species combines characters of P. australis Saussure and P. rufa (Tepper). It was previously reported from Queensland (pitfall traps) and Northern Territory (bat caves). Its eyes are fairly well developed.

Genus Neotemnopteryx Princis

Remarks
There are ten previously known species of Neotemnopteryx, most of them occurring on the eastern coast of Australia; one of them, N. douglasi (Princis), is cavernicolous, and with another species, N. fulva (Saussure), occur on the southwestern coast of Western Australia (Roth 1990, fig. 34). The following new species is the second cave dwelling member of the genus.

Neotemnopteryx wynnei sp. nov.
Figures 3A–F

Material Examined
Holotype
♂, Cave 6N–747, eastern extension, 70 m from entrance, Nullarbor Plain, Western Australia, Australia, 2 January 1994, R. Wynne (S47), BES: 1256 (WAM 94/714).

Diagnosis
Cavernicolous. Male: Eyes absent. Tegmina reduced, widely separated, hind wings vestigial. Front femur Type A, pulvilli and arolia absent. Supraanal plate hind margin convexly rounded, entire. Subgenital plate trigonal; styli dissimilar, the right one slightly larger and at the apex of the plate, apices with numerous small black spines. Reddish brown.

Description
Male
Head exposed; eyes absent (Figure 3B); antennae filamentous. Pronotum subparabolic (Figure 3A).
Figure 3  Neotennopteryx wynnei sp. nov., ♂ holotype: A, habitus; B, head; C, subgenital plate (ventral); D, E, apex of subgenital plate showing styli (dorsal and ventral respectively); F, front leg (anterior view; coxa and trochanter not shown).

Tegmina reduced to well separated lateral, coriaceous pads, apices rounded, reaching to middle of second abdominal tergum (Figure 3A). Hind wings vestigial, narrow, hidden under tegmina, reaching to hind margin of first abdominal tergum. Front femur Type A3, five proximal spines widely spaced, succeeding row of seven smaller, equally long spines closer together; pulvilli and arolia absent, tarsal claws simple, symmetrical (Figure 3F); basitarsus of front leg about equal in length to the others combined (Figure 3F), of the mid and hind legs slightly longer than the others. Abdominal terga unspecialized (Figure 3A). Supraanal plate with hind margin convexly rounded, entire, not reaching apex of protruding subgenital plate (Figure 3A). Subgenital plate convex, trigonal, the sides at the apex thickened into rounded ridges; styli dissimilar, small, bulbous, sclerotised, both with numerous small dark spines, the right style larger at the apex of the plate, the smaller one a short distance to its left (Figures 3C–E). Colouration: Dark reddish brown. Head reddish brown with “ocular” area and clypeus, labrum, and mandibles lighter, yellowish (Figure 3B).

Female
Unknown.
Measurements (mm)
Length, 23.2; pronotum length x width, 6.8 x 8.8; tegmen length x width, 7.3 x 3.4; hind wings vestigial, hidden under tegmina.

Remarks
The other cavernicolous species in Neotemnopteryx, namely douglasi (Princis) (= Shawella douglasi Princis), from Jurien Bay, Western Australia, is distinctly different from N. wynnei, and has reduced eyes, longer tegmina, and a large densely setose tergal gland on the first segment (Roth 1990: 556).

Etymology
The species is dedicated to its collector, Mr Richard Wynne, a young speleologist.

Genus Trogloblattella Mackerras

Remarks
There is only one species in this monotypic genus, namely T. nullarborensis Mackerras, and it is found only in Western and South Australia. Trogloblattella chapmani Roth was described from limestone caves in Sarawak (Roth 1980: 97) but this species has been transferred to Neotrogloblattella Roth (Roth 1991c: 1017).

Trogloblattella nullarborensis Mackerras
Trogloblattella nullarborensis Mackerras, 1967a: 39, pl. 1A–D, figs 1–6; Roth, 1990: 558, Figures 15A–I, 35

Material Examined
Australia: Western Australia: Nullarbor Plain: 1 ♂, 1 ♀ nymph, Cave 6N–707, terminating chamber, 700 m from 10 m vertical entrance, ca. 30 km N. of Mundrabilla Homestead, 28 December 1993, BES.1254, (L13) (WAM); 1 ♂, same data except BES.1255 (M11), Norm Poulter (WAM); 1 ♀ nymph, Cave 6N–36, dark zone, ca. 10 m from entrance, 4 January 1994, M. Melh, BES.1258 (WAM); 1 ♂, Cave 6N–37, between the drop off and camp, 5 January 1994, BES.1259 (L2), N. Poulter (WAM); 1 nymph, Cave 6N–748, dark zone ca. 30 m from entrance, 3 February 1994 (S76), R. Wynne (WAM).

Subfamily Pseudophyllodromiinae
Ellipsidion humerale (Tepper)
Ellipsidion humerale (Tepper): Hebard, 1943: 110, Pl. XII, fig. 10; Princis, 1969: 986 (literature).

Material Examined
Australia: Western Australia: Cape Range Peninsula: 1 ♀ (tegmina and wing on slide 25), camp, near 22°15’S, 114°03’E, headtorch, 21 May 1990, Brooks, CR 90 #135 (WAM).

Remarks
The species has also been recorded from Northern Territory, and Central and Western Australia. The type specimen is a female from “Northern Territory of South Australia”. Hebard suggested that E. lactum Hanitsch, from Burnside, Northern Territory may be a variant of humerale.

There is considerable colour variation in this species and Hebard suggested that those from Western Australia may represent a more western race or species but that a “Detailed consideration of large series is necessary to determine which.” I have available a large number of specimens from different localities and time permitting hope to study the variation in colour, size, and genitalia in this taxon.

Family Blattidae
Subfamily Polyzosteriinae
Drymaplaneta semivittata (Walker)
Drymaplaneta semivittata (Walker): Mackerras, 1968b: 547, figs 37a–c, 45, 91 (male and female).

Material Examined
Australia: Western Australia: 1 ♀, Triggs, near Perth, 5 December 1965, Ch. Morris (PMYU).

Remarks
This species is confined to the south-western part of Western Australia, where apparently it is a common domestic pest throughout Perth and other settlements.

Platyzosteria (Melanozosteria) ?nigrofasciata (Shaw)
Platyzosteria (Melanozosteria) nigrofasciata (Shaw): Mackerras, 1968a: 285, figs 87, 102, 120, pl. 2G (redescription: male and female).

Material Examined
Australia: Western Australia: 1 ♂, Cape Range Peninsula, near Cave C-60, 22°06’S, 113°59’E, 17 May 1990, J. Waldock (WAM).

Remarks
This specimen keyed closest to nigrofasciata (Mackerras 1968a: 240). However, the hind margin of its vestigial tegmina are separated from the...
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mesonotum by a little more than half its length (rather than about one third; see fig. 120 in Mackerras, 1968a) and the middle of the pronotal disk is yellowish rather than solidly dark (pl. 2G in Mackerras 1968a).

**Platyzostra (Leptozostra) spenceri Shelford**

**Platyzostra (Leptozostra) spenceri Shelford:**
Mackerras, 1967b: 1295, figs 104, 110, pl. 4, figs 4, 5 (redescription).

**Material Examined**

**Holotype**
δ (probably a nymph), “Central Australia”, Spencer Gillen Expedition, 1901–02 (NMV).

**Other Material**

**Australia: Northern Territory:** 1 nymph, base of Ayers Rock, 22 May 1954, C.A., Geelong College Expedition (NMV). **Western Australia:** 1 ♀ nymph, nr. Boonooa Pool, Pigandy Creek, Ashburton District, 27 August 1975, P.C. and C.W. Kendrick (WAM 92/659); 1 nymph, 130 miles SE. of Broome, September, A.S. Cudmore (NMV).

**Remarks**
The species is known only from nymphs and has been reported from Northern Territory, South Australia, and Western Australia.

**Zonioploca pallida Shelford**

**Zonioploca pallida Shelford:** Mackerras, 1965: 911, figs 5, 14, 23, pl. 1, figs 5, 6 (redescription, male and female).

**Material Examined**

**Australia: Western Australia:** 1 ♀ with ootheca, Perth, 15 October 1931, Darlington, Australia/ Harvard Expedition (MCZ).

**Remarks**
The species is restricted to the southwestern corner of Western Australia.

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**REFERENCES**


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