

AUSTRALIAN BLATTIDÆ.

WITH DESCRIPTIONS OF ELEVEN NEW SPECIES.

BY ELAND SHAW, M.R.C.S., F.E.S., &c.

(Seventeen original Text-figures.)

IN the following paper sixteen species of BLATTIDÆ are dealt with, eleven of which are new to science; nine of these are from Queensland, one from Victoria, and one from Western Australia; and two cosmopolitan species are noted, which have not previously been recorded from Australia.

A revision of the genus *Cutilia* Stål will soon be advisable. The tegminal vestiges may be entirely absent, as in *Cutilia tepperi* mihi, and the diagnosis of the genus as given by Shelford in Wytzman's *Genera Insectorum*, Fasc. 109 (1910), should be enlarged to include this, a fact not to be wondered at when the close alliance between *Cutilia* and *Platyzosteria* is considered. Shelford includes six species in the genus *Cutilia*, and in the present paper five new species are added to these.

The following definitions of the words "Type" and "Cotype" are thought desirable, in view of the misuse of these terms which now commonly prevails:—

"Type"—The actual specimen from which a description is written, when only one specimen has been so used; and the use of the word prohibits the use of the word *Cotype* in respect of the same species. *Note.*—There may be separate types of ♂ and ♀.

"Cotype"—One of a series of two or more actual specimens from which a description is written; and the use of the word prohibits the use of the word *Type* in respect of the same species. *Note.*—There may be separate cotypes of ♂ and ♀.

ON THE ABBREVIATION OF THE ORGANS OF FLIGHT IN CERTAIN BLATTIDÆ.

The organs of flight of many Blattidæ display an abbreviated condition usually known amongst Blattidists as "rudimentary"; but it appears evident, from a consideration of the numerous apterous and semi-apterous Blattid forms, that these abbreviated tegmina and wings should be regarded as vestiges of lost organs, rather than as rudiments of organs to come. Sometimes as in *Escala*—an Ectobine genus—the males have the tegmina and wings fully explicate, whilst in the females

these are represented by squamiform lobes; and I have previously shown¹ that the female of *Escala circumducta* Walk. was erroneously described as a species of the genus *Loboptera* Brunner. In this instance the females, having come to spend their entire existence under the bark of trees, have almost discarded their organs of flight; whilst the males, only associated with them during a brief pairing season, have retained theirs. A similar sexual dimorphism obtains in the Panchlorine genus *Oniscosoma* Brunner, the females of which are wholly apterous, whilst the males are fully winged. Here both sexes may be found together under bark all the year round, and I have never taken the male on the wing; and both sexes are typically depressed insects. The same occurs commonly in the Epilamprinæ; whilst in the *Polyzosteria* group of the Blattinæ may be found every condition of the flying organs, from the fully spread tegmina and wings of both sexes of *Methana* Stål, through the quadrate tegmina and squamiform wings of *Scabina* Shelf., the quadrate tegmina and absent wings of *Tennelytra* Tepper, the squamiform tegmina and absent wings of most species of *Polyzosteria* Brunner and *Cutilia* Stål, up to the completely apterous condition of the whole of *Polyzosteria* Burmeister, and many species of *Polyzosteria* and *Cutilia*: some apterous species still showing in a faint crumpling of the lateral parts of the mesonotum and metanotum a vestige of the unrequired and discarded organs of flight. My experience of the *Polyzosteria* group (with the exception of the genus *Polyzosteria* itself, of whose habits I am at present in ignorance), and of the other semi-apterous and apterous forms alluded to above, leads me to the conclusion that all the known species are cryptic in their habits, being found under fallen wood, under loose bark of standing trees, and in crevices; very seldom seen until their habitat is disturbed; and that there is a definite correlation between a depression of form and an absence of flying organs.

In *Panesthia* there are in the one genus examples of the various stages in this advance, from species with fully explicate tegmina and wings, to completely apterous forms, with the addition of what appears to be an intermediate stage. I refer to the condition which Brunner v. Wattenwyl² writes of as an accidental mutilation found in several species of *Panesthia*. It has been previously suggested by me³ that this was a purposeful rather than an accidental abbreviation of the flying organs, and I look upon it as one of the early steps towards the discarding of organs of flight in species whose modified habits no longer demand their retention. The squamiform tegmina and wings would be a further step, and a condition to be properly described as vestigial rather than rudimentary. Dr. R. J. Tillyard informs me that no adult fossil cockroaches are known with abbreviated organs of flight; and it seems probable that Mr. Shelford⁴ was right when he suggested, though on other grounds, that our *Polyzosteria* group of cockroaches, instead of being primitive forms, are on the contrary very highly evolved.

¹ Shaw: Victorian Naturalist, xxxi, 7, 1914, p. 101.

² Brunner: Nouv. Syst. Blatt. 1865, p. 391 *et seq.*

³ Shaw: Viet. Nat., xxxi, 7, 1914, p. 107.

⁴ Shelford: Trans. Ent. Soc. Lond. 1909, p. 254.

SUBFAMILY BLATTINÆ.

GENUS PLATYZOSTERIA Brunner v. Wattenwyl.

PLATYZOSTERIA INCURVA sp. nov.

Dark castaneous to black, except portions of the distal abdominal somites, nitid. Visible margins of all the tergites and abdominal sternites ciliate. Head reddish brown, margin of the clypeus and labrum paler, antennæ concolorous. Thoracic tergites with a few shallow punctures, and furnished with a sparse erect pubescence. No vestiges of tegmina or wings. Posterior angles of the 5th abdominal tergite backwardly produced: of 6th more strongly produced, and the posterior third of this tergite is occupied in about its outer fourth by an orange yellow macula, broadest externally, and not reaching to the extreme margin which is dark: 7th abdominal tergite with the posterior angles strongly produced backwards, posterior third orange yellow, but the lateral margins of the tergite and the apices of the spines are dark: 9th abdominal tergite orange yellow except the angles which are black, and which are produced into sharp spines. Supra-anal lamina of ♂ (Text-figure 1) black, trigonal, apex truncate, widely and deeply emarginate with 1 to 3 spines about the posterior external angles. Cerci large, depressed, black, with the tips reddish brown, exceeding the supra-anal lamina in length. Supra-anal lamina of ♀ (Text-fig. 3), trigonal, apex truncate, with a wide shallow emargination, angles denticulate. Subgenital lamina of ♂ (Text-fig. 2) subquadrate with rounded angles, terminating in two large, strongly incurved, acuminate processes or spines. Styles long, acuminate, black, with tips reddish brown, and inserted externally to the base of the large incurved spines. Subgenital lamina of ♀ black, lateral margins yellow, valves black. Coxæ margined with yellow. Legs reddish brown. Posterior metatarsus nearly as long as the remaining joints, not spined, with its pulvillus occupying nearly the whole length of the joint. Arolia large.

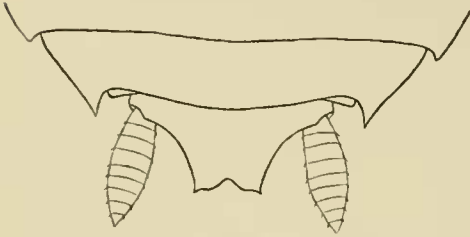
Length.—♂ 16 mm.; ♀ 16 mm. Pronotum 3 × 6 mm.

Types.—♂ and ♀, Coll. Auct. (Spms. No. 7 ♂ and No. 8 ♀.)

Habitat.—Queensland: Green Island—Moreton Bay, Cleveland, Wynnum (Auct.); Mt. Coot-tha near Brisbane (H. Tryon); Brisbane (J. C. Bridwell); "Near Brisbane" (Q. Mus.: H. Hacker).

NOTES.—The form of the subgenital lamina of the ♂ and the yellow colouring of the distal abdominal tergites, unlike anything else in the genus *Platyzosteria*, make this species quite distinctive. There is considerable variation, from castaneous to black, in the general colour. The orange-yellow portions of the distal tergites are also variable; the base of the supra-anal lamina of the ♂ being orange in some specimens, as are also the angles of the 9th tergite.

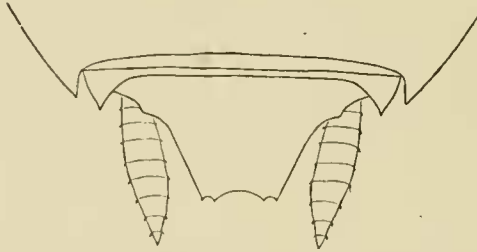
The subgenital lamina of the larval ♂ is similar to that of the adult, and that of the larval ♀ is of the usual Blattelline form.



Text-fig. 1.—*Platyzosteria incurva*.
Supra-anal lamina of ♂, much enlarged.
(Drawn from Spm. No. 9, Coll. Auct.)



Text-fig. 2.—*Platyzosteria incurva*.
Subgenital lamina of ♂, much enlarged.
(Drawn from the type, Spm. No. 7, Coll. Auct.)



Text-fig. 3.—*Platyzosteria incurva*. Supra-anal lamina of ♀, much enlarged.
(Drawn from the type, Spm. No. 8, Coll. Auct.)

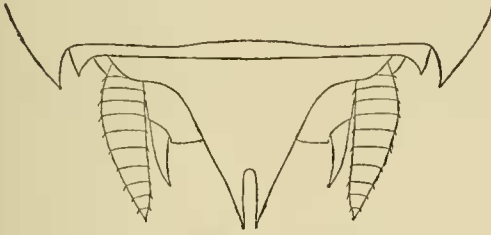
PLATYZOSTERIA SUBARMATA sp. nov.

Nigro-castaneous, nitid, a few scattered impressed dots on the thoracic tergites, lateral and posterior margins of all the tergites ciliate, not scabrous. Head nigro-castaneous ocelliform spots yellow, antennæ rufo-castaneous, with about the proximal $\frac{1}{6}$ of their length darker. Thoracic tergites somewhat rufous laterally, darker on the disc. No vestiges of tegmina or wings. Abdominal tergites with a darker band occupying the posterior half; margins more rufous, especially towards the apex of the abdomen, where the posterior lateral angles of the tergites and the distal portions of the appendages are rufo-castaneous. Angles of abdominal tergites 5, 6, and 7 backwardly produced; lateral margins of tergites 6 and 7 not denticulate. Supra anal lamina of ♂ (Text-fig. 4) triangular, produced into two long spines, with or without a spine on the lateral margin, extending beyond the cerci which are very long. Subgenital lamina of ♂ (Text-fig. 5) quadrate, emarginate, styles long, acuminate, slightly incurved, inserted laterally, and without a spine at the base. Coxæ margined with yellow, legs castaneous, anterior and middle femora paler than posterior femora. Distal tarsal joints paler than the metatarsus, which is rather long, not spined beneath, and with its pulvillus occupying almost the whole of its length. Arolia large.

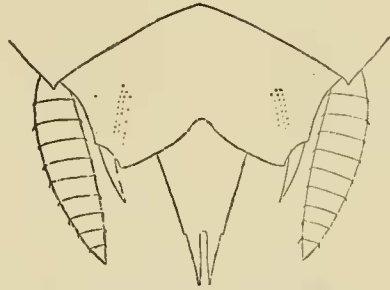
Length.—♂ 29-33 mm. Pronotum 7.9-5 mm. × 11.5-14 mm. Abdomen 13-15 mm. wide.

Type.—♂ Coll. Auct. (Spm. No. 4.)

Habitat.—Laidley, Queensland, 1 ♂ (Auct.); Brewarrina, N.S.W., 2 ♂ (W. W. Froggatt).



Text-fig. 4.—*Platyzosteria subarmata*.
Supra-anal lamina of ♂, much enlarged.
(Drawn from the type, Spm. No. 4, Coll. Auct.)



Text-fig. 5.—*Platyzosteria subarmata*.
Subgenital lamina of ♂, much enlarged.
(Drawn from Spm. No. 23, Coll. Auct.)

NOTES.—This species is nearly related to *P. armata* Tepper, from the Fraser Range, West Australia, described in Trans. Roy. Soc. S. Aust. 1893, p. 84, and redescribed and figured by Shelford in Trans. Ent. Soc. Lond. 1909, p. 273, Pl. vii, figs. 8 and 9. It differs however from *armata* Tepp. in its smaller and narrower proportions, darker colouring, and in several structural details, viz. :—The body is not scabrous; the lateral margins of the 6th and 7th tergites are not denticulate; and in the absence of a spine on the subgenital lamina at the base of the styles. Also the coxæ are bordered with yellow, whilst those of *armata* are concolorous. In *armata* the apices of the cerci, the styles, and the spines of the supra-anal lamina are about level, the spines extending but slightly further backwards; whilst in *subarmata* the long cerci and spines extend considerably beyond the styles.

I have not yet seen the ♀ of this species, and of the three ♂ known the supra-anal lamina of one is abortive.

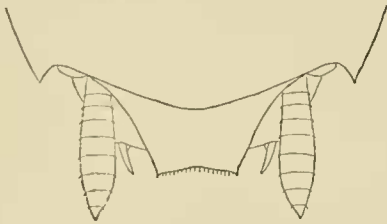
The type was taken under the bark of a *Eucalyptus* sp. near Laidley, Q.

GENUS CUTILIA Stål.

CUTILIA NITIDELLA sp. nov.

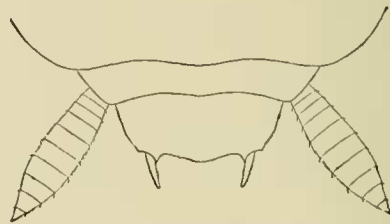
Dark castaneous to black, nitid, tergites finely punctate, with a sparse erect pubescence. Margins ciliate. Head with the vertex and frons furnished with a few erect hairs, castaneous, clypeus and labrum paler, ocelliform spots yellow, antennæ reddish brown with the second joint blackish. Tegmina vestigial, lateral margins somewhat thickened and everted, apex obliquely truncate, densely punctate. The tegminal punctures are much coarser than those of the tergites, and are coarser in the ♀ than in the ♂. In colour the tegminal vestiges are paler than the mesonotum,

and are usually rufo-castaneous. Wings absent. Abdominal tergites with their posterior angles backwardly produced, lateral margins, which are slightly thickened and paler, entire. Posterior margin of the 7th abdominal tergite sinuate. Supra-anal lamina of ♂ (Text-fig. 6) quadrate, angles obtuse, lateral margins everted, finely punctate, posterior margin ciliate, with a wide, shallow, angular emargination. Cerci extending considerably beyond the lamina in both sexes, tips fuscous. Supra-anal lamina of ♀ (Text-fig. 8) triangular, apex truncate, concavely emarginate, not densely ciliate, and with each external angle terminating in a definite spine, lateral margins ciliate. Subgenital lamina of ♂ (Text-fig. 7) subquadrate, posterior margin convex, with a stout spine at the base of the styles. Styles inserted on the posterior border within the angles, acuminate, slightly incurved. When viewed dorsally the styles partly conceal the laminal spines, thereby assuming a broad-based appearance. The two laminae are of about equal length. Coxæ bordered with yellowish on the upper surface (next the sternites) and are, with the femora, dark castaneous. Trochanters and tibiæ considerably lighter in colour, the tibiæ usually rufo-castaneous. Posterior metatarsus long, biseriately spined beneath, its pulvillus apical, remaining joints unspined, their pulvilli occupying their whole length. The two proximal joints of the tarsi are very dark castaneous; and the three distal joints much paler. Arolia present.



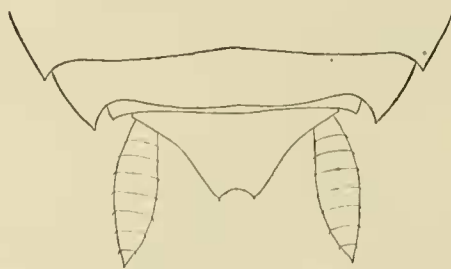
Text-fig. 6.—*Cutilia nitidella*.

Supra-anal lamina of ♂, much enlarged.
(Drawn from Spm. No. 24, Coll. Auct.)



Text-fig. 7.—*Cutilia nitidella*.

Subgenital lamina of ♂, much enlarged.
(Drawn from cotype, Spm. No. 12, Coll. Auct.)



Text-fig. 8.—Supra-anal lamina of ♀, much enlarged. (Drawn from Spm. No. 25, Coll. Auct.)

Length.—♂ 15-16 mm.; ♀ 17-18 mm. Pronotum 5.5 × 9 mm.

Cotypes.—2 ♂ and 2 ♀, Coll. Auct. (Spms. Nos. 11 and 12 ♂; Nos. 13 and 14 ♀.)

Habitat.—Queensland: Brisbane, Wynnum, Capalaba, Ormiston, Wellington Point, Tingalpa, Cleveland, Laidley (Auct.), Sunnybank (H. Tryon), Brisbane (Q. Mus.: H. Hacker), (J. C. Bridwell).

Ootheca.—Chitinous, longitudinally fluted, the length about twice the depth, carried with the suture uppermost, suture serrate. The ootheca of *C. nitidella* differs greatly from that of *C. nitida* Brun., which is very long and smooth. Comparative measurements are given below. One of the ♀ cotypes (Spm. No. 14, Coll. Auct.) has the ootheca still attached.

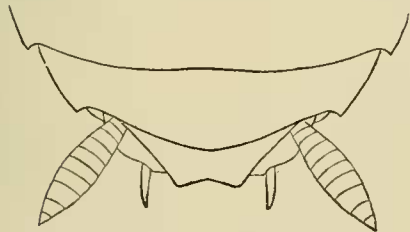
	<i>C. nitidella</i> mihi.	<i>C. nitida</i> Brun.
Length	8 mm.	17 mm.
Depth	4 mm.	5 mm.
No. of serrations	20	30
Longitudinal keels	Numerous, on sides and base.	One on each side, below suture.

NOTES.—This species is very common around Brisbane. At first sight it appears to be black but most of the specimens taken are nigro-castaneous. The colour of the legs with its alternating shades of dark coxæ, paler trochanters, dark femora, paler tibiæ, dark proximal and pale distal portions of tarsi, is distinctive; and this appearance is especially noticeable in the larvæ.

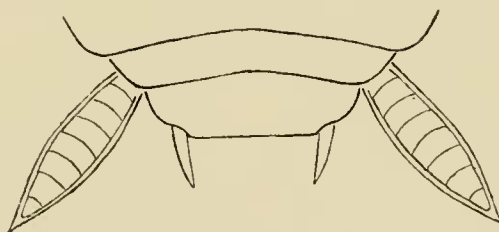
CUTILIA TEPPERI sp. nov.

Drymaplancta (Periplancta) circumcincta Tepper, MS.

Rufo-castaneous with a broad flavo-testaceous border all round. Discal colour darker towards the lateral borders and on the distal tergites, also considerably darker in the ♂ than in the ♀. The flavo-testaceous border is, on the margins of the tergites, outlined with reddish brown. Head with the vertex rufo-castaneous; frons yellow, the disc being occupied by a broad longitudinal reddish-brown macula; labrum fulvous, eyes black, antennæ testaceous. Lateral margins of the tergites slightly thickened. No vestiges of tegmina or wings. Posterior margins of abdominal tergites 1 and 2 slightly convex, of tergite 3 nearly straight, of tergites 4 and 5 slightly concave, and of tergites 6 and 7 sinuate. Posterior angles of tergites 5, 6, and 7 backwardly produced, that of 7th tergite more produced in the ♀ than in the ♂. Posterior margin of 7th abdominal tergite broadly flavo-testaceous. Supra-anal



Text-fig. 9.—*Cutilia tepperi*.
Supra-anal lamina of ♂, much enlarged.
(Drawn from Spm. No. 26, Coll. Auct.)



Text-fig. 10.—*Cutilia tepperi*.
Subgenital lamina of ♂, much enlarged.
(Drawn from Spm. No. 26, Coll. Auct.)

lamina of ♂ (Text-fig. 9) triangular, apex truncate, widely and angularly emarginate, lateral margins entire, a little everted, exceeding the subgenital lamina in length. Basal portion nigro-castaneous, apical portion flavo-testaceous. Cerei much exceeding the lamina in length, blackish, tipped pale. Supra-anal lamina of ♀ similar to that of ♂, but the emargination is concave rather than angular. Subgenital lamina of ♂ (Text-fig. 10) quadrate, angles obtuse, castaneous, no spines. Styles inserted externally to the angles, acuminate, slightly incurved, reddish-brown. Abdominal sternites fusco-castaneous; lateral and posterior margins paler in ♀. Legs testaceous, spines reddish brown, a castaneous macula at the base of the coxæ. Posterior metatarsus long, biserially spined beneath, its pulvillus apical; remaining joints unspined beneath, their pulvilli occupying their whole length. Arolia present.

Length.—♂ 12-13 mm.; ♀ 13-15 mm.

Cotypes.—2 ♂ and 2 ♀, Coll. Auct. (Spms. Nos. 18 and 19 ♂, Nos. 20 and 21 ♀.)

Habitat.—Victoria: Wimmera district, 1911 (L. Kelly), Dookie, 1913 (L. Kelly).

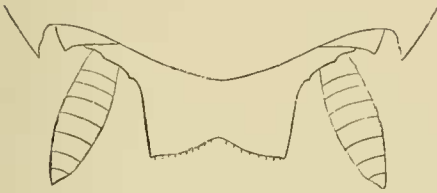
NOTES.—My friend Mr. Leslie Kelly first sent me this species from the Wimmera district of Victoria, and later in abundance from Dookie; and it appeared to be identical with specimens in the Nat. Mus. Melb., labelled "*Drymaplaneta circumcincta* Tepper." Two of these specimens were amongst the Victorian Blattidæ sent to Mr. Tepper for determination in 1895, and were returned by him named "*Drymaplaneta* (*Periplaneta*) *circumcincta* n. sp." No mention, however, is made of the species in his paper dealing with this collection (Trans. Roy. Soc. S. Austr. 1895, pp. 146-166), nor could any published name or description be found. Mr. Tepper, writing to me in May, 1916, in reply to inquiries, says he cannot find any published record of the species, and that he "must have entirely missed it"; adding, "It is therefore quite at your disposition both as to genus and species name."

As Shelford points out (Trans. Ent. Soc. Lond. 1909, p. 265 *et seq.*), Tepper founded his genus *Drymaplaneta* on an immature condition of the subgenital lamina of ♀. The genus cannot stand, and the species placed therein by Tepper will probably go into *Platyzosteria* or *Cutilia*. The posterior metatarsus of the present species being typically that of *Cutilia* I have placed it in that genus, and have added as specific name that of Mr. Tepper, the discoverer of the species, and one to whom we owe so much for his work on Australian Blattidæ.

CUTILIA UNCINATA sp. nov.

Nigro-castaneous with a broad reddish-yellow border. Head with the vertex rufo-castaneous, frons nigro-castaneous with a rufo-castaneous spot between the antennal sockets; ocelliform spots large, rhomboidal, yellow; margins of the clypeus and labrum rufo-fuscous, the latter deeply emarginate with rounded lobes; palpi long; antennæ fuscous. Pronotum smooth nitid, anteriorly parabolic; margins deflexed anteriorly, with a few scattered impressed punctures, and some sparse erect hairs; posterior margin nearly straight, nigro-castaneous; with a broad yellow lateral

border, widely separated anteriorly, extending to the posterior angles. Mesonotum and metanotum similar in colouring, but disc rufo-castaneous, and the yellow border of the metanotum narrower, and in the ♂ interrupted. Tegmina vestigial, apices not separated from the posterior angles of the tergite; no vestiges of wings. Abdominal tergites nigro-castaneous with the basal portion rufo-castaneous; the yellow border of the thoracic tergites continued as a series of blotches and spots, basally situated within the narrow rufo-castaneous margin, and diminishing in size from before backwards; no yellow spot on the 7th tergite, the lateral margins of which are entire. All the angles backwardly produced. Supra-anal lamina of ♂ (Text-fig. 11) subquadrate, widely and rather deeply emarginate, ciliate; cerci longer than the lamina, rufous at the tips. Supra-anal lamina of ♀ (Text-fig. 12) triangular, apex truncate, subtectiform,



Text-fig. 11.—*Cutilia uncinata*.

Supra-anal lamina of ♂, much enlarged.
(Drawn from the type, Spm. No. 78, Coll. Auct.)



Text-fig. 12.—*Cutilia uncinata*.

Supra-anal lamina of ♀, much enlarged.
(Drawn from the type, Spm. No. 77, Coll. Auct.)



Text-fig. 13.—*Cutilia uncinata*.

Subgenital lamina of ♂, much enlarged. (Drawn from the type, Spm. No. 78, Coll. Auct.)

with a wide concave emargination. Subgenital lamina of ♂ (Text-fig. 13) asymmetrical, triangularly produced, and terminating in a single stout hook, strongly curving towards the left; styles long, stout, incurved, the left style being longer than the right, and situated nearer to the middle line; a short blunt process internal to the right style. Subgenital lamina of the ♀ of the usual valvular form. Beneath, the yellow margins of the thoracic tergites are reproduced, and similar yellow spots obtain on the abdominal sternites, which are nigro-castaneous with the disc rufo-castaneous. Legs rufo-fuscous; coxæ narrowly bordered with yellow; trochanters paler; posterior metatarsi longer than the remaining joints, biserially spined beneath, pulvillus apical; 2nd joint unspined, pulvillus occupying its whole length; arolia large.

Length.—♂ 19 mm. : ♀ 15 mm.

Types.—♂ and ♀, Coll. Auct. (No. 78 ♂ : No. 77 ♀).

Habitat.—Queensland : Lizard Id., Eagle Id. (W. J. Young, July 1916).

NOTES.—Three specimens were taken by Mr. Young, a ♂ on Lizard Island, and ♂ and ♀ on Eagle Island, N.Q. These were sent to me for determination by Mr. F. H. Taylor, F.E.S., of Townsville, who has kindly presented me with the types, and the third specimen is in his collection. The form of the vestigial tegmina and the extraordinary asymmetrical subgenital lamina of the ♂ are, as far as I know, unique amongst the Blattinae. The Lizard Island ♂ is larger than that from Eagle Island, which is of the same dimensions as the ♀ ; but both have the tegmina and subgenital laminae identical in form.

CUTILIA MELANESIÆ Shelf.

Shelford : Trans. Ent. Soc. Lond. 1909, p. 291.

Shelford described the ♂ from Torres Strait, and the type is in the British Museum. The single ♀ in my collection from N. Queensland is, I think, to be referred to this species in spite of the fact that the posterior tarsi are unfortunately broken off. In *Cutilia* the anterior and middle metatarsi also are longer than in *Platyzosteria*, and this obtains in the ♀ under consideration. To Shelford's description may be added :—

♀. Head with a broad transverse castaneous stripe occupying the vertex between the eyes ; labrum rufo-castaneous. Mesonotum and metanotum finely impressed punctate laterally, also the abdominal tergites, the punctures encroaching further on the disc in the distal tergites ; 7th abdominal tergite with the posterior margin sinuate. Supra-anal lamina triangular, apex truncate, widely concavely emarginate. Subgenital lamina of the usual Blattine form. Tegmina vestigial, more thickly and coarsely punctate than the mesonotum ; wings none. Posterior coxæ with the dorsal surface margined very pale. Anterior and middle metatarsi with a few basal spines beneath.

Length.—♀ 20 mm. Pronotum, 6 mm. × 5.5 mm.

Type.—♂, British Mus. ; of ♀, Coll. Auct. (Spm. No. 68).

Habitat.—N. Queensland : Lower Burdekin District (L. Kelly, 1915).

CUTILIA NIGROFASCIATA sp. nov.

Testaceous banded with black. Head with the vertex exposed, testaceous ; vertex of a blackish-brown colour, which is continued down the frons in a broad longitudinal stripe with irregular edges, the colour gradually diminishing in intensity to the margin of the clypeus and the labrum which are brownish testaceous ; eyes black ; antennæ missing except the first segment which is brownish testaceous ; palpi pale. Pronotum with the lateral margin a little thickened, and slightly deflexed anteriorly ; fore margin truncate ; the anterior portion of the disc occupied by a black macula, which fades through brown into the testaceous ground colour. The

same obtains in the dark bands of all the tergites. Extreme lateral margin of all the tergites narrowly brown: posterior border of the pronotum banded black extending to the angles. Mesonotum testaceous with a black band anteriorly and posteriorly, the former not reaching the lateral margins. Tegmina vestigial, only partly separated from the mesonotum, testaceous with the tips blackish brown. Metanotum similar in colouring, the posterior angles slightly produced; no vestiges of wings. Abdominal tergites testaceous, with a broad blackish-brown band occupying the posterior border, but narrowing laterally; angles of the 5th, 6th, and 7th tergites backwardly produced; posterior margin of the 7th tergite sinuate, lateral margins entire. Supra-anal lamina of ♂ subquadrate, short, widely emarginate, ciliate, lateral margins entire, medially longitudinally sulcate, the sulcus broad at the base and occupied by a pointed brown streak, the point not reaching the apex of the emargination. Cerci about twice the length of the lamina, testaceous.

Supra-anal lamina of ♀ longer, triangular, apex truncate, emarginate, lateral margins entire, not concealing the tips of the subgenital valves, testaceous, with a broad-based triangular blackish macula basally situate. Subgenital lamina of ♂ subquadrate, about equalling the supra-anal lamina in length, angles obtuse, concavely emarginate, of a bright pale brown. Styles stout, long, and acuminate, placed externally to the angles. Beneath: thoracic sternites testaceous; abdominal sternites bright pale brown on the disc with a broad testaceous lateral border. Legs testaceous, spines brownish; posterior metatarsus longer than the remaining joints together, biserially spined beneath; pulvillus apical; remaining joints with their pulvilli occupying their whole length, unspined; arolia large; anterior and middle metatarsi long, the latter biserially spined beneath in the basal third, pulvillus apical.

Length.—♂ 16 mm.: ♀ 17.5 mm.

Types.—♂ and ♀, Coll. Auct. (No. 93 ♂, No. 94 ♀).

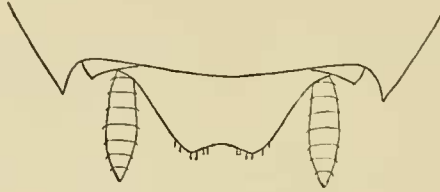
Habitat.—Waddouring, W. Australia, Oct. 1915. (Presented by the West Australian Museum.)

NOTES.—The species in colouring bears a great resemblance to *C. triangulata* Brunner (*Leptozosteria secunda* Tepper), but is smaller, not so depressed, and the form of the supra-anal lamina of ♂ is different. The pronotal marking of *triangulata* is quite distinctive.

CUTILIA KELLYI sp. nov.

♂ nigro-castaneous, of small size, convex species. Head rufo-castaneous, with the ocelliform spots, and margin of the clypeus pale; eyes black; antennæ rufo-castaneous, longer than the body. Pronotum parabolic, forming in transverse section an arch almost semicircular, posterior margin straight, smooth, nitid, with a few erect hairs, and scattered punctures, dark castaneous. Mesonotum and metanotum similar; tegmina vestiges completely separated, more thickly punctate, sharply pointed, and extending slightly beyond the tergite; postero-lateral angles of the metanotum somewhat backwardly produced. Abdominal tergites darker than the thoracic, almost piceous posteriorly; lateral margins rufo-castaneous; postero-lateral angles backwardly produced; 2nd to 5th tergites slightly scabrous laterally.

6th more scabrous, and 7th with the posterior half and sides scabrous. Supra-anal lamina (Text-fig. 14) triangular, apex truncate, faintly emarginate, ciliate, lateral margins somewhat everted, entire, scabrous; cerci considerably longer than the lamina.



Text-fig. 14.—*Cutilia kellyi*.

Supra-anal lamina of ♂, much enlarged. (Drawn from the type, Spm. No. 79, Coll. Auct.)

Subgenital lamina subquadrate, posterior margin convex; styles long, slightly incurved, with a large stout spine within the base of each. Beneath castaneous; legs rufo-castaneous; posterior metatarsus exceeding the remaining joints in length, biserially spined beneath, its pulvillus apical; middle metatarsus long, pulvillus occupying about half its length, and a few basal spines beneath.

Length.—13 mm.

Type.—♂, Coll. Auct. (Spm. No. 79).

Habitat.—N. Queensland: Lower Burdekin District, ♂ (Mr. L. Kelly).

NOTES.—I wish to record in the name of this species my appreciation of a keen naturalist, my friend Mr. Leslie Kelly, of Healesville, Victoria, one with whom I spent many pleasant days cockroach hunting, who has sent me many specimens, and who, at the time of writing, is in France fighting for his country.

GENUS COSMOZOSTERIA Stål.

COSMOZOSTERIA SUBZONATA Tepp.

Platyzosteria subzonata Tepp., Trans. Roy. Soc. S. Austr. 1894, p. 181.

Cosmozosteria subzonata Kirby, Syn. Cat. Orth. B.M., vol. I., p. 133 (1904).

This species was described from specimens presented to Mr. Tepp by Mr. C. French. The locality is given as "Victoria," but possibly this is an error, as with the exception of *C. bicolor* Sauss. (which also occurs in Queensland) recorded from the Darling and the Hunter Rivers, N.S.W., all the known species of the genus come from Queensland, and nearly all of them from the northern parts of that State; and Tepp himself queries⁵ the accuracy of the locality "Victoria (French)" for the Cooktown species *C. picta* Tepp. I have taken *C. subzonata* Tepp not uncommonly in the Brisbane district, and some of these specimens sent to the S. A. Museum have been compared with Tepp's types, and are stated by the Museum

⁵ Tepp: Trans. Roy. Soc. S. Aust. 1894, p. 182.

to be in agreement with them. An examination of a good series indicates that Shelford's⁶ opinion that Tepper's species is but a colour-variety of *C. bicolor* Sauss. cannot be supported, for, in addition to the differences in colour, the pronotum of *C. subzonata* Tepper is considerably wider in proportion to its length, there is no spine at the posterior-lateral angles of the supra-anal lamina of the ♂, and the rugosity of its abdominal tergites is much finer, in fact only a shagreening. The average pronotal measurements of 10 adult specimens of each species was found to be—*C. bicolor* Sauss., 10.3×7.1 mm.; *C. subzonata* Tepper, 10.3×6.1 mm. I think Tepper's species is a good one, and should stand. My specimens of *C. bicolor* Sauss. are from the Burdekin district, N.Q.; and I have not found it in the Brisbane district.

Types.—♂ and ♀, S. Aust. Mus.

Habitat.—Brisbane District, Q., in the following localities:—Birkdale, Ormiston, Tingalpa, Wynnum (Auct.); Taringa (H. W. May). ? Victoria (*teste* Tepper).

GENUS SCABINA Shelford.

SCABINA ANTIPODA Kirby.

Pelmatosilpha (?) *antipoda* Kirby, Ann. Mag. Nat. Hist., ser. 7, xii, p. 376 (1903).

Scabina antipoda Shelf., Trans. Ent. Soc. Lond. 1909, p. 306.

Kirby does not state the sex of the type which is in the British Museum, but the addition to Kirby's description by Shelford in Trans. Ent. Soc. Lond. 1909, p. 306, indicates that it is a ♂. As I have examined several specimens of the ♂, and recently captured examples of both sexes at Tambourine Mountain, S. Queensland, a few descriptive notes of the ♀ may be added. The sinuation of the outer margin of the tegmen of the ♂ is more apparent than real, the appearance being produced by a sharp deflection of the marginal area.

♀ with the tegmina castaneous, marginal area but slightly deflexed, the sinuation when viewed dorsally being scarcely apparent; wings squamiform, supra-anal lamina trigonal, subtectiform, castaneous towards the margins, apex truncate, sinuately emarginate, lateral margins not serrate, everted, terminating in a spine; cerci of about the same length as the lamina. Subgenital lamina valvular. Subgenital lamina of the larval ♀ of the usual Blattine form.

Length.—30 mm. Tegmen 7.5 mm.; pronotum 9.25 mm.×12 mm.

Types.—Spm. No. 95 (Coll. Auct.), from which the above descriptive note was taken, may be regarded as the type of ♀. Shelford (*loc. cit.*) writing of ♂ says—"British Mus., type; Oxford Mus., cotype"; but this seems to be a misuse of the word "cotype," for no species can have both type and cotypes.

Localities.—S. Queensland: Tambourine Mountain (Auct., H. Hacker); National Park, Lamington Plateau (H. Tryon).

⁶ Shelford: Trans. Ent. Soc. Lond. 1909, p. 297.

SUBFAMILY PANCHLORINÆ.

GENUS LEUCOPHÆA Brunner v. Wattenwyl.

LEUCOPHÆA SURINAMENSIS, Linné.*Blatta surinamensis* Linn., Syst. Nat. (ed. x), i, p. 424, n. 3 (1758).

This cosmopolitan species has not been previously recorded from Australia; but it is widely distributed in Queensland, and further observation will probably reveal its presence in many localities other than those here enumerated. Cleveland, where in 1915 I found it under loose stones near the lighthouse, was in early days expected to develop into an important port: but it is more than half a century since any overseas shipping came in there, and it is probable that this species has occupied its isolated position at the point of the Cleveland peninsula for many years.

Localities.—Queensland: Cleveland, Brisbane (Auct.); Townsville, Lizard Island (F. H. Taylor); Ayr (L. Kelly); Cairns, Gordonvale (J. F. Illingworth).

GENUS NAUPHÆTA Burmeister.

NAUPHÆTA CINEREA Olivier.*Blatta cinerea* Oliv. Enc. Méth. Ins., iv., p. 314, n. 3 (1789).*Nauphæta bivittata* Burm. Handb. Ent., ii, p. 508, n. 3 (1838).

Another cosmopolitan species hitherto unrecorded from Australia.

Localities.—Ayr (L. Kelly, 1915); Brisbane (Q. Mus.: H. Hacker); Townsville (J. F. Illingworth, F. H. Taylor); Cairns, Gordonvale (J. F. Illingworth).

SUBFAMILY PANESTHIINÆ.

GENUS PANESTHIA Serville.

The four Queensland species of which brief descriptions are given below appear to be new. Two of them, *parva* and *obtusa*, are fully winged, although the tegmina and wings may be broken off short in the line of fracture usual to the genus. The other two, *sloanei* and *tryoni*, are quite apterous.

PANESTHIA PARVA sp. nov.

Small, black, nitid, all visible tergites and sternites thickly punctate, the punctures becoming coarser on the abdominal tergites 5, 6, and 7. Head: vertex of ♂ with a very large foveola; margin of the clypeus, ocelliform spots, terminal five segments of the antenna, and tarsi pale. Pronotum transverse, anteriorly widely emarginate in ♂, the emargination almost as wide as the interocular space, and bounded laterally by large, prominent, rounded, and somewhat everted tubercles; faintly emarginate in ♀, not tuberculate; disc in ♂ excavated in its anterior $\frac{2}{3}$, the excavation showing a prominent median, longitudinal carina, and being bounded posteriorly by 4 or 5 small diverticula. Tegmina and wings either fully explicate, and deeply infusate, with dark-brown veins, or broken across in the manner common to the genus. Anterior femora unspined, but for a single apical spine in the posterior border, no genicular spine. Abdominal tergites with none of the posterior angles sharply produced; 7th with the lateral margins entire, the posterior margin straight and the postero-lateral angles roundly produced. Supra-anal lamina with the posterior margin gently arcuate, entire.

Length.—♂ 18 mm., ♀ 17-18 mm.

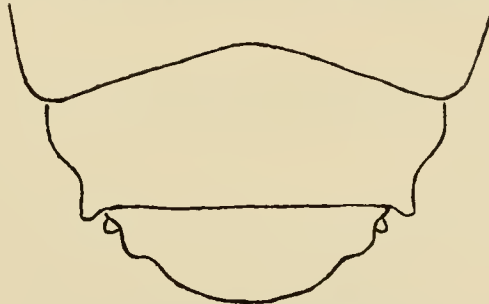
Cotypes.—2 ♂ and 2 ♀ (Coll. Auct., Nos. 64 and 82 ♂; Nos. 83 and 84 ♀).

Habitat.—Queensland: Laidley (Auct. 1915), Mount Gravatt near Brisbane (H. Tryon).

NOTES.—In July, 1915, I took 2 ♂ and numerous ♀ and larval specimens at Laidley from firewood obtained in the neighbourhood. More recently I found some specimens from Mount Gravatt near Brisbane, in the collection of Mr. H. Tryon, Govt. Entomologist, one of which (cotype of ♂, No. 64, Coll. Auct.) he kindly gave me. The remaining cotypes are from Laidley. This is the only Australian species whose ♂ has de Saussure's "depression en fossette" on the vertex, and the foveola is relatively much larger than in any of the other species possessing it, which I have examined.

PANESTHIA OBTUSA sp. nov.

Nigro-castaneous, nitid. Head with the vertex and frons finely punctate; vertex of ♂ not foveolate; ocelliform spots, margins of the clypeus, and of the labrum, and distal segments of the antennæ brownish yellow, also the tips of the palpi in ♂. Pronotum transverse, finely punctate, disc of ♂ excavated in its anterior $\frac{3}{4}$, the excavation ending posteriorly in three diverticula, the large median diverticulum having a longitudinal carina, and being bounded by a blunt tubercle on each side; anterior margin roundly emarginate, a rounded tubercle on each side; disc of ♀ similar, but less pronounced, excavation not extending so far backwards, with the anterior portion of its floor tumefied, and the emargination of the anterior border obsolete. Mesonotum and metanotum with a few scattered punctures, the middle of the posterior border of each obtusely backwardly produced. Tegmina and wings darkly infumate, veins black: fully explicate, or fractured in the usual line. Abdominal tergites punctate, the 1st tergite with only a few scattered punctures, which become more numerous, and coarser towards the distal tergites, until in the ♂ the 6th and 7th tergites are densely and coarsely punctate; 7th tergite with the posterior margin straight, the lateral margins deeply sinuate, backwardly produced into a bluntly rounded process (Text-fig. No. 15). Supra-anal lamina of ♂ densely and coarsely punctate, posterior margin gently arcuate, not crenulate, lateral processes bluntly rounded; cerei fulvous in the distal half. Abdominal sternites punctate, more



Text-fig. 15.—*Panesthia obtusa* ♀.
Distal tergites $\times 6$. (Drawn from Spm. No. 96, Coll. Auct.)

coarsely so in ♂. Legs castaneous, trochanters and tarsi paler. Anterior femora 1 or 2 spinose.

Length.—♂ 25 mm., ♀ 26 mm.

Types.—♂ and ♀. Coll. Auct. (♂ No. 87, ♀ No. 88).

Habitat.—Queensland: Spring Bluff (W. G. Jones), Manly, Brisbane District; Tambourine Mountain (Auct.). N. S. Wales: Armidale (F. W. Carr).

NOTES.—This species is near *P. australis* Brunner but is smaller, the postero-lateral angles of the 7th tergite, which in *australis* are dentiform, are in *obtusa* roundly and bluntly produced, and the markedly sinuate lateral margin of the same tergite is distinctive. In both species the posterior margin of the supra-anal lamina is entire; but in *obtusa* it is less arcuate, and the lateral processes though relatively larger are more bluntly rounded. These structural peculiarities are more marked in the ♂. Two ♀ from Tambourine Mountain, S.Q., are smaller than the type, one of them measuring only 23.5 mm.

PANESTHIA SLOANEI sp. nov.

♂ large, apterous, of a rich chestnut brown, darkening towards the margins. Head impunctate, castaneous, margin of the clypeus, margin of the labrum, and distal half of the antennæ pale; no foveola of the vertex; no pale ocelliform spots. Pronotum deeply excavated in its anterior $\frac{1}{3}$; the excavation with its floor scabrous, and presenting tumefactions, extending posteriorly into a large, wide diverticulum, and bounded laterally by two tubercles, the posterior tubercle being much the more prominent; anterior margin roundly emarginate, the emargination bounded on each side by a strong, recurved tubercle, the tips of which extend backwardly; a shallow transverse furrow on the disc posterior to the excavation, divided into two portions by a median ridge. Mesonotum and metanotum smooth, impunctate; with a lateral crumpling. Abdominal tergites 1, 2, 3, and 4 with a few punctures laterally, the 4th with some minute punctures in the disc also; 5th, 6th, and 7th tergites coarsely punctate, the surface between the punctures smooth; 7th tergite with the postero-lateral angles sharply backwardly produced, lateral margins entire. Supra-anal lamina (Text-fig. 16) densely and coarsely punctate, posterior margin prominently denticulate. Beneath concolorous. Legs with the femora and trochanters rather paler; anterior femora bi-spinose.



Text-fig. 16.—*Panesthia sloanei* ♂.

Supra-anal lamina $\times 6$. (Drawn from Spm. No. 90, Coll. Auct.)

Length.—45 mm.

Type.—Coll. Auct. (No. 89).

Habitat.—Queensland: "The Tableland" behind Cooktown, elevation 1,600 ft., 2 ♂, 1 larval ♂, 3 larval ♀, July 1916 (Mr. T. G. Sloane).

NOTES.—I have named this fine species after Mr. T. G. Sloane, its discoverer, who kindly presented me with the six specimens captured by him "in damp scrub, feeding on the decaying trunks of large softwood trees." The specimen from which Fig. 16 was drawn has one more denticulation of the supra-anal lamina than the type. There is a single ♂ in the Queensland Museum without a locality label.

PANETHIA TRYONI sp. nov.

Large, apterous, piceous, differs from the preceding species in the following structural details:—The emargination of the anterior border of the pronotum is narrow and angular; the excavation of the disc is less pronounced, and the large posterior diverticulum is narrower, and connected with the transverse furrow behind by a shallow depression; the transverse furrow is much more pronounced. The pronotum of the ♀ is similar in form to that of the ♂. Supra-anal lamina (Text-fig. 17)



Text-fig. 17.—*Panesthia tryoni* ♂.
Supra-anal lamina $\times 6$. (Drawn from Spm. No. 121, Coll. Auct.)

with its posterior margin bluntly and unevenly crenulate. Legs with the extremities of the coxæ, the whole of the trochanters, the femoro-tibial articulations, the extremities of the last tarsal joints, and the claws rufo-castaneous. Anterior femora 1 or 2 spinose.

Length.—♂ 45 mm., ♀ 48 mm.

Types.—♂ and ♀, Coll. Auct. (♂ No. 91, ♀ No. 92).

Habitat.—Queensland: National Park, Lamington Plateau, elevation 3,000 ft. (H. Tryon, Jan. 1917); Montville, Blackall Range, elevation 1,600 ft. (H. Tryon), (Q. Mus.).

NOTES.—In Jan. 1917 Mr. Tryon captured 2 ♂, 2 ♀, 2 larval ♂, and 1 larval ♀ specimens on the Lamington Plateau, and it gives me much pleasure to name the species after this distinguished entomologist. One ♀ labelled "Montville April 1915" was handed to me for determination by the Queensland Museum, and quite recently Mr. Tryon captured several specimens in the same locality. Like *P. sloanei* this species seems to occur at considerable altitudes. Beyond their difference of colour the two species may be at once distinguished by the form of the supra-anal lamina.

[Wynnum, Q.]