

VOLUME 52
PART 1

MEMOIRS
OF THE
QUEENSLAND MUSEUM

© Queensland Museum

PO Box 3300, South Brisbane 4101, Australia
Phone 06 7 3840 7555
Fax 06 7 3846 1226
Email qmlib@qm.qld.gov.au
Website www.qmuseum.qld.gov.au

National Library of Australia card number
ISSN 0079-8835

NOTE

Papers published in this volume and in all previous volumes of the *Memoirs of the Queensland Museum* may be reproduced for scientific research, individual study or other educational purposes. Properly acknowledged quotations may be made but queries regarding the republication of any papers should be addressed to the Director. Copies of the journal can be purchased from the Queensland Museum Shop.

A Guide to Authors is displayed at the Queensland Museum web site www.qmuseum.qld.gov.au/resources/resourcewelcome.html

A Queensland Government Project
Typeset at the Queensland Museum

REVIEW OF AUSTRALIAN SPECIES OF *PERITROPIS*
(INSECTA: HETEROPTERA: MIRIDAE: CYLAPINAE)

TIMOTHY MOULDS AND GERASIMOS CASSIS

Moulds, T. & Cassis, G. 2006 11 10: A review of Australian species of *Peritropis* (Insecta: Heteroptera: Miridae: Cylapinae). *Memoirs of the Queensland Museum* 52(1): 171-190. Brisbane. ISSN 0079-8835.

Six new species of *Peritropis* Uhler are described from Australia: *adusta*, *albaspecca*, *basseti*, *phalaroptera*, *postlei* and *roebucki* spp nov. The male and female genitalia are illustrated and an identification key is provided. The distribution of three Pacific and Papua New Guinea species (*aotearoae*, *novocaledonicus* and *punctatus*) is extended to include Australia and Christmas Island. □ *Miridae*, *Cylapinae*, *Peritropis*, *Australia*, *new species*, *taxonomy*.

Timothy Moulds (e-mail: timothy.moulds@adelaide.edu), Australian Museum, 6 College Street, Sydney 2010; Centre for Evolutionary Biology and Biodiversity, School of Earth and Environmental Sciences, University of Adelaide, North Terrace, Adelaide 5005; Gerasimos Cassis, Australian Museum, 6 College Street, Sydney 2010; 15 November 2005.

Apart from the ubiquitous genus *Fulvius* Stål, *Peritropis* Uhler is the most speciose genus of the basal mirid subfamily Cylapinae. It has a cosmopolitan distribution, with 62 species currently described (Schuh, 1995; <http://research.amnh.org/pbi/catalog/>; Table 1). The type species, *saldaeformis* Uhler, was described from the United States. However, most of the species are found in the Eastern Hemisphere.

Despite the lack of definition of most of cylapine genera in a phylogenetic context, species of *Peritropis* have a characteristic body form, with a small size, porrect head, enlarged eyes, and mottled body. Schmitz (1970) overviewed the concept of the genus, and made the following diagnostic remarks that we consider significant: 1, last antennal segment is secondarily divided, giving a five segmented appearance; 2, parameres subequal in size; 3, male aedeagus bilobed with two spicules; and, 4, sclerotised rings 'buckled'. Gorczyca (2000), in revising the Afrotropical species of *Peritropis*, added that the labium minimally attains the metacoxae, the pronotal collar is greatly reduced to absent, and the tarsal claws have a subapical tooth.

Cassis & Gross (1995) did not record any species of *Peritropis* from continental Australia. Gorczyca (1997a) described the first Australian species, *Peritropis kotejai*, from a single specimen from Kosciusko National Park in New South Wales. However, it has been known for some time that additional species exist in collections. This work provides an overview of

the genus in Australia with description of new species, and new records of other species in the Eastern Hemisphere. In this work we have not treated the Christmas Island species, *Peritropis listeri* Izzard, in detail, as we were unable to examine the holotype.

MATERIALS AND METHODS

Two hundred and seventy-six specimens were examined in this study. Institutional acronyms are AM, Australian Museum, Sydney; AMNH, American Museum of Natural History, New York; ANIC, Australian National Insect Collection, CSIRO, Canberra; BPBM, Bernice P. Bishop Museum, Honolulu; DPIQ, Department of Primary Industries, Queensland, Brisbane; NTM, Northern Territory Museum, Darwin; QM, Queensland Museum, Brisbane; SAMA, South Australian Museum, Adelaide; USNM, United States National Museum, Washington D.C.; and, WAM, Western Australian Museum, Perth. Abbreviations used in material examined sections are: Ck, Creek; DC, Doug Cook; GM, Geoff Monteith; GT, Geoff Thompson; Mt, Mount; Mtn, Mountain; NP, National Park; Pen., Peninsula; R., River; Ra., Range; Rd, Road; Tbl, Tableland.

Morphological techniques and terminology follow those of Cassis (1995) and Cassis et al. (2003) and references therein. Description of the male genitalia is complex and positional statements refer to the resting position of the components within the pygophore.

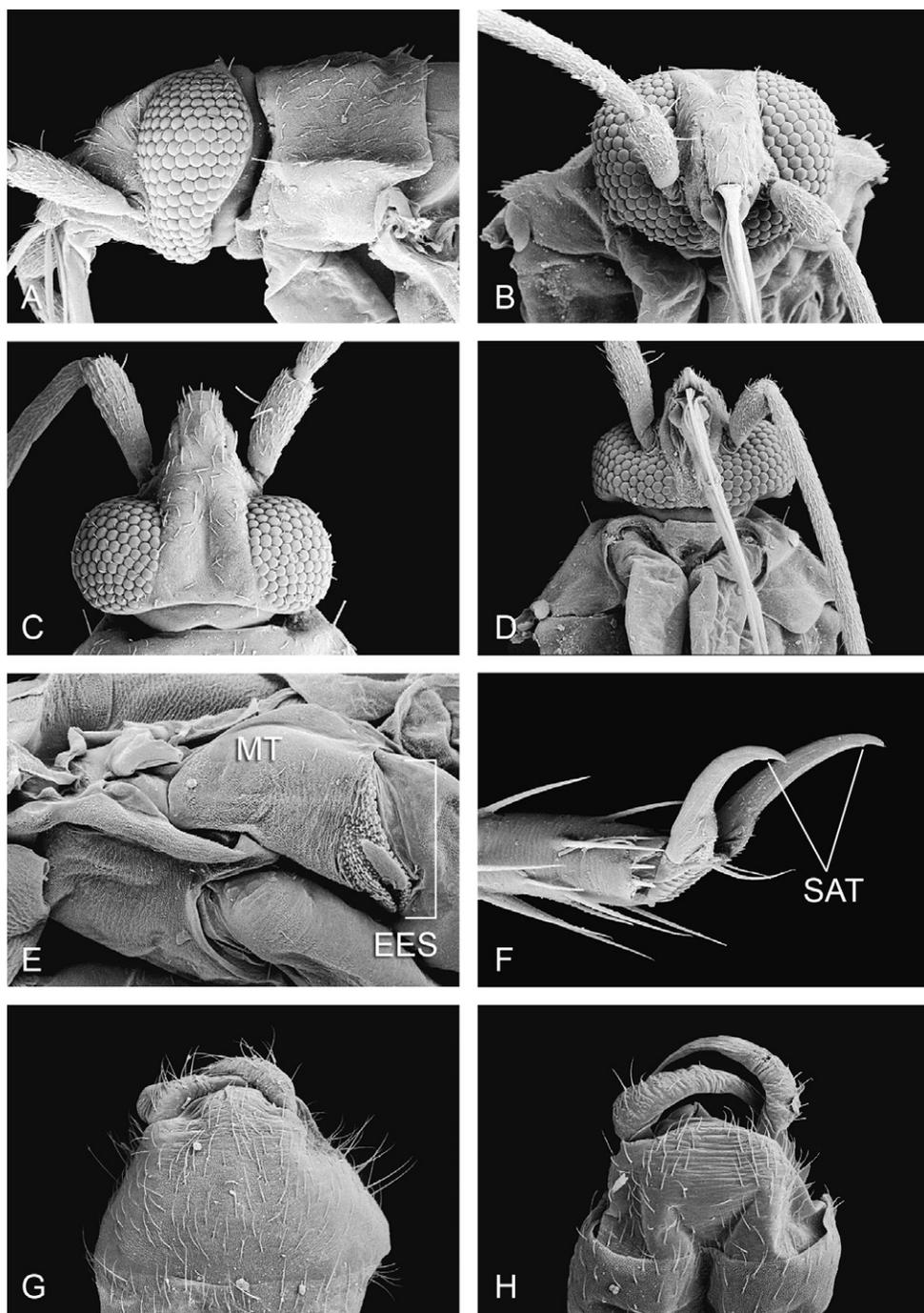


FIG. 1. A, *Peritropis roebucki* sp. nov. head lateral. B, *P. roebucki* sp. nov. head anterior. C, *P. roebucki* sp. nov. head dorsal. D, *P. roebucki* sp. nov. head ventral. E, *P. adusta* sp. nov. metathoracic peritreme F, *P. adusta* sp. nov. tarsi G, *P. roebucki* sp. nov. pygophore ventral. H, *P. adusta* sp. nov. pygophore ventral. MT= metepisternum, EES= external efferent system. SAT= subapical teeth.

Species	PAL	AFR	ORI	AUS	NEA	NEO
<i>adusta</i>				x		
<i>advena</i>	x					
<i>africana</i>		x				
<i>albaspecca</i>				x		
<i>annulicornis</i>				x		
<i>aotearoae</i>				x		
<i>armillarius</i>		x				
<i>basseti</i>				x		
<i>bicolor</i>				x		
<i>botswanaica</i>		x				
<i>crassicornis</i>		x				
<i>electilis</i>			x			
<i>granulosa</i>		x				
<i>gressitti</i>				x		
<i>guamensis</i>				x		
<i>hasegawai</i>	x					
<i>husseyi</i>					x	
<i>insularis</i>	x					
<i>iriomotensis</i>	x					
<i>javanica</i>			x			
<i>kerzhneri</i>		x				
<i>kotejai</i>			x	x		
<i>lewisi</i>			x			
<i>linnaevuorii</i>		x				
<i>listeri</i>			x			
<i>lugubris</i>			x			
<i>macrotricha</i>		x				
<i>maculicornis</i>		x				
<i>maculisparsa</i>		x				
<i>magna</i>		x				
<i>malawiana</i>		x				
<i>minuta</i>		x				
<i>monikae</i>				x		
<i>nigripennis</i>			x			
<i>nilotica</i>		x				
<i>ovocaledonicus</i>				x		
<i>obscurella</i>		x				
<i>phalaroptera</i>				x		
<i>pierrardi</i>		x				
<i>ponapensis</i>				x		
<i>poppiana</i>			x			
<i>postlei</i>				x		
<i>punctatus</i>				x		
<i>pusillus</i>			x			
<i>roebucki</i>				x		
<i>rostrata</i>		x				
<i>rugulosa</i>		x				
<i>rynskii</i>		x				
<i>saldaeformis</i>					x	
<i>schaeferi</i>		x				
<i>schmitzi</i>		x				
<i>selene</i>		x				
<i>setosicornis</i>			x			
<i>similis</i>			x			
<i>smreczynskii</i>		x				
<i>stysi</i>		x				
<i>suturella</i>			x			
<i>takahashii</i>		x				
<i>tanzanica</i>		x				
<i>tuberculatus</i>						x
<i>unicolor</i>						x
<i>yapensis</i>				x		

All measurements are maximum lengths in millimetres. Abbreviations for morphometric characters are: BL, body length; HW, head width across eyes; IOD, interocular distance; HL, head length; PL, pronotal length; PW, pronotal width at posterior margin; AII, length of second antennal segment; LL, labial length.

Scanning electron micrographs were prepared using techniques outlined in Bolte (1996) and Swearingen et al. (1997). Illustrations were drafted using a camera lucida and rendered using Adobe Illustrator software.

Locality information is given in the materials section of each species. For specimens lacking latitude and longitude information, coordinates were calculated using ESRI software (ArcInfo and ArcView) and are given in brackets.

TAXONOMY

Peritropis Uhler

Peritropis Uhler, 1891: 121; Bergroth, 1925: 159 (discussion); Carvalho, 1956: 9 (key to Micronesian spp.); Carvalho, 1957: 21 (catalogue); Schmitz, 1970: 504 (discussion and description); Schuh, 1995: 33 (catalogue); Gorczyca, 2000: 111 (key to African spp.).

TYPE SPECIES. *Peritropis saldaeformis* Uhler, 1891, by monotypy.

DIAGNOSIS. Macropterous (Figs 7, 11); body elongate-ovoid (Figs 7, 11) to ovoid; head porrect (Fig. 1A, C); eyes elongate, reniform, commonly reaching gula (Fig. 1A-C); antennae shorter than body; pronotum trapezoidal (Figs 7, 11), posterior margin excavate; labium slender (Fig. 1D); collar thin to absent (Fig. 1C); callosite region of pronotum moderately developed; external efferent system of metathoracic glands reduced (Fig. 1E) to posterior margin of metepisternum, peritreme short, tongue-like; metathoracic spiracle (Fig. 1E) exposed, without evaporative areas; pretarsal claws arcuate and slender with subapical tooth (Fig. 1F), setiform parempodia, sometimes asymmetrical; hemelytral embolium moderately explanate (Figs 7, 11); median flexion line relatively short, not reaching apex of claval commissure (Figs 7, 11); cuneus

TABLE 1. Checklist of species of *Peritropis* and distribution by major zoogeographic region. PAL = Palearctic; AFR = Afrotropical; ORI = Oriental; AUS = Australian; NEA = Nearctic; NEO = Neotropical

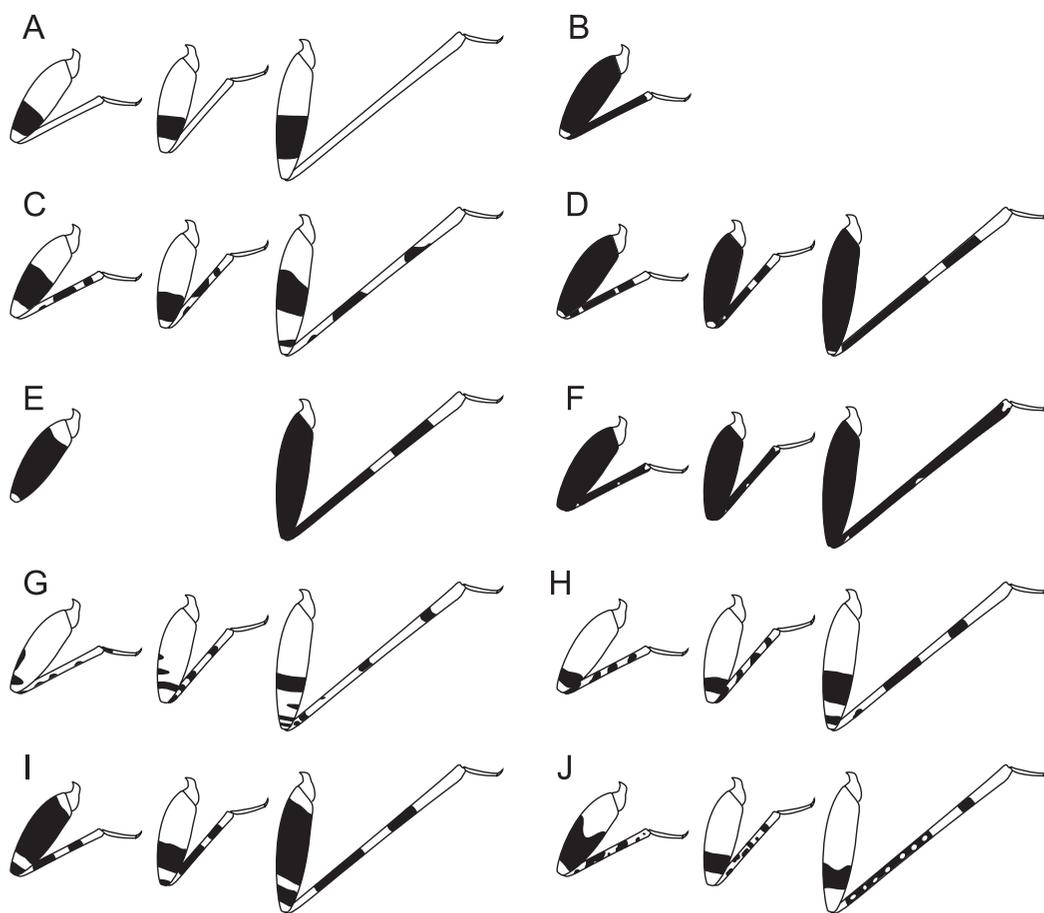


FIG. 2. Colour patterns on forefemora, mesofemora and metafemora of Australian species of *Peritropis*. A, *Peritropis adusta* sp. nov.; B, *P. albaspecca* sp. nov., mesofemora and metafemora absent in specimens examined. C, *P. aotearoae* sp. nov.; D, *P. basseti* sp. nov.; E, *P. kotejai* sp. nov. mesofemora absent in all specimens examined. F, *P. novocaledonicus* sp. nov.; G, *P. phalaroptera* sp. nov.; H, *Peritropis postlei*. I, *P. punctatus* sp. nov.; J, *P. roebucki* sp. nov.

slightly longer than wide, costal fracture present (Figs 7, 11); legs short, relatively slender; genital opening of male pygophore terminal in orientation (Figs 1G, H, 6A, B); parameres subequal in size (Fig. 1G, H) and sometimes roughly symmetrical (Fig. 6C, D); aedeagus with membranous sac-like endosoma, with 1 (Fig. 6E) or 2 endosomal spicules (Fig. 8E); sclerotised rings simple, basally tapered (Fig. 13A); posterior wall without interramal lobes (Fig. 13B).

DISTRIBUTION. There are 62 described species of *Peritropis*, with the genus now known from all major zoogeographic regions of the world (Table 1). The greatest diversity occurs in the Afrotropical (26 species), Oriental (12) and

Australian (17) regions, indicating that the genus is predominately an Eastern Hemisphere group, and probably of Gondwanan origins. Only two species of *Peritropis* each are known from the Nearctic (Henry & Wheeler, 1988) and Neotropical regions (Schuh, 1995), although undescribed South American species are known in collections. Four species of *Peritropis* are known from the Palearctic (Kerzhner & Josifov, 1999) region. Considering the relative maturity of taxonomy in the Holarctic, it is unlikely that many new species of *Peritropis* will be found there. Aside from Yasunaga's (2000) description of three new species from Japan, there have been no new Northern Hemisphere species of *Peritropis*

Christmas Island

▽

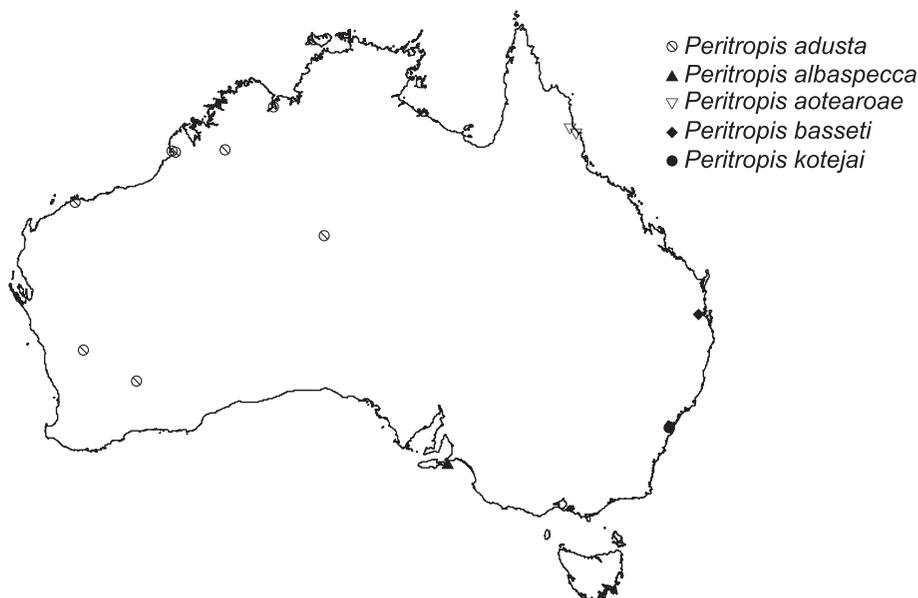


FIG. 3. Distributions of *Peritropis adusta*, *P. albaspecca*, *P. aotearoae*, *P. basseti* and *P. kotejai* spp. nov.

described since Kerzhner's (1972) description of a new species from eastern Russia. Gorczyca (1997a-c, 1998, 1999, 2000) has described 24 of the known species, mostly from sub-Saharan Africa, and has made the most significant contribution in documenting the diversity of the genus. The *Peritropis* fauna of the Australian region is the least well known, and until this work, only one species was known from continental Australia (*P. kotejai*), with the other species known from Melanesia (Carvalho & Lorenzato, 1978) and Micronesia (Carvalho, 1956). It is likely that the actual diversity of the world fauna of *Peritropis* is still inadequately understood, as the habits of these cryptozoic mirids are poorly known. This is reflected by the fact that most specimens have been collected at light.

REMARKS. There are few mirid genera thought to be truly cosmopolitan, and even in highly speciose examples such as *Orthotylus* (Orthotylinae), there is considerable doubt as to whether these genera are monophyletic. In the basal subfamilies of the Miridae, particularly the Isometopinae and Cylapinae, there are stronger indications that some of the genera are truly cosmopolitan in distribution. For example, *Myiomma* (Isometopinae; Australian representatives undescribed), and *Fulvius* and *Peritropis*

(Cylapinae) are upheld as monophyletic taxa across their cosmopolitan range.

The male genitalia are consistent with a number of other cylapine taxa, with the parameres roughly symmetrical, especially in comparison with mirids belonging to most other subfamilies, where the right paramere is often greatly reduced (e.g. Dicyphini) or different in shape (e.g. Orthotylini). The aedeagus is very simple, and is characterised by one or two endosomal sclerites.

The Australian species of *Peritropis* described here adhere to previous diagnoses of the genus (Schmitz, 1970; Gorczyca, 2000) and do not depart significantly from the character states found in the type species of the genus (*saldaeformis*). Our examination of numerous species of *Peritropis* from all regions of the world indicate that they are remarkably homogeneous in their morphology. Therefore, we redefine *Peritropis* to include the following character states: the metathoracic spiracle visible and external efferent system of the metathoracic glands reduced and oriented along the posterior margin of the metepisternum. The latter character state is akin to that found in *Fulvius* (Cassis, 1995).

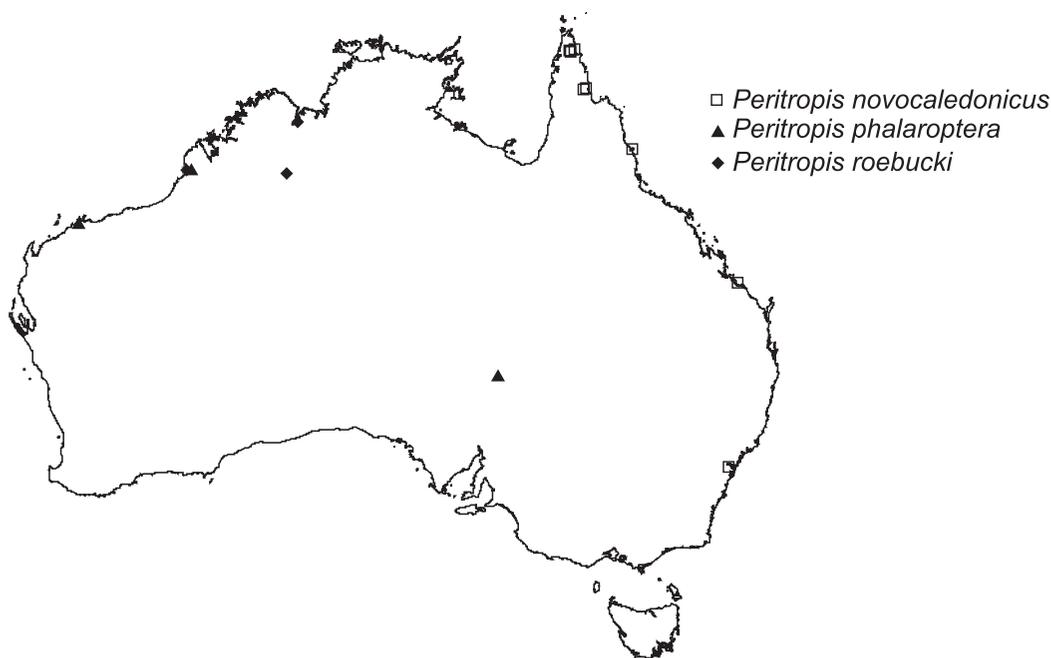


FIG. 4. Distributions of *Peritropis novocaledonicus*, *P. phalaroptera* and *P. roebucki* spp. nov.

TABLE 2. Checklist of Australian *Peritropis*

SPECIES	LOCATION
<i>adusta</i> sp. nov.	Western Australia
<i>albaspecca</i> sp. nov.	South Australia
<i>aotearoae</i> Gorczyca & Eyles, 1997	Queensland, Christmas Island, Papua New Guinea
<i>basseti</i> sp. nov.	Queensland
<i>kotejai</i> Gorczyca, 1997	New South Wales, Malaysia
<i>listeri</i> Izzard, 1936	Christmas Island
<i>novocaledonicus</i> Gorczyca, 1997	Queensland, New South Wales, New Caledonia
<i>phalaroptera</i> sp. nov.	Western Australia, South Australia
<i>postlei</i> sp. nov.	Western Australia
<i>punctatus</i> Carvalho & Lorenzato, 1978	Queensland, Western Australia, Australian Capital Territory, Papua New Guinea
<i>roebucki</i> sp. nov.	Western Australia

KEY TO AUSTRALIAN SPECIES OF *PERITROPIS*

(Note that *Peritropis listeri* is not included in this key)

- Femora entirely dark brown to fuscous, commonly with a small stramineous marking distally (Fig. 2B, D, F) 2
Femora stramineous, very commonly with two to three fuscous annulations of varying width (Fig. 2A, C, E, G-J) 4
- Antennal segment II flattened *basseti* sp. nov.
Antennal segment II cylindrical 3
- Hemelytra generally entirely black to fuscous, occasionally with weak stramineous mottling; body elongate-ovoid; apex of scutellum occasionally with fuscous to mottled stramineous, longitudinal kings *novocaledonicus* Gorczyca
Hemelytra generally fuscous to brown with moderate stramineous mottling; body elongate and weakly ovoid; posterior termination of scutellum with large stramineous marking *albaspecca* sp. nov.
- Membrane clear and/or concolorous, stramineous mottling absent; apex of scutellum entirely fuscous; posterior margin of head with pair of triangular fuscous markings, often contiguous *adusta* sp. nov.
Membrane with stramineous mottling present; scutellum with stramineous markings at apex; posterior margin of head entirely stramineous, lacking triangular fuscous markings 5
- Antennal segment II stramineous with two broad, brown to fuscous annulations 6

Christmas Island

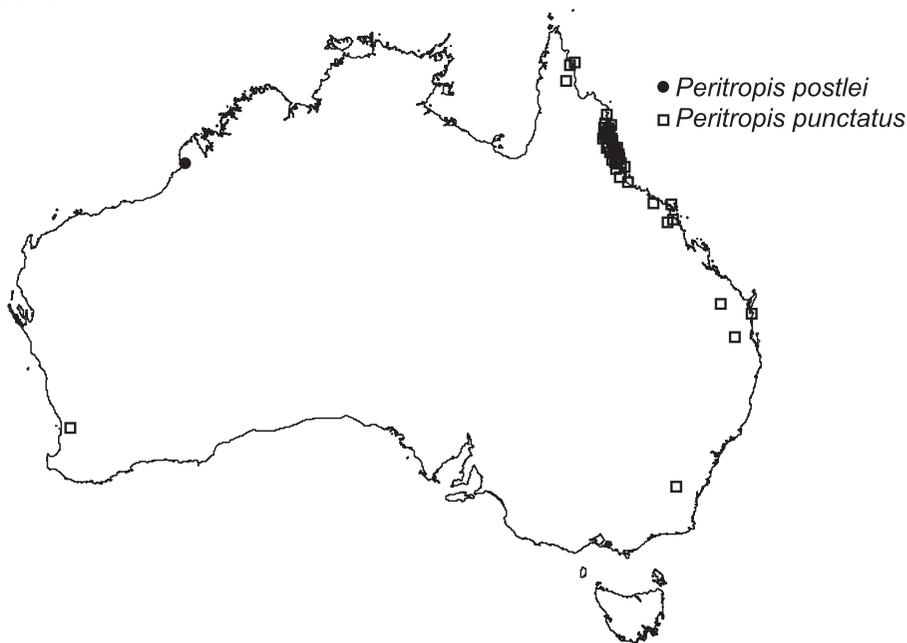


FIG. 5. Distributions: *Peritropis postlei* and *P. punctatus* spp. nov.

- Antennal segment II fuscous with stramineous mottling or with small stramineous annulations 7
- 6. Body with dense covering of pale, adpressed, scale-like setae *postlei* sp. nov.
- Body with sparse to moderately dense covering of pale simple setae *phalaroptera* sp. nov.
- 7. Forefemora with single, broad fuscous annulation (Fig. 2E) *kotejai* Gorczyca & Eyles
- Forefemora with fuscous annulations (Fig. 2C, I-J) 8
- 8. Metafemora with a single broad fuscous annulation on distal third (Fig. 2J) *roebucki* sp. nov.
- Metafemora with two fuscous annulations (Fig. 2C, I) 9
- 9. Metafemora with very thin fuscous annulation on distal quarter and broad fuscous annulation medially; apices of fore- and mesofemora stramineous (Fig. 2C) *aotearoae* Gorczyca & Eyles
- Metafemora with fuscous annulation on distal third and very broad fuscous annulation medially; base and apex of fore- and mesofemora fuscous (Fig. 2I) *punctatus* Carvalho & Lorenzato

***Peritropis adusta* sp. nov.**
(Figs 1E-F, 1H, 2A, 3, 6A-E, 7)

ETYMOLOGY. Latin *adustus*, referring to the fuscous scutellum and cuneus.

MATERIAL. HOLOTYPE: WESTERN AUSTRALIA: ♂, Roebuck Plains via Broome, (18.02°S 122.42°E), 10-13 December 1999, ex light trap, S Kniveton (AM). PARATYPES: WESTERN AUSTRALIA:

Roebuck Plains via Broome, ex light trap as follows; 4♂♂, same data as holotype; 1♂, 30 Dec. 1997 – 2 Jan. 1998, C Johnston; 1♂, 22-25 Sept. 1998, C Brockway; 2♂♂, 30 Jan. 1998 – 4 Feb. 1998, C Brockway; 16♂♂, 5-8 Apr. 1998, A Postle; 2♂♂, 30 Nov. 1997, C Brockway; 1♂, 26-29 Jan. 1999, A Postle; 7♂♂, Wyndham (15.47°S 128.10°E), ex light trap as follows; 7♂♂, 10-13 Sept. 1999, N Wilson; 5♂♂, 8 Dec. 1999, T Vinnicombe; 5♂♂, 18-21 Dec. 1998, J De Long; Dip Yards, Broome, (17.97°S 122.23°E), ex light trap as follows; 2♂♂, 15-18 Dec. 1998, C Brockway; 1♂, 13 Oct. 1999, A Postle; 2♂♂, 16-19 Apr. 1999, A Postle; 3♂♂, 13 Dec. 1999, S Kniveton (AM); 1♂, “12 mile” via Broome, (17.93°S 125.27°E), 10-13 Sept. 1999, ex light trap; 1♂, Karratha, (20.88°S 116.67°E), 25 May 1998, ex light trap, R Parr (all AM); 1♂, near Mount Gibson, (29.35°S 117.12°E) 11-12 Mar. 1982, ex light trap, TF Houston and B Hanich (434-3) (WAM 94/614); 1♂, Boorabbin Rock, (31.12°S 120.17°E), 20-21 Jan. 1982, ex light trap, B Hanich and TF Houston (433-3) (WAM 94/592); NORTHERN TERRITORY: 1♂, Lake Bennett area, 25km SE of Manton Dam, (22.83°S, 131.03°E), 29-30 Dec. 1979, MB Malipatil (NTM).

DIAGNOSIS. Second antennal segment incrassate (Fig. 7); head with stramineous markings on posterior margin of vertex (Fig. 7); cuneus fuscous, apex stramineous; forewing membrane stramineous (Fig. 7); scutellum fuscous; metafemora with broad fuscous

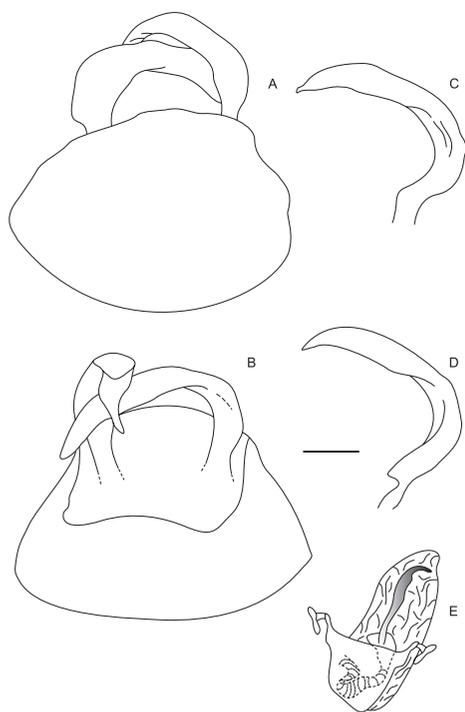


FIG. 6. *Peritropis adusta* sp. nov. male genitalia. A, pygophore ventral view. B, pygophore dorsal view. C, left paramere. D, right paramere. E, aedeagus. Scale bar 0.1mm.

annulation (Fig. 7); parameres sub-symmetrical (Fig. 6C, D); and, endosoma with single basal sclerite, apically arcuate (Fig. 6E). This species is similar to *P. postlei* in possessing a single basal sclerite (cf. Figs 6E, 10F), in contrast to most other species that possess two endosomal sclerites (e.g. *P. basseti*, Fig. 8D). *Peritropis adusta* is differentiated from *P. postlei* by the thickened second antennal segment, and the narrower body. In addition, the latter species possesses scale-like setae on the dorsum.

DESCRIPTION. *Colouration.* Head: stramineous with weak to strong red-fuscous mottling, circular red-fuscous markings adjoining eyes; posterior margin of vertex with pair of triangular red-fuscous markings, often contiguous. Antennae: AI stramineous with broad fuscous annulation medially, sometimes more extensive on apical half; AII-AIV stramineous to fuscous. Pronotum: stramineous with moderate to intense red to fuscous mottling, callosite region with strong fuscous to red mottling. Mesoscutum: red-fuscous with moderate stramineous mottling; anterior

margin sometimes with 4 semicircular fuscous markings; lateral margins with red to stramineous longitudinal markings, intense stramineous mottling medially. Scutellum: red-fuscous to black with weak stramineous mottling; lateral margins black. Hemelytra: grey-brown to red-fuscous to black with intense stramineous mottling; embolium commonly black to fuscous, occasionally with red colouration; brown-fuscous to black markings extending from cuneus towards medial fracture; red-fuscous mottling anteriorly to costal fracture; cuneus predominately fuscous with stramineous extremities, membrane stramineous. Legs: stramineous, fore- and mesofemora with red to fuscous annulation on distal third, metafemora with very broad fuscous annulation medially (Fig. 2A).

Dorsal texture. Head, pronotum and hemelytra rugulose.

Vestiture. Hemelytra with moderately dense to sparse distribution of simple, erect, fine, pale setae.

Structure. Macropterous, elongate-ovoid. Head: posterior margin weakly convex; vertex weakly convex; antennal insertions slightly removed from eyes. Antennae: AI tapered basally; AIII-AIV short, slender. Eyes: greatly enlarged, reaching gula and contiguous with posterior margin of head. Pronotum: transverse, trapeziform; collar obsolete; callosite region moderately developed; medial foveae obsolete; anterior angles obtuse, lateral margins strongly explanate; posterior margin moderately concave, medially emarginate. Mesoscutum: prominent, strongly convex. Scutellum: flat, posterior third moderately declivent. Hemelytra: clavus moderately declivent; embolium moderately explanate; costal fracture weakly developed. Thoracic pleura: proepisternum anteriorly orientated; proepimeron deeply depressed medially; peritreme of metathoracic glands medially orientated; metathoracic spiracle exposed. Male genitalia (Fig. 6A-E): pygophore subconical (Fig. 6A); genital opening large (Fig. 6B), circular; left paramere (Fig. 6C) elongate, strongly curved with small, acute, apical termination; right paramere (Fig. 6D) elongate, strongly curved; aedeagus (Fig. 6E) with secondary gonopore shallow trough-shaped, ductus seminis moderately elongate and sclerotised, endosoma with single basal sclerite.

Measurements. 5♂♂ BL 2.35-2.73, HW 0.50-0.63, IOD 0.15-0.27, HL 0.46-0.61, PL 0.29-0.36, PW 0.77-1.00, AII 0.70-0.96, LL 1.41-1.98.

REMARKS. *Peritropis adusta* is broadly distributed primarily in tropical Australia, from western NT to the Kimberley district of WA (Fig. 3). It has been collected primarily in semi-arid, monsoonal localities. This species is sympatric with *P. phalaroptera*, *P. postlei* and *P. roebucki*, at Roebuck Plains, near Broome.

***Peritropis albaspecca* sp. nov.**
(Figs 2B, 3)

ETYMOLOGY. Taken from the Latin *albus*, meaning white, and *specca*, referring to the stramineous mottling covering the dorsal surface.

MATERIAL. HOLOTYPE: SOUTH AUSTRALIA: 1♀, Kangaroo Island, (35.83°S 138.05°E), (SAMA). PARATYPE: 1♂, same data as holotype (SAMA).

DIAGNOSIS. Dorsum with uniform stramineous mottling; AII fuscous with medial stramineous annulation; scutellum fuscous with posterior third stramineous; forewing membrane grey with stramineous mottling; and, forefemora mostly fuscous with apex stramineous (Fig. 2B). *Peritropis albaspecca* is similar to *P. novocaledonicus*. It is best distinguished from it by the less ovoid body, more mottling on the hemelytra, and the larger stramineous marking on the apex of the scutellum.

DESCRIPTION. *Colouration*. Head: dark brown to fuscous with moderate stramineous mottling. Antennae: mostly fuscous; AI stramineous basally, with circular stramineous marking medially; AII with stramineous annulation medially. Pronotum: red-fuscous with moderate stramineous mottling; posterior margin with two semicircular fuscous markings medially. Mesoscutum: fuscous. Scutellum: fuscous with weak stramineous mottling, basal third stramineous. Hemelytra: stramineous to red-fuscous laterally,

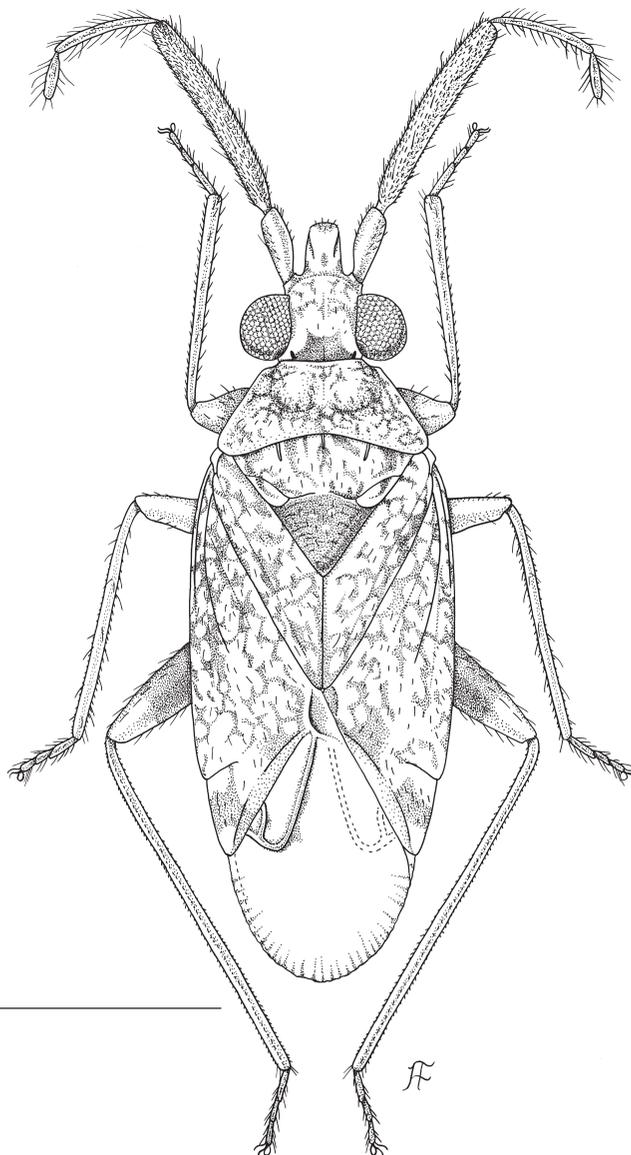


FIG. 7. Dorsal habitus of *Peritropis adusta* sp. nov., scale bar 0.8 mm.

with moderate stramineous mottling; membrane grey-brown with moderate stramineous mottling. Legs: fuscous, apex of forefemur and foretibia stramineous (Fig. 2B), mid and hind legs missing.

Dorsal texture. Head, pronotum and hemelytra rugulose.

Vestiture. Hemelytra with moderately dense distribution of simple, semi-erect, fine, pale setae.

Structure. Macropterous, elongate-ovoid. Head: posterior margin rectilinear, vertex moderately excavate, antennal insertions contiguous with eyes. Antennae: AI tapered basally, AIII-AIV shortened and slender. Eyes: reaching gula and contiguous with posterior margin of head. Pronotum: transverse, trapeziform; collar obsolete; callosite region moderately developed, medial foveae obsolete; anterior angles obtuse; lateral and posterior margins strongly explanate; posterior margin sinuate. Mesoscutum: prominent, strongly convex. Scutellum: flat, posterior third moderately declivent. Hemelytra: clavus moderately declivent with narrow ridge medially; embolium moderately explanate; costal fracture weakly developed. Thoracic pleura: proepisternum anteriorly orientated; proepimeron deeply depressed medially; peritreme of meta-thoracic glands weakly fusiform, medially oriented; metathoracic spiracle exposed. Male and female genitalia not examined.

Measurements. 1♂ BL 2.50, HW 0.54, IOD 0.27, HL 0.42, PL 0.33, PW 0.96, AII 0.63, LL 1.17; 1♀ BL 2.67, HW 0.55, IOD 0.30, HL 0.45, PL 0.38, PW 0.97, AII 0.68, LL 1.24.

REMARKS. *Peritropis albaspecca* is known only from the type locality on Kangaroo Island in SA (Fig. 3). Kangaroo Island is not known to be a significant centre of endemism and it is unlikely that *P. albaspecca* is restricted to the island.

***Peritropis aotearoae* Gorczyca & Eyles, 1997**
(Figs 2C, 3)

Peritropis aotearoae Gorczyca & Eyles 1997: 226.

DIAGNOSIS. Antennae fuscous with stramineous mottling; scutellum subdistally with stramineous marking; femora mostly stramineous with subdistal fuscous annulation (Fig. 2C). *Peritropis aotearoae* is distinguished from *P. punctatus* by the colouration of the femora. The metafemur of *P. punctatus* has a very broad fuscous annulation medially and a thin fuscous annulation on the distal quarter, with the apex stramineous (cf Figs 2C & 2I). In comparison, the metafemur of *P. aotearoae* has a broad fuscous annulation submedially and a narrow subapical fuscous annulation.

MATERIAL. QUEENSLAND: 1♂, Cairns district, (16°55'S 145°46'E), AM Lea (SAMA); 2♀♀, Kuranda, (16°49'S 145°36'E), FP Dodd (SAMA); CHRISTMAS ISLAND: 2♀♀, Central area workshop, 10.29°S 105.37°E, 25 Apr 1989, JC Cardale, on lichen covered bark mainly at light (ANIC); PAPUA NEW GUINEA: 1♀, Bisiatabu, Port Moresby, WN Lock (SAMA).

REMARKS. *Peritropis aotearoae* was previously known only from New Zealand. The specimens from north Queensland, Christmas Island and Papua New Guinea (Fig. 3) significantly extend the range of this species. This species is known from temperate forests in New Zealand to tropical rainforests in north Queensland.

***Peritropis basseti* sp. nov.**
(Figs 2D, 3, 8A-D)

ETYMOLOGY. For Dr Yves Basset who collected the type material.

MATERIAL. HOLOTYPE: 1♂, Mount Glorious, 27°19'S 145°45'E, 700m, January 1988, Y Basset *Argyrodendron actinophyllum* (QM). PARATYPES: QUEENSLAND: Mount Glorious, 27°19'S 145°45'E, 700m, Y Basset *Argyrodendron actinophyllum* as follows; 1♂, same data as holotype; 1 sex undetermined (damaged), Jan 1987; 2♀♀, Jan-Feb 1987; 1♂, Jan-Feb 1988; 1♂1♀, Feb 1986, (AM); 1♂, Feb 1988; 1♀, Feb-Mar 1986; 1♂1♀1 sex undetermined (damaged), Mar 1987; 2♂♂, Mar-Apr 1986 (AM); 1♂, Apr 1986; 3♂♂, Apr 1987; 1♂, Nov-Dec 1986; 1♀, Nov 1987; 2♀♀, Dec 1986; 1♂, Dec 1987 (all QM unless indicated).

DIAGNOSIS. Distinguished by the following combination of characters: antennal segment II laterally flattened; scutellum with stramineous marking basally darkened; hemelytra with minor stramineous mottling; right paramere larger than left (cf. Figs 8B & C), with shaft of former flanged; and, endosoma with two sclerites, distal sclerite strongly arcuate (Fig. 8D). *Peritropis basseti* closely resembles *P. punctatus* with the latter is distinguished by the flattened antennal segment AII, completely fuscous tibiae, and generally darker *Colouration*.

DESCRIPTION. *Colouration.* Head: brown to fuscous, commonly with weak stramineous mottling. Antennae: fuscous, occasionally with weak stramineous mottling; AII with a single stramineous spot medially. Pronotum: fuscous to brown with weak mottling. Mesoscutum: fuscous with weak stramineous mottling. Scutellum: fuscous with weak stramineous mottling, stramineous marking basally. Hemelytra: fuscous to brown with weak to moderate stramineous mottling; cuneus fuscous with basal third stramineous; costal fracture stramineous; posterior margin of hemelytra with fuscous marking, sometimes indistinct red-brown markings present; membrane grey with stramineous mottling. Legs: fuscous; tibiae commonly with two to three stramineous annulations (Fig. 2D).

Dorsal texture. Head, pronotum and hemelytra rugulose.

Vestiture. Hemelytra with moderate distribution of adpressed, pale, scale-like setae.

Structure. Macropterous, elongate-ovoid. Head: posterior margin weakly convex; vertex weakly concave; antennal insertions contiguous with eyes. Antennae: AI tapered basally; AII flattened laterally; AIII-AIV shortened and abruptly slender. Eyes: reaching bucculae and contiguous with posterior margin of head. Pronotum: transverse, trapeziform; collar obsolete; callosite region moderately to strongly developed; medial foveae obsolete; anterior angles obtuse, lateral margins strongly explanate; posterior margin moderately concave, medially emarginate. Mesoscutum: prominent, strongly convex. Scutellum: flat, posterior third moderately declivent. Hemelytra: clavus moderately declivent; embolium moderately explanate; costal fracture weakly developed. Thoracic pleura: proepisternum anteriorly orientated; proepimeron deeply depressed medially; peritreme of metathoracic glands medially orientated; spiracle exposed. Male genitalia: (Fig. 8A-D), pygophore subconical (Fig. 8A); genital opening large (Fig. 8A), circular. Left paramere: (Fig. 8B), moderately elongate, basal lobe weakly to moderately developed, apical third with small ridge, apical termination moderately rounded. Right paramere: (Fig. 8C), elongate and strongly curved apical termination acute. Aedeagus: (Fig. 8D), secondary gonopore trough shaped, ductus seminis moderately elongate and sclerotised, two endosomal sclerites present, distal one strongly arcuate.

Measurements. 5♂♂ BL 2.52-2.94, HW 0.62-0.66, IOD 0.29-0.30, HL 0.47-0.53, PL 0.42-0.48, PW 1.01-1.13, AII 0.88-0.94, LL 1.88; 5♀♀ BL 3.20-3.76, HW 0.60-0.72, IOD 0.29-0.39, HL 0.55-0.60, PL 0.52-0.57, PW 1.23-1.31, AII 0.93-1.02, LL 1.90.

REMARKS. *Peritropis basseti* (Fig. 3) is known only from the type locality and occurs within the range of the closely-related *P. punctatus*.

***Peritropis kotejai* Gorczyca, 1997**
(Figs 2E, 3)

Peritropis kotejai Gorczyca, 1997a: 555

Peritropis listeri (Izzard, 1936)

Cylapofulvius listeri Izzard, 1936: 587; Carvalho, 1957: 13 (catalogue); Carvalho, 1981: 2 (diagnosis; genus position); Schuh, 1995: 22 (catalogue); Cassis & Gross, 1995: 147 (catalogue)

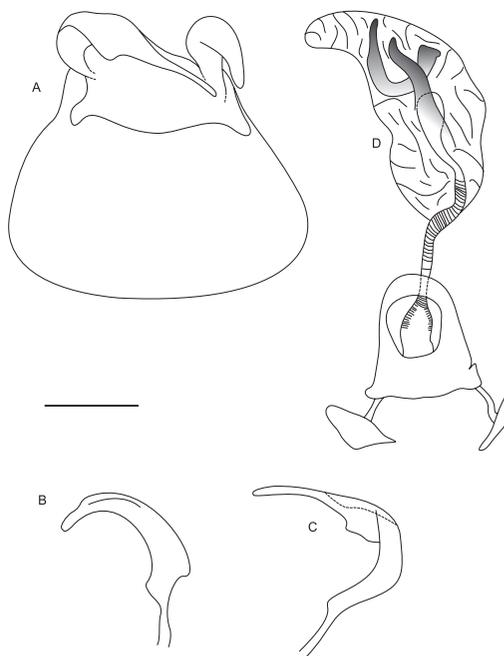


FIG. 8. *Peritropis basseti* sp. nov. male genitalia; A, pygophore dorsal view; B, left paramere; C, right paramere; D, aedeagus with theca; scale bar 0.1 mm.

Peritropis listeri Gorczyca, 1997c: 181 (new combination; diagnosis)

MATERIAL. NEW SOUTH WALES: 1♀, Sydney, (33°52'S 151°12'E), Lea (SAMA); MALAYSIA: 1♀, Gap (Fraser's Hill), Malay Peninsula, AM Lea and wife (SAMA).

DIAGNOSIS. Mesoscutum fuscous with longitudinal stramineous band laterally; scutellum with moderately large stramineous marking basally; hemelytra red-brown with stramineous mottling, large brown fuscous markin gon apical third contiguous, or nearly so, with clavus; and femora mostly fuscous, with extremities narrowly stramineous (Fig. 2E). *Peritropis kotejai* is distinguished from *P. roebucki*, *P. aotearoae* and *P. punctatus* by its almost entirely fuscous forefemora that have a very wide fuscous annulation (cf. Fig. 2E & 2C, 2I-J). *Peritropis kotejai* is distinguished from *P. basseti* by the basal stramineous marking on the forefemora in the former (cf. Fig. 2E & 2D).

REMARKS. The material examined significantly extends the range of this species into the tropics (Fig. 3). It was originally described from Kosciusko

National Park, NSW (Gorczyca, 1997a). We tentatively assign the Malaysian specimen to this species on the basis of the colour patterns of its femora.

We have not had access to the type material of *P. listeri* and have not been able to confirm its identity. Izzard (1936) first described the species from a male from Christmas Island. He gave a detailed description of its colour and structure of the species but did not describe its genitalia. Carvalho (1981) first questioned the generic placement of the species, and gave a brief morphological diagnosis. Gorczyca (1997c) placed it in *Peritropis*, making reference to the porrect head, oval and smooth body, and the developed cuneal fracture. We have identified additional specimens of *Peritropis* from Christmas Island as *P. aeotearoae*, originally considered endemic to New Zealand (Gorczyca & Eyles 1997). We conclude that these specimens are not conspecific with *P. listeri*, on the basis that Izzard's (1936) description indicated that the legs are pale yellow. In contrast, the specimens we examined have banded legs (Fig. 2C).

***Peritropis novocaledonicus* Gorczyca, 1997**
(Figs 2F, 4)

Peritropis novocaledonicus Gorczyca, 1997b: 559.

MATERIAL. QUEENSLAND: 1♀, McIlwraith Range, NE of Coen, Cape York Pen., (13°45'S 143°20'E), 29 June 1976, JF Donaldson (DPIQ); 1♀, Coen Area, Cape York Pen., (13°48'S 143°12'E), 6-12 May 1975, KJ Houston (DPIQ); 1♀, Cairns district, FP Dodd (AM); 1♀, Bertie Ck, Cape York Pen., 11°50'S 142°30'E, 13 Mar. 1992, G Cassis at light (AM); 2♀♀, Junction of Bamaga and Captain Billy Landing Rds, 11°41'S 142°42'E, 23 Mar 1992, G Cassis at light (AM); 1♂ (dissected), Heathlands, 11°45'S 142°25'E, 15-26 Jan 1992, I Naumann and T Weir at light (ANIC); 1♂, Canoe Point E.P., 23°56'S 151°21'E, 5m, 20 Mar 2000, GM pyrethrum trees, vine scrub (QM); NEW SOUTH WALES: 1♀, Scheyville, (33°37'S 150°53'E), Jan 1988, HF Recher, from narrow-leaved ironbark *E. crebra* (AM).

DIAGNOSIS. Body generally oval and almost uniformly black to brown, sometimes with weak stramineous mottling; scutellum with pair of brown to stramineous longitudinal markings, nearly contiguous with apex; and uniformly black femora and mostly black tibiae (Fig. 2F). *Peritropis novocaledonicus* is distinguished from *P. albaspecca* by the more ovoid body shape, the generally darker hemelytra with mottling weak to absent, and the less distinct

fuscous to stramineous markings on the posterior region of the scutellum.

REMARKS. *Peritropis novocaledonicus* is here recorded from the east coast of Australia (Fig. 4) for the first time. The distribution of the species from tropical and monsoonal north Queensland to the temperate region of Sydney supports the notion that numerous species of *Peritropis* have broad climatic ranges.

***Peritropis phalaroptera* sp. nov.**
(Figs 2G, 4, 9A-E)

ETYMOLOGY. Greek, *phalaroptera*, referring to the white spots present on the forewing membrane.

MATERIAL. HOLOTYPE: WESTERN AUSTRALIA: 1♂, Dip Yards, Broome, (17.97°S 122.23°E), 15-18 December 1998, ex light trap, C Brockway (AM). PARATYPES: WESTERN AUSTRALIA: 2♂♂, Karratha, (20.88°S 116.67°E), 19-22 Jan. 1999, R Parr (AM); SOUTH AUSTRALIA: 1♂, Minnie Downs, NE corner of South Australia, L Reese (SAMA); 1♀, Cannuwaukaninna Dune, 16km W of Etadunna Homestead, (28.79°S 138.55°E), 6 Mar. 1972, EG Matthews (SAMA).

DIAGNOSIS. Antennal segment AII with distinctive fuscous annulations medially and at apices; pronotum stramineous medially; forewing membrane grey with stramineous mottling; and parameres asymmetrical, with left smaller than right (Fig. 9C, D). *Peritropis phalaroptera* is distinguished from *P. postlei* in having sparse, pale, scale-like setae on the body. The parameres of the two species are also differently shaped (cf. Figs 9C, D & 10C, D).

DESCRIPTION. *Colouration.* Head: stramineous with weak red mottling to brown. Antennae: AI brown with stramineous mottling, basal half stramineous, occasionally entirely stramineous; AII stramineous with two fuscous annulations, apex fuscous; AIII-AIV stramineous. Pronotum: fuscous with stramineous mottling, medially with trapeziform stramineous marking. Mesoscutum: fuscous to brown. Scutellum: brown with weak to moderate stramineous mottling, posterior third with stramineous annulation. Hemelytra: stramineous, weak red and brown mottling to strong brown mottling; fuscous circular markings near cuneus; membrane grey with strong stramineous mottling. Legs: stramineous; femora with red to fuscous annulations on the distal third; tibiae with three red to fuscous annulations and occasionally mottling (Fig. 2G).

Dorsal texture. Head, pronotum and hemelytra rugulose.

Vestiture. Head and body with moderately dense distribution of simple, fine, pale, erect setae.

Structure. Macropterous, elongate. Head: posterior margin weakly concave; vertex medially sulcate; antennal insertions contiguous with eyes. Antennae: AI tapered basally; AIII-AIV shortened and slender. Eyes: reaching gula and contiguous with posterior margin of head. Pronotum: transverse, trapeziform; collar obsolete; callosite region moderately developed, medial foveae obsolete; anterior angles obtuse, lateral margins strongly explanate, posterior margin sinuate. Mesoscutum: prominent, strongly convex. Scutellum: weakly declivent, posterior termination moderately declivent. Hemelytra: clavus moderately tectiform; embolium moderately explanate; costal fracture weakly developed. Thoracic pleura: proepisternum anteriorly orientated; proepimeron deeply depressed medially; peritreme of metathoracic glands medially orientated, weakly fusiform; spiracle exposed. Male genitalia (Figs 9A-E): pygophore subconical (Fig. 9A); genital opening large (Fig. 9B, E), circular; left paramere (Fig. 9C) short; apical third thin and strongly curved; apical termination broken in specimen examined; right paramere (Fig. 9D) elongate and moderately curved; apical termination acute; aedeagus not examined.

Measurements. 3♂♂ BL 1.82-2.40, HW 0.51-0.68, IOD 0.16-0.25, HL 0.35-0.54, PL 0.26-0.36, PW 0.67-0.96, AII 0.59-0.88, LL 1.08-1.47; 1♀ BL 2.85, HW 0.75, IOD 0.40, HL 0.46, PL 0.44, PW 1.16, AII 1.02. LL not measured.

REMARKS. *Peritropis phalaroptera* has been collected mostly in arid areas. The specimens from northern WA are very widely separated from that from north-eastern SA populations (Fig. 4).

***Peritropis postlei* sp. nov.**
(Figs 2H, 5, 10A-F)

ETYMOLOGY. For Dr Tony Postle.

MATERIAL. HOLOTYPE: WESTERN AUSTRALIA: 1♂, Roebuck Plains via Broome, (18.02°S 122.42°E), 22-25 September 1998, ex light trap, C Brockway (AM). PARATYPES: 1♂ 1♀, same data as holotype (AM).

DIAGNOSIS. Dense adpressed scale-like setae on body; membrane grey with stramineous mottling; fuscous annulations on antennae and

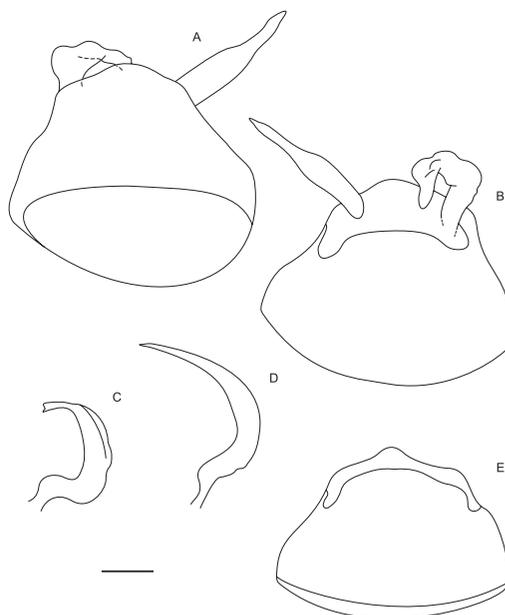


FIG. 9. *Peritropis phalaroptera* sp. nov. male genitalia. A, pygophore ventral view; B, pygophore dorsal view; C, left paramere; D, right paramere; E, genital opening dorsal view; scale bar 0.1mm.

legs (Fig. 2H); sub-symmetrical parameres (Fig. 9C, D); and, a single endosomal basal sclerite. *Peritropis postlei* is distinguished from *P. roebucki* and *P. phalaroptera* in having dense, adpressed, pale, scale-like setae on the entire habitus. The genitalia of *P. postlei* closely resemble those of *P. adusta*. They both have roughly symmetrical parameres (cf. Figs 6C, D & 9C, D) and an aedeagus with a single basal sclerite, although paramere shape varies between the species (cf. Figs 6E & 9F).

DESCRIPTION. *Colouration.* Head: stramineous with occasional red mottling, sometimes with 1 or 2 fuscous circular markings contiguous with eyes. Antennae: AI brown-fuscous, basal third stramineous; AII stramineous with two wide fuscous annulations medially, apex fuscous; AIII-AIV dark stramineous. Pronotum: stramineous with weak red-orange mottling, anterior lateral margins fuscous. Mesoscutum: brown-fuscous, posterior lateral margins with weak stramineous to red mottling. Scutellum: brown with weak red mottling, posterior third stramineous or with two almost contiguous circular stramineous markings. Hemelytra: stramineous to brown with weak red mottling, fuscous marking extending from

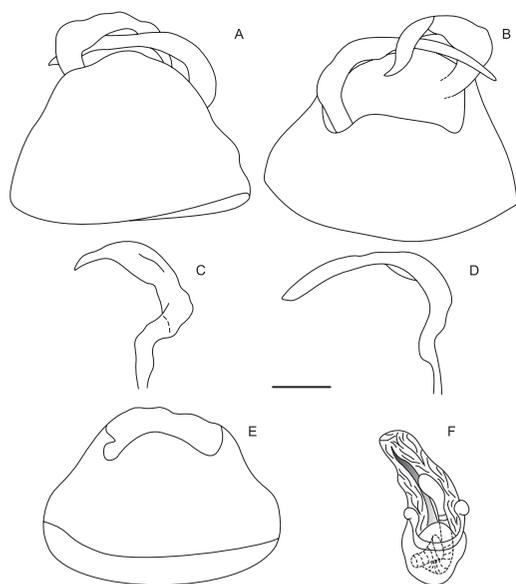


FIG. 10. *Peritropis postlei* sp. nov. male genitalia. A, pygophore ventral view; B, pygophore dorsal view; C, left paramere; D, right paramere; E, genital opening dorsal view; F, aedeagus with theca; scale bar 0.1mm.

posterior half of claval commissure to cuneus; embolium with indistinct red to fuscous markings; membrane grey-brown with stramineous mottling. Legs: stramineous, fore- and mesofemora with narrow red to fuscous annulations on distal third; metafemora with a broad red-fuscous annulation on distal half and a red-fuscous annulation near the distal termination; tibiae with three fuscous annulations and occasional mottling (Fig. 2H).

Dorsal Texture. Head, pronotum and hemelytra rugulose.

Vestiture. Head and body with dense distribution of adpressed, pale, flattened, scale-like setae.

Structure. Macropterous, elongate. Head: posterior margin rectilinear, vertex moderately sulcate medially; antennal insertions contiguous with eyes. Antennae: AI tapered basally; AIII-AIV shortened and slender. Eyes: reaching gula and contiguous with posterior margin of head. Pronotum: transverse, trapeziform; collar obsolete; callosite region moderately developed; medial foveae obsolete; anterior angles obtuse, lateral margins strongly explanate; posterior margin sinuate. Mesoscutum: prominent, strongly convex.

Scutellum: flat. Hemelytra: clavus moderately declivent with narrow ridge medially; embolium moderately explanate; costal fracture weakly developed. Thoracic pleura: proepisternum anteriorly orientated; proepimeron deeply depressed medially; peritreme of metathoracic glands small, tumid, medially orientated; spiracle exposed. Male genitalia (Figs 10A-F): pygophore subconical (Fig. 10A); genital opening large (Fig. 10B, E), circular; left paramere (Fig. 10C) elongate, curved with small, acute, apical termination; right paramere (Fig. 10D) extremely elongate and strongly curved; aedeagus (Fig. 10F) with secondary gonopore shallow, trough-like, ductus seminis moderately elongate and sclerotised, endosoma with a single basal sclerite.

Measurements. 2♂♂ BL 1.40-1.80, HW 0.43, IOD 0.19-0.20, HL 0.28-0.35, PL 0.22-0.24, PW 0.68-0.73, AII 0.50-0.53, LL 0.92-1.23; 1♀ BL 1.76, HW 0.46, IOD 0.22, HL 0.37, PL 0.23, PW 0.72, AII 0.57, LL 0.97.

REMARKS. *Peritropis postlei* is known only from the type locality, Roebuck Plains near Broome (Fig. 5) and is sympatric with *P. adusta* and *P. roebucki*. Like the two latter species, we expect the actual distribution of *P. postlei* to include much of monsoonal northern Australia.

***Peritropis punctatus* Carvalho & Lorenzato, 1978 (Figs 2I, 5)**

Peritropis punctatus Carvalho & Lorenzato, 1978: 145; Schuh, 1995: 34 (catalogue)

MATERIAL. 73♂♂, 85♀♀ 2 sex undetermined (damaged), (AM, QM unless indicated) from the following localities QUEENSLAND: Mt Lewis via Mossman, 1500-3000', December (19)57, J Darlington (AMNH); Kuranda, (16°49'S 145°36'E), 200m, 12/iii/1956, JL Gressitt (BPBM); 1km SE Mt Cook, 15.30°S 145.16°E, 13/x/1980, T Weir (ANIC); Bellenden Ker Ra., Cableway Base Stn, (17.16°S 145.54°E), 100m, 17/x - 9/xi/981, Earthwatch/QM; Bellenden Ker Ra., 1km S Cable Tower 6, (17.16°S 145.53°E), 500m, 17 Oct. - 9 Nov. 1981, Earthwatch/QM; Mt Fort Williams via Kalpowar, 18/i/990, GM; Tower near The Crater NP, 17°27'S 145°29'E, 1230m, 25/xi/1994, GM; Vine Ck Rd, 17°27'S 145°32'E, 1100m, 24/xi/1994, GM; Graham Ra., 17°17'S 145°58'E, 550m, 1/xi/1995, GM; Upper Mulgrave Rd, Kearneys Falls, (17°14'S 145°47'E), 100m, 10/xii/1988, GM & GT; Lamb Ra., 19km SE Mareeba, (17°07'S 145°38'E), 1200m, 3/xii/1988, GM & GT; Carbine Tblld, plane crash site, (16°27'S 145°11'E), 1330m, 28/xi/1990, GM & Janetzk; Mt Formartine South, 10km N Kuranda, 700m, 23/xi/1990, GM & GT; Davies Ck Rd, 20km SE Mareeba, 750m, 17/

xii/1989, GM & GT; Bell Peak North, Malbon Thompson Ra., (17°05'S 145°53'E), 600m, 22/xi/1990, GM & GT; Upper Cattle Ck, Eungella, 21°02'S 148°36'E, 900m, 17/xi/1992, GM, GT & Janetzki; Mt Mcartney, 20°50'S 148°34'E, 900m, 19/xi/1992, GM, GT & Janetzki; Charmillin Ck, 17°42'S 145°31'E, 940m, 1/xii/1997, GM; West Claudie R, Iron Ra., (12°44'S 143°17'E), 3-10/xii/1985, GM & DC; Baldy Mtn Rd, 7km SW Atherton, (17°16'S 145°28'E), 1150m, 9/xii/1988, GM & GT; Mount Bartle Frere, west side, (17°22'S 145°49'E), 1050m, 8/xii/1990, GM, GT and Sheridan; Mossman Bluff track, 9km W Mossman, (16°26'S 145°16'E), 1000m, 22/xii/1989, GM, ANZSES pyrethrum site 7; Windsor Tblld, 35km NNW Mount Carbine, (16°13'S 145°02'E), 1050m, 25-26/iv/1982, GM, D Yeates & DC; Windsor Tblld, 5.7km past barracks, 16°14'S 145°00'E, 1300m, 24/xi/1997, GM; Wallaman Falls Rd, 1km W junction, 18°39'S 145°52'E, 650m, 12/ii/1996, GM; Mt Dryander, 20°15'S 148°33'E, 700m, 21/xi/1992, GM, GT & Janetzki; Cardwell Ra., Mt McAlister area, (17°34'S 145°33'E), 1000m, 19/xii/1986, GM, GT & Hamlet; Sluice Ck, 9km WSW Millaa Millaa, (17°31'S 145°31'E), 1150m, 5/xii/1988, GM & GT; Mt Boolbun South, 15°57'S 145°08'E, 850m, 5/xi/1995, GM; McDowall Ra., 17km N Daintree, (16°03'S 145°15'E), 520m, 27/xi/1985, GM & DC; Tully R. crossing, 10km S Koombuloomba Dam, (18°02'S 146°03'E), 750m, 4/i/1990, GM; 2km SE Mt Spurgeon via Mount Carbine, (16°28'S 145°12'E), 1100m, 20/xii/1988, GM & GT; Hann Tblld, north end, 16°49'S 145°11'E, 1000m, 13/xii/1995, GM, DC & GT; Mt Spurgeon, Sandy Creek, 16°28'S 145°12'E, 1100m, GM; Hughes Rd, Topaz, 17°26'S 145°42'E, 650m, 4/xii/1993, GM & Janetzki; Wallaman Falls Rd junction, 18°39'S 145°52'E, 650m, 5/ii/1996, GM; "Camp Milo" Coolooloa, (26°00'S 153°00'E), 17-28/viii/1970, EC Dahms, under bark, standing tree; Mt Lewis Rd, 29km from Highway, 16°31'S 145°16'E, 1210m, 29/xi/1997, GM; Rex Ra. summit, 16°32'S 145°23'E, 400m, 18/v/1998, GM; Gadgarra Rd, 5km E Lake Eacham, (17°17'S 145°38'E), 700m, 9/xii/1989, GM, GT & Janetzki; Peeramon Scrub, 17°19'S 145°37'E, 750m, 9/xii/1995, GM; Kirrama Ra., Douglas Creek Rd,

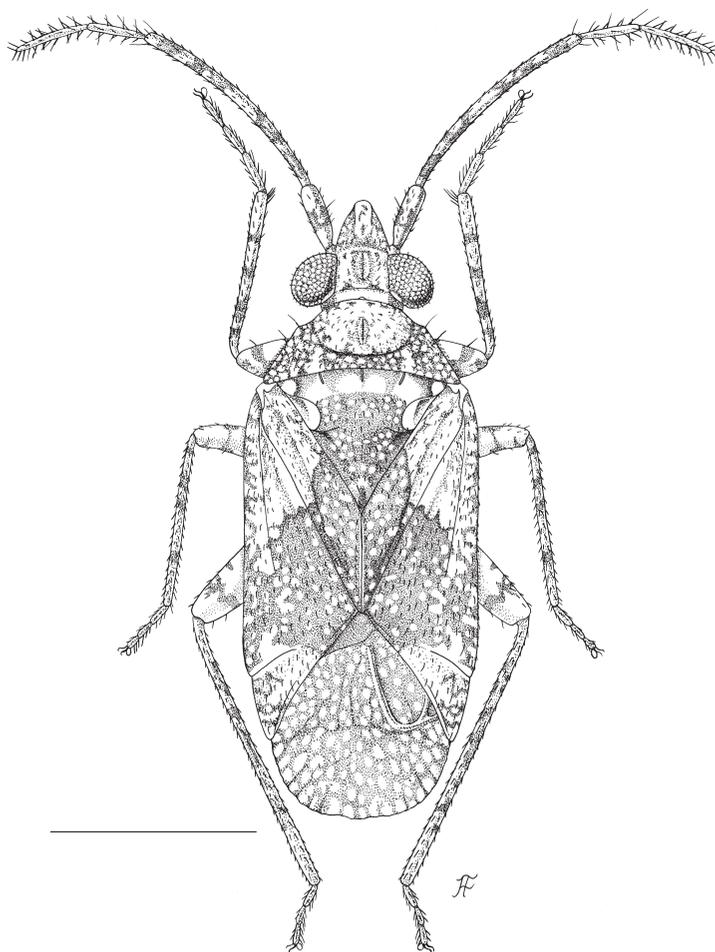


FIG. 11. Dorsal habitus of *Peritropis roebucki* sp. nov.; scale bar 0.8 mm.

(18°06'S 145°42'E), 850m, 10-12/xii/1986, GM, GT and Hamlet; Paluma Dam Rd, Birthday Ck, (18°58'S 146°09'E), 800m, 17/xi/1990, GM & Seymour; 3km SE Coen, 13.55°S 143.11°E, 24/vi/1993, ID Naumann and P Zborowski, at light (ANIC); Boonjie, 13km ESE Malanda, (17°24'S 145°45'E), 700m, 8/xii/1988, GM & GT; Pease's Lookout, Eungella, 21°07'S 148°31'E, 900m, 17/xi/1992, GM, GT & Janetzki; 3km W Bones Knob, 17°13'S 145°25'E, 1100m, 10/xii/1995, GM, DC & GT; Packers Ck via Portland Roads, (12°38'S 143°25'E), 6/xii/1985, GM & DC; Gurgeena Plateau, 25°27'S 151°23'E, 360m, 22/viii/1998, GM; 0.5km SE Mt Spurgeon, 16°27'S 145°12'E, 1180m, 21/xi/1997, GM; Mt Fisher summit, 17°33'S 145°33'E, 8/ii/1999, GM; 3km S Mt Deongwar, 27°14'S 152°15'E, 450m, 27/xii/1998, GM; Mt Abbot, top camp, 20°06'S 147°45'E, 800m, 8/xii/1996, GM; Lamington, O'Reillys, 14/i/1995, site M-2; WESTERN

AUSTRALIA: Kangaroo Gully, 1km NW Brookton Highway, 32°07'S 116°09'E, 260m, 5/i/2000, CJ Burwell knockdown, pyrethrum polyporus fungi on logs; AUSTRALIAN CAPITAL TERRITORY: Canberra, Black Mtn, (35°16'S 149°06'E), 600m, 7-12/iii/1980, A Newton and M Thayer, dry sclerophyll, window trap (AMNH). NEW SOUTH WALES: Concord, (33°50'S 151°05'E), December 1950, A Dyce; CHRISTMAS ISLAND: near Central Area workshop, 10.29°S 105.37°E, 13-28/iv/1989, JF Lawrence on lichen covered bark mainly at light (ANIC); near Central Area workshop, 10.29°S 105.37°E, 25/iv/1989, JC Cardale on lichen covered bark (ANIC).

DIAGNOSIS. Body elongate-ovoid; AII narrow; stramineous marking on apex of scutellum; fuscous markings on anterior two thirds of cuneus; fuscous marking on posterior margin of hemelytra; fore- and metafemora with broad medial black annulation and narrow subapical black annulations (Fig. 2I); and aedeagus with a single basal sclerite. *Peritropis punctatus* is distinguished from *P. aotearoae* (cf. Figs 2C & 2I) by the very broad fuscous annulation on the hind femora, and from *P. roebucki* by the absence of stramineous apices of the fore- and metafemora (cf. Fig. 2I & 2J).

REMARKS. *Peritropis punctatus* is a widespread species (Fig. 5), occurring along most of eastern coastal Australia from the ACT to northern Qld, extending into Papua New Guinea. It also occurs in the south-western corner of WA and Christmas Island. Specimens have been predominately collected by pyrethrum knockdown on dead trees and logs, indicating a possible association with fungal mycelia. Several specimens from Western Australia were also collected by pyrethrum knockdown from a log encrusted with polyporus fungi, a habitat association consistent with the proposition of mycetophagy as a general habit for cylapines (Wheeler, 2001).

***Peritropis roebucki* sp. nov.**

(Figs 1A-E, 1G, 2J, 4, 11, 12A-D, 13A-B)

ETYMOLOGY. This species is named after Roebuck Plains near Broome in Western Australia where many of the type specimens were collected.

MATERIAL. Holotype: WESTERN AUSTRALIA: 1♂, Roebuck Plains via Broome, (18.02°S 122.42°E), 10-13 December 1999, ex light trap, S Kniveton (AM). Paratypes: WESTERN AUSTRALIA: Roebuck Plains via Broome, ex light trap as follows; 3♂♂ 1♀, same data as holotype; 1♂, 30 Jan. 1998 - 4 Feb. 1998, C Brockway; 2♂♂, 30 Dec. 1997 - 2 Jan. 1998, C Johnstone; 1♂, Wyndham, (15.47°S 128.10°E), 8 Dec. 1999, ex light trap, T Vinnicombe (AM); 1♀, "Moola Bulla" via Halls Creek, (18.2°S

127.5°E), 15-18 Mar. 1999, ex light trap, M and J Shaw (all AM).

DIAGNOSIS. *Peritropis roebucki* is distinguished by the following combination of characters: antennae brown with stramineous mottling; pronotum with distinct fuscous and stramineous markings; hemelytra, scutellum fuscous, and membrane grey with stramineous mottling; femora mostly stramineous with subdistal fuscous annulation (Fig. 2J); aedeagus with two endosomal sclerites (Fig. 12D); sclerotised rings basally tapered (Fig. 13A); and, inter-ramal sclerite laterally thickened (Fig. 13B). *Peritropis roebucki* is distinguished from *P. postlei* by the less dense covering of adpressed, pale, scale-like setae on the dorsum. The distinctive pattern of fuscous annulations on the femora of *P. roebucki* (cf. Fig. 2C, 2I and 2J) distinguishes it from species such as *P. aotearoae* and *P. punctatus*.

DESCRIPTION. *Colouration*. Head: stramineous, occasionally with fuscous to red mottling. Antennae: AI brown with moderate stramineous mottling, basal third stramineous; AII brown with moderate stramineous mottling; AIII-AIV brown to fuscous. Pronotum: brown with intense stramineous mottling; medial callosite region stramineous with weak red-orange mottling. Mesoscutum: brown, posteriorly with weak stramineous mottling. Scutellum: brown with weak stramineous mottling, posterior third with 2 almost contiguous, indistinct, stramineous markings. Hemelytra: brown with weak stramineous mottling, usually with large circular stramineous markings near anterior lateral margins and costal fracture; membrane grey with stramineous mottling. Legs: stramineous, forefemora with broad fuscous annulation medially, proximal margin strongly concave; meso- and metafemora with narrow fuscous annulation on distal third; tibiae stramineous with brown mottling to fuscous with stramineous mottling (Fig. 2J).

Dorsal texture. Head, pronotum and hemelytra rugulose.

Vestiture. Head and body with moderately dense distribution of simple, fine, pale, erect setae.

Structure. Macropterous, elongate. Head: posterior margin moderately concave; vertex medially sulcate; antennal insertions contiguous with eyes. Antennae: AI tapered basally; AIII-AIV shortened and slender. Eyes: reaching gula and contiguous with posterior margin of head. Pronotum: transverse, trapeziform; collar obsolete; callosite region moderately developed, medial foveae

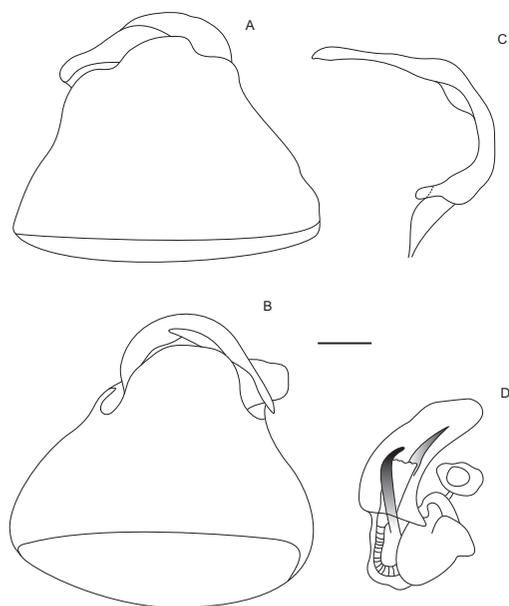


FIG. 12. *Peritropis roebucki* sp. nov. male genitalia. A, pygophore ventral view. B, pygophore dorsal view. C, left paramere. D, aedeagus with theca. Scale bar 0.1mm.

obsolete; anterior angles obtuse, lateral margins moderately explanate, posterior margin weakly bisinuate. Mesoscutum: prominent, strongly convex. Scutellum: flat, posterior third moderately declivent. Hemelytra: clavus moderately declivent with narrow ridge medially; embolium moderately explanate; costal fracture weakly developed. Thoracic pleura: proepisternum anteriorly orientated; proepimeron deeply depressed medially; peritreme of metathoracic glands, weakly fusiform, medially orientated; spiracle exposed. Male genitalia (Fig. 12A-D): pygophore subconical (Fig. 12A); genital opening large (Fig. 12B), circular; left paramere absent from specimen dissected; right paramere (Fig. 12C) elongate and strongly curved; aedeagus (Fig. 12D) with secondary gonopore elongate, trough-like; ductus seminis moderately elongate and sclerotised, two endosomal sclerites present. Female genitalia (Figs 13A-B): sclerotised rings (Fig. 13A) large, elliptical, and tapered basally; posterior wall (Fig. 13B) with lateral margins of inter-ramal sclerite thickened.

Measurements. 5♂♂ BL 1.72-2.94, HW 0.44-0.51, IOD 0.16-0.18, HL 0.40-0.43, PL 0.27-0.31, PW 0.63-0.78, AII 0.63-0.74, LL 1.35-1.52; 2♀♀

BL 1.84-2.94, HW 0.55, IOD 0.26, HL 0.52, PL 0.38, PW 0.72, AII 0.80, LL 1.64.

REMARKS. *Peritropis roebucki* occurs in the Kimberley region of WA (Fig. 4).

CONCLUSIONS

The large and diverse Cylapinae genus *Peritropis* Uhler, which now comprising 62 species worldwide, was previously known from Australia by only a single species (*P. kotejai* Gorczyca, 1997a). This work establishes a significant presence for this cosmopolitan genus in Australia. It is now known to occur in all Australia states and territories, except Victoria and Tasmania, ranging from monsoonal northern zones and tropical rainforest to arid and temperate regions. The distributions of several species thought to be restricted to islands in the Pacific Ocean, such as New Caledonia and New Zealand, have been significantly expanded to include Australia, and, in the case of *P. aotearoae* and *P. punctatus*, Christmas Island. There is some uncertainty about the identity of the Christmas Island species

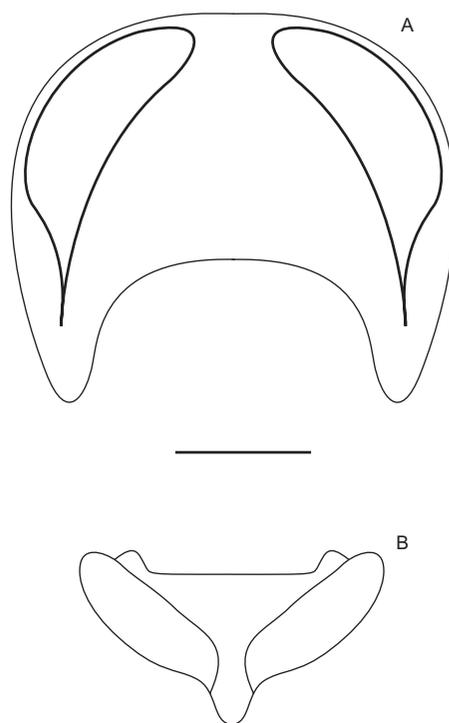


FIG. 13. *Peritropis roebucki* female genitalia. A, sclerotised rings B, posterior wall. Scale bar 0.1mm.

P. listeri, and comparison with *P. aotearoae* is required.

The fuscous patterning of the tibiae and femora (Fig. 2A-J) frequently provides the most straightforward means of distinguishing the Australian species of *Peritropis*. Four species (*P. albaspecca*, *P. kotejai*, *P. basseti* and *P. novocaledonicus*) have a completely, or mostly fuscous femora and only minor stramineous markings medially on the tibiae (Fig. 2D). This colouration easily separates these four from the rest of Australian species which show varying patterns of fuscous annulations on the femora and tibiae. These other Australian species each have their own distinctive colour patterns on the fore-, meso- and metafemora, as shown in Figure 2.

ACKNOWLEDGEMENTS

This work was supported by the Australian Biological Resources Study. We thank Ms Hannah Finlay for her habitus illustrations of *Peritropis adusta* and *P. roebucki*. Ms Sue Lindsay provided technical support for the scanning electron microscopy. The following curators are thanked for the loan of specimens: Dr Randall T. Schuh (AMNH), Mr Gordon Nishida (BPBM), Dr Graham Brown (NTM), Dr Geoff Monteith (QM), Dr Gordon Gross and Ms Jan Forrest (SAMA), Dr Thomas J. Henry (USNM) and Dr Terry Houston (WAM). Thanks also to Dr Tony Postle (Australian Quarantine Inspection Service) who provided specimens that were fundamental to this study.

LITERATURE CITED

- BERGROTH, E. 1925. On the annectant bugs of Messrs. MacAtee and Malloch. *Bulletin of the Brooklyn Entomological Society* 20: 159-164.
- BOLTE, K.B. 1996. Techniques for obtaining scanning electron micrographs of minute arthropods. *Proceedings of the Entomological Society of Ontario* 127: 67-87.
- CARVALHO, J.C.M. 1956. Insects of Micronesia: Miridae. Bishop Museum., Honolulu, *Insects of Micronesia* 7: 1-100.
1957. A catalogue of the Miridae of the world. Part I. *Arquivos do Museu Nacional, Rio de Janeiro* 44: 1-58.
1981. *Analecta Miridologica, V: observations on type specimens in the collection of the British Museum of Natural History (Hemiptera: Miridae)*. *Revista Brasileira de Biologia*. 41:1-8.
- CARVALHO, J.C.M. & LORENZATO, L.M. 1978. The Cylapinae of Papua New Guinea (Hemiptera: Miridae). *Revista Brasileira de Biologia* 38:121-149.
- CASSIS, G. 1995. A reclassification and phylogeny of the Termatophylini (Heteroptera: Miridae: Deraeocorinae), with a taxonomic revision of the Australian species, and a review of the tribal classification of the Deraeocorinae. *Proceedings of the Entomological Society of Washington* 97(2): 258-330.
- CASSIS, G. & GROSS, G.F. 1995. *Zoological Catalogue of Australia. Coleorrhyncha to Cimicomorpha. Volume 73.A*. Melbourne: CSIRO Australia.
- CASSIS, G., SCHWARTZ, M.D. & MOULDS, T.A. (2003). Systematics and new taxa of the *Vannius* complex (Hemiptera: Miridae: Cylapinae) from the Australian Region. *Memoirs of the Queensland Museum* 49(1): 123-151.
- GORCZYCA, J. 1997a. A new species of the genus *Peritropis* Uhler, 1891, from Australia (Heteroptera: Miridae: Cylapinae). *Genus* 8(3-4): 555-558.
- 1997b. A new species of the genus *Peritropis* Uhler, 1891, from New Caledonia (Heteroptera: Miridae: Cylapinae). *Genus* 8(3-4): 559-561.
- 1997c. *Xenocylapidius tamasi* gen. et sp. nov. from New Caledonia (Heteroptera: Miridae: Cylapinae). *Polskie Pismo Entomologiczne* 66: 177-184.
1998. A new species of *Peritropis* Uhler from Malawi (Heteroptera: Miridae: Cylapinae). *Annals of the Natal Museum* 39: 199-202.
1999. A new remarkable species of *Peritropis* Uhler from Tanzania (Heteroptera: Miridae: Cylapinae). *Genus* 10: 21-23.
2000. A systematic study on Cylapinae with a revision of the Afrotropical Region (Heteroptera, Miridae). Katowice: Wydawnictwo Uniwersytetu Śląskiego 176 pages
- GORCZYCA, J. & EYLES, A.C. 1997. A new species of *Peritropis* Uhler, the first record of Cylapinae (Heteroptera: Miridae) from New Zealand. *New Zealand Journal of Zoology* 24: 225-230.
- HENRY, T.J. & WHEELER, A.G. Jr 1988. Family Miridae Hahn, 1833 (= Capsidae Burmeister, 1835). The plant bugs. Pages 251-507, in Henry, T.J. & Froeschner, R.C. (eds). *Catalog of the Heteroptera, or True Bugs, of Canada and the Continental United States*. E.J. Brill: Leiden.
- IZZARD, R.J. 1936. The Hemiptera of Christmas Island. *Annals and Magazine of Natural History* (10)17:577-600.
- KERZHNER, I.M. 1972. New and little known Heteroptera from the Far East of the USSR. *Trudy Zoologicheskogo Instituta Akademiya Nauk SSSR* 52: 276-295.
- KERZHER, I.M. & JOSIFOV, M. 1999. Cimicomorpha II. Miridae. Pages xiv, 1-576, in Aukema, B. &

- Rieger, C. (eds). Catalogue of the Heteroptera of the Palaearctic Region. The Netherlands Entomological Society: Amsterdam.
- SCHMITZ, G. 1970. Contribution a la faune du Congo (Brazzaville). Mission A. Villiers et A. Descarpentries. XCVIII. Hemipteres Miridae et Isometopidae (1re partie). Bulletin de l'Institut Francais de l'Afrique Noire 32A: 501-530.
- SCHUH, R.T. 1995. Plant bugs of the World (Insecta: Heteroptera: Miridae). Systematic catalog, distributions, host list, and bibliography. The New York Entomological Society: New York.
- SWEARINGEN, M., HEADRICK, D. & BELLOWS, T. 1997. Comparison of fixation and drying procedures for scanning electron microscopy among insect body types. Proceedings of the Entomological Society of Washington 99(3): 513-522.
- UHLER, P.R. 1891. Observations on some remarkable forms of Capsidae. Proceedings of the Entomological Society of Washington 2:119-123.
- WHEELER, A.G. Jr 2001. Biology of the Plant Bugs (Hemiptera, Miridae). Pests, Predators, Opportunists. Cornell University Press: Ithaca.
- YASUNAGA, T. 2000. The mirid subfamily Cylapinae (Heteroptera: Miridae) or fungal inhabiting plant bugs in Japan. Tijkschrift voor Entomologie 143: 183-209.

