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Phylogenetic revision of the New Zealand genus *Dasytricheta*, with a discussion of its systematic position within the subfamily Aleocharinae (Coleoptera: Staphylinidae)

GRZEGORZ PAŚNIK

Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Sławkowska 17, 31-016 Kraków, Poland;
e-mail: pasnik@isez.pan.krakow.pl

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Abstract. The genus *Dasytricheta* Bernhauer, 1943 is redefined. The genus *Pyromecroma* Cameron, 1945 is considered a new synonym of *Dasytricheta*. Eleven valid species are recognised in the genus: *Dasytricheta spectabilis* Bernhauer, 1943 (the type species of *Dasytricheta*), *D. funesta* (Broun, 1912) comb. n. (the type species of *Pyromecroma*, originally described in *Myrmecopora* Saulcy, 1864), and nine species described as new: *Dasytricheta haastiana* sp. n., *D. hookeriana* sp. n., *D. intermedia* sp. n., *D. kapuniana* sp. n., *D. mahitahiana* sp. n., *D. periana* sp. n., *D. shotoveriana* sp. n., *D. testacea* sp. n. and *D. waihoana* sp. n. The taxa are diagnosed, keyed and illustrated. The phylogeny of *Dasytricheta* is analysed using cladistic methods. The systematic position of *Dasytricheta* within the Aleocharinae is discussed.

INTRODUCTION

The aleocharine genus *Dasytricheta* Bernhauer, 1943 is endemic to New Zealand. Bernhauer (1943) described the genus based on a single species, *D. spectabilis* Bernhauer, 1943, and included it in the tribe Myrmedoniini. Bernhauer erected the new genus emphasizing as distinguishing characters the dorso-ventrally flattened body, the wide head with narrow neck, the very dense puncturation of the body, the dense, silky body pubescence and the structure of the mouthparts. Until now, no other species have been assigned to *Dasytricheta*.

In order to clarify the status of *Dasytricheta*, the type material of *D. spectabilis* was reexamined. The current study provides a redefinition of the genus, descriptions and illustrations of new and previously known species, and a key to all species. The revised *Dasytricheta* includes eleven species, nine of which are described as new in this paper.

MATERIAL AND METHODS

The type material is deposited in the Field Museum of Natural History in Chicago (FMNH), The Natural History Museum in London (BMNH) and the Institute of Systematics and Evolution of Animals PAS in Kraków (ISEA).

Dissection of male and female genitalia, mouthparts and terminalia follows the technique of Uhlig & Watanabe (1992). Strongly sclerotised body parts were bleached in a few drops of lactic acid, rinsed in distilled water and dehydrated in propyl alcohol until all air bubbles disappeared. Dissected parts were mounted on small plastic slides using Marc André No 2 medium (Massoud, 1967) and pinned together with the specimen.

Illustrations were made using a drawing tube on a Leica MZ 12.5 stereomicroscope. Illustrations were digitalised as bitmap images and subsequently modified.

The cladistic analysis was performed using PAUP version 4.0b10 (Swofford, 2001). The most parsimonious cladograms were generated by a heuristic search, with 100 replicates of random addition of taxa and tree-bisection-reconnection (TBR) branch-swapping, with the "multiple trees" option in effect, "steepest descent" options not in effect, and branches collapsed if maximum branch length is zero. Clade confidence values were obtained by a bootstrap analysis with 1000 replicates using heuristic searches with simple addition of taxa and TBR branch-swapping, and decay indices (Bremer support) (Bremer, 1988, 1994).

SYSTEMATICS

Genus *Dasytricheta* Bernhauer, 1943

(Figs 1–9)

Dasytricheta Bernhauer, 1943: 171. Type species: *Dasytricheta spectabilis* Bernhauer, 1943: 172 (by monotypy).

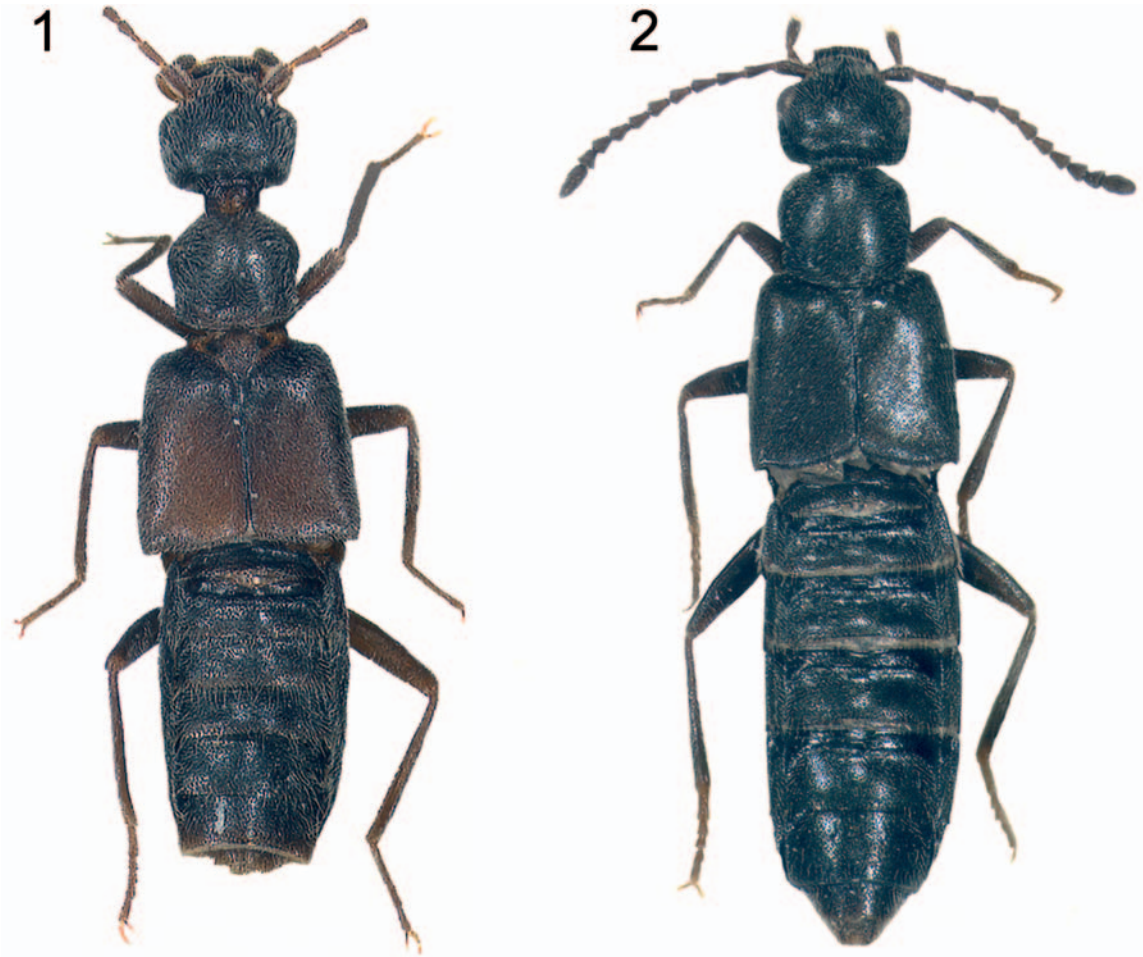
Pyromecroma Cameron, 1945: 165, syn. n. Type species: *Myrmecopora funesta* Broun, 1912: 398 (by original designation).

Diagnosis

Body. Small to medium sized, length 2.5–5.3 mm. Body slender, parallel-sided, flattened dorso-ventrally, weakly glossy, covered by white dense pubescence.

Head. Quadrate to transverse, temples parallel-sided, hind angles broadly rounded; eyes weakly to moderately protruding from lateral contours of head; genae without infraorbital ridge. Antennae long, clearly increasing in width apically, extending to 1/3 of elytra. Antennomere 11 with pair of coeloconic sensilla.

Mouthparts. Maxilla (Fig. 3) with galea as long as or slightly shorter than lacinia; galea narrow, rounded apically, subequal in width to lacinia at widest part; apex of galea with membranous lobe covered with very long setae; lacinia with inner margin of spines and long setae;



Figs 1–2. 1 – *Dasytricheta spectabilis*, habitus. Body length 5.2 mm. 2 – *Dasytricheta funesta*, habitus. Body length 4.8 mm.

maxillary palpus tetramerous, palpomere 1 very short, 2 elongate, slightly widened apically, 3 elongate and slender, subequal in length to 2, 4 short, about 1/5 the length of 3. Labrum (Fig. 5) strongly transverse, widely emarginate apically and with characteristic arrangement of setae. Labium (Fig. 4) with ligula relatively narrow and slender, about 3/4 length of labial palpomere 1; bifid in apical 1/3, apex of ligula with pair of long subapical setae; prementum with two very long medial setae; medial setae separated by 3 times the width of setal pore; median pseudopore field relatively wide and more or less linear, composed of numerous pseudopores, lateral pore field with a single setose pore, three asetose pores and numerous small pseudopores; labial palpi trimerous, palpomere 1 elongate, with 3 long setae, 2 slightly shorter and distinctly narrower than 1, 3 shorter and narrower than 2, with a desclerotized band and 2 preapical sensory pores.

Mentum transverse (Fig. 6), widest at base, apical margin slightly concave, anterior angles rounded, 5 long setae present on each side. Mandibles curved towards apex, right mandible (Fig. 7) with very large median tooth at middle of inner margin, strongly serrate in dorsal molar region, "velvety patch" area relatively small, composed of rows of very fine spinules.

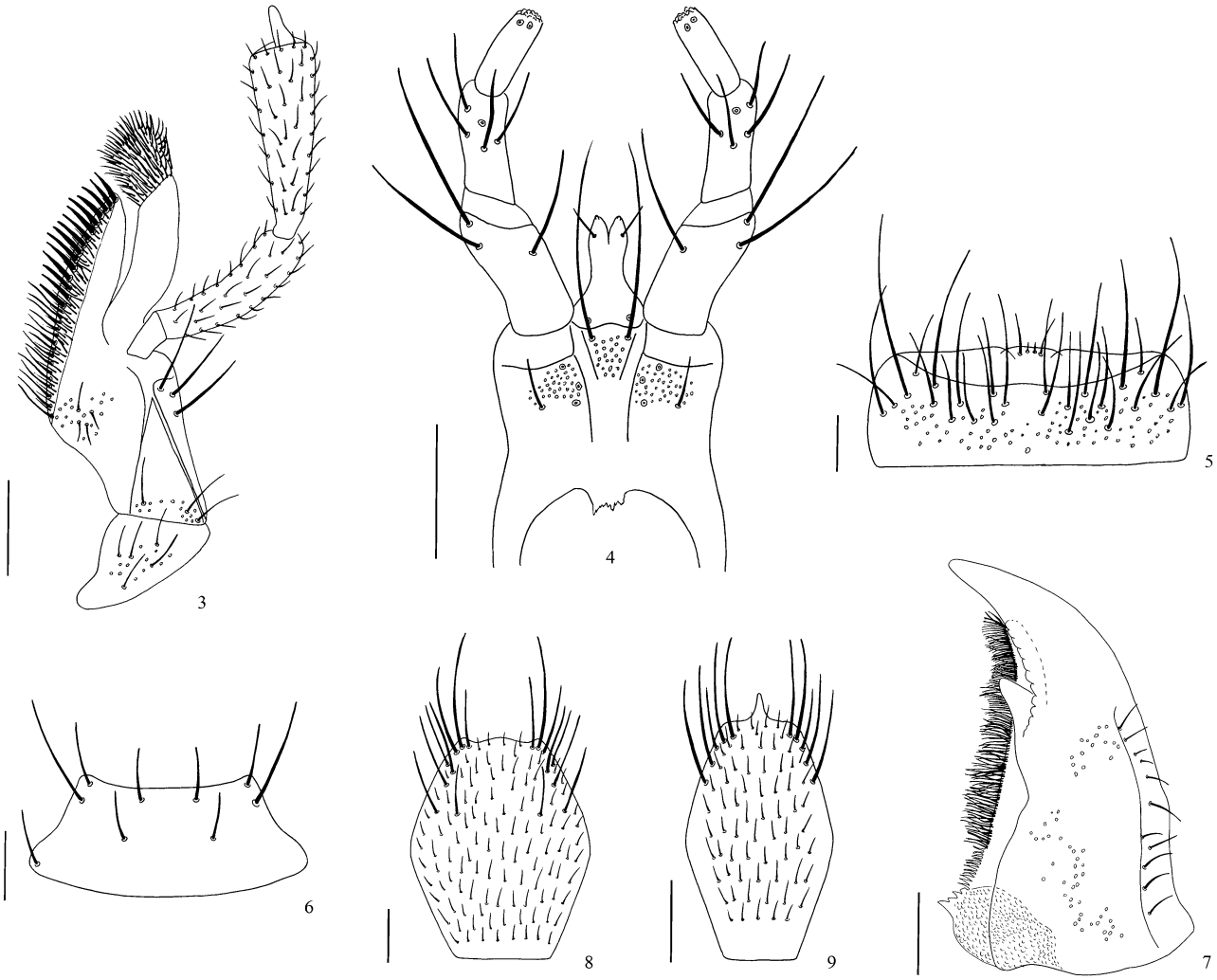
Thorax. Pronotum subquadrate, weakly to moderately convex, weakly glossy, widest in apical third, lateral sides narrowed concavely or in straight line to hind angles. Pubescence at midline directed entirely posteriorly. Hypomera very wide, fully visible in lateral view. Mesocoxae narrowly separated. Mesosternal process wide, triangular, rounded at apex, extending to about 1/3 of mesocoxae; metasternal process triangular in outline, broadly rounded at apex, very short, extending to 1/3 of mesocoxae. Mesocoxal cavities margined posteriorly by a fine carina.

Elytra. Quadrate to elongate, lateral sides straight; widest at base, postero-lateral angles distinctly sinuate.

Abdomen. Parallel-sided, widest at tergites V and VI; tergites III–V distinctly transversely impressed at base, impressions punctate; tergite X as in Figs 8–9; sternites not impressed at base.

Legs elongate, metatarsus moderately long, ranging from 1/2 to 3/4 the length of metatibia; basal tarsomere of metatarsus long, subequal in length to 2 and 3 combined, tarsomeres 2–4 relatively short, subequal in length, 5 elongate, longer than 3 and 4 combined and subequal in length to 1; tarsal formula 4-5-5.

Median lobe of aedeagus short to relatively long and slender, more or less strongly bent ventrally in lateral view; gradually narrowed to apex or subparallel-sided and abruptly narrowed apically in ventral view; apex of median lobe rounded, hooked or constricted apically

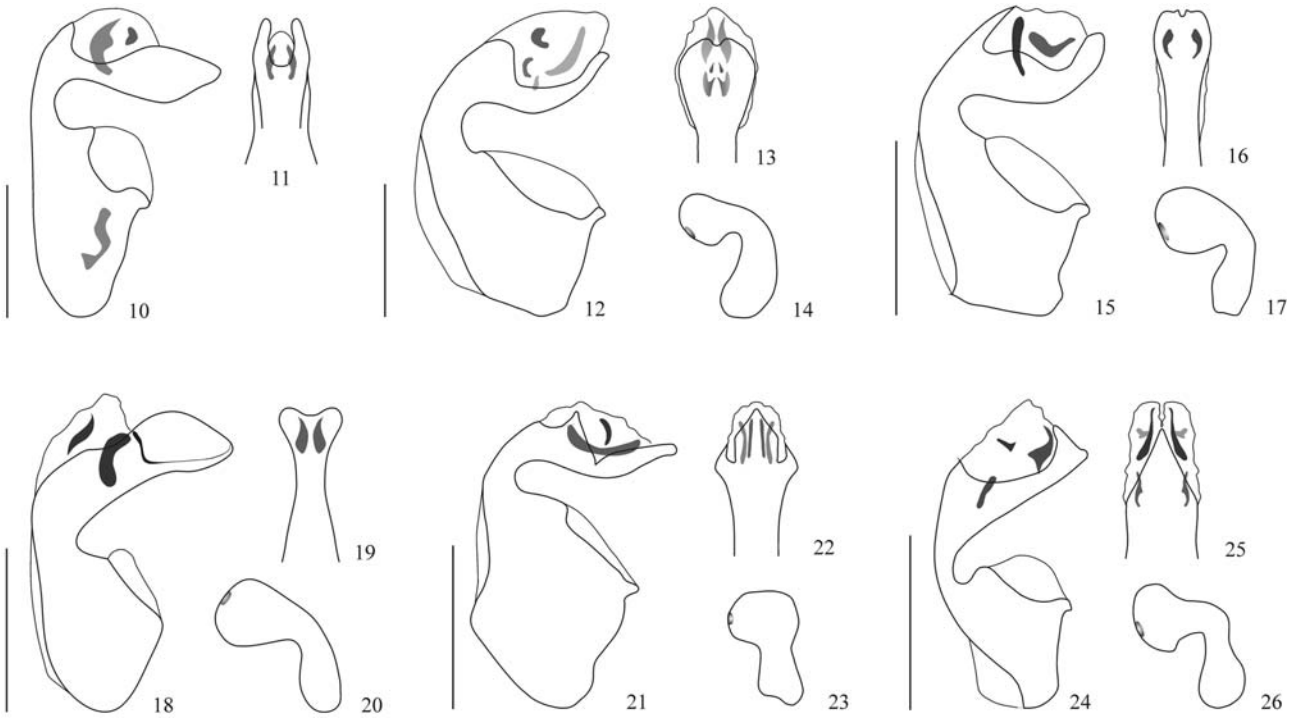


Figs 3–9. *Dasytricheta spectabilis*. 3 – maxilla; 4 – labium; 5 – labrum; 6 – mentum; 7 – right mandible; 8–9 – tergite X. Scale bars 0.1 mm.

(lateral view); crista apicalis large and prominent; internal sac with several pairs of sclerites differing in size and shape.

Key to the species of *Dasytricheta*

1 Elytra quadrate or slightly transverse, ratio width : length is 1.0–1.2 (measured from scutellar apex to elytral base); head puncturation coarser than on pronotum; pronotal basal transverse impression wide and deep. 2
– Elytra elongate, ratio width : length is 0.9–0.95; head puncturation similar to that on pronotum; pronotal basal transverse impression narrow and shallow. 8
2 Body length 4.5–5.3 mm; pronotal lateral sides weakly sinuate. 3
– Body length 2.7–4.0 mm; pronotal lateral sides not sinuate. 4
3 Antennomere 3 shorter than 2; antennomere 10 as long as wide; legs red; elytra reddish-brown; aedeagus as in Figs 10–11. . . . . *spectabilis*
– Antennomeres 2 and 3 subequal in length; antennomere 10 longer than wide; legs and elytra black; aedeagus as in Figs 12–13; spermatheca as in Fig. 14. . . . . *funesta*
4 Antennomere 8 longer than wide; aedeagus as in Figs 15–16; spermatheca as in Fig. 17 . . . . . *shotoveriana* sp. n.
– Antennomere 8 as long as wide; aedeagus and spermatheca different. 5
5 Pronotal and tergal microsculpture obsolete; elytra reddish-brown; aedeagus as in Figs 18–19; spermatheca as in Fig. 20. . . . . *intermedia* sp. n.
– Pronotal and tergal microsculpture distinct; elytral colour different; aedeagus and spermatheca different. 6
6 Antennomeres 2 and 3 subequal in length; antennomere 10 wider than long; aedeagus as in Figs 21–22; spermatheca as in Fig. 23. . . . . *testacea* sp. n.
– Antennomere 3 shorter than 2; antennomere 10 as wide as long; aedeagus and spermatheca different. 7
7 Eyes large, length of each seen from above longer than postocular region; head 1.15 times wider than long; aedeagus as in Figs 24–25; spermatheca as in Fig. 26. . *hookeriana* sp. n.
– Eyes moderately sized; length of each seen from above as long as postocular region; head 1.35 times wider than long; aedeagus as in Figs 27–28. . . . . *haastiana* sp. n.
8 Antennomere 3 shorter than 2; antennomere 10 wider than long; pronotal microsculpture obsolete; aedeagus as in Figs 29–30. . . . . *waihoana* sp. n.
– Antennomeres 2 and 3 subequal in length; antennomere 10 as long as wide; pronotal microsculpture distinct; aedeagus different. 9



Figs 10–26. Aedeagus in lateral view, apex of median lobe in ventral view and spermatheca. 10, 11 – *Dasytricheta spectabilis*; 12–14 – *D. funesta*; 15–17 – *D. shotoveriana*; 18–20 – *D. intermedia*; 21–23 – *D. testacea*; 24–26 – *D. hookeriana*. Scale bars 0.3 mm.

9 Antennomere 8 wider than long; elytra black; aedeagus as in Figs 31–32. . . . . *mahitahiana* sp. n.
– Antennomere 8 as long as wide; elytra reddish-brown; aedeagus different. 10
10 Eyes large, length of each seen from above as long as postocular region; aedeagus as in Figs 36–37; spermatheca as in Fig. 38. . . . . *periana* sp. n.
– Eyes small, length of each seen from above shorter than postocular region; aedeagus as in Figs 33–34; spermatheca as in Fig. 35. . . . . *kapuniana* sp. n.

Dasytricheta spectabilis Bernhauer, 1943

(Figs 1, 10–11, 39)

Dasytricheta spectabilis Bernhauer, 1943: 172.

Redescription

Body. Length 5.1–5.3 mm, convex, parallel-sided, weakly glossy; body colour black, elytra brown, tergites black with posterior margin brown, legs and antennae red.

Head transverse in outline, moderately convex, widest across eyes; eyes relatively large, moderately protruding from lateral contours of head, length of each seen from above subequal to that of postocular region; temples parallel-sided, surface of head with fine transversely stretched isodiametric mesh microsculpture; puncturation relatively coarse and very dense, interstices between punctures smaller than their diameter, pubescence short and dense, directed inward. Antennae long, moderately increasing in width apically, antennomere 3 shorter than 2, antennomeres 4–8 longer than wide, antennomeres 9–10 quadrate.

Pronotum subquadrate, moderately convex, widest in apical third, lateral sides slightly concavely narrowed to obtuse hind angles; before base a wide and relatively deep transverse impression, surface with fine transversely stretched isodiametric mesh microsculpture; puncturation fine and very dense, much finer than that on head; pubescence at midline directed posteriorly.

Elytra subquadrate, slightly wider than pronotum; lateral sides straight; at suture distinctly longer than pronotal length at midline; surface with distinct transversely stretched isodiametric mesh microsculpture; puncturation fine and dense.

Abdomen parallel-sided, bases of tergites III–V each with relatively deep transverse impression, impressions coarsely punctate; tergal puncturation fine and very dense, interstices between punctures smaller than their diameter; surface of tergites with fine transverse microsculpture; pubescence relatively long and dense.

Male. Aedeagus as in Figs 10–11. Female. Spermatheca not found.

Remarks. *Dasytricheta spectabilis* is very similar to *D. funesta*, from which it can be distinguished by its larger size, brown elytra (black in *D. funesta*), antennomere 3 shorter than 2 (antennomeres 2 and 3 subequal in length in *D. funesta*), antennomere 10 as long as wide (longer than wide in *D. funesta*) and shape of the aedeagus.

Type material. Holotype: ♀, New Zealand, Rakaia, J. Walker (FMNH).

Additional material. ♂, New Zealand, Rakaia, J. Walker (BMNH).

Dasytricheta funesta (Broun, 1912), comb. n.

(Figs 2, 12–14, 39)

Myrmecopora funesta Broun, 1912: 398.
Pyromecroma funesta: Cameron, 1945: 165.

Redescription

Body. Length 4.5–4.8 mm, convex, parallel-sided, weakly glossy; body colour black, legs pitchy brown, antennae brown.

Head transverse in outline, moderately convex, widest across eyes; eyes relatively large, moderately protruding from lateral contours of head, length of each seen from above subequal to that of postocular region; temples parallel-sided; surface of head with fine transversely stretched isodiametric mesh microsculpture; puncturation relatively coarse and very dense, interstices between punctures smaller than their diameter; pubescence short and dense, directed inward. Antennae long, increase moderately in width apically, antennomeres 2 and 3 subequal in length, antennomeres 4–10 longer than wide, decreasing in length.

Pronotum subquadrate, moderately convex, widest in apical third; lateral sides slightly concavely narrow to obtuse hind angles; before base a wide and relatively deep transverse impression; surface with fine transversely stretched isodiametric mesh microsculpture; puncturation fine and very dense, much finer than on head; pubescence at midline directed posteriorly.

Elytra subquadrate, slightly wider than pronotum; lateral sides straight; at suture distinctly longer than pronotal length at midline; surface with distinct transversely stretched isodiametric mesh microsculpture; puncturation fine and dense.

Abdomen parallel-sided; bases of tergites III–V each with relatively deep transverse impression, impressions coarsely punctate; tergal puncturation fine and very dense, interstices between punctures smaller than their diameter; surface of tergites with fine transverse microsculpture; pubescence relatively long and dense.

Male. Aedeagus as in Figs 12–13. Female. Spermatheca as in Fig. 14.

Remarks. See under *Dasytricheta spectabilis*.

Type material. Holotype: ♂, New Zealand, Broken River, Canterbury (BMNH).

Additional material. New Zealand, Broken River, Canterbury, ♂ (BMNH); New Zealand, OL: Queenstown, Arthurs Point, banks of Shotover River, 1.ii.1984, streamside gravel, P.M. Hammond, 31♂ and 18♀ (BMNH), ♂ and ♀ (ISEA); New Zealand, WD: 20 km E Haast, banks of Haast River, 80 m, 4.i.1984, on mud, P.M. Hammond, ♀ (BMNH).

Dasytricheta shotoveriana sp. n.

(Figs 15–17, 39)

Description

Body. Length 3.2–3.5 mm, convex, parallel-sided, slightly glossy; body colour black, legs red, antennae brown.

Head transverse in outline, moderately convex, widest across eyes; eyes relatively large, moderately protruding from lateral contours of head, length of each seen from above subequal in length to that of postocular region; temples parallel-sided, surface of head with fine transversely stretched isodiametric mesh microsculpture; puncturation relatively coarse and very dense, interstices between punctures smaller than their diameter; pubescence short and dense, directed inward. Antennae long, increase moderately in width apically, antennomeres 2 and 3 subequal in length, antennomeres 4–8 longer than wide, antennomeres 9–10 quadrate.

Pronotum subquadrate, moderately convex, widest in apical third; lateral sides gradually narrow in straight line to obtuse hind angles; before base a wide and relatively deep transverse impression; surface with fine transversely stretched isodiametric mesh microsculpture; puncturation fine and very dense, much finer than that on head; pubescence at midline directed posteriorly.

Elytra subquadrate, slightly wider than pronotum; lateral sides straight; at suture distinctly longer than pronotal length at midline; surface with distinct transversely stretched isodiametric mesh microsculpture; puncturation fine and dense.

Abdomen parallel-sided; bases of tergites III–V each with relatively deep transverse impression, impressions coarsely punctate; tergal puncturation fine and very dense, interstices between punctures smaller than their diameter; surface of tergites with fine transverse microsculpture, pubescence relatively long and dense.

Male. Aedeagus as in Figs 15–16. Female. Spermatheca as in Fig. 17.

Remarks. *Dasytricheta shotoveriana* sp. n. is very similar to *D. intermedia* sp. n., from which it can be distinguished by the distinct pronotal and abdominal microsculpture (obsolete in *D. intermedia*), black elytra (reddish-brown in *D. intermedia*), elytra 1.2 times longer than pronotal length at midline (1.30–1.35 in *D. intermedia*) and shape of the aedeagus.

Etymology. The name refers to the type locality.

Type material. Holotype: ♂, New Zealand, OL: Queenstown, Arthurs Point, banks of Shotover River, 1.ii.1984, streamside gravel, P.M. Hammond (BMNH). Paratypes: 23♂ and 11♀, same data as holotype (BMNH); ♂, same data as holotype (ISEA).

Dasytricheta intermedia sp. n.

(Figs 18–20, 40)

Description

Body. Length 3.3–3.8 mm, convex, parallel-sided, slightly glossy; body colour black, elytra reddish-brown with lateral sides and shoulders black, legs and antennae pitch-brown.

Head transverse in outline, moderately convex, widest across eyes; eyes relatively large, moderately protruding from lateral contours of head, length of each seen from above subequal in length to that of postocular region; temples parallel-sided; surface of head with fine transversely stretched isodiametric mesh microsculpture; puncturation relatively coarse and very dense, interstices between punctures smaller than their diameter; pubescence short and dense, directed inward. Antennae long,

increase moderately in width apically, antennomeres 2 and 3 subequal in length, antennomeres 4–7 longer than wide, antennomeres 8–10 quadrate.

Pronotum subquadrate, moderately convex, widest in apical third; lateral sides gradually narrow in straight line to obtuse hind angles; before base a wide and relatively deep transverse impression; surface with fine transversely stretched isodiametric mesh microsculpture; puncturation fine and very dense, much finer than on head; pubescence at midline directed posteriorly.

Elytra subquadrate, slightly wider than pronotum, relatively glossy; lateral sides straight; at suture distinctly longer than pronotal length at midline; surface with obsolete transversely stretched isodiametric mesh microsculpture; puncturation fine and dense.

Abdomen parallel-sided, bases of tergites III–V each with a relatively deep transverse impression, impressions coarsely punctate; tergal puncturation fine and very dense, interstices between punctures smaller than their diameter; surface of tergites with fine transverse microsculpture; pubescence relatively long and dense.

Male. Aedeagus as in Figs 18–19. Female. Spermatheca as in Fig. 20.

Remarks. *Dasytricheta intermedia* sp. n. is similar to *D. shotoveriana* sp. n. and *D. testacea* sp. n., but it may be distinguished from both by the obsolete microsculpture on pronotum and abdomen, and the shape of the aedeagus. From *D. testacea* by its lager size, antennomere 10 as long as wide (transverse in *D. testacea*) and transverse head (quadrate in *D. testacea*). See also under *D. shotoveriana.*

Etymology. The name *intermedia* refers to the characters intermediate between *D. shotoveriana* and *D. testacea*.

Type material. Holotype: ♂, New Zealand, OL: Queenstown, Arthurs Point, banks of Shotover River, 1.ii.1984, streamside gravel, P.M. Hammond (BMNH). Paratypes: 26♂ and 16♀, same data as holotype (BMNH); ♂ same data as holotype (ISEA).

Dasytricheta testacea sp. n.

(Figs 21–23, 39)

Description

Body. Length 2.7–3.3 mm, convex, parallel-sided, slightly glossy; body colour black, elytra and legs red, antennae brown.

Head transverse in outline, moderately convex, widest across eyes; eyes relatively large, moderately protruding from lateral contours of head, length of each seen from above subequal in length to that of postocular region; temples parallel-sided; surface of head with fine transversely stretched isodiametric mesh microsculpture; puncturation relatively coarse and very dense, interstices between punctures smaller than their diameter; pubescence short and dense, directed inward. Antennae long, increase moderately in width apically, antennomeres 2 and 3 subequal in length, antennomeres 4–6 longer than wide, antennomeres 7–8 quadrate, antennomeres 9–10 wider than long.

Pronotum subquadrate, moderately convex, widest in apical third; lateral sides gradually narrow in straight line to obtuse hind angles; before base a wide and relatively deep transverse impression; surface with fine transversely stretched isodiametric mesh microsculpture; puncturation fine and very dense, much finer than that on head; pubescence at midline directed posteriorly.

Elytra subquadrate, slightly wider than pronotum; lateral sides straight; at suture distinctly longer than pronotal length at midline; surface with distinct transversely stretched isodiametric mesh microsculpture; puncturation fine and dense.

Abdomen parallel-sided, bases of tergites III–V each with relatively deep transverse impression, impressions coarsely punctate; tergal puncturation fine and very dense, interstices between punctures smaller than their diameter; surface of tergites with fine transverse microsculpture; pubescence relatively long and dense.

Male. Aedeagus as in Figs 21–22. Female. Spermatheca as in Fig. 23.

Remarks. See under *Dasytricheta intermedia*.

Etymology. The name *testacea* refers to the elytral colour.

Type material. Holotype: ♂, New Zealand, OL: Queenstown, Arthurs Point, banks of Shotover River, 1.ii.1984, streamside gravel, P.M. Hammond (BMNH). Paratypes: 4♂ and 5♀, same data as holotype (BMNH); ♂, same data as holotype (ISEA).

Dasytricheta hookeriana sp. n.

(Figs 24–26, 40)

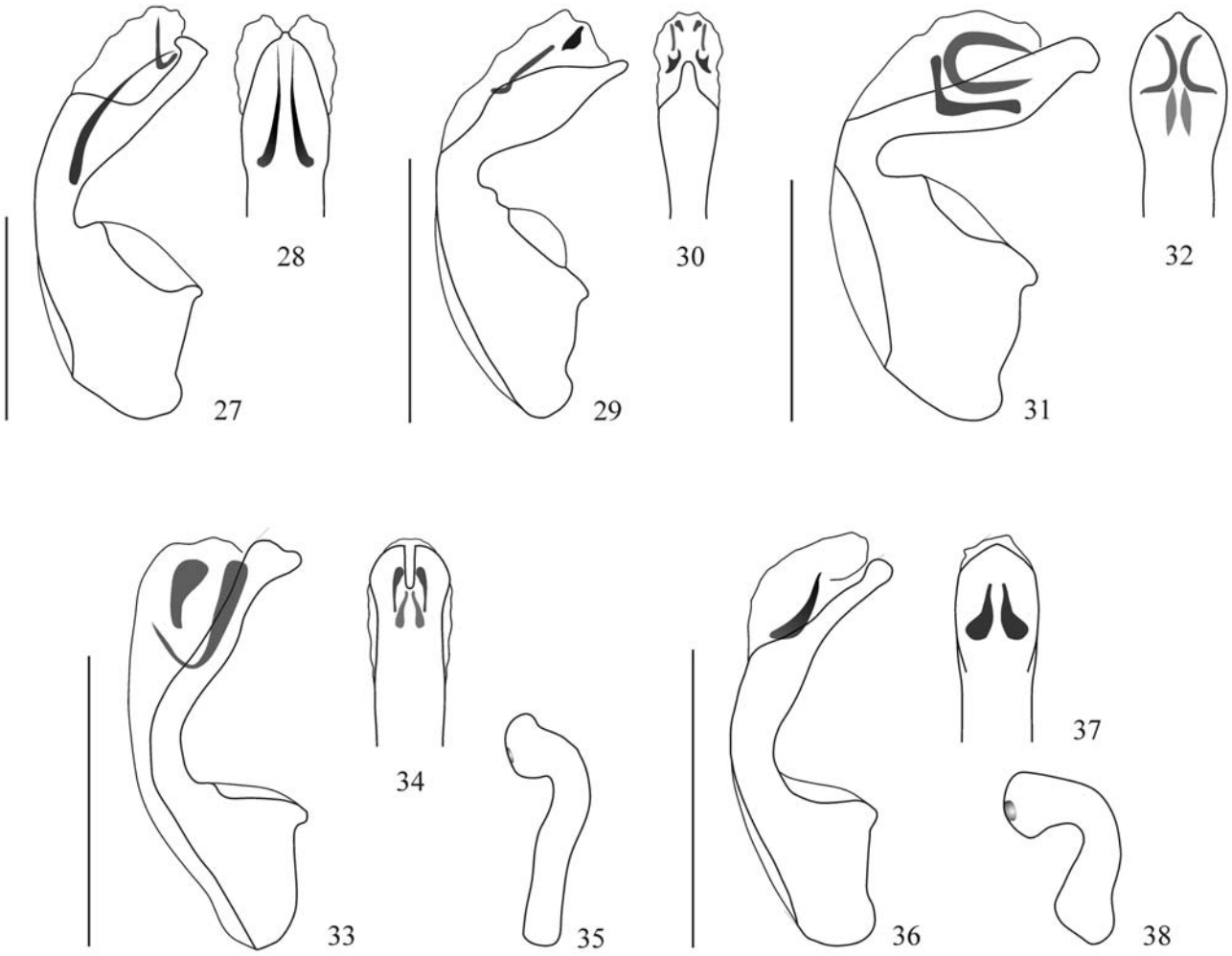
Description

Body. Length 3.5–4.0 mm, convex, parallel-sided, slightly glossy; body colour black, elytra pitch-brown, legs red, antennae black with antennomeres 1–2 brown.

Head transverse in outline, moderately convex, widest across eyes; eyes relatively large, moderately protruding from lateral contours of head, length of each seen from above longer than postocular region; temples parallel-sided; surface of head with fine transversely stretched isodiametric mesh microsculpture; puncturation relatively coarse and very dense, interstices between punctures smaller than their diameter; pubescence short and dense, directed inward. Antennae long, increase moderately in width apically, antennomere 3 shorter than 2, antennomeres 4–6 longer than wide, antennomeres 7–10 quadrate.

Pronotum subquadrate, moderately convex, widest in apical third; lateral sides gradually narrow in straight line to obtuse hind angles; before base a wide and relatively deep transverse impression; surface with fine transversely stretched isodiametric mesh microsculpture; puncturation fine and very dense, much finer than that on head; pubescence at midline directed posteriorly.

Elytra subquadrate, slightly wider than pronotum; lateral sides straight; at suture distinctly longer than pronotal length at midline; surface with distinct transversely stretched isodiametric mesh microsculpture; puncturation fine and dense.



Figs 27–38. Aedeagus in lateral view, apex in ventral view and spermatheca. 27, 28 – *Dasytricheta haastiana*; 29, 30 – *D. waihoana* sp. n.; 31, 32 – *D. mahitahiana* sp. n.; 33–35 – *D. kapuniana* sp. n.; 36–38 – *D. periana* sp. n. Scale bars 0.3 mm.

Abdomen parallel-sided, bases of tergites III–V each with relatively deep transverse impression, impressions coarsely punctate; tergal puncturation fine and very dense, interstices between punctures smaller than their diameter; surface of tergites with fine transverse microsculpture; pubescence relatively long and dense.

Male. Aedeagus as in Figs 24–25. Female. Spermatheca as in Fig. 26.

Remarks. *Dasytricheta hookeriana* sp. n. is similar to *D. haastiana* sp. n., but differs in having larger eyes, which are longer than postocular region in dorsal aspect (subequal in *D. haastiana*), head as wide as long (transverse in *D. haastiana*), red legs (pitch-brown in *D. haastiana*) and in the shape of the aedeagus.

Etymology. The name refers to the type locality.

Type material. Holotype: ♂, New Zealand, OL: Queenstown, Arthurs Point, banks of Shotover River, 1.ii.1984, streamside gravel, P.M. Hammond (BMNH). Paratypes: 14♂ and 7♀, same data as holotype (BMNH); ♂, same data as holotype (ISEA).

Dasytricheta haastiana sp. n.

(Figs 27–28, 40)

Description

Body. Length 4.0 mm, convex, parallel-sided, slightly glossy; body colour black, elytra and legs pitch-brown, antennae brown.

Head transverse in outline, moderately convex, widest across eyes; eyes relatively large, moderately protruding from lateral contours of head, length of each seen from above subequal to that of postocular region; temples parallel-sided; surface of head with fine transversely stretched isodiametric mesh microsculpture; puncturation relatively coarse and very dense, interstices between punctures smaller than their diameter; pubescence short and dense, directed inward. Antennae long, increase moderately in width apically, antennomere 3 shorter than 2, antennomeres 4–7 longer than wide, antennomeres 8–10 quadrate.

Pronotum subquadrate, moderately convex, widest in apical third; lateral sides gradually narrow in straight line to obtuse hind angles; before base a wide and relatively deep transverse impression; surface with fine transversely stretched isodiametric mesh microsculpture; puncturation fine and very dense, much finer than on head; pubescence at midline directed posteriorly.

Elytra subquadrate, slightly wider than pronotum, lateral sides straight; at suture distinctly longer than pronotal length at midline; surface with distinct transversely stretched isodiametric mesh microsculpture; puncturation fine and dense.

Abdomen parallel-sided, bases of tergites III–V each with a relatively deep transverse impression, impressions coarsely punctate; tergal puncturation fine and very dense, interstices between punctures smaller than their diameter; surface of tergites with fine transverse microsculpture; pubescence relatively long and dense.

Male. Aedeagus as in Figs 27–28. Female unknown.

Remarks. See under *Dasytricheta hookeriana*.

Etymology. The name refers to the type locality.

Type material. Holotype: ♂, New Zealand, WD: 20 km E. Haast, banks of Haast river, 80 m, 4.i.1984, P.M. Hammond (BMNH).

Dasytricheta waihoana sp. n.

(Figs 29–30, 40)

Description

Body. Length 2.5 mm, convex, parallel-sided, slightly glossy; body colour black, elytra red, abdomen black with tergites 3–5 brown, legs red, antennae brown with antennomeres 1–3 red.

Head quadrate in outline, moderately convex, widest across eyes; eyes relatively small, weakly protruding from lateral contours of head, length of each seen from above shorter than postocular region; temples parallel-sided; surface of head with fine transversely stretched isodiametric mesh microsculpture; puncturation fine and very dense, interstices between punctures smaller than their diameter; pubescence short and dense, directed inward. Antennae long, increase moderately in width apically, antennomere 3 shorter than 2, antennomeres 4–5 longer than wide, antennomeres 6–7 as wide as long, antennomeres 8–10 wider than long.

Pronotum subquadrate, moderately convex, widest in apical third; lateral sides gradually narrow in straight line to obtuse hind angles; before base a wide and relatively deep transverse impression; surface with fine transversely stretched isodiametric mesh microsculpture; puncturation fine and very dense, similar to that on head; pubescence at midline directed posteriorly.

Elytra subquadrate, slightly wider than pronotum; lateral sides straight; at suture distinctly longer than pronotal length at midline; surface with distinct transversely stretched isodiametric mesh microsculpture; puncturation fine and dense.

Abdomen parallel-sided, bases of tergites III–V each with relatively deep transverse impression, impressions coarsely punctate; tergal puncturation fine and very dense, interstices between punctures smaller than their diameter; surface of tergites with fine transverse microsculpture; pubescence relatively long and dense.

Male. Aedeagus as in Figs 29–30. Female unknown.

Remarks. *Dasytricheta waihoana* sp. n. is very similar to *D. mahitahiana* sp. n., but may be distinguished by its smaller size, red elytra (black in *D. mahitahiana*), antennomere 3 shorter than 2 (subequal in length in *D. mahitahiana*), antennomere 10 wider than long (as long as wide in *D. mahitahiana*), the obsolete pronotal microsculpture (distinct in *D. mahitahiana*) and the shape of its aedeagus.

Etymology. The name refers to the type locality.

Type material. Holotype: ♂, New Zealand, WD: Waiho River valley, ca. 200 m, 6.ii.1984, river and stream banks, P.M. Hammond (BMNH).

Dasytricheta mahitahiana sp. n.

(Figs 31–32, 40)

Description

Body. Length 3.1 mm, convex, parallel-sided, slightly glossy; body colour black, legs red, antennae black with antennomeres 1–2 brown.

Head quadrate in outline, moderately convex, widest across eyes; eyes relatively small, moderately protruding from lateral contours of head, length of each seen from above shorter than postocular region; temples parallel-sided; surface of head with fine transversely stretched isodiametric mesh microsculpture; puncturation fine and very dense, interstices between punctures smaller than their diameter; pubescence short and dense, directed inward. Antennae long, increase moderately in width apically, antennomeres 2 and 3 subequal in lenght, antennomeres 4–6 longer than wide, antennomeres 7–9 wider than long, antennomere 10 as wide as long.

Pronotum subquadrate, moderately convex, widest in apical third; lateral sides gradually narrow in straight line to obtuse hind angles; before base a wide and relatively deep transverse impression; surface with fine transversely stretched isodiametric mesh microsculpture; puncturation fine and very dense, similar to that on head; pubescence at midline directed posteriorly.

Elytra subquadrate, slightly wider than pronotum; lateral sides straight; at suture distinctly longer than pronotal length at midline; surface with distinct transversely stretched isodiametric mesh microsculpture; puncturation fine and dense.

Abdomen parallel-sided, bases of tergites III–V each with relatively deep transverse impression, impressions coarsely punctate; tergal puncturation fine and very dense, interstices between punctures smaller than their diameter; surface of tergites with fine transverse microsculpture; pubescence relatively long and dense.

Male. Aedeagus as in Figs 31–32. Female unknown.

Remarks. See under *Dasytricheta waihoana*.

Etymology. The name refers to the type locality.

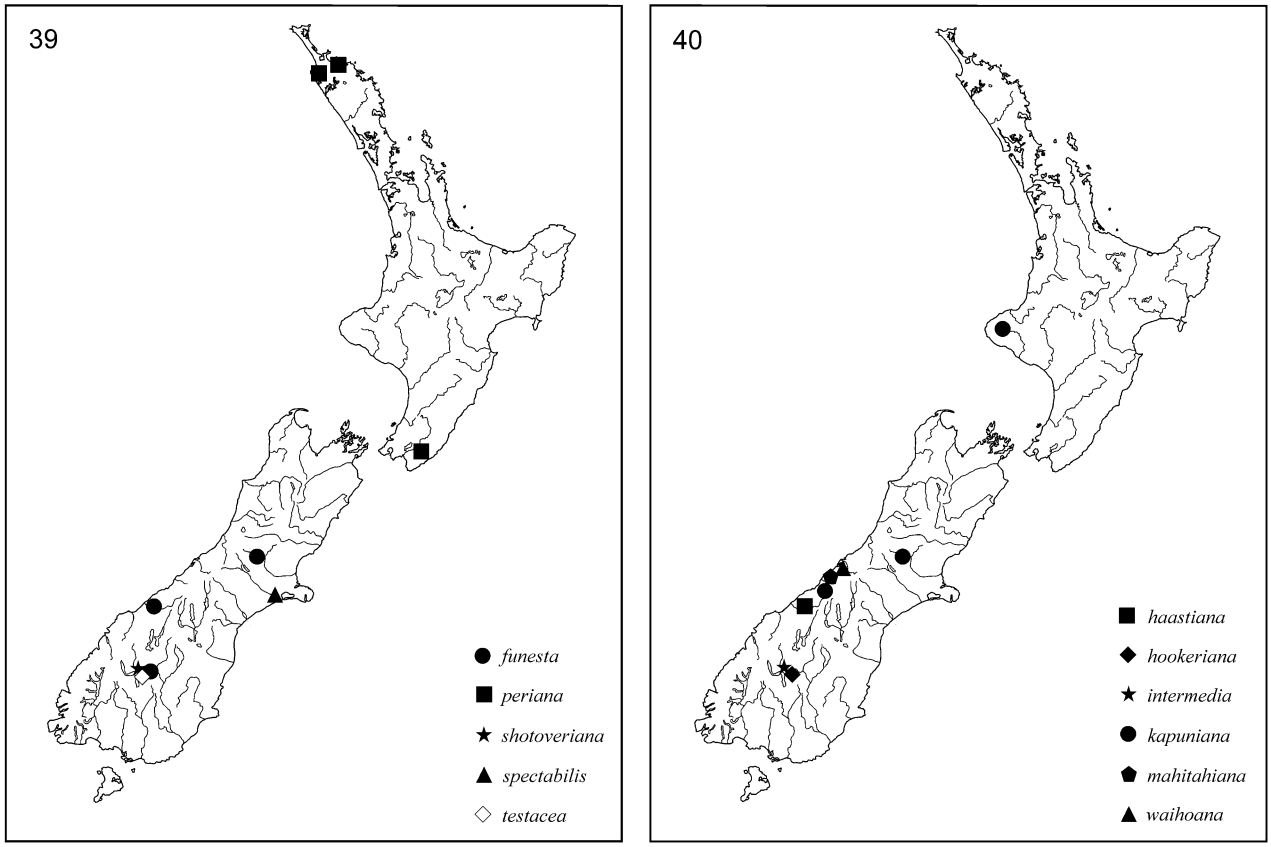
Type material. Holotype: ♂, New Zealand, WD: Mahitahi River, Scenic Reserve podocarp forest, 5.ii.1984, streamside gravel and mud, P.M. Hammond (BMNH).

Dasytricheta kapuniana sp. n.

(Figs 33–35, 40)

Description

Body. Length 2.5–2.9 mm, convex, parallel-sided, slightly glossy; body colour black, elytra reddish-brown, legs red, antennae brown with antennomeres 1–2 red.



Figs 39–40. Geographic distribution of *Dasytricheta* species.

Head quadrate in outline, moderately convex, widest across eyes; eyes relatively small, weakly protruding from lateral contours of head, length of each seen from above shorter than postocular region; temples parallel-sided; surface of head with fine transversely stretched isodiametric mesh microsculpture; puncturation fine and very dense, interstices between punctures smaller than their diameter; pubescence short and dense, directed inward. Antennae long, increase moderately in width apically, antennomeres 2 and 3 subequal in length, antennomeres 4–7 longer than wide, antennomeres 8–10 quadrate.

Pronotum subquadrate, moderately convex, widest in apical third; lateral sides gradually narrow in straight line to obtuse hind angles; before base a wide and relatively deep transverse impression; surface with fine transversely stretched isodiametric mesh microsculpture; puncturation fine and very dense, similar to that on head; pubescence at midline directed posteriorly.

Elytra subquadrate, slightly wider than pronotum; lateral sides straight; at suture distinctly longer than pronotal length at midline; surface with distinct transversely stretched isodiametric mesh microsculpture; puncturation fine and dense.

Abdomen parallel-sided, bases of tergites III–V each with a relatively deep transverse impression, impressions coarsely punctate; tergal puncturation fine and very dense, interstices between punctures smaller than their diameter; surface of tergites with fine transverse microsculpture; pubescence relatively long and dense.

Male. Aedeagus as in Figs 33–34. Female. Spermatheca as in Fig. 35.

Remarks. *Dasytricheta kapuniana* sp. n. is very similar to *D. periana* sp. n., but may be distinguished by eyes shorter than temples (as long as temples in *D. periana*) and the shape of the aedeagus.

Etymology. The name refers to the type locality.

Type material. Holotype: ♂, New Zealand, TK: Egmont National Park, Kapuni valley, 1,030–1,250 m, 6.xii.1983, moss by water fall, P.M. Hammond (BMNH). Paratypes: 5♂ and 2♀, same data as holotype (BMNH); ♂, same data as holotype (ISEA); 2♂, New Zealand, MK: Governors Bush, Hooker valley, 700–740 m, 21.–22.i.1984, streamside gravel, P.M. Hammond (BMNH); ♂ and ♀, New Zealand, WD: 5 km N Otira, 300 m, 9.ii.1984, streamside, P.M. Hammond (BMNH).

Dasytricheta periana sp. n.

(Figs 36–39)

Description

Body. Length 2.7–3.0 mm, convex, parallel-sided, slightly glossy; head black, pronotum and elytra reddish-brown, abdomen black with tergites 3–4 brown, legs red, antennae black with antennomeres 1–2 red.

Head quadrate in outline, moderately convex, widest across eyes; eyes relatively small, weakly protruding from lateral contours of head, length of each seen from above subequal to that of postocular region; temples parallel-sided; surface of head with fine transversely stretched isodiametric mesh microsculpture; puncturation fine and very dense, interstices between punctures smaller than

TABLE 1. Character matrix.

Taxon	Character No.		
	1	1111111112	2222222223
	1234567890	1234567890	1234567890
A. graminicola	0000000200	1000000100	0000000000
I. leucopus	0000000000	0000000000	0101000000
M. publicana	0102002000	0000100100	0010000001
D. funesta	1111002211	1111111000	0111010110
D. haastiana	1111010011	1111101000	0111001100
D. hookeriana	0111210011	1111101000	0011001100
D. intermedia	1111000011	1111101110	1110010110
D. kapuniana	0101100011	1111100011	1000100010
D. mahitahiana	0101101011	1111100011	0000010000
D. periana	0101000011	1111100011	1000100000
D. shotoveriana	1111002011	1111101000	0011010110
D. spectabilis	1111012011	1111111000	1011010110
D. testacea	0111000111	1111101010	2011010100
D. waihoana	0101111111	1111100111	2000000000

their diameter; pubescence short and dense, directed inward. Antennae long, increase moderately in width apically, antennomeres 2 and 3 subequal in length, antennomeres 4–7 longer than wide, antennomeres 8–10 quadrate.

Pronotum subquadrate, moderately convex, widest in apical third; lateral sides gradually narrow in straight line to obtuse hind angles; before base a wide and relatively deep transverse impression; surface with fine transversely stretched isodiametric mesh microsculpture; puncturation fine and very dense, similar to that on head; pubescence at midline directed posteriorly.

Elytra subquadrate, slightly wider than pronotum; lateral sides straight; at suture distinctly longer than pronotal length at midline; surface with distinct transversely stretched isodiametric mesh microsculpture; puncturation fine and dense.

Abdomen parallel-sided, bases of tergites III–V each with a relatively deep transverse impression, impressions coarsely punctate; tergal puncturation fine and very dense, interstices between punctures smaller than their diameter; surface of tergites with fine transverse microsculpture; pubescence relatively long and dense.

Male. Aedeagus as in Figs 36–37. Female. Spermatheca as in Fig. 38.

Remarks. See under *Dasytricheta kapuniana*.

Etymology. The name refers to the type locality.

Type material. Holotype: ♂, New Zealand, ND: Honeymoon valley, Peria Stream, 60 m, 12.xii.1983, streamside gravel, P.M. Hammond (BMNH). Paratypes: ♂, same data as holotype (BMNH); 2♂, New Zealand, ND: Mangamuka Gorge, 90 m, 12.xii.1983, flood debris, P.M. Hammond (BMNH); ♀, New Zealand, WA: Ruakokoputuna Blue Rock Stream, 16.i.1984, streamside gravel, P.M. Hammond (BMNH).

PHYLOGENY

Character coding

The eleven species of *Dasytricheta* examined were included as terminals in the analysis. Representative species of *Myrmecopora* Saulcy, 1864, *Atheta* Thomson, 1859 and *Ischnopoda* Stephens, 1835 were chosen as outgroups, because of the hypothesized relationship with *Dasytricheta*. In describing character states, I have refrained from formulating any hypothesis about their transformation. In particular, coding is not implying whether a state is derived or ancestral. All characters were considered unordered with forward and backward changes equiprobable.

Characters used in the cladistic analyses are listed below. The character matrix is presented in Table 1.

Head

1. Head width: (0) subquadrate (ratio width : length 1.0–1.15); (1) transverse (ratio width : length 1.20–1.35).
2. Head base: (0) more or less rounded; (1) straight (Figs 1–2)
3. Puncturation: (0) similar to that on pronotum; (1) coarser than that on pronotum.
4. Neck width: (0) absent or very broad, about 3/4 of head width; (1) moderately broad, about 1/2 of head width; (2) narrow, about 1/3 of head width.
5. Eyes in dorsal view: (0) as long as temples; (1) shorter than temples; (2) longer than temples.
6. Antennomere 3: (0) as long as antennomere 2; (1) shorter than antennomere 2.
7. Antennomere 8: (0) as long as wide; (1) wider than long; (2) longer than wide.
8. Antennomere 10: (0) as long as wide; (1) wider than long; (2) longer than wide.
9. Antennomere 11: (0) without pair of coeloconic sensilla; (1) with pair of coeloconic sensilla.

Mouthparts

10. Labium, length of palpomere 2: (0) short, about 1/2 of palpomere 1 length; (1) long, about 3/4 of palpomere 1 length.
11. Labium, width of medial pseudopore field: (0) narrow, width less than width of medial setal pore; (1) very wide, width wider than 2.0 times width of medial setal pore (Fig. 4).
12. Labium, separation of pair of sensory pores before medial setae: (0) narrowly separated, width less than pseudopore; (1) widely separated, width wider than 2 times width of pseudopore (Fig. 4).
13. Mandible, molar tooth on right mandible: (0) small; (1) large.
14. Mandible, dorsal molar region: (0) weakly to moderately serrate; (1) strongly serrate.
15. Galea length to lacinia: (0) galea shorter than lacinia; (1) more or less equal (Fig. 3).

Pronotum

16. Lateral sides: (0) narrowed in straight line to hind angles; (1) narrowed concavely to hind angles.
17. Basal transverse impression: (0) narrow and shallow; (1) wide and deep.
18. Microsculpture: (0) strong microsculpture present; (1) obsolete microsculpture present.

Elytra

19. Length at suture: (0) up to 1.25 times pronotal length at midline; (1) 1.3–1.4 times pronotal length at midline.
20. Shape: (0) quadrate or weakly transverse (ratio width : length 1.0–1.2); (1) longer than wide (ratio width : length 0.9–0.95).

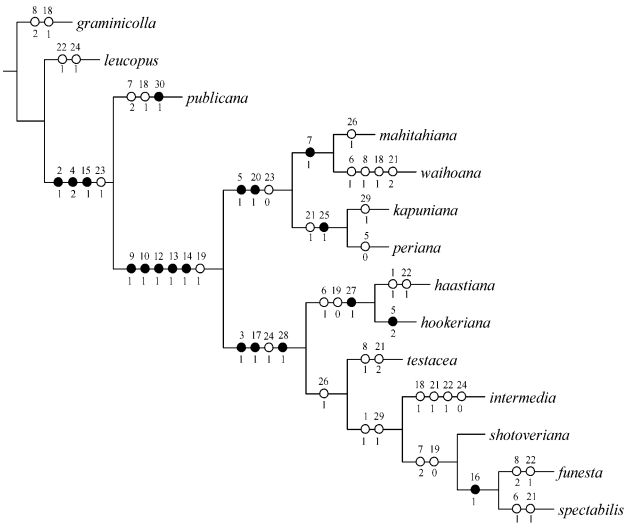


Fig. 41. Single most parsimonious cladogram generated for *Dasytricheta* (length = 59; CI = 0.59; RI = 0.73). Unambiguously placed character changes are mapped on the cladogram. Unique and homoplasious changes are indicated by black and white dots, respectively.

21. Colour: (0) black; (1) reddish-brown; (2) red.

Legs

22. Colour: (0) red; (1) black.

Abdomen

23. Tergal puncturation: (0) minute, scarcely visible; (1) relatively coarse, well visible.
24. Microsculpture: (0) obsolete; (1) distinct.
25. Tergite 10: (0) without sharp tooth on anterior margin; (1) with sharp tooth on anterior margin (Fig. 9).

Aedeagus

26. Median lobe in lateral view: (0) weakly bent on ventral; (1) strongly bent on ventral.
27. Apex of median lobe in lateral view: (0) more or less rounded; (1) hooked posteriorly.
28. Crista apicalis: (0) small; (1) large.
29. Apex of median lobe in ventral view: (0) rounded; (1) split apically.
30. Paramere velum: (0) not divided into a paramerite and condylite lobe; (1) divided into a paramerite and condylite lobe.

Results

Cladistic analysis of this matrix produced single most parsimonious cladogram with a length of 59 steps, consistency index (CI) of 0.59 and retention index (RI) of 0.73 (Fig. 41).

The genus *Dasytricheta* is well characterized, being strongly supported by five synapomorphies (Fig. 41): the antennomere 11 with a pair of coeloconic sensilla (character 9), the labial palpomere 2 long, about 3/4 length of palpomere 1 (character 10), the labial pair of sensory pores before medial setae widely separated, width greater than 2 times width of pores (character 12), the right mandible with large molar tooth (character 13), and the dorsal molar region of right mandible strongly serrate (character 14). The monophyly of *Dasytricheta* is strongly supported by the high bootstrap value (96) and Bremer support of 8 (Fig. 42).

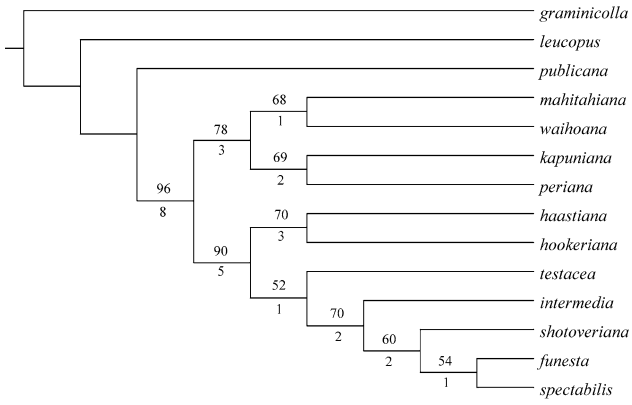


Fig. 42. Single most parsimonious cladogram for *Dasytricheta* with bootstrap values (above branches, given for nodes with 50% or higher bootstrap support) and Bremer support (below branches).

Based on the cladogram in Fig. 41, two groups were recovered in the analysis. The clade that includes *D. spectabilis* through *D. haastiana* is supported by four characters, three of which represent synapomorphies: the head puncturation coarser than that on pronotum (character 3), the pronotal basal transverse impression wide and deep (character 17) and the aedeagus with large crista apicalis. The group is well supported by high bootstrap value (90) and Bremer support (5) (Fig. 42). The second clade includes *D. periana* through *D. mahitahiana*. This group is characterized by three character states, two of which represent synapomorphies: the eyes in dorsal view shorter than temples (character 5) and the elytra longer than wide (character 20). This group is only moderately supported (bootstrap value 78 and Bremer support 3).

Systematic position of *Dasytricheta*

Relationships of *Dasytricheta* are obscure. Bernhauer (1943) placed the genus in the tribe "Myrmedoniini", as an isolated group between subtribes "Athetae" and "Falagriae". He noted that *Dasytricheta* differs from the members of the first subtribe by having a head with narrow neck, and from the second subtribe by the lack of basal transverse impressions on sternites. The tribe name Myrmedoniini was later synonymized with the name Athetini by Seevers (1978). Bernhauer also mentioned that *Dasytricheta* was related to the genus *Gnypeta* Thomson, 1858, emphasising as distinguishing characters the wide and dorso-ventrally flattened body, the narrow neck, the very dense puncturation of the body and the dense, silky pubescence.

The latest mention of the genus *Dasytricheta* was by Klimaszewski et al. (1996) and Thayer & Newton (2005). They classified the genus *Dasytricheta* in the tribe Falagriini. However, members of *Dasytricheta* lack the following synapomorphies of Falagriini: The velum of paramerite and condylite clearly separated into two lobes, the head with a very slender neck, the pronotum narrowed behind middle and sulcate along median line (some

Falagriini) and abdominal sternum IV with external gland in basal region.

The use of traditional characters for higher systematic placement of the species of the genus *Dasytricheta* will not provide an unambiguous assignment. By virtue of the 4-5-5 tarsal formula and the number of maxillary and labial palpal segments, this genus can tentatively be assigned to the tribes Athetini or Tachyusini. However, the median lobe of the aedeagus of the members of *Dasytricheta* lacks a transverse sclerotized stripe called the "athetine bridge", which is regarded as a synapomorphic character of the tribe Athetini (Seevers, 1978). Also, the position of *Dasytricheta* in the tribe Tachyusini is problematic.

In the literatue, the Tachyusini is considered either as a separate tribe (Lohse & Lucht, 1989; Jelínek, 1993; Lucht & Klausnitzer, 1998) or as a subtribe of the tribe Oxypodini (Seevers, 1978; Muona, 1979; Newton & Thayer, 1992; Newton et al., 2000). In this paper, the first point of view is accepted and Tachyusini is considered distinct and recognized as a separate tribe rather than a subtribe of Oxypodini.

The genus *Dasytricheta* shares some similarities with the members of Tachyusini, especially with the genera *Ischnopoda* Stephens, 1835 and *Gnypeta* Thomson, 1858: the dense puncturation of body, the very elongate and slender legs, and the similar build of the maxilla (length of galea subequal in length to lacinia, similar arrangements of teeth and spines on lacinia). Based on these characters as well as the tarsal formula, the shape of the aedeagus and the sclerites of its internal sac, the genus *Dasytricheta* should be placed in the tribe Tachyusini. However, the genus is very unlike other Tachyusini in the structure of the labium (the ligula with pair of long, subapical setae, the median pseudopore field very wide and with numerous pseudopores, and the medial setae widely separated), and the presence of a pair of coeloconic sensilla on antennomere 11.

At present, the systematic position of *Dasytricheta* within Tachyusini is uncertain and should be studied in greater detail. The phylogenetic relationships among members of Tachyusini, including *Dasytricheta*, are currently under investigation by the author.

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