

A new *Henicops* (Chilopoda: Lithobiomorpha) from Lord Howe Island and its sister group relationship with Australasian species

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Abstract — Parsimony analysis of morphological characters resolves a new species of Henicopinae (Lithobiomorpha) from Lord Howe Island as sister group to Australian and New Zealand species of *Henicops* Newport 1844. The diagnosis of *Henicops* is broadened to accommodate *H. howensis* sp. nov., which is documented with electron micrographs. Cladistic analyses with equal and implied weights resolve the New Caledonian *Easonobius* Edgecombe 2003 or *Henicops brevilabiatus* (Ribaut 1923), respectively, as sister to the Lord Howe + Australasian clade.

Key words — Chilopoda, Lithobiomorpha, Henicopidae, *Henicops*, Lord Howe Island

Lord Howe Island is an eroded volcanic remnant in the South Pacific, 575 km to the east of Australia at 31°34'S latitude. Sampling of the invertebrate fauna of the island by the Australian Museum in 2000–2002 found four species of lithobiomorph centipedes. All are members of the predominantly southern temperate family Henicopidae. They include the widespread *Lamyctes emarginatus* Newport 1844, and *L. coeculus* (Brölemann 1889), a third species shared with the southeastern states of the Australian mainland [*Anopsobius giribeti* (Edgecombe 2004)], and an endemic species of *Henicops* Newport 1844, described herein. The Lord Howe *Henicops* is significant because its morphology indicates a sister group relationship to the monophyletic radiation of the genus in Australia and New Zealand.

Specimens cited herein are housed in the Australian Museum, Sydney (prefix AM KS).

Henicops Newport 1844

Henicops Newport 1844, p. 372 (Type species: *Henicops maculatus* Newport 1844).

Diagnosis. Member of *Lamyctes-Henicops* Group with 26–51 antennal articles; dental margin of maxillipede coxosternum with 3+3 or 4+4 teeth (exceptionally up to 6+6), lacking pseudoporodent; lacinate or plumose setae amidst simple setae on coxal process of first maxilla; projections on (at least) tergites 9, 11 and 13; last distal spinose projection of tibia on leg 14; tarsi of legs 13 and 14 divided into three or four tarsomeres; distitarsus of leg 15 divided into at least two tarsomeres; first genital sternite of male divided into two sclerites by longitudinal median furrow

(emended from Hollington & Edgecombe 2004).

Discussion. Inclusion of *H. howensis* sp. nov. in *Henicops* requires a broadening of the generic diagnosis. Taxonomic diagnosis is framed in the context of a cladistic analysis of 41 morphological characters (Appendix and Table 1). Taxonomic sampling is restricted to the Henicopinae. Included are 14 species that sample the genera of the *Lamyctes-Henicops* Group (sensu Edgecombe & Giribet 2003a,b), among these the five valid named species of *Henicops* (Hollington & Edgecombe 2004). Also included are 12 species that span the four subgenera of *Paralamyctes* Pocock 1901. Together, *Paralamyctes* and the *Lamyctes-Henicops* Group comprise the Henicopini (see Edgecombe & Giribet 2003b, fig. 3 for optimal cladogram based on combined morphological and molecular data). Two members of the other tribe in the Henicopinae, the Zygethobiini, are selected as outgroups for Henicopini. The cladograms are rooted between *Zygethobius* and *Cermatobius* [Zygethobiini] and the ingroup.

The data were analysed with PAUP*4.0b10 (Swofford 2002). A heuristic search used 1000 random stepwise addition sequences, saving 5 trees per replicate, then swapping on those trees with TBR (Tree Bisection Reconnection) branch swapping. Support for nodes was evaluated by parsimony jackknife values and decay indices (Bremer support). Jackknifing used 1000 replicates, each with a heuristic search using 33% character deletion. Bremer support was computed by the 'enforce converse constraints' command in PAUP*, using MacClade version 4.0 (Maddison & Maddison 2000) to generate the PAUP* command file with converse constraints. Multistate characters were scored as unordered.

Table 1. Morphological character data (see Appendix for character list).

| | | | |
|--|---|--|---|
| <i>Zygethobius pontis</i> Chamberlin 1911 | 0000000200 0000010000 0101001300 00--000000 0 | <i>Lamyctopristus (Eumyctes) sinuatus</i> (Porat 1893) | 0100000000 1010000110 0000000310 10--100100 0 |
| <i>Cermatobius japonicus</i> (Silvestri 1909) | 1000000200 1000010000 0101101200 1123000001 0 | <i>Lamyctopristus (Lamyctopristus) validus</i> Attems 1928 | 0100000001 1010000110 00?0000310 10--1??-02 0 |
| <i>Paralamyctes chilensis</i> (Gervais in Walckenaer & Gervais 1847) | 0000010300 0001000100 0000100300 00--0000001 | <i>Analamyctes tucumanus</i> Chamberlin 1955 | 0100000000 0000100100 0000000200 00--000100 0 |
| <i>Paralamyctes (Haasiella) cammoensis</i> Edgecombe 2004 | 1000110310 0000101100 0000100110 00--000000 0 | <i>Lamyctes africanus</i> (Porat 1871) | 0100000001 0000100100 0010000110 00--000110 0 |
| <i>Paralamyctes (Haasiella) subicolus</i> Edgecombe 2004 | 1000010410 1000001100 0000100310 00--000000 0 | <i>Lamyctes coeculus</i> (Brölemann 1889) | -000100001 0000100100 0010000010 00--0001?0 0 |
| <i>Paralamyctes (Haasiella) trailli</i> (Archey 1917) | -000110510 1000001100 0000100210 00--000100 0 | <i>Lamyctes emarginatus</i> (Newport 1844) | 0100000001 0000100100 0010000010 00--000100 0 |
| <i>Paralamyctes (Nothofagobius) cassisi</i> Edgecombe 2001 | 0000010300 0001000100 1000100400 00--000001 1 | <i>Easonobius humilis</i> (Ribaut 1923) | 0100000000 0000010100 0000010200 00--000000 0 |
| <i>Paralamyctes (Paralamyctes) asperulus</i> Silvestri 1903 | 0000010300 1000010101 0001100200 00--100000 0 | <i>Easonobius tridentatus</i> Edgecombe 2003 | 0100000100 0000010100 0000010200 00--000000 0 |
| <i>Paralamyctes (Paralamyctes) harrisi</i> Archey 1922 | 0012011200 1100000101 0001100300 00--000000 0 | <i>Henicops brevilabiatus</i> (Ribaut 1923) | 0100000200 1100100100 0000010210 00--000010 0 |
| <i>Paralamyctes (Paralamyctes) monteithi</i> Edgecombe 2001 | 0012011200 1100000101 0001100300 00--100000 0 | <i>Henicops dentatus</i> Pocock 1901 | 0000000100 0000010110 0000010301 0101000010 0 |
| <i>Paralamyctes (Paralamyctes) spenceri</i> Pocock 1901 | 0000010300 1000000101 0001100200 00--000000 0 | <i>Henicops howensis</i> sp. nov. | 0100000000 0001000100 0000010300 0100000010 1 |
| <i>Paralamyctes (Paralamyctes) weberi</i> Silvestri 1903 | 0000010300 1000000101 0001100300 00--100000 0 | <i>Henicops maculatus</i> Newport 1844 | 0101000100 0000000110 0000010301 0112000010 0 |
| <i>Paralamyctes (Thingathinga) grayi</i> Edgecombe 2001 | 1000011400 1000010100 1000101300 00--011000 0 | <i>Henicops milledgei</i> Hollington & Edgecombe 2004 | 0101000100 0000000110 0000010301 0112000010 0 |
| <i>Paralamyctes (Thingathinga) validus</i> Archey 1917 | 0000011400 1000000100 1000101400 00--011000 0 | <i>Henicops tropicanus</i> Hollington & Edgecombe 2004 | 0000000100 0000010110 0000010301 0101000010 0 |

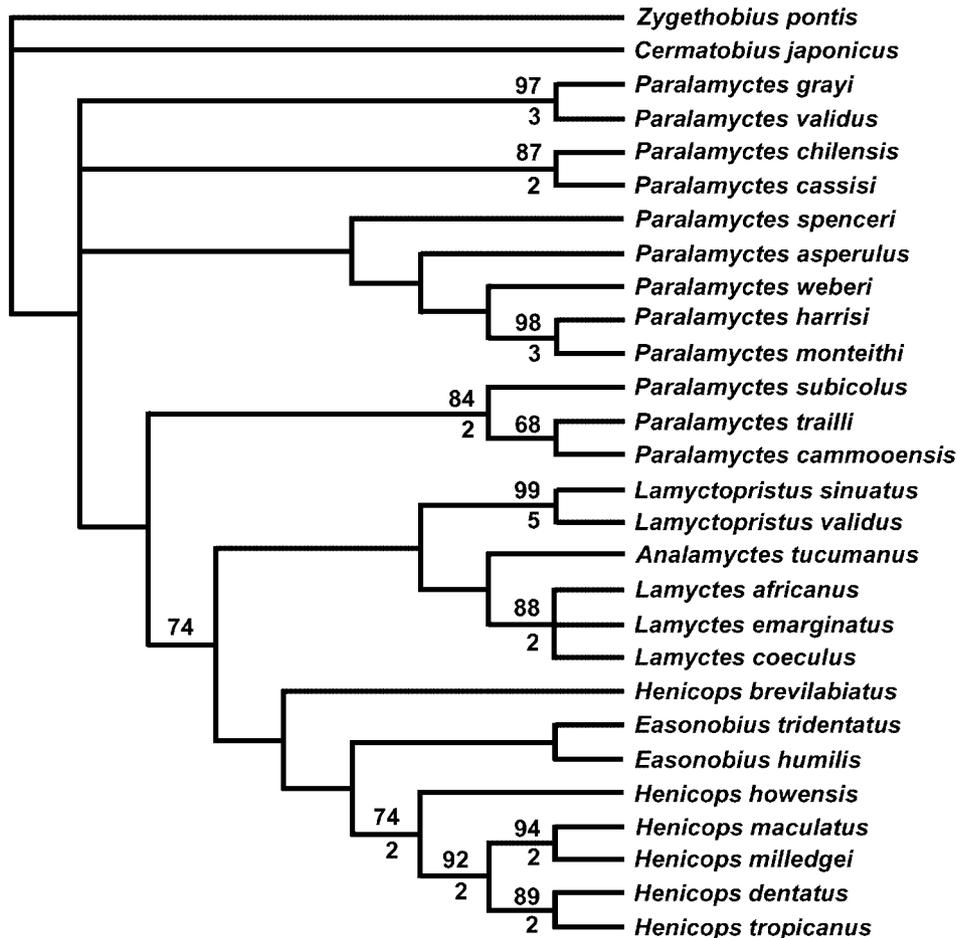


Fig. 1. Strict consensus of six shortest cladograms (99 steps) based on morphological characters in Table 1 with equal weights. Numbers above nodes are parsimony jackknife values greater than 50%. Numbers below nodes are Bremer support values greater than 1.

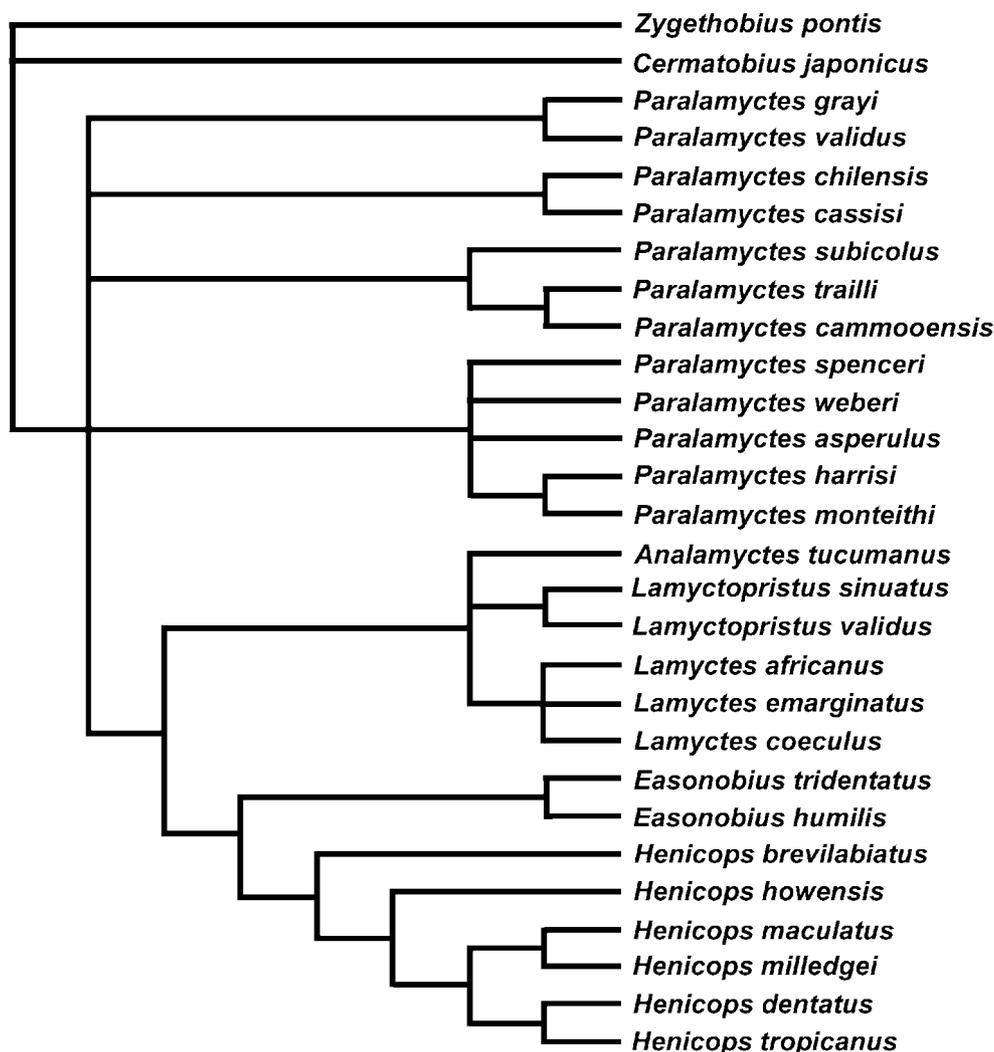


Fig. 2. Strict consensus of 252 optimal cladograms with implied weights (Goloboff 1993) for concavity parameters $k=1, 2$ and 3 .

Analysis with the commands described above retrieves six shortest cladograms (Length=99; Consistency Index=0.54; Retention Index=0.74; Rescaled Consistency Index=0.40), the strict consensus of which is shown in Fig. 1. A clade composed of the four Australian/New Zealand species of *Henicops* (*maculatus*, *milledgei*, *dentatus*, *tropicanus*) is supported by a relatively straight dental margin on the maxillipede coxosternum (character 8, state 1), two rows of mandibular aciculae (character 19, state 1), and a tripartite tarsus on legs 1–12 having a subdivided basitarsus (character 30, state 1). This group has strong jackknife support (92%) as do its two ingroup clades, *H. dentatus* + *H. tropicanus* and *H. maculatus* + *H. milledgei*. *Henicops dentatus* and *H. tropicanus* are united by two characters that show homoplasy on the cladogram: a reversal to less markedly shortened pairs of antennal articles (character 2, state 0) and a transverse medial extent of tergite 7 (character 16, state 1), together with a tripartite distitarsus on leg 15 (character 34, state 1). Grouping of *H. maculatus* and *H.*

milledgei is based on three uniquely shared characters: a weak Tömösváry organ near the midwidth of the cephalic pleurite (character 4, state 1), and elaborately subdivided distitarsi on leg 14 (character 33, state 1) and leg 15 (character 34, state 2). *Henicops howensis* from Lord Howe Island is grouped with these four Australasian species based on the subdivision of the distitarsi of legs 14–15 (character 32, state 1) and the presence of a distal spinose projection on the tibia of leg 14 (character 28, state 3); this clade receives moderate jackknife support (74%) and Bremer support of 2. The distitarsus of leg 14 is divided into two tarsomeres at the node where *H. howensis* unites with Australasian *Henicops*, this state being present in *H. dentatus* and *H. tropicanus* as well as the new species. *Easonobius*, composed of *E. tridentatus* Edgecombe 2003, and *E. humilis* (Ribaut 1923), unites with *Henicops* based on the presence of a basitarsal/distitarsal articulation on all legs (character 29, state 0). Neither the monophyly of *Easonobius* nor its grouping with *Henicops* has strong jackknife or Bremer

support (both present in less than 50% of jackknife replicates). *Henicops brevilabiatus* (Ribaut, 1923) groups with all of these species based on lacinate or plumose setae amidst the simple setae on the coxal process of the first maxilla (character 26, state 1).

To test the robustness of clades to alternative measures of character fit, the data were reanalysed with implied weights during tree searching (Goloboff 1993). A range of concavity parameters for character fit were explored ($k=1, 2, 3, 4, 5$ and 6). Each analysis used a heuristic search with 1000 random stepwise addition sequences, saving 5 trees per replicate. Analyses with $k=1, 2$ and 3 each retrieve 252 cladograms with optimal fit, the strict consensus of which is shown in Fig. 2. Analyses with $k=4, 5$ and 6 retrieve the same six cladograms as equal weights (consensus in Fig. 1). Implied weights for $k=1-3$ favour *Henicops brevilabiatus*, rather than *Easonobius*, being sister group of *Henicops howensis* and Australasian *Henicops*. This hypothesis is supported by the division of the first genital sternite of the male into two sclerites (character 39, state 1). Either cladogram provides the same biogeographic information, with the following hierarchy: (New Caledonia (Lord Howe Island (Australia + New Zealand))).

Several apomorphic characters that otherwise diagnose *Henicops* (sensu Attems 1911, 1914, 1928; Archey 1917, 1937; Hollington & Edgecombe 2004) are lacking in *H. howensis* sp. nov. The maxillipede coxosternum has a relatively narrower, more convex dental margin (versus moderately wide and relatively straight in other *Henicops*); the mandibular aciculae are aligned in a single row (versus arranged in inner and outer rows in Australian/New Zealand *Henicops*); fewer plumose setae are present on the coxal process of the first maxilla; the basitarsus of legs 1–12 lacks subdivision into two tarsomeres or paired larger setae that indicate the limits of tarsomeres; the gonopods in both sexes are less abundantly setose. The new species also lacks dark pigment spots on its antennae and tergites, these spots being present within the other four species of *Henicops*. Rather than restricting *Henicops* to the node uniting Australian/New Zealand species, the scope of the genus is broadened to the more inclusive node (Fig. 1) that includes *H. howensis*. This eliminates the need to erect a monotypic genus for *H. howensis*. As well, strong molecular evidence in favour of *H. brevilabiatus* being a member of *Henicops* (Edgecombe & Giribet 2003a, b) suggests the same for *H. howensis*, given their relative positions on the morphological cladograms (Figs. 1, 2). The molecular data and the morphological cladogram with implied weights (Fig. 2) favour an assignment of *H. brevilabiatus* to *Henicops*.

***Henicops howensis* sp. nov.**
(Figs. 3–41)

Diagnosis. *Henicops* with length of body up to 11.5 mm; 26–30 antennal articles; Tömösváry organ strongly defined; dental margin of maxillipede coxosternum relatively

narrow, each half convex, with U-shaped median notch; outer (third) tooth on dental margin smallest; apex of first maxillary coxal projection with two or three plumose setae, three to five simple setae; mandible with single row of 9–10 aciculae, all with strong projections along both margins; tarsus of legs 1–12 bipartite, tarsus of legs 13–15 tripartite, with distitarsus divided; basal article of female gonopod with short spur-bearing process.

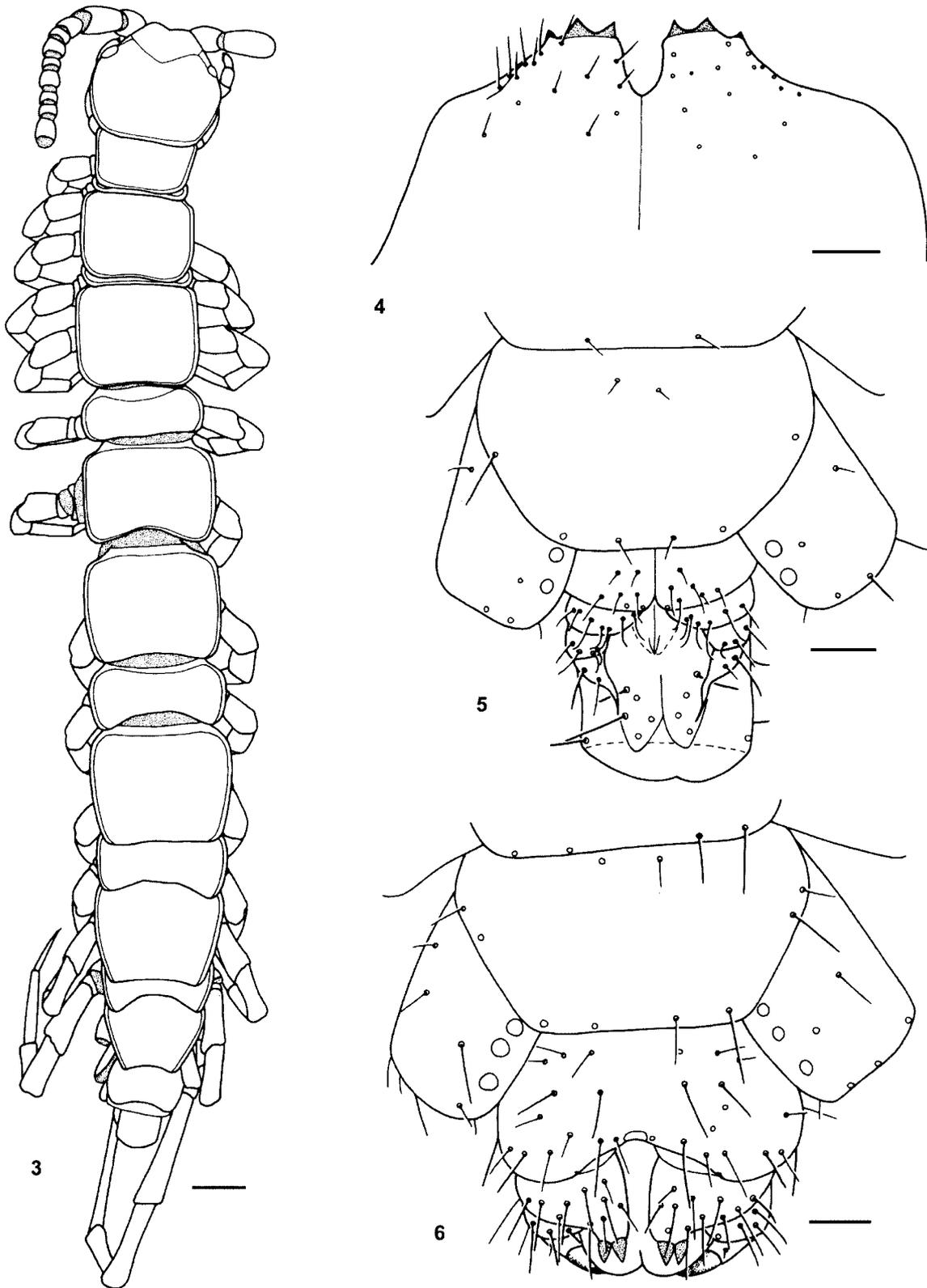
Description. Length (anterior margin of head shield to end of telson) up to 11.5 mm; width of head shield up to 1.25 mm.

Colour (based on specimens in 80% ethanol). Head shield pale yellow with pale purple mottling to light brown; deep purple ring around ocellus. Antenna pale brown proximally, grading to orange distally. Tergites lavender, variably with purple longitudinal median band; brown band across posterior margin; posterior few tergites mostly light brown. Anterior sternites lavender, grading to pale yellow or pale orange posteriorly. Legs lavender except for pale orange tarsi.

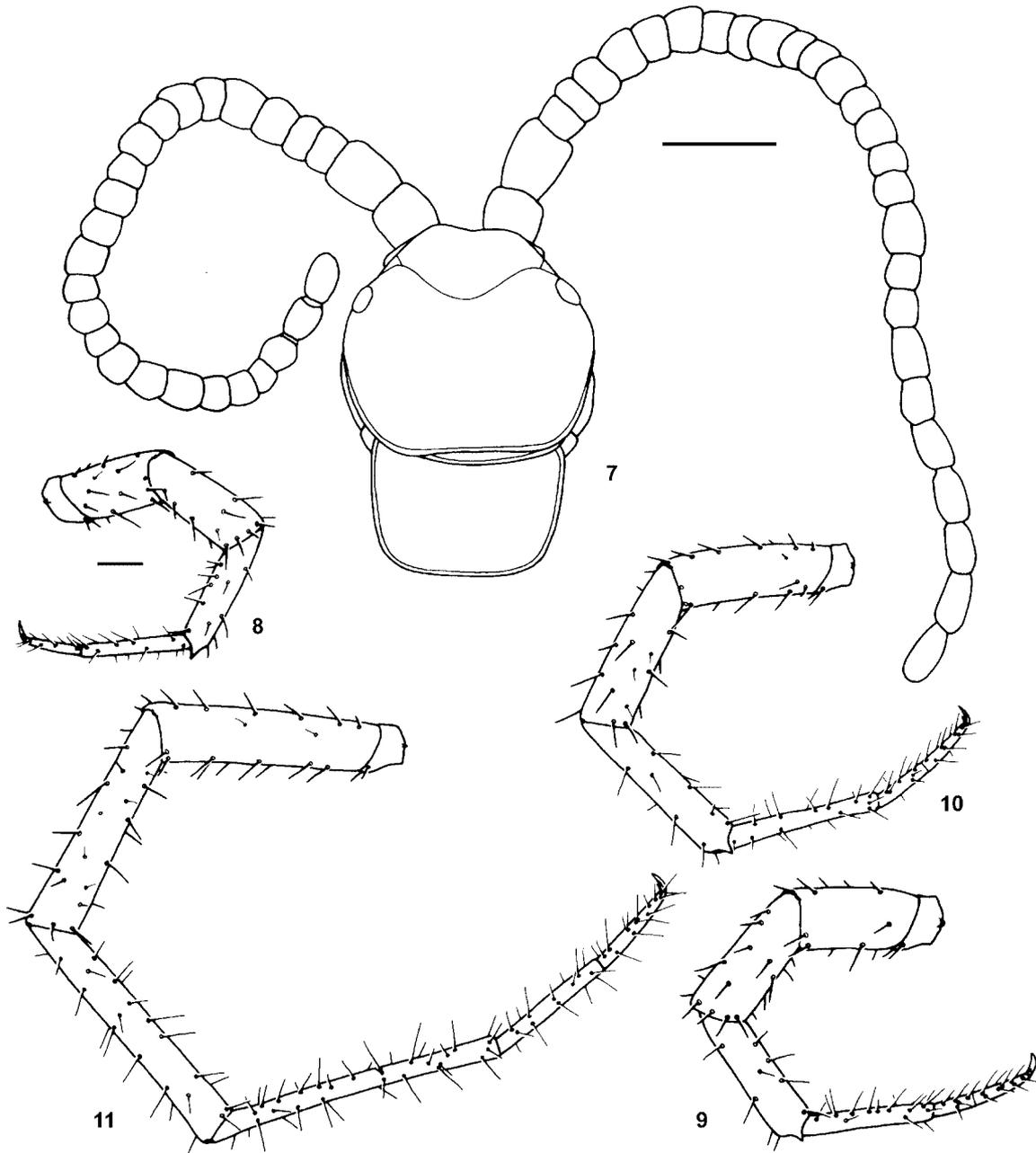
Head shield with shallow median notch (Figs. 3, 7); posterior margin transverse or weakly concave. Antenna up to 5.2 times length of head shield, composed of 26/28 (Fig. 7) to 30/30 articles; basal two articles much larger than others; articles 3–4 short; a few additional pairs of short articles in proximal two-thirds of antenna; shorter articles moniliform; terminal article similar in length to penultimate article or up to 1.5 times longer. Single digitiform thin-walled basiconic sensillum at anterior edge of most articles on dorsal side of antenna, separated from one or two shorter, conical, thick-walled sensilla (Fig. 31); trichoid sensilla arranged in up to eight imprecisely-defined whorls on longer articles (Fig. 30). Ocellus moderately large, domed. Tömösváry organ elliptical, relatively small and recessed, on anterolateral part of cephalic pleurite at about one-third width of pleurite (Fig. 14) or slightly closer to lateral margin. Band of six short setae across posterior part of clypeus; cluster of four or five moderate to long setae at clypeal apex, two pairs on margin, one variably present medially (Fig. 12). Labral margin weakly concave where fringe of bristles overhangs (Fig. 13); each bristle with many slender, hair-like branches along its length, with longer, wider distal branches.

Maxillipede. Coxosternum subpentagonal; dental margin narrow, convex, with 3+3 conical teeth, their cusps usually equidistant; outer tooth slightly to markedly smaller than others; median notch moderately (Fig. 17) to deeply (Fig. 4) U-shaped. Coxosternal setae concentrated anteriorly, especially along anterolateral margin. Pretarsal part of tarsungulum equal in length to tarsal part (Fig. 16), with even concentration of setae on inner and outer margins of tarsus.

Mandible. Four paired teeth. Nine or ten aciculae in single row (Fig. 25), all with 13–23 strong, blunt-tipped projections along both margins for most of their length (Figs. 26, 27). Fringe of branching bristles skirts aciculae; ventralmost bristles in fringe narrow-based, with abundant spine-like



Figs. 3-6. *Henicops howensis* sp. nov. 3, holotype AM KS 86042, female, dorsal habitus, scale 500 μm . 4, AM KS 86326, female, dental margin of maxillipede coxosternum, scale 100 μm . 5, AM KS 86329, male, terminal segments and gonopods, scale 100 μm . 6, AM KS 86328, female, terminal segments and gonopods, scale 100 μm .

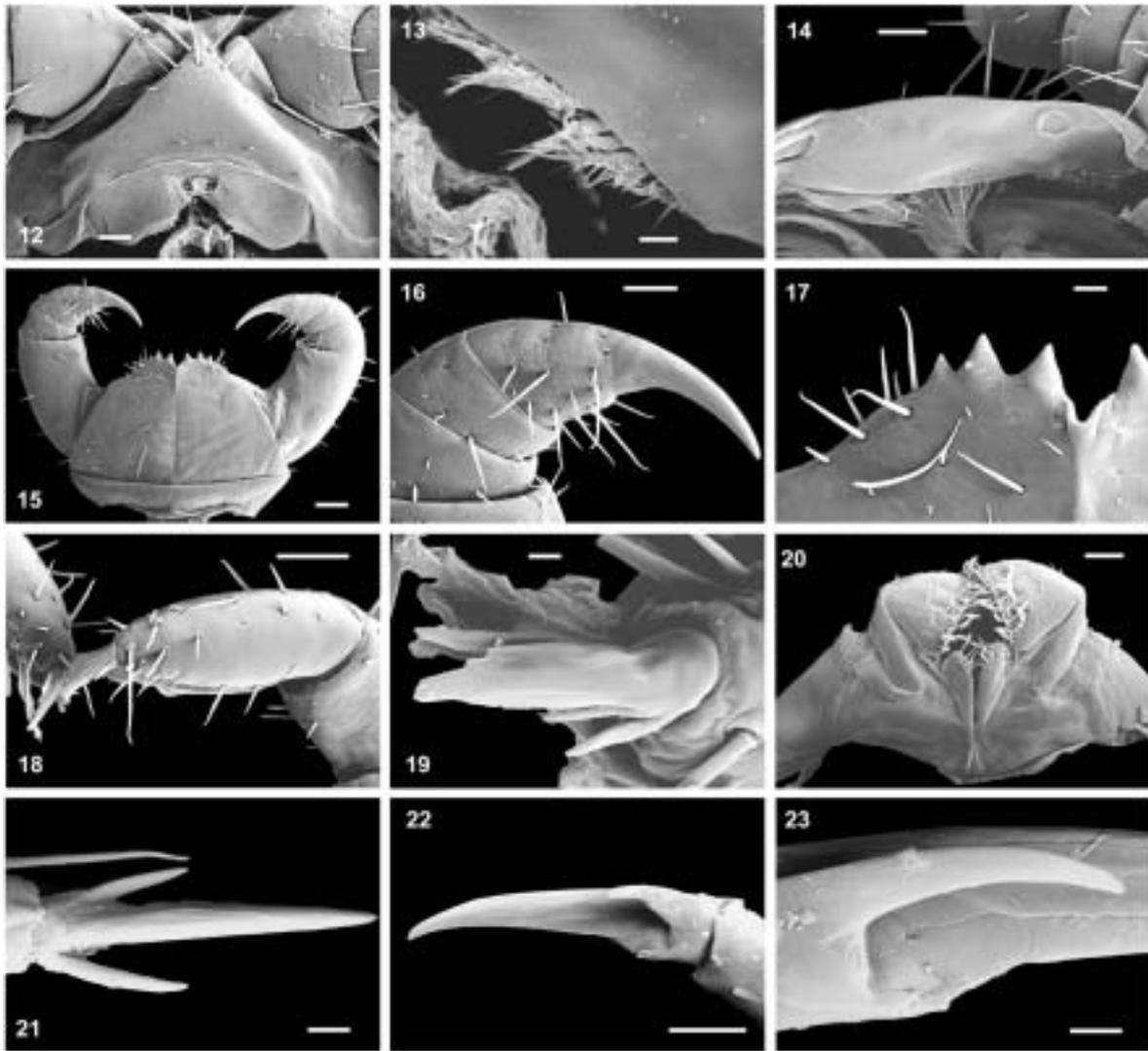


Figs. 7–11. *Henicops howensis* sp. nov. 7, AM KS 86327, female, head, maxilliped tergite and T1, scale 500 μm . 8–11, AM KS 35818, male. 8, leg 12; 9, leg 13; 10, leg 14, 11, leg 15. Scale 200 μm .

projections along their length, including basally, branching into a few spines distally; abrupt transition in form of fringe between the first and second (ventral) paired teeth, dorsal half of fringe composed of four rows of wide, multifurcating scales; each scale with up to 22 hair-like branches, scales nearly continuous with each other, each row overlapping the next; fringe narrowing against dorsalmost tooth. Dorsal three paired teeth with strong grooved ridge bearing row of blunt accessory denticles (Fig. 24); largest accessory denticles bluntly conical, grading into smaller rod-like denticles and multifurcating scales near fringe of scale-like

bristles (Fig. 28); many accessory denticles on dorsal tooth form multifurcating scales, each with 3–6 subparallel rods; large, smooth scale separates dentate lamina from furry pad (Fig. 29); furry pad a dense cluster of elongate, simple bristles, a few with bifid terminations (Fig. 29).

First maxilla. Sternite narrow, wedge-shaped (Fig. 20), with strong sutures. Coxal process with apical cluster of three to five simple setae and two or three plumose setae that branch along their distal half (Fig. 34); cluster of about five sensilla microtrichoidea at posterolateral edge of coxal process (Fig. 34). Inner margin of distal article of telopodite



Figs. 12–23. *Henicops howensis* sp. nov. AM KS 86329, male. 12, clypeus and labrum, scale 50 μm ; 13, bristles on labral sidepiece, scale 5 μm ; 14, cephalic pleurite, scale 50 μm ; 15–17, maxillipede, telopodite, and dental margin of coxosternum, scales 100 μm , 50 μm , 20 μm ; 18, 19, tarsus and claw of second maxilla, scales 50 μm , 5 μm ; 20, first maxillae, scale 50 μm ; 21–23, pretarsus, leg 14. 21, dorsal view, scale 10 μm ; 22, posterior view, scale 20 μm ; 23, anterior view, scale 5 μm .

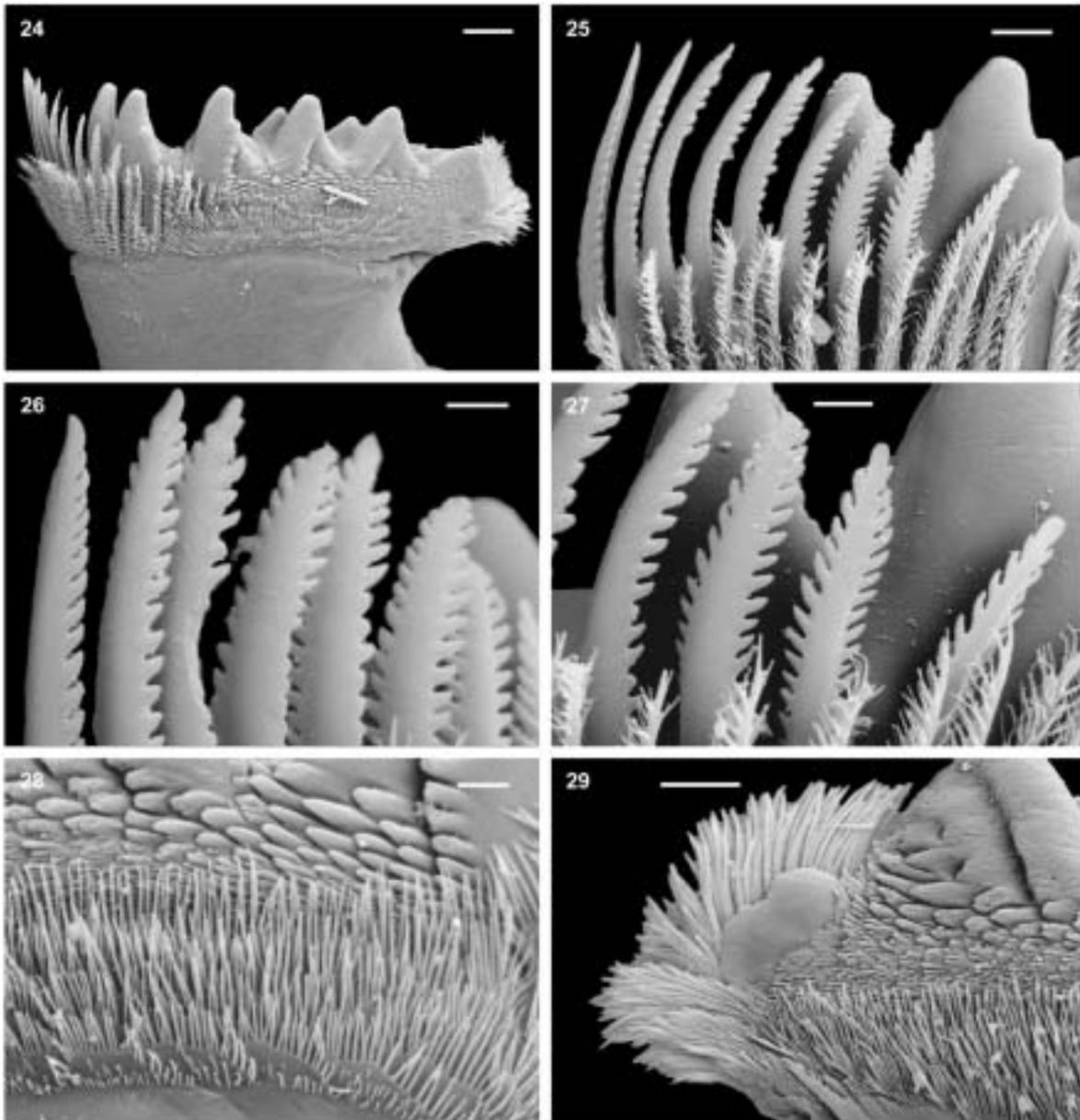
fringed by 11–13 paired plumose bristles, each branching along its distal half (Fig. 33) to two-thirds (Fig. 36); row of short, simple setae just outside inner margin between each plumose bristle; up to 12 simple setae scattered over ventral surface of distal article (Fig. 32).

Second maxilla. Sternite trapezoidal, fused with coxae. A few short setae in row across anterior part of coxa. Tarsus with about 12 plumose setae on membranous field on inner surface, each branching along its distal half; membranous field fringed by about six simple setae. Claw composed of five digits, median digit long, thick, irregularly tapering distally; outer and intermediate digits spine-like, each about half length of median digit (Figs. 18, 19).

Tergites. Wrinkled, turned up at margins. T1 nearly 80% width of head shield, narrowing posteriorly; posterior margin transverse (Fig. 7) or faintly concave. TT3 and 5 about

85% and 95% width of head shield, respectively; T7 as wide as head shield. Posterior margins of TT3, 5 and 8 gently concave, posterior angles rounded (Fig. 3). Posterior margin of T7 quite deeply concave, TT10, 12 and 14 gently to moderately concave. TT9, 11 and 13 with broad projections having rounded posterior angles; median sector between projections convex or transverse. Tergal margins and anterior part of tergites with few short setae.

Legs. Legs 12–15 with ratios of lengths 1 : 1.2 : 1.5 : 2.4. Distal spinose projections on tibia of legs 1–14 (Figs. 8–10), lacking on leg 15 (Fig. 11). Basitarsal-distitarsal articulation well-defined on legs 1–12, variably flexed in largest specimens; all tarsal setae slender, without paired thickened setae. Distitarsus about 80% length of basitarsus on leg 15; leg 15 basitarsus 10–13 times longer than maximum width; distitarsus divided into two tarsomeres that comprise about

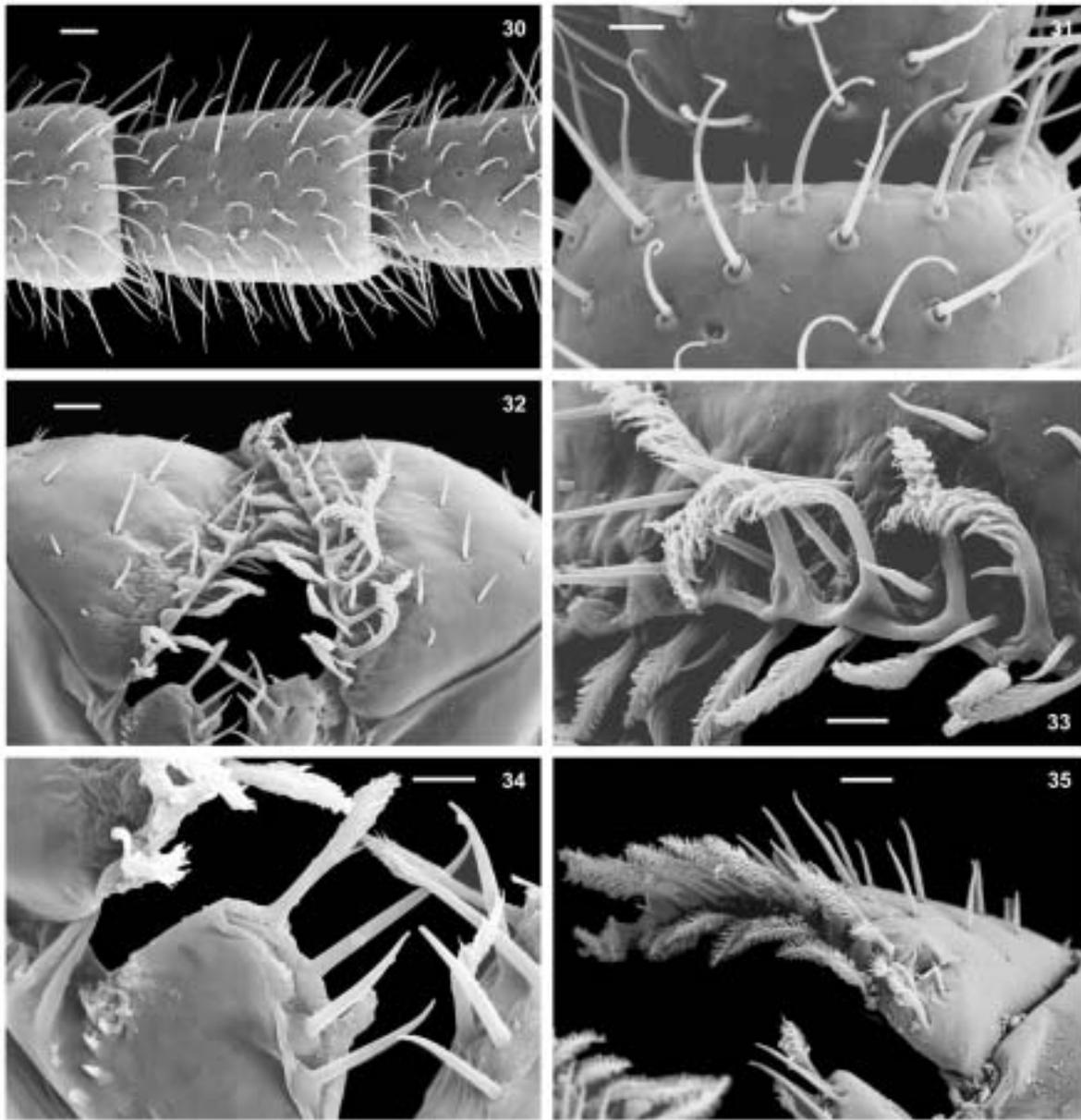


Figs. 24–29. *Henicops howensis* sp. nov. AM KS 35817, female. 24, gnathal edge of mandible, scale 20 μm ; 25–27, aciculae, scales 10 μm , 5 μm , 5 μm ; 28, accessory denticles and fringe of branching scales, scale 5 μm ; 29, dorsal tooth and furry pad, scale 10 μm .

55% (proximal tarsomere) and 45% (distal tarsomere) of its length; one specimen with faint trace of a subdivision of distal tarsomere into two segments, the more proximal segment shorter. Two tarsomeres of distitarsus of leg 14 equal in length. Pretarsus with anterior and posterior accessory claws on all legs, moderately divergent (Fig. 21), bases at dorsolateral margin of main claw (Fig. 22); accessory claws with ornament of closely-spaced ridges and grooves, lacking scales. Scales well defined along length of main claw, including dorsoproximally; one or two rimmed pores at margins of scales beneath accessory claws (Fig. 23). Posteroventral spine short, distally oriented, with subsidiary spine (Fig. 22).

Coxal pores. All round (Figs. 5, 6), 1,2,2,3/1,2,2,3 to 2,3,3,4/3,3,4,4 in females; 1,2,2,2/1,2,2,2 to 1,2,3,3/1,3,3,3 in males.

Female (Fig. 6). Sternite of segment 15 with transverse posterior margin; four setae along posterior margin, a pair anterolaterally, a pair anteromedially. First genital sternite with 26–35 setae scattered over its surface except medially. Gonopod with 11–22 mostly moderately long setae on basal article (Fig. 40); pair of spurs at end of a short, neck-like process; spurs conical, relatively stout, about equal in size, touching at their bases (Fig. 41); second article of gonopod with 4–13 setae; third article with up to four setae. Claw simple; numerous pores with sensilla coelonica on



Figs. 30–35. *Henicops howensis* sp. nov. 30–34, AM KS 86329, male. 30, 31, articles from distal part of antenna and detail showing basiconic sensilla at anterior end of an article, scales 20 μm , 10 μm ; 32, distal articles of telopodites of first maxillae, scale 20 μm ; 33, plumose bristles on inner margin of telopodite of first maxilla, scale 10 μm ; 34, coxal processes of first maxillae, scale 10 μm . 35, AM KS 35817, female. Distal article of telopodite of first maxilla, scale 20 μm .

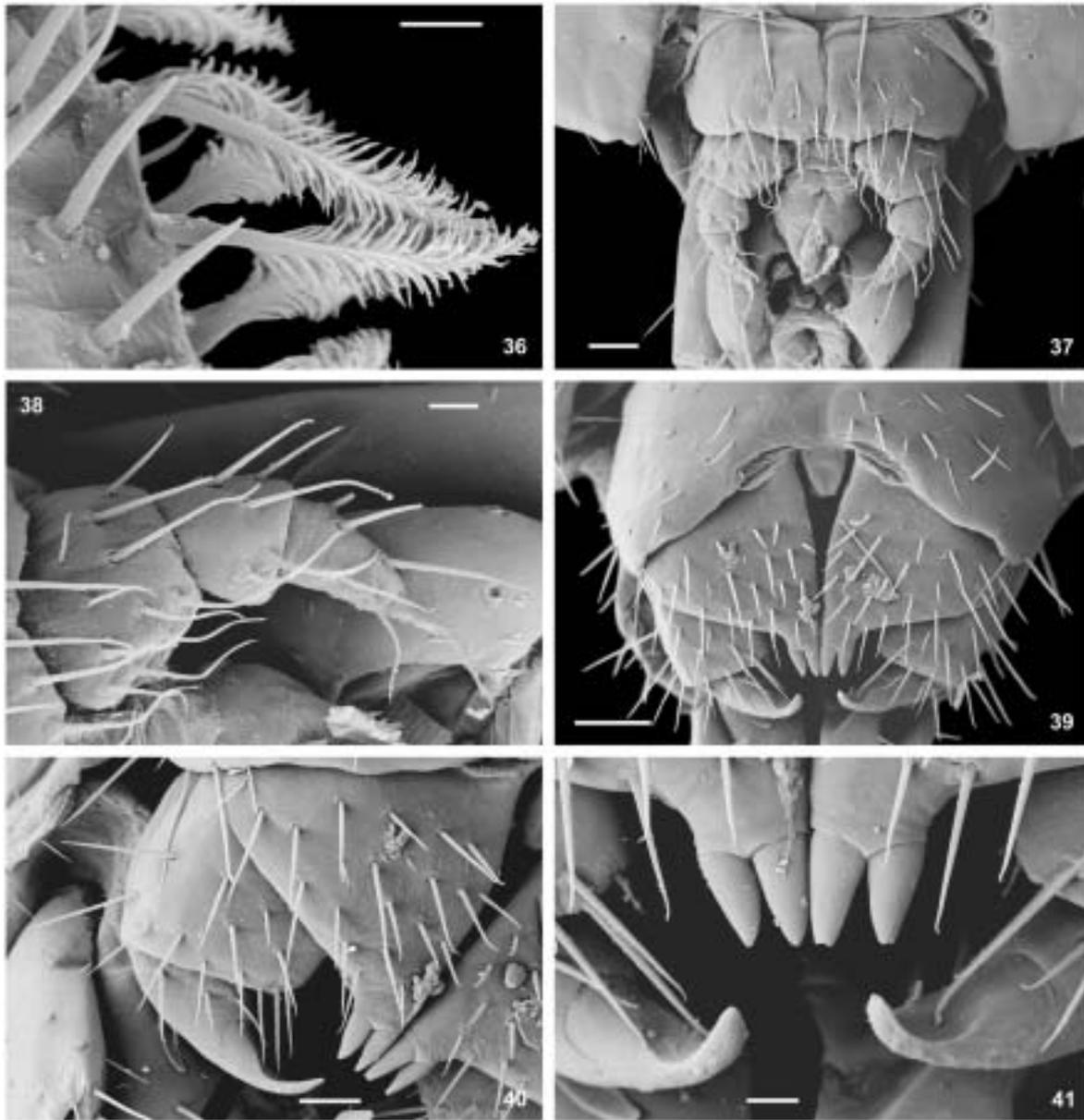
dorsodistal surface of claw (Fig. 41).

Male (Fig. 5). Sternite of segment 15 with transverse posterior margin; four setae along posterior margin, one anterolaterally, a pair anteromedially. First genital sternite fully divided by longitudinal median suture (Fig. 37); 7–9 short setae concentrated posteromedially on each half. Gonopod (Fig. 38) with 6–11 short setae on first article, most of them distally curved, 3–5 on second article, 2–5 on third; third article grades into tapering terminal filament with several short, slender spines on its basal part. Extended penis projects to base of terminal filament (Fig. 37).

Holotype. AM KS 86042 (ex. KS 35819), female (Fig.

3), Lord Howe Island, 9–II–1979, T. S. Kingston.

Paratypes. Lord Howe Island: AM KS 35819, 1 male, from type collection; AM KS 35636, 1 female (Figs. 39–41), 1 male (Figs. 37, 38), northeastern area of Mt Gower summit, near campsite, 31°35.0'S 159°04.8'E, 855 m, 12–15–II–1971, M. R. Gray, moss forest; KS 35817, 1 female (Figs. 24–29, 35, 36), 1 larval stadium LIV, Mt Gower, 8–VII–1978, T. S. Kingston; KS 35818, 1 male (Figs. 8–11), unspecified site, 29–I–1979, T. S. Kingston; AM KS 86326, 1 female (Fig. 4), Lord Howe Island, southern face of Mt Lidgbird at base of summit tabletop, 31°34'37"S 159°05'04"E, 3–XII–2000, AM CBCR, closed rainforest,



Figs. 36–41. *Henicops howensis* sp. nov. 36, AM KS 35817, female. Plumose bristles on inner margin of telopodite of first maxilla, scale 10 μ m. 37–41, AM KS 35636. 37, first genital sternite and gonopods of male, scale 50 μ m; 38, male gonopod, scale 20 μ m; 39, 40, ventral and ventrolateral views of female gonopods, scales 100 μ m, 50 μ m; 41, spurs and claws of female gonopods, scale 20 μ m.

Drypetes/Cryptocarya habitat; KS 86327, 1 female (Fig. 7), The Saddle, Erskine Valley, 31°34'49"S 159°04'58"E, 2–XII–2000, AM CBCR, closed rainforest, *Drypetes/Cryptocarya* habitat; KS 86328, 1 female (Fig. 6), southern end of Salmon Beach, 31°34'08"S 159°04'28"E, 27–XI–2000, AM CBCR, broad megaphyllous closed sclerophyll forest, *Howea forsteriana* habitat; KS 86329, 1 male (Figs. 5, 8–23, 30, 34), Mt Lidgbird, west side of valley between Pimple and summit, 31°33'19"S 159°05'01"E, 11–IV–2002, I. Hutton, ex. *Hedyscepe canterburyana*, *Macropiper hooglandi*, *Coprosma huttoniana*; KS 86330, 1 Agenitalis, Mt Gower, east end of summit, 31°34'53"S 159°04'43"E, 28–VIII–2001, I. Hutton, ex. *Hedyscepe canterburyana*,

Dysoxylum pachyphyllum, *Zygogynum howeanum*, *Dracophyllum fitzgeraldi*.

Remarks. Plesiomorphic characters by which *Henicops howensis* differs from congeners in Australia and New Zealand are cited in the phylogenetic discussion of *Henicops* above. The most conspicuous autapomorphy of the species is the short spur-bearing process on the basal article of the female gonopod. This process resembles that of certain species of *Paralamyctes* (Edgecombe 2001, 2003a) but is not observed in other *Henicops*.

Etymology. For Lord Howe Island.

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Appendix. Morphological characters used in phylogenetic analysis (see Edgecombe et al. 2002; Edgecombe 2003b, 2004, for character descriptions).

1. Convexity of ocellus: (0) bulging; (1) flattened.
2. Change in length of antennal articles: (0) gradual change in length along antenna; (1) markedly uneven in proximal part of antenna, with paired short articles interspersed between longer ones.
3. Long tubular antennal articles: (0) absent; (1) present.
4. Lateral position of Tömösváry organ: (0) near margin of cephalic pleurite; (1) weakly recessed, near midwidth of cephalic pleurite; (2) in membranous field on ventral margin of head.
5. Large Tömösváry organ positioned posteriorly on pleurite: (0) absent; (1) present.
6. Median furrow on head shield: (0) terminating in front of transverse suture; (1) deep and continuous to transverse suture.
7. Shoulder in labral margin: (0) absent; (1) present.
8. Shape of maxillipede coxosternum: (0) subtriangular with a narrow curved dental margin; (1) narrow, straight dental margin; (2) semicircular; (3) trapezoidal with narrow curved dental margin; (4) wide, subtransverse dental margin; (5) narrow, straight dental margin, projected forward.
9. Maxillipede teeth progressively decreasing in size medially: (0) absent (teeth of similar size, irregular, or smaller laterally); (1) present.
10. Pseudoporodont: (0) absent; (1) conical, tooth-like.
11. Proportions of maxillipede tarsungulum: (0) pretarsal section of approximately equal length to tarsal section; (1) pretarsal section much longer than tarsal section.
12. Dense setation on inner part of maxillipede tibia and femur: (0) absent; (1) present.
13. Tergal tuberculation: (0) absent or faint; (1) strong, more pronounced on male than female.
14. Body narrowed across anterior part of trunk: (0) T1 of similar width to head and T3; (1) T1 narrower than head and T3.
15. Angulation of posterolateral corners of tergites: (0) some angular/toothed; (1) all rounded.
16. Posterior margin of tergite 7 embayed, with median sector straight: (0) absent; (1) present.
17. Course of posterior margin of tergite 8: (0) concave; (1) transverse.
18. Spiracle on first pedigerous trunk segment: (0) absent; (1) present.
19. Arrangement of mandibular aciculae in rows: (0) one row; (1) two rows.
20. Aciculae with row of digitiform pinnules along dorsal edge only, tips of pinnules pointed: (0) absent; (1) present.
21. Simple aciculae: (0) absent; (1) present.
22. Ventral bristles in fringe of mandible with a wide base: (0) absent; (1) present.
23. Accessory denticles on dorsalmost mandibular tooth and adjacent to furry pad: (0) mostly or exclusively simple, angular accessory denticles; (1) mostly flattened, multifurcating scales.
24. Furry pad intergrades with accessory denticles: (0) absent; (1) present.
25. Shape of first maxillary sternite: (0) small, wedge shaped; (1) large, bell-shaped, coxae not merged anterior to sternite, suture between coxa and sternite confined to posterior edge of maxilla.
26. Structure of setae on coxal process of first maxilla: (0) simple; (1) cluster of lacinate or plumose setae amidst simple setae.
27. Coxal pores set in deep cuticular fold, largely concealed in

- ventral view: (0) absent; (1) present.
28. Distribution of distal spinose projections on tibiae: (0) strong pointed projection on legs 1–11, weak angulation on leg 12; (1) strong projection on legs 1–12; (2) strong projection on legs 1–13; (3) strong projection on legs 1–14; (4) strong projection on legs 1–15.
 29. Tarsus of legs 1–12: (0) divided into tarsomeres; (1) undivided.
 30. Basitarsus of legs 1–12 divided (tripartite tarsus): (0) absent; (1) present.
 31. Curvature of distitarsal part of leg: (0) straight; (1) curved.
 32. Distitarsus of legs 14 and 15 divided: (0) undivided; (1) divided.
 33. Number of tarsomeres in distitarsus of leg 14: (0) two; (1) three; (2) six to ten.
 34. Number of tarsomeres in distitarsus of leg 15: (0) two; (1) three; (2) four; (3) 20–25.
 35. Insertion of anterior accessory claw: (0) dorsally or dorsolaterally on main claw; (1) ventrolaterally on main claw.
 36. Definition of scales on pretarsal accessory claws: (0) absent or weak; (1) strong.
 37. Definition of scales on dorsoproximal part of main pretarsal claw: (0) distinct; (1) indistinct.
 38. Length of posteroventral spine on pretarsus: (0) short (less than one quarter length of main claw); (1) long (at least half length of main claw).
 39. First genital sternite of male divided longitudinally into two sclerites: (0) undivided; (1) divided.
 40. Number of spurs on female gonopod: (0) two; (1) three; (2) five to seven.
 41. First article of female gonopod extended as a short process: (0) absent; (1) present.