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Revision of the family Cavognathidae (Coleoptera: Cucujoidea)

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Abstract World species of the family Cavognathidae are described, keyed and illustrated. The family contains nine species from Australia (two), New Zealand (four) and South America (three). All species of the family are here classified in *Taphropiestes* Reitter 1875, recognised here as a senior synonym of *Neocercus* Broun 1921 syn. n. (type species, *N. electus* Broun 1921), *Cavognatha* Crowson 1964 syn. n. (type species, *C. pullivora* Crowson 1964) and *Zeonidicola* Crowson 1973 syn. n. (type species, *Z. dumbletoni* Crowson 1973). Four new species are described: *Taphropiestes australis* sp. n. (Australia), *T. magna* sp. n. (Chile, Argentina), *T. plaumanni* sp. n. (Brazil, Argentina, Venezuela) and *T. watti* sp. n. (New Zealand). *Cavognatha pullivora* Crowson 1964, *N. electus* Broun 1921, *Zeonidicola chathamensis* Watt, 1980 and *Z. dumbletoni* Crowson 1973 are here transferred to *Taphropiestes* as *T. pullivora* (Crowson) comb. n., *T. electa* (Broun) comb. n., *T. chathamensis* (Watt) comb. n and *T. dumbletoni* (Crowson) comb. n.

Key words beetles, bird nests, new species.

INTRODUCTION

Cavognatha was described by Crowson (1964) in Cucujoidea (=Clavicornia) without family designation but with an indication that it belonged to an undescribed family. Crowson's description was based on adults and larvae found in nests of the Australian magpie in the Canberra region. The most controversial feature of *Cavognatha* was a mandible with a peculiar internal cavity with an opening on its outer face. Two years latter Sen Gupta and Crowson (1966) formally described Cavognathidae as a subfamily within the newly erected Boganiidae. The subfamily Cavognathinae was established for *Cavognatha* and *Neocercus* Broun 1921, transferred there from Nitidulidae. Sen Gupta and Crowson (1969) raised Cavognathidae to family rank and listed characters relating it to Cryptophagidae and moved the Chilean *Taphropiestes* Reitter 1875 from Cryptophagidae to Cavognathidae. Crowson (1973) presented a revised key to genera of Cavognathidae and described the fourth genus *Zeonidicola* from the nests of the spotted shag in New Zealand. This genus was further diagnosed by Watt (1980), who described a second species from Chatham Islands and the larvae of both species.

Cavognathidae are often regarded as bird parasites based on three species from Australia and New Zealand that have been found in the nests of various, taxonomically unrelated birds (Lawrence 1991). The bird host species include the magpie *Gymnorhina tibicen* (Latham), pipit *Anthus novaseelandiae* (Gmelin), the white winged triller *Lalage sueurii* (Vieillot), the weebill *Smicrornis brevirostris* (Gould), the regent honeyeater *Xanthomyza phrygia* (Shaw), the sooty shearwater *Puffinus griseus* (Gmelin), the spotted shag *Stictocarbo punctatus* (Sparrman), the fairy prion *Pachyptila turtur* (Kuhl), the giant petrel *Macronectes giganteus* (Gmelin), and the northern royal albatross *Diomedea epomophora sanfordi* (Murphy). Both adults and larvae have been found in the nests or sifted from nest debris but the actual nature of the associations with their hosts are not well understood. Crowson (1964) reports adults and larvae of *Taphropiestes pullivora* (Crowson) taken from the nestlings of the magpie and those of *Taphropiestes dumbletoni* (Crowson 1973) from nestlings of the spotted shag. The latter statement was corrected by Watt (1980) as the larvae were found in the nests but not on nestlings. Lyle Courtney's observations (Chisholm 1952, p. 403) in nests in Victoria indicated that larvae of the then unnamed *Taphropiestes* 'did not harm the young birds but confined their attention to scavenging'.

The phylogenetic placement of Cavognathidae within Cucujoidea is not well understood, and Leschen (1996) used this taxon as one of the outgroups to root his phylogenetic analysis of Cryptophagidae. Leschen *et al*. (2005) performed cladistic analyses of all 'basal' cucujoid families based on both larval and adult characters. Based on this study, *Taphropiestes* (=*Cavognatha*) was placed in a clade containing 12 other cucujoid families, and among these *Lamingtonium* Crowson and *Myrabolia* Reitter shared apomorphic characters of adults and larvae combined, whereas adult characters alone placed *Taphropiestes* as sister taxon of *Agapytho* Broun + Phloeostichidae, and larval characters alone placed the genus as the sister taxon of *Protosphindus* Sen Gupta & Crowson (Sphindidae).

In spite of their interesting biology, Cavognathidae remain poorly known beetle family with very few specimens available

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in major entomological collections. To stimulate further interest in this fascinating group we summarised all available biological and geographical data and provided first world species level revision of the family.

MATERIALS AND METHODS

Material used in this study are deposited in the following collections and in the care of the curators listed:
AA, Albert Allen collection, Boise, Idaho (A. Allen);
AM, The Australian Museum, Sydney (C.A.M. Reid);
ANIC, Australian National Insect Collection, Canberra;
BMNH, The Natural History Museum, London (R. Booth);
CAS, California Academy of Sciences, San Francisco, CA (D. Kavanaugh);
EMEC, Essig Museum of Entomology, University of California, Berkeley, CA (E.T. Arias);
FMNH, Field Museum Natural History, Chicago, IL (A. Newton);
MNHN, Muséum National d'Histoire Naturelle, Paris (N. Berti);
MNNC, Museo Nacional de Historia Natural, Santiago, Chile (M. Elgueta);
MIZ, Museum and Institute of Zoology, PAS, Warsaw;
MNNC, Museo Nacional de Historia Natural, Santiago (M. Elgueta);
MV, Museum of Victoria, Melbourne (K. Walker);
NZAC, New Zealand Arthropod Collection, Auckland (R. Leschen);
QDPIM, Queensland Department of Primary Industries, Mareeba (R. Storey);
QM, Queensland Museum, Brisbane (G. Monteith);
RALC, Richard A. Leschen Collection (R. Leschen);
SAM, South Australian Museum, Adelaide (E. Matthews, P. Hudson);
UMV, University of Maracay, Maracay (H. Escalona).

The measurements were made using a micrometer attached to a dissecting microscope as follows: length, from apical margin of clypeus to apex of elytra; (PL) pronotal length, from the middle of anterior margin to margin of basal foramen; (PW) pronotal width at widest part; (EL) elytral length along suture, including scutellum; (EW) elytral width across both elytra at widest part. Entire specimens or their parts were dissected and cleared in 10% solution of KOH and examined and digitally photographed in glycerol. Scanning electron micrographs were taken of coated gold specimens at various CSIRO microscopes.

Male genitalia. We have dissected and photographed male genitalia of multiple specimens of all species within the genus; these were revealed to be very uniform and without stable species-specific character states. In many cases variation in a shape of parameres between specimens of one identified species was greater than between morphologically and geographically highly distant species. Consequently genital characters were not included in the species characteristics discussed here.

PHYLOGENY AND SYSTEMATICS

Since the description of *Cavognatha* by Crowson in 1964, three more monotypic genera from New Zealand and Chile have been added to Cavognathidae, but only *Zeonidicola* was described intentionally as a new genus of this family (Crowson 1973). The remaining two (*Taphropiestes* and *Neocercus*) were originally misplaced and latter found to belong to Cavognathidae (Sen Gupta & Crowson 1966, 1969).

While examining all the species available to Sen Gupta and Crowson and several new taxa, we have found that there were many errors in illustrations and original descriptions leading to multiplication of the recognised genera. The critical character for the family (nature of the internal mandibular cavity) has been misinterpreted following Sen Gupta and Crowson (1966) who described a single cavity in *Cavognatha* and subsequently in *Taphropiestes* and *Zeonidicola*. Two mandibular cavities were used to justify validity of *Neocercus* by Sen Gupta and Crowson (1966). Watt (1980) noticed and corrected an error in this character among *Neocercus* and *Zeonidicola*, and we have confirmed that only two species of *Zeonidicola* have a single mandibular cavity, with the remaining known Cavognathidae having a lower larger and smaller upper cavity (Figs 25,26).

While critically examining the generic key characters (Crowson 1973) for character matrix development we found that most of the characters were recorded erroneously or were not discrete enough to serve as character states in the matrix. After an exhaustive search of potential characters we found that the true differences among the four recognised genera can be reduced to a combination of four discrete characters: (1) frontal pits, absent/present; (2) frontal U-shaped groove, present/absent; (3) additional mandibular cavity, present/absent; and (4) ventral genal projections, present/absent. This is obviously not enough to resolve a phylogenetic relationship of the nine terminal taxa. A parsimony analysis in NONA using exhaustive search (Goloboff 1999) with *Hobartius eucalypti* (Blackburn) (Hobartiidae) as an outgroup recovered a monophyletic Cavognathidae but no stable clades within the ingroup. Based on these findings we consider all available generic names as junior synonyms of *Taphropiestes* Reitter.

Taphropiestes Reitter

Taphropiestes Reitter 1875: 83. Type species, by monotypy, *Taphropiestes fusca* Reitter 1875. – Sen Gupta and Crowson 1969: 576.
Neocercus Broun 1921: 522. Type species, by monotypy, *Neocercus electus* Broun 1921. – Sen Gupta and Crowson 1966: 66; 1969: 576. **Syn. n.**
Cavognatha Crowson 1964: 241. Type species, by original designation, *Cavognatha pullivora* Crowson 1964. **Syn. n.**
Zeonidicola Crowson 1973: 59. Type species, by original designation, *Zeonidicola dumbletoni* Crowson 1973. **Syn. n.**
Diagnosis. The internal mandibular vesicles (cavities) are unique to adults of *Taphropiestes* (Cavognathidae) among all Cucujoidea.

Adult description. Length 2.4–4.6 mm. Body distinctly longer than wide. Upper surfaces clothed with short adpressed, fine hairs.

Head transverse, declined, sometimes abruptly constricted posteriorly. Transverse occipital ridge absent or weak; occiput without stridulatory files. Eyes large and round, prominent, entire, coarsely facetted, without or with scarcely visible interfacetal setae. Antennal insertions partially covered by a weak frontal carina; subantennal groove absent. Frontoclypeal suture absent; pair of lateral pits usually present, sometimes joined by U-shaped groove mimicking frontoclypeal suture (Figs 2,3,21). Genae anteriorly projecting, acute in some species. Antennae 11-segmented with three-segmented club; antennomeres V and VII (especially in males) wider than neighbouring segments. Labrum strongly transverse, its anterior margin subtruncate to slightly convex. Mandible slightly longer than wide, flattened, bidentate; outer edge evenly curved; dorsal surface with neither tubercle nor cavity but with outlets of internal vesicle (cavities) along outer edge; incisor edge with single subapical tooth; prostheca membranous; mola strongly reduced. Maxilla with galea only slightly wider than lacinia, which bears strong hooked uncus; terminal palpomere about twice as long as wide, widest at base, narrowed and narrowly rounded at apex. Mentum transverse; ligula transverse, sclerotised and undivided; apical labial palpomere narrowly rounded at apex. Gular sutures widely separated; pregular region broadly concave with pair of oblique grooves, each bearing deeper and inwardly directed pit just below maxillary articulation (Figs 10,11). Corpotentorium narrow, without median process.

Pronotum transverse; sides moderately curved, not explanate; base slightly narrower than combined elytral bases; lateral carinae at least anteriorly obliterated; anterior and posterior angles obtuse; posterior edge weakly curved, unmargined; disc simple or with few shallow impressions. Prosternum in front of coxae about as long as or slightly longer than shortest diameter of procoxal cavity. Prosternal process complete, weakly expanded apically and extending well beyond posterior margins of coxae, flat, with variably shaped apex. Notosternal suture incomplete anteriorly. Procoxae not projecting below prosternum, with short concealed lateral extensions; trochantins concealed. Procoxal cavities oval, narrowly separated, externally narrowly open, with very narrow lateral extensions; internally open. Scutellum strongly transverse, not abruptly elevated, anteriorly simple, posteriorly angulated. Mesocoxae not projecting, moderately separated, open laterally (partly closed by mesepimera); mesotrochantin slightly exposed. Mesometaventral junction with two small mesoventral knobs.

Elytra about 1.7–1.9 times as long as combined width and 2.5–3.5 times as long as pronotum; sides weakly arcuate, convergent posteriorly, punctation dense, irregular, without scutellary striole; elytral flange well developed at apical 1/4; epipleura narrow, extending to apex. Metaventrite elongate and slightly convex, with incomplete discrimen; postcoxal lines absent; exposed portion of metanepisternum very long and narrow. Metacoxae strongly transverse and narrowly separated. Metendosternite with short stalk, long lateral arms, slender laminae, short anterior process; anterior tendons inserted near midline, narrowly separated. Hind wing rarely absent; if present about twice as long as wide with short apical field; radial cell absent, r4 cross-vein and R-M loop indistinct or absent; medial field with four free veins and no medial fleck; wedge cell absent; anal lobe highly reduced; anal notch present. Legs slender; trochanterofemoral joint strongly oblique with base of femur very close to or touching coxa; single spurs short, located in apical fringe of stout setae; tarsi 5-5-5 in both sexes; in males anterior and mid tarsi with tarsomeres 1–3 expanded and spongy underneath; tarsomeres without ventral lobes; tarsomere 1 longer than 2, penultimate only slightly shorter than antepenultimate; pretarsal claws simple, empodium absent.

Abdomen with five free ventrites. Ventrite 1 not much longer than 2, without postcoxal lines; intercoxal process narrowly triangular. Spiracles well developed on segments I–VII. Anterior edge of sternite VIII in male without median strut. Anterior edge of sternite IX in male with short spiculum gastrale. Aedeagus partly or completely inverted on left side of abdomen, cucujiform, symmetrical; anterior edge of tegmen with short median strut; parameres (Fig. 23) short and narrow, articulated to phallobase and free from one another; penis (Fig. 24) not divided into two sections, its anterior edge with paired struts and no carina, apex angulate or acute; endophallus usually with a sclerite. Female sternite VIII with well-developed spiculum ventrale. Ovipositor moderately long and broad, with paired longitudinal bacula on paraprocts and proctiger; proximal gonocoxite short and broad, with oblique, curved or sinuate transverse baculum; distal gonocoxite moderately elongate, narrowed apically; stylus moderately long and cylindrical, attached subapically; internal tract with small curved, weakly sclerotised spermatheca.

Larval description (Fig. 31). Length 3–7 mm. Body elongate, parallel-sided, slightly flattened. Lightly pigmented, except for head, mandibles, thoracic and abdominal tergites and urogomphi. Vestiture of simple, long, sparsely distributed setae.

Head prognathous, slightly flattened, moderately rounded laterally. Epicranial stem absent; frontal arms separated at base, lyriform, extending to antennal insertions. Endocarinae absent. Stemmata six on each side (reduced in *Taphropiestes chathamensis* Watt). Antennae moderately long; basal antennomere short and broad, second four to five times as long as first, third about one-third as long as second; sensorium minute, conical. Frontoclypeal suture absent. Labrum free. Mandibles symmetrical, broad at base and narrow at apex, bidentate, with additional subapical tooth (very close to apex, which may appear tridentate), without accessory ventral process; mola absent being replaced by two processes, one sclerotised and acute, the other hyaline and setose; prostheca absent. Ventral mouthparts strongly retracted; maxillary articulating area moderately developed, narrowly oval. Cardo transverse, undivided; stipes longer than wide; apex of mala falciform, with several teeth along inner apical margin; palp three-segmented. Labium consisting of prementum, mentum

and submentum; mentum completely free; ligula simple, shorter than labial palps, which are two-segmented and separated by less than width of first palpomere. Hypopharyngeal sclerome absent. Hypostomal rods moderately long and diverging; ventral epicranial ridges absent. Gular sutures separate; gula wider than long, fused to labium. Thoracic and abdominal terga without lateral processes or patches or rows of asperities. Legs well developed, five-segmented; pretarsus acute and claw-like, with two setae lying in line with its axis; coxae separated by 1–2 diameters. Abdomen more than twice as long as thorax. Terga and sterna without patches or rows of asperities. Segment IX excluding appendages as long as segment VIII, with paired of moderately long, fixed and upturned urogomphi. Segment X circular with anal region posteroventrally oriented. Spiracles biforous usually placed at ends of very short spiracular tubes.

Key to the species of *Taphropiestes*

1 Dorsal surface of head with two deep, oval pits or U-shaped arcuate groove between bases of antennae (Figs 2,3,21); each mandible with two internal cavities (large and small) (Fig. 25) …… 3
- Dorsal surface of head without pits or groove (Fig. 4); each mandible with single internal cavity (Fig. 26) …… 2

2 At least pronotum without microsculpture, strongly shiny; male fore tarsi strongly and mid tarsi weakly expanded; antennomeres 5 and 7 longer than wide (Fig. 18); New Zealand ….. *T. dumbletoni* (Crowson)
- Dorsal surfaces dull; pronotum and elytra with distinct microsculpture; male fore and mid tarsi strongly expanded (Fig. 20); antennomeres 5 and 7 transverse or at most as long as wide (Fig. 4); New Zealand …. …… *T. chathamensis* (Watt)

3 Frontal pits connected by arcuate groove (Fig. 2) ….. …… 4
- Frontal pits separate, not connected by a groove (Fig. 3) …… 7

4 Genal projections long, prominent (Fig. 9) …… 5
- Genal projections obsolete (Fig. 10) …… 6

5 Temples large and distinctly prominent (Fig. 21). Pronotum widest near mid length, its maximum width narrower than elytral width at shoulders; terminal antennomere at least 1.5 times longer than wide (Fig. 22); dorsum strongly shiny; pronotum with three round, median depressions and elytra with two, oblique, lateral depressions in about one-third of apical length (Fig. 29); New Zealand …… …… *T. electa* (Broun)
- Temples strongly reduced. Pronotum widest near one-third of basal length, its maximum width broader than elytral width at shoulders (Figs 2,28). Body dull, pronotum and elytra without depressions (Fig. 28); terminal antennomere at most 1.1 times longer than wide; Argentina, Chile …… *T. magna* sp. n.

6 Antenna short and stout with antennomeres 3 and 11 at most as long as wide, club very short and compact (Fig. 17); male fore tarsi scarcely expanded; Australia …… *T. pullivora* (Crowson)
- Antenna longer with antennomeres 3 and 11 elongate, club longer and rather loose (Fig. 13); male fore tarsi distinctly expanded; Brazil …….. *T. plaumanni* sp. n.

7 Genal projections distinct, although comparatively short; terminal antennomere as long as wide (Fig. 12); male fore tarsi scarcely expanded; pronotum with sides parallel; Australia …… *T. australis* sp. n.
- Genal projections indistinct; terminal antennomere at least 1.5 times longer than wide; male fore tarsi distinctly expanded; pronotum slightly widening towards one-third of its basal length …… 8

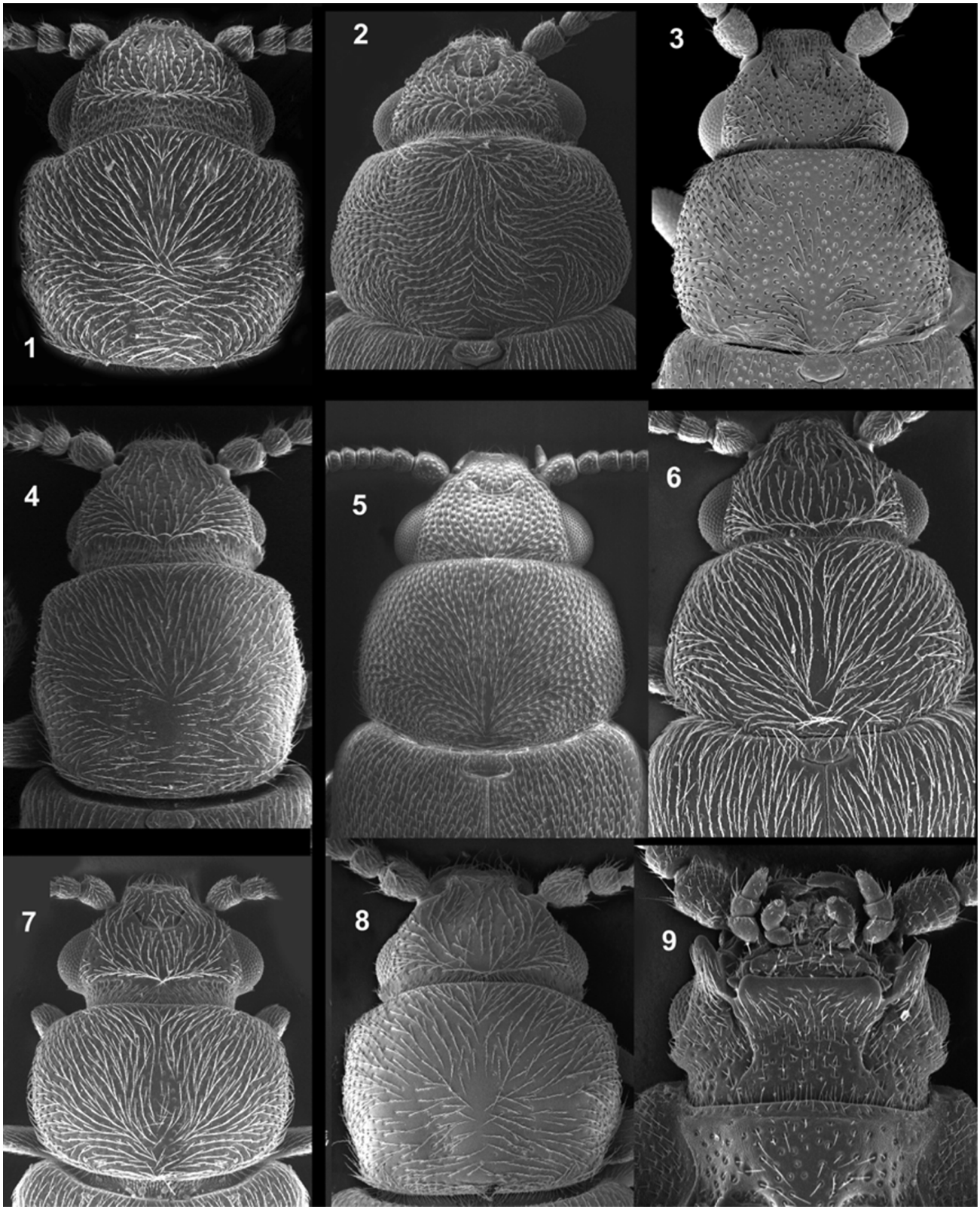
8 Antennomeres 9 and 10 large, subquadrate and of equal size, as wide as terminal one (Fig. 19); body covered with long, dense hairs; prosternal process somewhat angulate at apex; Chile …. *T. fusca* Reitter
- Antennomeres 9 and 10 strongly transverse, 9 narrower than 10, which is as wide as terminal one (Fig. 15); body not as densely pubescent (Fig. 32); prosternal process broadly rounded at apex; New Zealand …… *T. watti* sp. n.

Taphropiestes australis sp. n. (Figs 1,12,30)

Types. Holotype male. ***South Australia***, 31.20S 138.35E, Brachina Creek, 8.xi.1987, J.C. Cardale, at light (ANIC). Paratypes. ***Western Australia***: 21.35S 117.04E, Millstream, nr. Mouth of Dawson's Ck., 7.xi.70, at light, E.B. Britton (1: ANIC); Millstream, Fortescue R. S of Roebourne, 12.xi.1978, M.S. & B.J. Moulds (1: AA); 13 mi E by S of Karonie, 9.xi.1969, M.S. Upton (1: ANIC). ***Northern Territory***, 23.46S 133.46E Roe Creek, 12 km SW by W of Alice Springs, 27.ix.1978, M.S. Upton (1: ANIC); 6.4 km SSW of Victoria Riv. Downs, 14–17.vii.1973, L.P. Kelsey (1: ANIC); Larrimah, 8.ix.1982, R. Storey, at light (1: QPIM); ***South Australia***: Mt. Serle, N. Flinders Ra., Hale & Tindale (1: SAM); ***Victoria***: Myrtleford, *Eucalyptus* spp., MV-traps, 23.i.1973, A. Neboiss (1: NMV); ***New South Wales***: CSIRO Lab Chiswick nr Armidale, II.1966, B. Clydesdale (1: ANIC); ***Queensland***: 27.36S 153.13E, Mt. Cotton, Scott's Dam, 19.xii.1997–7.v.1998, 120 m, rainforest pitfall, G. Monteith (1: QMB); n Qld, 15 km WNW of South Johnstone, light trap, 22.x.1985, Fay & Halfpapp (1: QDPIM).

Diagnosis. This is the second species of *Taphropiestes* known from Australia. It differs from *T. pullivora* by much more narrower body, the frontal pits separate, much longer and slender antennae and distinctly acute genal projections.

Description. Length 2.4–2.8 mm; PL/PW = 0.7–0.8; EL/EW = 1.6–1.8; EL/PL = 2.5–2.8. Body (Fig. 30) brown to dark brown, appendages light brown. Dorsum slightly convex and uniformly covered by golden, moderately dense, adpressed pubescence; all setae about the same length or 0.7 times as long as the width of scutellum; dorsal surfaces feebly shiny with microsculpture clearly visible on pronotum and



Figs 1–9. (**1–8**) *Taphropiestes* spp., head and pronotum: (**1**) *T. australis* sp. nov.; (**2**) *T. magna* sp. nov.; (**3**) *T. watti* sp. nov.; (**4**) *T. chathamensis* (Watt); (**5**) *T. pulivora* (Crowson); (**6**) *T. fusca* Reitter; (**7**) *T. plaumanni* sp. nov.; (**8**) *T. dumbentoni* (Crowson). (**9**) *Taphropiestes dumbletoni* (Crowson), head and prothorax, ventral.

often on elytra at 100× magnification. Head weakly constricted posteriorly with large eyes and no distinct temples; frontal area with separate pits; posterior transverse sulcus weak. Genal projections short and acute. Antennomere III 1.4 times longer than broad; IX 1.7 times broader than long, XI 1.2 times longer than broad (Fig. 12). Pronotum widest at middle (Fig. 1), more strongly narrowing posteriorly than anteriorly, distinctly narrower than elytral shoulders; lateral marginal carina weak and visible in basal half only; dorsum with very narrow median impunctate area, otherwise with punctures as large as those on vertex. Prosternal process widened posteriorly, about 1.5 times longer than coxal length and almost as broad as coxal cavity width. Scutellum transverse and densely punctate. Elytral humeral angles not prominent forward; surfaces densely punctate, punctures about as large as those on pronotal disc. In male, tarsomeres 1–3 of the anterior tarsi weakly expanded, tarsomeres of the mid tarsi not expanded.

Etymology. The name of this species is formed from the Latin adjective *australis* meaning southern, referring to austral distribution of the species.

Distribution. Australia.

Taphropiestes chathamensis (Watt) comb. n.
(Figs 4,14,20,26)

Zeonidicola chathamensis Watt 1980: 336.

Types. New Zealand: Paratype, female '*Zeonidicola chathamensis* Watt, 1979/Chatham Is., NZ, South East I, 22.i.75, E. Young/litter from *Puffinus griseus*, 75/32' (NZAC).

Other material examined. New Zealand, Chatham Islands: South East I, 6.i.1984, C. Miskelly, ex nest of *Pachyptila vittata* (8: NZAC); same but 13–16.xii.1987, A. Grant (DOC) (9: ANIC, MIZ); same but 11.i.1984, *Pterodoma axillaris* (linings of two burrows) (17: NZAC); same but 13.i.1984, Snipe nest under *Pteridium* (12: NZAC, MIZ); same but 29.xi.1983, 16.i.1984 and 28.xii.1985, *Coenocorypha* a. *pusilla* nest under *Carex* (12: ANIC, NZAC); 6.i.19084, *Coenocorypha* a. *pusilla* nest under *Carex* (1: NZAC); Rangatira I, 29.xi.1992, S.M. Phillipson, litter ex petrel burrows, LCNZ 92/10 (3: AA).

Diagnosis. This species is endemic to the Chatham Islands and is the only wingless species of the genus. It is similar to *T. dumbletoni* in lacking the frontal pits and possessing relatively convex and sparsely setose body. *Taphropiestes chatchamensis* is distinguished from *T. dumbletoni* by its strongly reticulate, dull dorsum and distinctly expanded mid tarsi in the male.

Description. Length 2.6–3.2 mm; PL/PW = 0.8–0.9; EL/EW = 1.7–1.8; EL/PL = 2.4–2.6. Apterous. Body dark brown to black with appendages light or dark brown. Dorsum convex and uniformly covered by golden, adpressed pubescence; dorsal setae distinctly longer and apparently denser along lateral parts of elytra as compared with those on disc, length of the shorter setae about 0.5 width of scutellum; surfaces almost matt to feebly shiny with microsculpture clearly visible onpronotum and often on elytra at 100× magnification. Head weakly constricted posteriorly with relatively small eyes and temples 0.5 times as long as eye length; frontal area without pits; posterior transverse sulcus weakly defined. Genal projections very long and acute. Antenna almost as long as head and pronotum; antennomere III subquadrate to weakly transverse; IX 1.4 times broader than long, XI 1.2–1.3 times longer than broad (Fig. 14). Pronotum widest at weak angulation just behind middle, more strongly narrowing posteriorly than anteriorly (Fig. 4); at base narrower than elytral shoulders; lateral marginal carina incomplete anteriorly, mostly well visible; dorsum often with median impunctate area, otherwise with punctures slightly smaller than those on vertex. Prosternal process widened posteriorly, about two times longer than coxal length and almost two times as broad as coxal cavity width. Scutellum transverse and densely punctate. Elytral humeral angles strongly prominent forward; surfaces densely punctate, punctures about as large as those on pronotal disc. Anterior (Fig. 20) and mid tarsi in male with strongly expanded segments 1–3.

Taphropiestes dumbletoni (Crowson) comb. n.
(Figs 8,9,18)

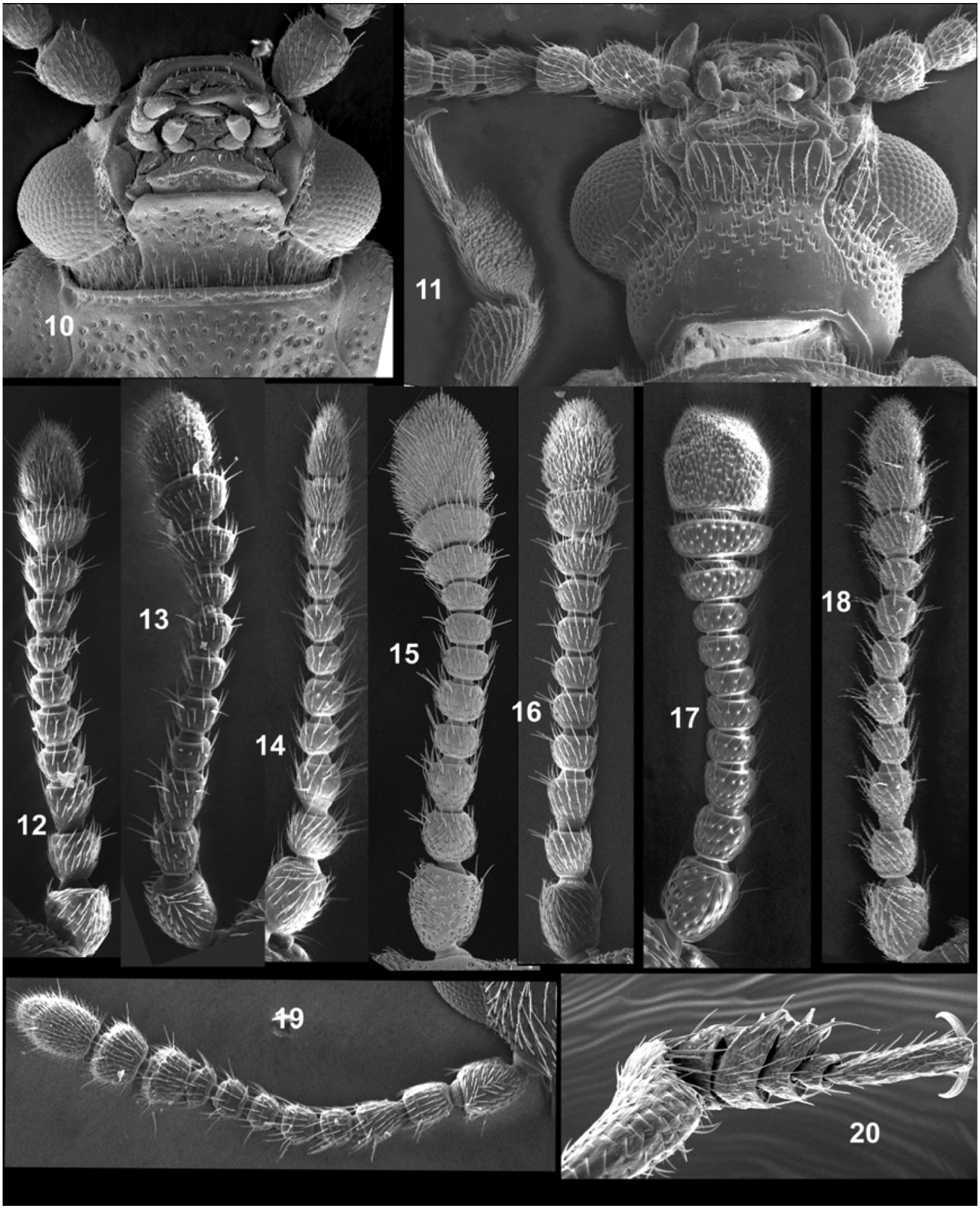
Zeonidicola dumbletoni Crowson 1973: 59. Watt 1980: 336.

Types. New Zealand: '*Zeonidicola dumbletoni* Crowson 1973/Birdlings Flat, 29.XI, L.T. Dumbleton/*Stictocarbo punctatus* nests' (10 Paratypes, NZAC).

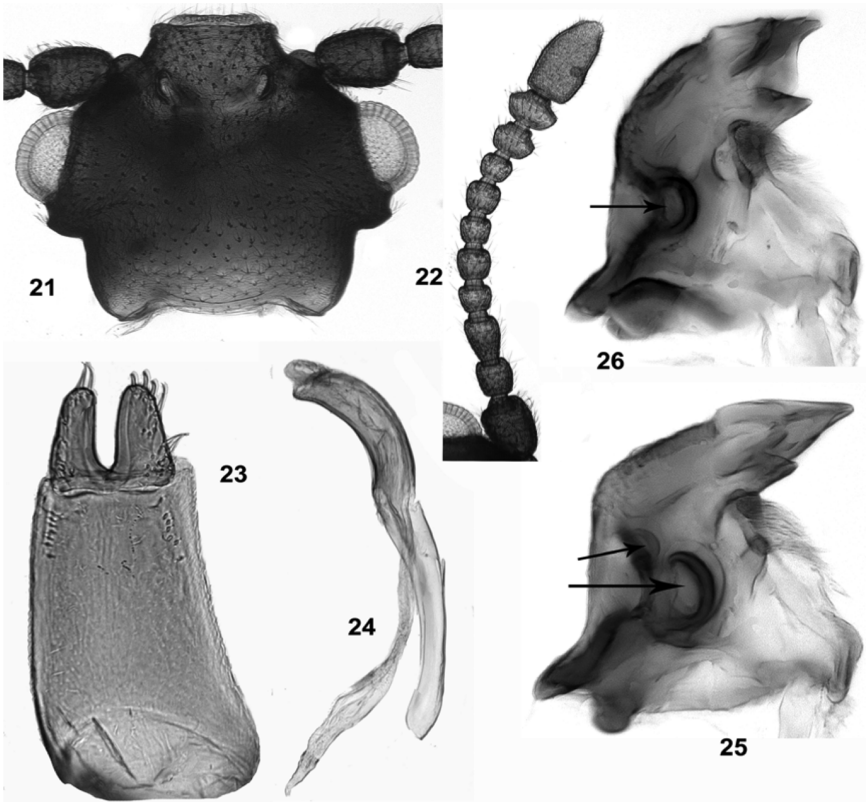
Other specimens examined. New Zealand, MC, Birdlings Flat, 24.xi.1957, L.T. Doumbleton, ex. Pied shag nests (1: NZAC); Tumbleton Bay, 10.xi.1967, T.R.Tac Kson, LL/20, *Eudyptula albosignata* nest (1: NZAC); NN, Hope – Kiwi V., A. Cox, from nest *Cyanoramphus auriceps* (1: NZAC); DN, Stony Creek, 2 km S. Shag Pt. 24.xii.1982, C. Lalas '*Stictocarbo punctatus* nests' (7: NZAC); Neyward Pt. 5.xi.82, C. Lalas, from pallet in nest of *Stictocarbo punctatus* (1: NZAC); I. Otago Pen. 11.x.81, C. Lalas, ex fresh pellet *Leucocarbo chalconotus* (1: NZAC).

Diagnosis. Both *T. dumbletoni* and *T. chatchamensis* differ from remaining species of the genus by lack of the frontal pits and relatively convex and sparsely setose body. *Taphropiestes dumbletoni* is distinguished from *T. chatchamensis* by its shiny dorsum without distinct reticulation and the mid tarsi in male only weakly expanded.

Description. Length 2.8–3.3 mm; PL/PW = 0.8; EL/EW = 1.8–1.9; EL/PL = 3.0–3.1. Body dark brown to black with appendages dark brown. Dorsum convex and sparsely covered by golden, adpressed pubescence; the setae longer and apparently denser along lateral parts of elytra as compared with those on disc, length of the longer setae about 0.5–0.7 width of scutellum; surfaces shiny with fine microsculpture visible on sides of pronotum and often on elytra at 100× magnification. Head weakly constricted posteriorly with moderately sized eyes and temples 0.3 times as long as eye length; frontal area without pits; posterior transverse sulcus weakly defined. Genal projections very long and acute (Fig. 9). Antenna almost as long as head and pronotum; antennomere III 1.3 times longer than broad; IX 1.6 times broader than long, XI 1.2 times longer than broad (Fig. 18). Pronotum widest at weak angulation just behind middle (Fig. 8), more strongly narrowing posteriorly



Figs 10–20. (**10**) *Taphropiestes watti* sp. nov., head ventral. (**11**) *Taphropiestes fusca* Reitter, male, head and protarsus ventral. (**12–19**) *Taphropiestes* spp., antenna: (**12**) *T. australis* sp. nov.; (**13**) *T. plaumanni* sp. nov.; (**14**) *T. chathamensis* (Watt); (**15**) *T. watti* sp. nov.; (**16**) *T. magna* sp. nov.; (**17**) *T. pulivora* (Crowson); (**18**) *T. dumbentoni* (Crowson); (**19**) *T. fusca* Reitter. (**20**) *Taphropiestes chathamensis* (Watt), protarsus of male.



Figs 21–26. (**21–25**) *Taphropiestes electa* (Broun): (**21**) head dorsal; (**22**) antenna; (**23**) tegmen, inner; (**24**) aedeagus dorsal; (**25**) mandible showing two vesicles. (**26**) *Taphropiestes chathamensis* (Watt), mandible showing single vesicle.

than anteriorly; lateral marginal carina well visible near posterior angles only; dorsum often with large median impunctate area and weak admedian impressions near base, otherwise with punctures slightly smaller than those on vertex. Prosternal process widened posteriorly, about 1.5 times longer than coxal length and 1.2 times as broad as coxal cavity width. Scutellum transverse and densely punctate. Elytral humeral angles not prominent forward; surfaces densely punctate, punctures about as large as those on pronotal disc. Anterior tarsi in male with strongly expanded segments 1–3, those of mid tarsi weakly expanded.

Distribution. New Zealand.

Tapropiestes electa (Broun) comb. n.
(Figs 21–25,29)

Neocercus electus Broun 1921: 523. – Sen Gupta and Crowson 1966: 66; Watt 1980: 335.

Types. New Zealand: Mt Algidus, 14.x.1913, T. Hall (BMNH, syntype).

Other specimens examined. ***New Zealand***, Canaan, W. Nelson, 17–26.i.48, A.E. Brookes collection (1: NZAC; 1: ANIC, completely dissected); Lake Rotoiti, 13.i.1916, T. Broun (1, NZAC).

Diagnosis. This is the most distinctive species in this genus with its pronotum bearing three foveae and each elytron two oblique impressions and one longitudinal impression.

Description. Length 3.2–3.4 mm; PL/PW = 0.8; EL/EW = 1.8–1.9; EL/PL = 2.9–3.0. Body (Fig. 29) brown with antero-median part of elytra yellowish brown, appendages brown. Dorsum weakly convex and covered by yellowish, moderately dense, adpressed pubescence, forming pattern along impressed parts of elytra; all setae about the same length or 0.7–0.8 times as long as the width of scutellum; dorsal surfaces strongly shiny with fine microsculpture visible on elytra only. Head constricted posteriorly with moderately large eyes and short, acute temples (Fig. 21); frontal area with U-shaped groove; posterior transverse sulcus weak. Genal projections well visible and acute. Antennomere III 1.3 times longer than broad; IX 1.6 times broader than long, XI 1.8–2.0 times longer than broad (Fig. 22). Pronotum widest at middle, more strongly narrowing anteriorly than posteriorly; lateral marginal carina weak and visible near posterior angles only; dorsum with three impressions, single antero-median and two admedian but well separated from posterior margin; punctures in impressed areas dense, otherwise sparse and as large as those on vertex. Prosternalprocess widened posteriorly, apically truncated, about 1.4 times longer than coxal length and 1.3 times as broad as coxal cavity width. Scutellum transverse and sparsely punctate. Elytral humeral angles not prominent forward; surfaces with oblique lateral impressions, one weakler shortly behind humeri and another much more pronounced one about posterior third; apical part weakly longitudinally impressed along suture; surfaces densely punctate, punctures about as large as those on pronotal disc. In male, tarsomeres 1–3 of the anterior tarsi strongly expanded, 1–3 of the mid tarsi weakly expanded.

Distribution. New Zealand.

Taphropiestes fusca Reitter (Figs 6,11,19)

Taphropiestes fusca Reitter 1875: 84. Sen Gupta and Crowson 1969: 576.

Types. 'Chili, *Taphropiestes fusca*, det. A. Grouvelle, "*Paramecosoma*? familia mihi" (2: MNHN, probably syntypes received by Grouvelle from Reitter)'.

Other specimens examined. ***Chile***, ***Malleco Pr.***: 14 km E Malalcahuello, 1570 m, site 649, 13–31.xii.1982, *Nothofagus pumilio*, *Araucaria* forest, A. Newton, M. Thayer; light intercept window/trough trap (2: ANIC). ***Osorno Prov.***: Parque Nac. Puyehue Antillanca Road. 965 m, site 658, 18–25.xii.1982, *N. pumilio* for., A. Newton, M. Thayer; light intercept window/trough trap (1: ANIC); Pucatrihue, I.85, L. Pena (1, AA). ***Nuble Prov.*** Las Trancas, 19.5 km ESE Recinto, 1250 m, site 647; 10.xii.82–1.iii.83, *Nothofagus* for., Newton & Thayer (1: ANIC). ***Curicó Prov.***, 15 km. E. Potrero Grande, Camino, El Relvo, 24.v.2004, leg. J.E. Barriga, fogging, a/*Nothofagus alpina*, *N. obliqua*, *Laurelia*, 1000 m, 36°12.4S 70°57.8W (59: ANIC, BMNH, MIZ); 15 km. E. Potrero Grande, Puente Morongoa, 25.xi.2003, fogging, a/*Nothofagus dombeyi*, 36°12′58.1″S 70°58′37.4″W, J.E. Barriga (3: ANIC); 20 km. E. Potrero Grande, El Relvo, 23.xi.2003, fogging a/flor *Laurelia sempervirens*, 36°11′8.2″S 70°56′6″W, leg. J.E. Barriga (9: ANIC); same but 21.xii.2003, a/*N. dombeyi*, 36°11′1″S 70°56.1′W (1: ANIC); same but 16.i.2004, a/*N. dombeyi*, *Cucumis hystrix*, *Chusquea culecu*, *retamo*, 36°11.1′S 70°56.2′W (1: ANIC); same but a/*Cullaia saponaria*, 36°11′8.2″S 70°56′6″W; 20 km. E. Potrero Grande, El Relvo, 24.i–6.ii.2004, leg. J.E. Barriga, 1100 m, 36°11.14S 70°56.1W (5: ANIC); 15 km. E. Potrero Grande, 8.xi.2003, leg. J.E. Barriga (7: ANIC). ***Talca Pr.***: Altos del Lircay, Sendero Laguna del Alto, 1360 m, 35°37.04S, 71°03.62W; 3–26.xii.2002, *Nothofagus* spp. forest, open shrub understory, light intercept, trap, Thayer, Newton, Solodovnikov, 1053 (1: FMNH); Alto Vilches, Cordillera Talca, I.1992 (1: AM). ***Valparaíso***: San Antonio, Las Cruces, 18.xi.2000 (3: AA). ***Argentina***, Largo Puelo, Chubut, 27.xii.1963, A. Kovacs (1: ANIC).

Diagnosis. This species is easily recognised from the remaining two Neotropical *Taphropiestes* by the obsolete genal projections (Fig. 11), the frontal pits not connected by an arcuate groove, and the dorsum relatively shiny and densely setose.

Description. Length 2.7–3.1 mm; PL/PW = 0.6–0.7; EL/EW = 1.8–1.9; EL/PL = 3.5–3.8. Body brown with head and pronotum usually darker than elytra often brownish black, appendages light or dark brown. Dorsum weakly convex and uniformly covered by yellowish or golden, dense and adpressed pubescence; all setae about the same length or as long as the width of scutellum; dorsal surfaces moderately shiny with microsculpture clearly visible on pronotum and often on elytra at 100× magnification. Head constricted posteriorly with large eyes and no distinct temples; frontal area with separate pits; posterior transverse sulcus weakly defined. Genal projections very short and indistinct. Antennomere III 1.4 times longer than broad; IX 1.4 times broader than long, XI 1.8–1.9 times longer than broad (Fig. 19). Pronotum widest at basal third (Fig. 6), more strongly narrowing anteriorly than posteriorly; distinctly narrower than elytral shoulders; lateral marginal carina incomplete anteriorly, mostly well visible; dorsum often with median impunctate area and two weak admedian impressions near base, otherwise with punctures slightly smaller than those on vertex. Prosternal process widened posteriorly, about two times longer than coxal length and almost as broad as coxal cavity width. Scutellum transverse and densely punctate. Elytral humeral angles not prominent forward; surfaces densely punctate, punctures about as large as those on pronotal disc. Anterior tarsi in male with strongly expanded segments 1–3, those of mid tarsi not clearly expanded.

Distribution. Chile and Argentina.

Taphropiestes magna sp. n. (Figs 2,16,28)

Types. Holotype male. ***Chile.*** Nuble prov., Las Trancas, 19.5 km ESE Recinto, 1250 m, Site 647; 10.xii.1982–1.iii.1983, *Nothofagus* forest, Newton & Thayer (MNNC). **Paratypes**: ***Chile***, prov. Curicó, 20 km. E. Potrero Grande, El Relvo, 8.v.2004, leg. J.E. Barriga, fogging, a/*N. dombeyi*, 1100 m, 36°11.14′S 70°56.1′W; (1: ANIC); same but 3.ii.2004; 36°10.8S 70°56.7W and 36°11.13S, 70°56.1W; (2: ANIC); same but 16.i.2004, *Laurelia*, *C. hystrix*, *P. saglina*, 1100 m, 36°11.14S, 70°56.1W; (2: ANIC, MIZ); Prov. Valvidia, Valvidia, 3.ii.1985, E. Krahmer (6: MNNC; MIZ); Sto. Domingo, Valvidia, 12.iii.1978 and 15.ii.1981, E. Krahmer (2: ANIC); Panguipulli, 26.x.1985, E. Krahmer (2: BMNH); Punta Curinanco, 177 m, 39°42.79′S 73°24.32′W, fogging *Aexoticon punctatum*, 24.i.2003, Arias *et al.*, UC Berkeley (1: EMEC). ***Argentina***, prov. Chubut, Mallin camino La Ratona, xi.1969, leg R. Mauri; (4: ANIC); San Martin, de los Andes, 3.i.94 (1: AA). Rio Negro Prov., Lago Mascardi, 1 km N. Villa Mascardi, 18.xi.66, 850 m, M.E. Irwin, E. Schlinger (1: CAS).

Diagnosis. This is largest known species of the genus; it can be separated easily from all of its congeners by having completely dull dorsal surfaces combined with a relatively transverse pronotum that is as broad (female) or broader (male) than the elytra.

Description. Length 3.4–4.6 mm; PL/PW = 0.6–0.7; EL/EW = 1.8–1.9; EL/PL = 3.3–3.5. Body (Fig. 28) uniformly brown, appendages light or dark brown. Dorsum relatively flattened or weakly convex and uniformly covered by golden, relatively dense, adpressed pubescence; all setae about same length or as long as 0.7 times width of scutellum; dorsal surfaces dull with head feebly shiny, microsculpture clearly visible on pronotum and elytra at 60× magnification. Head constricted posteriorly with large eyesand no distinct temples; frontal area with U-shaped groove; posterior transverse sulcus weakly defined. Genal projections short and acute. Antennomere III1.5 times longer than broad; IX 1.7 times broader than long, XI 1.3 times longer than broad (Fig. 16). Pronotum widest at basal third, more strongly narrowed anteriorly than

posteriorly; especially in males (Figs 2,28), distinctly broader than elytral shoulders; lateral marginal carina indistinct; dorsum often with very narrow median impunctate area and two weak admedian impressions near base, otherwise with punctures 0.5 times as large as those on vertex. Prosternal process slightly widened posteriorly, about two times longer than coxal length and almost as broad as coxal cavity width. Scutellum transverse, transversely grooved and setose. Elytral humeral angles not prominent forward; surfaces densely punctate, punctures about as large as those on pronotal disc. Anterior tarsi in male with strongly expanded segments 1–3, those of mid tarsi weakly expanded.

Etymology. The name of this species is formed from the Latin adjective *magnus* meaning large, referring to the relatively large body of this species.

Distribution. Chile and Argentina.

Taphropiestes plaumanni sp. n. (Figs 7,13)

Types. Holotype male, ***Brazil***: Sta. Catharina, Nova Teutonia, 3–8.xi.1935, leg. F. Plaumann (FMNH). Paratypes: same data as the holotype (1: FMNH; 2: RALC); same but x.1934 (1: ANIC); same but 3.vii.1937 (1: FMNH); same but x.1977 (1: CAS); same but xi.1934, in wilted leaf *Caporeira* (1: FMNH); Nova Teutonia, 300–500 m, 27°11′ B, 52°23′ L, Fritz Plaumann, x.1972, xi.1973 (1: MIZ; 1: ANIC). ***Argentina***: La Plata, CNHM 1955, Karl Brancsik colln., ex Eduard Knirsch (1: FMNH); Prov. Buenos Aires, Tigre, I.1981. M. Vianna (1: ANIC). ***Venezuela***: Aragua, Rancho Grande, 1500 m, 26.ii.1987, 10°21′N, 67°41′O, trampa de interceptaecion, C. Bordon (1: UMV)

Diagnosis. *Taphropiestes plaumanni* most closely resembles *T. australica*, especially in body shape, colouration and dorsal vestiture but the frontal pits are distinctly connected by a frontal groove in *T. plaumanni*.

Description. Length 2.5–3.1 mm; PL/PW = 0.6–0.8; EL/EW = 1.8–2.0; EL/PL = 2.9–3.3. Body brown, appendages light brown. Dorsum weakly convex and uniformly covered by golden, relatively dense, adpressed pubescence; all setae about the same length or 0.5 times as long as the width of scutellum; dorsal surfaces moderately shiny with microsculpture clearly visible on pronotum and often on elytra at 100 times magnification. Head constricted posteriorly with large eyes and no distinct temples; frontal area with pits joined by U-shaped groove; posterior transverse sulcus well defined. Genal projections very short and acute. Antennomere III 1.4 times longer than broad; IX 1.3–1.4 times broader than long, XI 1.4 times longer than broad (Fig. 13). Pronotum widest at middle (Fig. 7), more strongly narrowing posteriorly than anteriorly; distinctly narrower than elytral shoulders; lateral marginal carina obsolete; dorsum often with median impunctate area, otherwise with punctures slightly smaller than those on vertex. Prosternal process widened posteriorly, about 1.2 times longer than coxal length and almost as broad as coxal cavity width. Scutellum transverse and densely punctate. Elytral humeral angles not prominent forward; surfaces densely punctate, punctures about as large as those on pronotal disc. In male, tarsomeres 1–3 of the anterior tarsi strongly, of the mid tarsi weakly expanded.

Etymology. This species is named for the late Fritz Plaumann, a famous Brazilian/German entomologist and collector who collected most of the type series of this interesting beetle.

Distribution. Venezuela, Brazil and Argentina.

Taphropiestes pullivora (Crowson) comb. n. (Figs 5,17,27)

Cavognatha pullivera Crowson 1964: 245 (original misspelling). – Watt 1980: 332.

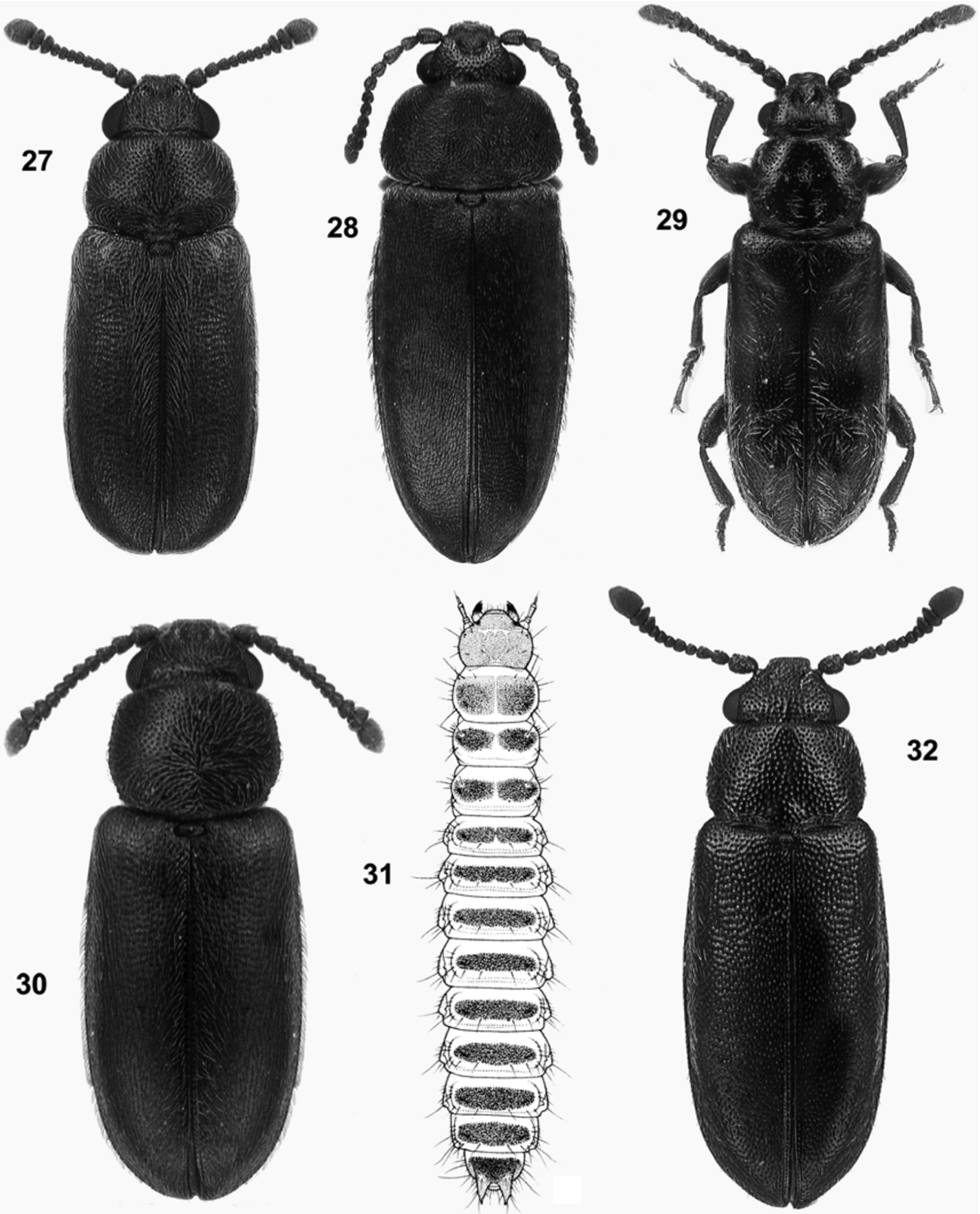
Cavognatha pullivora Crowson 1964, pp. 241–244. – Sen Gupta & Crowson 1966: 66; Crowson 1973: 59.

Types. ***Australia***, ACT, Gungahlin, 13.xi.1959, W.J.M. Vestjens (ANIC, holotype female and 20 paratypes).

Other material examined. ***Queensland***: Mossman Bluff Track, 5–10 km W. Mossman, 1–17.i.1989, 1180 m, flight intercept, Monteith & Thompson (1: QM); Tully R. Xing, 10 km S Koombooloomba Dam, 8.xii.1989–4.i.1990, intercept trap. Monteith, Thompson and Janetzki (1: QMB). Mt. Lewis Road via Julatten, 1000 m, 10.x.–11.xi.1987, intercept trap, A. Walford-Huggis (1: ANIC). Mt Spec, 875 m, 10.i.–8.ii.1995, FI traps, M. Cermak (1: ANIC). Mt Misery summit, 850 m, 6.xii.1990–17.i.1991, flight intercept, Qld Mus & ANZSES (1, RALC). ***New South Wales***: v.1950, KA Hindwood, from nest of weebill (25, BMNH). ***Victoria***: in finch's nest, v.1950, K.A. Hindwood (ANIC); Maryborough, 23.iii.1950, nest of weebill, M.I. Courtenay (1: ANIC). Ben Cairn, NE Slope NW Warburton, 960 m, 30.i.–11.ii.1987, flight intercept trap, A. Newton and M. Thayer (1: ANIC)

Diagnosis. This very distinctive Australian species is characterised by relatively short and compact antenna, frontal pits connected by a groove and lack of genal projections.

Description. Length 2.5–3.3 mm; PL/PW = 0.6–0.7; EL/EW = 1.6–1.7; EL/PL = 3.0–3.3. Body (Fig. 27) brown, appendages light brown. Dorsum rather depressed and uniformly covered by golden, relatively dense, adpressed pubescence; all setae about the same length or 0.8 times as long as the width of scutellum; dorsal surfaces dull with dense microsculpture clearly visible on pronotum and elytra at 80× magnification. Head weakly constricted posteriorly with large eyes and no distinct temples; frontal area with U-shaped groove; posterior transverse sulcus weakly defined. Genal projections very short and indistinct. Antenna distinctly shorter than combined length of head and pronotum; antennomere III as long as broad; IX 2.4 times broader than long, XI 0.8–0.9 times longer than broad (Fig. 17). Pronotum (Fig. 5) widest at basal third, more strongly narrowing anteriorly than posteriorly; lateral marginal carina indistinct; dorsum flattened and with dense punctures slightly smaller than those on vertex. Prosternal process widened posteriorly, about two times longer than coxal length and almost as broad as coxal cavity width. Scutellum transverse and punctate and setose. Elytral humeral angles not prominent forward; surfaces densely punctate, punctures about as large as those on pronotal disc. Anterior tarsi in male



Figs 27–32. (**27**) *Taphropiestes pulivora* (Crowson); (**28**) *T. magna* sp. nov., male; (**29**) *T. electa* (Broun); (**30**) *T. australis* sp. nov.; (**31**) *T. dumbentoni* (Crowson), mature larva, by D. Helmore from Watt (1980); (**32**) *T. watti* sp. nov.

with strongly expanded segments 1–3, those of mid tarsi not clearly expanded.

Note. In the Crowson's (1964) paper containing description of the genus *Cavognatha* there are two spellings of the type species: *C. pullivora* appears in an abstract and through the entire text except for the heading of the new species description, where it reads *C. pullivera.* We use here *C. pullivora*, as this name was subsequently used by the author (Crowson 1973) and treat *C. pullivera* is a lapsus according to Code (Arts 32.2.1, 32.5). This spelling is also consistent with the intended meaning of the species name – *pullivora* – meaning eating bird chicks.

Distribution. Widely distributed in Australia.

Taphropiestes watti sp. n. (Figs 3,10,15,32)

Types. Holotype male. ***New Zealand***, ND, Hen and Chicken Is, Hen I, 13.xii.1978; C.R. Veitch (WL) nest of *Prosthemadera novaeseelandiae*, 78/286 (NZAC). **Paratypes.** Same data as holotype (3: ANIC; 3: MIZ; 15: NZAC). KA, Kowhai Bush, 13.i.1972, D. Flack, ex nest of *Petroica australis australis* (6: NZAC); same and Kaikoura, 12.i.1972 (2: NZAC);

Diagnosis. This species can easily be distinguished from remaining New Zealand *Taphropiestes* by the black and flattened body, small and not connected frontal pits and lack of the genal projections.

Description. Length 2.7–3.3 mm; PL/PW = 0.6–0.7; EL/EW = 1.7–1.9; EL/PL = 3.3–3.6. Body (Fig. 32) black or dark brown, appendages light brown. Dorsum only weakly convex and bearing sparse, adpressed pubescence on head, pronotum and lateral parts of elytra; all setae about the same length or 0.5 times as long as the width of scutellum; dorsal surfaces feebly shiny with dense microsculpture clearly visible on pronotum and on elytra at 100× magnification. Head weakly constricted posteriorly with large eyes and no distinct temples; frontal area with two separate pits (Fig. 3); posterior transverse sulcus weak. Genal projections short and indistinct (Fig. 10). Antennomere III 1.2 times longer than broad; IX 1.7 times broader than long, XI 1.9 times longer than broad. Pronotum widest at middle, more strongly narrowing posteriorly than anteriorly, distinctly narrower than elytral shoulders; lateral marginal carina not easily visible; dorsum with very narrow median impunctate area and weak admedian impressions at base, otherwise with punctures slightly smaller than those on vertex. Prosternal process widened posteriorly, about 1.8 times longer than coxal length and almost as broad as coxal cavity width. Scutellum transverse and punctate. Elytral humeral angles not prominent forward; surfaces densely punctate, punctures about as large as those on pronotal disc. In male, tarsomeres 1–3 of the anterior tarsi strongly, of the mid tarsi weakly expanded.

Etymology. This species is dedicated to the late Dr J. Charles Watt who had a keen interest in this group and recognised this species as new to science.

Distribution. New Zealand.

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