

The identity of *Haliplus* (Coleoptera: Haliplidae) from the Pilbara region of Australia, including the description of four new species

C.H.S. Watts¹ and J. McRae²

¹Department of Science, South Australian Museum, North Terrace, Adelaide, South Australia 5000, Australia.

²Bennelongia Pty Ltd, 64 Jersey Street, Jolimont, Western Australia 6014, Australia.

Abstract - The subtropical, semi-arid Pilbara region of Western Australia was recently subject to an extensive survey of its invertebrate fauna including aquatic habitats. Among the aquatic beetles collected were numerous specimens of the genus *Haliplus*, none of which could be confidently identified. We report on our study of this material and provide descriptions, including detailed illustrations of four new species; *H. halsei* sp. nov., *H. fortescueensis* sp. nov., *H. pinderi* sp. nov. and *H. pilbaraensis* sp. nov. A key to the species of *Haliplus* now known for the Pilbara is given.

Key words: Coleoptera, Haliplidae, *Haliplus*, taxonomy, Western Australia, Pilbara.

INTRODUCTION

The taxonomy of the haliplids of Australia is now well known due to the work of Watts (1988) and particularly Van Vondel (1995) who described and comprehensively illustrated all the known species and provided a key to the species. No specimens from the Pilbara region in Western Australia were available to him. Since that time collections by Lars Hendrich (Berlin), the senior author and, particularly, the biological surveys conducted by the Western Australian Government's Department of Environment and Conservation, have resulted in the collection of relatively large numbers of Haliplids from the region. These clearly belong to the genus *Haliplus* Latreille but have proved to be difficult to specifically identify using the descriptions and keys in Van Vondel (1995).

Based on this new material lodged in the Western Australian and South Australian Museums and the collection of the wildlife research section of the Western Australian Department of Environment and Conservation - we consider that four species of *Haliplus* occur in the Pilbara, all of which are undescribed. In this paper we describe these new species.

METHODS

Specimens were collected using standard dip nets. Two invertebrate samples were collected per site, one benthic sample using a 250 µm net and a plankton sample using a 50 µm net. The benthic sample was preserved in 75% ethanol and the plankton sample in buffered formalin.

Samples were then sieved and specimens removed, these were then transferred to 100% ethanol. Most specimens were then card mounted. Many male specimens were dissected and the genitalia mounted on a card with the rest of the specimen. The male genitalia of a few specimens of each species were dissected and mounted in polyvinyl lactophenol on microscope slides. These were then illustrated using a Zeiss Axioscop microscope with differential contrast (Nomarski) and camera lucida. Illustrations were made from dried alcohol specimens using a camera lucida attached to a Leica MZ16 binocular microscope. The descriptions follow the style used by Van Vondel (1995).

Abbreviations

CALM, Western Australian Department of Conservation and Land Management, Perth, Australia (now the Department of Environment and Conservation); CLH, Collection of L. Hendrich, Berlin, Germany, property of the Naturhistorisches Museum Wien, Vienna, Austria; SAMA, South Australian Museum, Adelaide, Australia; UWA, University of Western Australia, Perth, Australia; WAM, Western Australian Museum, Perth, Australia.

BIOLOGY

Haliplids in Northern Australia are found most abundantly during and at the end of the wetter summer season in still, shallow, thickly vegetated areas at the edges of creeks/rivers. In many cases these are temporary and dry out in the dry winter period. They also occur occasionally in low

numbers in small permanent or semi-permanent rock pools and pools in creeks. In northern and north-eastern Australia the species are virtually absent during the dry winter period but relatively abundant in still water during the 'wet'. All northern Haliplids show a similar pattern and the same is true for the Pilbara. Larvae were collected in association with all four species described here. These will be described in a separate publication.

SYSTEMATICS

Family Haliplidae Aube, 1836

Genus *Haliplus* Latreille, 1802

Haliplus Latreille, 1802: 77.

Type species

Dytiscus impressus Fabricius, 1787, by subsequent designation of Latreille (1810).

Subgenus *Haliplus* (*Neohaliplus*) Netolitzky, 1911

Haliplus (*Neohaliplus*) Netolitzky, 1911: 271.

Type species

Dytiscus lineatocollis Marsham, 1802, by monotypy.

Diagnosis (Australian species)

Small deep bodied, with pronotal plicae, with a small visible first ventrite, apical ventrite without medial ridge, right paramere without apical digitus (Van Vondel 1995).

Haliplus (*Neohaliplus*) *pinderi* sp. nov.

Figures 1a-e

Material examined

Holotype

Australia: Western Australia: ♂, 'WA Kalgan Pool on Kalgan Creek, PSW066, 23°11'17"S, 119°41'57"E, 24 April 2005, CALM' (WAM Entomology No. 72040).

Paratypes

Australia: Western Australia: 2 adults, collected with holotype (SAMA); 3 adults, 'WA House Pool on Cane River PSW047, 22°05'44"S, 115°37'15"E, 16/5/05 CALM' (SAMA); 1 adult, 'WA Murchison River 24k N Binnu, 18/5/2001. CHS Watts' (SAMA); 4 adults, 'WA Homestead Creek nr Newman, UWA 1/4/2003' (SAMA); 2 adults, 'WA Pelican Pool PSW021 21 19 55S 120 22 26E 2/9/03 CALM' (1 in WAM Entomology No. 72041; 1 in SAMA (male genitalia on separate slide).

Other material (not paratypes)

Australia: Western Australia: Bobswim Pool (23°03'27"S, 118°05'29"E), 19 May 2005, Pinder and McRae; Gorge Junction Pool (24°05'00"E 118°03'17"E), 9 September 2005, Pinder and McRae; Innawally Pool (23°21'49"S, 120°11'29"E), 24 April 2006, Pinder and McRae; Kalgan Pool on Kalgan Creek (23°11'17"S, 119°41'57"E), 24 April 2005; Nyeetbury Spring (21°51'29"S, 116°30'57"E, 29 August 2003, Pinder and McRae; House Pool on Cane River (22°05'44"S, 115°37'15"E), 16 May 2005, Pinder and McRae; Bonnie Pool (21°58'41"S, 119°59'27"E), 22 September 2004, Pinder and McRae (all in CALM).

Description

Adults

Length 2.6–2.9 mm. Deep bodied, oval, subparallel in middle, pronotal/elytra junction indented, widest in middle.

Head. Relatively small, elongate. Light testaceous; antenna and palpi yellow. Punctures moderate, scattered. Distance between eyes about 1.6 x dorsal width of eye.

Pronotum. Light testaceous. Depressed at base between long, inwardly curved well-marked plicae, positioned relatively close to sides opposite elytral stria 6, depressed slightly on inside (Figure 1a). Lateral borders finely margined; posterior corners slightly rounded. Almost completely covered by large punctures becoming stronger towards posterior corners, smaller towards anterior, much weaker in basal depression.

Elytra. Light testaceous with basal, central and subapical bands of black markings on the primary puncture rows, adjacent lines often confluent forming large black maculae; sutural region narrowly black. Primary punctures dense, small in stria 1, increasing in size considerably to stria 5, about 38 punctures in stria 1; basal 8–10 punctures of stria 5 obliterated by longitudinal impression (elytral plica), somewhat longer than pronotal plicae, basal punctures of stria 4 also sometimes confluent forming groove; striae 7 and 8 reaching base; secondary punctures along suture very small, in single row, hard to trace in some specimens; other intervals virtually impunctate. Completely margined, margin in middle invisible from above, tips slightly flared.

Ventral surface. Light testaceous, darker on prosternal and metasternal processes; legs light testaceous, darker towards bases. Elytral epipleura reaching to hind edge of ventrite 2 (sternite 5); five visible ventrites, ventrite 1 reduced to small triangular sclerite, strong dense puncture-row on narrowed posterior portion, 2 puncture rows in

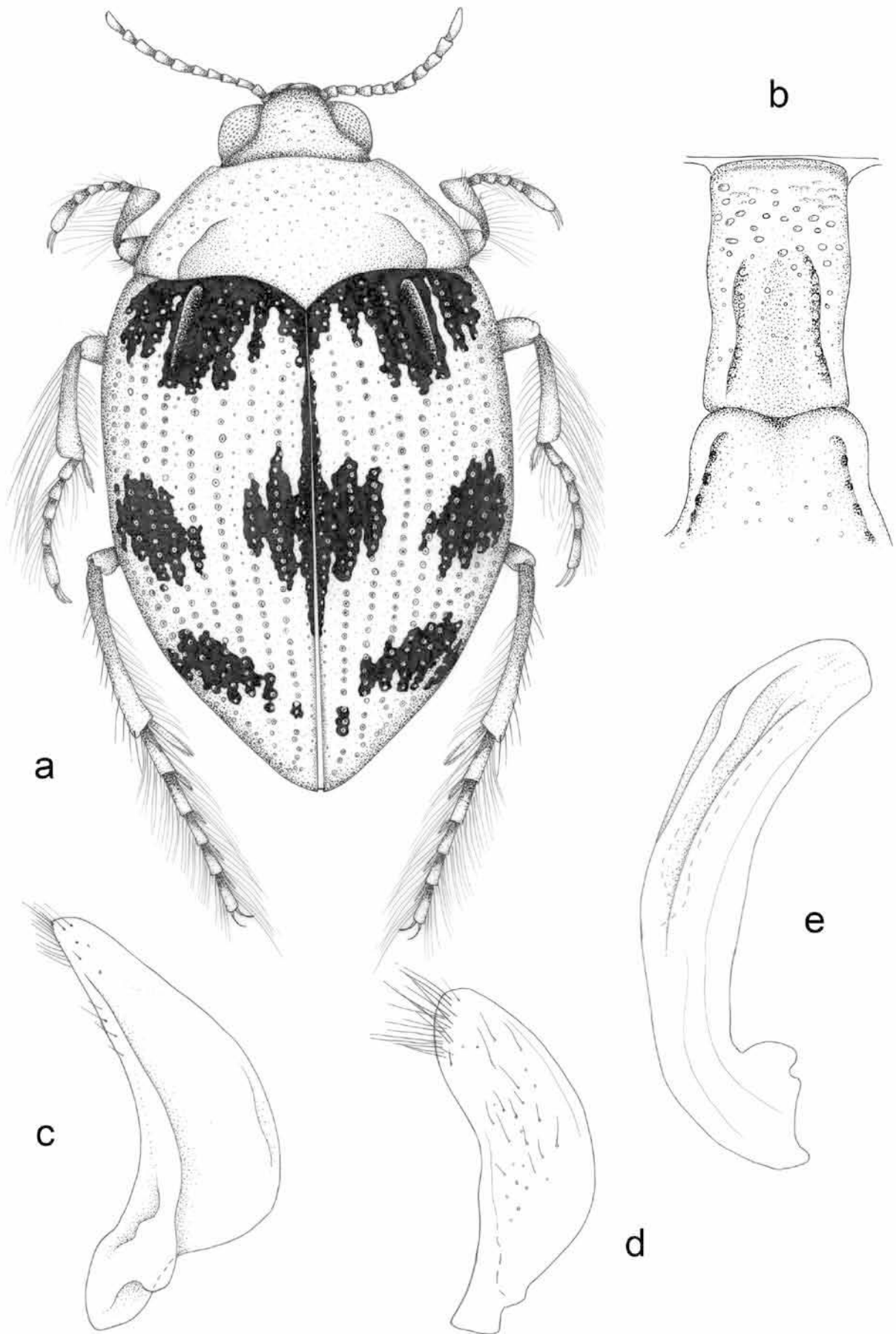


Figure 1 *Haliplus pinderi* sp. nov. a, habitus; b, prosternal and metasternal processes; c, right paramere; d, left paramere; e, lateral view of penis.

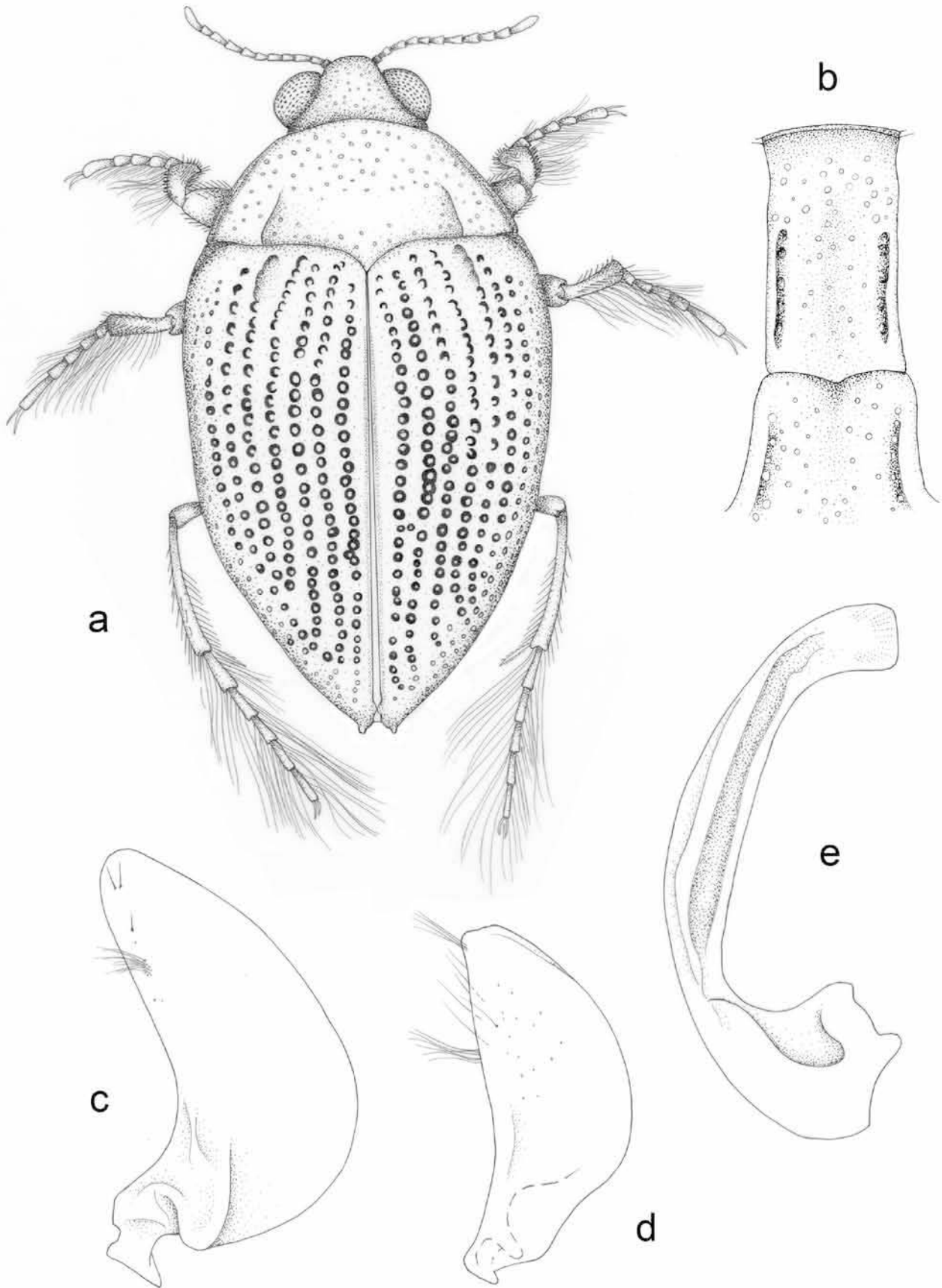


Figure 2 *Haliplus fortescueensis* sp. nov. a, habitus; b, prosternal and metasternal processes; c, right paramere; d, left paramere; e, lateral view penis.

anterior portion, punctures in inner row largest. Prosternum with 3–8 weak to moderate sized punctures, proepisternum impunctate. Prosternal process nearly parallel-sided; in middle strongly depressed in posterior 2/3, anterior edge strongly margined, lateral ridges with groove formed by row of coarse punctures; anterior portion densely and coarsely punctured; posterior depression impunctate (Figure 1b). Metasternal process diverging posteriorly, anteriorly depressed in middle, weakly punctured in middle, without hairs, laterally with row of large confluent punctures forming groove (Figure 1b). Metacoxal lobes reaching nearly to edge of ventrite 2, weakly and sparsely punctured near suture, strongly punctured laterally. Ventrites 2–4 each with irregular row of punctures posteriorly. Apex of last ventrite moderately punctured. Metatibia without setiferous striole on dorsal face, longer tibial spur 1.1 x as long as first tarsal segment.

Male. Pro and mesotarsomers 1–3 more robust, tarsomere 1 more dilated ventrally. Tarsomeres 1 + 2 with sucker hairs on ventral side. Outer protarsal claw bit stronger than inner. Penis and parameres as in Figures 1c, d and e.

Biology

The Binnu specimen was collected from a small, *Chara*-choked, shallow (< 1 m) billabong with a base of sand and rock. The type specimens were collected from Kalgan Pool on Kalgan Creek which is a deep clear (Turbidity 0.4–0.9, TDS 1 g/L, Colour 2.5–9 TCU at time of sampling), freshwater pool up to about 4m depth at the base of a cliff, with dense patches of *Chara* and *Nijas*. Sediments coarse, dominated by pebble, cobble, boulder and gravel.

Distribution

Haliplus pinderi was collected across the southern and eastern Pilbara (Figure 5).

Remarks

Haliplus pinderi is a very distinctive species both in colour and morphology and is unlikely to be confused with any other Australian species. Apart from the colour pattern (Figure 1a) the most striking characters are the long, widely spaced pronotal plicae (Figure 1a) and the strongly rugose prosternal process (Figure 1b).

Etymology

This species is named for Adrian Pinder from the Department of Environment and Conservation Western Australian, Wanneroo, who collected the type specimen.

Haliplus (Neohaliplus) fortescueensis sp. nov.
Figures 2a–e

Material examined

Holotype

Australia: Western Australia: ♂, 'WA Fortescue Marsh West PSW003(B) 22°19'0"S 119°8'58"E 29°4'06" CALM' (WAM Entomology No. 72042).

Paratypes

Australia: Western Australia: 6 adults, collected with holotype (4 in SAMA, 2 in WAM Entomology No. 72043–72044); 4 adults, 'Coondiner Pool PSW001 22°43'26"S 119°39'23"E 15/8/03 CALM' (1 in WAM Entomology No. 72045, 3 in SAMA); 1 adult, 'Gnalka Gnoona claypan PSW 004 26°9'14"S 118°28'29"E 24/5/04 CALM' (SAMA).

Other material (not paratypes)

Australia: Western Australia: Cooliarin Pool (20°30'20"S, 118°37'20"E), 20 April 2006. Pinder and McRae; Fortescue Marsh West (Moojari Well) (22°19'00"S, 119°08'58"E, 29 April 2006, Pinder and McRae; Gregory Gorge Pool (21°32'59"S, 116°58'15"E), 25 August 2003, Pinder and McRae; Jacksons Bore Claypan (22°05'05"S, 120°14'01"E), 27 August 2005, Pinder and McRae (all in CALM).

Description

Adults

Length 2.4–2.9 mm. Body somewhat spindle-shaped, subparallel in middle, widest at shoulders.

Head. Relatively small, elongate. Light testaceous; antenna and palpi yellow. Punctures moderate, scattered. Distance between eyes about 1.6 x dorsal width of eye.

Pronotum. Light testaceous. Plicae well marked, slightly curved, reaching about 1/3 way across pronotum, starting opposite elytral stria 5, depressed at base between plicae (Figure 2a). Lateral borders finely margined; posterior corners slightly rounded. Almost completely covered by large punctures becoming smaller towards anterior, virtually impunctate between plicae except for posterior margin.

Elytra. Light testaceous, punctures black except towards sides and apex. Primary punctures moderately strong, about a puncture width apart, about 28 punctures in stria 1; between 3 and 9 basal punctures of stria 5 obliterated by longitudinal impression (elytral plica) (Figure 2a); striae 7 and 8 not reaching base; secondary punctures along suture extremely small, in single row; other intervals virtually impunctate. Completely margined, margin in middle invisible from above, smooth; small but distinct spine close to apex.

Ventral surface. Light testaceous, bases of legs and areas of prosternal and metasternal processes

darker. Elytral epipleura reaching to hind edge of ventrite 2 (sternite 5), single row of 4–6 large punctures on wider anterior portion, narrow posterior portion impunctate. Prosternum and proepisternum virtually impunctate. Sides of prosternal process weakly sinuate, anterior and posterior ends of similar width, strongly depressed in middle in posterior 2/3, anterior edge strongly margined, lateral ridges with one or two grooves formed by row(s) of coarse punctures, anterior portion sparsely punctured; posterior depression impunctate (Figure 2b). Metasternal process a little broader than prosternal process, sides almost straight, depressed in middle particularly anteriorly, weakly punctured in middle, without hairs, laterally with row of moderate sized confluent punctures (Figure 2b). Metacoxal lobes reaching middle of ventrite 2, weakly and sparsely punctured near suture, strongly punctured laterally. Five visible ventrites, ventrite 1 reduced to small triangular sclerite, ventrites 2–4 each with irregular row of small punctures posteriorly. Apex of last ventrite moderately punctured. Protibia with 10–13 strong comb-like setae on outside, those in basal ½ as wide as adjacent tibia; metatibia without setiferous striole on dorsal face, longer tibial spur about 0.8 x as long as first tarsal segment.

Male

Pro and mesotarsomers 1–3 more robust, tarsomere 1 more dilated ventrally. Tarsomeres 1 and 2 with a few sucker hairs on ventral side. Outer protarsal claw much longer and thicker than inner. Aedeagus and parameres as in Figures 2 c, d and e.

Variation

The small series from Coondiner Pool are overall almost black but otherwise conform to this species. This dark appearance may be due to the method of preservation.

Distribution

Haliplus fortescueensis seems mainly restricted to the Fortescue Marsh region in the north of the Pilbara (Figure 5) although it was also collected once in a claypan near Port Hedland.

Etymology

This species is named after the Fortescue Marsh where the species appears to be most abundant.

Biology

Fortescue Marsh is a very large salt marsh at the terminus of the upper portion of the Fortescue River. Fresh when first filled, it becomes more saline as it dries.

Remarks

A uniformly pale testaceous species with a superficial resemblance to pale coloured examples of *H. fuscatus* Clark or *H. gibbus* Clark the former of which occurs just south of the Pilbara region. It is separated from these, and most other Australian Haliplids with pronotal plicae, by the strongly uneven male proclaws, the small but distinct spine on the tip of the elytron, the peculiarly strong comb-like spines on the outside of the protibia in both sexes, much stronger elytral plicae in most and strong ridges on the sides of the metasternal process. From *H. gibbus* it also differs in the longer and thinner aedeagus. For difference from *H. pinderi* see under that species. Three of the four specimens from Coondiner Pool are very dark but do not seem to differ in any other way.

Subgenus *Haliplus* (*Liaphlus*) Guignot, 1928

Haliplus (*Liaphlus*) Guignot, 1928: 138.

Type species

Dytiscus fulvus Fabricus, 1801, by subsequent designation of Guignot (1930).

Diagnosis (Australian species)

Pronotum without basal plicae, lacking small triangular first ventrite i.e. only four ventrites, right paramere with apical digitus (Van Vondel 1995).

Haliplus (*Liaphlus*) *halsei* sp. nov.

Figures 3a–e

Material examined

Holotype

Australia: Western Australia: ♂, 'WA Gnalka Gnoona claypan PSW 004 24°09'14"S, 118°28'29"E), 24 May 2004, CALM' (WAM Entomology No. 72046).

Paratypes

Australia: Western Australia: 1 adult, collected with holotype (SAMA); 11 adults, 'Koondepindawarrina Pool PSW 005, 22°07'06" S 118° 23'47"E 24/5/2004 CALM' (4 in SAMA; 7 in WAM Entomology No. 72047–72053).

Other material (not paratypes)

Australia: Western Australia: House Pool on Cane River (22°05'44"S, 115°37'15"E), 16 May 2005, Pinder and McRae; Myanore Creek Pool (21°26'30"S, 115°51'46"E), 13 May 2006, Pinder and McRae; Glen Ross Creek (24°10'44"S, 118° 1'48"E), 9 September 2005, Pinder and McRae; Kumina Creek (21°51'45"S, 116°54'32"E), 15 September 2005, Pinder and McRae; Coondiner Pool (22°43'26"S, 119°39'23"E), 15 August

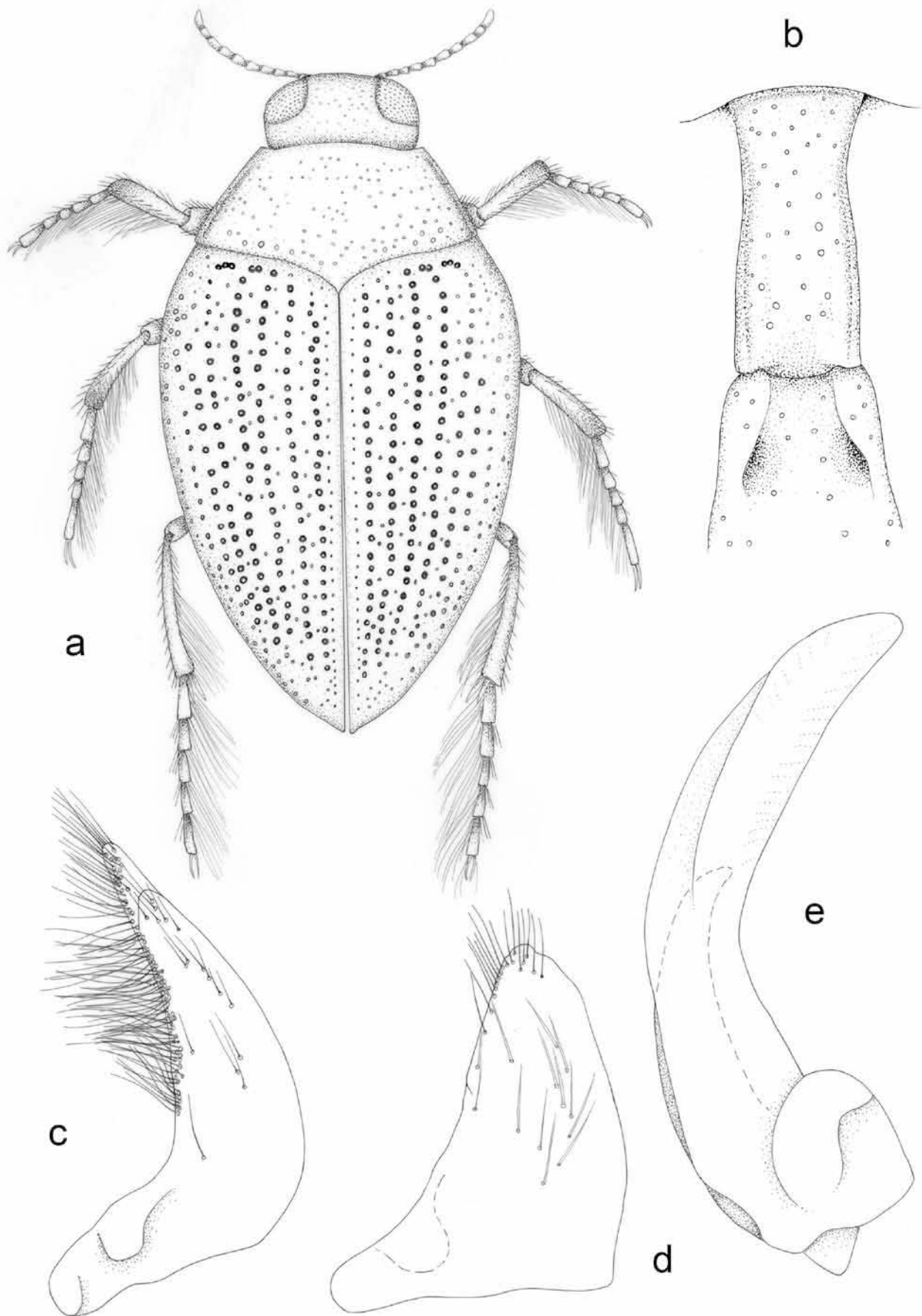


Figure 3 *Haliphus halsei* sp. nov. a, habitus; b, prosternal and metasternal processes; c, right paramere; d, left paramere; e, lateral view of penis.

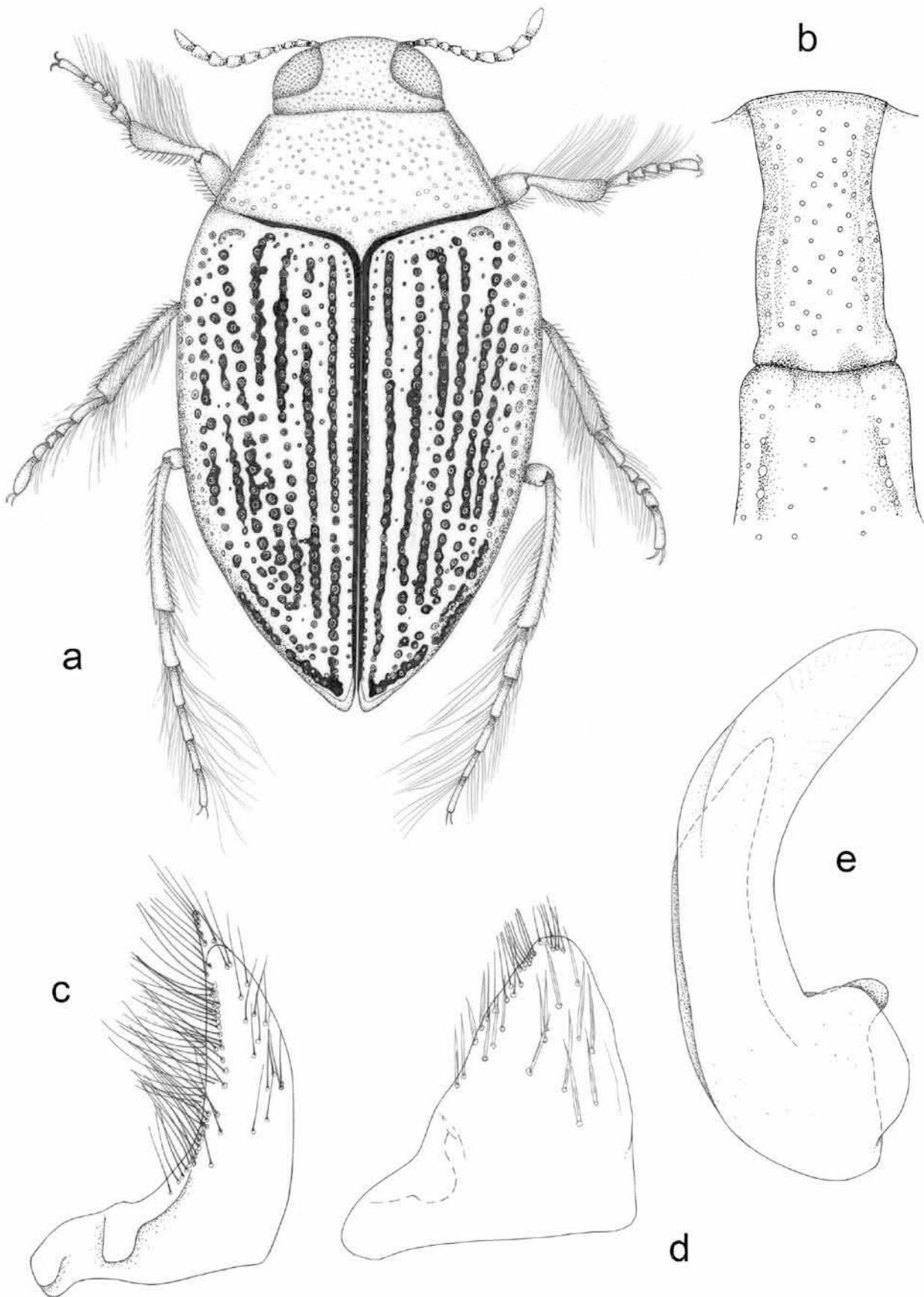


Figure 4 *Haliplus pilbaraensis* sp. nov. a, habitus; b, prosternal and metasternal processes; c, right paramere; d, left paramere; e, lateral view of penis.

2003, Pinder and McRae; Fortescue Marsh West (Moojari Well) (22°19'00"S, 119°08'58"E), 29 April 2006, Pinder and McRae; Chalyarn Pool (21°45'12"S, 116°02'17"E), 28 August 2003, Pinder and McRae; Moreton Pool (22°40'35"S, 115°42'58"E), 28 August 2004, Pinder and McRae; Creek Pool nr Mt Amy Well (22°11'41"S, 115°57'18"E), 25 August 2004, Pinder and McRae; Paradise Pool (20°22'35"S, 119°25'21"E), 14 May 2004, Pinder and Barron; Munreemya Billabong (20°40'11"S, 120°13'32"E), 19 September 2004, Pinder and McRae; Wackilina Creek Pool (22°22'58"S, 117°36'48"E), 9 September 2004 Pinder and McRae; West Peawah Creek Pool (20°45'50"S, 118°00'47"E), 20 May 2006, Pinder and McRae; Harding River Pool (21°20'17"S, 117°04'10"E), 16 May 2006, Pinder and McRae; Un-named Creek in Millstream National Park (21°34'49"S, 117°06'13"E), 2 February 2005, Pinder and McRae (all in CALM).

Description

Adults

Length 3.5–4.1 mm. Body broad, somewhat spindle-shaped, broadest at shoulders, subparallel in middle.

Head. Relatively small, elongate. Light testaceous; antenna and palpi yellow. Punctures small on disc, larger towards posterior, scattered. Distance between eyes about 1.8 × dorsal width of eye. Antennal segments 6–9 somewhat broader than others.

Pronotum. Light testaceous. Without plicae. Lateral borders finely margined; posterior corners slightly rounded. Unevenly punctured, disc sparsely punctate, a few much larger punctures towards posterior angles.

Elytra. Light testaceous, punctures black except at sides and apex. Primary punctures relatively small, becoming stronger until stria 5, 33–39 punctures in stria 1; basal 2–3 punctures of stria 5 stronger than others, often confluent but seldom obliterated, basal 1–2 punctures in stria 4 also tend to be stronger than adjacent punctures in row (Figure 3a); striae 7 and 8 reaching base; secondary punctures along suture small, in single row; interstriae 1, 2 and 4 with rows of 11–15 small punctures. Completely margined, margin weakly serrated, apex rounded and slightly protuberant.

Ventral surface. Testaceous, bases of legs and ridges on prosternal and metasternal processes darker. Elytral epipleura reaching to posterior edge of ventrite 1, two rows of large shallow punctures on wider anterior portion, narrow posterior portion virtually impunctate. Prosternum punctate, punctures relatively small, most about a puncture width apart; anterior of proepisternum with 5–15 unevenly sized and distributed punctures,

some very small, largest same size as those on prosternum, few if any on posterior portion. Prosternal process robust, slightly constricted in middle, quite strongly punctate, punctures as on prosternum, stronger at sides, sides roundly ridged, anterior edge clearly margined (Figure 3b). Metasternal process broader than apex of prosternal process; side strongly ridged, anterior portion bulbous, posterior portion narrowing quite rapidly; ridges diverging slightly towards rear, central portion quite deeply depressed inwards from sides (Figure 3b). Metacoxal lobes nearly reaching posterior edge of ventrite 1, weakly and sparsely punctured near suture, strongly but sparsely punctured laterally. Four visible ventrites, ventrites 2–3 each with irregular row of punctures across width. Apex of last ventrite (4) sparsely punctured, punctures a little larger than those on ventrite 3. Metatibia with longer tibial spur thin, 3/4 as long as first tarsal segment.

Male

Basal three segments of pro and mesotarsi weakly expanded, each with a few sucker-hairs. Penis and parameres as in Figures 3c, d and e.

Etymology

The species is named for Dr Stuart Halse, formerly from the Department of Environment and Conservation Western Australian, Wanneroo, who arranged the aquatic component of the Pilbara Biological Survey in which the majority of the *Haliplus* specimens were collected.

Biology

The type specimens were collected from Gnalka Goona Pool which is a large fresh (0.12 g/L), turbid (340NTU), seasonal, open water claypan with sand and clay sediment. No macrophytes were present on the date collected, depth about 1 m.

Distribution

Haliplus halsei was collected widely across the Pilbara region (Figure 5).

Remarks

See under *H. pilbaraensis*.

Haliplus (Liaphlus) pilbaraensis sp. nov.

Figures 4a–e

Material examined

Holotype

Australia: Western Australia: ♂, 'Kalgan Pool on Kalgan Creek PSW 066 23°11'17"S, 119°41'57"E, 24/4/2005, CALM' (WAM Entomology No. 72054).

Paratypes

Australia: Western Australia: 8 adults, collected with holotype (WAM Entomology No. 72055–72062); 1 adult, 'WA 22k NNW Eerala Stn 23/5/01 C.H.S.Watts' (SAMA Database No. 25-003304); 4 adults, 'WA 10k NW Eerala Stn 23/5/01 C.H.S.Watts' (SAMA Data base NO25-003303); 2 adults, 'WA Gregory Gorge nr Millstream 24/5/01 C.H.S. Watts' (SAMA Data base No 25-003305); 2 adults, 'Pilbara Millstream Chichester NP Gregory Gorge Pool at river crossing 26.8.2002 21 33S 117 03E Hendrich leg/ loc WA 5/169' (CLH); 4 adults, 'WA Bonnie Pool PSW064 21°58'41"S, 119°59'27"E, 25/4/2005, CALM' (WAM Entomology No. 72063–72066); 1 adult, 'WA Killagurra Spring 23 44S 122 25E 2/7/03 CHSWatts' (SAMA Data base No 25-009112); 1 adult, 'WA 12 k W Mt Florance Stn 25/5/01 C.H.S.Watts' (SAMA Data base No25-003310); 1 adult, 'Pilgangoora Well 24 May, 1953 N.B.Tindale' (SAMA Database No 25-008420).

Other material (not paratypes)

Australia: Western Australia: Gorge Junction Pool (24°05'00"E 118°03'17"E), 9 September 2005, Pinder and McRae; Nyeetbury Spring (21°51'29"S, 116°30'57"E, 29 August 2003, Pinder and McRae; House Pool on Cane River (22°05'44"S, 115°37'15"E), 16 May 2005, Pinder and McRae; Myanore Creek Pool (21°26'30"S, 115°51'46"E), 13 May 2006, Pinder and McRae; Panorama Spring (21°12'02"S, 119°19'10"E), 11 September 2005, Pinder and McRae; Glen Ross Creek (24°10'44"S, 118° 1'48"E), 9 September 2005, Pinder and McRae; Miningarra Creek (20°44'55"S, 120°18'24"E), 19 September 2004, Pinder and McRae; Kumina Creek (21°51'45"S, 116°54'32"E), 4 May 2005, Pinder and McRae; Carawine Gorge (21°28'57"S, 121°01'40"E), 4 September 2003, Pinder and McRae; Tanguin Rockhole (21°11'25"S, 121°05'03"E), 3 September 2003, Pinder and McRae; Glen Herring Pool (21°20'32"S, 119°36'50"E), 2 September 2003, Pinder and McRae; Pelican Pool (21°19'55"S, 120°22'26"E), 2 September 2003, Pinder and McRae; Coppin Gap (20°52'60"S, 120°07'07"E), 21 May 2004, Pinder and Barron (all in CALM).

Description*Adults*

Length 3.3–4.0 mm. Body broad, somewhat spindle-shaped, broadest at shoulders, subparallel in middle.

Head. Relatively small, elongate. Light testaceous; antenna and palpi yellow. Punctures small on disc, larger towards posterior, scattered. Distance between eyes about 2.1 × dorsal width of eye.

Pronotum. Light testaceous. Without plicae. Lateral borders finely margined; posterior corners

slightly rounded. Unevenly punctured, weaker and sparser on disc, a few much larger punctures towards posterior angles.

Elytra. Reddish-yellow, stria on disc black, black stripes tending to break up towards sides and posterior; sutural region narrowly black in most specimens. Primary punctures relatively small, becoming stronger until rows 5–6, 34–40 punctures in stria 1; basal 3–4 punctures of stria 5 almost obliterated by strongly curved impression, basal 1–2 punctures in stria 4 also tend to be strongly impressed; striae 7 and 8 nearly reaching base; secondary punctures along suture small, in single row; interstriae 1, 2 and 4 with 12–14 small punctures. Lateral edges of elytra margined, weaker towards rear, weakly serrated towards front, apex rounded and slightly projecting.

Ventral surface. Light testaceous, bases of pro and meso legs darker. Elytral epipleura reaching to posterior edge of ventrite 1, two rows of large shallow punctures on wider anterior portion, a single row of wide, shallow, virtually obsolete, punctures on narrow posterior portion. Prosternum punctate, punctures relatively small, most about a puncture width apart; front of proepisternum with 8–20 unevenly sized and distributed punctures, largest same size as those on prosternum, few if any on posterior portion. Prosternal process robust, slightly constricted in middle, punctate, as on proepisternum, side ridges rounded, anteriorly clearly margined. Metasternal process broader than apex of prosternal process, sides strongly ridged, ridges diverging slightly towards rear, central portion flat except for slight dip at apex, inner edges of sides ridges sometimes weakly and sharply depressed/ grooved. Metacoxal lobes not reaching posterior edge of ventrite 1, weakly and sparsely punctured near suture, strongly punctured laterally. Four ventrites, ventrites 2–3 each with irregular row of punctures across width. Apex of last ventrite (4) sparsely punctured, punctures a little larger than those on ventrite 3. Metatibia with longer tibial spur about 2/3 as long as first tarsal segment.

Male

Basal three segments of, pro and mesotarsi weakly expanded, each with a small number of sucker hairs. Penis and parameres as in Figures 4 c, d and e.

Etymology

The species is named for the Pilbara region of northern Western Australia where it occurs.

Distribution

Haliplus pilbaraensis was collected widely across the Pilbara (Figure 5).

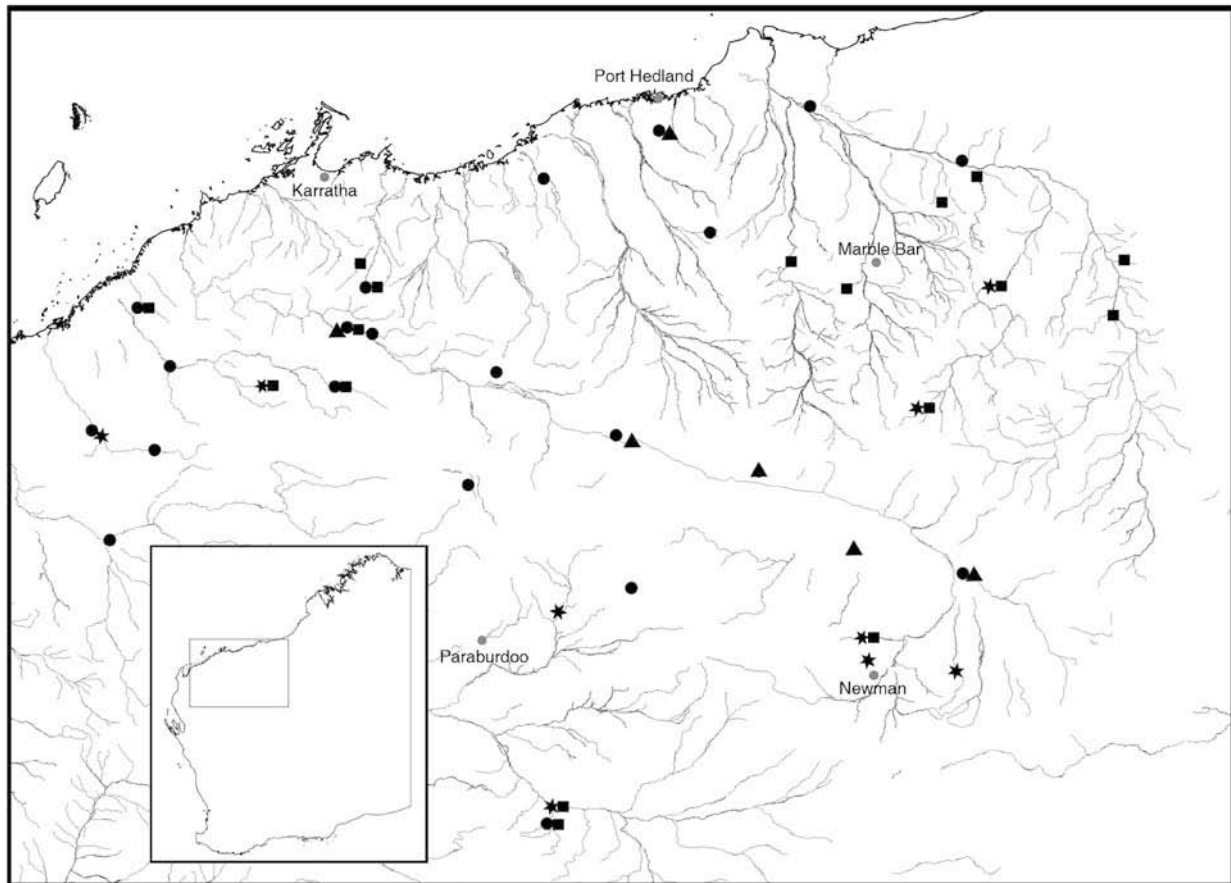


Figure 5 Distribution of ▲ *Haliplus fortescueensis* sp. nov., ■ *H. pilbaraensis* sp. nov., ★ *H. pinderi* sp. nov. and ● *H. halsei* sp. nov., in the Pilbara of Western Australia.

Biology

Kalgan Pool on Kalgan Creek is a deep clear (Turbidity 0.4–0.9, TDS 1 g/L, Colour 2.5–9 TCU at time of sampling), freshwater pool up to about 4 m depth at the base of a cliff, with dense patches of *Chara* and *Najas*. The sediments were coarse and dominated by pebble, cobble, boulder and gravel.

Remarks

Haliplus testudo Clark, *H. australis* Clark and *H. wattsi* van Vondel form a closely related species complex in coastal Australia from the Kimberly in Western Australia clockwise to the Mt Lofty Ranges in South Australia, characterized by the lack of dark elytral patches (other than dark punctures and puncture lines), and lack of a deeply grooved base to stria 5 on each elytron (Van Vondel 1995).

The two species of the *Haliplus* subgenus *Liaphlus* from the Pilbara are clearly members of this complex of species. *Haliplus wattsi* is easily recognized by the strong, even sized, nearly confluent punctures on the proepisternal which are not present in the other species and their more angular shaped penises (Van Vondel 1995). From *H. australis* the new species differ in their weak

discal elytral punctures, single line of sutural secondary punctures, presence of dark lines or rows of spots on the elytra, and the lack of the small distal thumb-like digitus on the tip of the left paramere found in *H. australis* (Van Vondel 1995). From *H. testudo* they differ by the lack of dark spots on the pronotum present in most *H. testudo*, and the less strongly serrated edge of elytra at the shoulders and towards the apex. From all three species they differ in their sparsely punctate proepisternum (impunctate in *H. australis* and *H. testudo*, strongly punctate in *H. wattsi*), and more robust prosternal and metasternal processes both with raised sides and strong punctures. The new species also resemble *H. timmsi* Van Vondel in their broad shoulders, sparsely punctate proepisternum and even the metasternal depression (in *H. halsei*), but *H. timmsi* differs from them in having vague to quite noticeable dark patches on the elytra, stronger elytral plicae, prosternal process without side ridges, stronger metasternal depressions and in the quite strongly serrated humeral edges to the elytra.

Referring to the two new species from the Pilbara, *H. pilbaraensis* differs from *H. halsei* most noticeably in the dark inner elytral striae in contrast to the rows of dark spots in *H. halsei* (Figures 3,

4). Other characters which help to distinguish the two species are: the elytral punctures are weaker in *H. pilbaraensis* and the basal elytral groove on stria 8 is deeper and in most cases obliterates the punctures whereas in *H. halsei* the punctures are larger and in most cases are separate although often confluent; the sides of the metasternal process are more robust in *H. halsei*, club-shaped with the head at the anterior end and have a depression inside the side ridge.

Haliplus (Neohaliplus) fuscatus Clark, 1862

Haliplus fuscatus Clark, 1862: 401; Zimmermann 1920: 308; Watts 1985: 27; Van Vondel 1995: 69.

Diagnosis

Small, oval, with short pronotal plicae and weak elytral plicae, elytral tips rounded, elytra dark reddish brown often with primary puncture rows black; penis long, thin and sinuate in ventral view (Van Vondel 1995).

Remarks

A fifth species of *Haliplus*, *H. fuscatus* Clark, could potentially be present in the Pilbara but has yet to be collected there. It is widespread in Southern Australia including inland areas (Van Vondel 1995) and has been collected recently from Lake Way near Wiluna and beside the Murchison River near Binu (both specimens in the South Australian Museum).

KEY TO THE SPECIES OF HALIPLUS FOUND IN THE PILBARA REGION OF WESTERN AUSTRALIA

1. Pronotal base with longitudinal plicae, area between them depressed (subgenus *Neohaliplus*) 2
 Pronotal base without plicae (subgenus *Liaphlus*) 4
2. Elytra with strong dark/light colour pattern (Figure 1a) *H. pinderi* sp. nov.
 Elytra uniformly coloured or with indistinct colour pattern 3
3. Apex of elytron with distinct small spine, row of strong comb-like spines on outside of protibia (Figure 2a) *H. fortescueensis* sp. nov.
 Apex of elytron rounded, without row of comb-like spines on outside of protarsi (e.g. Figure 1a) (south of Wiluna) *H. fuscatus* Clark
4. Elytra with rows of mostly isolated dark spots (Figure 3a); raised sides of metasternal process robust, widening towards front

(Figure 3b), punctures at base of elytral stria 8 mostly separate, although often confluent.....
 *H. halsei* sp. nov.

Inner elytral striae with uninterrupted dark line for most of their length (Figure 4a) raised sides of metasternal process rather narrow and even in width (Figure 4b); punctures at base of elytral stria 8 usually obliterated by strong groove..... *H. pilbaraensis* sp. nov.

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