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Update of Australian *Sternopriscus* SHARP, 1882 with description of three new species (Coleoptera: Dytiscidae: Hydroporinae)

L. HENDRICH & C.H.S. WATTS

Abstract

Three new species of the genus *Sternopriscus* SHARP, 1882 (Coleoptera: Dytiscidae) are described: *S. emmae* (intermittent streams in northern and north-western Australia), *S. eikei* (acid coastal peat land pools of south-western Australia near Northcliffe), and *S. williamsi* (open alpine sedge/heath land pools of the Central Plateau Conservation Area of Tasmania). *Sternopriscus emmae* belongs to the *S. hansardii* group, *S. williamsi* to the *S. tarsalis* group, and *S. eikei* is similar to *S. marginatus* WATTS, 1978 (species group unknown). The median lobes, male antennae and color patterns are illustrated. The known distribution and ecology of each species is briefly outlined. The total number of described species in the genus *Sternopriscus* is now 29.

Key words: Coleoptera, Dytiscidae, *Sternopriscus*, Tasmania, northern Australia, south-western Australia, faunistics, taxonomy.

Introduction

Beetles of the genus *Sternopriscus* SHARP, 1882 occur commonly in all but the most arid regions of Australia in both standing and running water. When this genus was recently revised, a total of 26 species, divided into three species groups and some probably phylogenetically isolated species, were recognised (HENDRICH & WATTS 2004). Most species of the genus show a high sexual dimorphism with larger males, which have a small notch in the protibia and the antennal segments often greatly expanded.

The aim of this paper is to describe three additional new species, collected by the authors in the Kimberley region of north-western Australia, the coastal peat lands of south-western Australia and in the Central Lakes Area of Tasmania. With the 29 species now recognised, *Sternopriscus* is one of the most speciose epigeal dytiscid genera in Australia.

Material and Methods

This study is based on the examination of 483 specimens, most of them deposited in SAMA, and the collection of the first author. Drawings were made with the aid of an Olympus VMZ and a Leica MZ 12 with a drawing tube.

The material used for this study is deposited in the following collections:

ANIC	Australian National Insect Collection, Canberra, Australia
BMNH	Natural History Museum, London, England
CLH	Collection L. Hendrich, Berlin, Germany; property of NMW
NMW	Naturhistorisches Museum Wien, Vienna, Austria
NTM	Northern Territory Museum, Darwin, Northern Territories, Australia
SAMA	South Australian Museum, Adelaide, South Australia, Australia
WAM	Western Australian Museum, Perth, Western Australia, Australia
ZSM	Zoologische Staatssammlung, München, Germany

Abbreviations: ACT = Australian Capital Territory, NG = New Guinea, NSW = New South Wales, NT = Northern Territory, QLD = Queensland, SA = South Australia, TAS = Tasmania, VIC = Victoria, WA = Western Australia.

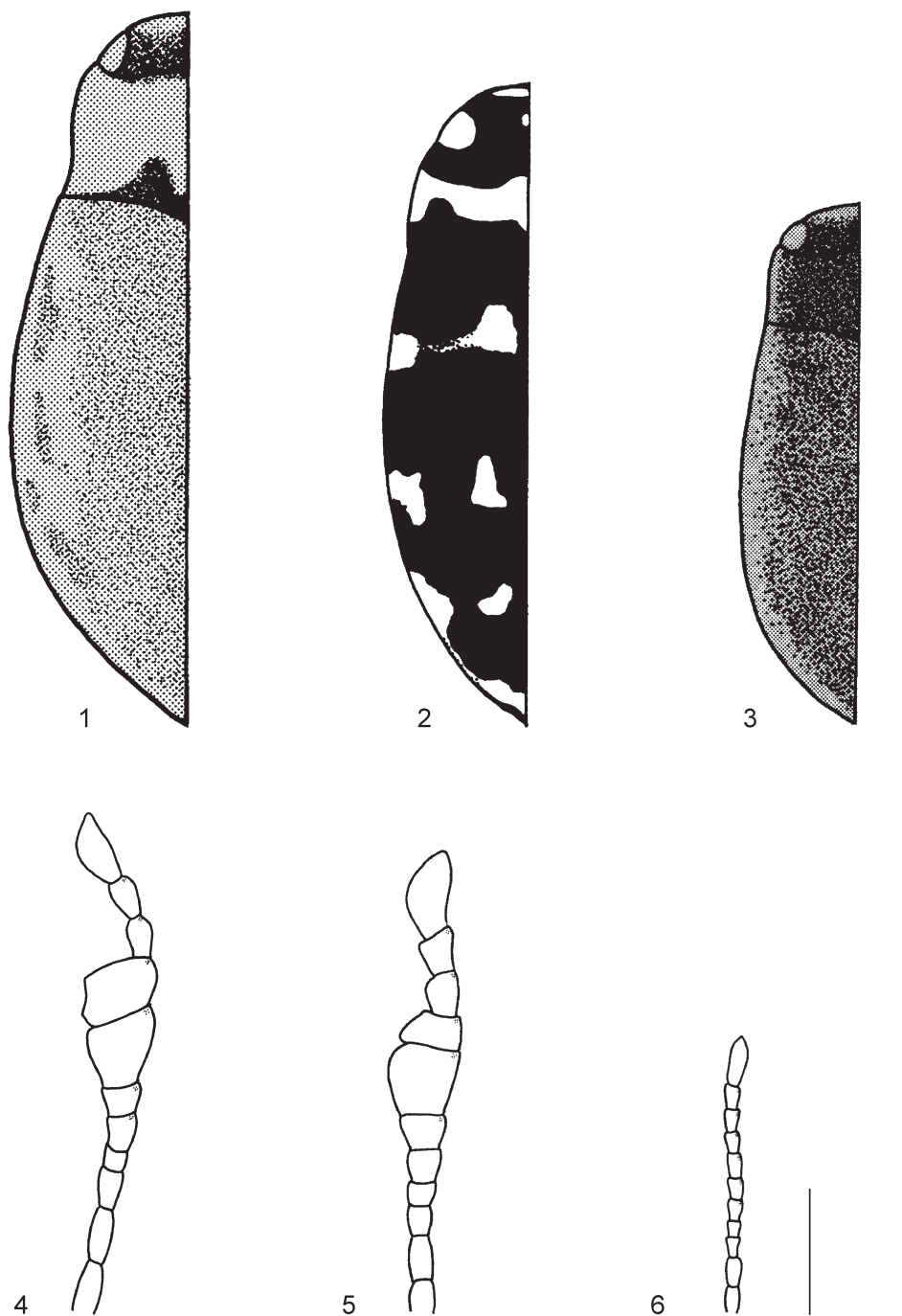
Sternopriscus SHARP, 1882

A genus of 29 small elongate rugose-punctate species with fourth segment of pro- and mesotarsi distinctly visible. Mesoventrite prominent between prosternum and metaventricle, metatibia rugose-punctate, males with slight notch in protibia and with segments of antenna often greatly expanded.

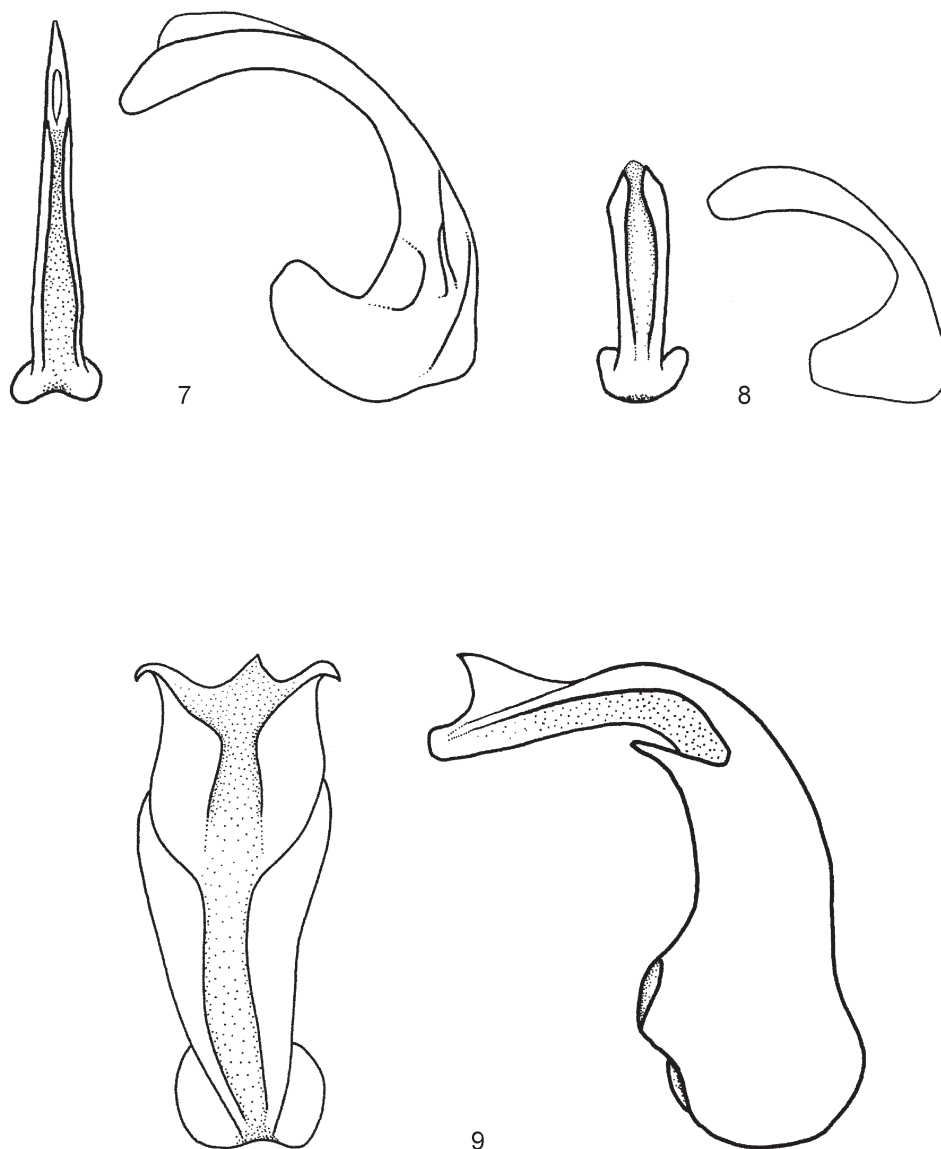
World Checklist-list:

<i>S. alligatorensis</i> HENDRICH & WATTS, 2004	N-WA, NT, N-QLD
<i>S. alpinus</i> HENDRICH & WATTS, 2004	VIC, TAS, NSW
<i>S. aquilonaris</i> HENDRICH & WATTS, 2004	N-WA, NT, N-QLD
<i>S. balkei</i> HENDRICH & WATTS, 2004	N-WA, NT, N-QLD
<i>S. barbarae</i> HENDRICH & WATTS, 2004	NW-TAS
<i>S. browni</i> SHARP, 1882	SW-WA
<i>S. clavatus</i> SHARP, 1882	SA, VIC, TAS, NSW, QLD, NG ¹
<i>S. eikei</i> sp.n.	SW-WA
<i>S. emmae</i> sp.n.	N-WA, NT
<i>S. goldbergi</i> HENDRICH & WATTS, 2004	NT, N-QLD
<i>S. hansardii</i> (CLARK, 1862)	VIC, NSW, ACT
<i>S. marginatus</i> WATTS, 1978	SW-WA
<i>S. meadfootii</i> (CLARK, 1862)	VIC, TAS, NSW, ACT
<i>S. minimus</i> LEA, 1898	SW-WA
<i>S. montanus</i> WATTS, 1978	TAS
<i>S. mouchampsi</i> HENDRICH & WATTS, 2004	VIC, NSW
<i>S. multimaculatus</i> (CLARK, 1862)	WA, SA, VIC, TAS, NSW, ACT, QLD, NT
<i>S. mundanus</i> WATTS, 1978	VIC, TAS, NSW, ACT
<i>S. pilbaraensis</i> HENDRICH & WATTS, 2004	C-WA
<i>S. signatus</i> SHARP, 1882	SA, VIC
<i>S. storeyi</i> HENDRICH & WATTS, 2004	SW-WA
<i>S. tarsalis</i> SHARP, 1882	SA, VIC, TAS, NSW
<i>S. tasmanicus</i> SHARP, 1882	SA, VIC, TAS
<i>S. wallumphilina</i> HENDRICH & WATTS, 2004	S-QLD
<i>S. wattsi</i> PEDERZANI, 2000	SW-WA
<i>S. weckwerthi</i> HENDRICH & WATTS, 2004	TAS
<i>S. wehnckeii</i> SHARP, 1882	SA, VIC, TAS, NSW, ACT
<i>S. weiri</i> HENDRICH & WATTS, 2004	TAS, NSW, S-QLD
<i>S. williamsi</i> sp.n.	TAS

¹ The single record of *S. clavatus* from Irian Jaya, New Guinea [NG] (see BALKE 1995) needs to be confirmed (HENDRICH & WATTS 2004).



Figs. 1–6: Body outlines and colour patterns (1–3), and male antenna (4–6) of 1) *Sternopriscus eikei*, 2) *S. emmae*, 3) *S. williamsi*, 4) *S. eikei*, 5) *S. emmae*, 6) *S. williamsi*. Scales 1–3 = 1 mm, 4–6 = 0.3 mm.



Figs. 7–9: Penis, ventral (left) and lateral (right) view, 7) *Sternopriscus eikei*, 8) *S. williamsi*, 9) *S. emmae*. Scale = 0.5 mm.

Sternopriscus hansardii group

Characterised by large size, weak-obsolete pronotal plicae without depressed area between them, prosternal process reaching metaventrite, males with strongly modified antennal segments 7 and 8, and apex of median lobe of aedeagus complex (HENDRICH & WATTS 2004).

***Sternopriscus emmae* sp.n.**

TYPE LOCALITY: Limestone Creek, Gregory National Park, Northern Territory, Australia.

TYPE MATERIAL: **Holotype:** ♂, "AUSTRALIA/NT/Gregory N. P., Bullita Stock Road, Limestone Creek, 40 m, 2.7.1999, Hendrich leg./coll. Loc. 31 / 131", "Holotype *Sternopriscus eikei* sp.n. Hendrich & Watts des. 2006" [red printed label] (SAMA). – **Paratypes: Northern Territory:** 93 specimens (41 ♂♂, 52 ♀♀) with same data as holotype (ANIC, BMNH, CLH, NMW, SAMA, ZSM); 2 ♀♀, "N.T. Limestone Gorge 16.02 S 130.23 E 23–26 June 1986 m. Malipatil Operation Raleigh 1986", "Paratype *Sternopriscus emmae* sp.n. Hendrich & Watts des. 2006" [red printed label] (NTM); **Western Australia:** 16 specimens (7 ♂♂, 9 ♀♀): "AUSTRALIA/WA/West Kimberley, Gibb River Road, Saddler Spring, Iminji Aboriginal Community, 350 m, 22.6.1999, Hendrich leg./coll. Loc. 20/120", "Paratype *Sternopriscus emmae* sp.n. Hendrich & Watts des. 2006" [red printed label] (CLH).

DIAGNOSIS: Elongate, widest near middle of elytra, weakly convex (Fig. 2).

DESCRIPTION: Measurements. Holotype, male: TL = 3.0 mm, TL-H = 2.8 mm; width = 1.5 mm. Paratypes, males: TL = 3.0–3.2 mm, TL-H = 2.7–2.9 mm; width = 1.5 mm; females: TL = 2.9–3.0 mm, TL-H = 2.6–2.7 mm; width = 1.5–1.6 mm.

Colour: Head dark brown to black, area between antennal bases and small central spot near rear margin testaceous; pronotum dark brown to black, wide central transverse area and sides in front half, testaceous; elytron dark brown to black with three pairs of small testaceous spots (one lateral and one near suture, in some specimens both basal spots connected), apex testaceous; ventral surface dark testaceous, prosternum lighter. Appendages lighter; antennal segments 3–7 (or 3–8), and tips of palpi darker (Fig. 2).

Sculpture: Strongly reticulate, punctures relatively large, even, close, those on head weaker but well marked. Pronotal plicae well marked reaching to half way or bit more along pronotum. Edge of elytron weakly serrate, slightly widened towards apex, narrowing abruptly near apex, apex acuminate. Setae on pronotum and elytron well developed. Pronotal process rugose-punctate, ridged, sides subparallel, reaching metaventrite. Midline of metaventrite raised anteriorly; metacoxal lines strongly raised, weakly diverging in anterior half.

Male: Longer. Antennal segment 6 expanded, segment 7 greatly expanded, segment 8 about as wide as segment 7 but half length, lateral sloped anteriorly, segments 9 and 10 not expanded, apical segment wider than segment 10, same length as segments 9 and 10 combined (Fig. 5). Protarsus moderately expanded; protibia bent near apex; profemur with small spine on front edge towards base. Mesotibia very weakly curved; mesotarsi with segments 2–3 quite strongly and asymmetrically expanded. Pro- and mesotrochanters with a thin ridge near apex, mesofemur without peg-like structure near base.

Median lobe of aedeagus broad in apical half, narrowing towards base, tip complex, with well developed finger-like ventral piece (Fig. 9).

Female: Shorter. Antennal segments not expanded; tarsi moderately and symmetrically expanded.

AFFINITIES: *Sternopriscus emmae* is a member of the *S. hansardii* group and closely related to *S. aquilonaris*, *S. balkei* and *S. goldbergi* but can be separated from these and other members of the *S. hansardii* group by colour, the form of the median lobe and the male antennae.

In the key to *Sternopriscus* species in HENDRICH & WATTS (2004), *S. emmae* will run to couplet 11, where it can be taken out by the following characters: North Australia, antennal segments 9 and 10 of the male longer than wide (Fig. 5). Females cannot be reliably separated from those of *S. goldbergi*.

ETYMOLOGY: Dedicated to the senior author's wife Emma Hendrich.

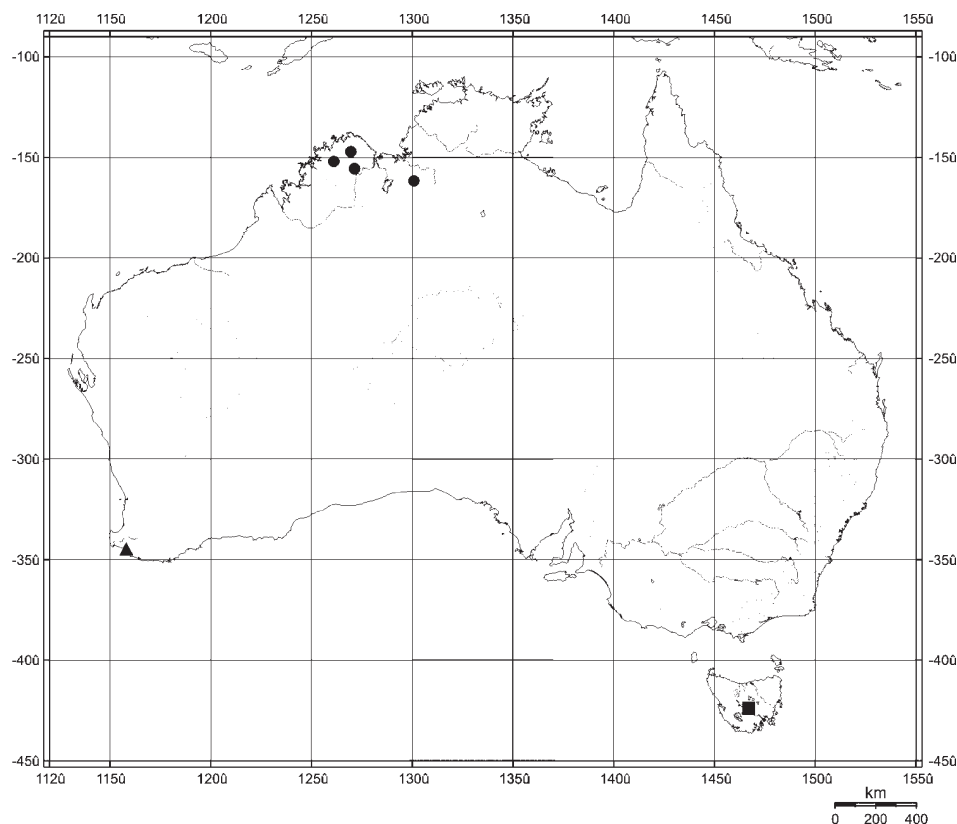


Fig. 10: Geographical distribution of *Sternopriscus eikei* (triangles), *S. emmae* (circles) and *S. williamsi* (squares).

DISTRIBUTION: Northern coastal Australia (Gregory National Park and Kimberley region) (Fig. 10).

HABITAT: A rheophilic species living in streams and small rivers. At Saddler Spring it occurs in a slowly flowing, exposed and deep stream, with the bank covered by stands of large Cyperaceae. All water beetles were collected in a shallow (20–30 cm) embayment of 3 sqm, among roots of emergent vegetation and plant debris. In Gregory Park all beetles were collected from two small (4–6 sqm), shallow (maximum depth about 25 cm), exposed pools in an almost dry limestone creek (Fig. 12). The bottom consists of sand and stones covered with dense mats of living and rotting Characeae. Apart from the *Sternopriscus*, the water beetle coenosis in the limestone creek included the following Dytiscidae: *Hyphydrus decemmaculatus* WEHNCKE, *Hydroglyphus grammopterus* (ZIMMERMANN), *H. leai* (GUIGNOT), *Tiporus centralis* (WATTS), *T. giuliani* (WATTS), *T. undecimmaculatus* (CLARK), *T. georginae* WATTS, and *Laccophilus clarki* SHARP.

***Sternopriscus tarsalis* group
(*S. meadfootii* complex)**

All members of this group are characterised by small size, moderate to strong pronotal plicae with depressed area between them, prosternal process not reaching metaventrite, males with antennal segments not or only moderately modified, and median lobe of aedeagus simple (HENDRICH & WATTS 2004).

***Sternopriscus williamsi* sp.n.**

Type locality: Between lakes Augusta and Ada, NW-Tasmania, Australia.

TYPE MATERIAL: **Holotype:** ♂, "Australia/NW-Tasmania between lakes Augusta and Ada, Feb. 1963 W.D. Williams leg.", "Holotype *Sternopriscus williamsi* sp.n. Hendrich & Watts des. 2002" [red printed label] (SAMA). – **Paratypes:** 1 ♂, 1 ♀, same data as holotype (CLH, CPZ). 44 exs., "TAS Rocky Lagoon 2 k E Lake Ada 41 52 52 146 29 43 7/10/02 C.H.S. Watts", "Paratype *Sternopriscus williamsi* sp.n. Hendrich & Watts des. 2002" [red printed label] (SAMA); 320 exs., "Australia: C TAS, CPCA, 500 m E Lake Ada, pools, 1154m, 14.XII.2006, 41.52.575S 146.28.432E, L. & E. Hendrich (TAS 149)", "Paratype *Sternopriscus williamsi* sp.n. Hendrich & Watts des. 2007" [red printed label] (BMNH, CLH, NMW, ZSM).

DIAGNOSIS: Small, strongly reticulate reddish-brown species.

DESCRIPTION: Measurements. Holotype, male: TL = 2.5 mm, TL-H = 2.2 mm; width = 1.2 mm. Paratypes, male: TL = 2.4–2.6 mm, TL-H = 2.1–2.3 mm; width = 1.2–1.3 mm; female: TL = 2.3–2.6 mm, TL-H = 2.1–2.4 mm; width = 1.1–1.3 mm.

Colour. A very variable species. Most specimens dark red-brown, head and disc of pronotum almost blackish (Fig. 3). In some specimens sides of pronotum paler and elytra with moderately distinct lighter mottling, particularly at base and sides.

Sculpture. Strongly reticulate. Elytral margin very weakly serrated towards apex. Pronotum and elytron covered with rather long setae. Head with relatively sparse rather shallow punctures, pronotum covered with strong, evenly placed punctures very rugose at sides, rest of body strongly rugose-punctate. Pronotal plicae well marked, reaching a little over half way along pronotum, joined by a shallow, narrow depression. Prothoracic process robust, subparallel, strongly rugose-punctate, not reaching metaventrite. Metacoxal lines strongly raised, relatively close, diverging slightly towards front.

Male. Antennal segments 8–10 slightly expanded, apically elongate, about same width as segment 10 and about twice as long. (Fig. 6). Protarsus strongly expanded; profemur expanded with basal ridge on inside near base strongly developed; protibia moderately expanded, curved, with slight excavation near base on inside. Basal three segments of mesotarsus moderately expanded. Median lobe of aedeagus broad, very thin apically, tip bilobed (Fig. 8).

Female. Almost same size as males. Antenna shorter, robust, middle segments not expanded, apical slightly elongate, about same width as segment 10 and about 1½ as long. Protarsus strongly expanded, basal segments of mesotarsus moderately expanded.

AFFINITIES: A member of the *S. meadfootii* complex. Within the complex *S. williamsi* is separated from all other species by its relatively simple male antennae, except *S. mundanus*. In its dark colour, elongate shape and rugose sculpture it most resembles *S. montanus*, but is readily distinguished by its relatively simple male antennae in contrast to *S. montanus* with its strongly expanded middle antennal segments in the male. In addition, the female can also be easily recognised by its simple antennae and strongly expanded pro- and mesotarsi.

In the key to *Sternopriscus* species given by HENDRICH & WATTS (2004) it will run to *S. mundanus*. It can be separated from this species by: sides of pronotum widely and clearly

testaceous (*S. mundanus*); pronotum (and often rest of dorsal surface) black or dark chocolate-brown, at most with narrow region diffusely lighter at sides (*S. williamsi*).

ETYMOLOGY: Dedicated to the late Australian limnologist W.D. Williams (Adelaide, Australia) who collected part of the type material.

DISTRIBUTION: Tasmania. Only known from the type locality. Collected between two alpine lakes (above 1000 m) of the eastern part of the Central Plateau Conservation Area of Tasmania (Fig. 10).

HABITAT: At Lake Ada this species was collected in open, moderately deep (to 20 cm) tarns, in places with some sparse aquatic vegetation on a flat peaty bottom, in a region of open alpine sedge/heath land (Fig. 13).

Apart from the *Sternopriscus*, the water beetle coenosis included the following species: Dytiscidae: *Antiporus femoralis* (BOHEMAN), *Exocelina australiae* (CLARK), *Platynectes reticulosus* (CLARK), *Rhantus suturalis* (MACLEAY) and *Sternopriscus alpinus*; Hydrophilidae: *Limnoxenus zealandicus* (BROUN).

Species incertae sedis (species group unknown)

As mentioned in HENDRICH & WATTS (2004) it was not possible to place the following three western Australian species [*S. marginatus*, *S. browni*, and *S. watti*] which appear to be phylogenetically isolated. A fourth species, described below, is similar to *S. marginatus*.

***Sternopriscus eikei* sp.n.**

TYPE LOCALITY: Peat land pond, 5 km south of Northcliffe, southwestern Australia.

TYPE MATERIAL: **Holotype**: ♂, "AUSTRALIA / WA: 5 km S Northcliffe, 50 m 2.1.2000, Hendrich leg. (loc.10a/156)", "Holotype *Sternopriscus eikei* sp.n. Hendrich & Watts des. 2006" [red printed label] (WAM). – **Paratypes**: 4 ♀♀ with the same data as holotype (1 ex. in WAM, 1 ex. in SAMA, 2 exs. in CLH); 1 ♀, "AUSTRALIA / WA: D'Entrecasteaux N.P., 15 km S Northcliffe, Windy Harbour Road, 50 m, 3.1.2000, Hendrich leg. (Loc. 10c/156)", "Paratype *Sternopriscus eikei* sp.n. Hendrich & Watts des. 2006" [red printed label] (CLH); 2 ♂♂, 2 ♀♀, "AUSTRALIA / WA: D'Entrecasteaux N.P., 15 km S Northcliffe, Windy Harbour Road, 50 m, 3.1.2000, Hendrich leg. (Loc. 10b/156)", "Paratype *Sternopriscus eikei* sp.n. Hendrich & Watts des. 2006" [red printed label] (CLH); 1 ♀, "Australia: SW WA, D'Entrecasteaux NP, 11 km S Northcliffe, 77 m, 4.1.2007, 34.44.048 S 116.05.35 E, L. & E. Hendrich leg. (WA 162)", "Paratype *Sternopriscus eikei* sp.n. Hendrich & Watts des. 2007" [red printed label] (ZSM).

DIAGNOSIS: Body oval, elytron widest in middle, weakly constricted just before base of pronotum; apical half of elytra broadly flanged; dorsal surface dark yellowish, shiny (Fig. 1).

DESCRIPTION: Measurements. Holotype, male: TL = 3.0 mm, TL-H = 2.8 mm; width = 1.5 mm. Paratypes, males: TL = 3.1 mm, TL-H = 2.9 mm; width = 1.6 mm; females: TL = 2.8–3.0 mm, TL-H = 2.5–2.7 mm; width = 1.5–1.7 mm.

Colour: Head testaceous, hind angles and around eyes brown; pronotum pale testaceous, base with distinct dark brownish marking in middle; elytron diffusely mottled testaceous and brown; ventral surface brown with darker and lighter patches, appendages lighter except segments 9–10 of antenna which are darker (Fig. 1).

Sculpture: Reticulate. Punctures on head well marked, of small size and density, rest of body moderately strongly rugose-punctate. Pronotal plicae almost straight, well marked, reaching to about half way along pronotum. Midline of metaventricle strongly keeled but not raised in front to meet prothoracic process. Prothoracic process robust, subparallel, strongly rugose-punctate, not

keeled, weakly curved in lateral view and not reaching metaventricle. Metacoxal lines raised to metaventricle, weakly diverging towards front.

Male: Larger. Antennal segments 7 and 8 strongly and broadly expanded, segments 5 and 6 progressively less so, segments 1–3 and 9–10 same length, apical segment moderately enlarged but longer than penultimate (Fig. 4). Apical segment of labial palpus thick, moderately bifid. Basal three segments of protarsus very moderately expanded; protibia weakly notched near base; profemur with small spines in middle and weakly notched at apex. Mesotarsi clearly expanded; mesotibia almost straight; mesofemur elongate without setae along inner edges. Median lobe of aedeagus elongate, very thin and simple, not expanded in ventral view but strongly enlarged in lateral view at tip. (Fig. 7).

Female: Smaller. Appendages simple, segments of antennae lighter except segments 5–7 and 11 which are darker towards apex, labial palpus weaker.

AFFINITIES: A south-western Australian species with broadly flanged elytra, similar to *S. marginatus* but readily separable by its more elongate body, paler testaceous colour of dorsal surface, form of the median lobe and more strongly modified male antennae.

In the key to *Sternopriscus* given in HENDRICH & WATTS (2004) *S. eikei* will run to *S. marginatus* but can be distinguished as follows: segments 7 and 8 of male antennae at least 3x the size of segments 9 and 10 (*S. eikei*) (Fig. 4); segments 7 and 8 of male antennae < 2x size of segments 9 and 10 (*S. marginatus*).

DISTRIBUTION: Southwest Australia. Known only from summer-dry peat lands south of Northcliffe (Fig. 10). A detailed map of the localities sampled is given in HENDRICH (2001).

HABITAT: Most specimens were collected in a peat swamp surrounded by *Melaleuca* trees (loc. 10a, HENDRICH 2001), with dark humic and slightly acidic water (pH 6.0). The whole area is seasonally flooded with a permanent central water body of approximately 200 sqm in summer. The vegetation is dominated by large stands of *Juncus* and dense beds of macrophytes dominated by *Triglochin* and *Callitriche*; maximum depth is about 40 cm; the bottom consists of sedge-filled peat, twigs and rotten leaves. A single male was obtained from shallow and half-shaded pools in a *Melaleuca* blackwater swamp (loc. 10b), with a few clumps of *Juncus* spp. and extensive beds of macrophytes; depth about 20 cm; the bottom consists of sedge-filled peat (pH 5.5), twigs and rotten leaves. One female was collected from a shallow (60 cm deep) pond (10 sqm) (loc. 10c) without any vegetation, partly shaded by old Eucalypt forest and a bottom consisting of sand with a thin layer of rotten leaves (Fig. 11).

Apart from the *Sternopriscus*, the water beetle coenosis included the following species: Dytiscidae: *Uvarus pictipes* (LEA), *Limbodessus inornatus* (SHARP), *Antiporus femoralis*, *A. gottwaldi* HENDRICH, *A. hollingsworthi* WATTS, *A. mcraeae* WATTS & PINDER, *Sternopriscus browni*, *S. marginatus*, *S. minimus*, *Exocelina ater* (SHARP), *Megaporus solidus* (SHARP), *Platynectes aenescens* (SHARP), *P. brownei* GUEORGUIEV, *Rhantus simulans* RÉGIMBART, *R. suturalis* and *Spencerhydrus pulchellus* SHARP; Hydrophilidae: *Enochrus eyrensis* (BLACKBURN), *Limnoxenus zealandicus*, *Paracymus pygmaeus* (MACLEAY).

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Figs. 11–12: Habitat of 11) *Sternopriscus eikei*, temporary coastal heath land pool south of Northcliffe, south-western Australia; 12) *S. emmae*, Limestone Creek in Gregory National Park, Northern Territory (photographs: L. Hendrich).



Fig. 13: Habitat of *Sternopriscus williamsi*, shallow pools south of Lake Ada, Central Plateau Conservation Area, Tasmania (photograph: L. Hendrich).

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Dr. L. HENDRICH

Zoologische Staatssammlung, Münchhausenstraße 21, D – 81247 München, Germany (hendrich1@aol.com)

Dr. C.H.S. WATTS

South Australian Museum, North Terrace, Adelaide, South Australia 5000, Australia
(watts.chris@saugov.sa.gov.au)

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