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Bembidion (*Zeperyphodes*) *nesophilum* Broun, 1886

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Synopsis of the genus *Bembidion* Latreille in New Zealand (Coleoptera: Carabidae: Bembidiini)

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Abstract. The genus *Bembidion* Latreille (Carabidae: Bembidiini) is reviewed for New Zealand. Thirty-six species-group taxa are recognized. Seven species are described as new: *Bembidion* (*Zecillenus*) *karikari* new species, *Bembidion* (*Zecillenus*) *puponga* new species, *Bembidion* (*Zecillenus*) *tepaki* new species, *Bembidion* (*Zecillenus*) *waimarama* new species, *Bembidion* (*Zemetallina*) *bullerense* new species, *Bembidion* (*Zemetallina*) *mangamuka* new species, *Bembidion* (*Zemetallina*) *waiho* new species. The taxonomic status of two species-group taxa is changed (valid names listed after equal sign): *Bembidion* (*Zeactedium*) *orbiferum giachinoi* Toledano, 2005 = *Bembidion* (*Zeactedium*) *giachinoi* Toledano, 2005; *Bembidion* (*Zeperyphodes*) *nesophilum* Broun, 1886 (previously synonymized with *Bembidion* (*Zeperyphodes*) *callipeplum* Bates, 1878) is resurrected from synonymy. A new synonymy is established (valid name listed after equal sign): *Bembidion* (*Ananotaphus*) *rotundicolle eustictum* Bates, 1878 = *Bembidion* (*Ananotaphus*) *rotundicolle* Bates, 1874. A concise review of the taxonomy of all taxa is provided. Descriptions, identification keys, illustrations of male genitalia, habitus photos, as well as distributional data and maps are given. Extensive information on ecology, biology, dispersal power, and collecting techniques is included for each species.

Key Words. Carabidae, Bembidiini, *Bembidion*, New Zealand, taxonomy, new species, keys, distribution, ecology, dispersal power.

Introduction

Bembidion Latreille, 1802 (Carabidae: Bembidiini) is a highly diverse genus worldwide in distribution. The New Zealand Bembidiini were catalogued by Larochelle and Larivière (2001) who recorded two genera (*Bembidion* and *Zecillenus* Lindroth, 1980) and 26 species. The current taxonomic review deals with eight subgenera (including *Zecillenus*) and 35 species of *Bembidion*. Six subgenera and 34 species are endemic to New Zealand.

Lindroth (1976, 1980) provided the first taxonomic review for this fauna. His work covered twenty-five species and was based on limited museum material and about 1,000 specimens collected by himself in the late winter to early spring (August–September) of 1972. Twelve new taxa were described as new to science: four subgenera, *Zemetallina* Lindroth, 1976, *Zeperyphodes* Lindroth, 1976, *Zeperyphus* Lindroth, 1976, *Zeplataphus* Lindroth, 1976; the genus *Zecillenus* Lindroth, 1980; seven species-group taxa, *B.* (*Zemetallina*) *anchonoderus stewartense* Lindroth, 1976, *B.* (*Zemetallina*) *solitarium* Lindroth, 1976, *B.* (*Zemetallina*) *townsendi* Lindroth, 1976, *B.* (*Zemetallina*) *urewerense* Lindroth, 1976, *B.* (*Zemetallina*) *wanakense* Lindroth, 1976, *B.* (*Zeplataphus*) *maorinum levatum* Lindroth, 1976, *B.* (*Zecillenus*) *emersoni* (Lindroth, 1980). The only other contributions to the taxonomic revision of New Zealand *Bembidion* were made by Emberson (1993) and Toledano (2005). Emberson elevated to species level *Bembidion* (*Zemetallina*) *stewartense* Lindroth, 1976 (previously a subspecies of *B.* (*Zemetallina*) *anchonoderus* Bates, 1878). Toledano described *Bembidion* (*Zeactedium*) *orbiferum giachinoi* and reduced the genus *Zecillenus* to subgeneric status.

This synopsis provides a concise treatment of the taxonomy, identification keys to all taxa of New Zealand Bembidiini, and extensive information on species distribution, ecology, biology, dispersal power, and collecting techniques. The male genitalia are described and illustrated, and habitus photos are provided for all taxa for the first time. Habitat photographs are also given for eight *Bembidion* (*Zecillenus*) species.

This review is another step in the authors' goal of attaining a comprehensive understanding of the New Zealand carabid fauna within a reasonable time frame, and of making large amounts of information available for practical use by a wide range of users. It follows the publication of a catalogue of New Zealand Carabidae (Larochelle and Larivière 2001), a revision of the tribe Harpalini (Larochelle and Larivière 2005), a synopsis of supraspecific carabid taxa (Larochelle and Larivière 2007), and a synopsis of species of the tribes Amarotypini, Cicindelini, Clivinini, Migadopini, Pamborini, Rhysodini, Moriomorphini, and Trechini (Larochelle and Larivière 2013).

Materials and Methods

This study is based on the examination of over 11,000 specimens from several hundred New Zealand localities. Most of this material (about 90%) was collected by the authors from 1992 to 2014 and is deposited in the New Zealand Arthropod Collection (NZAC), Auckland.

Other specimens were kindly provided by the following museums and collections: Auckland Institute and Museum, Auckland, New Zealand (AMNZ); Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, U.S.A. (CMNH); Entomology Research Museum, Lincoln University, Lincoln, New Zealand (LUNZ); John Nunn private collection, Dunedin, New Zealand (JNNZ); Museum of New Zealand Te Papa Tongarewa, Wellington, New Zealand (MONZ); The Natural History Museum, London, U.K. (BMNH). Type material has been deposited in some of the above collections as well as in the Canterbury Museum, Christchurch, New Zealand (CMNZ).

The morphological terminology used in this work follows Larochelle and Larivière (2007, 2013). All descriptions are based on the same list of characters so as to be fully comparative between taxa. The microsculpture of head, pronotum and elytra was examined in great detail and proved highly useful in discriminating species. The male genitalia, also highly diagnostic at the species level, were dissected across numerous populations of each taxon.

In the identification key to subgenera and species, additionally helpful but not necessarily exclusive characters are provided between square brackets.

The taxonomic arrangement of subgenera and species-group taxa, and the sequence of habitus photos and illustrations of male genitalia, follows the order of taxa in the identification key.

Original names and type locality are provided. Other synonymy is omitted unless taxonomic changes have occurred since the publication of the Catalogue of Larochelle and Larivière (2001). Type data, where provided, are listed in this order: type status followed by sex, acronym of entomological collection or museum serving as repository, and original label data with a forward slash (/) indicating a different label.

The two-letter abbreviation codes of Crosby et al. (1976, 1998) for areas of New Zealand (Fig. 70), were used to record geographic distributions. Full distributional information is given for species known from ten localities or fewer. Appendix A provides decimal degree coordinates for localities cited in the text. Maps summarizing species distribution are alphabetically arranged (Fig. 71–106).

Notes on the ecology, biology and dispersal power are based on an analysis and synthesis of specimen label data and field observations by the authors. The terminology and style of presentation follow Larochelle and Larivière (2001, 2003).

Most dorsal habitus photos were taken by B. E. Rhode. Figure 24 was provided by H. Goulet. Figures 1–2, 4–6, 10–11, 19, and 21–24 were modified by the authors who also prepared all other illustrations.

Bembidion Latreille, 1802

Bembidion Latreille, 1802: 82.

Type species. *Carabus quadriguttatus* Fabricius, 1775 (=*Cicindela quadrimaculata* Linnaeus, 1761), designated by Andrewes 1935: 17.

Description (New Zealand). Body length 2.8–9.3 mm; pedunculate or not pedunculate; depressed or convex. Color dark or pale. Metallic lustre usually present (often strong, aeneous). Dorsal surface mostly glabrous. **Head**. Usually moderately wide. Mandibles moderately long. Eyes present, normally developed, convex. Tempora not inflated. Antennae usually filiform and very long, rarely submoniliform and rather short; pubescence starting from segment 2 or 3. Mentum: median tooth usually entire, rarely subtruncate or truncate; circular foveae absent. Submentum usually with six setae (rarely with four setae). Ligula with two apical setae, free or fused. Palpi with penultimate segment fusiform; penultimate labial segment with two to eight scattered setae on anterior margin. **Thorax**. Pronotum variously shaped, often cordate (heart-shaped); base narrower than apex; posterolateral angles rectangular, acute or obtuse; one (usually anteriorly) or two setiferous punctures situated on each side (if present, posterolateral puncture close to or greatly removed from posterolateral angle). Scutellum either inserted entirely between elytral bases, or placed partly between and above elytral bases. **Legs**. Long. Protibiae not obliquely truncate on outer side apically. Male protarsi with the first two basal segments dilated, dentate on inner side. **Elytra**. Oblong, subovate or elliptical. Free along suture (hindwings usually fully developed, seldom reduced) or rarely fused along suture (hindwings vestigial). Basal margin absent or present (incomplete). Shoulders well developed or poorly developed, usually rounded, rarely angulate or obtuse, not serrate. Scutellar setiferous pore present. Scutellar striole present. Striae complete or incomplete, generally consisting of well-developed punctate striae (outer striae sometimes less developed); stria 8 present, usually complete and more deeply impressed than other striae; stria 1 not recurrent apically. Oblique longitudinal sulcus absent. Interval 3 or stria 3 with two to five discal setiferous punctures; interval 5 with or without two discal setiferous punctures. Umbilicate series separated into two major groups (4+4), with posterior group divided in two subgroups (2+2); eight setiferous punctures. Radial field without fine dense pubescence. Subapical sinuations present, usually feeble, rarely strong. Sutural apices usually angulate, sometimes subtruncate or rounded. Epipleura twisted (with strong inner fold or plica) near apex. **Abdomen**. Apex invisible dorsally. Sterna IV–VI with paired ambulatory setae only; last visible sternum (sternum VII) of male with two long ambulatory setae only; sternum VII of female with four long ambulatory setae, with or without numerous short setae. **Male genitalia**. Internal sac of aedeagus with a brush sclerite (absent in subgenus *Zecillenus*). Other characters as for tribe.

References. Lindroth 1976: 161–198 (revision of New Zealand taxa), 1980: 179–186 (as *Zecillenus*; revision); Larochelle and Larivière 2001: 79–85 (as *Bembidion*; catalogue), 85–87 (as *Zecillenus*; catalogue); Toledano 2005 (subgeneric status of *Zecillenus*); Larochelle and Larivière 2007: 47 (description, ecology, general distribution, references).

Remarks. Maddison (2012) as well as Liebherr and Maddison (2013) substantially advanced our understanding of the molecular phylogeny of the genus *Bembidion*. These studies, however, did not include representatives of all New Zealand subgenera and did not provide any formal taxonomic changes to the subgeneric classifications of Lindroth (1976) and Toledano (2005), which are followed here.

Alphabetical checklist of taxa

Valid genus- and species-groups taxa are listed alphabetically (A=Adventive, E=Endemic, N=Native, but not endemic to New Zealand).

Genus ***Bembidion*** Latreille, 1802 [N]
Subgenus ***Ananotaphus*** Netolitzky, 1931 [N]
    rotundicolle Bates, 1874 [E]
Subgenus ***Notaphus*** Stephens, 1827 [A]
    brullei Gemminger and Harold, 1868 [A]
Subgenus ***Zeactedium*** Netolitzky, 1931 [E]

giachinoi Toledano, 2005 [E]
musae Broun, 1882 [E]
orbiferum Bates, 1878 [E]
Subgenus ***Zecillenus*** Lindroth, 1980 [E]
albescens (Bates, 1878) [E]
alacre (Broun, 1921) [E]
chalmeri (Broun, 1886) [E]
embersoni (Lindroth, 1980) [E]
karikari [E] new species
puponga [E] new species
tepaki [E] new species
tillyardi (Brookes, 1927) [E]
waimarama [E] new species
Subgenus ***Zemetallina*** Lindroth, 1976 [E]
anchonoderus Bates, 1878 [E]
bullerense [E] new species
chalceipes Bates, 1878 [E]
hokitikense Bates, 1878 [E]
mangamuka [E] new species
parviceps Bates, 1878 [E]
solitarium Lindroth, 1976 [E]
stewartense Lindroth, 1976 [E]
tekapoense Broun, 1886 [E]
urewerense Lindroth, 1976 [E]
wanakense Lindroth, 1976 [E]
waiho [E] new species
Subgenus ***Zeperyphodes*** Lindroth, 1976 [E]
callipeplum Bates, 1878 [E]
nesophilum Broun, 1886[E]
Subgenus ***Zeperyphus*** Lindroth, 1976 [E]
actuarium Broun, 1903 [E]
Subgenus ***Zeplataphus*** Lindroth, 1976 [E]
charile Bates, 1867 [E]
dehiscens Broun, 1893 [E]
granuliferum Lindroth, 1976 [E]
maorinum levatum Lindroth, 1976 [E]
maorinum maorinum Bates, 1867 [E]
tairuense Bates, 1878 [E]
townsendi Lindroth, 1976 [E]

Key to subgenera and species of *Bembidion*

1. Pronotum with two setiferous punctures on each side [Antennae submoniliform]. **2**
— Pronotum with a single setiferous puncture on each side (anteriorly) [Antennae usually filiform, submoniliform in *B. stewartense* and *B. hokitikense*]. **12**

2(1). Posterolateral setiferous puncture of pronotum greatly removed from posterolateral angle; elytra with strong subapical sinuations and interval 3 with three discal setiferous punctures; Fig. 1–9 [Body length 3.1–5.2 mm]. ..... ***Bembidion* (*Zecillenus*) Lindroth 3**
— Posterolateral setiferous puncture of pronotum close to posterolateral angle; elytra with feeble subapical sinuations and stria 3 or interval 3 with two discal setiferous punctures; Fig. 10–11. ..... **11**

3(2). Elytra subelliptical, widest before middle, with lateral margins strongly or moderately widened subapically; Fig. 1–4 [North Island, north of HB]. **4**

— Elytra elliptical, widest about middle, with lateral margins slightly widened subapically; Fig. 5–9 [North Island, south of GB; South Island; Stewart Island]. **7**

4(3). Elytra with a dark triangular discal marking and prominent shoulders; Fig. 1–2. ..... **5**

— Elytra without a dark triangular discal marking and effaced, obliquely rounded shoulders; Fig. 3–4. ..... **6**

5(4). Elytra with lateral margins strongly widened subapically and subapical tooth sharp; posterolateral angles of pronotum strongly obtuse, with extreme tip acute; color rather pale, antennae and legs entirely pale testaceous; Fig. 1 [Body length 4.1–4.4 mm; elytra with a dark brown triangular discal marking; northern North Island (northern ND, Aupouri and Karikari Peninsulas)]. ..... ***Bembidion* (*Zecillenus*) *karikari* new species**

— Elytra with lateral margins moderately widened subapically and subapical tooth rounded; posterolateral angles of pronotum moderately obtuse, with extreme tip rectangular; color darker, antennae pale testaceous (segments 5–11 infuscated basally), legs mostly pale testaceous (apex of femora and base of tibiae infuscated); Fig. 2 [Body length 3.9–4.7 mm; elytra with a black, rarely dark brown (ND), triangular discal marking; northeastern North Island, Mimiwhangata Coastal Park (ND) to GB]. ..... ***Bembidion* (*Zecillenus*) *albescens* (Bates)**

6(4). Color mostly black, antennae bicolored with segments 1–4 pale testaceous and segments 5–11 strongly infuscated (dark brown), legs testaceous with apex of femora and base and apex of tibiae infuscated; disc of elytra with striae 2–5 very deep and intervals strongly convex; Fig. 3 [Rather large, body length 4.6–5.2 mm; northwestern North Island (AK, WO); on black ironsand]. ..... ***Bembidion* (*Zecillenus*) *alacre* (Broun)**

— Color mostly pale testaceous, antennae and legs entirely pale testaceous; disc of elytra with striae 2–5 moderately deep and intervals slightly convex; Fig. 4 [Smaller, body length 4.3–4.6 mm; northernmost North Island from Aupouri and Karikari Peninsulas to Aranga Beach and Ruakaka (ND); on white sand]. ..... ***Bembidion* (*Zecillenus*) *tepaki* new species**

7(3). Color rather pale, head dark brown posteriorly, pronotum dark brown apically and basally, elytra with a light brown triangular discal marking, antennae mostly pale testaceous (segment 11 infuscated in apical half), abdomen pale brownish; disc of elytra with striae 2–5 moderately deep and intervals slightly convex; Fig. 5 [Body length 4.1–4.5 mm; southeastern North Island (HB, WA)]. ..... ***Bembidion* (*Zecillenus*) *waimarama* new species**

— Color darker, head and pronotum black, piceous or ferrugineous, elytra with or without a reduced irregular discal marking, antennae pale testaceous (segments 5–11 infuscated), abdomen piceous or dark brown; disc of elytra with striae 2–5 shallow and intervals more or less depressed; Fig. 6–9. ..... **8**

8(7). Disc of head with moderately transverse microsculpture; elytra short, mostly pale, with or without a reduced pale irregular discal marking; pronotum widest before middle. **9**

— Disc of head with irregularly isodiametric microsculpture; elytra elongate, bicolored, with a dark triangular discal marking; pronotum widest about middle. **10**

9(8). Head and pronotum black or piceous, elytra pale testaceous with a reduced brownish irregular discal marking and with interval 2 infuscated behind middle, legs pale testaceous with apex of femora and base of tibiae slightly infuscated, abdomen piceous; Fig. 6 [Body length 3.0–4.5 mm; southwestern North Island (WI, WN) and northwestern South Island (NN, Puponga Farm Park)]. ..... ***Bembidion* (*Zecillenus*) *puponga* new species**

— Head and pronotum ferrugineous, elytra pale testaceous with or without a reduced light brown irregular discal marking and with interval 2 entirely pale, legs ferrugineous, abdomen dark

brown; Fig. 7 [Body length 3.1–4.1 mm; northern South Island (NN, Nelson, Tahunanui)]. . ..... ***Bembidion* (*Zecillenus*) *tillyardi* (Brookes)**

10(8). Head dark brown, pronotum light brown basally, apically, and discally, elytra pale testaceous with a dark brown triangular discal marking reaching interval 7; apex of elytra oblique; Fig. 8 [Body length 3.9–4.8 mm; southeastern South Island (SL, DN)]. ....***Bembidion* (*Zecillenus*) *chalmeri* (Broun)**

— Head black, pronotum black with rufotestaceous margins, elytra pale testaceous with a black triangular discal marking reaching interval 6; apex of elytra rounded; Fig. 9 [Body length 5.0 mm; Stewart Island]. .....***Bembidion* (*Zecillenus*) *embersoni* (Lindroth)**

11(2). Elytra subdepressed, with variegated color pattern, shoulders angulate, discal setiferous punctures small (not foveate), inserted on interval 3; pronotum rectangular, depressed, with laterobasal carinae; frontal furrows prolonged upon clypeus; Fig. 10 [Body length 5.1–6.5 mm; North and South Islands, subantarctic Auckland Islands; loamy coastal estuaries]. .... ***Bembidion* (*Notaphus*) *brullei* Gemminger and Harold**

— Elytra moderately convex, without variegated color pattern, shoulders moderately rounded, discal setiferous punctures large (foveate), inserted in stria 3; pronotum cordate, moderately convex, without laterobasal carinae; frontal furrows not prolonged upon clypeus; Fig. 11 [Body length 3.5–4.6 mm; North and South Islands, Chatham Islands; sandy riverbanks and lakeshores]. .....***Bembidion* (*Ananotaphus*) *rotundicolle* Bates**

12(1). Elytra with two discal setiferous punctures on interval 5 [Body length 3.8–9.3 mm]. ....***Bembidion* (*Zeplataphus*) Lindroth 13**

— Elytra without setiferous punctures on interval 5. .....**19**

13(12). Pronotum with thin raised lateral bead complete, well developed near posterolateral angles; last visible abdominal sternum (sternum VII) of female with numerous short setae in addition to four long ambulatory setae [Body length 3.8–6.8 mm].....**14**

— Pronotum with thin raised lateral bead incomplete, obsolete near posterolateral angles; last visible abdominal sternum (sternum VII) of female with four long ambulatory setae only [Body length 5.8–9.3 mm]. **16**

14(13). Microsculpture of elytra transverse; pronotum strongly convex; Fig. 12 [Body length 4.5–6.1 mm; antennae and legs piceous (antennal segment 1 and tibiae pale rufous); elytra subdepressed, stria 7 incomplete behind middle; North and South Islands]. ....***Bembidion* (*Zeplataphus*) *tairuense* Bates**

— Microsculpture of elytra isodiametric; pronotum moderately convex. **15**

15(14) Rather large, body length 5.2–6.8 mm; antennae and legs piceous; elytra subdepressed, dull, with stria 7 complete behind middle (joined apically to stria 6); pronotum with laterobasal foveae moderately deep; Fig. 13 [North and South Islands]. ....***Bembidion* (*Zeplataphus*) *granuliferum* Lindroth**

— Smaller, body length 3.8 mm; antennae and legs rufous (antennal segments 3–11 and femora slightly infuscated); elytra slightly convex, shiny, with stria 7 incomplete behind middle; pronotum with laterobasal foveae shallow; Fig. 14 [Northern South Island (NN, Teal Valley)]. .....***Bembidion* (*Zeplataphus*) *townsendi* Lindroth**

16(13). Elytra short, slightly convex; elytral microsculpture absent or feeble; pronotum clearly wider than head, with sides strongly rounded anteriorly and moderately sinuate posteriorly; Fig. 15–16. .....**17**

— Elytra elongate, subdepressed; elytral microsculpture present, strong; pronotum barely wider than head, with sides slightly rounded anteriorly and slightly sinuate posteriorly; Fig. 17–18. .....**18**

17(16). Microsculpture absent on elytra; Fig. 16 [Body length 5.8–7.9 mm; North Island]. .... ***Bembidion* (*Zeplataphus*) *maorinum levatum* Lindroth**

— Microsculpture present on elytra, irregularly isodiametric, feeble on intervals 1–5, strong on intervals 6–7; Fig. 15 [Body length 5.8–8.0 mm; South Island]. .... ***Bembidion* (*Zeplataphus*) *maorinum maorinum* Bates**

18(16). Appendages rather pale, antennae mostly pale yellowish, tibiae pale yellowish strongly contrasting with dark femora, apex of femora pale; elytra with all striae complete behind middle and microsculpture very strong, regularly isodiametric in male, almost granulate in female; Fig. 17 [Body length 6.5–9.3 mm; North and South Islands]. .... ***Bembidion* (*Zeplataphus*) *charile* Bates**

— Appendages darker, antennae rufous to piceous (segment 1 infuscated, at least above), tibiae rufous to piceous not strongly contrasting with femora, apex of femora dark; elytra with striae incomplete behind middle and microsculpture moderately strong, irregularly isodiametric; Fig. 18 [Body length 6.2–9.0 mm; North and South Islands]. .... ***Bembidion* (*Zeplataphus*) *dehiscens* Broun**

19(12). Elytra with two discal setiferous punctures on interval 3; submentum with four setae. **20**

— Elytra with three discal setiferous punctures in stria 3; submentum with six setae. **23**

20(19). Rather small, body length 3.7–4.3 mm; pronotum with laterobasal carinae and wide elongate-oblong laterobasal foveae; elytral striae incomplete (striae 2–7 abbreviated apically); microsculpture absent on head and pronotum, absent on elytra in male, present on apex of elytra in female; Fig. 19 [North Island]. ..... ***Bembidion* (*Zeperyphus*) *actuarium* Broun**

— Larger, body length 5.5–7.6 mm; pronotum without laterobasal carinae, with narrow linear laterobasal foveae; elytral striae complete; microsculpture present on head, pronotum, and elytra in both sexes; Fig. 20–22. ..... ***Bembidion* (*Zeactedium*) Netolitzky 21**

21(20). Elytra moderately convex, yellowish with a dark variegated color pattern and shallow, finely punctate striae; Fig. 20 [Body length 6.2–7.6 mm; North and South Islands (WO to FD–DN), Stewart Island]. ..... ***Bembidion* (*Zeactedium*) *musae* Broun**

— Elytra strongly convex, mostly black, without a dark variegated color pattern, with deep and coarsely punctate striae; Fig. 21–22. ..... **22**

22(21). Elytra black, with yellowish oblique subapical markings and sides slightly rounded about middle; pronotum with posterolateral angles acute, strongly projected laterally and sides strongly sinuate posteriorly; Fig. 21 [Rather large, body length 6.0–7.3 mm; western South Island]. . ..... ***Bembidion* (*Zeactedium*) *orbiferum* Bates**

— Elytra bicolored, black with wide yellowish lateral margins and sides parallel about middle; pronotum with posterolateral angles rectangular and sides moderately sinuate posteriorly; Fig. 22 [Smaller, body length 5.5–6.2 mm; southern North Island]. .... ***Bembidion* (*Zeactedium*) *giachinoi* Toledano**

23(19). Elytra pale with dark variegated color pattern; Fig. 23–24 [Legs pale; North Island]. .... ***Bembidion* (*Zeperyphodes*) Lindroth 24**

— Elytra dark without variegated color pattern; Fig. 25–36 [Legs pale or dark; North and South Islands, Stewart Island]. ..... ***Bembidion* (*Zemetallina*) Lindroth 25**

24(23). Body stout; antennae filiform, yellowish with segments 5–11 infuscated, legs testaceous with femora infuscated; elytra widest about middle, with rather large dark brown markings; pronotum with sides slightly sinuate posteriorly and posterolateral angles subrectangular, slightly obtuse; microsculpture isodiametric, strong on head, pronotum, and elytra; Fig. 23 [Rather small, body length 3.1–3.9 mm; southern North Island (BP to WN–WA); coastal and inland species]. ..... ***Bembidion* (*Zeperyphodes*) *callipeplum* Bates**

— Body slender; antennae subfiliform (segments 8–10 stout), pale testaceous, legs pale testaceous; elytra widest before middle, with smaller light brown markings; pronotum with sides strongly sinuate posteriorly and posterolateral angles acute, projected laterally; microsculpture transverse, obsolete on disc of head and pronotum, feeble on elytra; Fig. 24 [Larger, body length 3.6–4.9 mm; northern North Island (ND to WO); coastal species]. ..... ***Bembidion* (*Zeperyphodes*) *nesophilum* Broun**

25(23). Elytra with striae 2–6 complete, well impressed apically [Last visible abdominal sternum (sternum VII) of female with four long ambulatory setae only]. **26**

— Elytra with outer striae (at least striae 5–6) absent or poorly impressed apically [Last visible abdominal sternum (sternum VII) of female with or without numerous short setae, in addition to four long ambulatory setae]. **28**

26(25). Forebody narrow in comparison to elytra; elytra subdepressed, with shoulders angulate, sides subparallel, striae shallow and finely punctate, stria 7 obsolete, intervals depressed; Fig. 25 [Body length 4.0–4.9 mm; North and South Islands, Stewart Island]. ..... ***Bembidion* (*Zemetallina*) *tekapoense* Broun**

— Forebody moderately or very wide in comparison to elytra; elytra moderately convex, with shoulders moderately rounded, sides rounded, striae deep and coarsely punctate, stria 7 strong, intervals slightly convex; Fig. 26–27. ..... **27**

27(26). Body slender; forebody moderately wide in comparison to elytra; antennae filiform, moderately long (reaching about elytral shoulders); elytra with stria 7 punctate in anterior two-thirds; elytral epipleura and legs piceous; Fig. 26 [Rather large, body length 4.0–4.8 mm; North and South Islands]. ..... ***Bembidion* (*Zemetallina*) *anchonoderus* Bates**

— Body stout; forebody wider in comparison to elytra; antennae submoniliform, rather short (reaching about elytral base); elytra with stria 7 punctate in anterior half; elytral epipleura and legs rufous; Fig. 27 [Smaller, body length 3.4–3.8 mm; Stewart Island]. ..... ***Bembidion* (*Zemetallina*) *stewartense* Lindroth**

28(25). Microsculpture absent on head, pronotum, and elytra; forebody narrow in comparison to elytra; Fig. 28 [Body length 4.1–5.3 mm; elytra with striae 2–6 incomplete, disappearing before apex and stria 7 well developed, although incomplete apically; North and South Islands]. ..... ***Bembidion* (*Zemetallina*) *parviceps* Bates**

— Microsculpture present, at least on sides of head, pronotum, and elytra; forebody moderately wide in comparison to elytra; Fig. 29–36. ..... **29**

29(28). Microsculpture poorly developed on head and pronotum, often obsolete discally. **30**

— Microsculpture strongly developed on head and pronotum. **34**

30(29). Elytra with isodiametric microsculpture, at least basally and laterally. **31**

— Elytra with transverse microsculpture throughout. **32**

31(30). Posterolateral angles of pronotum obtuse; elytra depressed, subelongate, sides subparallel, stria 7 obsolete with or without rudimentary punctures, apical striole absent, preapical setiferous puncture isolated; Fig. 29 [Body length 3.5–4.6 mm; western South Island]. ..... ***Bembidion* (*Zemetallina*) *waiho* new species**

— Posterolateral angles of pronotum acute, projected laterally; elytra moderately convex, subovate, sides moderately rounded, stria 7 strong and coarsely punctate, apical striole present, preapical setiferous puncture not isolated; Fig. 30 [Body length 3.2–4.1 mm; North Island]. ..... ***Bembidion* (*Zemetallina*) *urewerense* Lindroth**

32(30). Head and pronotum black, elytra dark brown; pronotum with posterolateral angles acute at extreme tip and epipleura, in dorsal view, exposed in front of posterolateral angles; elytra

with shoulders obtuse and striae shallow; Fig. 31 [Body length 4.0–4.7 mm; posterolateral angles of pronotum acute, projected laterally; last visible abdominal sternum (sternum VII) of female with four long ambulatory setae only; northern North Island (ND)]. ....***Bembidion* (*Zemetallina*) *mangamuka* new species**

— Head, pronotum, and elytra black; pronotum with posterolateral angles obtuse at extreme tip and epipleura, in dorsal view, not exposed in front of posterolateral angles; elytra with shoulders rounded and striae 4–7 moderately deep; Fig. 32–33. .....**33**

33(32). Metallic lustre greenish or bluish on head, pronotum, and elytra; posterolateral angles of pronotum subrectangular; elytra moderately convex, subovate, moderately wide, with shoulders and sides moderately rounded; last visible abdominal sternum (sternum VII) of female with four long ambulatory setae only; Fig. 32 [Body length 4.4–5.2 mm; southern North Island]. .....***Bembidion* (*Zemetallina*) *solitarium* Lindroth**

— Metallic lustre greenish on head, aeneous on pronotum and elytra; posterolateral angles of pronotum acute, projected laterally; elytra strongly convex, elongate, narrow, with shoulders and sides slightly rounded; last visible abdominal sternum (sternum VII) of female with numerous short setae, in addition to four long ambulatory setae; Fig. 33 [Body length 4.6–5.5 mm; northwestern South Island]. .....***Bembidion* (*Zemetallina*) *bullerense* new species**

34(29). Antennae submoniliform, rather short, reaching about elytral base; pronotum with basal constriction very short and posterolateral angles strongly obtuse; elytra with discal setiferous punctures of stria 3 poorly developed, very small; last visible abdominal sternum (sternum VII) of female with numerous short setae, in addition to four long ambulatory setae; Fig. 34 [Smallest species of the subgenus, body length 2.8–4.0 mm; antennae and legs entirely black; North and South Islands]. .....***Bembidion* (*Zemetallina*) *hokitikense* Bates**

— Antennae filiform, moderately long, reaching about elytral shoulders; pronotum with basal constriction moderately long and posterolateral angles rectangular; elytra with discal setiferous punctures of stria 3 well developed; last visible abdominal sternum (sternum VII) of female with four long ambulatory setae only; Fig. 35–36 [Body length 3.7–5.2 mm]. **35**

35(34). Rather large, body length 4.4–5.2 mm; pronotum strongly convex, very wide, with laterobasal foveae reaching or almost reaching basal margin; elytra subovate, with sides moderately rounded and apical striole shallow; Fig. 35 [Legs black to piceous; South Island]. ....***Bembidion* (*Zemetallina*) *chalceipes* Bates**

— Smaller, body length 3.7–4.5 mm; pronotum moderately convex, moderately wide, with laterobasal foveae shorter, not reaching basal margin; elytra subelongate, with sides subparallel and apical striole deep; Fig. 36 [Legs usually dark rufous (tibiae sometimes black or piceous in CO, DN, MK); South Island]. .....***Bembidion* (*Zemetallina*) *wanakense* Lindroth**

Subgenus *Zecillenus* Lindroth, 1980
Fig. 1–9

Zecillenus Lindroth, 1980: 182.
Bembidion (*Zecillenus*): Toledano 2005: 130.

Type species. *Cillenum albescens* Bates, 1878a, by original designation.

Description. Body length 3.0–5.2 mm; color mostly pale (rarely mostly dark or with forebody dark); elytra with or without variegated color pattern; legs pale or mostly pale. Microsculpture present, poorly or well developed. Forebody very wide in comparison to elytra. **Head**. Antennae submoniliform, rather short, reaching about elytral base. Frontal furrows not prolonged on clypeus. Submentum with six setae. Ligula with two free, approximate setae. Palpi with penultimate labial segment plurisetose (five or six setae) on anterior margin. **Thorax**. Pronotum strongly convex, subcordate (cordate in other endemic

subgenera), usually widest before middle (rarely about middle); laterobasal carinae absent; two setiferous punctures on each side, posterolateral puncture greatly removed from posterolateral angle (close to posterolateral angle in *Ananotaphus* and *Notaphus*); laterobasal foveae poorly developed. Epipleura (in dorsal view) not exposed in front of posterolateral angles. **Elytra**. Strongly convex, subelliptical or elliptical, widest before or about middle. Shoulders strongly rounded. Scutellar striole consisting of an impunctate line. Striae incomplete, punctate. Intervals convex or depressed on disc of elytra; interval 3 with three discal setiferous punctures; interval 5 without discal setiferous punctures. Lateral margins with a subapical tooth (without subapical tooth in other subgenera). Subapical sinuations moderately or very strong (feeble in other subgenera). Apical striole absent; preapical setiferous puncture isolated. Sutural apices rounded. Apex rounded, rarely oblique. **Abdomen**. Last visible sternum (sternum VII) of female with four long ambulatory setae only. **Aedeagus**. Internal sac without a brush sclerite (with a brush sclerite in other subgenera). **Parameres**. Three terminal setae present (as in subgenus *Zemetallina*).

Geographic distribution. New Zealand (endemic).

Ecology. Sandy banks of meandering estuarine streams situated in or near sand dunes.

References. Lindroth 1980: 182 (as *Zecillenus*; description), 179–186 (revision); Larochelle and Larivière 2001: 85 (as *Zecillenus*; catalogue); Toledano 2005: 130 (subgeneric status of *Zecillenus*); Larochelle and Larivière 2007: 48 (as *Bembidion* (*Zecillenus*); classification).

Remarks. Species of this subgenus are morphologically close. A considerable amount of color variation occurs within taxa. Male genitalia, however, show constant differences between species. These coastal beetles have been considered very rare until the authors discovered their ecological requirements.

Bembidion (*Zecillenus*) *karikari* new species

Fig. 1, 37, 86, 108

Bembidion karikari Larochelle and Larivière, new species. Holotype: male (NZAC) labeled: "NEW ZEALAND ND Tokerau Beach, Dick Urlich Rd 3m 20.IX.1997 Larochelle & Larivière (typed)/ Wet, sandy estuary streambanks. In burrows. Gregarious. Moderate runner. (typed)/ HOLOTYPE [male symbol] *Bembidion karikari* Larochelle & Larivière, 2015 (red label; typed)." Paratypes: one male (NZAC) and two females (MONZ, NZAC) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length 4.1–4.4 mm. Pale testaceous; disc of head and pronotum brown; elytra with a dark brown triangular discal marking (reaching interval 7) and interval 2 infuscated behind middle; antennae and legs entirely pale testaceous; abdomen dark brown. Microsculpture obsolete, with traces of transverse meshes (microlines) on disc of head and pronotum; strong on disc of elytra, moderately transverse (male) or isodiametric (female), granulate elsewhere. Head, pronotum, and disc of elytra shiny, remainder of elytra dull; metallic lustre absent. **Thorax**. Pronotum widest before middle; sides moderately rounded anteriorly, not sinuate posteriorly; posterolateral angles strongly obtuse, with extreme tip acute; laterobasal foveae shallow, ill-defined (vaguely elongate), short, not reaching basal margin. **Elytra**. Subelliptical, widest before middle. Shoulders prominent. Sides strongly rounded anteriorly, oblique posteriorly. Striae incomplete, barely suggested and impunctate laterally and apically; striae 2–5 well impressed, very deep and finely punctate on disc; striae 6–7 obsolete. Intervals moderately convex on disc. Lateral margins strongly widened subapically; subapical tooth sharp. Subapical sinuations very strong. Sutural apices angularly rounded. Apex strongly rounded. **Aedeagus**. Lateral view (Fig. 37): very strongly arcuate, strongly widened in apical half; base moderately convex dorsally; middle slightly concave dorsally, moderately convex ventrally; apex subtriangular, concave dorsally and ventrally, with extreme tip wide and moderately long.

Material examined. 51 specimens (CMNH, JNNZ, MONZ, NZAC).

Geographic distribution (Fig. 86). North Island: ND–Karikari Peninsula: Matai [=Maitai] Bay; Puheke [=Puwheke] Beach stream; Tokerau Beach, Dick Urlich Road [end]. Aupouri Peninsula: Kapowairua, Te Horo Beach.

Ecology. Coastal lowland. Fossorial. Banks of meandering estuarine streams (3–5 m wide) running through sand dunes (Fig. 108), just above the highest tidal line, at a certain distance (2–3 m) from water. Open ground; wet, sandy (white), bare or sparsely vegetated soil. Nocturnal; hides during the day in the sand. Gregarious. Occurs in association with staphylinids (Coleoptera) and *Bembidion* (*Zeperyphodes*) *nesophilum*.

Biology. Seasonality: September, December, February. Tenerals: February. Often infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Brachypterous (incapable of flight). Moderate runner. Vagility limited by flight incapacity.

Collecting techniques. Pouring water over the ground; treading the soil with the feet.

Remarks. The species is common on the Karikari Peninsula and is therefore named after this region. *Bembidion karikari* is morphologically close to *B. albescens*. In addition to diagnostic characters of the male genitalia, *B. karikari* has the following distinguishing features: body paler, with antennae and legs entirely pale testaceous, elytra bearing a dark brown triangular discal marking, and abdomen dark brown; posterolateral angles of pronotum strongly obtuse, with extreme tip acute; elytra with lateral margins widened subapically and subapical tooth sharp. Both species are allopatric: *B. karikari* is restricted to the northernmost North Island (Northland, ND) while *B. albescens* occurs in the northeastern North Island from central Northland (ND) to Gisborne (GB).

***Bembidion* (*Zecillenus*) *albescens* (Bates, 1878)**
Fig. 2, 38, 73, 109

Cillenum [*sic*] *albescens* Bates, 1878a: 193. Type locality: Tairua, CL.
Bembidion (*Cillenus*) *albescens*: Csiki 1928: 130.
Zecillenus albescens: Lindroth 1980: 183.
Bembidion (*Zecillenus*) *albescens*: Toledano 2005: 130.

Description. Body length 3.9–4.7 mm. Pale testaceous; head mostly dark brown to black; disc of pronotum usually piceous; elytra with a black or dark brown (ND) triangular discal marking (reaching interval 7) and interval 2 infuscated behind middle; antennae pale testaceous with segments 5–11 infuscated basally; legs mostly pale testaceous, with apex of femora and base of tibiae infuscated; abdomen piceous. Microsculpture obsolete, with traces of transverse meshes (microlines) on disc of head and pronotum; strong on disc of elytra, moderately transverse (male) or isodiametric (female), granulate elsewhere. Head, pronotum, and disc of elytra shiny, remainder of elytra dull; metallic lustre present on disc of elytra (aeneous). **Thorax**. Pronotum widest before middle; sides moderately rounded anteriorly, not sinuate posteriorly; posterolateral angles moderately obtuse, with extreme tip rectangular; laterobasal foveae shallow, ill-defined (vaguely elongate), short, not reaching basal margin. **Elytra**. Subelliptical, widest before middle. Shoulders prominent. Sides strongly rounded anteriorly, oblique posteriorly. Striae incomplete, barely suggested and impunctate laterally and apically; striae 2–5 well impressed, very deep and finely punctate on disc; striae 6–7 obsolete. Intervals moderately convex on disc. Lateral margins moderately widened subapically; subapical tooth rounded. Subapical sinuations moderately strong. Sutural apices angularly rounded. Apex strongly rounded. **Aedeagus**. Lateral view (Fig. 38): very strongly arcuate, slightly widened in apical half; base slightly convex dorsally; middle slightly convex dorsally, almost straight ventrally; apex subtriangular, concave dorsally and ventrally, with extreme tip wide and long.

Material examined. 301 specimens (AMNZ, JNNZ, LUNZ, NZAC).

Geographic distribution (Fig. 73). North Island: AK–Long Bay. Pakiri Beach. Tawharanui Regional Park. BP–Oruaiti Beach. Waiotahi Beach. CL–Great Barrier Island (Awana Bay; Kaitoke Beach; Whangapoua Beach). Opoutere Beach. Otama Beach. Port Jackson. Tairua. GB–Anaura Bay. Te Araroa. ND–Mimiwhangata Coastal Park. Ocean Beach. Ruakaka.

Ecology. Coastal lowland. Fossorial. Banks of meandering estuarine streams (2–3 m wide) running through sand dunes (Fig. 109), just above the highest tidal line, at a certain distance (2–3 m) from water. Open ground; wet, sandy (white, yellow), bare soil. Nocturnal; hides during the day in the sand. Gregarious. Occurs in association with staphylinids (Coleoptera) and *Bembidion* (*Zeperyphodes*) *nesophilum*.

Biology. Seasonality: September–February, June. Tenerals: October–November, January–February, June. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Brachypterous (incapable of flight). Moderate runner. Vagility limited by flight incapacity.

Collecting techniques. Pouring water over the ground; treading the soil with the feet.

References. Larochelle and Larivière 2001: 86 (as *Zecillenus albescens*; catalogue; biology, dispersal power, ecology, geographic distribution, references), 2007: 110 (as *Bembidion* (*Zecillenus*) *albescens*; updated checklist).

Remarks. Lindroth (1980) recorded four localities for this species; it is now known from over 17 localities in the Northland (ND), Auckland (AK), Coromandel (CL), Bay of Plenty (BP), and Gisborne (GB) regions. Northland (ND) populations of this species are more lightly colored.

***Bembidion* (*Zecillenus*) *alacre* (Broun, 1921)**
Fig. 3, 39, 72, 110

Cillenum [*sic*] *alacris* Broun, 1921: 601. Type locality: Karekare, AK.
Bembidion (*Cillenus*) *alacre*: Andrewes 1938: 195.
Zecillenus alacris: Lindroth 1980: 184.
Bembidion (*Zecillenus*) *alacre*: Toledano 2005: 130.

Description. Body length 4.6–5.2 mm. Head, pronotum, and most of elytra black; shoulders and lateral margins of elytra pale testaceous; interval 2 entirely black; antennae bicolored, with segments 1–4 pale testaceous and segments 5–11 strongly infuscated (dark brown); legs testaceous, with apex of femora, base and apex of tibiae infuscated; abdomen dark brown. Microsculpture obsolete, with traces of transverse meshes (microlines) on disc of head and pronotum; strong and isodiametric on disc of elytra, granulate elsewhere. Head, pronotum, and disc of elytra shiny, remainder of elytra dull; metallic lustre absent. **Thorax**. Pronotum widest about middle; sides moderately rounded anteriorly, not sinuate posteriorly; posterolateral angles strongly obtuse, with extreme tip acute; laterobasal foveae shallow, ill-defined (vaguely elongate), short, not reaching basal margin. **Elytra**. Subelliptical, widest before middle. Shoulders effaced (obliquely rounded). Sides slightly rounded anteriorly, slightly rounded posteriorly. Striae incomplete, barely suggested and impunctate laterally and apically; striae 2–5 well impressed, very deep and finely punctate on disc; striae 6–7 obsolete. Intervals strongly convex on disc. Lateral margins strongly widened subapically; subapical tooth sharp. Subapical sinuations very strong. Sutural apices angularly rounded. Apex slightly rounded. **Aedeagus**. Lateral view (Fig. 39): very strongly arcuate, strongly widened in apical half; base moderately convex dorsally; middle rather straight dorsally and ventrally; apex subtriangular, slightly concave dorsally and ventrally, with extreme tip wide and short.

Material examined. 56 specimens (JNNZ, NZAC).

Geographic distribution (Fig. 72). North Island: AK–Waitakere Ranges (Bethells Beach; Karekare; Whatipu). WO–Kaawa Stream. Waimai Stream.

Ecology. Coastal lowland. Fossorial. Banks of meandering estuarine streams (2–3 m wide) running through sand dunes (Fig. 110), just above the highest tidal line, at a certain distance (1–3 m) from water. Open ground; wet, sandy (black ironsand), bare or sparsely vegetated soil. Nocturnal; hides during the day in the sand. Gregarious. Occurs in association with staphylinids (Coleoptera) and *Bembidion* (*Zeperyphodes*) *nesophilum*.

Biology. Seasonality: November, January–April. Tenerals: October, February–March. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running or digging, or emits a strong smell.

Dispersal power. Brachypterous (incapable of flight). Fast runner. Vagility limited by flight incapacity.

Collecting techniques. Pouring water over the ground; treading the soil with the feet.

References. Larochelle and Larivière 2001: 81 (as *Zecillenus alacris*; taxonomy, geographic distribution, ecology, biology, dispersal power), 2007: 110 (as *Bembidion* (*Zecillenus*) *alacre*; updated checklist).

Remark. Lindroth (1980) recorded a single locality for this species (AK, Waitakere Ranges, Karekare); it is now known from five localities in the Auckland (AK) and Waikato (WO) regions.

Bembidion (*Zecillenus*) *tepaki* new species

Fig. 4, 40, 100, 107

Bembidion tepaki Larochelle and Larivière, new species. Holotype: male (NZAC) labeled: "NEW ZEALAND ND Te Paki (3km SW); Te Paki Stream) 30.XII.1992 A. Larochelle (typed)/ Sandy sterile edge of brook through dunes nr sea, water splashing (typed)/ HOLOTYPE [male symbol] *Bembidion tepaki* Larochelle & Larivière, 2015 (red label; typed)." Paratypes: one male (NZAC) and two females (AMNZ, NZAC) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length 4.3–4.6 mm. Pale testaceous; head and pronotum slightly infuscated; elytra with a brown oblong discal marking (reaching interval 7) and interval 2 pale; antennae and legs entirely pale testaceous; abdomen pale testaceous, slightly infuscated. Microsculpture obsolete, with traces of transverse meshes (microlines) on disc of head and pronotum; strong on disc of elytra, moderately transverse (male) or isodiametric (female), granulate elsewhere. Head, pronotum, and disc of elytra shiny, remainder of elytra dull; metallic lustre absent. **Thorax**. Pronotum widest before middle; sides moderately rounded anteriorly, not sinuate posteriorly; posterolateral angles strongly obtuse, with extreme tip acute; laterobasal foveae shallow, ill-defined (vaguely elongate), short, not reaching basal margin. **Elytra**. Subelliptical, widest before middle. Shoulders effaced (obliquely rounded). Sides slightly rounded anteriorly, oblique posteriorly. Striae incomplete, barely suggested and impunctate laterally and apically; striae 2–5 well impressed, moderately deep and finely punctate on disc; striae 6–7 obsolete. Intervals slightly convex on disc. Lateral margins strongly widened subapically; subapical tooth sharp. Subapical sinuations very strong. Sutural apices angularly rounded. Apex slightly rounded. **Aedeagus**. Lateral view (Fig. 40): very strongly arcuate, strongly widened in apical half; base moderately convex dorsally; middle rather straight dorsally and ventrally; apex subtriangular, concave dorsally, rather straight ventrally, with extreme tip wide and short.

Material examined. 98 specimens (AMNZ, CMNH, JNNZ, NZAC).

Geographic distribution (Fig. 100). North Island: ND–Aranga Beach. Kaikai Beach. Karikari Peninsula: Karikari Bay (East end [=Wairahoraho Stream]); Puheke [=Puwheke] Beach stream; Wairahoraho Stream. Ruakaka. Aupouri Peninsula: Pandora. Tapotu [=Tapotupotu Bay]. Te Paki Stream. North Cape, Whareana [Bay].

Ecology. Coastal lowland. Fossorial. Banks of meandering estuarine streams (3–5 m wide) running through sand dunes (Fig. 107), just above the highest tidal line, at a certain distance (1–3 m) from water. Open ground; wet, sandy (white), bare soil. Nocturnal; hides during the day in the sand. Gregarious. Occurs in association with staphylinids (Coleoptera) and *Bembidion* (*Zeperyphodes*) *nesophilum*.

Biology. Seasonality: September, December–March. Tenerals: December, February–March. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Brachypterous (incapable of flight). Moderate runner. Vagility limited by flight incapacity.

Collecting techniques. Pouring water over the ground; treading the soil with the feet.

Remarks. This species is named after its type locality, Te Paki. *Bembidion tepaki* is morphologically close to *B. alacre*. In addition to diagnostic characters of the male genitalia, *B. tepaki* has the following distinguishing features: body smaller (length 4.3–4.6 mm) and paler, with antennae and legs entirely pale testaceous, and abdomen pale testaceous, slightly infuscated; pronotum widest before middle; disc of elytra with striae 2–5 moderately deep and intervals slightly convex. Both species are allopatric: *B. tepaki* is restricted to the white sand beaches of northern Northland (ND) while *B. alacre* occurs on the black ironsand beaches of the Auckland (AK) and Waikato (WO) regions.

***Bembidion* (*Zecillenus*) *waimarama* new species**
Fig. 5, 41, 105, 111

Bembidion waimarama Larochelle and Larivière, new species. Holotype: male (NZAC) labeled: "NEW ZEALAND HB Waimarama (1.5km N along beach) 3948S 17659E 19.XII.2003 Larochelle & Larivière (typed)/ Bare, wet, yellow sand banks of estuary stream. Quick insect; emits smell when seized. (typed)/ HOLOTYPE [male symbol] *Bembidion waimarama* Larochelle & Larivière, 2015 (red label; typed)." Paratypes: one male (MONZ) and one female (NZAC) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length 4.1–4.5 mm. Pale testaceous; head mostly dark brown; pronotum dark brown basally and apically; elytra with a light brown triangular discal marking (reaching interval 7) and interval 2 infuscated behind middle; antennae mostly pale testaceous, with segment 11 strongly infuscated in apical half; legs entirely pale testaceous; abdomen brownish. Microsculpture strong and moderately transverse on disc of head; obsolete, with traces of transverse meshes (microlines) on disc of pronotum; strong on disc of elytra, moderately transverse (male) or isodiametric (female), granulate elsewhere. Head, pronotum, and disc of elytra shiny, remainder of elytra dull; metallic lustre absent. **Thorax**. Pronotum widest before middle; sides moderately rounded anteriorly, not sinuate posteriorly; posterolateral angles rectangular; laterobasal foveae shallow, ill-defined (vaguely elongate), short, not reaching basal margin. **Elytra**. Elliptical, widest about middle. Shoulders somewhat effaced (obliquely rounded). Sides slightly rounded. Striae incomplete, barely suggested and impunctate laterally and apically; striae 2–5 well impressed, moderately deep and finely punctate on disc; striae 6–7 obsolete. Intervals slightly convex on disc. Lateral margins slightly widened subapically; subapical tooth obtuse. Subapical sinuations moderately strong. Sutural apices angularly rounded. Apex strongly rounded. **Aedeagus**. Lateral view (Fig. 41): very strongly arcuate, rather moderately widened in apical half; base slightly convex dorsally; middle slightly concave dorsally towards its base and apex, almost straight

ventrally; apex subtriangular, moderately concave dorsally and ventrally, with extreme tip moderately wide and long.

Material examined. 84 specimens (MONZ, NZAC).

Geographic distribution (Fig. 105). North Island: HB–Napier (Taupo Road [probably Esk River mouth]). Porangahau. Waimarama. WA–Herbertville. Otahome, Otahome Stream mouth. Riversdale Estuary [=Riversdale Beach]. Tautane River [=Stream] mouth (North of Herbertville). Whakataki River mouth.

Ecology. Coastal lowland. Fossorial. Banks of meandering estuarine streams (2 m wide) running through sand dunes (Fig. 111), just above the highest tidal line, at a certain distance (2 m) from water. Open ground; wet, sandy (yellow), bare soil. Nocturnal; hides during the day in the sand. Gregarious. Occurs in association with staphylinids (Coleoptera).

Biology. Seasonality: October, December–January. Tenerals: December. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running or emits a strong smell.

Dispersal power. Brachypterous (incapable of flight). Fast runner. Vagility limited by flight incapacity.

Collecting techniques. Pouring water over the ground; treading the soil with the feet.

Remarks. This species is named after its type locality, Waimarama. *Bembidion waimarama* may superficially look like *B. tepaki* from Northland (ND) but it is morphologically closest to the southern *Zecillenus* species (*puponga* new species, *tillyardi, chalmeri*, and *embersoni*) with elliptical elytra that are widest about middle and have lateral margins slightly widened subapically. In addition to diagnostic characters of the male genitalia, *B. waimarama* has the following distinguishing features: body pale, with antennae mostly pale testaceous (segment 11 infuscated in apical half), head dark brown posteriorly, pronotum light brown apically and basally, legs entirely pale testaceous, elytra bearing a light brown triangular discal marking, and abdomen pale brownish; disc of elytra with striae 2–5 moderately deep and intervals slightly convex. *Bembidion waimarama* is restricted to the southeastern North Island (HB, WA).

***Bembidion* (*Zecillenus*) *puponga* new species**
Fig. 6, 42, 94, 112

Bembidion puponga Larochelle and Larivière, new species. Holotype: male (NZAC) labeled: "NEW ZEALAND NN Puponga Forest [=Farm] Park, Green Hills Stream mouth 4030S 17239E 4.III.2003 Larochelle & Larivière (typed)/ Estuary stream and lagoon: wet, bare, white-silver sand flat near dune; 1-2 m from water (typed)/ HOLOTYPE [male symbol] *Bembidion puponga* Larochelle & Larivière, 2015 (red label; typed)." Paratypes: one male (CMNZ) and one female (NZAC) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length 3.0–4.5 mm. Head and pronotum black or piceous; elytra pale testaceous, with a reduced brownish irregular discal marking (reaching interval 6) and interval 2 infuscated behind middle; antennae with segments 1–4 pale testaceous and segments 5–11 infuscated; legs pale testaceous, with apex of femora and base of tibiae slightly infuscated; abdomen piceous. Microsculpture strong and moderately transverse on disc of head; obsolete, with traces of transverse meshes (microlines) on disc of pronotum; strong on elytra, isodiametric on disc, granulate elsewhere. Head, pronotum, and disc of elytra shiny, remainder of elytra dull; metallic lustre present on head and pronotum (aeneous). **Thorax**. Pronotum widest before middle; sides moderately rounded anteriorly, not sinuate posteriorly; posterolateral angles rectangular; laterobasal foveae shallow, ill-defined (rounded), short, not reaching

basal margin. **Elytra**. Shorter than in other *Zecillenus* species (except *B. tillyardi*). Elliptical, widest about middle. Shoulders prominent. Sides moderately rounded. Striae incomplete, barely suggested and impunctate laterally and apically; striae 2–5 poorly impressed, shallow and finely punctate on disc; striae 6–7 obsolete. Intervals subdepressed on disc. Lateral margins slightly widened subapically; subapical tooth obtuse. Subapical sinuations moderately strong. Sutural apices obtusely rounded. Apex strongly rounded. **Aedeagus**. Lateral view (Fig. 42): moderately strongly arcuate, slightly widened in apical half; base moderately convex dorsally; middle moderately convex dorsally, slightly concave towards its apex, almost straight ventrally towards its apex; apex subtriangular, moderately concave dorsally and ventrally, with extreme tip wide and long.

Material examined. 93 specimens (CMNZ, JNNZ, MONZ, NZAC).

Geographic distribution (Fig. 94). North Island: WI–Santoft Forest (Koitiata Stream mouth). WN–Kuku Beach (near Levin) [=Kuku Beach Road end beach]. Lake Waiorongomai Stream mouth. Titahi Bay. South Island: NN–Puponga Forest [=Farm] Park (Green Hills Stream mouth; Whahariki Stream mouth).

Ecology. Coastal lowland. Fossorial. Banks of meandering estuarine streams (1–2 m wide) running through sand dunes (Fig. 112), just above the highest tidal line, at a certain distance (2–3 m) from water. Open ground; wet, sandy (white, black), bare soil. Nocturnal; hides during the day in the sand. Gregarious. Occurs in association with staphylinids (Coleoptera).

Biology. Seasonality: September, December, March. Tenerals: December, March. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Brachypterous (incapable of flight). Fast runner. Vagility limited by flight incapacity.

Collecting techniques. Pouring water over the ground; treading the soil with the feet.

Remarks. This species is named after its type locality, Puponga Farm Park. *Bembidion puponga* is morphologically close to *B. tillyardi*. In addition to diagnostic characters of the male genitalia, *B. puponga* has the following distinguishing features: head and pronotum black or piceous; elytra pale testaceous with a reduced brownish irregular discal marking and interval 2 infuscated behind middle; legs pale testaceous with apex of femora and base of tibiae slightly infuscated; abdomen piceous; elytra with intervals subdepressed on disc and subapical sinuations moderately strong. *Bembidion puponga* occurs in the southwestern North Island (WI, WN) and northwestern South Island (NN, Puponga Farm Park) while *B. tillyardi* is restricted to a single locality from the northwestern South Island (NN, Nelson, Tahunanui).

***Bembidion* (*Zecillenus*) *tillyardi* (Brookes, 1927)**
Fig. 7, 43, 101, 113

Cillenum [*sic*] *tillyardi* Brookes,1927: 563. Type locality: Tahuna (= Tahunanui, Back Beach), NN.
Bembidion (*Cillenus*) *tillyardi*: Andrewes 1938: 195.
Zecillenus tillyardi: Lindroth 1980: 184.
Bembidion (*Zecillenus*) *tillyardi*: Toledano 2005: 130.

Description. Body length 3.1–4.1 mm. Head and pronotum ferrugineous; elytra pale testaceous, with or without a reduced pale brown irregular discal marking (sometimes reaching interval 6) and interval 2 entirely pale; antennae with segments 1–4 pale testaceous and segments 5–11 slightly infuscated; legs entirely pale ferrugineous; abdomen dark brown. Microsculpture strong and moderately transverse on disc of head; obsolete, with traces of transverse meshes (microlines) on disc of pronotum; strong on elytra, isodiametric on disc, granulate elsewhere. Head, pronotum, and disc of elytra shiny, remainder

of elytra dull; metallic lustre present on head and pronotum (aeneous). **Thorax**. Pronotum widest before middle; sides moderately rounded anteriorly, not sinuate posteriorly; posterolateral angles subrectangular; laterobasal foveae shallow, ill-defined (subelongate), short, not reaching basal margin. **Elytra**. Shorter than in other *Zecillenus* species (except *B. puponga*). Elliptical, widest about middle. Shoulders prominent. Sides moderately rounded. Striae incomplete, barely suggested and impunctate laterally and apically; striae 2–5 poorly impressed, shallow and finely punctate on disc; striae 6–7 obsolete. Intervals depressed. Lateral margins slightly widened subapically; subapical tooth obtuse. Subapical sinuations moderately strong. Sutural apices obtusely rounded. Apex strongly rounded. **Aedeagus**. Lateral view (Fig. 43): moderately strongly arcuate, moderately widened in apical half; base moderately convex dorsally; middle bisinuate dorsally, slightly convex ventrally towards its apex; apex subtriangular, slightly concave dorsally and ventrally, with extreme tip wide and long.

Material examined. 67 specimens (AMNZ, MONZ, NZAC).

Geographic distribution (Fig. 101). South Island: NN–Nelson, Tahunanui, Back Beach.

Ecology. Coastal lowland. Fossorial. Tahunanui, Nelson: Terraces and mounds of a lagoon/inlet circled by meandering estuarine tidal channels (2–3 m wide) situated near dunes (Fig. 113), just above the highest tidal line, at a certain distance (2–4 m) from water. Open ground; wet, sandy (yellow), bare soil. Nocturnal; hides during the day in the sand. Semi-gregarious. Found in association with staphylinids (Coleoptera).

Biology. Seasonality: November–February. Tenerals: December, February. Defence mechanism: when alarmed, the adult escapes by running or hiding in sandhopper burrows.

Dispersal power. Brachypterous (incapable of flight). Fast runner. Vagility limited by flight incapacity.

Collecting techniques. Pouring water over the ground; treading the soil with the feet.

Reference. Larochelle and Larivière 2001: 86 (as *Zecillenus tillyardi*; catalogue; biology, dispersal power, ecology, geographic distribution).

Remarks. After extensive surveys by the authors in the coastal areas of the northern South Island, this species remains known only from the type locality Tahunanui, Back Beach (NN) where it is locally abundant. *Bembidion tillyardi* appears to be more marine than other *Zecillenus* species.

***Bembidion* (*Zecillenus*) *chalmeri* (Broun, 1886)**
Fig. 8, 44, 79, 114

Cillenum [*sic*] *chalmeri* Broun, 1886: 881. Type locality: Port Chalmers, DN.
Cillenum [*sic*] *batesi* Sharp, 1886: 374. Type locality: Otago, South Island. Secondary homonym of *Notaphus batesi* Putzeys, 1875 (=*Bembidion niloticum* Dejean, 1831).
Bembidion (*Cillenus*) *batesianum* Csiki, 1928: 130 (replacement name for *Bembidion batesi* Sharp, 1886). Synonymized by Lindroth 1980: 185.
Bembidion (*Cillenus*) *chalmeri*: Csiki 1928: 130.
Zecillenus chalmeri: Lindroth 1980: 185.
Bembidion (*Zecillenus*) *chalmeri*: Toledano 2005: 130.

Description. Body length 3.9–4.8 mm. Head dark brown; pronotum pale brown basally, apically and on disc; elytra pale testaceous, with a dark brown triangular discal marking (reaching interval 7) and interval 2 entirely pale; antennae with segments 1–4 pale testaceous and segments 5–11 slightly infuscated; legs mostly pale testaceous, with apex of femora slightly infuscated; abdomen piceous. Microsculpture strong, irregularly isodiametric on disc of head; obsolete, with traces of transverse meshes

(microlines) on disc of pronotum; strong on elytra, isodiametric on disc, granulate elsewhere. Head, pronotum, and disc of elytra shiny, remainder of elytra dull; metallic lustre present on head (aeneous). **Thorax**. Pronotum widest about middle; sides moderately rounded anteriorly, not sinuate posteriorly; posterolateral angles subrectangular; laterobasal foveae shallow, ill-defined (vaguely elongate), short, not reaching basal margin. **Elytra**. Elliptical, widest about middle. Shoulders somewhat prominent. Sides moderately rounded. Striae incomplete, barely suggested and impunctate laterally and apically; striae 2–5 poorly impressed, shallow and finely punctate on disc; striae 6–7 obsolete. Intervals subdepressed on disc. Lateral margins slightly widened subapically; subapical tooth obtuse. Subapical sinuations moderately strong. Sutural apices obtusely rounded. Apex oblique (rounded in other *Zecillenus* species). **Aedeagus**. Lateral view (Fig. 44): moderately arcuate, moderately widened in apical half; base moderately convex dorsally; middle rather straight dorsally, with moderate concavity towards its apex, moderately convex ventrally; apex subtriangular, moderately concave dorsally and ventrally, with extreme tip wide and long.

Material examined. 260 specimens (AMNZ, BMNH, JNNZ, LUNZ, NZAC).

Geographic distribution (Fig. 79). South Island: DN–Aramoana, The Spit. Port Chalmers. "Otago" [Coast or Peninsula]. Sandfly Bay, Morris Creek. Taieri Mouth (near Saw Mill Road). SL–Long Point, Waiheke Stream mouth. Long Beach, Longbeach Creek mouth. Papatowai beach. Tutuku Beach, Isas Creek.

Ecology. Coastal lowland. Fossorial. Banks of meandering estuarine streams (3–4 m wide) running through sand dunes (Fig. 114), just above the highest tidal line, at a certain distance (2–4 m) from water. Open ground; wet, sandy (yellow), bare soil. Nocturnal; hides during the day in the sand. Gregarious. Occurs in association with staphylinids (Coleoptera).

Biology. Seasonality: October–February. Tenerals: December–February. Food: Staphylinids (Coleoptera). Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Brachypterous (incapable of flight). Moderate runner. Vagility limited by flight incapacity.

Collecting techniques. Pouring water over the ground; treading the soil with the feet.

Reference. Larochelle and Larivière 2001: 86 (as *Zecillenus chalmeri* and *Z. embersoni*; catalogue; biology, dispersal power, ecology, geographic distribution, references).

Remarks. Examination of the holotype of *Cillenum batesi* confirmed it to be conspecific with *Bembidion chalmeri*. The illustration of the pronotum of *Bembidion chalmeri* by Lindroth (1980, Fig. 12; as *Zecillenus chalmeri*) does not represent the normal situation for this species where the pronotum is distinctly constricted basally.

***Bembidion* (*Zecillenus*) *embersoni* (Lindroth, 1980)**
Fig. 9, 82

Zecillenus embersoni Lindroth, 1980: 185. Type locality: Mason Bay, Stewart Island.
Bembidion (*Zecillenus*) *embersoni*: Toledano 2005: 130.

Description. Body length 5.0 mm. Head black; pronotum black with rufotestaceous lateral margins; elytra pale testaceous, with a black triangular discal marking (reaching interval 6) and interval 2 infuscated behind middle; antennae bicolored, with segments 1–4 pale testaceous and segments 5–11 strongly infuscated; legs pale testaceous, with apex of femora, base of tibiae and tarsi slightly infuscated;

abdomen dark brown. Microsculpture strong, irregularly isodiametric on disc of head; obsolete, with traces of transverse meshes (microlines) on disc of pronotum; strong on elytra, isodiametric on disc, granulate elsewhere. Head, pronotum, and disc of elytra shiny, remainder of elytra dull; metallic lustre present on head and disc of elytra (aeneous). **Thorax**. Pronotum widest about middle; sides moderately rounded anteriorly, not sinuate posteriorly; posterolateral angles subrectangular; laterobasal foveae shallow, ill-defined (vaguely elongate), short, not reaching basal margin. **Elytra**. Elliptical, widest about middle. Shoulders somewhat prominent. Sides moderately rounded. Striae incomplete, barely suggested and impunctate laterally and apically; striae 2–5 poorly impressed, shallow and finely punctate on disc; striae 6–7 obsolete. Intervals subdepressed. Lateral margins slightly widened subapically; subapical tooth obtuse. Subapical sinuations moderately strong. Sutural apices obtusely rounded. Apex strongly rounded. **Aedeagus**. Male unknown.

Material examined. 1 specimen (NZAC).

Geographic distribution (Fig. 82). Stewart Island: Mason Bay.

Ecology. Coastal lowland. Area of extensive sand dunes; probably along the sandy banks of a meandering estuarine stream.

Biology. Seasonality: February.

Dispersal power. Brachypterous (incapable of flight). Moderate runner. Vagility limited by flight incapacity.

Reference. Larochelle and Larivière 2001: 86 (as *Zecillenus embersoni*; catalogue; biology, dispersal power, ecology, geographic distribution, reference).

Subgenus *Notaphus* Stephens, 1827

Fig. 10

Notaphus Stephens, 1827: 51.

Type species. *Carabus varius* Olivier, 1795, designated by Westwood 1838: 7.

Description. Body length 5.1–6.5 mm; color mostly dark; elytra with variegated color pattern; legs pale. Microsculpture present, well developed. Forebody very wide in comparison to elytra. **Head**. Antennae submoniliform, rather short, reaching about elytral base. Frontal furrows prolonged on clypeus (contrary to other subgenera). Submentum with six setae. Ligula with two fused setae. Palpi with penultimate labial segment bisetose on anterior margin. **Thorax**. Pronotum depressed, rectangular (cordate in other subgenera), widest before middle; laterobasal carinae present; two setiferous punctures on each side, posterolateral puncture close to posterolateral angle (as in subgenus *Ananotaphus*); laterobasal foveae well developed. Epipleura (in dorsal view) not exposed in front of posterolateral angles. **Elytra**. Subdepressed, oblong, widest about middle. Shoulders angulate. Scutellar striole consisting of a row of punctures. Striae complete, punctate. Intervals depressed; interval 3 with two small discal setiferous punctures; interval 5 without discal setiferous punctures. Subapical sinuations feeble. Apical striole present; preapical setiferous puncture not isolated. Sutural apices angulate. **Abdomen**. Last visible sternum (sternum VII) of female with four long ambulatory setae only. **Aedeagus**. Internal sac with a brush sclerite. **Parameres**. One or two terminal setae present.

Geographic distribution. Holarctic and Neotropical Regions; Australia and New Zealand (adventive).

Ecology. Salt flats; banks of lagoons and estuarine streams.

References. Lindroth 1976 (description); Larochelle and Larivière 2001: 80 (catalogue); Toledano 2005 (taxonomy); Larochelle and Larivière 2007: 47 (description).

***Bembidion* (*Notaphus*) *brullei* Gemminger and Harold, 1868**
Fig. 10, 45, 75

Bembidion variegatum Brullé, 1838: 44. Type locality: Montevideo, Uruguay. Primary homonym of *Bembidium variegatum* Say, 1823.
Other synonymy as in Larochelle and Larivière (2001: 80).

Description. Body length 5.1–6.5 mm. Forebody piceous; elytra yellowish with a dark variegated color pattern; antennae and legs yellowish (antennal segments 2–11 infuscated apically). Microsculpture of head, pronotum, and elytra very strong, isodiametric or almost brick-shaped. Dull, with metallic lustre (bronze, greenish). **Thorax**. Pronotum: sides moderately rounded anteriorly, moderately sinuate posteriorly; posterolateral angles rectangular, sharp at tip; laterobasal foveae moderately deep, flat and square, moderately long, reaching basal margin. **Elytra**. Sides subparallel. Scutellar striole consisting of a row of punctures. Striae complete, shallow, finely punctate; stria 7 strong, finely punctate. Apical striole shallow, connected to stria 7. **Aedeagus**. Lateral view (Fig. 45): moderately arcuate; base slightly convex dorsally; middle wide, subparallel; apex subtriangular, mostly straight dorsally, with extreme tip wide and short.

Material examined. 51 specimens (NZAC).

Geographic distribution (Fig. 75). North Island: AK, BP, GB, HB, ND, WA, WI, WN. South Island: DN, KA, MB, MC, NN. Offshore Islands: AU. Extralimital range: Uruguay, Argentina, Falkland Islands, Australia (mainland), Lord Howe Island. Adventive. First New Zealand records: Auckland, AK, 1959 (NZAC); Auckland Islands, AU (Jeannel, 1962: 621). Well established.

Ecology. Coastal lowland. Epigean. Salt flats; banks of lagoons and estuarine streams. Open ground; wet, sandy, loamy or muddy, bare or sparsely vegetated soil. Nocturnal; hides during the day under vegetal debris, stones, at the base of plants, and in soil crevices. Gregarious.

Biology. Seasonality: December–May. Tenerals: September–October, December–January, March. Defence mechanism: when alarmed, the adult escapes by running or flying.

Dispersal power. Macropterous, capable of flight. Occasional flier to artificial lights at night. Moderate runner. Vagility strongly favoured by flight capacity.

Collecting techniques. Turning debris and stones; pouring water over the ground; treading the soil with the feet.

Reference. Larochelle and Larivière 2001: 80 (catalogue; biology, dispersal power, ecology, geographic distribution, references).

Remark. Lindroth (1976) recorded only four localities for this species; it is now known from many localities across the North Island, the South Island, and the subantarctic Auckland Islands.

Subgenus *Ananotaphus* Netolitzky, 1931
Fig. 11

Ananotaphus Netolitzky, 1931: 181.

Type species. *Bembidium errans* Blackburn, 1888, by monotypy.

Description. Body length 3.5–4.6 mm; color mostly dark; elytra without variegated color pattern; legs mostly dark. Microsculpture present, poorly or well developed. Forebody moderately wide in comparison to elytra. **Head**. Antennae submoniliform, rather short, reaching about elytral base. Frontal furrows not prolonged on clypeus. Submentum with six setae. Ligula with two free, approximate setae. Palpi with penultimate labial segment bisetose on anterior margin. **Thorax**. Pronotum moderately convex, cordate, widest before middle; laterobasal carinae absent; two setiferous punctures on each side, posterolateral puncture close to posterolateral angle (as in subgenus *Notaphus*); laterobasal foveae poorly developed. Epipleura (in dorsal view) not exposed in front of posterolateral angles. **Elytra**. Moderately convex, ovate or subovate, widest about middle. Shoulders moderately rounded. Scutellar striole consisting of a row of punctures. Striae incomplete, punctate; stria 3 with two discal setiferous punctures, more or less foveate (not foveate in other subgenera). Intervals depressed; interval 5 without discal setiferous punctures. Subapical sinuations feeble. Apical striole absent or almost so; preapical setiferous puncture isolated. Sutural apices angulate. **Abdomen**. Last visible sternum (sternum VII) of female with numerous short setae in addition to four long ambulatory setae. **Aedeagus**. Internal sac with a brush sclerite. **Parameres**. One or two terminal setae present.

Geographic distribution. Australia, New Zealand (Native).

Ecology. Mostly banks of streams, shores of lakes, ponds, sea beaches, lagoons and salt marshes.

References. Lindroth 1976 (description); Larochelle and Larivière 2001: 79 (catalogue); Toledano 2005: 89–93 (taxonomy); Larochelle and Larivière 2007: 47 (description).

***Bembidion* (*Ananotaphus*) *rotundicolle* Bates, 1874**
Fig. 11, 46, 95

Bembidium rotundicolle Bates, 1874: 275. Type locality: Lake Coleridge, MC (Bates, 1874: 275); Canterbury (Lindroth 1976: 195, lectotype designated).
Bembidium eustictum Bates, 1878a: 195. Type locality: Tairua, CL. **New synonym**
Bembidium clevedonense Broun, 1893: 1007. Type locality: Near Clevedon, Southern Wairoa [River], AK (Broun, 1893: 1008); "Hunua" [= Hunua Ranges], Clevedon, AK (Lindroth, 1976: 196, lectotype designated). Synonymized by Lindroth 1976: 196.
Bembidium waikatoense Broun, 1910: 9. Type locality: Mt Pirongia, WO. Synonymized by Lindroth 1976: 196.
Bembidion (*Peryphus*) *clevedonense*: Csiki 1928: 90.
Bembidion (*Peryphus*) *eustictum*: Csiki 1928: 95.
Bembidion waikatoense: Csiki 1928: 163.
Bembidion (*Peryphus*) *rotundicolle*: Csiki 1928: 110.
Bembidion (*Zeactedium*) *clevedonense*: Netolitzky 1931: 182.
Bembidion (*Zeactedium*) *eustictum*: Netolitzky 1931: 182.
Bembidion (*Zeactedium*) *rotundicolle*: Netolitzky 1931: 182.
Bembidion (*Ananotaphus*) *rotundicolle rotundicolle*: Lindroth 1976: 195.
Bembidion (*Ananotaphus*) *rotundicolle eustictum*: Lindroth 1976: 196.

Description. Body length 3.5–4.6 mm. Forebody black or piceous; elytra dark brown tinged with reddish, with or without a pale subhumeral marking, always with a pale subapical marking; antennae and legs dark brown tinged with reddish (tibiae paler rufous). Microsculpture feeble to moderate, isodiametric. Shiny, with metallic lustre (aeneous, bronze, greenish). **Thorax**. Pronotum: sides strongly rounded anteriorly, oblique and slightly sinuate posteriorly; posterolateral angles strongly obtuse, somewhat rounded at tip; laterobasal foveae shallow to moderately deep, linear, short to moderately long, not reaching basal margin. **Elytra**. Ovate or subovate. Sides subparallel or slightly rounded. Striae 2–6

incomplete, moderately deep, finely or moderately coarsely punctate; stria 7 strong, incomplete, finely or moderately coarsely punctate. Discal setiferous punctures strong, foveate, situated near stria 3. **Aedeagus**. Lateral view (Fig. 46): strongly arcuate, widened in apical half; base slightly concave dorsally; middle strongly convex dorsally with dorsal membranous area moderately wide and long and deflected to the left, slightly convex ventrally; apex subtriangular, rather straight dorsally and ventrally, with extreme tip triangular, wide and short.

Material examined. 301 specimens (JNNZ, LUNZ, MONZ, NZAC).

Geographic distribution (Fig. 95). North Island: AK, BP, CL, GB, HB, ND, RI, TO, WA, WI, WN, WO. South Island: BR, CO, DN, KA, MC, MK, NC, NN, OL, SC, SD, SL, WD. Offshore Islands: CH.

Ecology. Lowland, montane, subalpine. Epigean. Eurytopic. Mostly banks of streams, shores of lakes, ponds, sea beaches, lagoons and salt marshes. Also subalpine swards, cultivated fields and pastures. Open ground; moist or wet, sandy, loamy, muddy or clay, bare or sparsely vegetated soil. Nocturnal; hides during the day in the soil, in soil crevices, at the base of plants, under plant debris, moss carpets, algal mats, stones, and logs. Gregarious.

Biology. Seasonality: September–May, July–August. Tenerals: January–March. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running or flying short distances.

Dispersal power. Wing-dimorphic. Macropterous (capable of flight) or brachypterous (incapable of flight). Slow runner. Vagility likely favoured by flight capacity.

Collecting techniques. Pouring water over the ground; treading the soil with the feet; turning debris and stones.

Reference. Larochelle and Larivière 2001: 80 (catalogue; biology, dispersal power, ecology, geographic distribution, references).

Remark. This is the most variable of all New Zealand *Bembidion* species. Morphological variation in terms of size, color, microsculpture, body shape, and length of membranous wings, encompasses the range previously attributed to *Bembidion rotundicolle rotundicolle* and *B. rotundicolle eustictum*. In addition, the configuration of the male aedeagus is stable across all populations studied. Consequently, there is no need to maintain the subspecific status of *Bembidion rotundicolle eustictum* and, together with its synonyms *B. clevedonense* and *B. waikatoense,* it is synonymized it with *B. rotundicolle*.

Subgenus *Zeplataphus* Lindroth, 1976
Fig. 12–18

Zeplataphus Lindroth, 1976: 169.

Type species. *Bembidium maorinum* Bates, 1867, by original designation.

Description. Body length 3.8–9.3 mm; color dark; elytra without variegated color pattern; legs mostly dark. Microsculpture absent on head and pronotum, usually present and well developed on elytra (rarely absent or poorly developed). Forebody narrow in comparison to elytra. **Head**. Antennae filiform, very long, reaching about basal third of elytra. Frontal furrows not prolonged on clypeus. Mentum with medial tooth truncate or subtruncate at tip (entire in other subgenera). Submentum usually with six setae (rarely with four setae). Ligula with two fused setae. Palpi with penultimate labial segment bisetose on anterior margin. **Thorax**. Pronotum usually moderately convex (rarely strongly convex), cordate, widest before middle; laterobasal carinae absent; setiferous puncture absent near posterolateral angle;

laterobasal foveae poorly developed. Epipleura (in dorsal view) exposed in front of posterolateral angles. **Elytra**. Usually subdepressed (rarely slightly convex), oblong-elongate, widest before middle. Shoulders angulate. Scutellar striole usually consisting of a row of punctures (rarely of a line and punctures). Striae complete or incomplete, punctate. Intervals usually depressed (rarely slightly convex); interval 3 with three to five discal setiferous punctures; interval 5 with two discal setiferous punctures (absent in other subgenera). Subapical sinuations feeble. Apical striole present; preapical setiferous puncture not isolated. Sutural apices angulate or rounded. **Abdomen**. Last visible sternum (sternum VII) of female with or without numerous short setae in addition to four long ambulatory setae. **Aedeagus**. Internal sac with a brush sclerite. **Parameres**. One or two terminal setae present.

Geographic distribution. New Zealand (Endemic).

Ecology. Mostly gravelly river banks.

Reference. Larochelle and Larivière 2001: 84 (catalogue); Toledano 2005: 108 (taxonomy); Larochelle and Larivière 2007: 48 (description).

***Bembidion* (*Zeplataphus*) *tairuense* Bates, 1878**
Fig. 12, 47, 98

Bembidium tairuense Bates, 1878a: 193. Type locality: Tairua, CL.
Other synonymy as in Larochelle and Larivière (2001: 85).

Description. Body length 4.5–6.1 mm. Black; antennae and legs piceous (antennal segment 1 and tibiae pale rufous). Microsculpture of elytra very strong, irregularly transverse (isodiametric in other *Zeplataphus* species). Very shiny, without metallic lustre or with feeble aeneous lustre on head and pronotum, with slight metallic lustre (somewhat bluish) on elytra. **Thorax**. Pronotum strongly convex; thin raised lateral bead complete, well developed near posterolateral angles; sides moderately rounded anteriorly, slightly sinuate posteriorly; posterolateral angles rectangular, obtuse at tip; laterobasal foveae moderately deep, oblong, short, not reaching basal margin. **Elytra**. Subdepressed, elongate. Scutellar striole consisting of a line and punctures. Striae 2–6 complete, deep, coarsely punctate; stria 7 strong, incomplete, coarsely punctate. Intervals depressed; interval 3 with four or five discal setiferous punctures. Apical striole deep, connected to stria 5. Sutural apices angulate. **Abdomen**. Last visible sternum (sternum VII) of female with numerous short setae in addition to four long ambulatory setae. **Aedeagus**. Lateral view (Fig. 47): moderately arcuate; base sinuate dorsally; middle wide and strongly convex towards its base, narrow and subparallel towards its apex; apex subtriangular, slightly concave dorsally and ventrally, with extreme tip wide and short.

Material examined. 1,589 specimens (CMNH, JNNZ, LUNZ, MONZ, NZAC).

Geographic distribution (Fig. 98). North Island: AK, BP, CL, GB, HB, ND, RI, TO, WA, WI, WN, WO. South Island: BR, CO, DN, FD, KA, MB, MC, MK, NC, NN, OL, SC, SD, SL, WD.

Ecology. Lowland, montane, subalpine. Epigean. River banks, close to the water. Open ground; wet, gravelly, bare soil. Nocturnal; hides during the day deep among gravel and under small well embedded stones. Gregarious.

Biology. Seasonality: Throughout the year (September–August). Tenerals: November–March. Occasionally infested with fungi (Laboulbeniales) and mites. Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Fast runner. Vagility likely favoured by flight capacity.

Collecting techniques. Pouring water over the ground; treading the soil with the feet; raking the soil; turning stones.

Reference. Larochelle and Larivière 2001: 85 (catalogue; biology, dispersal power, ecology, geographic distribution, references).

Remarks. Lindroth (1976: 168, 176) overlooked the presence of numerous short setae in addition to the usual four long ambulatory setae on the last visible sternum (sternum VII) of the female of this species. *Bembidion tairuense* is among the most commonly encountered species on gravelly river banks. It is well recognizable among members of the subgenus *Zeplataphus* by its subdepressed elytra with transverse microsculpture.

***Bembidion* (*Zeplataphus*) *granuliferum* Lindroth, 1976**
Fig. 13, 48, 84

Bembidion (*Zeplataphus*) *granuliferum* Lindroth, 1976: 175. Type locality: Motueka River, NN.

Description. Body length 5.2–6.8 mm. Black; antennae and legs piceous (antennal segment 1 rufous, at least underneath). Microsculpture of elytra very strong, regularly isodiametric in male, more or less granulate in female. Dull (shiny, other *Zeplataphus* species), with slight metallic lustre (green, blue, aeneous). **Thorax**. Pronotum moderately convex; thin raised lateral bead complete, well developed near posterolateral angles; sides moderately rounded anteriorly, moderately sinuate posteriorly; posterolateral angles rectangular, rounded at tip; laterobasal foveae moderately deep, oblong, short, not reaching basal margin. **Elytra**. Subdepressed, elongate. Scutellar striole consisting of a row of punctures. Striae complete, shallow, finely punctate; stria 7 strong, finely punctate. Intervals depressed; interval 3 with four or five discal setiferous punctures. Apical striole deep, connected to stria 5. Sutural apices rounded. **Abdomen**. Last visible sternum (sternum VII) of female with numerous short setae in addition to four long ambulatory setae. **Aedeagus**. Lateral view (Fig. 48): moderately arcuate; base slightly convex dorsally; middle strongly convex dorsally with a slight concavity towards its apex, rather straight ventrally; apex subtriangular, rather straight dorsally, slightly concave ventrally, with extreme tip narrow and long.

Material examined. 369 specimens (CMNH, JNNZ, LUNZ, MONZ, NZAC).

Geographic distribution (Fig. 84). North Island: BP, GB, HB, RI, WA, WI, WN. South Island: BR, DN, KA, MB, MC, MK, NC, NN, SC, WD.

Ecology. Lowland. Epigean. Banks and beds of big rivers (often near their mouths), close to the water. Open ground; wet, gravelly, bare soil. Nocturnal; hides during the day deep under stones and among gravel. Gregarious.

Biology. Seasonality: September–April, July. Tenerals: December–March. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Fast runner. Vagility likely favoured by flight capacity.

Collecting techniques. Turning stones; raking the soil.

Reference. Larochelle and Larivière 2001: 84 (catalogue; biology, dispersal power, ecology, geographic distribution, references)

***Bembidion* (*Zeplataphus*) *townsendi* Lindroth, 1976**
Fig. 14, 102

Bembidion (*Zeplataphus*) *townsendi* Lindroth, 1976: 176. Type locality: Limestone Creek, Teal Valley, near Nelson, NN.

Description. Body length 3.8 mm. Black; antennae and legs rufous (antennal segments 3–11 and femora slightly infuscated). Microsculpture of elytra in female, very strong, regularly isodiametric. Very shiny, with slight metallic lustre (aeneous). **Thorax**. Pronotum moderately convex; thin raised lateral bead complete, well developed near posterolateral angles; sides moderately rounded anteriorly, slightly sinuate posteriorly; posterolateral angles rectangular, obtuse at tip; laterobasal foveae shallow, obsolete, not reaching basal margin. **Elytra**. Slightly convex, elongate. Scutellar striole consisting of a row of punctures. Striae 2–6 complete, deep, coarsely punctate; stria 7 strong, incomplete, coarsely punctate. Intervals slightly convex; interval 3 with three discal setiferous punctures. Apical striole deep, connected to stria 5. Sutural apices angulate. **Abdomen**. Last visible sternum (sternum VII) of female with numerous short setae in addition to four long ambulatory setae. **Aedeagus**. Male unknown.

Material examined. 1 specimen (NZAC).

Geographic distribution (Fig. 102). South Island: NN–Teal Valley, Limestone Creek.

Ecology. Lowland. Habitat unknown; probably riparian.

Biology. Seasonality: January.

Dispersal power. Macropterous, probably capable of flight. Moderate runner. Vagility likely favoured by flight capacity.

Reference. Larochelle and Larivière 2001: 85 (catalogue; biology, dispersal power, ecology, geographic distribution, references).

Remarks. The authors have made abundant collections of *Bembidion* species in Teal Valley (NN) and neighbouring areas but could not secure new specimens of *B. townsendi* which is only known from the female holotype. In Teal Valley, *Bembidion* (*Zemetallina*) *parviceps* and *B.* (*Zeplataphus*) *tairuense* – a rather small species morphologically close to and belonging to the same subgenus as *B. townsendi* – were both abundant in the field. Two aberrant specimens of *B.* (*Zemetallina*) *parviceps* were found; they were small in size like *B. townsendi* and possessed the *Zeplataphus* character of the elytral interval 5 with two setiferous punctures. The authors suspect that the female holotype of *B. townsendi* may represent an aberrant form of *B. parviceps* or a hybrid specimen between *B. parviceps* and *B. tairuense*.

***Bembidion* (*Zeplataphus*) *maorinum maorinum* Bates, 1867**
Fig. 15, 49, 89

Bembidium (*Peryphus*) *maorinum* Bates, 1867: 56. Type locality: Province of Canterbury, South Island (Bates, 1867: 56); New Zealand (Lindroth 1976: 171, lectotype designated).
Other synonymy as in Larochelle and Larivière (2001: 85).

Description. Body length 5.8–8.0 mm. Black; antennae and legs black (antennal segment 1 rufous underneath and tibiae often piceous). Microsculpture of elytra feeble on intervals 1–5, strong on intervals 6–7, irregularly isodiametric, somewhat stronger in female. Very shiny, with moderately strong metallic lustre (aeneous or greenish, rarely bluish). **Thorax**. Pronotum moderately convex, much wider than head (contrary to other *Zeplataphus* species); thin raised lateral bead incomplete, obsolete near posterolateral angles; sides strongly rounded anteriorly, moderately sinuate posteriorly; posterolateral

angles subrectangular, somewhat sharp at tip; laterobasal foveae moderately deep, oblong, short, not reaching basal margin. **Elytra**. Slightly convex, short. Scutellar striole consisting of a row of punctures. Striae 2–6 complete, deep, coarsely punctate; stria 7 strong, complete although slightly evanescent apically, coarsely punctate. Intervals depressed, becoming slightly convex posteriorly; interval 3 with three or four discal setiferous punctures. Apical striole shallow, connected to stria 5. Sutural apices rounded. **Abdomen**. Last visible sternum (sternum VII) of female with four long ambulatory setae only. **Aedeagus**. Lateral view (Fig. 49): moderately arcuate; base moderately concave dorsally; middle moderately convex dorsally, strongly concave ventrally; apex triangular, with extreme tip moderately wide and long.

Material examined. 1,011 specimens (CMNH, JNNZ, MONZ, NZAC).

Geographic distribution (Fig. 89). South Island: BR, CO, DN, FD, KA, MB, MC, MK, NC, NN, OL, SC, SD, SL, WD.

Ecology. Lowland, montane. Epigean. Banks and beds of rivers and brooks, at a certain distance (0–2 m) from water. Open ground; wet, gravelly, bare soil. Nocturnal; hides during the day deep among gravel and under stones as well as around their edges. Gregarious.

Biology. Seasonality: September, November–March, June. Tenerals: January–March. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Fast runner. Vagility likely favoured by flight capacity.

Collecting techniques. Raking the soil; turning stones.

Reference. Larochelle and Larivière 2001: 85 (catalogue; biology, dispersal power, ecology, geographic distribution, reference).

Bembidion (*Zeplataphus*) *maorinum levatum* Lindroth, 1976

Fig. 16, 88

Bembidion (*Zeplataphus*) *maorinum levatum* Lindroth, 1976: 171. Type locality: Mangakirikiri Stream, Urewera National Park, GB.

Description. Body length 5.8–7.9 mm. Black; antennae and legs black (antennal segment 1 rufous underneath and tibiae often piceous). Microsculpture absent on elytra. Very shiny, with moderately strong metallic lustre (aeneous or greenish, rarely bluish). **Thorax**. Pronotum moderately convex, much wider than head (contrary to other *Zeplataphus* species); thin raised lateral bead incomplete, obsolete near posterolateral angles; sides strongly rounded anteriorly, moderately sinuate posteriorly; posterolateral angles subrectangular, somewhat sharp at tip; laterobasal foveae moderately deep, oblong, short, not reaching basal margin. **Elytra**. Slightly convex, short. Scutellar striole consisting of a row of punctures. Striae 2–6 complete, deep, coarsely punctate; stria 7 strong, complete although slightly evanescent apically, coarsely punctate. Intervals depressed, becoming slightly convex posteriorly; interval 3 with three or four discal setiferous punctures. Apical striole shallow, connected to stria 5. Sutural apices rounded. **Abdomen**. Last visible sternum (sternum VII) of female with four long ambulatory setae only. **Aedeagus**. As in *B. m. maorinum*.

Material examined. 255 specimens (JNNZ, MONZ, NZAC).

Geographic distribution (Fig. 88). North Island: AK, BP, GB, HB, RI, TO, WA, WI, WN, WO.

Ecology. Lowland, montane. Epigean. Banks and beds of rivers and brooks, at a certain distance (0–2 m) from water. Open ground; wet, gravelly, bare soil. Nocturnal; hides during the day deep among gravel and under stones and as well as around their edges. Gregarious.

Biology. Seasonality: September, November–April. Tenerals: December–January. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Fast runner. Vagility likely favoured by flight capacity.

Collecting techniques. Raking the soil; turning stones.

Reference. Larochelle and Larivière 2001: 84–85 (catalogue; biology, dispersal power, ecology, geographic distribution, reference).

***Bembidion* (*Zeplataphus*) *charile* Bates, 1867**
Fig. 17, 50, 80

Bembidium (*Peryphus*) *charile* Bates, 1867: 79. Type locality: Province of Canterbury, South Island (Bates, 1867: 79); Christchurch, MC (Bates, 1874: 274); Canterbury (Lindroth 1976: 175, lectotype designated).
Other synonymy as in Larochelle and Larivière (2001: 84).

Description. Body length 6.5–9.3 mm. Black; antennae mostly pale yellowish (apex more or less infuscated); femora black (apex pale), tibiae and tarsi mostly pale yellowish. Microsculpture of elytra very strong, regularly isodiametric in male, almost granulate in female. Very shiny, with strong metallic lustre (aeneous, rarely bluish or greenish); tibiae sometimes with slight metallic lustre. **Thorax**. Pronotum moderately convex; thin raised lateral bead incomplete, obsolete near posterolateral angles; sides slightly rounded anteriorly, slightly sinuate posteriorly; posterolateral angles subrectangular, slightly projected laterally, somewhat obtuse at tip; laterobasal foveae very deep, oblong, short, not reaching basal margin. **Elytra**. Subdepressed, elongate. Scutellar striole consisting of a row of punctures. Striae 2–6 complete, shallow, finely punctate; stria 7 strong, complete, finely punctate. Intervals depressed; interval 3 with four or five discal setiferous punctures. Apical striole deep, connected to stria 5. Sutural apices rounded. **Abdomen**. Last visible sternum (sternum VII) of female with four long ambulatory setae only. **Aedeagus**. Lateral view (Fig. 50): moderately arcuate, gradually narrowed from base to apex; base rather straight dorsally; middle strongly convex dorsally with a concavity towards its apex, strongly concave ventrally; apex subtriangular, slightly convex dorsally, rather straight ventrally, with extreme tip narrow and short.

Material examined. 434 specimens (JNNZ, LUNZ, MONZ, NZAC).

Geographic distribution (Fig. 80). North Island: BP, GB, HB, RI, TK, TO, WA, WI, WN. South Island: BR, CO, DN, FD, KA, MB, MC, MK, NC, OL, SC, WD.

Ecology. Lowland, montane. Epigean. Banks and beds of rivers and brooks, close to the water. Open ground; wet, sandy bare soil with scattered stones. Nocturnal; hides during the day among gravel and under stones. Gregarious.

Biology. Seasonality: September–May. Tenerals: November–December, March. Occasionally infested with fungi (Laboulbeniales). Once observed with pseudoscorpion attached to body (TO). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Fast runner. Vagility likely favoured by flight capacity.

Collecting techniques. Raking the soil; turning stones.

Reference. Larochelle and Larivière 2001: 84 (catalogue; biology, dispersal power, ecology, geographic distribution, reference).

Remark. *Bembidion charile* and *B. dehiscens* are the largest members of the genus *Bembidion* in New Zealand; they are recognizable by their small pronotum, slender appendages, and rather flat elytra.

***Bembidion* (*Zeplataphus*) *dehiscens* Broun, 1893**
Fig. 18, 51, 81

Bembidium dehiscens Broun, 1893: 1009. Type locality: Pakuratahi Stream [=River], Rimutaka Range, WN (Broun 1893: 1009); Rimutaka Range, WN (Lindroth 1976: 173), lectotype designated).
Other synonymy as in Larochelle and Larivière (2001: 84).

Description. Body length 6.2–9.0 mm. Black; antennae and legs piceous to rufous (antennal segment 1, when rufous, infuscated above). Microsculpture of elytra moderately strong, irregularly isodiametric. Moderately shiny, with moderately strong metallic lustre (aeneous). **Thorax**. Pronotum moderately convex; thin raised lateral bead incomplete, obsolete near posterolateral angles; sides slightly rounded anteriorly, slightly sinuate posteriorly; posterolateral angles subrectangular, moderately projected laterally, somewhat sharp at tip; laterobasal foveae very deep, oblong, short, not reaching basal margin. **Elytra**. Subdepressed, elongate. Scutellar striole consisting of a row of punctures. Striae 2–6 incomplete (evanescent apically), shallow, finely punctate; stria 7 strong, incomplete, finely punctate. Intervals depressed; interval 3 with four or five setiferous punctures. Apical striole deep, connected to stria 5. Sutural apices rounded. **Abdomen**. Last visible sternum (sternum VII) of female with four long ambulatory setae only. **Aedeagus**. Lateral view (Fig. 51): moderately arcuate; base moderately concave dorsally; middle mostly narrow and subparallel; apex triangular, with extreme tip moderately narrow and long.

Material examined. 711 specimens (CMNH, JNNZ, LUNZ, MONZ, NZAC).

Geographic distribution (Fig. 81). North Island: BP, GB, HB, RI, TO, WA, WI, WN. South Island: BR, FD, KA, MB, MC, NC, NN, OL, SD, WD.

Ecology. Lowland, montane, subalpine. Epigean. Banks of big rivers, close to the water. Open ground; wet, gravelly or gravelly-stony, bare soil. Nocturnal; hides during the day deep among gravel and under stones. Gregarious.

Biology. Seasonality: September–April, June. Tenerals: November–March. Often infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running or flying short distances.

Dispersal power. Macropterous, capable of flight. Occasional flier. Fast runner. Vagility favoured by flight capacity.

Collecting techniques. Raking the soil; turning stones.

Reference. Larochelle and Larivière 2001: 84 (catalogue; biology, dispersal power, ecology, geographic distribution, reference).

Subgenus *Zeperyphus* Lindroth, 1976
Fig. 19

Zeperyphus Lindroth, 1976: 182.

Type species. *Bembidium actuarium* Broun, 1903, by monotypy.

Description. Body length 3.7–4.3 mm; color mostly dark; elytra without variegated color pattern; legs pale. Microsculpture absent on head, pronotum, and elytra; present, isodiametric on apex of elytra in female. Forebody narrow in comparison to elytra. **Head**. Antennae filiform, very long, reaching about basal third of elytra. Frontal furrows not prolonged on clypeus. Submentum with four setae. Ligula with two fused setae. Palpi with penultimate labial segment bisetose on anterior margin. **Thorax**. Pronotum moderately convex, cordate, widest before middle; laterobasal carinae present; setiferous puncture absent near posterolateral angle; laterobasal foveae well developed (as in subgenus *Notaphus*). Epipleura (in dorsal view) exposed in front of posterolateral angles. **Elytra**. Moderately convex, ovate, widest about middle. Shoulders strongly rounded. Scutellar striole consisting of a row of punctures. Striae incomplete, punctate. Intervals strongly convex (contrary to other subgenera); interval 3 with two discal setiferous punctures; interval 5 without discal setiferous punctures. Subapical sinuations feeble. Apical striole absent or almost so; preapical setiferous puncture isolated. Sutural apices angulate. **Abdomen**. Last visible sternum (sternum VII) of female with numerous short setae in addition to four long ambulatory setae. **Aedeagus**. Internal sac with a brush sclerite. **Parameres**. One or two terminal setae present.

Geographic distribution. New Zealand (endemic).

Ecology. Sandy stream banks.

References. Lindroth 1976: 182 (description); Larochelle and Larivière 2001: 83 (catalogue), 2007: 48 (description).

***Bembidion* (*Zeperyphus*) *actuarium* Broun, 1903**
Fig. 19, 52, 71

Bembidium actuarium Broun, 1903: 611. Type locality: Pipiriki, Wanganui [=Whanganui] River, RI (Broun 1903: 611).
Other synonymy as in Larochelle and Larivière (2001: 84).

Description. Body length 3.7–4.3 mm. Black; elytra rufous at extreme apex; antennae and legs rufous (antennal segments 3–11 infuscated). Very shiny, with feeble metallic lustre (greenish, bluish). **Thorax**. Pronotum: sides moderately rounded anteriorly, strongly sinuate posteriorly; posterolateral angles acute, slightly projected laterally, sharp at tip; laterobasal foveae very deep, elongate-oblong, moderately long, reaching basal margin. **Elytra**. Sides strongly rounded. Striae 2–6 incomplete, deep, coarsely punctate in basal half; stria 7 strong, incomplete, coarsely punctate. **Aedeagus**. Lateral view (Fig. 52): moderately arcuate, slender; base slightly concave dorsally; middle moderately convex dorsally with a slight concavity towards its apex, slightly concave ventrally; apex subtriangular, rather straight dorsally and ventrally, with extreme tip wide and short.

Material examined. 202 specimens (CMNH, JNNZ, MONZ, NZAC).

Geographic distribution (Fig. 71). North Island: AK, BP, GB, HB, ND, RI, TK, TO, WA, WI, WN, WO.

Ecology. Lowland. Epigean. Stream banks, at a certain distance from water (1–10 m). Open or half-shaded ground; wet, sandy, sparsely vegetated soil. Nocturnal; hides during the day usually under fallen leaves, also under fallen branches and stones, as well as in soil crevices. Gregarious.

Biology. Seasonality: October–April. Tenerals: December–February, April. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Wing-dimorphic. Mostly brachypterous (incapable of flight), rarely macropterous (probably capable of flight). Moderate runner. Vagility usually limited by flight incapacity.

Collecting techniques. Turning branches and stones; pouring water over the ground; treading the soil with the feet.

Reference. Larochelle and Larivière 2001: 84 (catalogue; biology, dispersal power, ecology, geographic distribution, reference).

Remark. Lindroth (1976) recorded only six localities for this species; it is now known from numerous localities across the North Island.

Subgenus *Zeactedium* Netolitzky, 1931

Fig. 20–22

Zeactedium Netolitzky, 1931: 182.

Type species. *Bembidium orbiferum* Bates, 1878b, by original designation.

Description. Body length 5.5–7.6 mm; color mostly dark or forebody dark and elytra bicolored; elytra with or without variegated color pattern; legs pale. Microsculpture present, poorly or moderately developed. Forebody narrow in comparison to elytra. **Head**. Antennae filiform, moderately long, reaching about elytral shoulders or very long, reaching about basal third of elytra. Frontal furrows not prolonged on clypeus. Submentum with four setae (as in subgenus *Zeperyphus*). Ligula with two free, distant setae. Palpi with penultimate labial segment plurisetose (five to seven setae) on anterior margin. **Thorax**. Pronotum moderately or strongly convex, cordate, widest before middle; laterobasal carinae absent; setiferous puncture absent near posterolateral angle; laterobasal foveae poorly developed. Epipleura (in dorsal view) exposed in front of posterolateral angles. **Elytra**. Moderately or strongly convex, ovate, widest about middle. Shoulders moderately rounded. Scutellar striole consisting of a row of punctures. Striae complete, punctate. Intervals depressed; interval 3 with two discal setiferous punctures; interval 5 without discal setiferous punctures. Subapical sinuations feeble. Apical striole present; preapical setiferous puncture not isolated. Sutural apices angulate. **Abdomen**. Last visible sternum (sternum VII) of female with four long ambulatory setae only. **Aedeagus**. Internal sac with a brush sclerite. **Parameres**. One or two terminal setae present.

Geographic distribution. New Zealand (endemic).

Ecology. Sandy river banks.

References. Lindroth 1976 (description); Larochelle and Larivière 2001: 81 (catalogue); Toledano 2005 (description of new subspecies; taxonomy); Larochelle and Larivière 2007: 48 (description).

Bembidion (*Zeactedium*) *musae* Broun, 1882

Fig. 20, 53, 90

Bembidium musae Broun, 1882: 225. Type locality: Mt Arthur, NN.
Other synonymy as in Larochelle and Larivière (2001: 81).

Description. Body length 6.2–7.6 mm. Head and pronotum black; elytra yellowish with a variegated dark color pattern; antennae and legs yellowish (antennal segments 5–11 and femora infuscated). Microsculpture strong, very transverse on head and pronotum; irregularly isodiametric to slightly transverse with a tendency to form transverse meshes on elytra in male; stronger, granulate, irregularly isodiametric on elytra in female. Very shiny, with metallic lustre on forebody and dark parts of elytra (aeneous or greenish). **Head**. Antennae moderately long (reaching about elytral shoulders). **Thorax**. Pronotum moderately convex; sides moderately rounded anteriorly, strongly sinuate posteriorly; basal constriction moderately short; posterolateral angles acute, moderately projected laterally, rounded at tip; laterobasal foveae shallow, linear, short, not reaching basal margin. **Elytra**. Moderately convex. Sides parallel about middle. Striae shallow throughout, finely punctate; stria 7 strong, finely punctate. Apical striole shallow, connected to stria 7. **Aedeagus**. Lateral view (Fig. 53): moderately arcuate, strongly widened in apical half; base strongly convex dorsally; middle strongly convex dorsally, slightly convex ventrally with dorsal membranous area wide and short; apex subtriangular, slightly concave dorsally, straight ventrally, with extreme tip wide and long.

Material examined. 187 specimens (CMNH, JNNZ, MONZ, NZAC).

Geographic distribution (Fig. 90). North Island: HB, RI, WI, WN, WO. South Island: CO, DN, FD, KA, MB, MC, NC, NN, OL, SC. Stewart Island.

Ecology. Lowland, montane. Fossorial. Banks of rivers and big brooks, at a certain distance (1–10 m) from water. Open ground; moist, soft, sandy (yellow), bare or sparsely vegetated soil. Nocturnal; hides during the day in the sand, sometimes at the base of plant-tufts and under well embedded stones. Gregarious.

Biology. Seasonality: September–April. Tenerals: January–March. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Fast runner. Vagility likely favoured by flight capacity.

Collecting techniques. Pouring water over the ground; treading the soil with the feet; turning stones.

Reference. Larochelle and Larivière 2001: 81 (catalogue; biology, dispersal power, ecology, geographic distribution, references).

Bembidion (*Zeactedium*) *orbiferum* Bates, 1878

Fig. 21, 54, 92

Bembidium orbiferum Bates, 1878b: 24. Type locality: West Coast, South Island.
Other synonymy as in Larochelle and Larivière (2001: 81).

Description. Body length 6.0–7.3 mm. Black; apex of elytra with a yellowish oblique subapical marking; antennae and legs yellowish (antennal segments 4–11 infuscated). Microsculpture feeble, irregularly isodiametric on head, consisting of confluent transverse lines on pronotum, irregularly isodiametric to slightly transverse with a tendency to form transverse meshes on elytra; microsculpture stronger in female. Moderately shiny (elytra dull in female), with metallic lustre (aeneous, greenish, bluish). **Head**. Antennae very long (reaching about basal third of elytra). **Thorax**. Pronotum strongly convex; sides strongly rounded, strongly sinuate posteriorly; basal constriction very short; posterolateral angles acute, strongly projected laterally, rather sharp at tip; laterobasal foveae very deep, linear, short, not reaching basal margin. **Elytra**. Strongly convex. Sides slightly rounded about middle. Striae deep, becoming shallower apically, coarsely punctate; stria 7 strong, coarsely punctate. Apical striole deep, connected to stria 7. **Aedeagus**. Lateral view (Fig. 54): moderately arcuate, strongly widened in apical

half; base strongly convex dorsally; middle strongly convex dorsally, slightly convex ventrally, with dorsal membranous area wide and moderately long; apex subtriangular, slightly convex dorsally, moderately concave ventrally, with extreme tip moderately wide and long.

Material examined. 31 specimens (NZAC).

Geographic distribution (Fig. 92). South Island: BR, FD, MK, NN, OL, WD.

Ecology. Lowland, montane. Fossorial. River banks and beds, at a certain distance (2–7 m) from water. Open ground; moist, soft, sandy (yellow), bare or sparsely vegetated soil. Nocturnal; hides during the day in the sand and under well embedded stones.
Gregarious.

Biology. Seasonality: September, December–March. Tenerals: December–March. One specimen infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Fast runner. Vagility likely favoured by flight capacity.

Collecting techniques. Pouring water over the ground; treading the soil with the feet; turning stones.

References. Larochelle and Larivière 2001: 81 (as *Bembidion* (*Zeactedium*) *orbiferum*; catalogue; biology, dispersal power, ecology, geographic distribution, references); Toledano 2005: 123 (taxonomy).

Remark. Lindroth (1976) recorded this species from eight localities. Three new South Island localities are added from NN (Tadmor River Bridge) and WD (Junction Littleman River and Highway 6; Karangarua River, between Rough Creek and Highway 6).

***Bembidion* (*Zeactedium*) *giachinoi* Toledano, 2005 new status**
Fig. 22, 55, 83

Bembidium orbiferum giachinoi Toledano, 2005: 123. Type locality: "New Zealand, North Island, Wanganui [=Whanganui] N.P., Wanganui [=Whanganui] River, Jerusalem", RI.

Description. Body length 5.5–6.2 mm. Black; elytra bicolored, with wide yellowish lateral margins; antennae and legs yellowish. Microsculpture feeble, slightly transverse on head and pronotum; more strongly transverse on elytra in male; isodiametric on elytra in female. Moderately shiny, with metallic lustre (greenish). **Head**. Antennae very long (reaching about basal third of elytra). **Thorax**. Pronotum strongly convex; sides strongly rounded anteriorly, moderately sinuate posteriorly; basal constriction very short; posterolateral angles rectangular, sharp at tip; laterobasal foveae very deep, linear, short, not reaching basal margin. **Elytra**. Strongly convex. Sides parallel about middle. Striae deep, becoming shallower apically, coarsely punctate; stria 7 strong, coarsely punctate. Apical striole deep, connected to stria 7. **Aedeagus**. Lateral view (Fig. 55): slightly arcuate, almost subparallel; base strongly convex dorsally with a slight concavity medially; middle slightly convex with dorsal membranous area wide and very long; apex subtriangular, straight dorsally and ventrally, with extreme tip rather narrow and short.

Material examined. 34 specimens (JNNZ, LUNZ, NZAC).

Geographic distribution (Fig. 83). North Island: GB–Mangatuna. RI–Komako, Pohangina River. Whanganui National Park (Arapoto Stream; Whanganui River, Jerusalem). RI/WI–Pohangina Valley, Makiekie Stream [= Creek] (near Utuwai, Makoura Road).

Ecology. Lowland, montane. Fossorial. River banks, at a certain distance (3–5 m) from water. Open ground; moist, soft, sandy (yellow), bare or sparsely vegetated soil. Nocturnal; hides during the day in the sand and under well embedded logs. Gregarious.

Biology. Seasonality: December–March. Tenerals: January–February. One specimen infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Fast runner. Vagility likely favoured by flight capacity.

Collecting techniques. Pouring water over the ground; treading the soil with the feet; turning logs.

Reference. Toledano 2005: 123–125 (as *Bembidion* (*Zeactedium*) *orbiferum giachinoi*; description, geographic distribution).

Remarks. Toledano (2005: 125) described a population of *Bembidion* from Jerusalem, RI (lower North Island) as *B. orbiferum giachinoi* stating that the male genitalia (Fig. 39 in Toledano) are identical to those of the nominotypical form (*Bembidion orbiferum orbiferum*) from the South Island. A close examination of the male genitalia of both forms unequivocally demonstrates them as distinct species. In addition to diagnostic characters of the male genitalia, *B. giachinoi* has the following features that clearly separate it from *B. orbiferum*: smaller, body length 5.5–6.2 mm; microsculpture slightly transverse on head; antennae entirely yellowish; pronotum with sides moderately sinuate posteriorly and posterolateral angles rectangular; elytra parallel about middle, black with wide yellowish lateral margins. The geographic distribution of these two allopatric species may also assist their identification.

Subgenus *Zeperyphodes* Lindroth, 1976
Fig. 23–24

Zeperyphodes Lindroth, 1976: 180.

Type species. *Bembidium callipeplum* Bates, 1878a, by monotypy.

Description. Body length 3.1–4.9 mm; forebody dark, elytra bicolored; elytra with variegated color pattern; legs pale. Microsculpture present, poorly or well developed. Forebody moderately wide in comparison to elytra. **Head**. Antennae filiform or subfiliform, moderately long, reaching about elytral shoulders. Frontal furrows not prolonged on clypeus. Submentum with six setae. Ligula with two fused setae. Palpi with penultimate labial segment bisetose on anterior margin. **Thorax**. Pronotum moderately convex, cordate, widest before middle; laterobasal carinae absent; setiferous puncture absent near posterolateral angle; laterobasal foveae poorly developed. Epipleura (in dorsal view) not exposed in front of posterolateral angles. **Elytra**. Moderately convex, subovate, widest about or before middle. Shoulders moderately rounded. Scutellar striole consisting of a line and punctures. Striae incomplete, punctate; stria 3 with three discal setiferous punctures. Intervals somewhat depressed or slightly convex; interval 5 without discal setiferous punctures. Subapical sinuations feeble. Apical striole present; preapical setiferous puncture not isolated. Sutural apices angulate. **Abdomen**. Last visible sternum (sternum VII) of female with four long ambulatory setae only. **Aedeagus**. Internal sac with a brush sclerite. **Parameres**. One or two terminal setae present.

Geographic distribution. New Zealand (endemic).

Ecology. Sandy stream banks.

References. Lindroth 1976: 180 (description); Larochelle and Larivière 2001: 83 (catalogue); Toledano 2005 (taxonomy); Larochelle and Larivière 2007: 48 (description).

***Bembidion* (*Zeperyphodes*) *callipeplum* Bates, 1878**
Fig. 23, 56, 77

Bembidium callipeplum Bates, 1878a: 195. Type locality: Wellington, WN.
Bembidion (*Peryphus*) *callipeplum*: Csiki 1928: 89.
Bembidion (*Zeactedium*) *callipeplum*: Netolitzky 1931: 182.
Bembidion (*Zeperyphodes*) *callipeplum*: Lindroth 1976: 182.

Description. Body length 3.1–3.9 mm. Stout. Head and pronotum black; elytra yellowish with dark brown variegated markings; antennae and legs pale testaceous (antennal segments 5–11 and femora infuscated); abdomen pale brownish. Microsculpture strong, isodiametric on head, pronotum, and elytra. Very shiny, with metallic lustre on head, pronotum, and dark elytral markings (aeneous, greenish). **Head**. Antennae filiform with segments 8–10 slender. **Thorax**. Pronotum: anterolateral angles rounded; sides strongly rounded anteriorly, slightly sinuate posteriorly; posterolateral angles subrectangular, slightly obtuse, sharp at tip; laterobasal foveae moderately deep, linear, moderately long, not reaching basal margin. **Elytra**. Widest about middle. Sides evenly and moderately rounded. Striae 2–6 incomplete, moderately deep, finely punctate; striae 6–7 weak, incomplete, finely punctate. Intervals very slightly convex. Apical striole shallow, connected to stria 5. **Aedeagus**. Lateral view (Fig. 56): strongly arcuate; base strongly convex dorsally with a very slight concavity towards its apex; middle strongly convex dorsally with dorsal membranous area moderately wide and long, deflected to the left, strongly concave ventrally; apex slender with a dorsal membranous area wide and deflected to the left, very slightly convex dorsally, rather straight ventrally, with extreme tip wide and short.

Material examined. 222 specimens (JNNZ, MONZ, NZAC).

Geographic distribution (Fig. 77). North Island: BP, GB, HB, RI, WA, WI, WN.

Ecology. Coastal and inland lowland. Epigean, fossorial. Stream banks, at a certain distance from water (2–10 m). Open ground; wet, sandy-silty bare soil. Nocturnal; hides during the day in soil crevices, as well as under plant leaves and fallen branches. Gregarious.

Biology. Seasonality: October, January, March–June. Tenerals: December. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Moderate runner. Vagility likely favoured by flight capacity.

Collecting techniques. Pouring water over the ground; treading the soil with the feet; raking the soil; turning fallen branches.

References. Lindroth 1976: 182 (taxonomy); Larochelle and Larivière 2001: 83 (catalogue; biology, dispersal power, ecology, geographic distribution, references).

Remark. The geographic distribution provided by Lindroth (1976) for this species included records for *Bembidion nesophilum* which is resurrected from synonymy in the current revision. *Bembidion callipeplum* is now known from numerous localities, mostly in southern areas of the North Island.

***Bembidion* (*Zeperyphodes*) *nesophilum* Broun, 1886 revised status**
Fig. 24, 57, 91

Bembidium nesophilum Broun, 1886: 828. Holotype: male (BMNH) labeled: "var. 114. (hand-written/ 1472. [male symbol] (hand-written) / Type (circular red-bordered label; typed)/ New Zeal. Broun Coll. Brit. Mus. 1922–482. (white label with red horizontal line; typed) Bembidion nesophilum. (hand-writ-

ten) / Waikato [=Lower Waikato River] (hand-written) / LECTOTYPE (rectangular red-bordered label (typed) nesophilum Lth. (hand-written) By C.H. Lindroth (typed) / callipeplum Bts. (hand-written) det. Lindroth (typed) .74 (hand-written)." Synonymized with *B. callipeplum* Bates, 1878 by Lindroth, 1976: 182.
Bembidion (*Peryphus*) *nesophilum*: Csiki 1928: 104.
Bembidion (*Zeactedium*) *nesophilum*: Netolitzky 1931: 182.

Description. Body length 3.6–4.9 mm. Slender. Head and pronotum black; elytra yellowish with light brown variegated markings; antennae and legs pale testaceous; abdomen pale brownish. Microsculpture transverse, obsolete on disc of head and pronotum, feeble on elytra. Very shiny, with metallic lustre on head, pronotum, and dark elytral markings (aeneous, greenish). **Head**. Antennae subfiliform, with segments 8–10 stout. **Thorax**. Pronotum: anterolateral angles obtuse; sides strongly rounded anteriorly, strongly sinuate posteriorly; posterolateral angles acute, projected laterally, sharp at tip; laterobasal foveae obsolete, shallow, sublinear, moderately long, not reaching basal margin. **Elytra**. Widest before middle. Sides very slightly rounded anteriorly (almost parallel). Striae 2–6 incomplete, shallow, finely punctate; striae 6–7 weak, incomplete, finely punctate. Intervals depressed to subdepressed. Apical striole shallow, connected to stria 5. **Aedeagus**. Lateral view (Fig. 57): strongly angulate; base slightly convex dorsally with a slight concavity towards its apex; middle angulate dorsally with dorsal membranous area very wide and long, deflected to the left, rather straight ventrally; apex stout, triangular, straight dorsally and ventrally, with extreme tip wide and short.

Material examined. 203 specimens (AMNZ, BMNH, CMNH, JNNZ, NZAC).

Geographic distribution (Fig. 91). North Island: AK, ND, WO.

Ecology. Coastal lowland. Fossorial. Banks of meandering estuarine streams (2–3 m wide) situated near dunes, just above the highest tidal line, at a certain distance (2–3 m) from water. Also banks and shores of neighbouring streams, lagoons, and lakes. Open ground; wet, sandy (white, yellow, black), bare soil. Nocturnal; hides during the day in the sand. Gregarious. Occurs in association with staphylinids and *Bembidion* (*Zecillenus*) species.
Biology. Seasonality: September–March. Tenerals: December–March. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Fast runner. Vagility likely favoured by flight capacity.

Collecting techniques. Pouring water over the ground; treading the soil with the feet.

References. Lindroth 1976: 182 (as a synonym of *Bembidion callipeplum*; taxonomy); Larochelle and Larivière 2001: 83 (as a synonym of *Bembidion callipeplum*; catalogue; biology, dispersal power, ecology, geographic distribution, references).

Remarks. *Bembidion nesophilum* is morphologically close to *B. callipeplum* and has previously been synonymized with it by Lindroth (1976). Examination of the lectotype of *B. nesophilum* revealed it to be a separate species from *B. callipeplum*. In addition to diagnostic characters of the male genitalia, *B. nesophilum* has the following features that clearly separate it from *B. callipeplum*: body slender, larger (length 3.6–4.9 mm); microsculpture transverse, obsolete on disc of head and pronotum, feeble on elytra; antennae subfiliform (segments 8–10 stout), pale testaceous; legs also pale testaceous; pronotum with sides strongly sinuate posteriorly and posterolateral angles acute, projected laterally; elytra widest before middle, with smaller light brown markings. *Bembidion nesophilum* is restricted to the northernmost part of the North Island (ND, AK, WO). This species is found in association with members of the subgenus *Zecillenus*, on the sandy banks of coastal estuarine streams; it hides during the day in the sand, at a certain distance from water.

Subgenus *Zemetallina* Lindroth, 1976
Fig. 25–36

Zemetallina Lindroth, 1976: 184.

Type species. *Bembidium anchonoderum* Bates, 1878a, by original designation.

Description. Body length 2.8–5.5 mm; color dark; elytra without variegated color pattern; legs dark or pale. Microsculpture usually present (rarely absent), poorly or well developed. Forebody usually moderately wide in comparison to elytra (rarely very wide or narrow). **Head**. Antennae usually filiform and moderately long, reaching about elytral shoulders (rarely submoniliform and rather short, reaching about elytral base). Frontal furrows not prolonged on clypeus. Submentum with six setae. Ligula with two fused setae. Palpi with penultimate labial segment bisetose on anterior margin. **Thorax**. Pronotum usually moderately convex (rarely strongly convex), cordate, widest before middle; laterobasal carinae absent; setiferous puncture absent near posterolateral angle; laterobasal foveae poorly developed. Epipleura (in dorsal view) exposed or not exposed in front of posterolateral angles. **Elytra**. Usually moderately convex (rarely depressed), subovate (sometimes elongate or ovate), widest about middle (rarely widest behind middle). Shoulders usually moderately rounded (rarely angulate or obtuse). Scutellar striole usually consisting of a row of punctures (rarely of a line and punctures). Striae complete or incomplete, punctate; stria 3 with three discal setiferous punctures. Intervals subdepressed or slightly convex; interval 5 without discal setiferous punctures. Subapical sinuations feeble. Apical striole usually present (rarely absent); preapical setiferous puncture not usually isolated. Sutural apices angulate. **Abdomen**. Last visible sternum (sternum VII) of female with or without numerous short setae in addition to four long ambulatory setae. **Aedeagus**. Internal sac with a brush sclerite. **Parameres**. Three terminal setae present (as in subgenus *Zecillenus*).

Geographic distribution. New Zealand (endemic).

Ecology. Mostly sandy banks of river and brooks.

References. Lindroth 1976: 184 (description); Larochelle and Larivière 2001: 81 (catalogue); Toledano 2005 (taxonomy); Larochelle and Larivière 2007: 48 (description).

***Bembidion* (*Zemetallina*) *tekapoense* Broun, 1886**
Fig. 25, 58, 99

Bembidium tekapoense Broun, 1886: 880. Type locality: Near Lake Tekapo, MK.
Other synonymy as in Larochelle and Larivière (2001: 83).

Description. Body length 4.0–4.9 mm. Black; antennae and legs piceous (darker than in *B. anchonoderus*). Microsculpture very strong, isodiametric. Shiny, with moderately strong metallic lustre (aeneous, sometimes greenish). Forebody narrow in comparison to elytra. **Head**. Antennae filiform, moderately long (reaching about elytral shoulders). **Thorax**. Pronotum moderately convex, narrow (compared to other *Zemetallina* species); sides strongly rounded anteriorly, moderately sinuate posteriorly; posterolateral angles subrectangular, somewhat obtuse at tip; laterobasal foveae, shallow, obsolete, moderately long, not reaching basal margin. Epipleura (in dorsal view) exposed in front of posterolateral angles. **Elytra**. Subdepressed, oblong-elongate, very wide, widest behind middle. Shoulders angulate. Sides subparallel. Scutellar striole consisting of a row of punctures. Striae 2–6 complete, shallow although well impressed apically, finely punctate (outer striae less impressed than inner ones); stria 7 obsolete, incomplete, finely punctate. Intervals depressed. Apical striole deep, connected to stria 5 or 7; preapical setiferous puncture not isolated. **Abdomen**. Last visible sternum (sternum VII) of female with four long ambulatory setae only. **Aedeagus**. Lateral view (Fig. 58): slightly arcuate, almost subparallel;

base slightly convex dorsally; middle slightly convex dorsally and ventrally; apex triangular, straight dorsally, slightly concave ventrally, with extreme tip narrow and short.

Material examined. 198 specimens (CMNH, JNNZ, MONZ, NZAC).

Geographic distribution (Fig. 99). North Island: BP, HB, RI, WA, WI, WN, WO. South Island: BR, CO, KA, MB, MC, MK, NC, NN, OL, WD. Stewart Island.

Ecology. Lowland, montane. Epigean. River banks and bars, at a certain distance (0–1 m) from water. Open ground; wet, sandy bare soil with gravel and scattered stones. Nocturnal; hides during the day under stones and among gravel. Gregarious.

Biology. Seasonality: September–April. Tenerals: February. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Fast runner. Vagility likely favoured by flight capacity.

Collecting techniques. Turning stones; raking the soil; pouring water over the ground.

Reference. Larochelle and Larivière 2001: 83 (catalogue; biology, dispersal power, ecology, geographic distribution, references).

***Bembidion* (*Zemetallina*) *anchonoderus* Bates, 1878**
Fig. 26, 59, 74

Bembidium anchonoderum [*sic*] Bates, 1878a: 195. Type locality: Tairua, CL.
Other synonymy as in Larochelle and Larivière (2001: 81).

Description. Body length 4.0–4.8 mm. Black; elytra piceous; antennae (segment 1 rufous, at least underneath) and legs piceous (tibiae rarely dark rufous). Microsculpture very strong, isodiametric. Shiny, with strong metallic lustre (aeneous, sometimes greenish or bluish); tibiae sometimes with slight metallic lustre. Forebody moderately wide in comparison to elytra. **Head**. Antennae filiform, moderately long (reaching about elytral shoulders). **Thorax**. Pronotum moderately convex, moderately wide; sides moderately rounded anteriorly, moderately sinuate posteriorly; posterolateral angles slightly projected laterally, somewhat obtuse at tip; laterobasal foveae moderately deep, linear, moderately long, not reaching basal margin. Epipleura (in dorsal view) exposed in front of posterolateral angles. **Elytra**. Moderately convex, subovate, moderately wide, widest about middle. Shoulders moderately rounded. Sides moderately rounded. Scutellar striole consisting of a row of punctures. Striae 2–6 complete, deep (even apically), coarsely punctate; stria 7 strong, incomplete, coarsely punctate. Intervals slightly convex. Apical striole deep**,** connected to stria 5 or 7; preapical setiferous puncture not isolated. **Abdomen**. Last visible sternum (sternum VII) of female with four long ambulatory setae only. **Aedeagus**. Lateral view (Fig. 59): moderately arcuate, slender; base slightly convex dorsally; middle moderately convex dorsally, moderately concave ventrally; apex narrow, triangular, straight dorsally and ventrally, with extreme tip wide and long.

Material examined. 3,470 specimens (CMNH, LUNZ, MONZ, NZAC).

Geographic distribution (Fig. 74). North Island: AK, BP, CL, GB, HB, RI, TK, TO, WA, WI, WN, WO. South Island: BR, CO, DN, FD, KA, MB, MC, MK, NC, NN, OL, SC, SD, SL, WD.

Ecology. Lowland, montane. Epigean, fossorial. Banks and bars of rivers and brooks, at a certain distance (1–5 m) from water. Open ground; wet, fine sandy bare or sparsely vegetated soil, often with

scattered stones and gravel. Nocturnal; hides during the day under stones, among gravel, in sand, at the base of plants, in soil crevices, in the soil, under fallen leaves and algal mats. Gregarious.

Biology. Seasonality: September–April, July. Tenerals: November–March. Occasionally infested with mites and fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Moderate runner. Vagility likely favoured by flight capacity.

Collecting techniques. Turning stones; raking the soil; pouring water over the ground; treading the soil with the feet.

Reference. Larochelle and Larivière 2001: 81 (as *Bembidion* (*Zemetallina*) *anchonoderus*; catalogue; biology, dispersal power, ecology, geographic distribution, references).

Remark. This is the most widespread *Bembidion* species in New Zealand.

***Bembidion* (*Zemetallina*) *stewartense* Lindroth, 1976**
Fig. 27, 60, 97

Bembidion (*Zemetallina*) *anchonoderum stewartense* Lindroth, 1976: 187. Type locality: Stewart Island. *Bembidion stewartense*: Emberson, 1993: 13.

Description. Body length 3.4–3.8 mm; stout (slender in other *Zemetallina* species). Black; elytra black with rufous epipleura; antennae (segment 1 pale rufous, only slightly infuscated above); legs rufous. Microsculpture very strong, isodiametric. Shiny, with strong metallic lustre (bronzy, greenish, rarely bluish). Forebody very wide in comparison to elytra. **Head**. Antennae submoniliform, rather short (reaching about elytral base). **Thorax**. Pronotum moderately convex, very wide; sides moderately rounded anteriorly, moderately sinuate posteriorly; posterolateral angles subrectangular, somewhat obtuse at tip; laterobasal foveae moderately deep, linear, moderately long, not reaching basal margin. Epipleura (in dorsal view) not exposed in front of posterolateral angles. **Elytra**. Moderately convex, ovate, very wide, widest about middle. Shoulders moderately rounded. Sides strongly rounded. Scutellar striole consisting of a row of punctures. Striae 2–6 complete, deep (even apically), strongly punctate; stria 7 strong, incomplete, coarsely punctate. Intervals slightly convex. Apical striole deep, connected to stria 5 or 7; preapical setiferous puncture not isolated. **Abdomen**. Last visible sternum (sternum VII) of female with four long ambulatory setae only. **Aedeagus**. Lateral view (Fig. 60): strongly arcuate; base almost straight dorsally; middle rather strongly convex dorsally, very slightly concave ventrally; apex narrow**,** almost straight dorsally and ventrally, with extreme tip narrow and short.

Material examined. 9 specimens (NZAC).

Geographic distribution (Fig. 97). Stewart Island: Mason Bay.

Ecology. Lowland. Epigean. Bare stream banks. Gregarious. Diurnal; active on mat plants.

Biology. Seasonality: February. Tenerals: February. One specimen infested with fungi (Laboulbeniales).

Dispersal power. Macropterous, probably capable of flight. Moderate runner. Vagility likely favoured by flight capacity.

Reference. Larochelle and Larivière 2001: 82 (catalogue; biology, dispersal power, ecology, geographic distribution, references).

***Bembidion* (*Zemetallina*) *parviceps* Bates, 1878**
Fig. 28, 61, 93

Bembidium parviceps Bates, 1878a: 194. Type locality: Tairua, CL (Bates 1878a: 194); Auckland, AK (Lindroth 1976: 193, lectotype designated).
Other synonymy as in Larochelle and Larivière (2001: 82).

Description. Body length 4.1–5.3 mm. Black; antennae black (segment 1 rufous); femora black (tibiae and tarsi paler, rufous black). Microsculpture absent on head, pronotum, and elytra (present in other *Zemetallina* species). Very shiny, sometimes with slight metallic lustre (greenish or bluish). Forebody narrow in comparison to elytra. **Head**. Antennae filiform, moderately long (reaching about elytral shoulders). **Thorax**. Pronotum moderately convex, moderately wide; sides moderately rounded anteriorly, moderately sinuate posteriorly; posterolateral angles obtuse; laterobasal foveae moderately deep, linear, short, not reaching basal margin. Epipleura (in dorsal view) exposed in front of posterolateral angles. **Elytra**. Moderately convex, subovate, moderately wide, widest about middle. Shoulders moderately rounded. Sides subparallel. Scutellar striole consisting of a row of punctures. Striae 2–6 incomplete, shallow, coarsely punctate; stria 7 strong, incomplete, coarsely punctate. Intervals slightly convex. Apical striole absent or almost so, not connected to stria 5 or 7; preapical setiferous puncture isolated. **Abdomen**. Last visible sternum (sternum VII) of female with numerous short setae in addition to four long ambulatory setae. **Aedeagus**. Lateral view (Fig. 61): slightly arcuate, rather wide; base strongly convex dorsally; middle moderately convex dorsally (with a slight concavity towards the apex), slightly concave ventrally; apex subtriangular, slightly convex dorsally, slightly concave ventrally, with extreme tip wide and short.

Material examined. 608 specimens (CMNH, JNNZ, LUNZ, MONZ, NZAC).

Geographic distribution (Fig. 93). North Island: AK, BP, CL, GB, HB, ND, RI, TO, WA, WN, WO. South Island: BR, CO, DN, FD, KA, MB, MC, MK, NC, NN, SC, SD, WD.

Ecology. Lowland, montane, subalpine. Epigean. Banks of swift-running brooks and small rivers, at a certain distance (1–3 m) from water. Open ground; wet, finely gravelly, bare soil. Nocturnal; hides during the day under stones and among gravel. Gregarious.

Biology. Seasonality: September–April, August. Tenerals: January–April. Often infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Moderate runner. Vagility likely favoured by flight capacity.

Collecting techniques. Turning stones; raking the soil; pouring water over the ground.

Reference. Larochelle and Larivière 2001: 82 (catalogue; biology, dispersal power, ecology, geographic distribution, references).

Remark. This is a very distinctive species easily recognized by the lack of dorsal microsculpture and the forebody narrow in comparison to the elytra.

***Bembidion* (*Zemetallina*) *waiho* new species**
Fig. 29, 62, 104

Bembidion waiho Larochelle and Larivière, new species. Holotype: male (NZAC) labeled: "NEW ZEALAND WD Franz Josef, Waiho River 100 m 4323S 17010E 11.III.2007 Larivière, Larochelle (typed)/ Moist, sandy glacial river moraine; scattered stones & gravel. Under embedded stones on sand; 2–3 m

from water. (typed) / HOLOTYPE [male symbol] *Bembidion waiho* Larochelle & Larivière, 2015 (red label; typed)." Paratypes: one male (CMNZ) and two females (MONZ, NZAC) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length 3.5–4.6 mm. Black; antennal segments 1–4 pale rufous (segments 3–4 infuscated apically), segments 5–11 dark rufous; femora rufous, tibiae yellow, tarsi infuscated yellow. Microsculpture isodiametric, feeble on head (absent on anterior two-thirds) and pronotum (almost erased on disc), moderately strong on elytra. Shiny, without metallic lustre or with very slight metallic lustre (aeneous). Forebody moderately wide in comparison to elytra. **Head**. Antennae filiform, moderately long (reaching about elytral shoulders). **Thorax**. Pronotum moderately convex, moderately wide; sides strongly rounded anteriorly, oblique posteriorly; posterolateral angles obtuse, somewhat sharp at tip; laterobasal foveae moderately deep, linear, very long, reaching basal margin. Epipleura (in dorsal view) exposed in front of posterolateral angles. **Elytra**. Depressed, subelongate, moderately wide, widest about middle. Shoulders moderately rounded. Sides subparallel. Scutellar striole consisting of a row of punctures. Striae 2–6 incomplete, shallow, finely punctate; stria 7 obsolete, incomplete, with or without rudimentary punctures. Intervals depressed. Apical striole absent; preapical setiferous puncture isolated. **Abdomen**. Last visible sternum (sternum VII) of female with numerous short setae in addition to four long ambulatory setae. **Aedeagus**. Lateral view (Fig. 62): strongly arcuate; base strongly convex dorsally; middle gradually narrowed (with a strong angle basally), very slightly convex dorsally, moderately concave ventrally; apex subtriangular, straight dorsally, very slightly concave ventrally, with extreme tip wide and short.

Material examined. 26 specimens (CMNZ, MONZ, NZAC).

Geographic distribution (Fig. 104). South Island: WD–Franz Josef, Waiho River. Hokitika. Karangarua River (between Highway 6 and Rough Creek). Poerua River (Highway 6 junction). Wanganui River (Highway 6 junction).

Ecology. Lowland. Fossorial. River banks and beds, at a certain distance (2–5 m) from water. Open ground; wet bare soil with fine sand and scattered stones. Nocturnal; hides during the day under well embedded stones. Gregarious.

Biology. Seasonality: November, March. Tenerals: March. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Moderate runner. Vagility likely favoured by flight capacity.

Collecting techniques. Turning stones; pouring water over the ground.

Remarks. The name of this species is based on its type locality, Waiho River (Franz Josef, WD). *Bembidion waiho* is morphologically close to *B. urewerense*. In addition to diagnostic characters of the male genitalia, *B. waiho* has the following distinguishing features: pronotum with sides oblique posteriorly and posterolateral angles obtuse; elytra depressed, subelongate, with sides subparallel, striae 2–6 finely punctate, stria 7 obsolete with or without rudimentary punctures, apical striole absent, and preapical setiferous puncture isolated. Both species are allopatric: *B. waiho* is restricted to the western South Island (WD) while *B. urewerense* occurs in southern areas of the North Island.

Bembidion (*Zemetallina*) *urewerense* Lindroth, 1976

Fig. 30, 63, 103

Bembidion (*Zemetallina*) *urewerense* Lindroth, 1976: 191. Type locality: Lake Waikaremoana, Urewera National Park, GB.

Description. Body length 3.2–4.1 mm. Black; antennae pale rufous (segments 5–11 infuscated); legs rufous. Microsculpture in both sexes, absent or almost so on disc of head and pronotum, slightly more visible laterally; elytra in male, with isodiametric microsculpture basally and laterally; elytra in female, with feeble isodiametric microsculpture over entire surface. Very shiny, without metallic lustre. Forebody moderately wide in comparison to elytra. **Head**. Antennae filiform, moderately long (reaching about elytral shoulders). **Thorax**. Pronotum strongly convex, very wide; sides strongly rounded anteriorly, strongly sinuate posteriorly (more sinuate than in other *Zemetallina* species); posterolateral angles acute, moderately projected laterally; laterobasal foveae shallow, obsolete, not reaching basal margin. Epipleura (in dorsal view) exposed in front of posterolateral angles. **Elytra**. Moderately convex, subovate, moderately wide, widest about middle. Shoulders moderately rounded. Sides moderately rounded. Scutellar striole consisting of a line and punctures. Striae 2–3 complete, 4–6 incomplete; striae shallow (deepening apically), coarsely punctate; stria 7 strong, incomplete, coarsely punctate. Intervals depressed or subdepressed. Apical striole deep, connected to stria 5 or 7; preapical setiferous puncture not isolated. **Abdomen**. Last visible sternum (sternum VII) of female with numerous short setae in addition to four long ambulatory setae. **Aedeagus**. Lateral view (Fig. 63): strongly arcuate, wide medially; base moderately convex dorsally; middle strongly convex dorsally, slightly concave ventrally; apex narrow, rather straight dorsally and ventrally, with extreme tip rather narrow and short.

Material examined. 138 specimens (NZAC).

Geographic distribution (Fig. 103). North Island: BP, GB, HB, RI, TK, WA, WI.

Ecology. Lowland, montane. Epigean. Edges of trickles, seepages, puddles, flats along roadsides and rivers, as well as stream banks, at a certain distance (3–15 m) from water.
Open ground; wet, usually sandy, sometimes clay, bare or sparsely vegetated soil. Nocturnal; hides during the day at the base of plants (e.g., *Juncus*), under fallen leaves and plant debris, as well as in moss, under stones and soil clods. Gregarious.

Biology. Seasonality: September, November–January, March, May–June. Tenerals: December–January. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Moderate runner. Vagility likely favoured by flight capacity.

Collecting techniques. Turning plant leaves and debris, stones and soil clods.

Reference. Larochelle and Larivière 2001: 83 (catalogue; biology, dispersal power, ecology, geographic distribution, reference).

Remark. Lindroth (1976) recorded only four localities for this species; it is now known from many localities in the southern half of the North Island.

Bembidion (*Zemetallina*) *mangamuka* new species

Fig. 31, 64, 87

Bembidion mangamuka Larochelle and Larivière, new species. Holotype: male (NZAC) labeled: "NEW ZEALAND ND Mangamuka (6 km NE; Opurehu R) 28.XII.1992 A. Larochelle (typed)/ Sandy sterile riverbank (typed) / HOLOTYPE [male symbol] *Bembidion mangamuka* Larochelle & Larivière, 2015 (red label; typed)." Paratypes: three males (CMNZ, LUNZ, NZAC) and one female (NZAC) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length 4.0–4.7 mm. Forebody black; elytra dark brown with epipleura pale rufous; antennae yellow to light brown; femora brown, tibiae and tarsi yellowish. Microsculpture moderately transverse, feeble on disc of head and pronotum, moderately strong on elytra. Shiny, with strong metallic lustre (aeneous, sometimes slightly greenish or bluish); femora and tibiae with slight metallic lustre. Forebody moderately wide in comparison to elytra. **Head**. Antennae filiform, moderately long (reaching about elytral shoulders). **Thorax**. Pronotum moderately convex, moderately wide; sides moderately rounded anteriorly, moderately sinuate posteriorly; posterolateral angles acute, strongly projected laterally, acute at extreme tip; laterobasal foveae moderately deep, linear, moderately long, not reaching basal margin. Epipleura (in dorsal view) exposed in front of posterolateral angles. **Elytra**. Moderately convex, subovate, moderately wide, widest about middle. Shoulders obtuse. Sides moderately rounded. Scutellar striole consisting of a row of punctures. Striae 3–7 incomplete, shallow, erased apically, moderately coarsely punctate; stria 7 strong, incomplete, coarsely punctate. Intervals depressed. Apical striole deep, connected to stria 7; preapical setiferous puncture not isolated. **Abdomen**. Last visible sternum (sternum VII) of female with four long ambulatory setae only. **Aedeagus**. Lateral view (Fig. 64): moderately arcuate; base strongly convex dorsally; middle slightly convex dorsally towards its base, rather straight dorsally towards its apex, slightly convex ventrally; apex triangular, straight dorsally and ventrally, with extreme tip narrow and short.

Material examined. 77 specimens (CMNZ, LUNZ, NZAC).

Geographic distribution (Fig. 87). North Island: ND–Herekino. Opurehu River (6 km North East of Mangamuka). Mangamuka River. Puketi Forest, Forest Road [end], Waipapa River. Pakotai.

Ecology. Lowland. Fossorial. River banks, at a certain distance from water. Open ground; wet, sandy, bare soil. Nocturnal; hides during the day in the sand. Gregarious.

Biology. Seasonality: September–October, December–January. Tenerals: December. Often infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Fast runner. Vagility likely favoured by flight capacity.

Collecting techniques. Pouring water over the ground; treading the soil with the feet.

Remarks. The name of this species is based on its type locality, Mangamuka (6 km NE; Opurehu River). *Bembidion mangamuka* is morphologically close to *B. solitarium* and *B. bullerense*. In addition to diagnostic characters of the male genitalia, *B. mangamuka* has the following distinguishing features: head and pronotum black; elytra dark brown; pronotum with extreme tip of posterolateral angles acute and epipleura (in dorsal view) exposed in front of posterolateral angles; elytra with shoulders obtuse and striae shallow. *Bembidion mangamuka* is restricted to the northern North Island (ND). The pale-legged specimens recorded from Herekino and Pakatai [=Pakotai] (ND) and identified as *B. anchonoderus* by Lindroth (1976: 187), refer to *B. mangamuka*.

Bembidion (*Zemetallina*) *solitarium* Lindroth, 1976

Fig. 32, 65, 96

Bembidion (*Zemetallina*) *solitarium* Lindroth, 1976: 185. Type locality: Rangitikei River flats, RI.

Description. Body length 4.4–5.2 mm. Black; antennae with segments 1 and 4–11, and underside of segments 2–3 rufous; femora brown, tibiae and tarsi yellowish. Microsculpture moderately transverse, feeble on disc of head and pronotum, and moderately strong on elytra. Shiny, with strong metallic lustre (greenish aeneous). Forebody moderately wide in comparison to elytra. **Head**. Antennae filiform, moderately long (reaching about elytral shoulders). **Thorax**. Pronotum strongly convex, moderately wide;

sides strongly rounded anteriorly, moderately sinuate posteriorly; posterolateral angles subrectangular, vaguely obtuse at tip; laterobasal foveae moderately deep, linear, moderately long, reaching basal margin or almost so. Epipleura (in dorsal view) not exposed in front of posterolateral angles. **Elytra**. Moderately convex, subovate, moderately wide, widest about middle. Shoulders and sides moderately rounded. Scutellar striole consisting of a row of punctures. Striae incomplete (striae 4–6 abbreviated apically), moderately deep, coarsely punctate; stria 7 strong, incomplete, coarsely punctate. Intervals depressed. Apical striole moderately deep, connected to stria 7; preapical setiferous puncture not isolated. **Abdomen**. Last visible sternum (sternum VII) of female with four long ambulatory setae only. **Aedeagus**. Lateral view (Fig. 65): moderately arcuate; base slightly concave dorsally; middle strongly convex dorsally, strongly concave ventrally; apex moderately wide, with extreme tip subtriangular and moderately long.

Material examined. 54 specimens (JNNZ, NZAC).

Geographic distribution (Fig. 96). North Island: HB, RI, WA, WI, WN.

Ecology. Lowland. Epigean. River banks, at a certain distance (1–5 m) from water. Open ground; wet, sandy bare soil sometimes mixed with loam or clay. Nocturnal; hides during the day under stones. Semi-gregarious.

Biology. Seasonality: September–October, December–January, April, July. Tenerals: December. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Fast runner. Occasional flier. Vagility favoured by flight capacity.

Collecting techniques. Turning stones; pouring water over the ground.

Reference. Larochelle and Larivière 2001: 82 (catalogue; biology, dispersal power, ecology, geographic distribution, references).

Remark. The distribution of this species was somewhat poorly known before this revision. It currently includes many North Island localities. The South Island record from Buller (BR), given by Townsend (1997) and subsequently by Larochelle and Larivière (2001), refers to *B. bullerense*.

Bembidion (*Zemetallina*) *bullerense* new species

Fig. 33, 66, 76

Bembidion bullerense Larochelle and Larivière, new species. Holotype: male (NZAC) labeled: "NEW ZEALAND BR Buller River, E. [=East of] Newton Creek [=River] Jct 150 m 4146E 17210E 6.III.2007 Larivière, Larochelle (typed)/ Open, moist, bare, clayed riverbank. Under deeply embedded stones, 2–3 m from water. (typed) / HOLOTYPE [male symbol] *Bembidion bullerense* Larochelle & Larivière, 2015 (red label; typed)." Paratypes: two males (AMNZ, LUNZ) and one female (NZAC) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length 4.6–5.5 mm. Black; antennae (segments 1–2 testaceous) and legs rufotestaceous (femora darker). Microsculpture moderately transverse, feeble on disc of head and pronotum, and moderately strong on elytra. Shiny, with strong metallic lustre (greenish on head, aeneous on pronotum and elytra). Forebody moderately wide in comparison to elytra. **Head**. Antennae filiform, moderately long (reaching about elytral shoulders). **Thorax**. Pronotum strongly convex, moderately wide; sides strongly rounded anteriorly, moderately sinuate posteriorly; posterolateral angles subacute, projected laterally, vaguely obtuse at tip; laterobasal foveae moderately deep, linear, moderately long, reaching or almost

reaching basal margin. Epipleura (in dorsal view) not exposed in front of posterolateral angles. **Elytra**. Strongly convex, elongate, narrow, widest about middle. Shoulders slightly rounded. Sides slightly rounded. Scutellar striole consisting of a row of punctures. Striae 2–3 complete, 4–6 incomplete; striae moderately deep, coarsely punctate; stria 7 strong, incomplete, coarsely punctate. Intervals depressed. Apical striole moderately deep, connected to stria 7; preapical setiferous puncture not isolated. **Abdomen**. Last visible sternum (sternum VII) of female with numerous short setae in addition to four long ambulatory setae**. Aedeagus**. Lateral view (Fig. 66): strongly arcuate; base slightly concave dorsally; middle moderately convex dorsally, moderately concave ventrally; apex stout, subtriangular, straight dorsally, slightly concave ventrally, with extreme tip wide and moderately long.

Material examined. 27 specimens (AMNZ, LUNZ, NZAC).

Geographic distribution (Fig. 76). South Island: BR–Awatuna, Waimea Creek. Buller River (East of Newton Creek [=River] Junction; Highway 6, 8 km West of Murchison; New Creek mouth). Maruia Falls. Maruia River, Creighton Road end. Upper Matakitaki River, Murty Flat.

Ecology. Lowland, montane. Epigean. River banks, at a certain distance (2–3 m) from water. Open ground; moist or wet, sandy bare soil sometimes mixed with silt or clay. Nocturnal; hides during the day under well embedded stones. Gregarious.

Biology. Seasonality: March. Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Fast runner. Vagility likely favoured by flight capacity.

Collecting techniques. Turning stones; pouring water over the ground.

Remarks. The name of this species is based on its type locality, Buller River and the Latin suffix –*ensis*, denoting a place or locality. *Bembidion bullerense* is morphologically close to *B. solitarium*. In addition to diagnostic characters of the male genitalia, *B. bullerense* has the following distinguishing features: metallic lustre greenish on head, aeneous on pronotum and elytra; pronotum with posterolateral angles acute, projected laterally; elytra strongly convex, elongate, narrow, with shoulders and sides slightly rounded; last visible abdominal sternum (sternum VII) of female with numerous short setae, in addition to four long ambulatory setae. Both species are allopatric: *B. bullerense* is restricted to the northwestern South Island (BR) while *B. solitarium* occurs in southern areas of the North Island.

Bembidion (*Zemetallina*) *hokitikense* Bates, 1878

Fig. 34, 67, 85

Bembidium hokitikense Bates, 1878b: 25. Type locality: West Coast, South Island.
Bembidium attenuatum Broun, 1886: 881. Type locality: Near Lake Tekapo, MK (Broun 1886: 881); Tekapo, MK (Lindroth 1976: 191, holotype examined). Tentative synonymy of Lindroth (1976: 191) confirmed.
Other synonymy as in Larochelle and Larivière (2001: 82).

Description. Body length 2.8–4.0 mm. Black (including antennae and legs; contrary to other *Zemetallina* species). Microsculpture very strong, isodiametric, with a tendency to form transverse meshes on head and pronotum. Dull (shiny, other *Zemetallina* species), with slight metallic lustre (aeneous, greenish, or bluish). Forebody very wide in comparison to elytra. **Head**. Antennae submoniliform, rather short (reaching about elytral base). **Thorax**. Pronotum moderately convex, very wide; sides strongly rounded anteriorly, not sinuate posteriorly; basal constriction very short (moderately long in other *Zemetallina* species); posterolateral angles strongly obtuse (more obtuse than in other *Zemetallina* species), strongly projected laterally, very acute at tip; laterobasal foveae moderately deep, linear, short, not reaching basal

margin. Epipleura (in dorsal view) not exposed in front of posterolateral angles. **Elytra**. Moderately convex, subovate, moderately wide, widest about middle. Shoulders moderately rounded. Sides moderately rounded. Scutellar striole consisting of a row of punctures. Striae 2–3 complete, 4–6 incomplete; striae deep, coarsely punctate; stria 7 obsolete, incomplete, at most with rudimentary punctures; stria 3 with very small, poorly visible discal setiferous punctures (highly visible in other *Zemetallina* species). Intervals depressed. Apical striole deep, not connected to stria 5 or 7; preapical setiferous puncture isolated. **Abdomen**. Last visible sternum (sternum VII) of female with numerous short setae in addition to four long ambulatory setae. **Aedeagus**. Lateral view (Fig. 67): strongly arcuate, wide; base strongly convex dorsally; middle moderately convex dorsally, moderately concave ventrally; apex subtriangular, mostly straight dorsally and ventrally, with extreme tip narrow and short.

Material examined. 207 specimens (JNNZ, LUNZ, MONZ, NZAC).

Geographic distribution (Fig. 85). North Island: BP, GB, TO, RI, WA, WI, WN. South Island: BR, CO, DN, FD, KA, MB, MC, MK, NC, NN, OL, SC, WD.

Ecology. Lowland, montane, subalpine, alpine. Epigean. Edges of brooks, river banks and bars; shores of alpine lakes; also roadsides, moraines situated near glaciers; at a certain distance (1–10 m) from water. Open ground; moist or wet, sandy (sometimes mixed with silt), bare soil. Nocturnal; hides during the day under small well embedded stones. Gregarious.

Biology. Seasonality: September–March, August. Tenerals: December, March. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Slow runner. Vagility likely favoured by flight capacity.

Collecting techniques. Turning small stones; pouring water over the ground.

Reference. Larochelle and Larivière 2001: 82 (catalogue; biology, dispersal power, ecology, geographic distribution, references).

Remarks. Lindroth (1976) tentatively synonymized *B. attenuatum* with *B. hokitikense*, pending examination of the male genitalia of *B. attenuatum* (described from Lake Tekapo, MK). The authors have dissected the male genitalia of representatives of numerous populations from Lake Tekapo and the wider Mackenzie (MK) area and have found them all to be of the same species. The synonymy of Lindroth is therefore confirmed. Lindroth (1976) recorded *B. hokitikense* from numerous localities on the South Island. The current revision extends the distribution of this species to the southern half of the North Island where it is known from many localities.

Bembidion (*Zemetallina*) *chalceipes* Bates, 1878

Fig. 35, 68, 78

Bembidium chalceipes Bates, 1878b: 24. Type locality: West Coast, South Island.
Other synonymy as in Larochelle and Larivière (2001: 81–82).

Description. Body length 4.4–5.2 mm. Black; antennae black (segment 1 rufous underneath, segments 2–3 rarely rufous underneath); legs black to piceous (tibiae rarely rufous). Microsculpture very strong, isodiametric. Shiny, with strong metallic lustre (aeneous, rarely greenish); tibiae sometimes with slight metallic lustre. Forebody moderately wide in comparison to elytra. **Head**. Antennae filiform, moderately long (reaching about elytral shoulders). **Thorax**. Pronotum strongly convex, very wide; sides strongly rounded anteriorly, moderately sinuate posteriorly; posterolateral angles rectangular, vaguely obtuse at tip; laterobasal foveae moderately deep, linear, moderately long, reaching or almost reaching basal

margin. Epipleura (in dorsal view) exposed in front of posterolateral angles. **Elytra**. Moderately convex (somewhat less than in *B. anchonoderus*), subovate, moderately wide, widest about middle. Shoulders moderately rounded. Sides moderately rounded. Scutellar striole consisting of a row of punctures. Striae 2–3 complete, 4–6 incomplete; striae shallow, finely punctate; stria 7 obsolete, incomplete, at most with rudimentary punctures. Intervals depressed. Apical striole shallow, connected to stria 5; preapical setiferous puncture not isolated. **Abdomen**. Last visible sternum (sternum VII) of female with four long ambulatory setae only. **Aedeagus**. Lateral view (Fig. 68): strongly arcuate, gradually narrowed from base to apex; base moderately concave dorsally; middle strongly convex dorsally, moderately concave ventrally; apex triangular, with extreme tip moderately wide and long.

Material examined. 301 specimens (JNNZ, MONZ, NZAC).

Geographic distribution (Fig. 78). South Island: BR, CO, DN, FD, KA, MB, MC, MK, NC, NN, OL, SC, SD, SL, WD.

Ecology. Lowland, montane, subalpine. Fossorial, epigean. Banks and beds of rivers and brooks, at a certain distance (1–4 m) from water. Open ground; moist or wet, sandy, bare or sparsely vegetated soil, sometimes mixed with silt. Nocturnal; hides during the day in the sand and under small stones. Gregarious.

Biology. Seasonality: September, November–April. Tenerals: February–March. Often infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Fast runner. Vagility likely favoured by flight capacity.

Collecting techniques. Pouring water over the ground; treading the soil with the feet; turning small stones.

Reference. Larochelle and Larivière 2001: 81 (catalogue; biology, dispersal power, ecology, geographic distribution, references).

Bembidion (*Zemetallina*) *wanakense* Lindroth, 1976

Fig. 36, 69, 106

Bembidion (*Zemetallina*) *wanakense* Lindroth, 1976: 189. Type locality: Matukituki River, West Branch, Northwest of Wanaka, OL.

Description. Body length 3.7–4.5 mm. Black; antennal segments 1–3 usually pale rufous (rarely dark rufous; infuscated above), segments 4–11 dark rufous; legs usually dark rufous (rarely piceous or black), tarsi infuscated. Microsculpture very strong, isodiametric. Shiny, with strong metallic lustre (aeneous). Forebody moderately wide in comparison to elytra. **Head**. Antennae filiform, moderately long (reaching about elytral shoulders). **Thorax**. Pronotum moderately convex and wide; sides strongly rounded anteriorly, moderately sinuate posteriorly; posterolateral angles rectangular, somewhat obtuse at tip; laterobasal foveae moderately deep, linear, moderately long, not reaching basal margin. Epipleura (in dorsal view) not exposed in front of posterolateral angles. **Elytra**. Moderately convex, subelongate, moderately wide, widest about middle. Shoulders moderately rounded. Sides subparallel. Scutellar striole consisting of a row of punctures. Striae 2–6 incomplete; striae 1–4 moderately deep, 5–8 shallow; striae moderately coarsely punctate; stria 7 obsolete, incomplete, with or without rudimentary punctures. Intervals 1–4 slightly convex, 5–8 depressed. Apical striole present, deep, connected to stria 5; preapical setiferous puncture not isolated. **Abdomen**. Last visible sternum (sternum VII) of female with four long ambulatory setae only. **Aedeagus**. Lateral view (Fig. 69): strongly arcuate, wide; base slightly

concave dorsally; middle strongly convex dorsally, moderately concave ventrally; apex subtriangular, straight dorsally, slightly concave ventrally, with extreme tip wide and short.

Material examined. 244 specimens (CMNH, JNNZ, LUNZ, MONZ, NZAC).

Geographic distribution (Fig. 106). North Island: WA. South Island: BR, CO, DN, FD, KA, MC, MK, NC, NN, OL, SC, WD.

Ecology. Lowland, montane. Fossorial. River banks and beds, at a certain distance (1–20 m) from water. Open ground; moist or wet, sandy, bare or sparsely vegetated (e.g., *Juncus*) soil, sometimes mixed with silt. Nocturnal; hides during the day usually in the sand, sometimes at the base of plants and under fallen leaves. Gregarious.

Biology. Seasonality: September–May. Tenerals: February–March. Occasionally infested with fungi (Laboulbeniales). Defence mechanism: when alarmed, the adult escapes by running.

Dispersal power. Macropterous, probably capable of flight. Fast runner. Vagility likely favoured by flight capacity.

Collecting techniques. Pouring water over the ground; treading the soil with the feet; inspecting the base of plants; raking fallen leaves.

Reference. Larochelle and Larivière 2001: 83 (catalogue; biology, dispersal power, ecology, geographic distribution, reference).

Remark. Populations of *Bembidion wanakense* from the southern South Island (CO, DN, MK) sometimes have darker antennae and legs (antennal segment 1 piceous and tibiae black or piceous).

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Literature Cited

Andrewes, H. E. 1935. On the genotypes of British Carabidae. — II. Annals and Magazine of Natural History (10) 16: 12–25.

Andrewes, H. E. 1938. On *Cillenus* Samouelle (Coleoptera, Carabidae). Proceedings of the Royal Entomological Society of London (Series B, Taxonomy) 7: 190–196.

Bates, H. W. 1867. New species of insects from the Province of Canterbury, New Zealand, collected by R.W. Fereday, Esq. Entomologist's Monthly Magazine 4: 52–56, 78–80.

Bates, H. W. 1874. On the geodephagous Coleoptera of New Zealand. Annals and Magazine of Natural History (4) 13: 233–246, 270–277.

Bates, H. W. 1878a. Additions to the geodephagous fauna of New Zealand. Entomologist's Monthly Magazine 14: 191–196.

Bates, H. W. 1878b. New species of geodephagous Coleoptera from New Zealand. Entomologist's Monthly Magazine 15: 22–28, 57–58.

Blackburn, T. 1888. Notes on Australian Coleoptera, with descriptions of new species. Transactions of the Royal Society of South Australia 10 (1886–87): 12–30, 36–51.

Brookes, A. E. 1927. A new genus and three new species of Coleoptera. Transactions and Proceedings of the New Zealand Institute 57: 563–566.

Broun, T. 1882. On the New Zealand Carabidae. New Zealand Journal of Science (Dunedin) 1: 215–227.

Broun, T. 1886. Manual of the New Zealand Coleoptera. Parts III and IV. Government Printer; Wellington. 745–973, XVII.

Broun, T. 1893. Manual of the New Zealand Coleoptera. Parts V–VII. Government Printer; Wellington. XVII, 975–1504.

Broun, T. 1903. Descriptions of new genera and species of New Zealand Coleoptera. Annals and Magazine of Natural History (7) 11: 450–458, 602–618; 12: 69–86.

Broun, T. 1910. Descriptions of new genera and species of Coleoptera. Bulletin of the New Zealand Institute 1: 1–78.

Broun, T. 1921. Descriptions of new genera and species of Coleoptera. Part VII. Bulletin of the New Zealand Institute 1: 475–665.

Brullé, G. A. 1838. Insectes de l'Amérique méridionale recueillis par Alcide d'Orbigny. *In*: A. d'Orbigny. Voyage dans l'Amérique méridionale. Volume 2, Partie 2. Bertrand; Paris. 222 p. [1–16 (1837), 17–56 (1838), 57–88 (1842), 89–104 (1844), 105–222 (1846)]

Crosby, T. K., Dugdale, J. S., and J. C. Watt. 1976. Recording specimen localities in New Zealand: an arbitrary system of areas and codes defined. New Zealand Journal of Zoology 3: 69 (+ map).

Crosby, T. K., Dugdale, J. S., and J. C. Watt. 1998. Area codes for recording specimen localities in the New Zealand subregion. New Zealand Journal of Zoology 25: 175–183.

Csiki, E. 1928. Carabidae: Mormolycinae, Harpalinae. Partes 97 et 98. p. 1–345. *In*: W. Junk and S. Schenkling (eds.). Coleopterorum Catalogus. Junk; Berlin. 1933 p.

Dejean, P. F. M. A. 1831. Species général des Coléoptères, de la collection de M. le Comte Dejean. Tome cinquième. Méquignon–Marvis; Paris. VIII, 883 p.

Emberson, R. M. 1993. The Bembidiina (Coleoptera: Carabidae) of Stewart Island. New Zealand Entomologist 16: 13–17.

Fabricius, J. C. 1775. Systema entomologiae, sistens insectorum classes, ordines, genera, species, adiectis synonymis, locis, descriptionibus, observationibus. Kortii; Flensburgi et Lipsiae. XXXII, 832 p.

Gemminger, M., and E. von Harold. 1868. Catalogus coleopterorum hucusque descriptorum synonymicus et systematicus. Tomus I. Cicindelidae–Carabidae. Gummi; Monachii. XXXVI, 424 p. (+ 8 unnumbered pages and index).

Jeannel, R. 1962. Les tréchides de la Paléantarctide occidentale. p. 527–655 *In*: C. Delamare Deboutteville and E. Rapoport. (eds.). Biologie de l'Amérique australe. Volume I. Études sur la faune du sol. Editions du Centre National de la Recherche Scientifique; Paris. 657 p.

Larochelle, A., and M.–C. Larivière. 2001. Carabidae (Insecta: Coleoptera): catalogue. Fauna of New Zealand 43: 1–281.

Larochelle, A., and M.–C. Larivière. 2003. A natural history of the ground-beetles (Coleoptera: Carabidae) of America north of Mexico. Pensoft; Sofia–Moscow. 583 p.

Larochelle, A., and M.–C. Larivière. 2005. Harpalini (Insecta: Coleoptera: Carabidae: Harpalinae). Fauna of New Zealand 53: 1–160.

Larochelle, A., and M.–C. Larivière. 2007. Carabidae (Insecta: Coleoptera): synopsis of supraspecific taxa. Fauna of New Zealand 60: 1–188.

Larochelle, A., and M.–C. Larivière. 2013. Carabidae (Insecta: Coleoptera): synopsis of species, Cicindelinae to Trechinae (in part). Fauna of New Zealand 69: 1–193.

Latreille, P. A. 1802. Histoire naturelle, générale et particulière des crustacés et des insectes. Ouvrage faisant suite à l'histoire naturelle générale et particulière, composée par Leclerc de Buffon, et rédigée par C.S. Sonnini, membre de plusieurs sociétés savantes. Familles naturelles des genres. Dufart; Paris. XII, 13–467 (+ 1 unnumbered page).

Liebherr, J. K., and D. R. Maddison. 2013. Colonisation of the Pacific by *Bembidion* beetles (Coleoptera: Carabidae), with description of *Bembidion tahitiense*, sp. nov. From Tahiti, French Polynesia. Invertebrate Systematics 27: 439–449.

Lindroth, C. H. 1976. Genus *Bembidion* Latreille (Coleoptera: Carabidae) in New Zealand: a revision. New Zealand Journal of Zoology 3: 161–198.

Lindroth, C. H. 1980. A revisionary study of the taxon *Cillenus* Samouelle, 1819 and related forms (Coleoptera: Carabidae, Bembidiini). Entomologica Scandinavica 11: 179–205.

Linnaeus, C. 1761. Fauna Suecica sistens animalia sueciae regni: mammalia, aves, amphibia, pisces, insecta, vermes. Distributa per classes & ordines, genera & species, cum diferentiis specierum, synonymis auctorum, nominibus incolarum, locis natalium, descriptionibus insectorum. Editio altera, auctior. Laurentii Salvii; Stockholmiae. XLVI, 578 p. (+ 2 plates)

Maddison, D. R. 2012. Phylogeny of *Bembidion* and related ground beetles (Coleoptera: Carabidae: Trechinae: Bembidiini: Bembidiina). Molecular Phylogenetics and Evolution 63: 533–576.

Netolitzky, F. 1931. Überprüfungen Afrikanischer und Australischer Bembidiini. Wiener Entomologische Zeitung 47: 169–183.

Olivier, A. G. 1795. Entomologie, ou histoire naturelle des insectes, avec leurs caractères génériques et spécifiques, leur description, leur synonymie et leur figure enluminée. Coléoptères: Tome troisième. Lanneau, Paris. [Each genus treated is separately paginated.]

Putzeys, J. 1875. Comptes-rendus. Annales de la Société Entomologique de Belgique 18: LII.

Say, T.L. 1823. Descriptions of insects of the families Carabici and Hydrocanthari of Latreille, inhabiting North America. Transactions of the American Philosophical Society (New Series) 2 (1825): 1–109.

Sharp, D. 1886. On New Zealand Coleoptera, with descriptions of new genera and species. Scientific Transactions of the Royal Dublin Society (2) 3: 351–454.

Stephens, J. F. 1827–1828. Illustrations of British entomology; or, a synopsis of indigenous insects: containing their generic and specific distinctions; with an account of their metamorphoses, times of appearance, localities, food, and economy, as far as practicable. Mandibulata. Volume I. Baldwin and Cradock; London. IV, 188 p. (+ 9 plates) [1827: 1–76, plates 1–4; 1828: 77–186, plates 5–9]

Toledano, L. 2005. The Australian species of *Bembidion* Latreille, 1802: a taxonomic treatment with notes about Gondwana as an evolutionary source area (Coleoptera, Carabidae, Bembidiini). p. 73–136. *In*: M. Daccordi and P.M. Giachino (eds.). Results of the Zoological missions to Australia of the Regional Museum of Natural Sciences of Turin, Italy, II. Monografia del Museo Regionale de Scienze Naturali, Torino 42: 1–644.

Townsend, J. I. 1997. Checklist of Nelson, Marlborough and West Coast Carabidae. An annotated list of Carabidae recorded from Nelson/Marlborough and West Coast Conservancies. Department of Conservation Occasional Publications 29: 1–19.

Westwood, J. O. 1838. Synopsis of the genera of British insects. Longmans, Orme, Brown, Green, and Longmans; London. 48 p.

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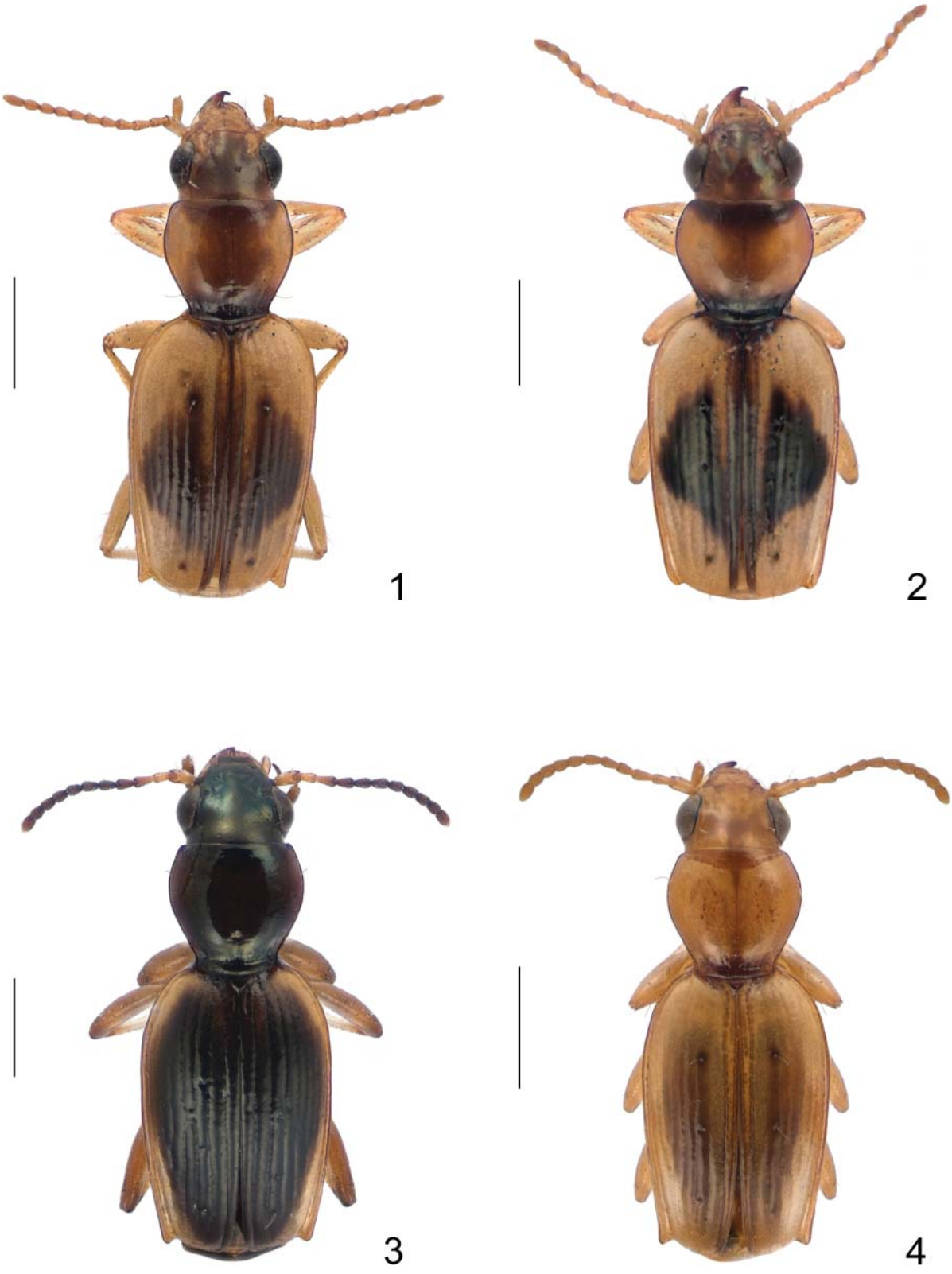
Appendix A. Geographical coordinates of localities in decimal degrees.

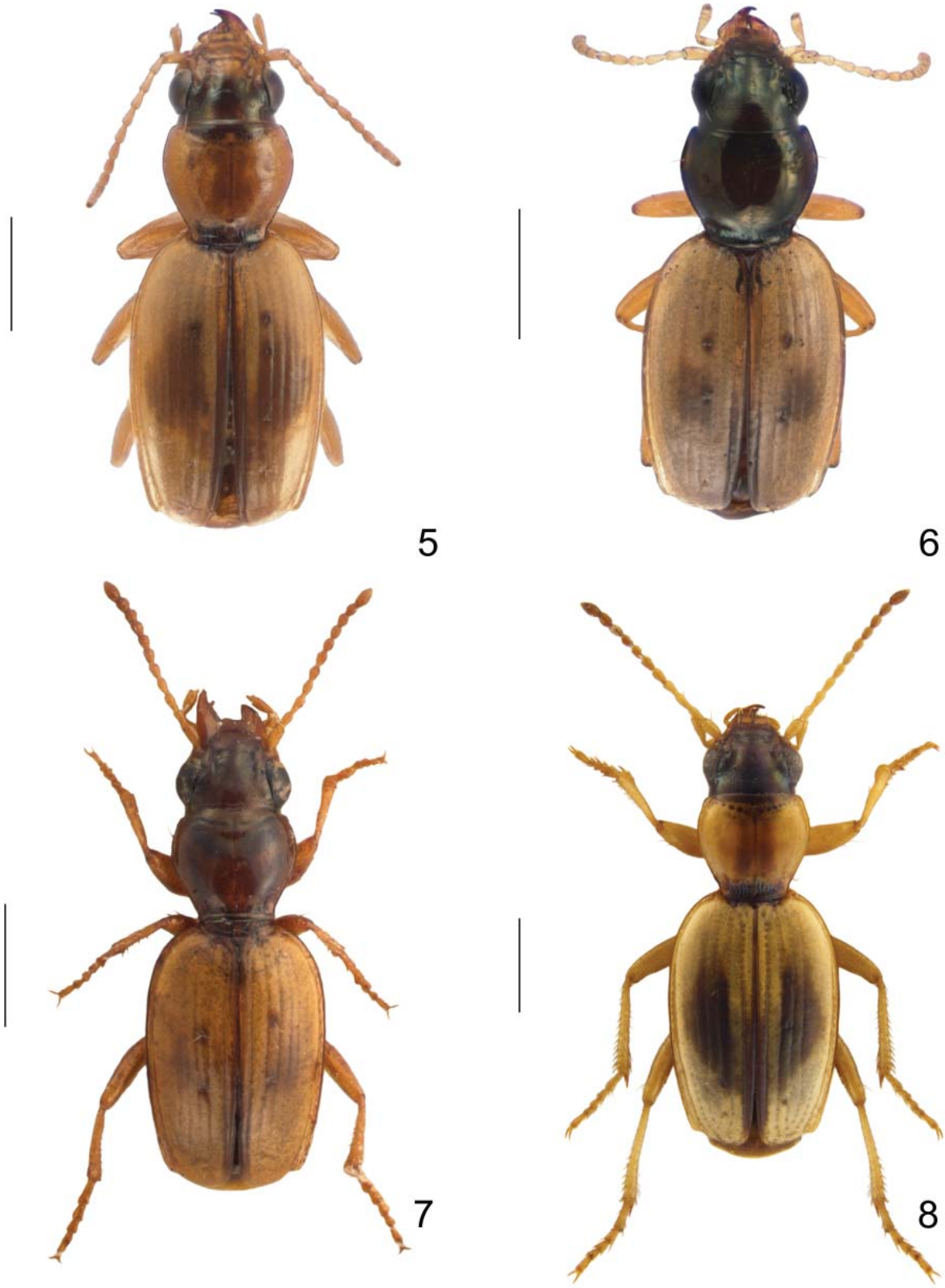
Locality	Area code	Latitude	Longitude
Anaura Bay	GB	-38.2363	178.3103
Aramoana, The Spit	DN	-45.7811	170.7102
Aranga Beach	ND	-35.7696	173.5742
Arapoto Stream	RI	-39.3178	174.9379
Auckland	AK	-36.8525	174.7622
Auckland Island	AU	-50.7008	166.0965
Aupouri Peninsula	ND	-34.7000	173.0000
Awana Bay	CL	-36.2107	175.4969
Awatuna, Waimea Creek	BR	-42.6541	171.0674
Bethells Beach	AK	-36.8963	174.4441
Buller River, E Newton River Jct	BR	-41.7766	172.1781
Canterbury	NC/MC/SC	-43.0000	172.0000
Christchurch	MC	-43.5160	172.5242
Clevedon	AK	-36.9923	175.0375
Esk River (mouth)	HB	-39.3973	176.8851
Franz Josef	WD	-43.3887	170.1824
Great Barrier Island	CL	-36.1793	175.4199
Green Hills Stream	NN	-40.5106	172.6519
Herbertville	WA	-40.4914	176.5584
Herekino	ND	-35.2655	173.2104
Hokitika	WD	-42.7172	170.9637
Hunua Ranges	AK	-37.0750	175.1800
Jerusalem	RI	-39.5513	175.0780
Kaawa Stream	WO	-37.5040	174.7456
Kaikai Beach	ND	-35.5909	173.4099
Kaitoke Beach	CL	-36.2448	175.4796
Kapowairua	ND	-34.4249	172.8606
Karangarua River (Highway 6-Rough Creek)	WD	-43.5765	169.8092
Karekare	AK	-36.9864	174.4793
Karikari Bay, Wairahoraho Stream	ND	-34.8419	173.3810
Karikari Peninsula	ND	-34.8894	173.3437
Koitiata Stream (mouth)	WI	-40.1054	175.1627
Komako	RI	-40.0938	175.8941
Kuku (Beach)	WN	-40.6596	175.1594
Lake Coleridge	MC	-43.3423	171.5481
Lake Tekapo	MK	-44.0013	170.4791
Lake Waikaremoana	GB	-38.7842	176.9945
Lake Waiorongomai Stream (mouth)	WN	-40.7049	175.1335
Long Bay	AK	-36.6849	174.7484
Long Beach, Longbeach Creek	SL	-46.6213	169.2665
Long Point, Waiheke Stream	SL	-46.5613	169.5709
Maitai Bay	ND	-34.8273	173.4072

Makiekie Creek	RI/WI	-40.0205	175.9103
Manawatu River (Palmerston North)	WI	-40.3813	175.5961
Mangakirikiri Stream	GB	-38.6377	176.8861
Mangamuka	ND	-35.2121	173.5386
Mangatuna	GB	-38.3002	178.2654
Maruia Falls	BR	-41.8600	172.2528
Maruia River, Creighton Road	BR	-42.1011	172.2080
Mason Bay	SI	-46.9127	167.7679
Matukituki River (W Branch)	OL	-44.5054	168.7117
Mimiwhangata Coastal Park	ND	-35.4396	174.4263
Motueka River	NN	-41.3400	172.7900
Mount Arthur	NN	-41.2179	172.6815
Mount Pirongia	WO	-37.9928	175.0979
Murchison	BR	-41.8044	172.3285
Murty Flat (Matakitaki River)	BR	-42.0127	172.3732
Napier	HB	-39.5025	176.8926
Nelson	NN	-41.2734	173.2823
New Creek	BR	-41.7823	172.0302
North Cape	ND	-34.4158	173.0516
Ocean Beach	ND	-35.8156	174.5595
Opoutere Beach	CL	-37.0925	175.8868
Opurehu River (NE Mangamuka)	ND	-35.1816	173.5598
Oruaiti Beach	BP	-37.6168	177.9494
Otago Peninsula	DN	-45.8874	170.6798
Otahome Stream (mouth)	WA	-40.9468	176.1558
Otama Beach	CL	-36.7080	175.7529
Pakiri Beach	AK	-36.2531	174.7409
Pakotai	ND	-36.6885	173.8997
Pakuratahi River, Rimutaka Range	WN	-41.1050	175.1871
Palmerston North	WI	-40.3556	175.6165
Pandora	ND	-34.4528	172.7786
Papatowai	SL	-46.5611	169.4695
Pipiriki	RI	-39.4798	175.0469
Poerua River (Highway 6 Jct)	WD	-43.1566	170.5042
Pohangina River/Valley	RI/WI	-40.0646	175.9145
Pokororo	NN	-41.2178	172.8409
Porangahau	HB	-40.2944	176.6679
Port Chalmers	DN	-45.8205	170.6223
Port Jackson	CL	-36.4853	175.3416
Puketi Forest	ND	-35.2211	173.7307
Puponga Farm Park	NN	-40.5048	172.6932
Puwheke Beach	ND	-34.8615	173.3107
Rangitikei River	RI	-39.7544	175.8438
Rimutaka Range	WN	-41.3791	174.9632
Riversdale Beach	WA	-41.0919	176.0728
Ruakaka	ND	-35.8947	174.4506

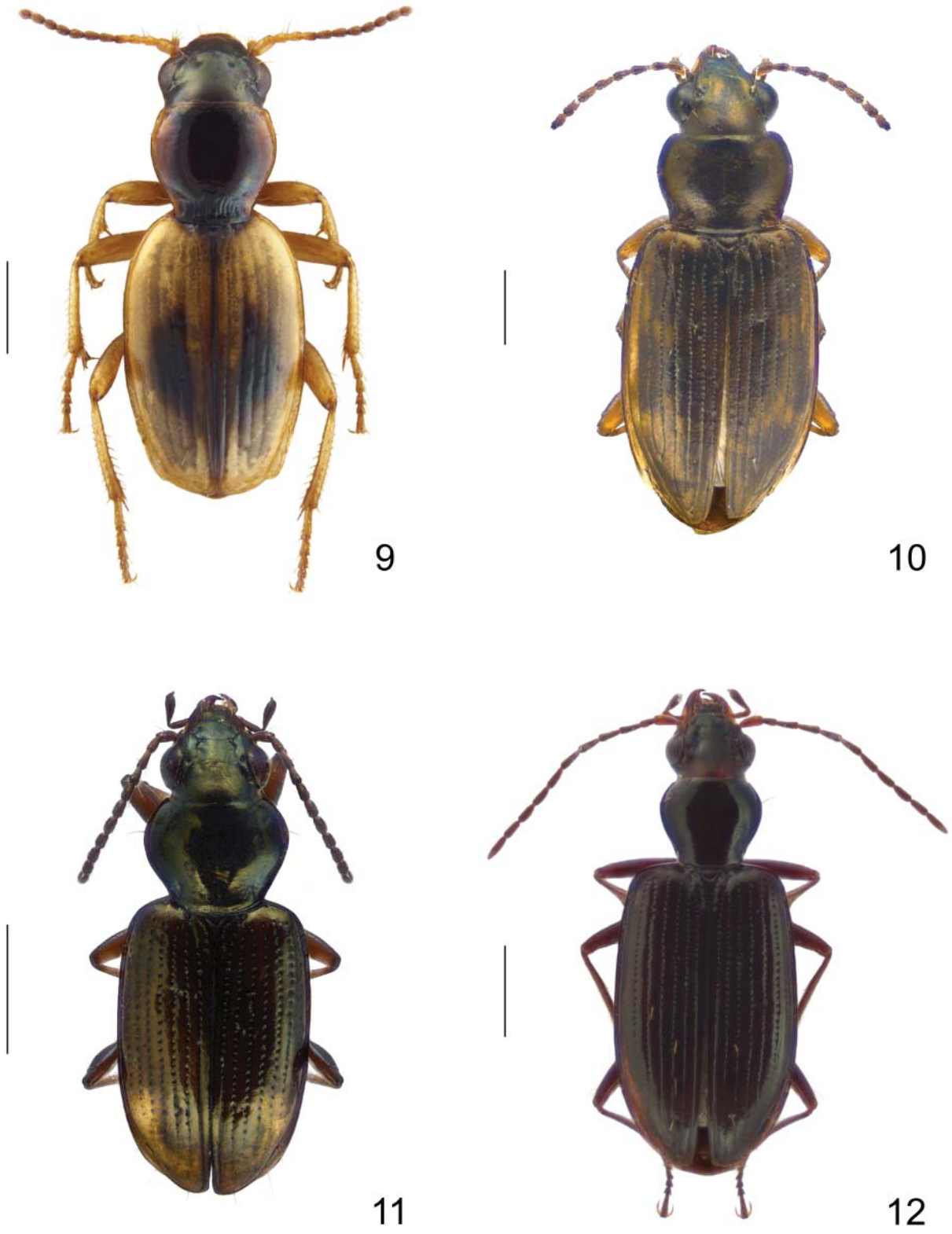
Sandfly Bay, Morris Creek	DN	-45.8935	170.6440
Santoft Forest	WI	-40.2386	175.2212
Stewart Island	SI	-46.9962	167.8842
Tahunanui, Back Beach	NN	-41.2824	173.2379
Taieri Mouth	SL	-46.0546	170.1934
Tairua	CL	-37.0052	175.8490
Tapotupotu Bay	ND	-34.4357	172.7157
Tautane Stream (mouth)	WA	-40.4909	176.5779
Tawharanui Regional Park	AK	-36.3722	174.8260
Te Araroa	GB	-37.6333	178.3693
Te Horo Beach	ND	-34.4506	172.8196
Te Paki Stream	ND	-34.5307	172.7721
Teal Valley	NN	-41.2495	173.3980
Titahi Bay	WN	-41.1069	174.8344
Tokerau Beach	ND	-34.9162	173.3717
Tutuku Beach, Isas Creek	SL	-46.5764	169.4527
Urewera National Park	GB	-38.7500	177.1500
Utuwai	RI	-40.0180	175.9329
Waiho River	WD	-43.3828	170.1757
Waikato River (Lower)	WO	-37.3308	174.7718
Waimai Stream	WO	-37.6327	174.7931
Waimarama	HB	-39.8157	176.9950
Waimatuku Stream (mouth)	SL	-46.3572	168.1519
Waiotahi Beach	BP	-37.9914	177.2326
Waipapa River (Puketi Forest)	ND	-35.2751	173.6868
Waipati Beach	SL	-46.6123	169.3671
Wairahoraho Stream	ND	-34.8417	173.3830
Wairoa River	AK	-37.0378	175.0723
Waitakere Ranges	AK	-36.9924	174.5203
Wanganui River (Highway 6 Jct)	WD	-43.1538	170.6231
Wellington	WN	-41.2783	174.7771
West Coast (South Island)	BR/WD	-43.3000	170.1400
Whakataki River (mouth)	WA	-40.8692	176.2270
Whanganui National Park	WI	-39.2941	174.9869
Whanganui River (Whanganui National Park)	WI	-39.3249	175.0006
Whangapoua Beach	CL	-36.7121	175.6125
Whangarei	ND	-35.7244	174.3202
Whararikí Stream	NN	-40.5030	172.6828
Whareana Bay	ND	-34.4612	173.0028
Whatipu	AK	-37.0393	174.5063



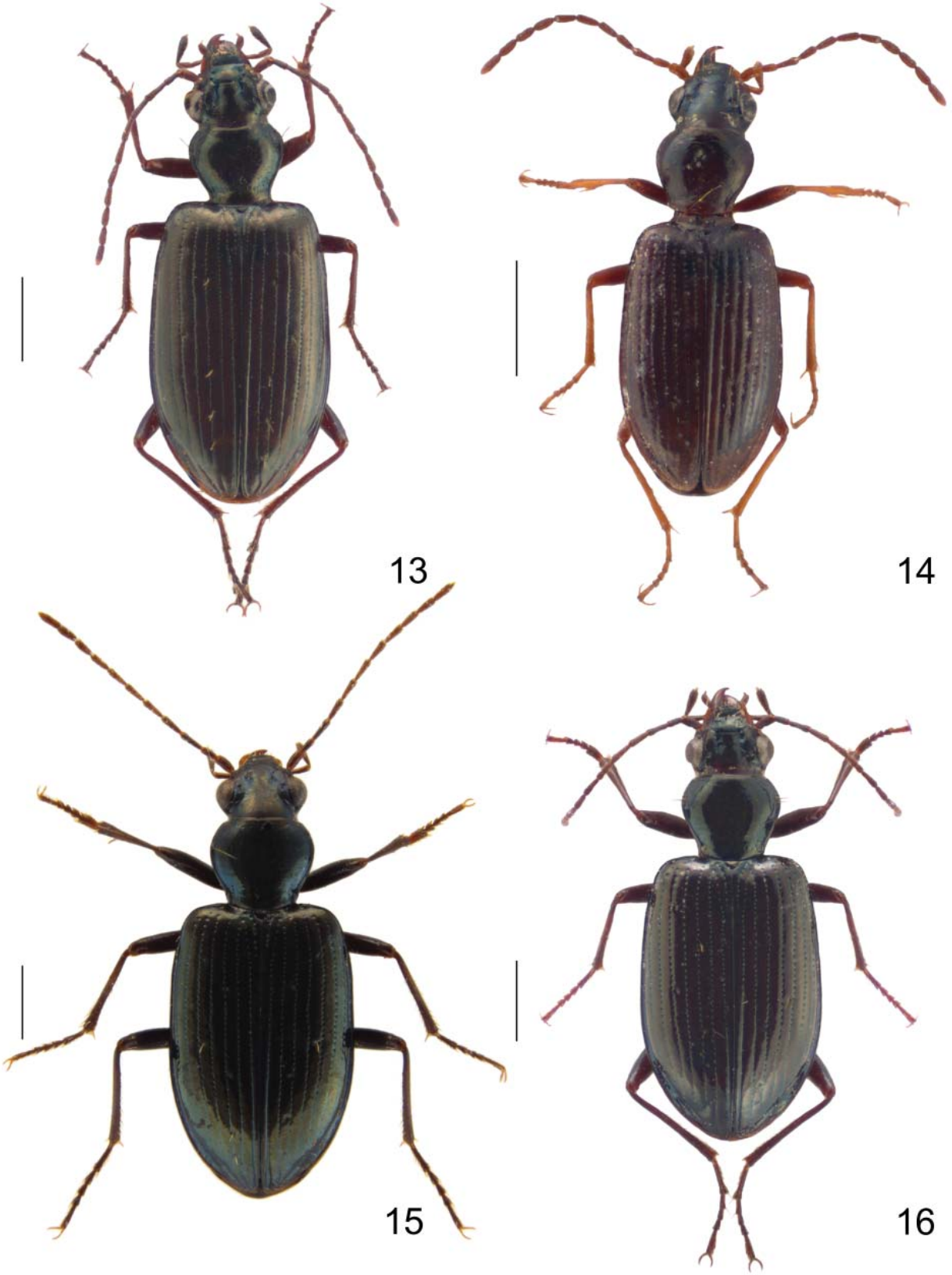
Figures 1–4. Dorsal habitus. **1)** *Bembidion karikari* new species. **2)** *B. albescens*. **3)** *B. alacre*. **4)** *B. tepaki* new species. Scale line = 1 mm.



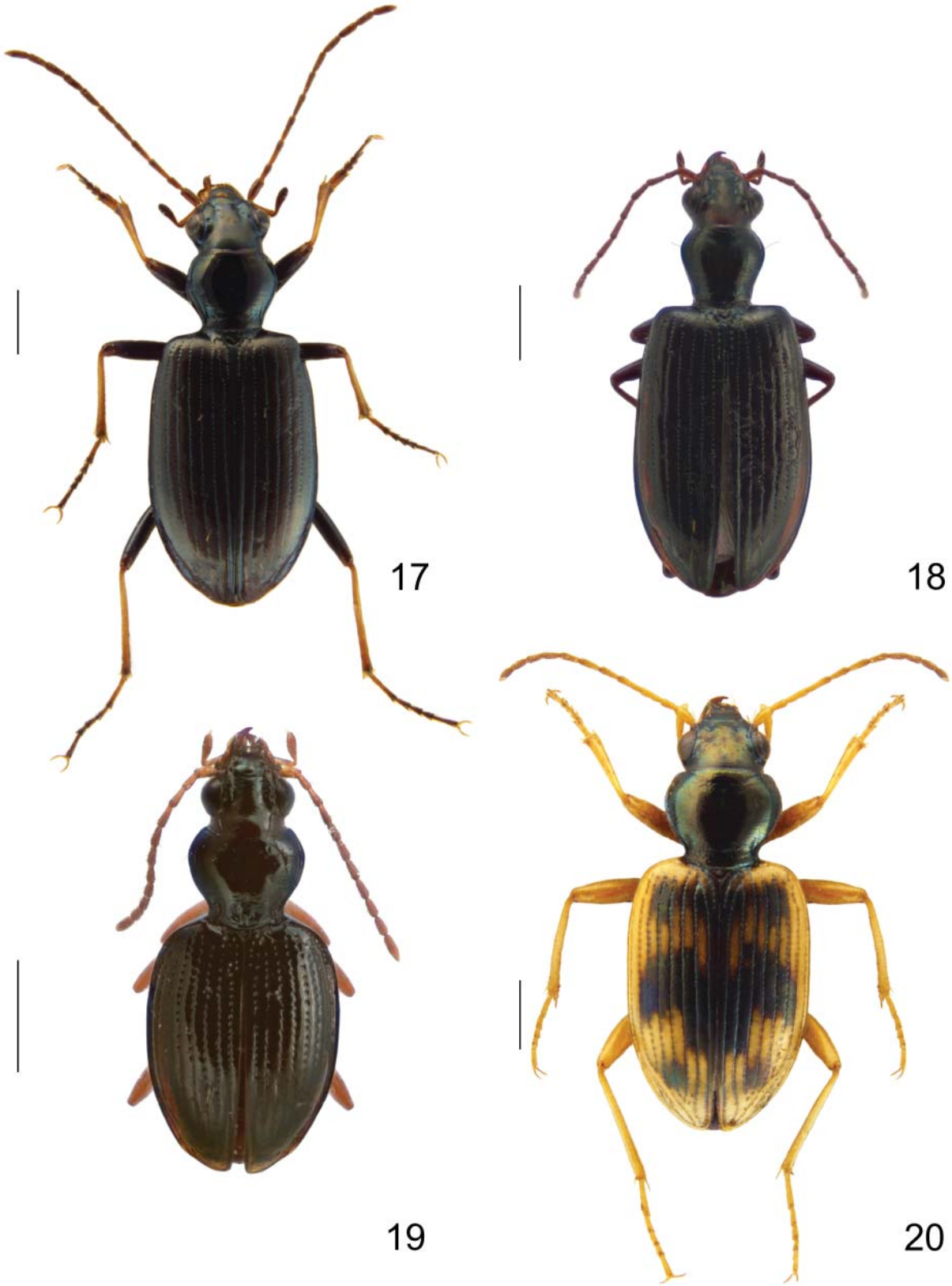
Figures 5–8. Dorsal habitus. **5)** *Bembidion waimarama* new species. **6)** *B. puponga* new species. **7)** *B. tillyardi*. **8)** *B. chalmeri*. Scale line = 1 mm.



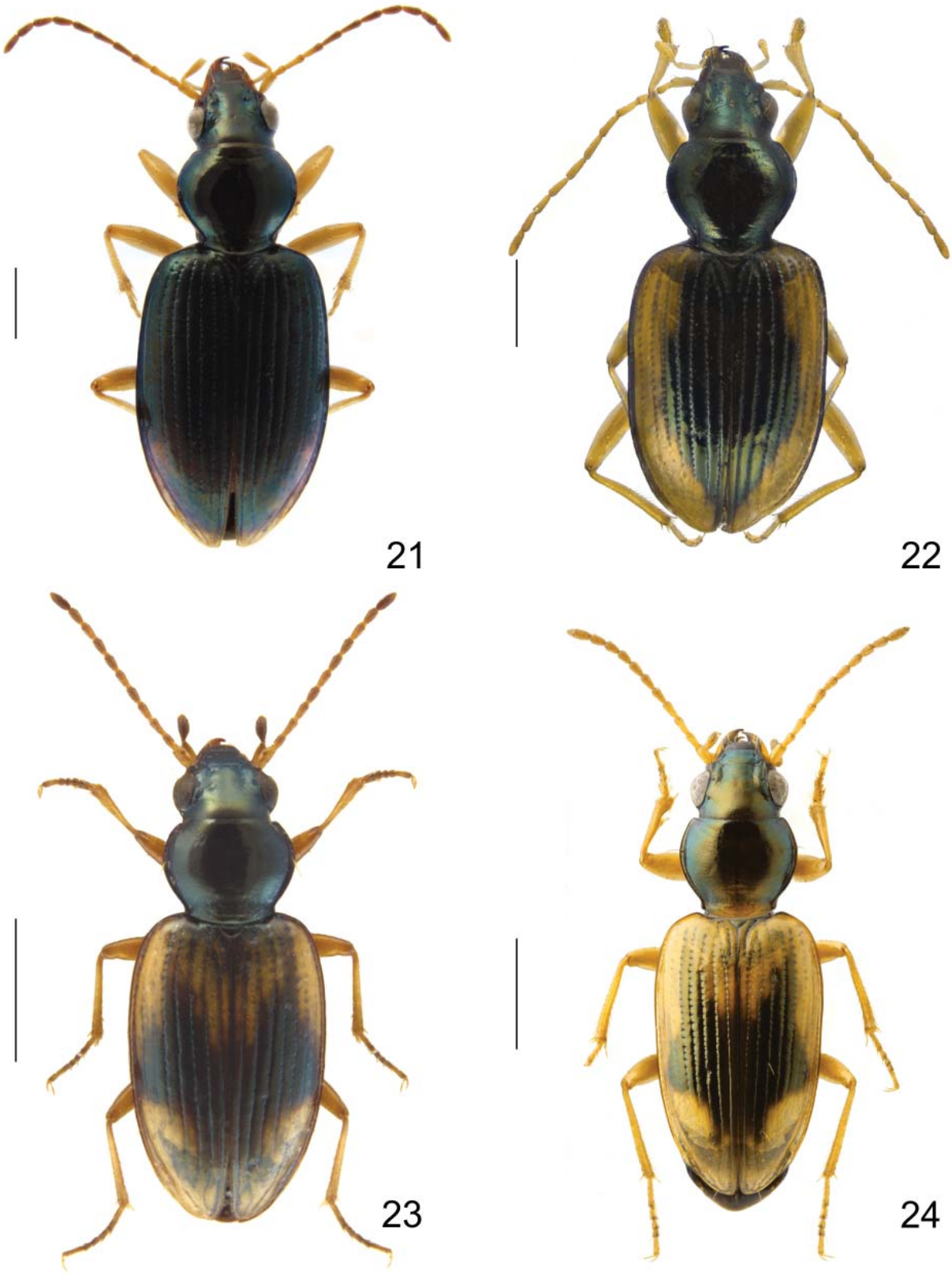
Figures 9–12. Dorsal habitus. **9)** *Bembidion embersoni*. **10)** *B. brullei*. **11)** *B. rotundicolle*. **12)** *B. tairuense*. Scale line = 1 mm.



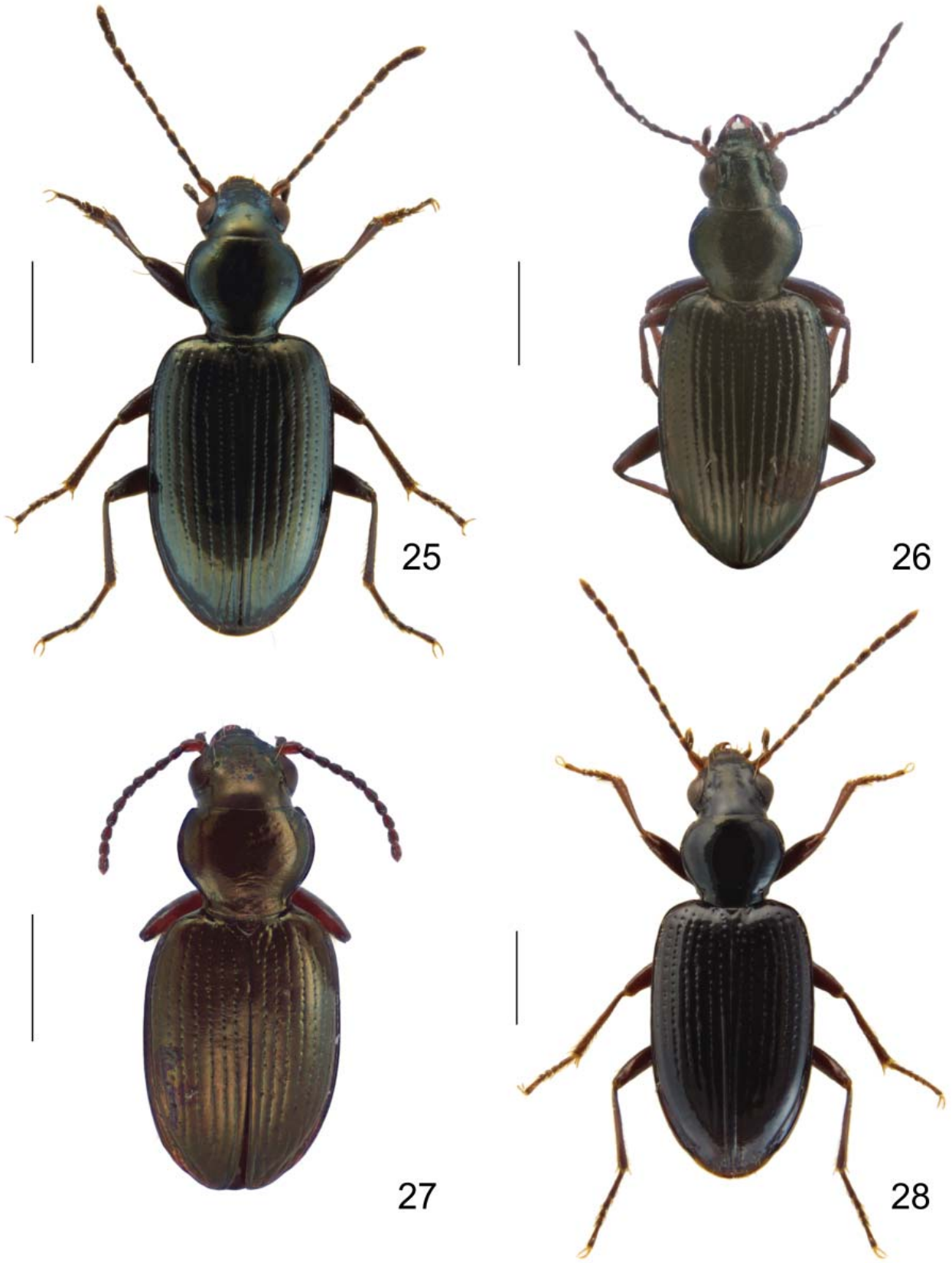
Figures 13–16. Dorsal habitus. **13)** *Bembidion granuliferum*. **14)** *B. townsendi*. **15)** *B. maorinum maorinum*. **16)** *B. m. levatum*. Scale line = 1 mm.



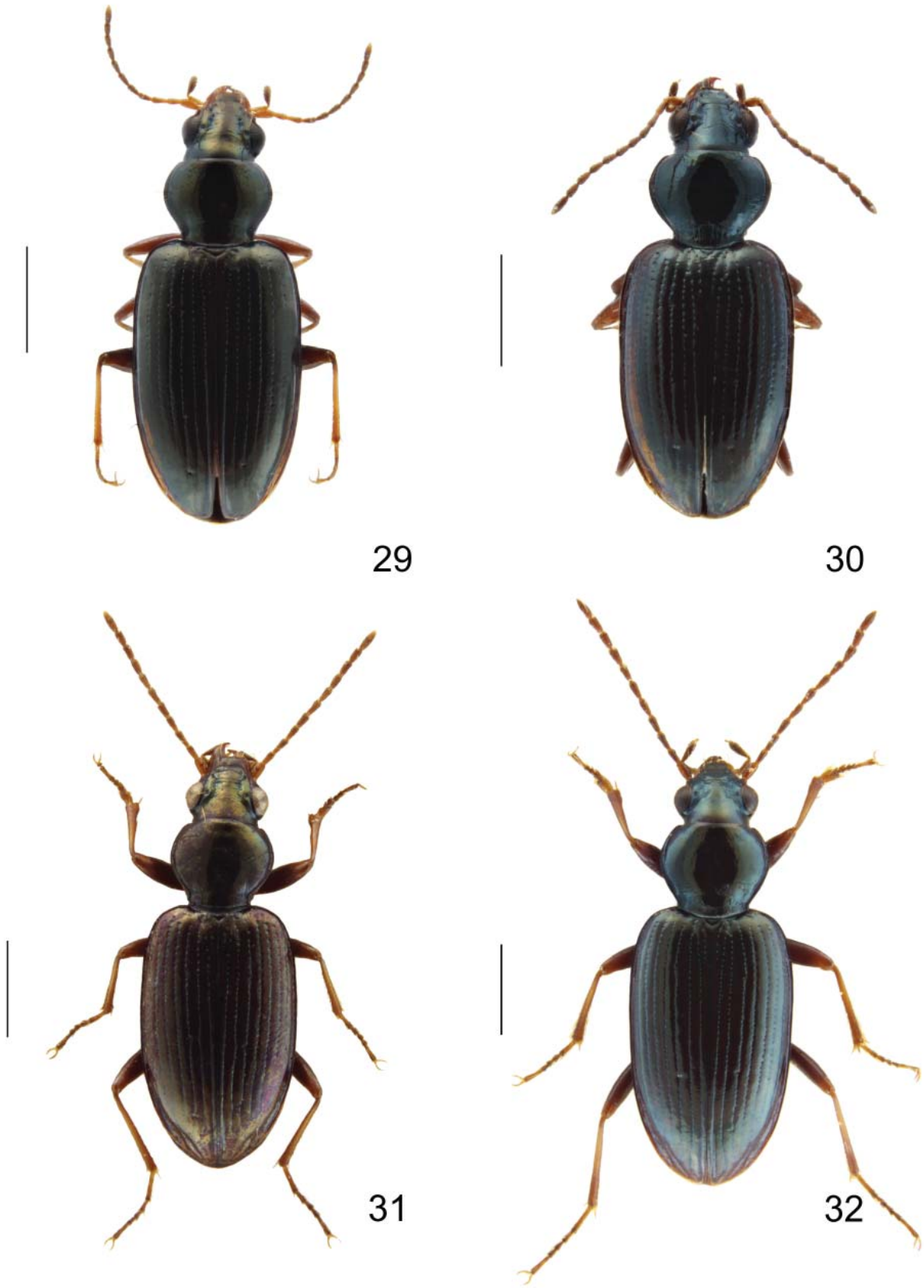
Figures 17–20. Dorsal habitus. **17)** *Bembidion charile*. **18)** *B. dehiscens*. **19)** *B. actuarium*. **20)** *B. musae*. Scale line = 1 mm.



Figures 21–24. Dorsal habitus. **21)** *Bembidion orbiferum*. **22)** *B. giachinoi*. **23)** *B. callipeplum*. **24)** *B. nesophilum*. Scale line = 1 mm.

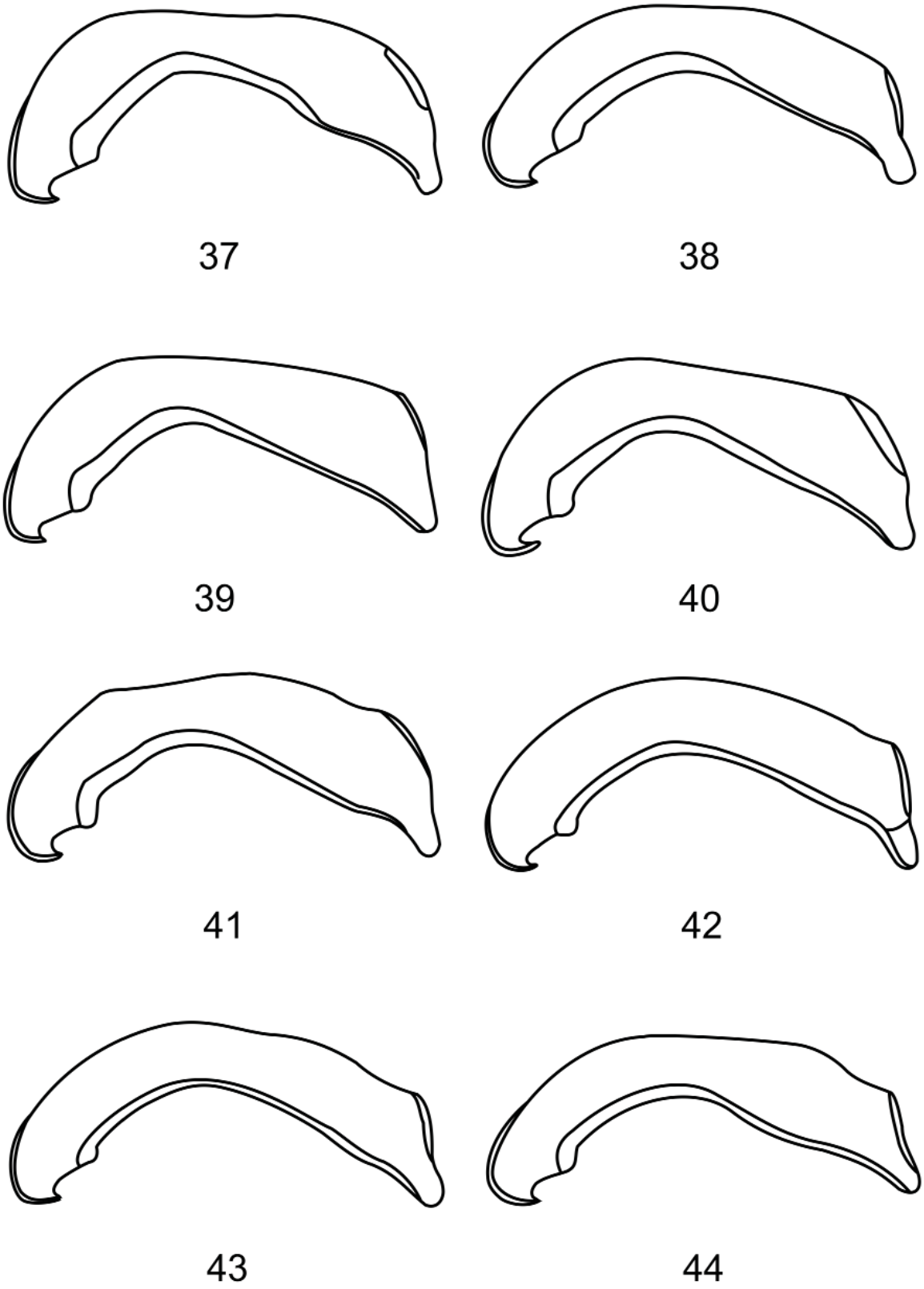


Figures 25–28. Dorsal habitus. **25)** *Bembidion tekapoense*. **26)** *B. anchonoderus*. **27)** *B. stewartense*. **28)** B. parviceps. Scale line = 1 mm.

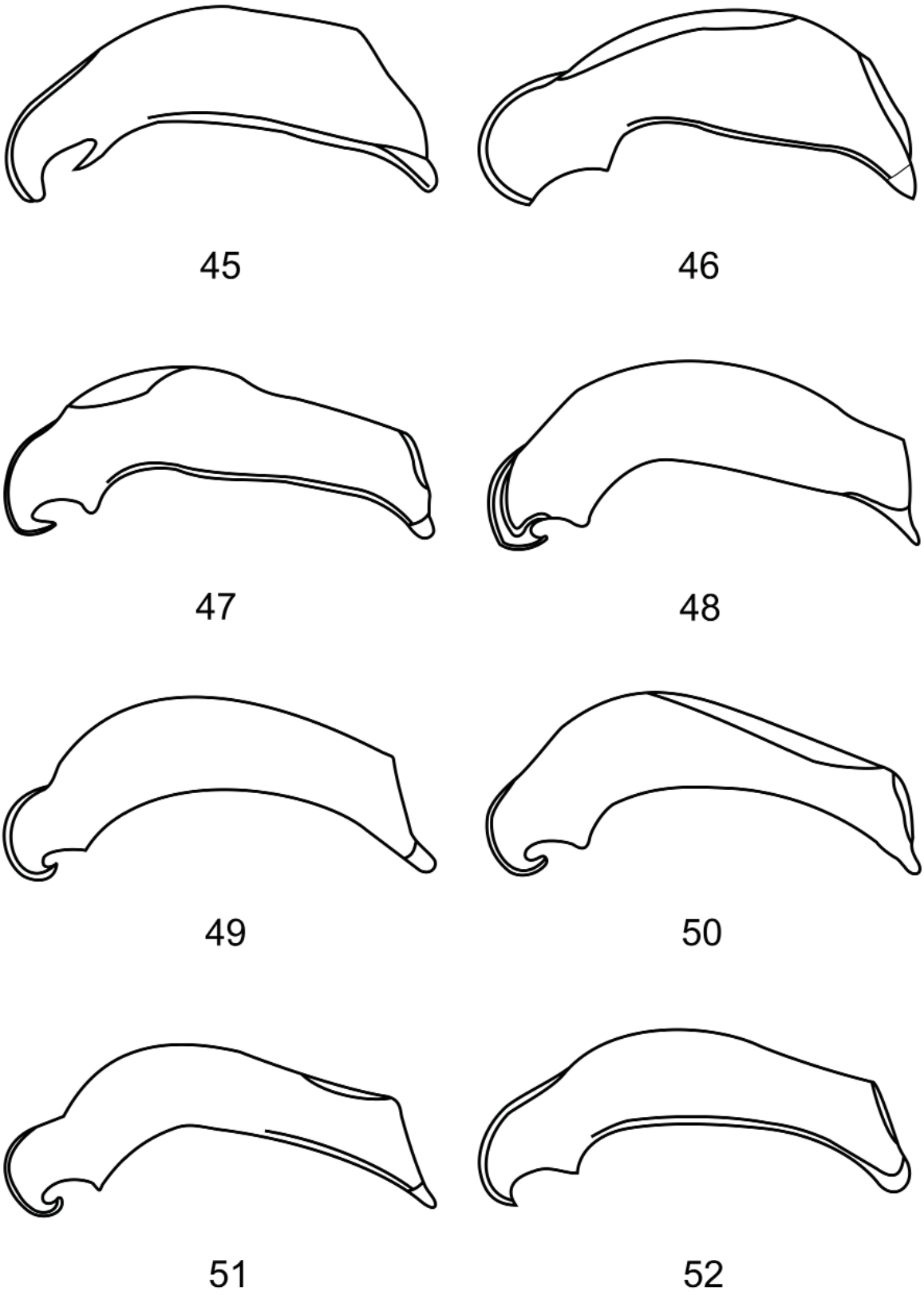


Figures 29–32. Dorsal habitus. **29)** *Bembidion waiho* new species. **30)** *B. urewerense*. **31)** *B. mangamuka* new species. **32)** *B. solitarium*. Scale line = 1 mm.

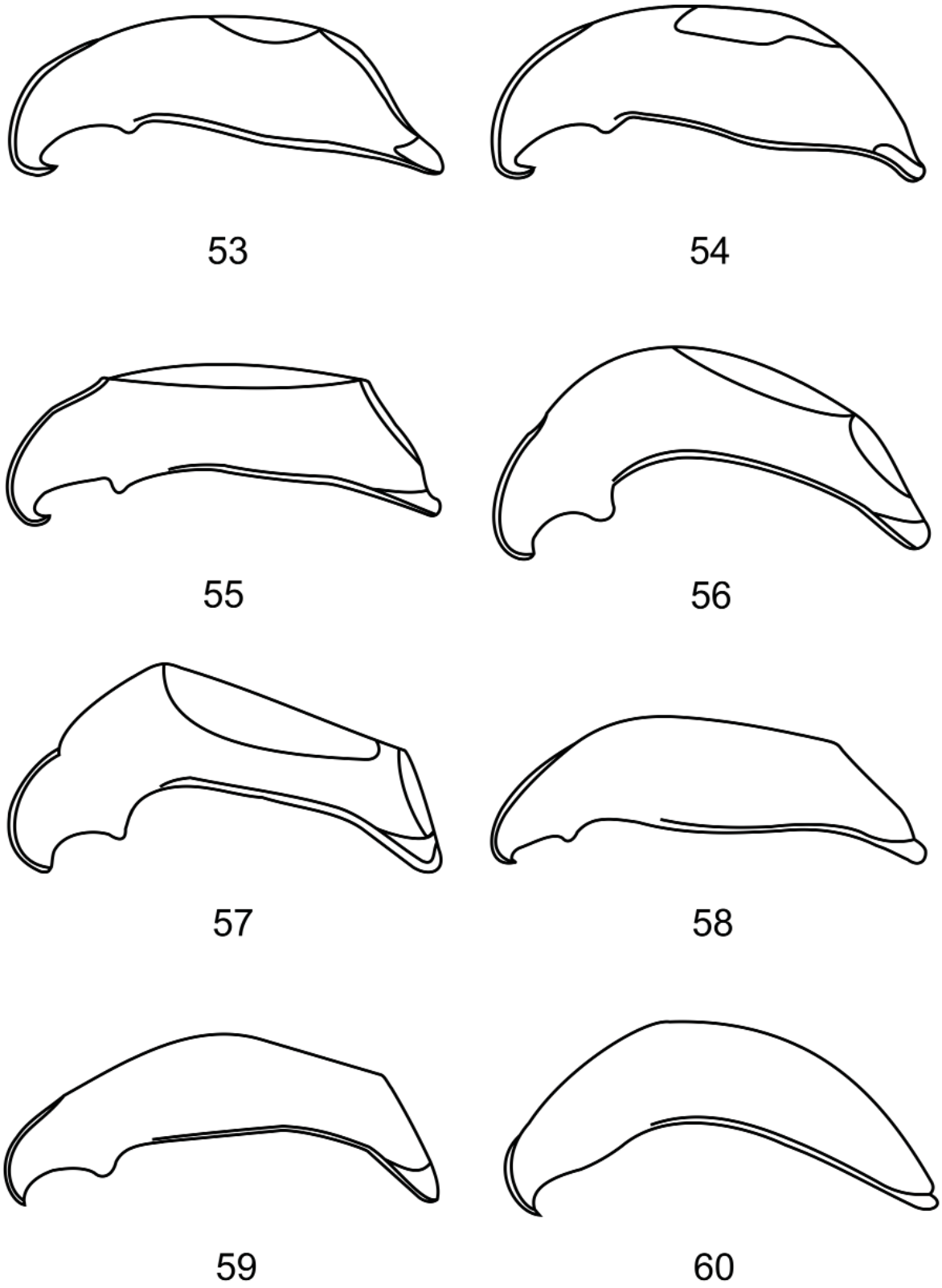
Figures 33–36. Dorsal habitus. **33)** *Bembidion bullerense* new species. **34)** *B. hokitikense*. **35)** *B. chalceipes*. **36)** *B. wanakense*. Scale line = 1 mm.



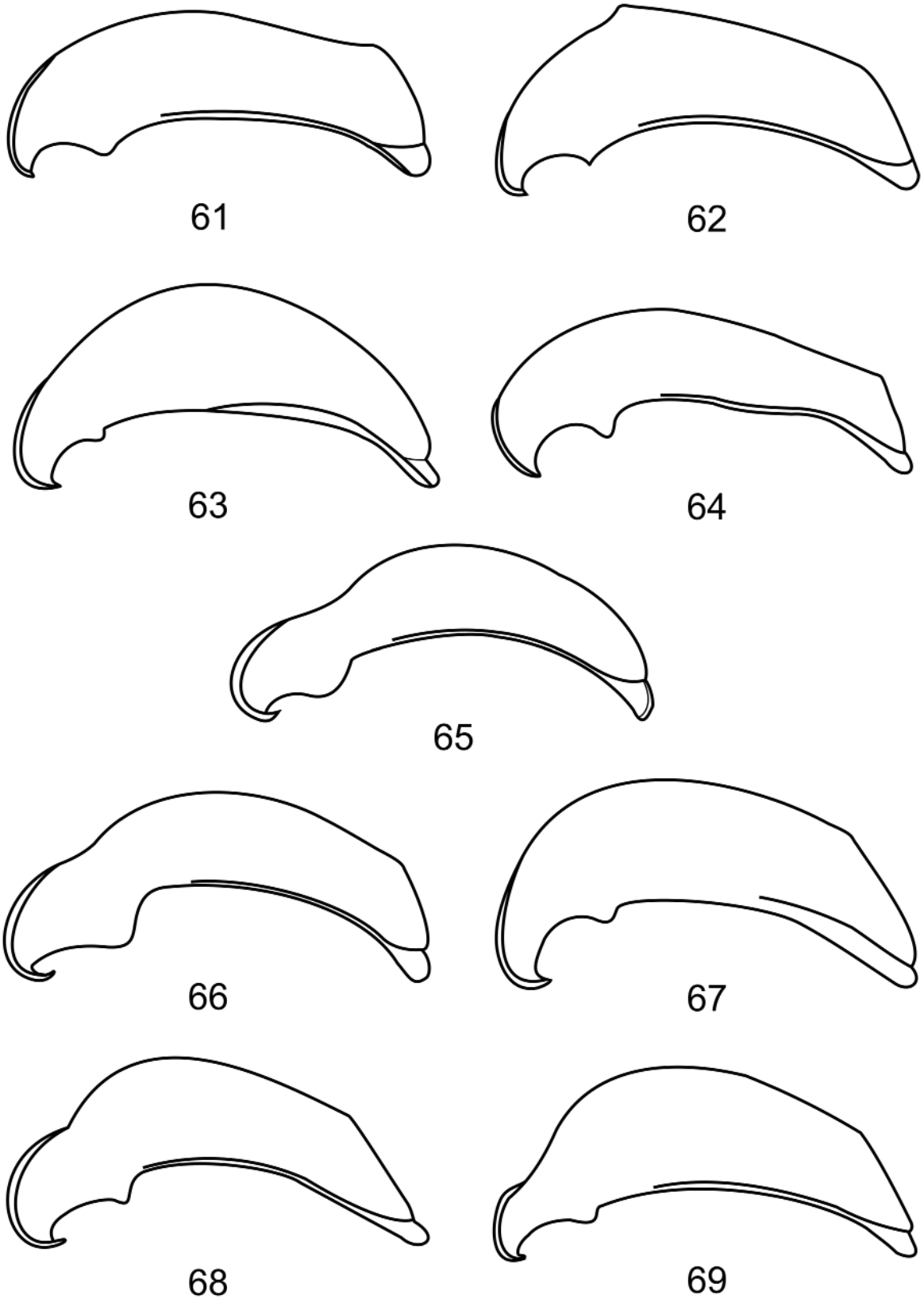
Figures 37–44. Aedeagi, lateral. **37)** *Bembidion karikari* new species. **38)** *B. albescens*. **39)** *B. alacre*. **40)** *B. tepaki* new species. **41)** *B. waimarama* new species. **42)** *B. puponga* new species. **43)** *B. tillyardi*. **44)** *B. chalmeri*.



Figures 45–52. Aedeagi, lateral. **45)** *Bembidion brullei*. **46)** *B. rotundicolle*. **47)** *B. tairuense*. **48)** *B. granuliferum*. **49)** *B. maorinum maorinum*. **50)** *B. charile*. **51)** *B. dehiscens*. **52)** *B. actuarium*.



Figures 53–60. Aedeagi, lateral. **53)** *Bembidion musae*. **54)** *B. orbiferum*. **55)** *B. giachinoi*. **56)** *B. callipeplum*. **57)** *B. nesophilum*. **58)** *B. tekapoense*. **59)** *B. anchonoderus*. **60)** *B. stewartense*.



Figures 61–69. Aedeagi, lateral. **61)** *Bembidion parviceps*. **62)** *B. waiho* new species. **63)** *B. urewerense*. **64)** *B. mangamuka* new species. **65)** *B. solitarium*. **66)** *B. bullerense* new species. **67)** *B. hokitikense*. **68)** *B. chalceipes*. **69)** *B. wanakense*.

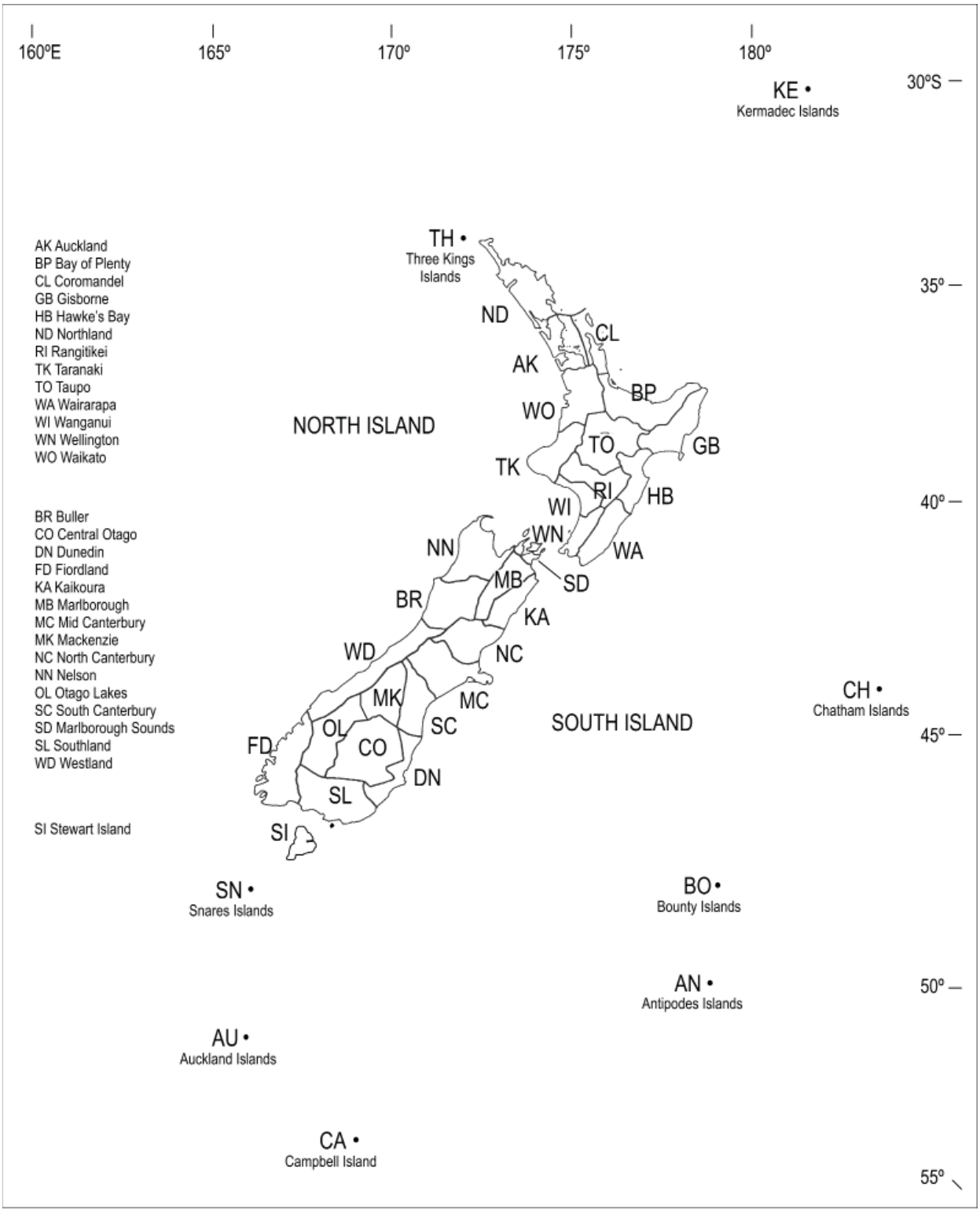


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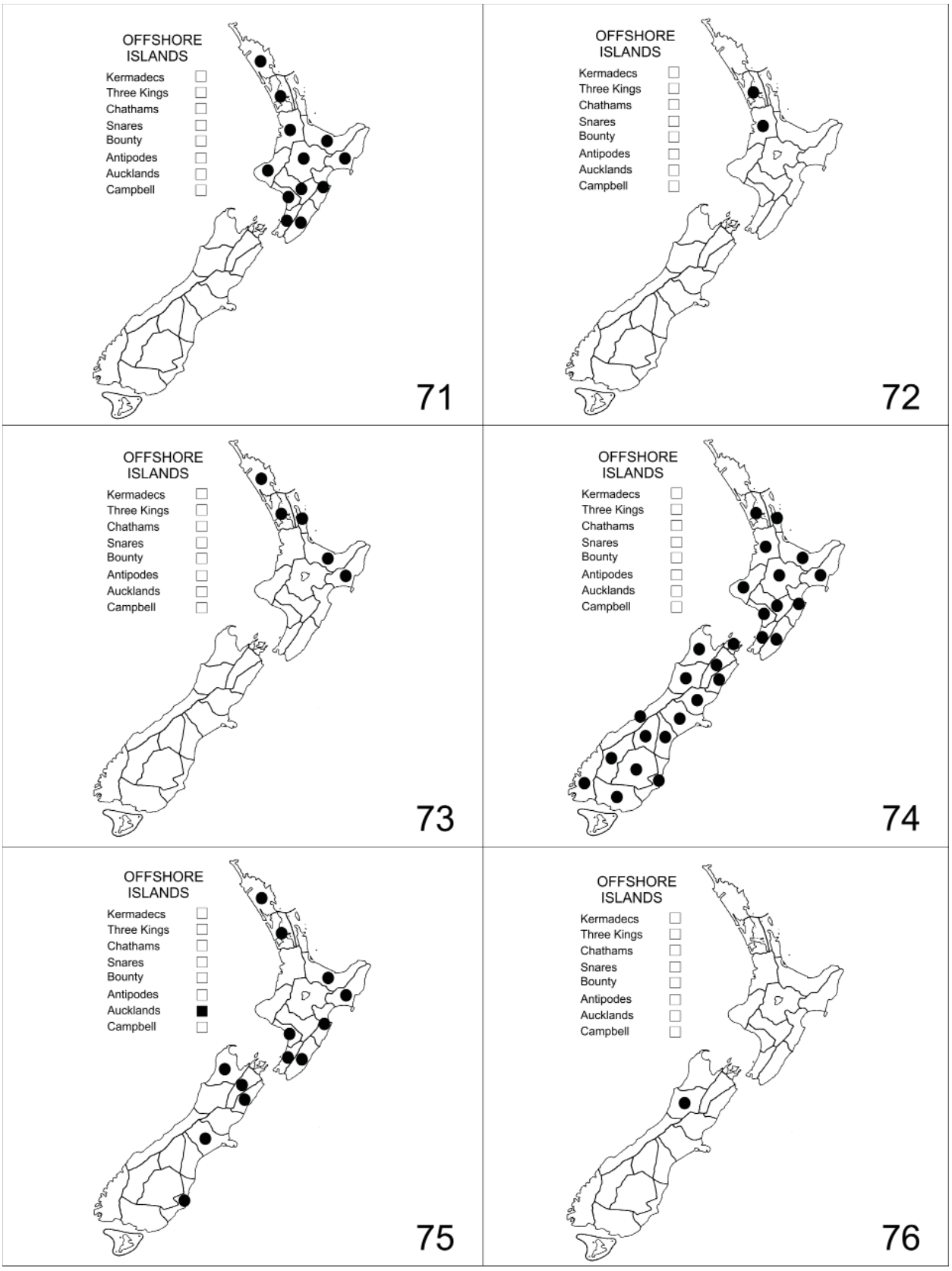
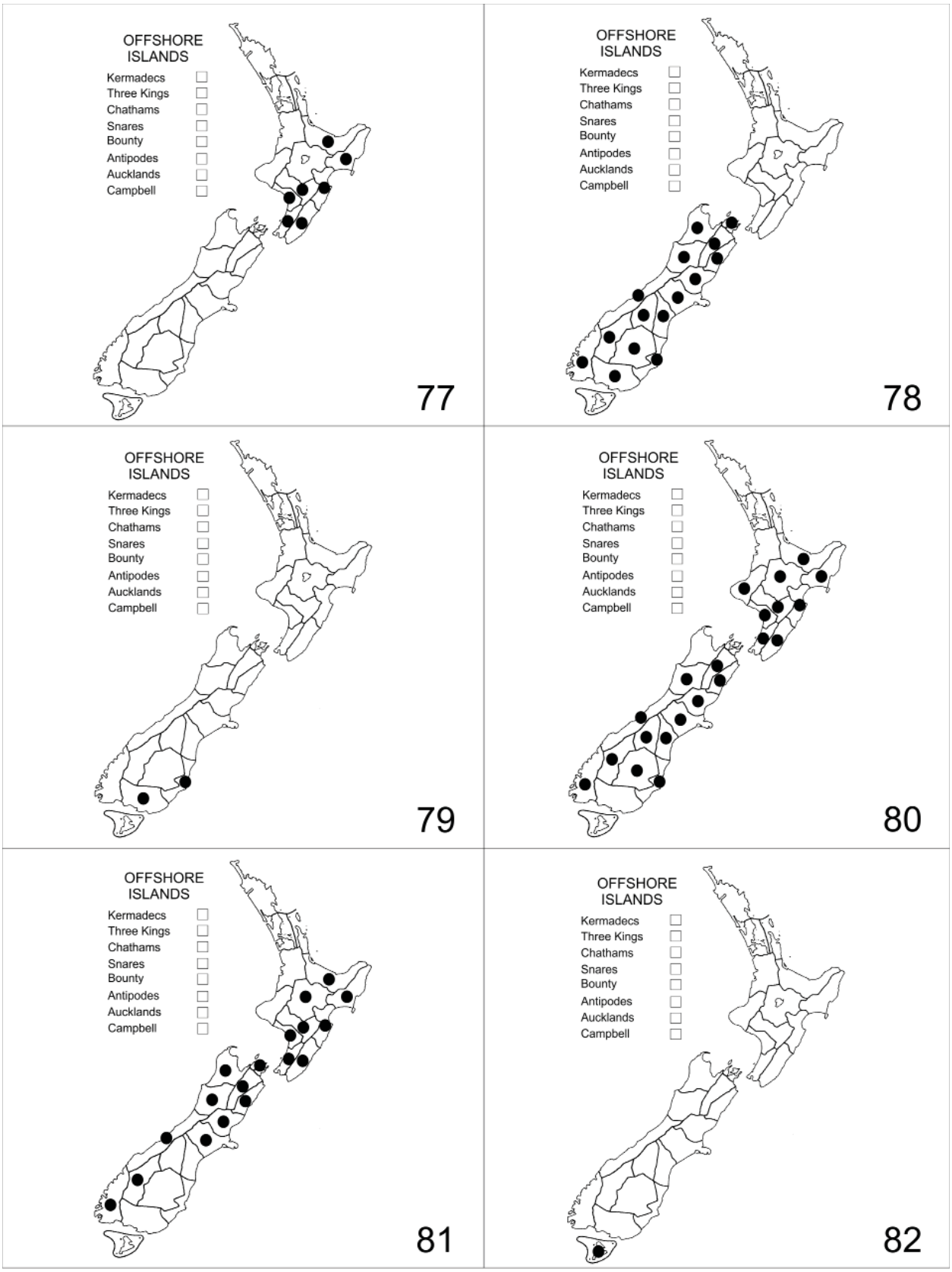
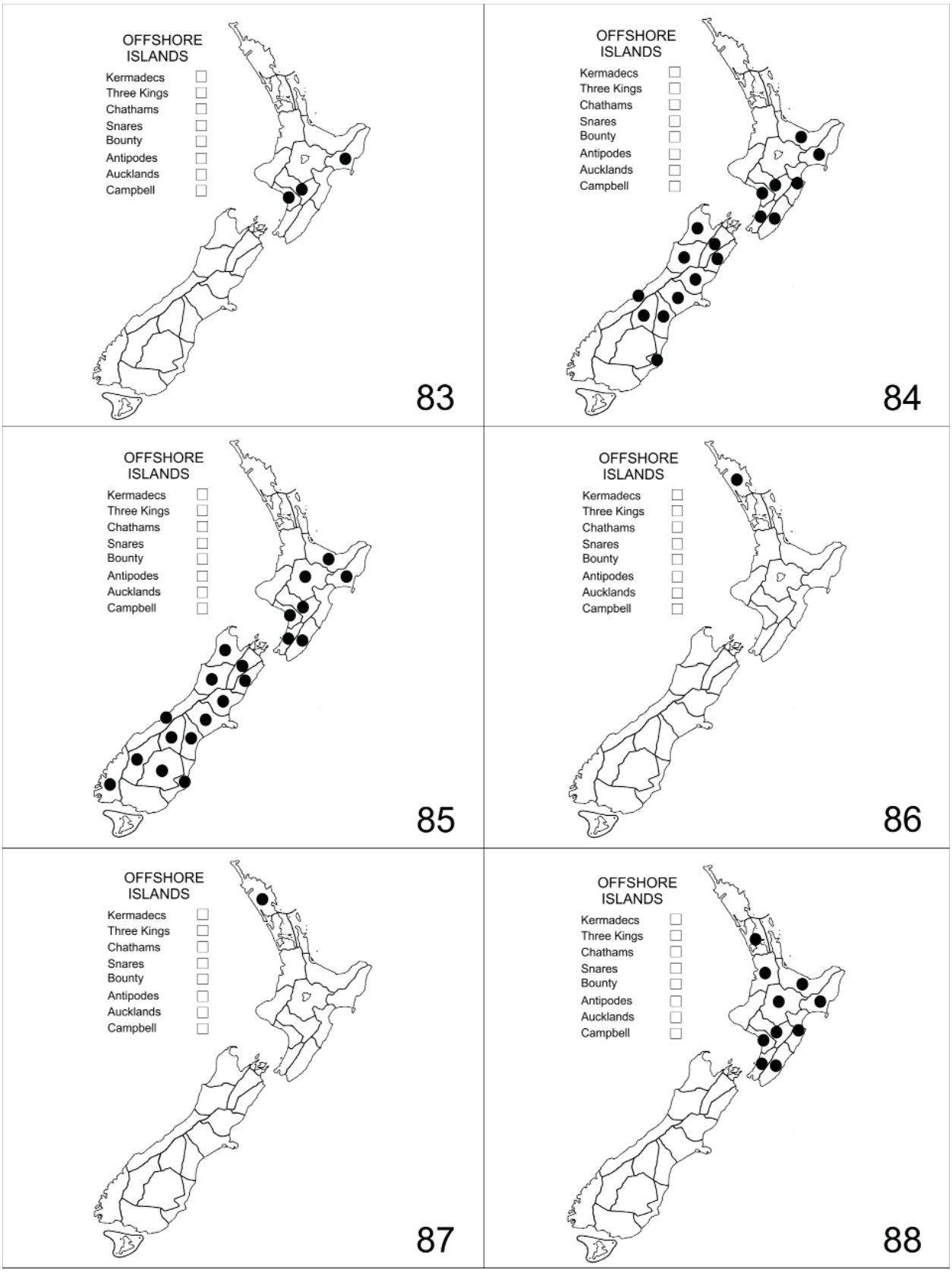
Figure 70. Map of New Zealand, outlying islands, areas and associated codes.



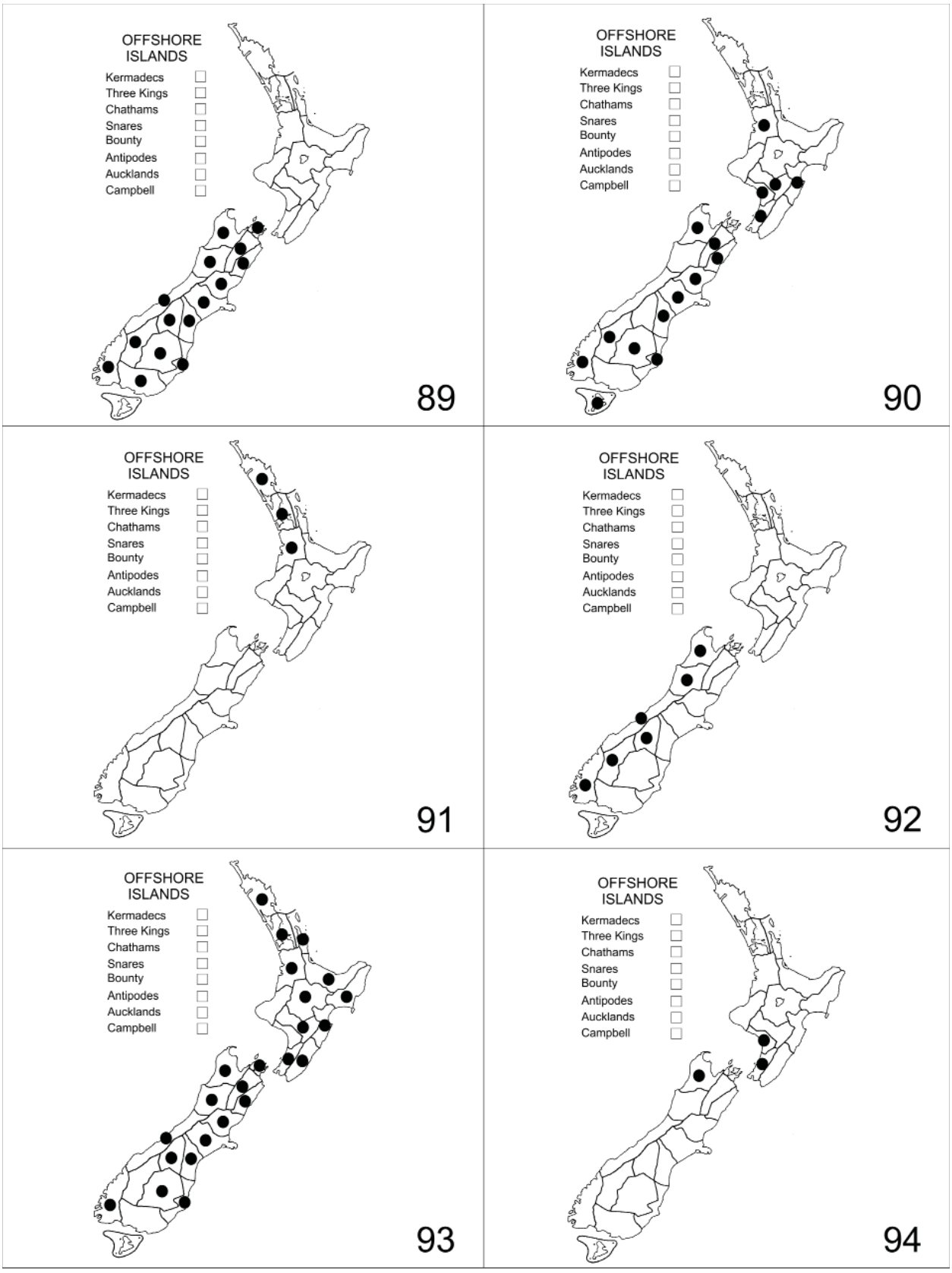
Figures 71–76. Species distribution maps. **71)** *Bembidion actuarium*. **72)** *B. alacre*. **73)** *B. albescens*. **74)** *B. anchonoderus*. **75)** *B. brullei*. **76)** *B. bullerense* new species.



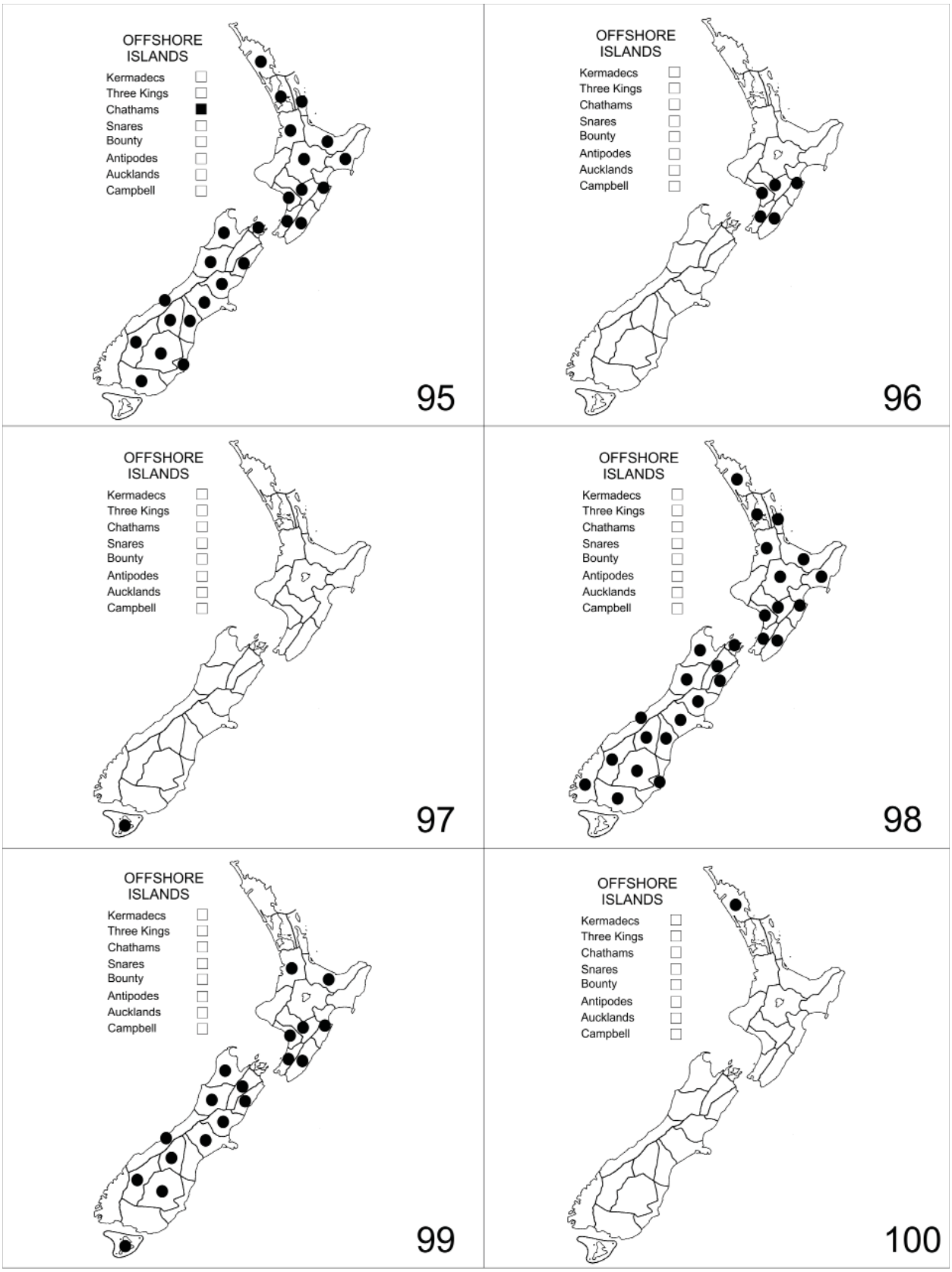
Figures 77–82. Species distribution maps. **77)** *Bembidion callipeplum*. **78)** *B. chalceipes*. **79)** *B. chalmeri*. **80)** *B. charile*. **81)** *B. dehiscens*. **82)** *B. embersoni*.



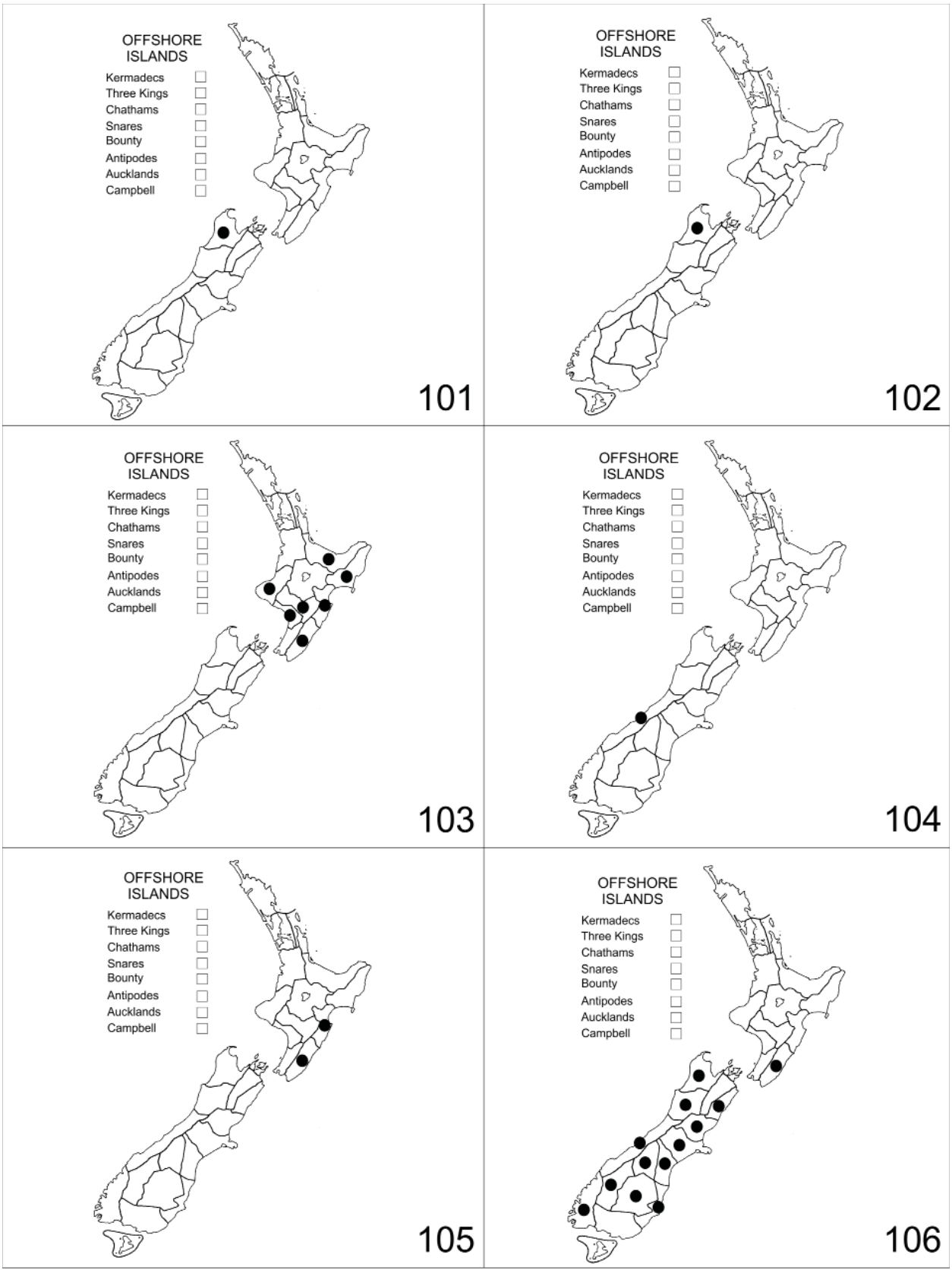
Figures 83–88. Species distribution maps. **83)** *Bembidion giachinoi*. **84)** *B. granuliferum*. **85)** *B. hokitikense*. **86)** *B. karikari* new species. **87)** *B. mangamuka* new species. **88)** *B. maorinum levatum*.



Figures 89–94. Species distribution maps. **89)** *Bembidion maorinum maorinum*. **90)** *B. musae*. **91)** *B. nesophilum*. **92)** *B. orbiferum*. **93)** *B. parviceps*. **94)** *B. puponga* new species.



Figures 95–100. Species distribution maps. **95)** *Bembidion rotundicolle*. **96)** *B. solitarium*. **97)** *B. stewartense*. **98)** *B. tairuense*. **99)** *B. tekapoense*. **100)** *B. tepaki* new species.



Figures 101–106. Species distribution maps. **101)** *Bembidion tillyardi*. **102)** *B. townsendi*. **103)** *B. urewerense*. **104)** *B. waiho* new species. **105)** *B. waimarama* new species. **106)** *B. wanakense*.

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Figures 107–108. Species habitats, *Bembidion* (*Zecillenus*). **107)** Northland (ND), Te Paki Stream, *B. tepaki* new species. **108)** Northland (ND), Puheke Beach stream, *B. karikari* new species.

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