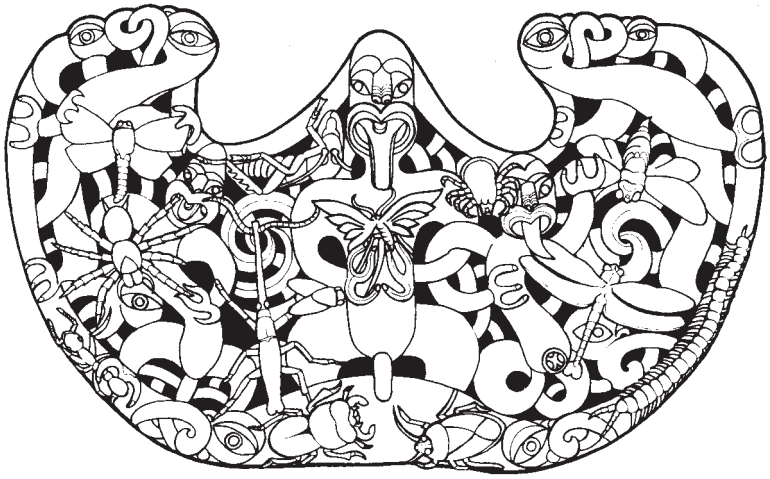

Fauna of New Zealand

Ko te Aitanga Pepeke o Aotearoa

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Number / Nama 74

Ceratomerinae
(Diptera: Empidoidea: Brachystomatidae)

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2017

Cataloguing in publication

Sinclair, B.J.

Ceratomerinae (Diptera: Empidoidea: Brachystomatidae) / by B.J. Sinclair; — Lincoln, N.Z. : Landcare Research NZ, 2017.

1 online resource

(Fauna of New Zealand, ISSN 1179-7193 (online) ; no. 74 = Ko te Aitanga Pepeke o Aotearoa ; nama 74)

ISBN 978-0-947525-10-1 (print)

ISBN 978-0-947525-11-8 (online)

1.Diptera -- New Zealand. I. Title. III. Landcare Research New Zealand Ltd.

UDC 595.773.1(931)

Suggested citation:

Sinclair, B.J. 2017. Ceratomerinae (Diptera: Empidoidea: Brachystomatidae). Lincoln, N.Z.: Landcare Research.

https://doi.org/10.7931/J2/FNZ.74

Prepared for publication by Zhi-Qiang Zhang and the authors using computer-based text processing, layout, and printing at Landcare Research, Private Bag 92170, Auckland, New Zealand.

To access on-line extracts from this series visit:
http://fnz.landcareresearch.co.nz/

Published by Landcare Research, P.O. Box 40, Lincoln, Canterbury, N.Z.
Website: http://www.landcareresearch.co.nz/

Printed by 3A

Cover design: Birgit Rhode

Date of publication 23 June 2017

Publication of the Fauna of New Zealand series is supported by Core funding for Crown Research Institutes from the Ministry of Business, Innovation and Employment's Science and Innovation Group, for the Defining New Zealand's Land Biota research programme.

POPULAR SUMMARY

Class **Insecta**

Order **Diptera**

Superfamily **Empidoidea**

Family **Brachystomatidae**

Ceratomerine flies

The Empidoidea are commonly known as dance flies and long-legged flies. There are four or five empidoid families in New Zealand depending on the classification followed. The subfamily Ceratomerinae of the family Brachystomatidae is known only from South America, Australia and New Zealand. The New Zealand ceratomerines belong to three genera: *Glyphidopeza*, *Zealandicesa* and *Ceratomerus*. The former two genera are endemic to New Zealand, occurring nowhere else in the world. The widespread genus *Ceratomerus* is highly diverse with more species found in New Zealand than in Australia and South America combined. The distribution suggests that this subfamily of dance flies is of Gondwanan origin.

Most New Zealanders have never encountered ceratomerine flies. These slender, long-legged, mostly yellowish brown flies are found along the edges and on emergent rocks of small streams, small roaring cascading rivers and in humid forests. Most species are believed to prey on small insects, except the *C. dorsatus* group where adults have been collected on flowers and likely feed mostly on nectar. Ceratomerines are readily and most effectively collected by setting out small yellow bowls with water and a drop of soap. The colour appears to be highly attractive to ceratomerines and many other insects. They can also be collected using sweep nets and Malaise and UV-light traps.

Glyphidopeza is known from two species in small streams in the northern region of the South Island. *Zealandicesa* is widespread on the North and South Islands occurring around small pools in sphagnum regions and damp cool forests. *Ceratomerus* is also found throughout the North and South Islands and also Stewart Island with 45 known species, of which 33 new species are described in this work based on the examination of some 1800 specimens. No ceratomerines are known from the distant offshore New Zealand islands. New Zealand *Ceratomerus* is divided into seven species groups defined on the basis of modified male secondary sexual characters or ornaments. There appears to be no end to the variety and form of the exaggerated male ornaments, which include modifications of the mouthparts, antennae, fore and midlegs, wings and thorax.

Major gaps in our understanding of the Ceratomerinae remain. The immature stages urgently need to be discovered and molecular techniques hold promise in achieving this goal. Mating and feeding behaviours are mostly unknown and new observations are to be encouraged.

Te rango Ceratomerine

E mōhio whānuitia ana te Empidoidea he rango kanikani, he rango waewae roroa. E whā, e rima rānei ngā whānau empidoid i Aotearoa, kei te āhua tonu o te karangatanga ka whāia. Ko te whānau iti, te Ceratomerinae o te whānau Brachystomatidae, nō Āwherika ki te Tonga, nō Ahitereiria me Aotearoa anahe. E toru ngā momo ceratomerine o Aotearoa: ko te *Glyphidopeza*, te *Zealandicesa* me te *Ceratomerus*. Ko te momo tuatahi me te tuarua nō Aotearoa taketake ake, kāore e kitea e waho atu. Ko te *Ceratomerus* he kanorau, he maha atu ōna momo ka kitea i Aotearoa tēnā i te katoa o ōna momo ka kitea i Ahitereira me Amerika ki te Tonga. He tohu pea tēnei i takea mai te whānau whāiti o ngā rango kanikani nei i te whenua o Gondwana.

Kāore te nuinga atu o te iwi o Aotearoa e tūpono atu ki te rango ceratomerine. Ko ngā rango waewae roroa tōhihi nei, he kaho nei te tae, ka kitea i te taha, i runga rānei i te toka e whātare mai ana i te awa iti, i ngā awa hūkere iti rānei me te ngahere pīpīwai. Ko te nuinga o ngā momo rango nei he kai pepeke moroiti, atu i te whānau *C. dorsatus* kua hopukina nei ngā kātua i te pua, he mīere hoki tā rātou tino kai. Ko te tikanga pai hei hopu i te Ceratomerine ko te waiho i te rīhi kōwhai iti he wai kei roto, ka hoatu ai i tētahi pata hopi ki roto. Ko te tae tonu ka poapoa mai i te ceratomerine me te maha atu o te pepeke. Ka taea anō te hopu ki te kupenga ringa, ki te kupenga rite ki te tēneti te hanga, me te tāwhiti whai rama UV.

E rua ngā momo *Glyphidopeza* ka kitea i ngā awa iti i te takiwā ki te raki o Te Waipounamu. He whānui te kitea o te *Zealandicesa* i Te Ika-a-Māui me Te Waipounamu i te hōpua wai iti, i te wāhi ka kitea te pūkohu sphagnum me te ngahere haukū makariri. Ka kitea anō te *Ceratomerus* i te whānuitanga atu o Te Ika-a-Māui, i Te Waipounamu me Rakiura. E 45 ngā momo e mōhiotia ana, ka mutu e 33 ngā momo hou ka kōrerohia i te tānga nei nā runga i te mātaitanga i ētahi rango 1800. Kāore e kitea ana te ceratomerine i ngā moutere e tawhiti atu ana i Aotearoa. E whitu ngā wehenga rōpū o te *Ceratomerus* kua tautuhia i runga i te hou o te āhua o ngā wāhanga taihemahema tuarua, ngā whakarei rānei o ngā toa. Te āhua nei he mutunga kore ngā momo me te āhua o ngā whakarei o ngā toa kua rahi haere nei, pērā i te hou o te āhua o ngā wāhanga o te waha, ngā pūhihi, ngā waewae o mua me ō waenganui, ngā parirau me te tārāuma.

He rahi tonu ngā kōrero mō ngā Ceratomerinae kāore tonu e mōhiotia ana. E whāwhaitia ana te kitea o ana torongū, ka mutu tērā pea mā ngā tikanga rāpoi ngota e tutuki ai tēnei whāinga. Ko te nuinga o ngā whanonga whakaputa uri me ngā whanonga kai kāore tonu e mōhiotia ana, nō reira kia kaha tonu te whakahau i ngā mātaitanga hou.

Contributor **Bradley Sinclair** was born in Hamilton, Ontario, Canada and received a BSc and MSc from the University of Guelph, where he developed a keen interest in entomology. He earned a PhD from Carleton

University, conducting systematic research at the Canadian National Collection of Insects (CNC) in Ottawa. Brad's thesis was on the aquatic dance fly subfamily Clinocerinae (Empididae), and included revisions of two North American genera and extensive morphological studies on fly larval mouthparts and male genitalia. Following completion of his PhD, Brad was an NSERC funded postdoctoral fellow at the Australian Museum in Sydney. It is during this time when he concentrated his research efforts on the Gondwanan restricted empidoid subfamily Ceratomerinae and collected extensively in eastern Australia and New Zealand. Prior to joining the Canadian Food Inspection Agency and the CNC in 2007 as a diagnostic entomologist, Brad was curator of Diptera at the Zoologisches Forschungsmuseum Alexander Koenig (Bonn, Germany) and assistant professor at Kyushu University (Fukuoka, Japan). He has studied and collected flies worldwide, particularly dance flies, and is author of more than 120 scientific articles and book chapters in Dipterology.

I whānau mai te kaituhi, a **Bradley Sinclair**, i Hamilton, Ontario, Canada, ka mutu i riro i a ia tana BSc me tana MSc i te Whare Wānanga o Guelph, i reira nei e tipu ana tana ngākaunui ki te mātai pepeke. I whiwhi ia i tana Tohu Kairangi i Te Whare Wānanga o Carleton, i tana whakahaere nahanaha i ana mahi rangahau i te Canadian National Collection of Insects (CNC) i Ottawa. E pā ana te tuhinga roa a Brad ki te whānau iti o te rango kanikani noho wai, ki te Clinocerinae (Empididae), me tana tirotiro anō i ētahi momo e rua o Amerika ki te Raki, me te whānui anō o tana mātai ā-rauropi ora nei i te waha o te torongū a te rango me ngā taihemahema o te toa. Whai muri i te tutukitanga o tana Tohu Kairangi, ka noho a Brad hei pou tākutatanga mā NSERC i te Whare Taonga o Ahitereiria i Poihākena. Nō konei i whakapau kaha ai ia ki te rangahau i te whānau iti empidoid, arā te Ceratomerinae, i whāiti mai nei tāna noho ki te whenua o Gondwana, me te tini o te rango i kohia e ia i Ahitereiria ki te rāwhiti me Aotearoa. I mua i tana haere ki te Canadian Food Inspection Agency me te CNC i te tau 2007 hei kaimātai pepeke tātari āhua, i noho a Brad hei kaitiaki mō ngā Diptera i te Zoologisches Forschungsmuseum Alexander Koenig (Bonn, Germany) hei ahorangi tuarua hoki i te Whare Wānanga o Kyushu (Fukuoka, Japan). Kua mātaitia, kua kohia e ia ētahi rango o te ao, ko te nuinga he rango kanikani, ka mutu neke atu i te 120 ngā tānga pūtaiao kua tuhia e ia, tae atu ki te upoko pukapuka e pā ana ki te Dipterology.

Māori translation by Te Haumihiata Mason

ABSTRACT

The 54 species of Ceratomerinae currently known from New Zealand are treated. New records of *Glyphidopeza* Sinclair and *Zealandicesa* Koçak & Kemal are recorded. Forty-five New Zealand species of *Ceratomerus* Philippi are revised, including the description of 33 new species (*C. akatarawa* n. sp., *C. alticolus* n. sp., *C. aquilonius* n. sp., *C. brevinervis* n. sp., *C. burgersi* n. sp., *C. collini* n. sp., *C. curvatus* n. sp., *C. dugdalei* n. sp., *C. flexuosus* n. sp., *C. fontinalis* n. sp., *C. latinervis* n. sp., *C. latipalpus* n. sp., *C. lobipennis* n. sp., *C. macfarlanei* n. sp., *C. mangamuka* n. sp., *C. mayae* n. sp., *C. minutus* n. sp., *C. mirandus* n. sp., *C. montanus* n. sp., *C. morrisi* n. sp., *C. notatus* n. sp., *C. ohakunensis* n. sp., *C. oparara* n. sp., *C. planti* n. sp., *C. rivalis* n. sp., *C. setifacies* n. sp., *C. simplex* n. sp., *C. spinosus* n. sp. *C. subnotatus* n. sp., *C. tonnoiri* n. sp., *C. trivittatus* n. sp., *C. wardi* n. sp., *C. whirinaki* n. sp.). All species of *Ceratomerus* are illustrated, described and distributions mapped. *Ceratomerus earlyi* Plant is proposed as a junior synonym of *C. prodigiosus* Collin. Seven New Zealand *Ceratomerus* species-groups are recognized. Keys to all New Zealand species of Ceratomerinae are presented. The evolution of the male secondary sexual characters among species of *Ceratomerus* is discussed. The phylogenetic relationships of the Ceratomerinae with emphasis on the New Zealand species-groups and unplaced species of *Ceratomerus* are analyzed. The first empidoid gynandromorph is reported that exhibits anterior/posterior division of male and female components. An updated key to empidoid family and genus groups of New Zealand is presented.

Key words: Insecta, Diptera, Empidoidea, Brachystomatidae, Ceratomerinae, New Zealand, *Ceratomerus*, *Glyphidopeza*, *Zealandicesa*, morphology, taxonomy, new species, keys, biogeography, dance flies

urn:lsid:zoobank.org:pub:CC5330C5-40BE-4DD0-B62D-308BFD0F17FF

Accepted by Robert Hoare: 15 Sept. 2016; published: 23 Jun. 2017

CHECKLIST OF TAXA

CONTENTS

INTRODUCTION

The New Zealand Diptera fauna includes at least 3225 species of which some 300 are Empidoidea (exclusive of Dolichopodidae *s.lat*.) (Macfarlane *et al*. 2010). The Empidoidea, commonly referred to as dance flies and long-legged flies, are a diverse, monophyletic lineage comprising five families, namely Atelestidae, Brachystomatidae, Empididae, Hybotidae, Dolichopodidae *s. lat*. (including Microphorinae and Parathalassiinae) (Sinclair & Cumming 2006) and three unassigned genus-groups. Some authors have treated two of these genus-groups as separate families (i.e., Homalocnemidae and Oreogetonidae), because of the availability of family–group names (Thompson 2009; Pape *et al*. 2011; Marshall 2012; Sinclair 2017). The Brachystomatidae comprise three subfamilies: Brachystomatinae, Ceratomerinae and Trichopezinae. The Ceratomerinae are confined to the Southern Hemisphere, recorded from New Zealand, Australia, Norfolk Island, southern South America and high altitude habitats in Peru, Ecuador and Bolivia (Sinclair 1997, 2003, 2010). They are a distinctive group, recognized by their narrow wings and often outstretched antennae bearing a small conus extending from the pedicel upon which the postpedicel is attached (Figs. 1, 2, 9–16). Transantarctic relationships within the Ceratomerinae were first suggested by Paramonov (1959) and several different patterns in the subfamily were outlined and discussed by Sinclair (2010), including the classic Southern Gondwana Pattern and the inverted Southern Pattern.

The first species of Ceratomerinae in New Zealand were described by Collin (1928, 1931) and Malloch (1931), but no further studies were published until Plant (1990a, 1991) and Sinclair (1997). The New Zealand Ceratomerinae are extremely diverse with two endemic genera, *Glyphidopeza* Sinclair and *Zealandicesa* Koçak & Kemal (= *Icasma* Collin) and the widespread genus *Ceratomerus* Philippi, for a total of 54 species, including those in the present study. This diversity far exceeds that of Australia (19 spp.) and South America (13 spp.) (Sinclair 2003, 2010). Although *Zealandicesa* and a small species-group of *Ceratomerus* are confined to wet forests, most adult Ceratomerinae are often very common on emergent rocks in streams and creeks throughout New Zealand.

This is the third in a series of contributions to the knowledge of Ceratomerinae, building from earlier studies on two New Zealand genera (Sinclair 1997), and revisions of the genus *Ceratomerus* from Australia and South America (Sinclair 2003, 2010). Keys to species of all New Zealand Ceratomerinae are presented. It is expected that numerous additional species of *Ceratomerus* will be discovered in the future, especially from the poorly sampled regions of the northern North Island and southern South Island.

MATERIAL AND METHODS

Material

This study is based on some 1800 adult specimens of Ceratomerinae borrowed from or deposited in the following institutions: Australian National Insect Collection, Canberra, Australia (ANIC); Australian Museum, Sydney, Australia (AMS); The Natural History Museum, London, England (BMNH); Canterbury Museum, Christchurch, New Zealand (CMNZ); Canadian National Collection of Insects, Ottawa, Canada (CNC); School of Environmental Sciences, University of Guelph, Guelph, Canada (DEBU); Entomology Research Museum, Lincoln University, Canterbury, New Zealand (LUNZ); Museum National d'Histoire Naturelle, Paris, France (MNHN); National Museum of Wales, Cardiff, Wales, U.K. (NMW); New Zealand Arthropod Collection, Auckland, New Zealand (NZAC); United States National Museum of Natural History, Washington, USA (USNM). Abbreviations given here are used throughout the text to indicate deposition of specimens.

Terms used for adult structures primarily follow Cumming & Wood (2009), except for the antenna and wing venation, where the terms of Stuckenberg (1999) and Saigusa (2006) are used, respectively. Male and female abdomens were macerated in hot 85% lactic acid in order to examine terminalia and immersed in glycerin.

Label data of holotypes are cited in full, with original spelling, punctuation and date, and lines are delimited by a slash mark (/) and a semicolon separates data quoted from different labels. New Zealand locality data are listed under area codes, which refer to specific regions (Crosby *et al*. 1976): AK—Auckland, BP—Bay of Plenty, BR—Buller, CL—Coromandel, FD—Fiordland, GB—Gisborne, KA—Kaikoura, MB—Marlborough, MC—Mid Canterbury, MK—Mackenzie, NC—North Canterbury, ND—Northland, NN—Nelson, OL—Otago Lakes, RI—

Rangitikei, SI—Stewart Island, SL—Southland, TK—Taranaki, TO—Taupo, WD—Westland, WN—Wellington. Determination of Tonnoir collection localities was aided by the summary and analysis of Crosby (1976).

The following abbreviations are used in the "Type material" and "Additional material examined" sections: Ck—creek; for.—forest; Hwy—highway; Lk—lake; MT—Malaise trap; NP—National Park; Pk—Park, R—river; SF—State Forest; str—stream; tp—trap; Tr.—trail; YPT—yellow pan traps; UV—ultra-violet light trap. The following abbreviations were used in the descriptions: acr—acrostichal setae; ad—anterodorsal; av—anteroventral; dc—dorsocentral seta; pd—posterior dorsal; pprn—postpronotal seta; presut spal—presutural supra-alar seta; npl—notopleural seta; psut spal—postsutural supra-alar seta; pal—postalar seta; pd—posterodorsal; pv—posteroventral; sctl—scutellar seta; T—tergite; S—sternite. The term radial fork refers to the branching of R_{4+5} and the term medial fork refers to the branching of M_{1+2}. The following abbreviations were used to designate the most common collectors: BJS—B.J. Sinclair; DJB—D.J. Bickel; JBW—J.B. Ward.

All type specimens of Plant (1990a, 1991) examined were originally stored in ethanol. These specimens were subsequently dehydrated, critical-point-dried, mounted and labelled. Adult Ceratomerinae were collected by the author either by sweep net, yellow pan traps or Malaise traps. Emergent rocks from cool, cascading streams were searched, capturing specimens by sweep net or aspirating adults directly from the rocks. Yellow pan traps (small yellow bowls filled with water and a few drops of dishwashing detergent) were distributed along and in streams and creeks, placed on emergent rocks and banks, especially at small cascades (Fig. 8). The yellow pan traps were left overnight and emptied the following day.

Cladistic analysis

Characters were scored for all known genera, species groups of *Ceratomerus*, unplaced New Zealand species of *Ceratomerus* and three outgroup genera: *Anomalempis archon* Melander (Brachystomatinae), *Heterophlebus versabilis* (Collin) (Trichopezinae) and *Oreogeton obscurus* (Loew) (Empidoidea, *incertae sedis* or Oreogetonidae). The complete list of all 26 exemplars is provided in Table 1. Sixty-three characters were analyzed in the cladistic analysis, including seven multi-state characters (Table 2). All characters were treated as unordered with multi-state characters considered as non-additive, and all characters were equally weighted. Character polarity was determined by rooting the tree with the three empidoid outgroups, which together were constrained to be paraphyletic in relation to the ingroup.

Table 1. List of exemplar taxa used in cladistics analysis.

Taxon	Collection locality
Ceratomerus akatarawa n. sp.	New Zealand, Cloustonville, Akatarawa Valley
Ceratomerus albistylus Hardy, 1930	Australia, NSW, Blue Mountains National Park
Ceratomerus attenuatus Sinclair, 2003	Australia, VIC, Burrow-Pine National Park
Ceratomerus brevifurcatus Plant	New Zealand, Waipoua Forest Park
Ceratomerus brevinervis n. sp.	New Zealand, Pelorus Bridge Scenic Reserve
Ceratomerus burgersi n. sp.	New Zealand, Go Ahead Creek
Ceratomerus crassinervis Malloch	New Zealand, Abel Tasman National Park
Ceratomerus curvatus n. sp.	New Zealand, NW Nelson Forest Park
Ceratomerus deansi Plant, 1995	Chile, Pata de Galina
Ceratomerus dorsatus Collin	New Zealand, Hinewai Reserve
Ceratomerus falcatus Sinclair, 2003	Australia, NSW, Border Ranges National Park
Ceratomerus flavus Plant, 1991	New Zealand, Mt. Arthur Tableland
Ceratomerus irramus Sinclair, 2010	Chile, Puyuhue National Park, Antillanca
Ceratomerus longicornis Sinclair, 2010	Ecuador, Pichincha
Ceratomerus masneri Sinclair, 2010	Ecuador, Napo
Ceratomerus mediocris Collin, 1933	Chile, Chiloé I., Ahoni Alto
Ceratomerus notatus n. sp.	New Zealand, Nelson Lakes National Park
Ceratomerus orientalis Sinclair, 2003	Australia, NSW, Border Ranges National Park

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Table 1 (continued)

Taxon	Collection locality
Ceratomerus paradoxus Philippi, 1865	Chile, Aysen, Puerto Cisnes
Ceratomerus prodigiosus Collin	New Zealand, Westland National Park
Ceratomerus spinosus n. sp.	New Zealand, Hwy 40, west of Ohura
Glyphidopeza fluviatilis Sinclair	New Zealand, Jones Creek
Zealandicesa setosa (Sinclair)	New Zealand, Abel Tasman National Park
Outgroup	
Oreogeton obscurus (Loew, 1864)	Canada, Cape Breton Highlands National Park
Anomalempis archon Melander, 1945	Canada, Yukon, Dempster Hwy
Heterophlebus versabilis (Collin, 1933)	Chile, Magellanes, Lag Amarga, Natales

Table 2. Characters used in the cladistics analysis.

	Head
01.	*Male eye contiguity*: holoptic (0); dichoptic (1).
02.	*Dimensions of scape*: equal or slightly longer than pedicel (0); more than 2X as long as pedicel (1).
03.	*Conus*: absent (0); present (1).
04.	*Dimensions of pedicel*: at most twice as long as wide (0); more than twice longer than wide (1).
05.	*Base of scape*: cylindrical (0); flattened (1).
06.	*Shape of male postpedicel*: gradually tapered from base onwards (0); apical portion slender and tapered, at least 2X *as long as* base (1).
07.	*Arista-like stylus (2nd +3rd flagellomeres)*: shorter than postpedicel (0); equal to or longer than postpedicel (1).
08.	*Ocelli*: all three ocelli equidistantly separated (forming equilateral triangle) (0); posterior ocelli more widely separated than distance from anterior ocellus (1).
09.	*Position of ocellar setae*: inserted anteromedially to posterior ocelli (0); inserted anterior to posterior ocelli (1); inserted near margin of eye, anterior to anterior ocellus (2).
10.	*Condition of postocular setae*: erect, not lying and overlapping compound eye (0); oblique, overlapping almost half width of eye (1).
11.	*Occipital setae of male*: row with many pairs of setae (0); 1–2 pairs (1).
12.	*Width of male face*: wide, at least somewhat divergent from antennal sockets (0); narrower than antennal sockets (1).
13.	*Face*: bare (0); lower half setose (1).
14.	*Male face*: flat (0); base with small, fleshy knob or lobe (1).
15.	*Base of male labrum*: smooth, flat (0); large tubercle, with apical processes (1).
16.	*Male palpus form*: setae fine, evenly dispersed (0); modified with tufts and/or long stout setae (1).
17.	*Male palpus shape*: cylindrical, short (0); flattened (1); cylindrical, prolonged (2).
18.	*Orientation of male palpus*: palpus held obliquely to proboscis (0); palpus held parallel to proboscis (1).
19.	*Condition of the lacinia*: free (0); fused to labial paraphyses (1).
20.	*Male labium*: thinly setose (0); stout marginal setae (1).
21.	*Pseudotracheae*: present (0); absent (1).
	Thorax
22.	*Prosternum*: Isolated from proepisternum (0); fused to preepisternum forming precoxal bridge (1).
23.	*Acrostichal setae*: acrostichals sloping posteriorly (0); acrostichals directed anteriorly (1); absent (2).
24.	*Postpronotal setae*: 0–1 (0); 2 (1); more than 2 (2).
25.	*Notopleural setae*: two or more distinct setae (0); one distinct seta (1).
26.	*Length of prescutellar setae relative to other dorsocentrals setae*: prescutellar pair longest (0); prescutellar pair shortest (1).
27.	*Position of first pair of dorsocentral setae*: in-line with remaining bristles (0); off-line from remaining pairs, often considered intrahumeral bristles (1).
28.	*Number of dorsocentral setae*: 6 or more (0); 2 (1); 4 (2); 5 (3); 0, but as row of setulae (4); 1, remaining are setulae (5).
29.	*Presutural supra-alar seta (posthumeral)*: present (0); absent (1).
30.	*Postsutural supra-alar setae*: present (0); absent (1).

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Table 2 (continued)

31.	*Antepronotum vestiture*: numerous fine setae (0); pair of bristle-like setae only (1); absent (2).
32.	*Male posterior basalare*: flat, not projecting (0); elevated as shiny lobe (1).
33.	*Laterotergite*: setose (0); bare (1).
	Wing
34.	*Microtrichia*: short (0); long (1).
35.	*Pterostigma*: present (0); absent (1).
36.	*Position of pterostigma*: not at apex of cell r_1 (0); positioned at apex of cell r_1 (1).
37.	*Shape of pterostigma*: elliptical (0); proximal end truncate (1).
38.	*Anterior margin of costa*: costa with longitudinal rows of simple setae (0); costa with stout, erect setae interspersed along costa (1).
39.	*Ventral margin of male costa*: bare (0); with erect widely spaced setae (1).
40.	*Subcosta*: complete, reaching wing margin (0); incomplete ending short of wing margin (1).
41.	*R_1 termination*: distal to mid-length of wing (0); proximal to mid-length of wing (1).
42.	*Male vein R_{2+3}*: straight and uniform (0); with swelling, or dipped towards R_{4+5} (1).
43.	*Medial branching pattern*: three veins emitted distally from cell dm (0); M_{1+2} petiolate, two veins emitted distally from cell dm (1), occasionally obscured in males and then based on female, which is more stable.
44.	Posterior margin of male wing at apex of M_4: gently curved, smooth (0); slightly to deeply excavated (1).
45.	*Cell bm*: present (0); very faintly defined or lacking (1).
46.	*Cell cua*: present (0); absent (1).
47.	*Posterior margin of male wing base*: unmodified (0); concave, sclerotized "pocket" (1).
	Legs
48.	*Male fore coxa shape*: straight (0); swollen (1).
49.	*Apex of male fore coxa*: lacking modified setae (0); with row of stout setae (1).
50.	*First tarsomere of male foreleg*: cylindrical, without groups of erect setae (0); slightly sinuous, bearing groups of erect setae (1).
51.	*Male fore femur, posterior face*: setose (0); bare, swollen, somewhat arched, bordered by straight row of setae (1).
52.	*Hind tibia vestiture:* lacking pile (0); posterior face with fine, erect pile (setulae) (1).
53.	*Hind tarsomere 1 basal setae*: no ventral seta(e) at base (0); 1–2 ventral setae (1).
54.	*Hind tarsomere 1 vestiture*: absent (0); erect posterior seta on basal third (1).
	Terminalia—Male
55.	*Epandrium*: u-shaped with sclerotized dorsal bridge (lobes connected) (0); lobes separate, not connected dorsally (1).
56.	*Postgonite*: present (0); absent (1).
57.	*Posterobasal margin of cercus*: Undifferentiated (0); expanded, bearing setae (1).
	Terminalia—Female
58.	*Sclerites of segment 8*: Separated (0); articulated anteriorly (1).
59.	*Acanthophorites*: Absent (0); present (1).
60.	*Flattened apodeme on anterolateral margin of tergum 8*: Absent (0); present (1).
61.	*Flattened apodeme on anterodorsal margin of tergum 8*: Absent (0); present (1).
62.	*Rod-shaped apodeme on anterodorsal margin of tergum 8*: Absent (0); present (1).
63.	*Spermathecal receptacle*: Spherical (0); flattened (1); tubular, lacking distinct sclerotzed receptacle (2); coiled tube (3).

Parsimony analysis of the character state matrix (Table 3) was performed using the program PAUP* version 4.0b10 (Swofford 2002). A heuristic search with stepwise addition was implemented to find the most parsimonious trees using random addition sequence of taxa, tree-bisection-reconnection (TBR) branch swapping and 1000 random replications. *A posteriori* character weighting was implemented using successive approximations according to the rescaled consistency index (RC), which was used as an aid to select the preferred cladogram. Bremer support values (Bremer 1994) for the branches supported in all of the equally parsimonious trees were calculated with the program TreeRot version 2c (Sorenson 1999). Character evolution, character state distributions and alternative tree topologies were examined using the program MacClade 4 (Maddison & Maddison 2003). The character matrix was generated and scored using the program Mesquite version 2.73 (Maddison & Maddison 2010).

Table 3. Data matrix for Ceratomerinae, listing 26 terminal taxa and 63 characters used in the analysis. See Table 2 for character descriptions. Character states were scored 0–5, "-" for inapplicable data and "?" for unknown data.

Taxon	1 1111111112 2222222223 3333333334 4444444445 5555555556 666 1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 123
Oreogeton obscurus	0000000000 0000000000 0000001000 0000000000 0000000000 0000000000 000
Anomalempis archon	0000000000 0000000000 0102001010 0010000000 0000000000 0000000111 003
Heterophlebus versabilis	0000001000 0000000000 0100001000 0000000100 0000000000 0000000110 012
Ceratomerus akatarawa	1110100021 0000000000 1100000200 00101 - -000 1010110000 0100100??? ??1
Ceratomerus albistylus	1110110000 0100000000 1100110200 1010011000 1010110000 0110100110 100
Ceratomerus attenuatus	1110101110 1100000000 1110110200 1010011000 1010110000 0110100110 101
Ceratomerus brevifurcatus	1110110110 1100012101 1101000200 11101 - -110 1011111001 1111100111 000
Ceratomerus brevinervis	1110110110 1100010100 1100000200 11101 - -110 1010111010 1111101??? ???
Ceratomerus burgersi	1110110110 1000000000 1100000200 11101 - -100 1110110101 0111100111 000
Ceratomerus crassinervis	1110100110 0110000000 1100000200 10101 - -100 1110110100 0111111110 000
Ceratomerus curvatus	1110110110 1001011101 1100000200 11101 - -110 1110111011 1111101111 000
Ceratomerus deansi	1110100110 0100000000 1101001200 1011000000 1010110000 0011100111 000
Ceratomerus dorsatus	1110100000 0000000000 1101001300 1011000000 1010110000 0011100111 000
Ceratomerus falcatus	1111100111 0000000000 1100000200 20101 - -000 1010110000 0110100110 100
Ceratomerus flavus	1110110110 1000000000 1100000200 10101 - -100 1010110000 0111111111 000
Ceratomerus irramus	1110100100 1100000000 1120000111 0010010000 1010110000 0110100111 000
Ceratomerus longicornis	1111100111 0000000000 1120000200 20101 - -000 1010110000 011010011? ???
Ceratomerus masneri	1110100000 0100000000 1120100410 00101 - -000 1010110000 0100100111 000
Ceratomerus mediocris	1110100000 0000000000 1100100510 00101 - -000 1010110000 0100100111 000
Ceratomerus notatus	1110110110 1101012101 1100000200 11101 - -110 1111111001 1111101111 000
Ceratomerus orientalis	1110100010 1100000000 1110110200 1010011000 1010110000 0110100111 000
Ceratomerus paradoxus	1110100110 0110000000 1100110200 0010011000 1010110100 0110100111 000
Ceratomerus prodigiosus	1110110110 1001112101 1100000200 11101 - -110 1110111001 0111100111 000
Ceratomerus spinosus	1111110111 0000010101 1100000200 10101 - -100 1010110011 1111100110 100
Glyphidopeza fluviatilis	1110000111 0000000010 0100001000 00101 - -100 1000000000 0000100110 101
Zealandicesa setosa	1110101000 0100000000 1100001200 00101 - -001 1010110000 0100100110 000

KEY TO EMPIDOID FAMILY AND GENUS GROUPS OF NEW ZEALAND

(modified from Sinclair 2011)

1 Cells bm and dm combined, bm-cu crossvein absent; combined cell broadened apically .... **Dolichopodidae *s. str.*** (see Bickel (1991) for key to genera)

— Cells bm and dm separate, although cell dm maybe absent, bm-cu crossvein present, at least partly 2

2 Vein R_{4+5} unbranched; costa ending at wing-tip (except Parathalassiinae); prosternum usually small and separated from proepimeron (except most Parathalassiinae and some Tachydromiinae); laterotergite always bare; scape (first antennal segment) often without setae 3

— Vein R_{4+5} branched; if unbranched, either costa circumambient (continued all round margin, although sometimes weakened), or prosternum large and fused with proepimeron forming precoxal bridge, or laterotergite usually with setae; scape (first antennal segment) usually with setae 5

3 Fore tibia base lacking anteroventral gland; Rs originates at or near level of crossvein h; crossvein r–m in basal fourth of wing; male terminalia rotated forward under preceding segments with pregenital segments partly twisted or rotated ..... ***Chimerothalassius*** Shamshev & Grootaert (**Dolichopodidae *s. lat.*: Parathalassiinae**) (see Shamshev & Grootaert 2002; Brooks & Cumming 2011)

— Fore tibia base with anteroventral gland; Rs originates well past the base of crossvein h; crossvein r–m distal to basal fourth of wing; male terminalia often twisted to the right, but not the pregenital segments … **Hybotidae** … 4

4 Cell dm absent; cell cua usually absent; vein CuA+CuP weak and faint ..... **Tachydromiinae** [see Collin (1928) for key to genera and revisions by Plant (1998, 1999) and Plant & Didham (2006)]

— Cell dm present or absent; if cell absent, then tarsomere 1 of hindleg with ventral spine-like setae; cell cua always present; presence of CuA+CuP variable ..... **Ocydromiinae** (see Sinclair & Cumming (2000) for key to genera)

5 Fore femur with one or more rows of black peg-like setae ventrally and also often swollen, 2–3X width of fore tibia; fore coxa at least two-thirds length of fore femur ..... **Hemerodromiinae** (**Empididae**) [see Collin (1928) for key to genera and revisions by Plant (1993, 2005, 2007, 2011)]

— Fore femur lacking black peg-like setae ventrally and width less than 1.5X that of fore tibia; fore coxa usually less than one-half length of fore femur 6

6 Only two long veins present (R_{4+5} and M_4); base of wing with transverse weakening; arista-like stylus more than half body length; wing length approx. 1 mm ..... ***Gondwanamyia*** Sinclair, Cumming, Brooks, Plant & Saigusa (**Brachystomatidae**: **Trichopezinae?**, in part) (see Sinclair *et al*. 2016)

— More than two longitudinal veins present; base of wing without weakening; arista-like stylus shorter than half body length; wing length more than 1.5 mm 7

7 Pedicel (second antennal segment) with thumb-like apical process or conus inserted into inner side of postpedicel; cell cua usually absent (except *Glyphidopeza* Sinclair) ..... **Ceratomerinae** (**Brachystomatidae**) (see Sinclair (1997) and below for key to genera)

— Pedicel (second antennal segment) lacking thumb-like apical process or conus; cell cua present 8

8 Cell cua extends to level of r-m crossvein; mid femur strongly swollen..... ..... ***Homalocnemis*** Philippi (**Homalocnemidae**) (see Malloch 1932)

— Cell cua does not extend to level of r-m crossvein; mid femur rarely strongly swollen 9

9 Wing narrow, without anal lobe; cell dm present; if cell absent R_{2+3} branched 10

— Wing broad, anal lobe developed; if lobe weakly developed, cell dm absent and R_{2+3} unbranched (*Hybomyia* Plant), or cell cua rounded apically and labrum very stout and curved posteriorly (*Hydropeza* Sinclair) 11

10 Costa with short, stout or fine erect setae on outer margin; cell cua nearly as long as cell bm; labellum sucker-like; empodium pulvilliform ..... **Clinocerinae** (**Empididae**) [the two known genera (*Asymphyloptera* Collin and *Clinocera* Meigen) can by identified using Sinclair (1995)]

— Costa lacking erect setae; cell cua short, only about one-half length of cell bm; labellum not sucker-like; empodium setiform, ciliate along ventral margin ..... ***Sematopoda*** Collin (**Brachystomatidae**: **Trichopezinae**, in part) (see Sinclair 2008)

11 Laterotergite with group of setae, R_1 not swollen before joining costa 12

— Laterotergite bare, if setose then R_1 distinctly swollen before joining costa 15

12 Costa usually ending at or slightly past R_{4+5}; female abdomen pointed, terminalia with projecting, lightly sclerotized cerci and lacking acanthophorites ..... **Empidini** (**Empididae**) (see Collin (1928) for key to genera)

— Costa circumambient; female abdomen truncate, terminalia with upright and heavily sclerotized cerci and acanthophorites usually present ..... (**Trichopezinae,** in part (**Brachystomatidae**) … 13

13 One or more of veins R_1, R_{2+3} and R_{4+5} with setae above or below; males holoptic (eyes narrowly separated or closely approximated) ..... ***Heterophlebus*** Philippi

— Veins R_1, R_{2+3} and R_{4+5} bare; males dichoptic (eyes widely separated above and throughout) 14

14 Postpedicel (third antennal segment) with small swollen base, abruptly tapered, prolonged apically, longer than apical stylus; palpi project obliquely, with short, apical spine-like setae .... ***Adipsomyia*** Yang, Zhang & Zhang (see Sinclair 2011)

— Postpedicel (third antennal segment) subtriangular, gradually tapered, subequal or slightly longer than apical stylus; palpi drooping, clothed in fine setae ..... **Undescribed genus A** (incl. "*Dipsomyia*" *mutabilis* Collin)

15 R_1 distinctly swollen before joining costa; palpi arched forward beneath head; male with basitarsus of foreleg often enlarged or swollen; male terminalia with hypandrium keel-like, forming narrow hood over phallus along hind margin ..... **Hilarini (Empididae)**
[see Collin (1928) for key to most genera, except *Thinempis* Bickel (see Bickel 1996) and *Hybomyia* Plant (see Plant 1995)]
— R_1 not swollen before joining costa; palpi not arched forward; male with basitarsus of foreleg not enlarged; male terminalia usually not keel-like 16

16 Labrum stout, curved posteriorly; fore coxa with many erect, spine-like setae; wing narrow with anal lobe weakly developed, forming a broad obtuse angle; males dichoptic ..... ***Hydropeza*** Sinclair **(Empididae**: **Ragadinae)**
(see Sinclair & McLellan 2004; Sinclair 2016)
— Labrum slender or stout, not curved posteriorly; fore coxa lacking erect, spine-like setae; anal lobe of wing well developed, with an acute angle; males holoptic or dichoptic 17

17 R_{4+5} branched; costa circumambient; males holoptic ..... ***Apalocnemis*** Philippi (**Brachystomatidae**: **Trichopezinae**, in part)
— R_{4+5} unbranched; costa greatly weakened after R_{4+5}; males dichoptic 18

18 Acrostichals absent [male genitalia as in Malloch (1931, fig. 1)] ..... **Undescribed genus B** (**Empididae**) (incl. "*Atrichopleura*" *compitalis* Collin)
— Acrostichals present (biserial) ..... **Undescribed genus C** (**Brachystomatidae**: **Trichopezinae**, in part)

CERATOMERINAE

Ceratomerinae Collin, 1928: 3. Type-genus: *Ceratomerus* Philippi, 1865.

Diagnosis. Colour generally yellowish brown. Eyes dichoptic in both sexes; without ommatrichia; anterior facets beneath eyes enlarged in all genera except *Glyphidopeza* (facets appear large throughout). Antenna projecting in live specimens; scape elongate, more than twice as long as pedicel, usually with long dorsal and ventral setae; scape with inner margin of basal portion flattened, adpressed with opposing scape; apical portion of scape projecting outwards, divergent from opposing scape (in dorsal view); apex of pedicel with finger-like conus or condyle inserted into postpedicel; postpedicel lengthened, usually longer than width of eye; usually extended apically. Posterior ocelli often widely separated with ocellar setae inserted anteriorly. Face with eyes narrowly separated to widely separated; setose or bare. Mouthparts elongate, slender. Thorax with chaetotaxy in distinct rows; acrostichals present, 2–5 dorsocentral setae, laterotergite bare. Legs long and slender; empodium often distinctly pubescent ventrally. Wings narrow, elongate and lacking anal lobe; radial (usually) and medial forks present; Costa circumambient; Sc complete; R_{4+5} branched or unbranched; cell dm emitting two veins (M_{1+2} and M_4) and cell cua absent (except *Glyphidopeza*). Male terminalia somewhat arched dorsally over abdomen with tergite 7 weakly sclerotized medially and tergite 8 greatly narrowed dorsally. Hypandrium cup-shaped and elongate, often with posterior margin prolonged. Gonocoxal apodemes variously developed. Postgonites usually present, arched and articulated, flanking phallus. Epandrial lamellae not connected dorsally; sometimes greatly inflated. Cercus normally well sclerotized posteriorly; anterior face of cercus mostly membranous, lightly pigmented with numerous setae especially long and stout surrounding anus. Surstyli highly variable, ranging from poorly differentiated lobes in some species to strongly articulated lobes. Female terminalia truncate with acanthophorites (tergite 10) bearing short, stout spine-like setae; tergite 7 with fringe of fine setae; tergite 8 membranous medially with long thicker posterior marginal setae; cercus often bearing short, stout spine-like or peg-like setae. Single sclerotized spermatheca, spherical to oval and flattened.

Ornaments and mating in *Ceratomerus*. At the outset it should be noted that the following discussion is purely hypothetical based only on the morphological modifications of the male, because mating has not yet been observed in the Ceratomerinae.

Many male secondary sexual characters (MSSC) have been referred to in the literature as "ornaments" (Sivinski 1997). Among species of *Ceratomerus*, there appears to be no end to the diversity of exaggerated male ornaments including structures on the mouthparts (modifications of the palpus, large horned labrum and setose labium), antennae (prolongation of postpedicel and reduction of apical stylus), fore and midlegs (various combs,

projections, thickened, twisted and distorted modifications), wings (inflated and twisted veins, vein patterns, projections), thorax (projections), and glands (darkened margins of abdomen). Closely related species possess analogous modifications on homologous structures (e.g., differences in swelling of R_{2+3} between *C. latinervis*, *C. latipalpus* and *C. tonnoiri* (Figs. 87, 88, 90)). Why are species of *Ceratomerus* and especially the New Zealand fauna so rich in ornaments or decorations (as is so common among Dolichopodidae *s. str.*)?

Ceratomerus is not restricted or concentrated onto a small resource controlled by males, and females are presumably predaceous. Consequently, ornaments are hypothesized to have evolved as males compete for attention from females by investing in signals or advertisement used in courtships (Sivinski 1997). The evolution of ornaments in Ceratomerinae is also possibly associated with feeding on the ground where displays using these ornaments could be more visibly exhibited (rather than used in physical contact). As in the Dolichopodidae *s. str.*, an evolutionary shift from courting and mating on the wing to courting and mating on the ground (Zimmer *et al*. 2003) has likely occurred in the Ceratomerinae.

In contrast to other geographical regions, where the male terminalia are characterized by distinct features and readily identifiable to specific species, the male terminalia of many New Zealand *Ceratomerus* are mostly homogeneous with small differences between species. The male terminalia are reduced in size and show relatively little variation. This suggests that there has been an evolutionary shift or greater selective pressure on male ornaments (Huber 2003). The modified wing veins are likely used in signalling the female, whereas the modified legs and mouthparts are possibly used in contact stimulation, stroking and touching.

Darwin (1871) first recognized that male ornaments used in courtship display probably confer a survival disadvantage to the male. Darwin proposed that if these ornamented males are more successful in obtaining a mate, then these traits might evolve through sexual selection and female choice. Lunau *et al*. (2006) summarized more modern theories of sexual selection and female choice to interpret the complex display behaviours and ornaments of dolichopodid flies, including the runaway process, the handicap theory and the indicator hypothesis. Since nothing is known about mating among the Ceratomerinae, how these theories of female choice can explain the evolution of male ornaments remains to be investigated.

Among the New Zealand fauna, species of the *C. dorsatus* group stand out in contrast, lacking MSSC or ornaments, but the male terminalia is variable and distinctive between species. Outside of New Zealand, the male legs are elaborately modified in the *C. paradoxus* (Chile) and *C. campbelli* (Australia) groups (Sinclair 2003, 2010). In the latter, the posterior margin of the wing is also highly modified and unusual.

Bionomics. Knowledge of the behaviour and life stages of Ceratomerinae remains at a very early stage. Ceratomerinae are a temperate group, collected in fast-flowing streams, creeks and among the understory of damp forests. At lower latitudes, the subfamily is known only from higher elevations; e.g., above 800 m in northern Queensland (Sinclair 2003) and above 2500 m in Bolivia (Sinclair 2010). Many species in New Zealand and Australia are found primarily on emergent rocks in streams, running about on the rocks (especially *C. ordinatus* group). Only a few species (i.e., *C. dorsatus* group, C. *albistylus* Hardy and *C. mediocris* group) are associated with forest habitats. The Australian *Ceratomerus victoriae* Sinclair was often collected from fronds of tree ferns overhanging Cement Creek (Sinclair 2003). Examples of habitats in New Zealand include: *Glyphidopeza* collected primarily in rocky streams and creeks; *Zealandicesa* associated with wet forest biomes, especially near cool sphagnum pools in the case of *Z. setosa* (Sinclair); *C. crassinervis* and *C. tarsalis* observed in Moana Scenic Reserve standing on pools; large numbers of *C. rivalis* n. sp. collected from emergent boulders and overhanging vegetation in the Bealey River of Arthur's Pass National Park (Fig. 5).

Individuals of *Ceratomerus ordinatus* Hardy have been observed on emergent rocks, with the proboscis extended feeding on conspecific flies squashed by the observer (Sinclair 2003). It was assumed that this behaviour is evidence for predaceous habits rather than of scavenging. In this study, a specimen of *C. dorsatus* Collin was collected on a small flowering bush, presumably feeding on nectar with its especially lengthened mouthparts. Marshall (2012: 292, fig. 5) provided a good-quality photograph of a live female specimen of *C. dorsatus* preparing to feed at a flower, which is reproduced here with permission (Fig. 1).

The immature stages of the Ceratomerinae are unknown, but are presumed to primarily occupy lotic habitats, where the adults are most commonly observed on emergent rocks. In the Northern Hemisphere, this niche is filled by the Clinocerinae and their larvae are encountered in riffle zones and submerged mosses in rocky streams and creeks (Sinclair 1995; Macfarlane & Andrew 2001). The unassociated or unidentified aquatic Empidoidea larvae

that are known from New Zealand (see Cowie & Winterbourn 1979; Winterbourn *et al*. 2000) and Australia (Marchant pers. comm. 1994: unpublished data in Museum Victoria), could in all likelihood be ceratomerines. It would be very interesting to investigate this further by associating adult and larval stages using molecular techniques.

KEY TO GENERA OF NEW ZEALAND CERATOMERINAE

1 Cell cua present; cell dm long and narrow, distally emitting 3 veins (Figs. 9, 70) ..... *Glyphidopeza*
— Cell cua absent; cell dm generally short, normally distally emitting 2 veins (Figs. 10–12, 71, 78)..... 2

2 R_{4+5} branched; Sc complete; wing long and narrow, lacking dark band; pterostigma present or absent (Figs. 11, 12, 79, 93); postpedicel long, slender and tapering (Figs. 21–23)..... *Ceratomerus*
— R_{4+5} unbranched; Sc incomplete; wing broad and short, often with dark band; pterostigma absent (Figs. 71–77); postpedicel acutely ovate (Fig. 10) ..... *Zealandicesa*

GLYPHIDOPEZA Sinclair

Glyphidopeza Sinclair, 1997: 196. Type-species: *G. fluviatilis* Sinclair. Other references: Sinclair & Cumming, 2006: 13 (phylogeny); Yang *et al*., 2007: 50 (catalogue); Sinclair, 2010: 222 (phylogeny).

Diagnosis. This genus is readily recognized among Ceratomerinae by the presence of cell cua, cell dm emitting three veins (M_1, M_2 and M_4), R_{4+5} branched or unbranched, male tarsomere 1 of midleg modified and presence of pseudotracheae.

Description. See Sinclair (1997) for full description of the genus.

Remarks. There are two described species of this endemic New Zealand genus, clearly diagnosed in the key to species. Additional material examined since Sinclair (1997) is listed under each of the following species.

KEY TO SPECIES OF *GLYPHIDOPEZA*

(from Sinclair 1997)

1 R_{4+5} branched (Fig. 70); scape short, less than half length of postpedicel; stylus very short, slightly longer than broad ..... *G. fluviatilis* Sinclair
— R_{4+5} unbranched; scape elongate, subequal in length to postpedicel; stylus elongate, slender, more than half length of postpedicel (Fig. 9) ..... *G. longicornis* Sinclair

Glyphidopeza fluviatilis Sinclair

Fig. 70

Glyphidopeza fluviatilis Sinclair, 1997: 197. Other references: Yang *et al*., 2007: 50 (catalogue); Sinclair, 2010: 222 (phylogeny); Macfarlane *et al*., 2010: 446 (New Zealand biodiversity).

Diagnosis. This species is distinguished by R_{4+5} branched; scape short, less than half length of postpedicel; stylus very short, slightly longer than broad; anterior postpronotal seta subequal in thickness to posterior postpronotal seta.

Additional material. **BR**—1 ♂, Bullock Ck, 15 m, K30 23740 58993, 2.xii.1999, UV (CMNZ); 1 ♂, 1 ♀, Nelson Lakes NP, Lake Rotoiti, Black Valley str., 15–16.ii.1995, YPT (CNC); 1 ♀, Woolley Ck., U.V. lights, 5.iii.1992 (CMNZ). **WD**—3 ♂, Jones Ck, Ross, J33 23314 58091, 6.xii.1999, UV (CMNZ).

Distribution. *Glyphidopeza fluviatilis* is recorded from the northern South Island, south to the Westland area.

Glyphidopeza longicornis Sinclair

Fig. 9

Glyphidopeza longicornis Sinclair, 1997: 198. Other references: Yang *et al*., 2007: 50 (catalogue); Macfarlane *et al*., 2010: 446 (New Zealand biodiversity).

Diagnosis. This species is distinguished by R_{4+5} unbranched; scape elongate, subequal in length to postpedicel; stylus elongate, slender, more than half length of postpedicel; anterior postpronotal seta much more slender than posterior postpronotal seta.

Description. **Female**. Similar to male except as follows: Postpedicel more slender, shorter, subequal in length to stylus; more strongly tapered. Legs unmodified. Terminalia as described in generic description (see Sinclair 1997: 197).

Additional material. **BR**—1 ♀, Nine Mile Ck., Buller Gorge, 40 m, K29 23989 59294, 30.xi.1999, UV (CNC). **MB**—1 ♂, Hanmer, Dog strm trib, 28.v.1991, 24977 58559, 400 m, UV tp (CMNZ). **WD**—1 ♂, Jones Ck, Ross, J33 23314 58091, 6.xii.1999, 70 m, UV (CNC).

Distribution. *Glyphidopeza longicornis* is recorded from the northern South Island, south to the Westland area.

Remarks. The female sex was unknown when the species was described. Both sexes are characterized by the elongate scape and unbranched R_{4+5}. The female of this species is described herein for the first time.

ZEALANDICESA Koçak & Kemal

Icasma Collin, 1928: 22, nec Turner, 1902: 90. Type-species: *I. singularis* Collin. Other references: Miller, 1950: 82 (New Zealand catalogue); Hennig, 1966: 9 (biogeography); Smith, 1989: 388 (Australasian catalogue); Plant, 1990a: 16 (new species); Pont, 1995: 26 (type catalogue); Sinclair, 1997: 198 (revision); Sinclair, 2003: 4 (morphology); Sinclair & Cumming, 2006: 13 (phylogeny); Yang *et al*., 2007: 50 (catalogue); Sinclair, 2010: 222 (phylogeny).

Zealandicesa Koçak & Kemal, 2010: 7 (replacement name).

Diagnosis. This genus is readily recognized among Ceratomerinae by the acutely ovate postpedicel, pseudotracheae absent, absence of cell cua, cell dm emitting two veins (M_1 and M_4), R_{4+5} unbranched, Sc incomplete, and thickly sclerotized male cercus.

Description. See Sinclair (1997) for full description of the genus.

Remarks. There are seven described species of this endemic New Zealand genus. Additional material examined since Sinclair (1997) is listed under four of the following species.

KEY TO SPECIES OF *ZEALANDICESA*

(modified from Sinclair 1997)

1 Mesonotum with pruinescence confined to scutellum (Sinclair 1997, fig. 32) 2
— Mesonotum either dusted entirely with pruinescence or with a median stripe 5

2 Wing with broad, dark band (Figs. 74, 75) 3
— Wing infuscate, lacking broad band (Fig. 71) 4

3 Hindleg yellow, lacking dark band; male with surstylus long, slender and strongly arched, expanded apically bearing setulae ..... ***Z. singularis*** (Collin)
— Hind femur and tibia with dark central band; male with surstylus short, expanding apically, bearing stout apical setae ..... ***Z. setosa*** (Sinclair)

4 Postpedicel brown, 1.5X longer than wide; arista-like stylus shorter than antenna; surstylus short, broadly expanded apically ..... ***Z. aequabilis*** (Plant)
— Postpedicel white, slightly longer than wide; arista-like stylus longer than antenna; surstylus gradually tapering to broad apex ..... ***Z. longicauda*** (Sinclair)

5 Mesonotum entirely dusted with pruinescence (Sinclair 1997, fig. 33) ..... ***Z. tararua*** (Sinclair)
— Mesonotum mostly shiny dark brown, with a median pruinescent stripe (Sinclair 1997, fig. 31) 6

6 Wing infuscate (Fig. 73); male cercus with round apex, posterior margin with subapical peg-like seta ..... ***Z. masneri*** (Sinclair)
— Wing with wide, dark band (Fig. 72); male cercus with narrow apex, anterior margin with large, spine-like seta … ..... ***Z. fascipennis*** (Sinclair)

Zealandicesa aequabilis (Plant)

Fig. 71

Icasma aequabilis Plant, 1990a: 16. Other references: Yang *et al*., 2007: 50 (catalogue); Macfarlane *et al*., 2010: 446 (New Zealand biodiversity).

Zealandicesa aequabilis: Koçak & Kemal, 2010: 7.

Diagnosis. This species is distinguished by lacking a broad band on the wings; lacking dark bands on hindlegs; dark antennae; postpedicel nearly 2X as long as wide; mesonotum with pruinescence confined to scutellum; cerci H-shaped, with spine-like setae on horizontal section.

Remarks. *Zealandicesa aequabilis* is confined to the North Island (Sinclair 1997).

Zealandicesa fascipennis (Sinclair)

Fig. 72

Icasma fascipennis Sinclair, 1997: 201. Other references: Yang *et al*., 2007: 50 (catalogue); Macfarlane *et al*., 2010: 446 (New Zealand biodiversity).

Zealandicesa fascipennis: Koçak & Kemal, 2010: 7.

Diagnosis. This species is distinguished by the broad band extending across the full width of the wing; dark brown hind femur, with yellow apex; antennae yellowish brown; postpedicel slightly longer than wide; mesonotum mostly shiny, with a median pruinescent stripe; cerci with upper half fused medially, with spine-like setae.

Remarks. *Zealandicesa fascipennis* is confined to the South Island (Sinclair 1997).

Zealandicesa longicauda (Sinclair)

Icasma longicauda Sinclair, 1997: 202. Other references: Yang *et al*., 2007: 50 (catalogue); Macfarlane *et al*., 2010: 446 (New Zealand biodiversity).

Zealandicesa longicauda: Koçak & Kemal, 2010: 7.

Diagnosis. This species is distinguished by its clear wings; hindlegs unbanded; antennae white; postpedicel slightly longer than wide; mesonotum shiny, with pruinescence confined to scutellum; cerci divided narrowly into pair of parallel lobes, bearing pair of long spine-like setae.

Additional material. NN—1 ♂, NW Nelson Forest Park, Mt. Arthur Tablelands, 950 m, 17.ii.1995, ex blossoms (CNC).

Remarks. *Zealandicesa longicauda* is known only from the Mt. Arthur Tablelands (NN) on the South Island (Sinclair 1997).

Zealandicesa masneri (Sinclair)

Fig. 73

Icasma masneri Sinclair, 1997: 205. Other references: Yang *et al*., 2007: 51 (catalogue); Macfarlane *et al*., 2010: 446 (New Zealand biodiversity).

Zealandicesa masneri: Koçak & Kemal, 2010: 7.

Diagnosis. This species is distinguished by the clear slender wings; hind femur with dark band on basal half; scape yellow, pedicel yellow; postpedicel 1.5X longer than wide; mesonotum shiny, with median pruinescent stripe; cerci with rounded apex, posterior margin with subapical peg-like seta.

Remarks. *Zealandicesa masneri* is known only from the type-locality on the South Island (WD) (Sinclair 1997).

Zealandicesa setosa (Sinclair)

Figs. 10, 74

Icasma setosa Sinclair, 1997: 202. Other references: Yang *et al*., 2007: 51 (catalogue); Sinclair, 2010: 222 (phylogeny); Macfarlane *et al*., 2010: 446 (New Zealand biodiversity).

Zealandicesa setosa: Koçak & Kemal, 2010: 7.

Diagnosis. This species is distinguished by a broad infuscate band on the wings; hindlegs banded; antennae pale yellow; postpedicel length nearly 2X width; mesonotum shiny, with pruinescence confined to scutellum; cerci divided dorsally by deep notch, bearing pair of long setae.

Additional material. **FD**—2 ♂, 2 ♀, Tutoko R., sweeping forest floor, 13.ii.1980 (LUNZ). **NN**—4 ♂, 6 ♀, Abel Tasman NP, Harwoods tr., 720 m, 3.ii.1981 (LUNZ). **TK**—1 ♂, Egmont NP, Potaena swamp, 700 m, 12.i.1999 (DEBU). **WD**—16 ♂, 12 ♀, Lake Manihapua, 42°47′31.20″S 170°54′0″E, 18–19.iii.2010, 20 m, pan tp (CNC); 2 ♂, 3 ♀, Poerua St. For., 10.ii.1976 (LUNZ).

Remarks. *Zealandicesa setosa* is found on the South Island (Sinclair 1997) and is newly recorded from the North Island.

***Zealandicesa singularis* (Collin)**

Fig. 75

Icasma singularis Collin, 1928: 23. Other references: Miller, 1950: 82 (New Zealand catalogue); Smith, 1989: 388 (Australasian catalogue); Pont, 1995: 151 (type catalogue); Sinclair, 1997: 204 (revision); Yang *et al*., 2007: 51 (catalogue); Macfarlane *et al*., 2010: 446 (New Zealand biodiversity).

Zealandicesa singularis: Koçak & Kemal, 2010: 7.

Diagnosis. This species is distinguished by a broad dark band extending across the wings; hindlegs lacking bands; antennae yellow; postpedicel length nearly 2X width; mesonotum shiny, with pruinescence confined to scutellum; cercus divided by deep notch, apical lobes closely approximated, tips divergent, bearing pair of long spine-like setae.

Additional material. **WD**—1 ♂, Arthur's Pass NP, Kelley's Ck, 42°48′7.20″S 171°34′19.20″E, 360 m, 18.iii.2010 (CNC); 1 ♂, 2 ♀, Fox Glacier, 43°28′8.40″S 170°0′57.60″E, 180 m, pan tp, 17.iii.2010 (CNC); 1 ♂, 2 ♀, Lake Manihapua, 42°47′31.20″S 170°54′0″E, 20 m, pan tp, 18-19.iii.2010 (CNC); 1 ♂, 10 ♀, Westland NP, Waiho R Valley, 43.412°S 170.175°E, 200 m, YPT, 17.iii.2010 (CNC).

Remarks. *Zealandicesa singularis* is found on the North and South Islands (Sinclair 1997).

***Zealandicesa tararua* (Sinclair)**

Figs. 76, 77

Icasma tararua Sinclair, 1997: 205. Other references: Yang *et al*., 2007: 51 (catalogue); Macfarlane *et al*., 2010: 446 (New Zealand biodiversity).

Zealandicesa tararua: Koçak & Kemal, 2010: 7.

Diagnosis. This species is distinguished by clear male wings and darkly banded female wings; hindlegs unbanded; antennae mostly yellow, postpedicel brown; postpedicel slightly longer than wide; mesonotum completely clothed in pruinescence; cerci H-shaped, with upper lobes short and divergent, bearing pair of long spine-like setae.

Additional material. **BR**—1 ♀, Reefton, Rahu Farm Clearing, 27.x.1970 (LUNZ). **FD**—1 ♂, Fiordland NP, Murchison Mts, Plateau Ck, 930 m, *Nothofagus* for., 3.xii.1980 (LUNZ).

Remarks. *Zealandicesa tararua* is widespread on the North and South Islands (Sinclair 1997).

***CERATOMERUS* Philippi**

Ceratomerus Philippi, 1865: 765. Type-species: *Ceratomerus paradoxus* Philippi (monotypy). Other references: Kertesz, 1909: 111 (World catalogue); Melander, 1928: 214 (review); Collin, 1928: 16 (New Zealand species); Hardy, 1930: 245 (Australian species); Malloch, 1931: 428 (New Zealand species); Collin, 1931: 352: 352 (New Zealand species); Collin, 1933: 316 (South American species); Stuardo, 1946: 112 (Chilean catalogue); Miller, 1950: 79 (New Zealand catalogue); Colless, 1963: 323 (female terminalia); Hennig, 1966: 13 (biogeography); Smith, 1967: 45 (Neotropical catalogue); Colless & McAlpine, 1970: 711 (Insects of Australia); Chvála, 1981: 226 (phylogeny); Chvála, 1983: 15 (morphology, phylogeny); Bickel, 1983: 44 (habitat); Barratt & Patrick, 1987: 88 (survey); Smith, 1989: 387 (Australasian catalogue); Plant, 1990a: 16 (distribution); Plant, 1991: 1313 (New Zealand revision); Wiegmann *et al*., 1993: 46 (phylogeny); Plant, 1993: 209 (wing morphology); Pont, 1995: 51 (type catalogue); Cumming *et al*. 1995 (phylogeny); Sinclair, 2000: 359 (Tasmanian species diversity); Sinclair & Cumming, 2000: 177 (biogeography); Sinclair, 2003: 5 (Australian revision); Sinclair & Cumming, 2006: 13 (phylogeny); Yang *et al*., 2007: 48 (catalogue); Moulton & Wiegmann, 2007: 703 (phylogeny); Cumming & Sinclair, 2008: 1148 (photo); Yeates *et al*. 2009: 239 (biogeography); Sinclair, 2010: 200 (Neotropical revision); Macfarlane *et al*., 2010: 347 (New Zealand biodiversity); Sinclair & Dorchin, 2010: 52 (type catalogue); Freitas-Silva & Ale-Rocha, 2013: 595 (apterous species).

Tomia Paramonov, 1961: 100 nec Martynov (1936: 1262). Type-species: *Tomia campbelli* Paramonov (original designation). Other references: Colless & McAlpine, 1970: 709 (Insects of Australia); Smith, 1989: 387 (Australasian catalogue); Colless & McAlpine, 1991: 760 (syn. of *Ceratomerus*).

Diagnosis. This genus is readily recognized by the following combination of characters: posterior ocelli usually widely separated with ocellar setae inserted anteriorly, postpedicel lengthened and tapered apically, pseudotracheae absent, acrostichal setulae present, 2–5 dorsocentral setae present, Sc complete, R_{4+5} branched or unbranched, cell dm emitting 2 veins (M_1 and M_4), cell cua absent, presence of distinct setae on tibiae, and scutum not highly polished.

Remarks. See Sinclair (2003) for full re-description of *Ceratomerus* and notes on synonymy.

Key to males of New Zealand species of *Ceratomerus*

(Note: Females are often difficult to associate with males, unless collected together at localities. Only females of the *C. dorsatus* group can be identified in the following key. A key to females is not possible at this time.)

1 Pterostigma present (Figs. 92, 93); first dorsocentral seta offset from others; labium long and slender, 2–3X longer than height of head (Figs. 1, 2); labellum reduced ..... (***C. dorsatus* group**) ... 2
— Pterostigma absent; first dorsocentral seta in line with others; labium not notably slender, generally less than 2X longer than height of head; labellum well developed 6

2 Pleura entirely yellow, lacking dark dorsal band (Figs. 1, 11) ..... ***C. dorsatus*** Collin
— Pleura with distinct band along dorsal margin, or a pale band across middle (Figs. 2, 14)..... 3

3 Scutum mostly dark, lateral margin sometimes pale 4
— Scutum with contrasting yellow and dark stripes (Fig. 14) 5

4 Scutum and pleura mostly dark brown, except for white band in middle of pleura; fore and mid femora mostly dark, hind femur with apical third dark..... ***C. aquilonius*** n. sp.
— Scutum with lateral margins pale, and pleura with fuscous region along dorsal margin; fore and mid femora yellow, hind yellow with extreme apex dark ..... ***Ceratomerus*** sp. (known only from female specimens)

5 Scutum with dark median vitta arching around prescutellar depression; broad lateral vittae extend beyond suture to nearly first dorsocentral seta ..... ***C. biseriatus*** Plant
— Scutum with dark median vitta extending from anterior margin, through the prescutellar depression to the scutellum; broad lateral dark vittae or patches confined posterior to suture (Fig. 14) ..... ***C. virgatus*** Collin

6 Second antennal segment or pedicel 3–4X longer than wide (Fig. 15) ... (***C. mangamuka* group**) 7
— Second antennal segment or pedicel approximately subequal in length and width (Figs. 41, 56, 68) 8

7 M_1 and M_2 arising separately directly from discal cell; R_{2+3} incomplete, terminating beyond radial fork (Fig. 107) . ..... ***C. spinosus*** n. sp.
— M_1 and M_2 petiolate proximally, fused vein longer than length of crossvein dm-m; R_{2+3} complete, reaching costa (Fig. 106) ..... ***C. mangamuka*** n. sp.

8 Ocellar setae inserted near margin of eye, distant from posterior ocelli (Fig. 35); erect costal setae or spines absent; radial branch short, broadly divergent, separated from medial fork by nearly length of R_5 ... (**Unplaced New Zealand species**) ..... ***C. akatarawa*** n. sp.
— Ocellar setae inserted anterolateral to posterior ocelli; erect costal setae or spines present; radial branch long, gradually divergent, separated from medial fork by less than length of crossvein dm-m 9

9 Posterior basalare swollen, often developed into anvil-shaped lobe (Figs. 34, 47, 48); costa often with fine, erect setae beyond R_1 on ventral face (Figs 102–105); base of wing stem usually with sclerotized concave pocket (Figs 103, 105) 10
— Posterior basalare not swollen; costa lacking erect setae beyond R_1 on ventral face; base of wing stem lacking sclerotized concave pocket..... 34

10 Palpus and first tarsomere unmodified; M_4 subequal to or shorter than crossvein dm-m (Fig. 116); base of face lacking fleshy knob or lobe ..... (**Unplaced New Zealand species**) ... ***C. brevinervis*** n. sp.
— Palpus and first tarsomere modified (Figs. 21, 34, 36, 57); M_4 usually longer than crossvein dm-m; base of face usually with small fleshy knob or lobe (Fig. 31) 11

11 Palpus arched upright, strongly appressed to face (in both sexes) (Figs. 36, 37); venation highly modified with vertical fold on basal quarter of wing and notch on anterior and posterior margins (Fig. 117) ....(**Unplaced New Zealand species**) ... ***C. burgersi*** n. sp.

— Palpus projecting ventrally or obliquely, not appressed to face; wing lacking fold on basal quarter and posterior notch usually at apex of M_4 12

12 Cell dm of wing pentagonal in shape, with five distinct sides (Fig. 85); palpus usually strongly flattened (Figs. 21, 41, 43); fore coxa usually with comb of long anteroapical setae, twice width of femur (Fig. 42) ..... (***C. curvatus* group**) ... 13
- Cell dm of wing not pentagonal in shape, with less than five distinct sides (Figs. 100, 112); palpus variable; fore coxa usually lacking comb of long anteroapical setae 19

13 R_{2+3} dipped toward R_{4+5} (Figs 85, 86, 91); in doubtful cases apical spine-like setae of palpus not outstandingly longer than fringe of lateral setae 14
— R_{2+3} straight, not dipped toward R_{4+5} (Figs 87, 89); apical spine-like setae much longer than lateral setae 16

14 R_{2+3} only slightly dipped (Fig. 91); apical spine-like setae of palpus not outstandingly longer than fringe of lateral setae (Fig. 23)..... ***C. wardi*** n. sp.
— R_{2+3} strongly dipped (Figs. 85, 86); apical spine-like setae of palpus outstandingly longer than fringe of lateral setae (Figs. 21, 41) 15

15 Dipped portion of R_{2+3} inflated or swollen about 2X width of vein (Fig. 86) ..... ***C. dugdalei*** n. sp.
- Dipped portion of R_{2+3} not inflated or swollen (Fig. 85)..... ***C. curvatus*** n. sp.

16 R_{2+3} not inflated or swollen (Fig. 89)..... ***C. ohakunensis*** n. sp.
— R_{2+3} inflated or swollen at 2X width of vein (Figs. 87, 88, 90)..... 17

17 R_{2+3} inflated or swollen for about 1/3 length of vein, not reaching opposite of radial branch (Fig. 90) ..... ***C. tonnoiri*** n. sp.
— R_{2+3} inflated or swollen for more than half length of vein, from near base to nearly opposite of radial branch (Figs. 87, 88) 18

18 R_{2+3} strongly swollen, nearly 3X width of vein; slightly arched towards costa submedially (Fig. 87)..... ***C. latinervis*** n. sp.
— R_{2+3} less strongly swollen, nearly 2X width of vein; straight, not arched towards costa (Fig. 88) ..... ***C. latipalpus*** n. sp.

19 Posterior wing margin at apex of M_4 with shallow to deep notch or incision (Figs. 100, 102); if lacking notch, anal lobe infuscate (Fig. 104); M_4 straight or gently curved; base of labrum without large tubercle ... (***C. longifurcatus* group**) 20
— Posterior wing margin at apex of M_4 lacking deep notch, at most margin only shallowly curved inwards (Figs. 110, 111, 112); anal lobe lacking infuscation; M_4 usually sinuous (Figs. 108, 115); base of labrum with large tubercle (Figs. 34, 65, 68) ..... (***C. prodigiosus* group**) ... 27

20 Wing margin at M_4 with shallow notch or lacking notch; anal lobe infuscate (Figs. 103, 104) 21
— Wing margin at M_4 with deep or distinct notch or incision; anal lobe not distinctly infuscate (Figs. 99–102) 22

21 Scutum with dark median vitta extending from anterior margin to scutellum; R_{2+3} slightly swollen sub-basally; wing margin at apex of M_4 with shallow notch; medial vein petiolate basally (Fig. 103); abdominal tergites 2–4 with charcoal-like pigmentation ..... ***C. notatus*** n. sp.
- Scutum dark, except anterior margin, lacking median vitta; R_{2+3} not swollen; wing margin at apex of M_4 lacking shallow notch; medial vein lacking petiole, arising directly from cell dm (Fig. 104); abdominal tergites 2–4 without dark pigmentation ..... ***C. subnotatus*** n. sp.

22 R_{2+3} with sub-basal or mid-length swelling or inflation (Figs. 100, 101, 105) 23
— R_{2+3} without sub-basal or mid-length swelling or inflation (Figs. 97, 99, 102) 25

23 Thorax dark, silvery-blue (e.g., Fig. 31); R_{2+3} with sub-basal swelling near r-m crossvein (Figs 100, 101) 24
— Thorax dark brown on scutum, pleura yellow; R_{2+3} with swelling near midlength, distant from r-m crossvein (Fig. 105) ..... ***C. whirinaki*** n. sp.

24 R_1 inflated near mid-length and dipped toward R_{2+3} prior to round swelling (Fig. 101) ..... ***C. mayae*** n. sp.
— R_1 not inflated and gradually arched to costa (Fig. 100) ..... ***C. longifurcatus*** Collin

25 Anal lobe without small bite on wing margin; cell dm subtriangular; petiole of medial fork strongly bent opposite incision on wing margin (Fig. 97)..... ***C. brevifurcatus*** Plant
— Anal lobe with small bite or cut-out on wing margin with sclerotized edge; cell dm subrectangular; petiole of medial fork only slightly arched (Figs. 99, 102)..... 26

26 Medial vein forked distal to radial fork (Fig. 102); first antennal segment greatly lengthened, 0.75X length of postpedicel..... ***C. mirandus*** n. sp.
— Medial vein forked proximal to radial fork (Fig. 99); first antennal segment 0.5X length of postpedicel ..... ***C. lobipennis*** n. sp.

27 Scutum yellow, lacking markings (Fig. 12) ..... ***C. rivalis*** n. sp.
— Scutum with central vitta or brown dorsally 28

28 Scutum with isolated central vitta extending entire length, not fused with lateral dark patches 29
— Scutum with central vitta merging with lateral patches posteriorly, or scutum brown dorsally, lacking vittae 32

29 R_{2+3} gradually curved to costa (Fig. 115) 30
— R_{2+3} strongly arched and convoluted (Figs. 111, 112)..... 31

30 R_{2+3} short not reaching radial fork, bearing small swelling; base of R_4 with short appendix (Fig. 115) ..... ***C. vittatus*** Plant
— R_{2+3} long reaching beyond branching of radial fork, without small swelling; base of R_4 without short appendix ..... ***C. trivittatus*** n. sp

31 M_4 L-shaped; wing margin smooth and straight at apex of M_2 (Fig. 112) ..... ***C. prodigiosus*** Collin
— M_4 S-shaped; wing margin produced posterior into short lobe at apex of M_2 (Fig. 111) ..... ***C. montanus*** n. sp.

32 R_{2+3} with deep subapical bend and curve (Fig. 108) ..... ***C. flexuosus*** n. sp.
— R_{2+3} gradually curved to wing margin (Figs. 109, 110) 33

33 R_{2+3} with small swelling proximal to mid point (Fig. 110) ..... ***C. melaneus*** Plant
— R_{2+3} without small swelling (Fig. 109) ..... ***C. macfarlanei*** n. sp.

34 Lower half of face lacking setulae; 1–2 spine-like setae on ventroapical margin of mid trochanter (Figs. 25, 26) ... (***C. exiguus* group**) 35
— Lower half of face with vertical row of setulae (Fig. 20); spine-like setae on mid trochanter lacking ... (***C. crassinervis* group**) 38

35 Apical 2/3 to 3/4 of postpedicel arista-like, clothed in long dense pubescence which is nearly as long as width of apical portion of flagellomere (Fig. 29) 36
— Postpedicel more gradually tapered, not arista-like, pubescence shorter than width of apical portion of flagellomere 37

36 Tarsomere 2 of mid tarsi with inner subapical tuft of setae; tarsomere 3 somewhat twisted, with basal inner fan of setae and subequal in length to tarsomere 2 (Fig. 27) ..... ***C. flavus*** Plant
— Mid tarsi with tarsomeres unmodified; tarsomere 2 longer than tarsomere 3 ..... ***C. fontinalis*** n. sp.

37 Mid trochanter with 2 spine-like setae on inner apical margin; mid femur strongly attenuated on apical half; mid tibia with erect ventral setae on apical half, longer than width of tibia (Fig. 25) ..... ***C. exiguus*** Collin
— Mid trochanter with 1 stout seta on inner apical margin; mid femur not attenuated; mid tibia with erect ventral setae along entire length, not longer than width of tibia (Fig. 24) ..... ***C. alticolus*** n. sp.

38 R_{2+3} and R_4 connected by auxiliary crossvein (Fig. 78) ..... ***C. collini*** n. sp.
— R_{2+3} and R_4 not connected by auxiliary crossvein (Figs. 79–84) 39

39 R_{2+3} lacking swelling (Fig. 83) 40
— R_{2+3} slightly swollen to strongly inflated (Figs. 79–82, 84) 41

40 Fore femur inflated; fore tarsi strongly modified and setose (Fig. 20) ..... ***C. setifacies*** n. sp.
— Fore femur not inflated; fore tarsi cylindrical, unmodified ..... ***C. simplex*** n. sp.

41 Thorax with bluish pruinescence (Fig. 18); radial fork appearing distinctly proximal to medial fork ..... ***C. morrisi*** n. sp.
— Thorax without bluish pruinescence; radial fork at or distal to medial fork 42

42 Longitudinal veins inflated, especially R_{4+5} (Figs. 79, 80) 43
— Only vein R_{2+3} noticably inflated (Figs. 81, 82, 84) 44

43 Anepisternum pale, except dorsal margin dark; fore femur grossly swollen (Fig. 39); R_{2+3} lacking small oval swelling (Fig. 79) ... ***C. crassinervis*** Malloch
— Fore femur only slightly swollen; R_{2+3} with small oval swelling (Fig. 80); anepisternum dark ..... ***C. minutus*** n. sp.

44 R_{2+3} with large and elongate bulbous swelling, 3–4X width of vein (Fig. 81) ..... ***C. oparara*** n. sp.
— R_{2+3} with short swelling, at most 2X width of vein (Figs. 82, 84) 45

45 First tarsomere laterally flattened; inner surface pale (Fig. 40) ..... ***C. tarsalis*** Plant
— First tarsomere not flattened, inner surface dark (Fig. 19) ..... ***C. planti*** n. sp.

Ceratomerus crassinervis species-group

This species group includes nine New Zealand species, defined by the following suite of characters: facial setulae present; face narrower than width of antennal bases; male eye somewhat directed anteriorly with anterior facets enlarged below antennae; male face, antenna and palpus unmodified; male foreleg usually highly modified.

The *C. crassinervis* group was weakly assigned as sister group to the *C. prodigiosus* and *longifurcatus* groups (Sinclair 2010).

Ceratomerus collini n. sp.

Map 1, Figs. 17, 78

Type material. Holotype male, "NEW ZEALAND: AK/ Pollen Is., MT/ 23.v.-30.vi.1990/ G. Hall leg."; "HOLOTYPE/ Ceratomerus/ collini/ Sinclair [red label]" (NZAC).

Paratypes: New Zealand: AK—1 ♂, 9 ♀, same data as holotype (NZAC).

Recognition. This species is very similiar to *C. crassinervis*, but males are distinguishable on the basis of wing venation (thickened veins and auxiliary crossvein on both wings) and swollen fore femur and unswollen fore coxa.

Description. Wing length 2.4–2.7 mm.

Male. Head: round, dark brown, not shiny; occiput dark brown with narrow vertical pruinescent stripe. Face slightly narrower than antennal sockets, slightly convergent; shiny brown, pale ventrally with median setulae and 2 pairs of long ventrolateral setae; eye facets enlarged anteriorly below antennae; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; pair of postocellar setae widely separated, posterior to ocelli,

2/3 length of ocellar seta; 2 vertical setae, more slender and nearly subequal in length to ocellar seta; postocular setae extending along margin of eye, lower 2/3 with dense row of pale brown setulae. Antenna brown with length of scape longer than height of eye with several erect dorsal setae, longest near apical third, and 1 long, slender, ventral subapical seta; pedicel somewhat paler, globular with setae confined to apical fringe. Postpedicel shorter than length of labrum, covered by short dense pruinescence; base rectangular with apical portion subequal in length to base; apical half gradually tapered; arista-like stylus nearly 1/2 length of apical half of postpedicel; length of first segment of stylus 2X width. Base of labrum lacking dorsal process; palpus whitish, slender, less than 1/5 length of labrum, clothed in fine pale setulae, extending obliquely to proboscis; prementum with short setae only.

Thorax: mesonotum with very finely dusted pruinescence; dark narrow vittae along acrostichal and dorsocentral rows; scutum, mediotergite (including laterotergite), and dorsal and posterior margin of anepisternum brown; antepronotum, postpronotal lobe and postalar yellowish brown; pleura mostly yellow, ventral margin of lower sclerites brownish; lacking modifications near wing base. Acrostichals with anterior pair long and erect; biserial, ending at prescutellar depression, directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower shorter; 1 anterior psut spal; 1 pal; 2 sctl; setulae on postpronotal lobe. Antepronotum with pair of short setae.

Wing (Fig. 78): infuscate, pterostigma absent; 1 long basal costal seta; costal margin straight with erect costal setae beyond R_1; posterior margin smooth, lacking incision; posterior setal margin complete, double row of long divergent setae; 3 stout posterior setae on wing stem; base of wing stem lacking sclerotized pocket. R_1 reaching costa before middle of wing; R_{2+3} smoothly curved to C; R_{4+5} thickened at base of radial fork; M vein not thickened; medial fork proximal to radial fork; cell dm rectangular, slender; auxiliary cross-vein between R_{2+3} and R_4 present; M_4 arched prior to joining wing margin. Halter knob brown.

Legs (Fig. 17): coxae and femora yellowish brown (likely faded due to original storage in ethanol); remaining segments brown. Fore coxa subequal in width to mid coxa; longer than length of mid and hind coxae combined; anterior and ad margin with long dark setae, 1/2 width of coxa. Fore trochanter lacking modified setae. Fore femur greatly swollen on basal half, with anterior face shrunken; basal half of anterior face with anteroventral row of 8 stout setae; distal half with peg-like ventral seta and row of fine av setae; inflated posterior face with numerous stout setae, forming pv row; base with 3 long ventral setae; in narrow distal section depression where angular projection of tibia fits. Fore tibia sinuous, shorter than length of femur; apex with anteroapical comb, not dilated; middle with flattened, posterior angular projection; apical half with pv row of 7–9 flattened, stout blunt setae, shorter than width of tibia. First tarsomere cylindrical, 2/3 length of fore tibia, with pv row of slender setae, longer than width of tarsomere; tarsomere 2 slightly longer than third, both cylindrical; tarsomeres 4 and 5 slightly broader than preceding tarsomeres.

Mid coxa and trochanter with dark fine setae, lacking modified spine-like setae. Mid femur nearly 1/3 longer than fore femur, unmodified, cylindrical, without rows of outstanding ventral setae; apex with 1 av and 1 pv preapical setae. Mid tibia slightly longer than femur; cylindrical, unmodified, mostly lacking setae, except short fine anteroventral setae on apical half; apex with 1–2 preapical setae. First tarsomere shorter than length of remaining 4 tarsomeres, slender; without erect setae; tarsomeres 2–4 cylindrical, unmodified; tarsomere 5 slightly broader than preceding tarsomeres.

Hind coxa lacking long lateral seta. Hind femur 1/3 longer than mid femur with pair of ventroapical setae; basal fourth without ad row of erect setae; lacking dorsoapical seta. Hind tibia subequal in length to femur; apex partially expanded, bearing posteroapical comb; lacking erect setae; ventral face with biserial row of stout setae on apical half; posterior face with very short, erect mat of fine pale setae. Hind tarsomeres subequal in length to tibia; first tarsomere with 1 erect posterodorsal seta proximal to mid-length; tarsomere 5 slightly broader than preceding tarsomere.

Abdomen: tergites 1–6 brown, slightly paler than mesonotum, with short posteromarginal setae; sternites paler than tergites; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 subequal in length to preceding sternite, anterolateral margin not produced; S8 with long setae.

Terminalia (not dissected): (very similar to *C. crassinervis*) hypandrium convex, posterior margin cone-shaped; postgonite lacking; phallus strongly curved apically, with laterally flattened expanded apex. Epandrial lamella oval. Surstylus not distinctly differentiated from epandrium; posterior margin with fringe of setae, apex

with short hook. Cercus short, non-tapered, with rounded tip; posterior face well sclerotized; apex with setae only; hypoproct with pair of long setae.

Female. Similar to male except as follows: face parallel-sided, as broad as antennal sockets; auxiliary crossvein present or absent. Fore femur more slender, straight; av row of slender setae, decreasing in length apically; mid tibia with 1 long preapical ventral seta; hind tibia with dorsal seta beyond mid-length; wing veins unmodified. Abdominal pleural membrane greyish; apical segments retracted into segment 7; posterior margin of T7 with dense fringe of short setulae; lateral margin of S7 straight. Terminalia (not dissected): T10 clothed in stout curved setae, setae on posterior margin stouter. Cercus with 2–3 stout apical setae, similar to posterior setae of T10.

Distribution. This species is known only from the type-locality, a narrow estuarine mangrove/ saltmarsh island in the Upper Waitemata Harbour, near the mouth of the Whau River (AK, North Island) (Map 1).

Remarks. This species apparently has a surprising halotolerance. It would be interesting to investigate this further by recollecting this species and noting the precise microhabitat.

Etymology. The specific name is in honour of the late J.E. Collin, in recognition of his substantial contribution to the knowledge of New Zealand Empidoidea.

Ceratomerus crassinervis Malloch

Map 2, Figs. 13, 39, 79, 118–121

Ceratomerus crassinervis Malloch, 1931: 428. Other references: Miller, 1950: 79 (New Zealand catalogue); Smith, 1989: 387 (catalogue); Plant, 1991: 1329 (revision); Smith, 1989: 387 (Australasian catalogue); Macfarlane, 2004: 2 (habitat assessment); Yang *et al*., 2007: 49 (catalogue); Sinclair, 2010: 222 (phylogeny); Macfarlane *et al*., 2010: 445 (New Zealand biodiversity).

Type material. Holotype male: "[New Zealand] Horseshoe Lake/ 23/11/[19]24 [J.W. Campbell]"; "Type No./ 43886/ U.S.N.M. [red label]"; "Ceratomerus/ crassinervis/ Type/ Det./ J.R. Malloch [hand written] [missing head]" (USNM).

Additional material. New Zealand: **BR—**2 ♂, Lk Brunner, Moana Scenic Res., Podocarp, 14.ii.1995 (CNC); 3 ♀, Lk Brunner, Moana, Arnold R, shoreline, 14.ii.1995 (NZAC); 1 ♂, Nelson Lakes NP, Lk Rotoiti, *Nothofagus*/ stream, YPT, 15–16.ii.1995 (CNC); 1 ♂, Punakaiki, Bullock Ck, 20 m, 23.x.-3.xii.1983 (AMS). **MC**—9 ♂, Styx Mill Res., 15 m, 43°28.1′S 172°36.4′E, muddy ditch by stock yards, 22.i.2004 (CMNZ); 1 ♂, Styx Mill Res., 25 m, 43°28.1′S 172°36.4′E, pan tp by river & bog, 14.xii.2003 (CMNZ); 2 ♂, Styx Mill Res., 25 m, 43°28.1S 172°36.4E, pan tp by creek above ford, 18–20.xii.2003 (CMNZ); 1 ♂, 2 ♀, Styx Mill Res., 25 m, 43°28.1′S 172°36.4′E, pan tp in willow for., 22–23.xii.2003 (CMNZ); 1 ♀, Knights Str., sandy bottom, N of trices Rd., 14 m, 43°35.3′S 172°33′E, pan tps, 23.ii.2004 (CMNZ); 1 ♂, 2 ♀, Styx Mill Res., 15 m, 43°28.1′S 172°36.4′E, N end, middle willow clump, pan tp, 21.i.2004 (CMNZ). **NN**—1 ♂, 2 ♀, Abel Tasman NP, 800 m, Harwoods Hole, sphagnum/*Nothofagus*, YPT, 6-7.ii.1995 (CNC). **WD**—4 ♂, 5 ♀, Lk Manihapua, 42°47′31.20″S 170°54′0″E, 18–19.iii.2010, 20 m, pan tp (CNC); 1 ♀, Westland NP, adj. Canavans Knob, 140 m, MT, 28.iii.-10.iv.1982 (LUNZ).

The following specimen is possibly conspecific based on pleural colouration, but males from the same locality are required for positive identification: **CL**—1 ♀, Whitianga, Front Bay, surface of rock pools, 13.xi.1957, K.A.J. Wise (NZAC).

Recognition. Males are recognized by the greatly thickened R_{4+5} and swollen fore coxa and femur. Females may be distinguished by a pair of long lateral facial setae; posterior surface of head from vertex to foramen with a vertical bluish stripe; scutum with median pruinescent stripe, flanked by pair of shiny stripes.

Re-description. Wing length 2.5–2.7 mm.

Male. Head: round, dark brown, not shiny; occiput from foramen to ocellar triangle with narrow vertical pruinescent stripe. Face narrower than antennal sockets, slightly convergent; shiny brown, pale ventrally with median setulae and 2 pairs of long ventrolateral setae; eye facets enlarged anteriorly below antennae; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; pair of postocellar setae widely separated, posterior to ocelli, 2/3 length of ocellar seta; 2 vertical setae, more slender and 1/2 length of ocellar seta; postocular setae extending along margin of eye, lower 2/3 with dense row of pale brown setulae. Antenna brown, with length of scape longer than height of eye with 1 erect dorsal seta near apical third and shorter setae, and 1 long, slender, ventral subapical seta; pedicel somewhat paler, globular with setae confined to apical fringe. Postpedicel short, covered by short dense pruinescence, shorter than length of labrum; base rectangular with apical portion subequal in length to base; apical half gradually tapered; arista-like stylus nearly 1/2 length of apical half of postpedicel; length of first segment of stylus twice width. Base of labrum lacking dorsal process; palpus yellow,

slender, less than 1/3 length of labrum, clothed in fine pale setulae, extending obliquely to proboscis; prementum with short setae only.

Thorax: mesonotum dusted with fine pruinescence, except for pair of shiny vittae between acr and dc; scutum, mediotergite (including laterotergite), and dorsal and posterior margin of anepisternum dark brown; antepronotum, postpronotal lobe and postalar brownish yellow; pleura mostly yellow, ventral margin of lower sclerites yellowish brown; lacking modifications near wing base. Acr with anterior pair long and erect; uniserial, ending at prescutellar depression, directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower shorter; 1 anterior psut spal; 1 pal; 2 sctl; setulae on postpronotal lobe and interspersed among dc. Antepronotum with pair of short setae.

Wing (Fig. 79): infuscate, pterostigma absent; 1 long basal costal seta; costal margin straight with erect costal setae beyond R_1; posterior margin smooth, lacking incision; posterior setal margin complete, double row of long divergent setae; setae on wing stem unmodified; base of wing stem lacking sclerotized pocket. R_1 reaching costa before middle of wing, apex thickened; R_{2+3} smoothly curved to C; R_{4+5} greatly thickened, except for base, M vein thickened from near base to near medial fork; medial fork proximal to radial fork; cell dm rectangular, slender; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 straight. Halter knob brown.

Legs (Fig. 39): coxae and ventral and anterior face of femora yellow, posterior face of femora brownish yellow; remaining segments brown. Fore coxa more than length of mid and hind coxae combined; anterior and ad margin with long dark setae, 1/2 width of coxa. Fore trochanter lacking modified setae. Fore femur greatly swollen on basal half, with anterior face deeply shrunken (observed in all males, but may be artefact of preparation); anterior shrunken face with 3 twisted stout setae and row of stout setae, nearly 1/2 width of femur; posterior face near middle with depression where angular projection of tibia fits; basal half with biserial row of pv setae, basal half of inner row with apically curved, short stout setae, apical half with 7–8 long setae; basal quarter with 3 long av setae, longest near base; apical half with antero- and pv rows of very short setae; apex with 2 ad preapical setae. Fore tibia shorter than length of femur; apex with anteroapical comb, not dilated; middle with flattened, posterior angular projection; pd row of setae, longer than width of tibia and interrupted row of ventral setae, proximal to projection; apical half with pv row of 8–9 flattened, stout blunt setae, shorter than width of tibia. First tarsomere cylindrical, 2/3 length of fore tibia, with pv row of slender setae, longer than width of tarsomere; tarsomere 2 slightly longer than third, both cylindrical; tarsomeres 4 and 5 slightly dorsoventrally flattened.

Mid coxa and trochanter lacking modified seta. Mid femur nearly 1/3 longer than fore femur, ventral surface somewhat sinuous, with apex flattened; pv margin with dense rows of erect slender setae, many nearly as long as width of femur; av row of very small setae bordering swelling in middle; apex with 2 pairs of long setae. Mid tibia 1/6 longer than femur; proximal half inflated, narrowed near mid-length, with apex inflated; anterior face with long slender setae, nearly subequal to width of tibia; pv margin with rows of erect slender setae, shorter than anterior setae; apical third with dense mat of setae; basal third with 1 ad and 1 pd seta; apical third with 1 subapical ad seta. Tarsomere 1 shorter than length of remaining 4 tarsomeres, slender; row of erect setae, including 1 basal seta beneath; pv margin with about 5 stout erect setae; tarsomeres 2 and 3 cylindrical, unmodified; tarsomeres 4 and 5 partially dorsoventrally flattened.

Hind coxa lacking 1 long lateral seta. Hind femur 1/3 longer than mid femur with pair of ventroapical setae; basal fourth with ad row of erect setae; lacking dorsoapical seta. Hind tibia slightly shorter than femur with 2 ad setae and 1 dorsal seta beyond mid-length; apex partially expanded, bearing posteroapical comb; posterior face with very short erect mat of fine pale setae. Hind tarsomeres subequal in length to tibia; first tarsomere with 1 erect ventral seta near base and several pv setae on basal third; tarsomere 5 dorsoventrally flattened.

Abdomen: tergites 1–6 dark brown, slightly paler than mesonotum with short posteromarginal setae; sternites paler than tergites; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 subequal in length to preceding sternite, anterolateral margin not produced; T8 rectangular, 1/6 length of sternite, lateral margin expanded, reduced to thin strip dorsally; S8 lacking long setae.

Terminalia (Figs. 118, 119): hypandrium convex, posterior margin cone-shaped; gonocoxal apodemes long, nearly extending beyond hypandrium; postgonite lacking; phallus strongly curved apically with laterally flattened expanded apex; base of phallus with pair of slender oblique processes. Epandrial lamella oval with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium;

posterior margin with fringe of setae, apex with short hook. Cercus short, non-tapered with rounded tip; posterior face well sclerotized; apex with setae only; hypoproct with pair of long, stout setae.

Female. Similar to male except as follows: face with 1 pair of ventrolateral setae. Fore femur more slender, straight; av row of slender setae, decreasing in length apically; mid tibia with 1 long preapical ventral seta; hind tibia with dorsal seta near mid-length; wing veins unmodified. Abdominal pleural membrane greyish; apical segments retracted into segment 7; posterior margin of T7 with dense fringe of short setulae; lateral margin of S7 straight. Terminalia (Fig. 120): T8 narrow dorsally, expanded laterally; sparse fringe of long setae present; anterior margin lacking sclerites. S8 triangular, posterior margin invaginated forming inner sclerite. T10 divided medially, forming pair of rectangular sclerites; apical half (lateral view) clothed in stout curved setae, setae on posterior margin stouter. Cercus rounded, with 2–3 stout apical setae, similar to posterior setae of T10; lateral margin with slender long setae. Spermathecal receptacle spherical, opening wide; duct strongly tapered and gradually depigmented (Fig. 121).

Distribution. The type-locality is a small oxbow lake in New Brighton, a suburb of Christchurch (R. Macfarlane pers. comm.). This species is known from the northern half of the South Island (Map 2).

Remarks. This species appears to occur around small, clean slow-flowing streams to small creeks of medium flow and current in low altitude regions. Specimens were also observed in the Lake Brunner area on stagnant pools standing on the water surface. Macfarlane (2004) observed *C. crassinervis* at low flow, silty drains in the Christchurch drainage.

***Ceratomerus minutus* n. sp.**

Map 3, Figs. 80, 122

Type material. Holotype male, "NEW ZEALAND: ND/ Waipoua For. Pk. Kauri/ for. Waikohatu Str./ 31.i.1995/ B.J. Sinclair"; "HOLOTYPE/ *Ceratomerus*/ *minutus*/ Sinclair [red label]" (NZAC).

Paratype: New Zealand: **ND**—1 ♀, same data as holotype [damaged] (NZAC).

Recognition. Males are distinguished from all other New Zealand species by the following combination of characters: face with setulae, base of R_{4+5}, M_{1+2} and M_4 thickened, R_{2+3} with small basal swelling, and upper half of pleura dark, concolourous with the scutum and lower half pale brown.

Description. Wing length 1.7–1.8 mm.

Male. Head: round, dark brown, not shiny; face pale yellow with fine setulae, very narrow below antennal sockets and slightly expanded apically; eye facets enlarged anteriorly below antennae; frons lacking setae; ocellar triangle with pair of divergent ocellar setae inserted anterior to posterior ocelli; postocellar setae widely separated, nearly posterior to ocelli, 2/3 length of ocellar seta; 3 pairs of long vertical setae, slightly shorter and stouter than postocellar seta; lower half of eye with 3 long postocular setae overlapping eye. Antenna brown with scape 2/3 length of height of eye, 1 dorsal seta at middle and 1 long preapical ventral seta; pedicel globular with apical fringe of long setae. Postpedicel covered by long dense pruinescence, 1/3 longer than length of labrum; rectangular base 1/2 length of apical portion; apex narrow, slightly tapered to stylus, concolourous with remaining antenna; apical portion with short bare apex; stylus bare, nearly equal to length of apical portion of postpedicel; difficult to distinguish first and second segments of stylus. Base of labrum lacking dorsal process; palpus yellow, parallel to labrum, almost 1/3 length of labrum with dark setulae; prementum with dense, slender erect setae along dorsolateral margin.

Thorax: mesonotum, mediotergite and upper half of pleura brown; postpronotal lobe, supraalar ridge, ventral half of pleura and anterior margin of anepimeron yellow to brownish yellow. Lacking modified sclerites at base of wing. Acr with anterior pair long and erect, uniserial, alternating left and right to prescutellar depression, directed posteriorly; 4 dc increasing in length toward scutellum; 1 pprn; 1 presut spal; 2 npl, lower weak and short; 2 psut spal; 1 short and slender pal; 2 sctl, some additional setulae interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 80): infuscate, pterostigma absent; 1 basal costal seta; costal margin straight; erect costal setae beyond R_1; lacking ventral costal setulae; posterior margin unmodified, lacking incisions, lobes and setae unmodified. Posterior base of wing stem with 2 stout setae; base of wing lacking sclerotized concave pocket. R_1 reaching costa well before middle of wing; R_{2+3} short, gradually arched to C just beyond middle of wing with small basal swelling; medial fork slightly proximal to radial fork; base of R_{4+5}, M_{1+2} and M_4 thickened; M_{1+2} straight; cell

dm subrectangular, short; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 straight, slightly curved at wing margin. Halter knob pale brown.

Legs: fore coxa, anterior and ventral 3/4 of femora pale brown; mid and hind coxae light brown; remaining leg becoming darker apically. Fore coxa subequal to length of mid and hind coxae combined; short sparse setae on inner anterior margin, lacking modified. Fore trochanter with slender setulae. Fore femur swollen with av and pv rows of dark setae, basal setae greater than 1/2 width of femur; pair of preapical ventral setae; 1 slender preapical dorsal seta. Fore tibia shorter than femur; apex with anteroapical comb, not dilated, lacking setae. Tarsomere 1 straight, cylindrical, about 1/2 length of fore tibia; fine short setae beneath. Tarsomeres 2–4 decreasing in length; tarsomere 5 longer than preceeding segment, dorsoventrally flattened, dorsoapical margin straight; empodium subequal in width to pulvillus.

Mid coxa lacking modified seta. Mid femur slender, with pair of subapical ventral setae. Mid tibia slender, slightly shorter than femur; basal fourth with pair of short slender ad and pd setae. Tarsomeres similar to fore tarsomeres.

Hind coxa with 1 long lateral seta. Hind femur straight, swollen; basal third with ad row of erect setae; pair of preapical ventral setae; 1 preapical dorsal seta. Hind tibia subequal in length to femur; posterior face with sparse erect setulae; pv comb slightly inflated; dorsal seta on apical third. Hind tarsomeres longer than tibia, similar to fore tarsomeres; 1 long ventrobasal seta on tarsomere 1, lacking posterior seta on basal third.

Abdomen: tergites brown, sternites pale, with short posteromarginal setae; sclerites lacking ridges and modified setae; central region of T7 membranous; S7 longer than preceding sclerite; posterolateral corner slightly produced posteriorly to articulate with S8.

Terminalia (Fig. 122): hypandrium convex, apex with single, thinly sclerotized median extension; gonocoxal apodemes slender, extending beyond hypandrium; postgonite upright, divergent from phallus, apex slightly curved posteriorly; apex of phallus straight, erect with pointed tip in lateral view. Epandrial lamella slightly tapered, with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus very long and narrow, well sclerotized with sparse posterior setae; lacking long anterior setae. Cercus long and narrow, entirely well sclerotized, except anterobasally; tapered apically with more than 5–7 long, erect posterior setae on apical third; anteromedially with 2–3 long setae; posterobasal margin narrow, lacking setae.

Female. (abdomen missing): similar to male except as follows: face brown, nearly as wide as antennal sockets; apical half of distal portion of postpedicel bare; first segment of stylus 4–5X longer than wide; second segment of stylus subequal to length of bare section of apical portion of postpedicel; palpus brown, oblique to labrum; prementum lacking modified setae. Fore femur slightly less swollen with several short ventral setae. Wings unmodified, medial fork proximal to radial fork.

Distribution. Known only from the type-locality, swept from a small stream in a kauri (*Agathis australis*) forest (North Island, ND) (Map 3).

Etymology. The specific name refers to the small size of this species.

Ceratomerus morrisi n. sp.

Map 4, Fig. 18

Type material. Holotype male, "NEW ZEALAND: MC:/ Cameron R., 1280m/ Arrowsmith Ra./ 13.ii.1995, UV/ S.J. Morris"; "HOLOTYPE/ Ceratomerus/ morrisi/ Sinclair [red label]" (CMNZ).

Recognition. The single male specimen is distinguished by the strongly modified forelegs; narrow, elongate swelling on R_{2+3}; scutum completely clothed in bluish-grey pruinescence.

Description. Wing length 2.9 mm.

Male. Head: round, slightly pointed anteroventrally, dark greyish brown, not shiny; face convergent ventrally, narrower than antennal sockets; eye facets enlarged anteriorly below antennae; face pale, dull with median row of short setulae; ocellar triangle with 2 long divergent setae, inserted anterolateral to posterior ocellus; postocellar seta slender, 1/3 length of ocellar seta; 3 vertical setae, shorter than ocellar seta; upper postocular setae in oblique posterior row, lower half of eye with 3–4 slender postocular setae. Antenna brown with length of scape 2/3 height of eye, 1 erect dorsal seta near mid-length and several setulae, and 1 long ventral subapical seta; pedicel globular with setae confined to apical fringe. Postpedicel long, covered by long dense pruinescence, slightly longer than length of labrum; base rectangular with apex 2X length of base, thick, half width of base; stylus very short, slightly

longer than width. Base of labrum lacking dorsal process; palpus yellow, slender, 1/4 length of labrum, clothed in fine pale setulae, extending parallel to proboscis; prementum with short setae only.

Thorax: reddish brown, clothed in iridescent bluish grey pruinescence; scutum without bare patches; lacking modifications near wing base. Acr with anterior pair long and erect with several scattered additional setulae proximal to prescutellar depression, directed posteriorly; 4 dc, increasing in length posteriorlywith several setulae interspersed; 1 pprn; 1 presut spal; 2 npl, lower shorter; 2 psut spal (anterior very short); 1 pal; 2 sctl. Antepronotum with pair of setae subequal in length to acrostichal setulae.

Wing: infuscate, pterostigma absent; 1 short basal costal seta; costal margin straight with erect costal setae beyond R_1; posterior margin smooth, lacking incision; posterior setal margin complete, setae on wing stem undifferentiated; base of wing stem lacking sclerotized pocket. R_1 reaching costa before middle of wing; R_{2+3} smoothly curved to C, basal third with elongate thickening; radial fork proximal to medial fork; cell dm rectangular, slender; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 slightly arched to wing margin. Halter with brown knob.

Legs (Fig. 18): coxae with bluish pruinescence; remaining leg segments yellowish brown. Fore coxa longer than length of mid and hind coxae combined; proximal half with fine pale setulae; distal half with long spine-like setae on anteromedial face. Fore trochanter without modified setae. Fore femur distinctly swollen, especially basal half with av and pv rows of long dark setae; lacking preapical dorsal seta. Fore tibia sinuous, shorter than length of femur; apex with anteroapical comb, not dilated; middle inflated posteriorly; ventrally with pv row of stout setae and av row of setae, very short and slender. Fore tarsi thickened compared to mid and hindlegs; tarsomere 1 nearly 1/2 length of fore tibia with brush of short spine-like setae at mid-length. Anterior face of tarsomere 2 flattened, bare with rounded basal protuberance; row of 5 stout setae proximal to protuberance. Tarsomere 3 slightly inflated basally and distally; tarsomeres 4 and 5 dorsoventrally slightly broader than preceding segments.

Mid coxa lacking modified seta. Mid femur lacking modified setae with 1 pair of ventroapical setae. Mid tibia slightly shorter than femur; basal fifth with 1 short ad and pd seta; apex with 3–5 apical setae. Tarsomere 1 shorter than length of remaining 4 tarsomeres with 1 erect ventral seta.

Hind coxa with unmodified setae. Hind femur slender, similar thickness to mid femur with 1 preapical dorsal seta and pair of ventroapical setae; basal fourth with ad row of erect setae. Hind tibia subequal in length to femur with 1 preapical ad seta and 1 pd seta at apical fifth; apex expanded, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral seta near base and 1 long posterior seta on basal third.

Abdomen: tergites 1–6 concolourous with thorax with short posteromarginal setae; sternites concolourous with tergites; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half; S7 subequal in length to preceding sternite, anterolateral margin not produced.

Terminalia (undissected): hypandrium convex with broad posterior extension; postgonite erect, arching out and around phallus. Epandrial lamella narrow produced into narrow surstylus. Surstylus not distinctly differentiated from epandrium; posterior margin with fringe of long setae. Cercus short broad, fleshy.

Female. Unknown.

Distribution. Known only from the holotype, collected above 1200 m, along the Cameron River of the Arrowsmith Range (MC), South Island (Map 4).

Etymology. Named in honour of the collector of the unique holotype.

Ceratomerus oparara n. sp.

Map 5, Fig. 81

Type material. Holotype male, "NEW ZEALAND: NN:/ NW Nelson For. Pk./ Oparara R., 8.ii./ 1995, B.J. Sinclair"; "HOLOTYPE/ *Ceratomerus*/ *oparara*/ Sinclair [red label]" (NZAC).

Paratypes: New Zealand: **BR**—1 ♂, Woolley Ck, UV lights, 5.iii.1992, JBW (CMNZ). **NN**—1 ♀, same data as holotype (NZAC).

Recognition. Males are distinguished by the strongly modified forelegs; large swelling on R_{2+3}; scutum completely clothed in bluish grey pruinescence.

Description. Wing length 2.3–2.6 mm.

Male. Head: round, dark greyish brown, not shiny; face convergent ventrally, slightly wider around antennal sockets; face pale apically, shiny with median biserial row of short setulae; eye facets enlarged anteriorly below

antennae; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/4 length of ocellar seta; 3 stout vertical setae, shorter than ocellar seta; upper postocular setae in oblique posterior row, lower half of eye with 3–4 long slender postocular setae. Antenna brown, with length of scape 3/4 height of eye with 1 erect dorsal seta near mid-length and several setulae, 1 long ventral subapical seta; pedicel globular with setae confined to apical fringe. Postpedicel long, covered by long dense pruinescence, length 1.3X length of labrum; base rectangular; apical portion nearly 3X length of base, stout, somewhat tapered; arista-like stylus bare, very short, less than basal width of apical portion of postpedicel. Base of labrum lacking dorsal process; palpus yellow, slender, less than 1/3 length of labrum, clothed in fine pale setulae, projecting obliquely from proboscis; prementum with short setae only.

Thorax: reddish brown, clothed in iridescent grey pruinescence; scutum completely clothed in pruinescence; lacking modifications near wing base. Acr with anterior pair long and erect; uniserial, alternating right and left, ending at prescutellar depression, directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn and 1 short seta, 1/4 length of seta; 1 presut spal; 2 npl, lower shorter; 2 psut spal; 1 short pal; 2 sctl; additional setulae interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 81): infuscate, pterostigma absent; 1 mid-size basal costal seta; costal margin straight with erect costal setae beyond R_1; posterior margin smooth, lacking incision; posterior setal margin complete, setae on wing stem undifferentiated; base of wing stem with small sclerotized pocket. R_1 reaching costa before middle of wing; R_{2+3} smoothly curved to C, basal third with large thickening or swelling; radial fork slightly proximal to medial fork; cell dm rectangular, slender; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 straight. Halter with yellowish brown knob.

Legs: coxae yellow to yellowish brown, remaining leg segments increasingly darker. Fore coxa twice length of mid and hind coxae combined; anterior margin clothed in short dark setae. Fore trochanter lacking modified setae. Fore femur distinctly swollen near base, basal half with rows of ventral setae, 1/4 width of femur; apical half with av and pv rows of short setae, subequal in length to basal setae; lacking preapical dorsal seta. Fore tibia 1/5 shorter than femur; apex with anteroapical comb, not dilated. Tarsomere 1 2/3 length of fore tibia, apical half with bare pv concavity. Tarsomere 2 short, partially dilated apically; tarsomere 3 nearly twice length of second with pv concavity on apical half; tarsomeres 4 and 5 dorsoventrally flattened on all legs.

Mid coxa lacking modified seta. Mid femur lacking modified setae with 2 pairs of ventroapical setae. Mid tibia slightly shorter than femur with 1 ad seta on basal half, 1 short subapical seta and 3–5 apical setae. Tarsomere 1 shorter than length of remaining 4 tarsomeres.

Hind coxa with unmodified setae. Hind femur more swollen than mid femur, with 1 preapical dorsal seta and pair of ventroapical setae; basal fourth with ad row of erect setae. Hind tibia subequal in length to femur with 1 ad and 1 dorsal seta; apex expanded, bearing posteroapical comb. Hind tarsomeres longer than tibia; first tarsomere with 1 long, erect ventral seta near base and 1 short posterior seta on basal third.

Abdomen: tergites 1–6 dark brown, with short posteromarginal setae; sternites concolourous with tergites; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 subequal in length to preceding sternite, anterolateral margin not produced.

Terminalia (undissected): appears very similar to *C. tarsalis*; hypandrium convex with broad posterior margin; surstylus tapered, not distinctly differentiated from epandrium; posterior margin with fringe of long setae. Cercus short, broad, inner posterior margin expanded medially.

Female. Similar to male except as follows: slender apex of postpedicel sparsely clothed in pruinescence, less than 2X length of base; stylus long, subequal in length to basal width of postpedicel; first segment of stylus 2X longer than wide. Fore femur inflated with long basal pv setae; wing veins unmodified. Abdominal pleural membrane greyish; apical segments retracted into segment 7; posterior margin of T7 with fringe of very short setulae, confined to dorsal margin; lateral margin of S7 straight. Terminalia: undissected.

Distribution. This species is known from the northwestern part of South Island (Map 5).

Etymology. The specific name is derived from the type-locality.

Remarks. Two specimens were collected from a roadside spring on route to Oparara River [NN—2 ♀, Hwy 67 W. Waimarie, roadcut spring, 8.ii.1995, BJS (CNC)], where the type material was collected along with specimens of *C. tarsalis*. The antennae are very long, similar to *C. tarsalis*, but the scutum is completely clothed in

pruinescence, similar to *C. oparara*. These two female specimens have not been included in the type-series and a male collected from this roadside spring is required for verification of species identification.

***Ceratomerus planti* n. sp.**

Map 6, Figs. 19, 82

Type material. Holotype male, "NEW ZEALAND: BR/ No Catchem Str. /Rainbow Valley/ 8.i.1996, U.V.-lights/ J.B. & G.M. Ward"; "HOLOTYPE/ Ceratomerus/ planti/ Sinclair [red label]" (CMNZ).

Recognition. The single male specimen is distinguished by the swollen fore femur and strongly modified fore tarsomeres, small narrow swelling on R_{2+3} and long facial setulae.

Description. Wing length 2.4 mm.

Male. Head: round, dark greyish brown, not shiny; face convergent ventrally, slightly wider around antennal sockets; face pale, shiny pruinescence with median row of long setulae; eye facets enlarged anteriorly below antennae; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/3 length of ocellar seta; 3 vertical setae, shorter than ocellar seta; upper postocular setae in oblique posterior row, lower half of eye with 3–4 dark postocular setae. Antenna brown with length of scape subequal to height of eye with 1 erect dorsal seta near mid-length and several setulae, 1 short ventral subapical seta; pedicel globular with setae confined to apical fringe. Postpedicel long, covered by long dense pruinescence, length 1.3X length of labrum; base rectangular with apex 3X length of base, very slender, arista-like; arista-like stylus bare, longer than basal width of postpedicel. Base of labrum lacking dorsal process; palpus yellow, slender, less than 1/3 length of labrum, extending parallel to proboscis, clothed in fine setulae and anterior row of dark erect setulae; prementum with short setae only.

Thorax: brown with patch of iridescent grey pruinescence posterior to propronotal lobe; scutum mostly shiny with pruinescent stripe along line of acrostichals and dorsocentrals; lacking modifications near wing base. Acr with anterior pair long and erect; uniserial, alternating right and left, ending at prescutellar depression, directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower shorter; 2 psut spal; 1 short pal; 2 sctl; additional setulae interspersed among dc. Antepronotum with pair of short setae.

Wing (Fig. 82): infuscate, pterostigma absent; 1 short basal costal seta; costal margin straight with erect costal setae beyond R_1; posterior margin smooth, lacking incision; posterior setal margin complete, setae on wing stem undifferentiated; base of wing stem lacking sclerotized pocket. R_1 reaching costa before middle of wing; R_{2+3} smoothly curved to C, basal third with small thickening or swelling; medial and radial forks aligned; cell dm rectangular, slender; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 straight, arched towards wing margin. Halter with dark knob.

Legs (Fig. 19): coxae, fore femur, basal half of mid and hind femora, basal half of fore tibia yellow, remaining leg segments brown. Fore coxa less than length of mid and hind coxae combined; anterior margin sparsely setose. Fore trochanter with short erect ventral setae; setae shorter than width of trochanter. Fore femur distinctly swollen with av and pv rows of long slender setae, less than width of femur; base with long slender setae, subequal to width of femur; lacking preapical dorsal seta. Fore tibia shorter than femur; apex with anteroapical comb, not dilated; with pv row of slender setae, length less than width of tibia. Tarsomere 1 nearly 1/2 length of fore tibia, not flattened, with large ventral swelling near mid-length as wide as tibia; swelling with bare pv groove; row of dark setae on posterior face below groove. Tarsomere 2 1/3 length of tarsomere 1 with short peg-like ventral seta. Tarsomere 3 shorter than tarsomere 1 with subbasal swelling and crown of dark stout setae. Tarsomere 4 very short, quadrate; tarsomere 5 dorsoventrally flattened on all legs.

Mid coxa lacking modified seta. Mid femur lacking modified setae with 2 pairs of preapical setae. Mid tibia slightly shorter than femur with 1 short, stout subapical seta. Tarsomere 1 shorter than length of remaining 4 tarsomeres, with 1 long, erect ventral seta.

Hind coxa with unmodified setae. Hind femur more swollen than mid femur with pair of preapical dorsal setae and several pairs of preapical setae. Hind tibia subequal in length to femur with 1 preapical ad and 1 anterior seta; 1 apical seta arising from beneath comb; apex expanded, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long, erect ventral seta near base and 1 long posterior seta on basal third.

Abdomen: tergites 1–6 light brown, paler than thorax with short posteromarginal setae; sternites concolourous with tergites; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half,

lacking long posteromarginal setae; S7 subequal in length to preceding sternite, anterolateral margin not produced; T8 rectangular, 1/6 length of sternite, widest on lateral margins, and reduced to thin strip dorsally.

Terminalia: undissected.

Female. Unknown.

Distribution. This species is known only from the type-locality on the South Island (BR) (Map 6).

Etymology. Named in honour of Dr. Adrian Plant, a dedicated dance fly taxonomist.

***Ceratomerus setifacies* n. sp.**

Map 7, Figs. 20, 123

Type material. Holotype male, "NEW ZEALAND: WN/ Cloustonville/ Akatarawa Valley/ Fern Gully, creek/ 3–4.ii.1995, yellow/ pans, B.J. Sinclair"; "HOLOTYPE/ *Ceratomerus*/ *setifacies*/ Sinclair [red label]" (NZAC).

Paratype: New Zealand: **WN**—1 ♀, same data as holotype (NZAC).

Recognition. Males are distinguished by their unmodified wing venation, modified forelegs, slightly modified palpus and narrow setose face.

Description. Wing length 2.8–3.0 mm.

Male. Head: round, dark brown, not shiny; face pale, with fine setulae (Fig. 20); face convergent, ventral margin 1/2 width of antennal sockets; eye facets enlarged anteriorly below antennae; frons lacking setae; ocellar triangle with pair of divergent ocellar setae inserted anterior to posterior ocelli; posterior ocelli narrowly separated, subequal in distance to anterior ocellus; postocellar setae narrowly separated, slender, 1/2 length of ocellar seta; 3 pairs of stout vertical setae, slightly shorter than postocellar seta; lower half of eye with 2 long postocular setae overlapping eye. Antenna brown with scape subequal to height of eye, 1 dorsal seta at beyond middle and 1 preapical ventral seta; pedicel globular with apical fringe of long setae. Postpedicel covered by long dense pruinescence, slightly shorter than length of labrum; rectangular base 1/2 length of apical stylus, sharply attenuated; apex narrow, arista-like stylus, slightly tapered; apical segments concolourous with remaining antenna, bare, 1/2 length of apical portion of postpedicel; difficult to distinguish segments of stylus. Base of labrum lacking dorsal process; palpus yellow, oblique to labrum, almost 1/5th length of labrum, with dark 8–9 ad setae, longer than width of palpus; prementum with slender, erect row of setae along dorsolateral margin.

Thorax: mesonotum and mediotergite dark, except postpronotal lobe, lower half of notopleuron and supra-alar ridge pale; pleura and laterotergite yellow. Lacking modified sclerites at base of wing. Acr with anterior pair long and erect, uniserial, alternating right and left to prescutellar depression, directed posteriorly; 4 dc increasing in length toward scutellum; 1 pprn; 1 presut spal; 2 npl, lower weak and short; 2 psut spal; 1 short and slender pal; 2 sctl, some additional setulae interspersed among dc and postpronotal lobe. Antepronotum with pair of short setae.

Wing: infuscate, pterostigma absent; 1 basal costal seta; costal margin straight; erect costal setae beyond R_1; lacking ventral costal setulae; posterior margin unmodified, lacking incisions, lobes and setae unmodified. Posterior base of wing stem lacking stout setae; base of wing lacking sclerotized concave pocket. R_1 reaching costa well before middle of wing; R_{2+3} long, gradually arched to C beyond middle of wing, lacking basal swelling; medial fork slightly proximal to or opposite radial fork; base of R_{4+5}, M_{1+2} and M_4 not thickened; M_{1+2} straight; cell dm subrectangular, short; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 straight, slightly curved at wing margin. Halter knob pale brown.

Legs (Fig. 20): coxae and femora, except apex yellow; remaining leg becoming darker apically. Fore coxa less than length of mid and hind coxae combined; short dark setae on inner anterior margin with 2–3 stout subapical setae. Fore trochanter with slender setulae. Fore femur distinctly swollen basally with av and pv rows of setae, 1/2 width of femur; basal third with 20–30 ventral setae, 3/4 length of base of femur; pair of preapical ventral setae; preapical dorsal seta lacking. Fore tibia stout, much shorter than femur; apical half somewhat curved; apex with anteroapical comb, not dilated, 1 subapical dorsal seta; row of setae beneath. Tarsomere 1 curved, with broad base and narrow apical half, 1/2 length of fore tibia; dark, rows of short, stout apically-directed setae on dorsal and ventral faces. Tarsomere 2 short, less than 1/2 length of tarsomere 1; tarsomere 3 1/3 longer than preceding segment, with ventrobasal swelling; tarsomere 4 produced anteriorly into small setose ridge; tarsomere 5 longer than preceding segment, dorsoventrally flattened, dorsoapical margin straight; empodium subequal in width to pulvillus.

Mid coxa lacking modified seta. Mid femur swollen, with pair of subapical ventral setae; apical half with row of 8 dark anterior setae. Mid tibia slender, slightly shorter than femur; basal half with 1 ad and 1 pd seta; apical half with 2 short av setae; apex with ring of stout preapical setae, ventral seta stoutest. Tarsomere 1 1/2 length of tibia, with 1 stout ventrobasal seta; tarsomere 5 dorsoventrally flattened.

Hind coxa with lateral seta reduced. Hind femur straight, swollen; basal third with ad row of erect setae; pair of preapical ventral setae; 2 preapical dorsal setae. Hind tibia subequal in length to femur; posterior face with mat of long, dense erect setulae; pv comb slightly inflated, with 1 seta arising from comb; 4 dorsal and 1 preapical ad setae. Hind tarsomeres nearly subequal to length of tibia; 1 long ventrobasal seta on tarsomere 1, lacking posterior seta on basal third.

Abdomen: tergites brown, sternites paler, with short posteromarginal setae 1/3 length of sclerite; sclerites lacking ridges and modified setae; central region of T7 membranous; S7 longer than preceding sclerite, prolonged posterolaterally to margin of S8. T8 narrow medially, greatly expanded laterally.

Terminalia (Fig. 123): hypandrium convex, apex truncate; gonocoxal apodemes slender, extending beyond hypandrium; postgonite upright, divergent, curved posteriorly, apex slender; phallus arched anteriorly, apex expanded apically, rounded in lateral view. Epandrial lamella tapered, with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus short, narrow, not strongly differentiated with sparse posterior setae. Cercus sclerotized on posterior margin; apical half narrow with sinuous apex; inner and apical margin with long stout setae; posterobasal margin narrow with 3 setae.

Female. Similar to male except as follows: face brown; postpedicel with short rectangular base, 1/2 length of slender apical portion; stylus subequal in length to apical portion of postpedicel; palpus brown, with only setulae. Fore femur swollen basally, but lacking distinct setae; hind tibia with 2 ad setae beyond middle. Wings with medial fork proximal to distal to radial fork. Apical segments retracted into segment 7; posterior margin with fringe of short setulae; lateral margin of S7 straight. Terminalia (undissected): T8 with deep U-shaped membranous region along posterior margin, extending 3/4 length of sclerite; anterior margin with fringe of long setae. S8 triangular. T10 divided medially, forming pair of rectangular sclerites; with stout posterior setae. Cercus with row of spine-like setae, similar to posterior setae of T10.

Distribution. This species is known only from the type-locality towards the southern tip of the North Island (WN) (Map 7).

Etymology. The specific name is in reference to the presence of setulae on the face.

Ceratomerus simplex n. sp.

Map 8, Figs. 83, 124

Ceratomerus exiguus Plant, 1991: 1322, nec Collin, 1928: 20 (mis-identification of male).

Type material. Holotype male, "NZ: Manangaatiuhi [as Manangaatiuhuia]/ Str. [BP] Urewera NP/ NZMS 1 N96 476529/ wet gravel be side water/ of stream. 19/4/87/ coll. A.R. Plant"; "HOLOTYPE/ *Ceratomerus*/ *simplex*/ Sinclair [red label]" (NZAC).

Paratype: New Zealand: **TO**—1 ♂, Whirinaki For. Pk., Minginui, Whirinaki R., YPT, 20-21.ii.1995, BJS (CNC).

Additional material (possibly conspecific). **ND**—1 ♀, Waipapa R., Puketi For., YPT, 1.xii.1989, DJB (AMS); 1 ♀, Waipoua Forest, YPT, 1–2.xii.1989, DJB (AMS).

Recognition. Males are distinguished by their unmodified wing venation, dark pleura and apparent absence of secondary sexual characters.

Description. Wing length 2.5 mm.

Male. Head: round, dark brown, not shiny; face brown, with fine setulae; face convergent, ventral margin narrower than width of antennal sockets; eye facets enlarged anteriorly below antennae; frons lacking setae; ocellar triangle with pair of divergent ocellar setae inserted anterolateral to posterior ocelli; posterior ocelli widely separated, greater than distance to anterior ocellus; postocellar setae widely separated, posterior to ocelli, 2/3 length of ocellar seta; 3 pairs of stout vertical setae, slightly shorter than postocellar seta; lower half of eye with 4 long postocular setae overlapping eye. Antenna brown, with scape slightly shorter than height of eye with 1 dorsal seta beyond middle and 1 preapical ventral seta; pedicel globular with apical fringe of long setae. Postpedicel covered by long dense pruinescence, subequal in length to labrum; rectangular base 1/3 length of apical portion, sharply

attenuated; apex narrow, arista-like, slightly tapered; stylus concolourous with remaining antenna, base 1/2 length of apical portion of postpedicel; difficult to distinguish second and third flagellomeres. Base of labrum lacking dorsal process; palpus light brown, parallel to labrum, almost 1/6 length of labrum with pale setulae; prementum with dense, slender erect setae along dorsolateral margin.

Thorax: mesonotum, mediotergite, and upper half of pleura brown; ventral half of pleura somewhat paler. Lacking modified sclerites at base of wing. Acr with anterior pair long and erect, uniserial, alternating right and left to prescutellar depression, directed posteriorly; 4 dc increasing in length toward scutellum; 1 pprn; 1 presut spal; 2 npl, lower weak and short; 2 psut spal; 1 short and slender pal; 2 sctl, some additional setulae interspersed among dc and postpronotal lobe. Antepronotum with pair of long setae.

Wing (Fig. 83): infuscate, pterostigma absent; 1 basal costal seta; costal margin straight; erect costal setae beyond R_1; lacking ventral costal setulae; posterior margin unmodified, lacking incisions, lobes and setae unmodified. Posterior base of wing stem lacking stout setae; base of wing lacking sclerotized concave pocket. R_1 reaching costa well before middle of wing; R_{2+3} long, gradually arched to C beyond middle of wing, lacking basal swelling; medial fork slightly proximal to or opposite radial fork; base of R_{4+5}, M_{1+2} and M_4 not thickened; M_{1+2} straight; cell dm subrectangular, short; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 straight, slightly curved at wing margin. Halter knob pale brown.

Legs: coxae and ventrum of femora pale; remaining leg becoming darker apically. Fore coxa less than length of mid and hind coxae combined; short sparse setae on inner anterior margin, lacking modified. Fore trochanter with slender setulae. Fore femur slightly swollen with av and pv rows of short slender setae; pair of preapical ventral setae; 1 preapical dorsal seta. Fore tibia shorter than femur; apex with anteroapical comb, not dilated, lacking setae. Tarsomere 1 straight, cylindrical, about 1/2 length of fore tibia; fine short setae beneath. Tarsomeres 2–4 decreasing in length; tarsomere 5 longer than preceding segment, dorsoventrally flattened, dorsoapical margin straight; empodium subequal in width to pulvillus.

Mid coxa lacking modified seta. Mid femur slender with pair of subapical ventral setae. Mid tibia slender, slightly shorter than femur; basal fourth with 1 ad seta; apex with ring of stout preapical setae, ventral seta stoutest. Tarsomeres similar to fore tarsomeres.

Hind coxa with 1 long lateral seta. Hind femur straight, swollen; basal third with ad row of erect setae; pair of preapical ventral setae; 1 preapical dorsal seta. Hind tibia subequal in length to femur; posterior face with sparse erect setulae; pv comb slightly inflated; 1 dorsal seta on apical 1/4 and 1 preapical anterior seta. Hind tarsomeres longer than tibia, similar to fore tarsomeres; 1 long ventrobasal seta on tarsomere 1, lacking posterior seta on basal third.

Abdomen: tergites brown, sternites pale, with short posteromarginal setae; sclerites lacking ridges and modified setae; central region of T7 membranous; S7 longer than preceding sclerite, prolonged posterolaterally to margin of S8. T8 narrow medially, greatly expanded laterally.

Terminalia (Fig. 124): hypandrium convex, apex with single, thinly sclerotized median extension; gonocoxal apodemes slender, extending beyond hypandrium; postgonite upright, flanking phallus, apex slightly curved posteriorly; apex of phallus straight, erect with pointed tip in lateral view. Epandrial lamella slightly tapered with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus very long and narrow, well sclerotized with sparse posterior setae; anterior margin with long setae, longer than twice width of surstylus. Cercus long and narrow, entirely well sclerotized, except anterobasally; tapered apically with more than 8 long, erect posterior setae on apical half; 2–3 long anteromedial setae posterobasally; margin narrow, with 3 setae.

Female. Not confidently associated (above females not included in type-series).

Distribution. This species is known with certainty only from the central North Island (BP, TO) (Map 8).

Etymology. The specific name refers to the lack of male secondary sexual characters.

Remarks. Plant (1991) originally identified the specimen selected as the holotype of *C. simplex* as *C. exiguus*, but it is clearly not conspecific with the latter species on the basis of thoracic colouration and body size (see under *C. exiguus*). The male terminalia of this specimen (holotype) were illustrated by Plant (1991, fig. 2G).

***Ceratomerus tarsalis* Plant**

Map 9, Figs. 40, 84, 125, 126

Ceratomerus tarsalis Plant, 1991: 1328. Other references: Yang *et al*., 2007: 50 (catalogue); Macfarlane *et al*., 2010: 445 (New Zealand biodiversity).

Type material. Holotype male, "NEW ZEALAND. N.Is.:/ TO: Whirinaki Forest,/ Urewera. 35º40′S 176º41′E./ Swept under podocarp/hardwood/ forest 13.xii.1986/ A.R. Plant"; "HOLOTYPE/ Ceratomerus/ tarsalis/ Plant [red label]" (NZAC).

Paratype: New Zealand: **NN**—1 ♂, same data as holotype (NMW).

Additional material. New Zealand: **BR**—1 ♂, Fuchsia Ck, W. Branch Buller Gorge, 60 m, K29 24006 59291, 30.xi.1999, UV lights (CMNZ); 1 ♀, Lk Brunner, Moana, Arnold R, shoreline, 14.ii.1995 (NZAC); 1 ♂, Nine Mile Ck, Buller Gorge, 40 m, K29 23989 59294, 30.xi.1999, UV lights (CMNZ); 1 ♂, Woolley Ck, UV lights, 5.iii.1992 (CMNZ). **NN**—3 ♂, NW Nelson For. Pk, Oparara R, 8–9.ii.1995 (CNC, NZAC). **WD**—1 ♀, Jones Ck, Ross, K33 23314 58091, 6.xii.1999, 70 m, UV lights (CMNZ).

Recognition. Males are distinguished by the uniquely modified forelegs; small swelling on R_{2+3}, dark reddish brown scutum with grey pruinescence, and bare shiny stripes.

Re-description. Wing length 2.3–2.6 mm.

Male. Head: round, dark greyish brown, not shiny; face convergent ventrally, slightly wider around antennal sockets; face pale, shiny with median row of short setulae; eye facets enlarged anteriorly below antennae; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/3 length of ocellar seta; 3 vertical setae shorter than ocellar seta; upper postocular setae in oblique posterior row, lower half of eye with 3–4 slender postocular setae. Antenna brown with length of scape 2/3 height of eye with 1 erect dorsal seta near mid-length and several setulae, and 1 long ventral subapical seta; pedicel globular with setae confined to apical fringe. Postpedicel long, covered by long dense pruinescence, length 1.3X length of labrum; base rectangular with apex 2X length of base, very slender; arista-like stylus bare, slightly longer than basal width of postpedicel. Base of labrum lacking dorsal process; palpus yellow, slender, less than 1/3 length of labrum, clothed in fine pale setulae, extending parallel to proboscis; prementum with short setae only.

Thorax: reddish brown, clothed in iridescent grey pruinescence; scutum with shiny bare stripe between dc and spal and short shiny patch between suture and psut spal; lacking modifications near wing base. Acr with anterior pair long and erect; uniserial, alternating right and left, ending at prescutellar depression, directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower shorter; 2 psut spal; 1 short pal; 2 sctl; additional setulae interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 84): infuscate, pterostigma absent; 1 short basal costal seta; costal margin straight with erect costal setae beyond R_1; posterior margin smooth, lacking incision; posterior setal margin complete, setae on wing stem undifferentiated; base of wing stem lacking sclerotized pocket. R_1 reaching costa before middle of wing; R_{2+3} smoothly curved to C, basal third with small thickening or swelling; medial fork slightly proximal to radial fork; cell dm rectangular, slender; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 straight. Halter with white knob.

Legs (Fig. 40): coxae, fore femur, basal half of mid and hind femora, basal two-thirds of fore tibia yellow, remaining leg segments brown. Fore coxa less than length of mid and hind coxae combined; anterior margin sparsely setose. Fore trochanter with long, anteriorly directed, stout ventral setae; apical setae longer than width of trochanter. Fore femur distinctly swollen with av and pv rows of long slender setae, less than width of femur; lacking preapical dorsal seta. Fore tibia shorter than femur; apex with anteroapical comb, not dilated; basal half with pv row of slender setae, length less than width of tibia. Tarsomere 1 nearly 1/2 length of fore tibia, flattened, wider than tibia, ventral margin bare; ventral margin with deep V-shaped notch near mid-length; basal half of dorsal margin with fringe of long curved setae. Ventral margin of tarsomeres 2 and 3 pale, flattened, bare; tarsomere 3 2X length of tarsomere 2 with basal swelling bearing tuft of setae; tarsomeres 4 and 5 dorsoventrally flattened on all legs.

Mid coxa lacking modified seta. Mid femur lacking modified setae with 2 pairs of ventroapical setae. Mid tibia slightly shorter than femur with 1 short subapical seta and 3–5 apical setae. Tarsomere 1 shorter than length of remaining 4 tarsomeres with 1 long erect ventral seta.

Hind coxa with unmodified setae. Hind femur more swollen than mid femur with 1 preapical dorsal seta and pair of ventroapical setae; basal fourth with ad row of erect setae. Hind tibia subequal in length to femur with 1

preapical ad seta and several apical setae, one of which arising from beneath comb; apex expanded, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral seta near base and 1 long posterior seta on basal third.

Abdomen: tergites 1–6 light brown, paler than thorax, with short posteromarginal setae; sternites concolourous with tergites; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 subequal in length to preceding sternite, anterolateral margin not produced; T8 rectangular, 1/6 length of sternite, widest on lateral margins, and reduced to thin strip dorsally.

Terminalia (Fig. 125, 126): hypandrium convex, with broad posterior extension; gonocoxal apodemes small, not extending beyond hypandrium; postgonite erect, arching out and around phallus, articulated at base of phallus; phallus curved, erect, apex expanded and round. Epandrial lamella narrow with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; posterior margin with fringe of long setae. Cercus short, broad, fleshy, inner posterior margin expanded medially, bearing stout setae.

Female. Similar to male except as follows: palpus pale brown, projecting obliquely to proboscis; slender apex of postpedicel sparsely clothed in pruinescence, more than 2X length of base; arista-like stylus present, 0.5X length of apical portion of postpedicel; first segment of stylus 3X longer than wide. Fore femur inflated, but lacking modified ventral setae; mid tibia with ad seta on basal third; hind tibia with dorsal seta near mid-length; wing veins unmodified. Abdominal pleural membrane greyish; apical segments retracted into segment 7; posterior margin of T7 with sparse fringe of short setulae, confined to dorsal margin; lateral margin of S7 straight. Terminalia: T8 narrow dorsally, expanded laterally; sparse fringe of short setae present; anterior margin with pair of small, flat dorsolateral sclerites. S8 triangular, posterior margin invaginated forming inner sclerite. T10 divided medially, forming pair of rectangular sclerites; clothed in stout curved setae, setae on posterior margin stouter. Cercus rounded, with 2–3 stout apical setae, similar to posterior setae of T10; lateral margin with slender long setae. Spermathecal receptacle spherical, lacking neck, opening to duct wide.

Distribution. *Ceratomerus tarsalis* is known from the western side of the South Island and from a single locality in the North Island (TO) (Map 9).

Ceratomerus curvatus species-group

This species-group includes seven New Zealand species, defined by the following combination of male characters: R_{2+3} often with long basal swelling, or dipped towards R_{4+5}; fore coxa with comb of long anteroapical setae, usually projecting well beyond coxae; fore basitarsus usually slightly curved with row of long arched setae; cell dm pentagonal-shaped; palpus usually laterally flattened with fringe of stout setae on anterior margin; basalare swollen, often hooked.

Ceratomerus curvatus n. sp.

Map 10, Figs. 21, 41, 42, 85, 127–130

Type material. Holotype male, "NEW ZEALAND: NN/ NW Nelson For. Pk./ Oparara R. + creek/ 8-9.ii.1995, yellow/ pans; B.J. Sinclair"; "HOLOTYPE/ *Ceratomerus*/ *curvatus*/ Sinclair [red label]" (NZAC).

Paratypes: New Zealand: **BR**—1 ♂, Brunner SF, small str, 5.xi.1994, 23745 58629 30, JBW (CMNZ). 2 ♂, Matakitaki Lodge, 3.xii.1993, J.B. & G.M. Ward (CMNZ); 11 ♂, 3 ♀, Nelson Lakes NP, Lk Rotoiti, Black Valley Str., y.pans, 15–16.ii.1995, BJS (CNC); 9 ♂, 28 ♀, same locality, Lk Rotoroa, Braeburn Tr., 7–8.ii.1995, BJS (CNC); 1 ♂, Paparoa NP, Porarari R, 10.ii.1995, BJS (NZAC); 1 ♂, Tawhai SF, Nelson-Westland Scheme, Big R. Rd., litter, 9.xi.1971, J.C. Watt (NZAC); 2 ♂, 1 ♀, Woolley Ck, UV lights, 5.iii.1992, JBW (CMNZ). **FD**—1 ♂, Milford Rd Cks, 154–160, D41 21096 56023, 28.i.2000, 30 m, UV lights, J.B. & G.M. Ward (CMNZ). **MB**—1 ♂, Mullans Rd., Dog Str/tribs, 2–3.xii.1994, J.B. & G.M. Ward (CMNZ); 2 ♂, 1 ♀, Mt. Richmond For. Pk., Butcher's Flat, cascading str, 5.ii.1995, BJS (AMS); 1 ♂, same locality, *Nothofagus* for., 5–6.ii.1995 (CNC); 3 ♂, same locality, small ck, YPT, 5-6.ii.1995 (ANIC); 2 ♂, 2 ♀, same locality, Doom Ck, YPT, 5–6.ii.1995 (BMNH). **MC**—1 ♂, Bowyers Str, 450 m, Sharplin Falls Car Pk, 23823 57298, 12.xi.1998, J.B. & G.M. Ward (CMNZ); 2 ♂, Craigieburn, tribs, 1050 m, UV lights, JBW (CMNZ). **NC**—1 ♂, Ashley R above main rd bridge, 273 m, L34 24471 57753, 9.ii.2001, J.B. & G.M. Ward (CMNZ); 25 ♂, 21 ♀, Glentui R trib., footbridge, 400 m, L34 24491 57789, 14.ii.2001, J.B. & G.M. Ward (CMNZ). **NN**—6 ♂, Graham R. South Branch, Graham Valley, YPT, 17–

18.ii.1995, BJS (CNC); 1 ♂, Nelson, 120-160m, UV-light, 29–30.xii.1994, JBW (CMNZ); 1 ♂, Nelson, 18.x.1923, A. Tonnoir (ANIC); 14 ♂, 11 ♀, NW Nelson For. Pk, Oparara R, 8.ii.1995, BJS (CNC); 19 ♂, 17 ♀, same data as holotype (NZAC); 1 ♂, same locality, mixed for., ex. lights, 9.ii.1995 (NZAC); 2 ♂, Hwy 67 N Waimarie, roadcut spring, 8.ii.1995, BJS (AMS). **SL**—1 ♂, Longwood Range, 12.i.1994, cascade stram, UV lights, JBW (CMNZ). **WD**—10 ♂, 6 ♀, Haast R, Harris Ck/ Greenstone Ck, Glitterburn, 3.xi.1994, JBW (CMNZ); 2 ♂, 2 ♀, Lk Paringa, bush nightlights, 26.ii.2001, R.P. Macfarlane (CMNZ); 14 ♂, 18 ♀, Lk Paringa, motel water supply ck, pan tp., 26–27.ii.2001, R.P. Macfarlane (CMNZ).

Additional material examined. New Zealand: **BR**—1 ♂, 4 ♀, Matakitaki R, tribs, W Bank Rd., Murchison, 14.iii.1993, JBW (CMNZ). **KA**—11 ♂, Kaikoura, Blue Duck Scientific Reserve, str., 5.ii.1991, R.K. Didham (CMNZ).

Recognition. Males are recognized by absence of the labral tubercle, sickle-shaped basalare, flattened palpus, R_{2+3} lacking swelling, running parallel to M vein for 2/3 length of discal cell, then strongly bent and arched gradually to costa, inner apex of fore coxa with comb of stout setae, length of setae twice width of coxa. Females may be distinguished by the colouration of the scutum: postpronotal lobe and surrounding area, notopleuron, pair of stripes bordering outer edge of acrostichals extending to or short of second dc, stripe from first to second psut spal, and postalar ridge yellow.

Description. Wing length 2.6–3.1 mm.

Male. Head (Fig. 21): round, dark brown, not shiny; face yellow and bare, slightly convergent, subequal to width of antennal sockets; ventral margin of face with very small, round fleshy lobe; eye facets slightly enlarged anteriorly below antennae; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; posterior ocelli widely separated, greater than distance to anterior ocellus; postocellar seta slender, 1/3 to nearly 1/2 length of ocellar setae; 3 vertical setae, 1/2 length of ocellar seta; upper postocular setae in single oblique row; 2–3 lower postocellars stout near eye margin. Antenna brown; length of scape subequal to height of eye with several short dorsal setae and 1 long seta beyond mid-length, 1 lateral seta in basal half, and 1 long, subapical ventral seta; pedicel somewhat paler, globular, with setae confined to apical fringe. Postpedicel brown, clothed in short dense pruinescence, slightly longer than length of labrum; base rectangular, 1/2 length of apical portion; apical portion narrow, very slightly tapered; apical stylus very short, bare, shorter than base of apical portion of postpedicel. Base of labrum lacking dorsal process; palpus yellow, laterally flattened, 1/3 length of labrum with 3 groups of stout pd setae, lacking basal tuft of setae; base with 4–5 stout setae, shorter than width of palpus; middle with several short setae, less than half width of palpus and 2 spine-like setae, longer than width of palpus; remaining margin of palpus with row of short setae terminating at tip with 2 setae, longer than width of palpus; base with 2 short lateral setae on lateral lobe; ventral setae lacking; prementum with row of erect, stout pd setae.

Thorax: mesonotum and postnotum mostly brown; postpronotal lobe and surrounding area, notopleuron, pair of stripes bordering outer edge of acrostichals extending to or short of second dc, stripe from first to second psut spal, and postalar ridge yellow; pleura and laterotergite yellow; anterior basalare inflated with sickle-shaped process, base of process brownish yellow; subalar sclerite not modified. Acrostichals with anterior pair long and erect; biserial, ending at prescutellar depression and directed posteriorly; 4 dc increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower short; 2 psut spal; 1 pal, short; 2 sctl; additional setulae on pprn and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 85): infuscate, pterostigma absent; 1 short basal costal seta; costal margin straight; erect costal setae beyond R_1; ventral margin of costa with fine erect setulae beyond R_1; posterior margin lacking incision and lobes; posterior setal margin unmodified, complete; setae on wing stem unmodified; base of wing stem with oval, sclerotized, shallow concave pocket. R_1 reaching costa before middle of wing; R_{2+3} parallel to vein R for 2/3 length of cell dm, then strongly bent and arched gradually to C, lacking swelling; medial fork slightly proximal to radial fork; M_{1+2} absent, 3 veins emitted from discal cell; cell dm pentagonal-shaped; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 straight, extending to wing margin. Halter knob pale yellow to yellowish brown.

Legs (Fig. 42): coxae yellow; femora yellowish brown, apex brown apex of hind femur; remaining leg segments becoming darker. Fore coxa slightly longer than length of mid and hind coxae combined; anterior margin very sparsely setose, lacking swelling at mid-length; anteroapical margin with comb of 5–6 long tightly positioned setae, twice width of fore femur. Fore trochanter with 3 ventral setae. Fore femur partially inflated on basal fourth, creating slight bend; anterior and posterior faces bare; pv margin with row of short setae, quite sparse near middle

and biserial row of basal setae, outer row nearly equal to width of femur; base with patch of stout, apically directed setae, shorter than width of femur; apical fifth with pd row of stout appressed setae; av row of fine short setae, increasing in length apically; 2 apicoventral setae and 1 preapical dorsal seta. Fore tibia shorter than femur; apex with anteroapical comb, partially dilated; with row of slender, short dorsal and ventral setae. First tarsomere nearly 1/2 length of fore tibia, with bare av preapical depression; 1 anteroventral seta at base, longer than width of tibia; basal half with ventral row of stout, comb-like curved setae, longer than width of tarsomere; apical half with pv row of slender setae; 1 erect ventral seta beyond depression, subequal to width of tarsomere. Tarsomere 2 shorter than tarsomere 3; anterior face with rows of spine-like setae, 1/2 width of tarsomere. Tarsomere 3 cylindrical, narrow, and slightly curved anteriorly. Tarsomeres 4 and 5 dorsoventrally flattened.

Mid coxa and femur lacking modified setae. Mid femur with pair of ventral subapical setae and 1 stout, subapical ad seta. Mid tibia subequal in length to femur, with 1 ad seta at middle and 2 short pv setae at apical third; apex with fringe of 3–4 subapical setae, ventral seta longest. Tarsomere 1 less than 1/2 length of tibia, with short erect setae on pv margin; tarsomere 5 partially dorsoventrally flattened.

Hind coxa with 1 long lateral seta. Hind femur somewhat inflated, with pair of ventral subapical setae; basal half with ad row of erect setae; 1 dorsal subapical seta. Hind tibia longer than femur with 2 ad setae on apical half and 1 dorsal seta on apical fourth; posterior face with long dense mat of setulae; apex slightly dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral setae near base and 1 long posterior seta on basal third and several rows of erect short setae; tarsomere 5 slightly dorsoventrally flattened.

Abdomen: tergites 1-6 brown, with short posteromarginal setae; sternites pale yellow; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 subequal in length to preceding sternite, anterolateral margin not produced; T8 rectangular, 1/6 length of sternite, with lateral margin expanded; S8 with setae of similar length.

Terminalia (Figs. 127, 128): hypandrium convex, posterior thinly sclerotized, apex divided into pair of wide processes, extending to apex of postgonites; gonocoxal apodemes short and slender; postgonite divergent from hypandrium, apex folded and rounded, base fused to hypandrium and medially; apex of phallus arched anteriorly, erect, with expanded tip in lateral view, lacking lateral membranous sac. Epandrial lamella broad, with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; very short, subtriangular, apex curved medially; posterior margin with fringe of setae. Cercus short, lateral and posterior faces well sclerotized, gradually tapered from expanded middle; base of cercus broad, bearing 3 setae; apex expanded medially bearing fringe of stout setae, longer than width of expanded region.

Female. Similar to male except as follows: lacking modifications of palpus; palpus brown, projecting obliquely; apical portion of postpedicel 1.5X longer than base, very slender and tapered; arista 1/2 length of apical portion of postpedicel. Mesonotum lacking modified anterior basalare; wing venation unmodified, median fork proximal to radial fork. Legs lacking modified setae; tarsomere 1 of foreleg with basoventral seta; mid tibia with 1 anterodorosal and 1 pd seta near middle; hind tibia with 2 stout pd setae. Abdominal tergites brown, posteromarginal setae mid-sized; pleural membrane white; apical segments retracted into segment 7; posterior margin of T7 with fringe of short setulae; lateral margin of S7 straight. Terminalia (Fig. 130): T8 narrow dorsally, expanded laterally; fringe of mid-sized setae present; anterior margin with pair of short flat dorsolateral sclerites. S8 triangular, posterior margin invaginated forming inner sclerite. T10 divided medially, forming pair of rectangular sclerites; with stout setae on posterior margin, remaining sclerite with more slender setae near median margin. Cercus rounded, with 2-3 stout setae, similar to posterior setae of T10; apical margin with several long slender setae. Spermathecal receptacle spherical, with short neck fading to duct (Fig. 129).

Distribution. *Ceratomerus curvatus* is widespread on the South Island (Map 10).

Etymology. The specific name is derived from the Latin *curvatus* (bend), referring to the bend or deflection of R_{2+3}.

***Ceratomerus dugdalei* n. sp.**

Map 11, Figs. 43, 86, 131

Type material. Holotype male, "NEW ZEALAND TK/ Pouakai Ra/ 10–13 Jan 1978/ J.S. Dugdale/ malaise trap"; "HOLOTYPE/ *Ceratomerus*/ *dugdalei*/ Sinclair [red label]" (NZAC).

Paratypes: New Zealand: **TK**—2 ♀, Ahukawakawa, SE Pouakai Ra., swamp, 914 m, 27.xi.1975, A.K. Walker (NZAC); 9 ♂, 20 ♀, same data as holotype (NZAC); 2 ♂, 4 ♀, Pouakai Ra., MT, 1220 m, 9.i.1978, J.S. Dugdale (NZAC); 1 ♀, Pouakai Ra., MT, 1220 m, 10.i.1978, J.S. Dugdale (NZAC); 4 ♂, 3 ♀, Pouakai Ra., 1280 m, stream thru tussock, 2.xii.1975, A.K. Walker (NZAC—mounted from alc.).

Additional material. **NC**—2 ♂, 5 ♀, Arthur's Pass NP, bog, alpine zone, 11–12.ii.1995, YPT, BJS (CNC)

Recognition. Males are very similar to *C. curvatus*, except the dipped portion of R_{2+3} is inflated, and spine-like setae of fore tarsomere 1 are shorter. Females are very similar to *C. curvatus* and not confidently separated unless associated with males.

Description. Wing length 2.7–3.0 mm.

Male. Head (Fig. 43): round, dark brown, not shiny; face yellow and bare, convergent, subequal to width of antennal sockets; ventral margin of face with small, round fleshy lobe; eye facets slightly enlarged anteriorly below antennae; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; posterior ocelli widely separated, greater than distance to anterior ocellus; postocellar setae slender, 1/2 length of ocellar seta; 3 vertical setae, 1/2 length of ocellar seta; upper postocular setae in single oblique row; 2–3 lower postocellars stout near eye margin. Antenna brown; length of scape slightly longer than height of eye, with several short dorsal setae and 1 long seta beyond mid-length, 1 lateral seta in basal half, and 1 long subapical ventral seta; pedicel somewhat paler, globular, with setae confined to apical fringe. Postpedicel brown, clothed in short dense pruinescence, subequal in length to labrum; base rectangular sharply attenuated, 1/3 length of apical portion; apical portion narrow, very slightly tapered, arista-like; stylus very short, bare, shorter than base of apical portion of postpedicel. Base of labrum lacking dorsal process; palpus whitish yellow, laterally flattened, 1/3 length of labrum with pd setae in continuous line, lacking basal tuft of setae; base with 4–5 stout setae, shorter than width of palpus; middle with several double row of short setae, and 1 long oblique seta longer than width of palpus; remaining margin of palpus with row of short setae terminating at tip with 1 spine-like seta, twice length of other setae; base with 2 short lateral setae on lateral lobe; ventral setae lacking; prementum with row of erect, short, stout pd setae.

Thorax: mesonotum and postnotum mostly brown, except anterior margin to third acrostichal seta, postpronotal lobe and surrounding area, notopleuron extending onto suture yellow; pleura and laterotergite yellow; anterior basalare inflated into sickle-shaped process, subalar sclerite not modified. Acrostichals with anterior pair long and erect; uniserial, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower short; 2 psut spal; 1 pal, short; 2 sctl; additional setulae on pprn and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 86): infuscate, pterostigma absent; 1 short seta; costal margin straight; erect costal setae beyond R_1; ventral margin of costa with fine erect setulae beyond R_1; posterior margin lacking incision and lobes; posterior setal margin unmodified, complete; setae on wing stem unmodified; base of wing stem with oval, sclerotized, shallow concave pocket. R_1 reaching costa before middle of wing; R_{2+3} dipped very close to R_{4+5}, swollen, then strongly curved anteriorly and arched gradually to C; medial fork slightly proximal to radial fork; M_{1+2} very short; cell dm pentagonal-shaped, prolonged apically; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 straight, until just before wing margin. Halter knob pale brown.

Legs: coxae and ventral margin of femora yellow, remaining leg segments becoming darker. Fore coxa subequal to length of mid and hind coxae combined; anterior margin very sparsely setose, lacking swelling at mid-length; anteroapical margin with comb of 5–6 long tightly positioned setae, twice width of fore femur. Fore trochanter with 2–3 ventral setae. Fore femur evenly inflated for most of its length, lacking slight bend; anterior and posterior faces bare; pv margin with row of short setae, biserial at base, length greater than half width of femur; pd margin with row of setae, becoming more closely spaced and longer apically; av row of fine short setae, increasing in length apically, biserial at base; 2 apicoventral setae and 1 preapical dorsal seta. Fore tibia shorter than femur; apex with anteroapical comb, partially dilated. Tarsomere 1 longer than 1/2 length of fore tibia, somewhat curved anteriorly, with broad subapical notch; basal 2/3 with anteroventral row of setae, increasing in length and strength basally, basal setae spine-like, longer than width of tarsomere; apical half with pv row of setae shorter than width of tarsomere. Tarsomere 2 stout, shorter than tarsomere 3; anterior face with rows of spine-like setae, 1/2 width of tarsomere. Tarsomere 3 cylindrical, narrow, and slightly curved anteriorly. Tarsomeres 4 and 5 dorsoventrally flattened.

Mid coxa and femur lacking modified setae. Mid femur with pair of ventral subapical setae and 1 stout, subapical ad seta. Mid tibia subequal in length to femur, with 1 ad seta at middle and 1 short pd seta on basal 1/3; apex with fringe of 3–4 subapical setae, ventral seta longest. Tarsomere 1 less than 1/2 length of tibia, with short erect setae on pv margin; tarsomeres 4–5 dorsoventrally flattened.

Hind coxa with 1 long lateral seta. Hind femur somewhat inflated, with pair of ventral subapical setae; basal half with ad row of erect setae; 1 dorsal subapical seta. Hind tibia longer than femur with 2 ad setae on apical half and 1 dorsal seta on apical 1/4; posterior face with long dense mat of setulae; apex slightly dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long, erect ventral seta near base and 1 long posterior setae on basal 1/3 and several rows of erect short setae; tarsomere 5 dorsoventrally flattened.

Abdomen: tergites 1–6 brown, with short posteromarginal setae; sternites pale yellow; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 subequal in length to preceding sternite, anterolateral margin not produced; T8 rectangular, middle 1/6 length of sternite, with lateral margin expanded; S8 with setae of similar length.

Terminalia (Fig. 131): hypandrium convex, apex divided into pair of wide divergent processes, extending to apex of postgonites; gonocoxal apodemes short and slender; postgonite divergent from hypandrium, apex folded and rounded about apex of hypandrial processes, arising from base of phallus; apex of phallus arched anteriorly, erect, with expanded tip in lateral view, lacking lateral membranous sac. Epandrial lamella broad, with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; very short, subtriangular, apex curved medially; posterior margin lacking fringe of setae. Cercus short, lateral and posterior faces well sclerotized, gradually tapered from expanded middle; base of cercus broad, bearing 3 setae; apex expanded medially bearing fringe of stout setae, longer than width of expanded region.

Female. Similar to male except as follows: lacking modifications of palpus; palpus brown, projecting obliquely; apical portion of postpedicel 1.5X longer than base, very slender and tapered; arista 1/2 length of apical portion of postpedicel. Mesonotum lacking modified anterior basalare; wing venation unmodified, median fork proximal to radial fork. Legs lacking modified setae; tarsomere 1 of foreleg with basoventral seta; mid tibia with 1 anterodorosal and 1 pd seta near middle. Abdominal tergites brown, posteromarginal setae mid-sized; pleural membrane white; apical segments retracted into segment 7; posterior margin of T7 with fringe of short setulae; lateral margin of S7 straight. Terminalia: very similar to *C. curvatus*, except T10 with more setae scattered on sclerite; posterior margin with row of 6 spine-like setae; cercus with row of 5 stout setae.

Distribution. *Ceratomerus dugdalei* is known primarily from the Pouakai Range in the western North Island (TK) (Map 11). Specimens were collected at higher elevations, some reported from swamps and bogs (i.e., standing water).

Etymology. The specific name is a patronym in honour of J.S. Dugdale, whose Malaise traps have contributed many valuable empidoids.

Remarks. The Arthur's Pass series was not included in the type series, because of slight differences in the male wing venation. Due to the absence of records linking the populations from the Pouakai Range (North Island) with that from Arthur's Pass (South Island), the latter disjunct population may represent a separate species. Additional collections are required to resolve the species concept.

Ceratomerus latinervis n. sp.

Map 12, Figs. 22, 44, 87, 132

Type material. Holotype male, "NEW ZEALAND: MB/ Mt. Richmond's For. Pk./ Butcher's Flat, 5.ii.1995/ B.J. Sinclair/ ex. cascading creek"; "HOLOTYPE/ *Ceratomerus*/ *latinervis*/ Sinclair [red label]" (NZAC).

Paratypes: New Zealand: **BR**—6 ♂, 1 ♀, Nelson Lakes, NP, Lk. Rotoiti, Black Valley Str., YPT, 15–16.ii.1995, BJS (AMS); 1 ♂, same locality, *Nothofagus* for. (NZAC). **FD**—1 ♂, Borland Burn, S. Branch, 640 m, 8.i.1997, J.B. & C.M. Ward (MNHN); 1 ♂, 3 ♀, Lk Hauroko, 157 m, 19.i.2001, C45 20750 54538, UV lights, B.H. & H. Patrick (CMNZ). **MB**—4 ♂, same data as holotype (NZAC); 6 ♂, 2 ♀, same locality as holotype, 5–6.ii.1995, Doom Ck., YPT/ sweeping (CNC); 3 ♂, 1 ♀, Boyle R. Trib, 2 km nr. Hwy 7 [42°31.36′S 172°24.43′E], UV lights, 7.xii.1991, J.B & G.M. Ward (CMNZ). **MC**—1 ♂, Bowyers Str, 450 m, Sharplin Falls Car Pk, 23823 57298, 12.xi.1998, J.B. & G.M. Ward (CMNZ); 4 ♂, 1 ♀, Craigieburn, Cave Str, 800 m, K34 24068 57833, 22.i.2001, J.B. & G.M. Ward (CMNZ). **NC**—5 ♂, 11 ♀, Arthur's Pass NP, Otira R., YPT, 11-12.ii.1995, BJS

(CNC, NZAC); 6 ♂, Andrews Str, trib [Waimakariri River], 24120 58008 [42°59.61′S 171°47.87′E], 580 m, 5.iii.1993, JBW (CMNZ); 1 ♂, Twin Ck, Waterfall A.P.N.P., 5.ii.1990, 575 m, UV lights, JBW (CMNZ). **NN**—60 ♂, 8 ♀, Graham R. South Branch, Graham Valley, YPT, 17–18.ii.1995, BJS (BMNH, CNC, NZAC, USNM); 1 ♂, NW Nelson For. Pk, Mt. Arthur Tablelands, 900 m, Quartz Ck., 17.ii.1995, BJS (NZAC). **SD**—1 ♂, Waitohi R, 2nd Fk, P27 25941 59882, 40 m, 20–21.i.1998, UV lights, J.B. & G.M. Ward (CMNZ). **SL**—1 ♂, Longwood Range, D46-176 265& 178 340, 80 m, 12.i.1994, JBW (MNHN).

Additional material examined. New Zealand: **BR**—17 ♂, 3 ♀, No Catchem Str., Rainbow Valley, UV lights, 8.i.1996, J.B. & G.M. Ward (CMNZ). **MC**—44 ♂, 18 ♀, Craigie Burn, tribs, UV lights, 1050 m, JBW (CMNZ); 7 ♂, Upper Craigie Burn, 1200 m, UV lights, 23.i.1992, JBW (CMNZ). **NC**—1 ♂, Andrews Str. Trib., nr. Shelter, L33 24118 58008, 20.i.2001, 580 m, J.B. & G.M. Ward (CMNZ); 2 ♂, Greyneys Ck, 1 km N, 6.iii.1993, UV lights, JBW (CMNZ). **SD**—1 ♂, Waitohi R below Dam, P27 25935 59869, 80 m, 13.xii.2000, J.B. & G.M. Ward (CMNZ). **SL**—6 ♂, Longwood Range, cascade stream, UV lights, 12.i.1994, JBW (CMNZ); 21 ♂, 24 ♀, Mimihau Str, South Branch, UV lights, 11.i.1994, JBW (CMNZ).

Recognition. Males are recognized by the greatly inflated and flattened R_{2+3} from near base to opposite radial fork, and unmodified fore tarsomeres. Females are very similar to *C. curvatus* but may be distinguished by the yellow postsutural supra-alar yellow stripe extending to the postalar ridge.

Description. Wing length 2.7–2.8 mm.

Male. Head (Figs. 22, 44): round, dark brown, not shiny; face yellow and bare, parallel-sided slightly less than width of antennal sockets with very small fleshy knob on ventral margin; eye facets slightly enlarged anteriorly below antennae; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; posterior ocelli widely separated, greater than distance to anterior ocellus; postocellar seta slender, 1/3 length of ocellar seta; 3 vertical setae, some nearly 1/2 length of ocellar seta; postocular setae in single marginal row; lower half of eye with 2–3 setae, overlapping eye. Antenna (Fig. 44) brown; length of scape slightly longer than height of eye with several short dorsal setae and 1 long seta beyond mid-length, and 1 long subapical ventral seta; pedicel somewhat paler, globular with setae confined to apical fringe. Postpedicel brown, clothed in short dense pruinescence, slightly shorter than length of labrum; base rectangular, nearly 1/2 length of apical portion; apical portion narrow, slightly tapered; stylus very short, bare, subequal to base of apical portion of postpedicel. Base of labrum lacking dorsal process; palpus yellow, cylindrical, 1/4th length of labrum, with sparse erect black setae; apex of palpus with long, stout posterior setae projecting obliquely. Prementum with row of erect, stout dorsal setae.

Thorax (Fig. 22): mesonotum and postnotum mostly brown; postpronotal lobe and surrounding area, notopleuron, pair of stripes bordering outer edge of acrostichals extending to suture, stripe at base of psut spal to postalar ridge yellow; pleura and laterotergite yellow; upper edge of anepisternum somewhat brownish; anterior basalare inflated but lacking process, subalar sclerite not modified. Acrostichals with anterior pair long and erect; biserial, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower short; 2 psut spal; 1 pal, short; 2 sctl; additional setulae on pprn and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 87): infuscate, pterostigma absent; 1 long basal costal seta; costal margin with straight erect costal setae beyond R_1; ventral margin of costa with fine erect setulae beyond R_1; posterior margin lacking incision and lobes; posterior setal margin unmodified, complete; pair of long setae on wing stem; base of wing stem with slender, sclerotized, shallow concave pocket. R_1 reaching costa before middle of wing; R_{2+3} greatly inflated, flattened from near base to opposite radial fork, then gradually to C; medial fork slightly proximal to radial fork; M_{1+2} absent, 3 veins emitted from discal cell; discal cell pentagonal-shaped; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 slightly sinuous, extending to wing margin. Halter knob brownish yellow.

Legs: coxae and femora yellow, remaining leg segments becoming darker. Fore coxa slightly longer than length of mid and hind coxae combined; anterior margin very sparsely setose, lacking swelling at mid-length; anterior, apical margin with 6 setae arranged in close line, longer than width of fore femur. Fore trochanter with 3 ventral setae. Fore femur inflated lower half of anterior and posterior faces bare, except for row of av and pv row of short setae, 2 slender apicoventral setae and 1 preapical dorsal seta. Fore tibia slightly shorter than femur; apex with anteroapical comb, not dilated. Tarsomere 1 nearly 1/2 length of fore tibia, with 1 stout ventral seta at base.

Remaining tarsomere unmodified, decreasing in length apically, except tarsomere 5; tarsomere 5 dorsoventrally flattened.

Mid coxa and femur lacking modified setae. Mid femur with pair of subapical ventral setae and 1 stout, subapical ad seta. Mid tibia subequal in length to femur, with 1 ad seta beyond middle and 1–2 pv setae in basal half; apex with fringe of 3–4 subapical setae, ventral seta longest. Tarsomere 1 less than 1/2 length of tibia, with short erect setae on pv margin; tarsomere 5 partially dorsoventrally flattened.

Hind coxa with 1 long lateral seta. Hind femur somewhat inflated, with pair of ventral subapical setae; basal half with ad row of erect setae; 1 dorsal subapical seta. Hind tibia longer than femur with 2 ad setae on apical half and 1 dorsal seta on apical 1/4; apex slightly dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral seta near base and 1 long posterior seta on basal 1/3 and several rows of erect short setae; tarsomere 5 slightly dorsoventrally flattened.

Abdomen: tergites 1–6 yellowish brown, with short posteromarginal setae; sternites pale yellow; sternites and tergites lacking modified setae and ridges; tergite 7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 subequal in length to preceding sternite, anterolateral margin not produced; T8 rectangular, 1/6 length of sternite, with lateral margin expanded; S8 with setae of similar length.

Terminalia (Fig. 132): hypandrium convex, posterior thinly sclerotized, apex divided into pair of wide, divergent processes, extending to apex of postgonites; gonocoxal apodemes slender, extending beyond hypandrium; postgonite divergent from hypandrium, apex folded and rounded, base fused to hypandrium and medially; apex of phallus arched anteriorly, erect, with rounded tip in lateral view. Epandrial lamella slightly tapered, with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; very short, subtriangular, apex curved medially; posterior margin with several setae. Cercus short, outer face well sclerotized, gradually tapered; expanded medially bearing fringe of stout setae, longer than width of expanded region; base expanded, bearing 3 lateral setae.

Female. Similar to male except as follows: lacking modifications of palpus and face; palpus brown, projecting obliquely; apical portion of postpedicel nearly twice length of base, slender and slightly tapered; stylus about 1/2 length of apical portion of postpedicel, second flagellomere 4X longer than wide, slightly shorter than third flagellomere. Thorax lacking modified anterior basalare; wing venation unmodified, median fork proximal to radial fork. Fore coxa with apical inner row of setae; fore femur slender, lacking distinct rows of ventral setae; mid tibia with 1 anterodorosal seta, 1 pd seta and 1 dorsal seta near middle; hind tibia with 2 stout pd setae on apical half. Abdominal tergites pale brown; pleural membrane greyish; apical segments retracted into segment 7; posterior margin of T7 with fringe of short setulae; lateral margin of S7 straight. Terminalia: Refer to description of *C. curvatus*.

Distribution. *Ceratomerus latinervis* is widespread on the South Island (Map 12).

Etymology. The specific name is derived from the Latin *latus* (broad) and *nervus* (tendon), referring to the broadly inflated vein R_{2+3}.

Ceratomerus latipalpus n. sp.

Map 13, Fig. 88

Type material. Holotype male, "NEW ZEALAND: WN/ Cloustonville/ Akatarawa Valley/ Fern Gully, creek/ 3–4.ii.1995, yellow/ pans, B.J. Sinclair"; "HOLOTYPE/ *Ceratomerus*/ *latipalpus*/ Sinclair [red label]" (NZAC).

Paratypes: New Zealand: **WN**—1 ♀, same data as holotype (NZAC).

Recognition. Males are distinguished from other species of this species-group by the long thin swelling of R_{2+3}, more than half length of vein, laterally flattened palpus and mostly yellow thorax.

Description. Wing length 3.5 mm.

Male. Head: round, dark brown, not shiny; face yellow and bare, slightly convergent, less than width of antennal sockets, with very small lobe on ventral margin; eye facets slightly enlarged anteriorly below antennae; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; posterior ocelli widely separated, greater than distance to anterior ocellus; postocellar seta slender, 1/2 length of ocellar seta; 3 vertical setae, 1/2 length of ocellar seta; upper postocular setae in single oblique row; 2 lower postocellars near eye margin. Antenna brown; length of scape slightly longer than height of eye, with several short dorsal setae and 1 long seta beyond

mid-length, 1 lateral seta in basal half, and 1 long subapical ventral seta; pedicel globular, somewhat paler than scape with setae confined to apical fringe. Postpedicel brown, clothed in short dense pruinescence, slightly longer than length of labrum; base rectangular, 1.5X length of apical portion, sharply attenuated; apical portion narrow, stylus-like, very slightly tapered; stylus very short, bare, shorter than base of apical portion of postpedicel. Base of labrum lacking dorsal process; palpus yellow, laterally flattened, 1/3 length of labrum with 3 groups of pd stout setae, lacking basal tuft of setae; base with 4–5 stout setae, shorter than width of palpus; middle with several short setae, less than half width of palpus and 2 spine-like setae longer than width of palpus; remaining margin of palpus with row of short setae terminating at tip with 1 spine-like seta, more than 1/2 length of palpus; base with 2 short lateral setae on lateral lobe; ventral setae lacking; prementum with row of erect, stout pd setae.

Thorax: mesonotum yellow, except for narrow, median stripe along acrostichals brown, expanded laterally on prescutellar depression; presutural supra-alar with short broad stripe posterior to seta; scutellum and postnotum brownish yellow; pleura yellow, except upper margin of anepisternum brown. Anterior basalare inflated with sickle-shaped process; subalar sclerite not visible. Acrostichals with anterior pair long and erect; uniserial, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower short; 2 psut spal; 1 pal, short; 2 sctl; additional setulae on pprn and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 88): infuscate, pterostigma absent; 1 basal costal seta; costal margin straight; erect costal setae beyond R_1; ventral margin of costa with fine erect setulae beyond R_1; posterior margin with slight concavity at M_4; posterior setal margin unmodified, complete; setae on wing stem unmodified; base of wing stem with oval, sclerotized, shallow concave pocket. R_1 reaching costa before middle of wing; R_{2+3} arched gradually to C, with long, narrow rectangular swelling for about 2/3 length of vein; medial fork strongly proximal to radial fork; medial fork petiolate, short; cell dm pentagonal-shaped, produced apically; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 slightly curved, arched subapically to wing margin. Halter yellowish brown.

Legs: coxae and femora mostly yellow, darker apically; remaining leg segments becoming darker. Fore coxa slightly longer than length of mid and hind coxae combined; anterior margin very sparsely setose, with slight basal swelling; anteroapical margin with comb of 5–6 long, tightly positioned setae, twice width of fore femur. Fore trochanter with 2 ventral setae. Fore femur somewhat inflated, with ventral flattening on basal fourth; anterior and posterior faces bare; pv margin with row of very short setae, biserial at base, outer row short, only slightly longer than inner row; pd row of stout appressed setae, increasingly stouter and longer apically; av row of fine short setae; 2 apicoventral setae and 1 preapical dorsal seta. Fore tibia shorter than femur; apex with anteroapical comb, partially dilated. Tarsomere 1 slightly sinuous, nearly 1/2 length of fore tibia, with bare, av preapical depression; basal 2/3 with av row of stout, comb-like curved setae, longer than width of tarsomere; apical half with pv row of slender setae; 1 erect, subapical ventral seta beyond depression, subequal to width of tarsomere. Tarsomere 2 shorter than tarsomere 3; anterior face with rows of spine-like setae, 1/2 width of tarsomere. Tarsomere 3 cylindrical, narrow; tarsomere 4 with anterior margin somewhat produced; tarsomere 5 dorsoventrally flattened.

Mid coxa and femur lacking modified setae. Mid femur with pair of ventral subapical setae and 1 stout, subapical anterior seta. Mid tibia subequal in length to femur, with 1 ad seta at middle and 1 short pd seta at basal third; apex with fringe of 3–4 subapical setae, ventral seta longest. Tarsomere 1 more than 1/2 length of tibia, with short erect setae on pv margin; tarsomere 5 dorsoventrally flattened.

Hind coxa with 1 long lateral seta. Hind femur somewhat inflated, with pair of ventral subapical setae; basal half with ad row of erect setae; 1 dorsal subapical seta. Hind tibia longer than femur with 3 evenly spaced ad setae; 1 dorsal seta on apical fourth; posterior face with long dense mat of setulae; apex slightly dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral seta near base, posterior seta with erect seta on basal third; tarsomere 5 dorsoventrally flattened.

Abdomen: tergites 1–6 pale, dark band on posterior margin, with short posteromarginal setae; sternites pale; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 shorter than preceding sternite, anterolateral margin not produced; T8 very slender; S8 with setae of similar length.

Terminalia (undissected): Surstylus not distinctly differentiated from epandrium; very short, subtriangular, apex curved medially; posterior margin with fringe of setae.

Female. Similar to male except as follows: lacking modifications of palpus; palpus brown, projecting obliquely; apical portion of postpedicel 1.5X longer than base, very slender and tapered; stylus 1/2 length of apical portion of postpedicel. Mesonotum lacking modified anterior basalare; median stripe wider, expanded on prescutellar depression to dc. Wing venation unmodified, median fork slightly proximal to radial fork; discal cell rectangular. Legs lacking modified setae; mid tibia with 1 anterodorosal and 1 pd seta near middle; hind tibia with stout setae. Abdominal tergites brown, darker on posterior margin, posteromarginal setae mid-sized; pleural membrane white; apical segments retracted into segment 7; posterior margin of T7 with fringe of short setulae; lateral margin of S7 straight. Terminalia (undissected): similar to *C. curvatus*.

Distribution. *Ceratomerus latipalpus* is known only from the type-locality near the southern tip of the North Island (WN) (Map 13).

Etymology. The specific name is derived from the Latin *latus* (broad) and *palpus*, referring to the broad male palpus.

***Ceratomerus ohakunensis* n. sp.**

Map 14, Figs. 45–48, 89, 133

Type material. Holotype male, "NEW ZEALAND: RI/ Tongariro NP, Ohakune/ Mangawhero R., 19-20./ ii.1995, Podocarp for./ yellow pans, B.J. Sinclair"; "HOLOTYPE/ *Ceratomerus*/ *ohakunensis*/ Sinclair [red label]" (NZAC).

Paratypes: New Zealand: **RI**—2 ♂, 2 ♀, same locality as holotype, swept, 19.ii.1995, BJS (NZAC); 10 ♂, 10 ♀, same data as holotype (NZAC). **TK—**3 ♂, 6 ♀, Mt. Egmont - Plateau, Enchanted Walk, streams, 3.ii.1995, BJS (CNC). **WN**—2 ♂, Rimutaka For. Pk., Catchpool Valley, stream + trail, 4–5.ii.1995, BJS (CNC); 8 ♂, 1 ♀, Cloustonville, Akatarawa R., YPT, 3–4.ii.1995, BJS (AMS); 1 ♂, 1 ♀, Cloustonville, Akatarawa Valley, Fern Gully, creek, YPT, 3–4.ii.1995, BJS (CNC).

Recognition. Males are very similar to *C. curvatus*, but R_{2+3} is gradually curved towards the costa and vein M is petiolate.

Description. Wing length 3.2–3.5 mm.

Male. Head: round, dark brown, not shiny; face yellow and bare, slightly convergent; ventral margin of face slightly less than width of antennal sockets, with very small, round fleshy lobe on ventral margin; eye facets slightly enlarged anteriorly below antennae; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; posterior ocelli widely separated, greater than distance to anterior ocellus; postocellar setae slender, 1/2 length of ocellar seta; 3 vertical setae, 2/3 length of ocellar seta; upper postocular setae in single oblique row; 2–3 stout lower postocellars near eye margin. Antenna (Fig. 45) brown; length of scape subequal to height of eye, with several dorsal setae and 1 longer seta on distal half, 1 lateral seta in basal half, and 1 long subapical ventral seta; pedicel somewhat paler, globular, with setae confined to apical fringe. Postpedicel brown, clothed in short dense pruinescence, slightly longer than length of labrum; base rectangular, 1.6X length of apical portion, sharply attenuated; apical portion narrow, slightly tapered; apical stylus very short, bare shorter than base of apical portion of postpedicel. Base of labrum lacking dorsal process; palpus yellow, laterally flattened, 1/3 length of labrum with 3 groups of pd stout setae, lacking basal tuft of setae; base with 4–5 stout setae, shorter than width of palpus; middle with several short setae, less than half width of palpus and 2 spine-like setae, longer than width of palpus; remaining margin of palpus with row of 3–5 short setae terminating at tip with 1 spine-like seta, 2/3 length of palpus; base with 2 short lateral seta on short lateral lobe; ventral setae lacking; prementum with rows of erect stout pd and pv setae.

Thorax (Figs. 47, 48) mesonotum and postnotum mostly brown, except postpronotal lobe and surrounding area, notopleuron extending onto suture, pair of stripes bordering outer edge of acrostichals extending to or short of second dc, stripe from first to second psut spal, and postalar ridge yellow; pleura and laterotergite yellow; anterior basalare inflated with sickle-shaped process, apex brownish yellow; subalar sclerite produced into short narrow lobe. Acrostichals with anterior pair long and erect; biserial, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower short; 2 psut spal; 1 pal, short; 2 sctl; additional setulae on pprn and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 89): infuscate, pterostigma absent; 1 short basal costal seta; costal margin straight; erect costal setae beyond R_1; ventral margin of costa with fine erect setulae beyond R_1; posterior margin with slight concavity at

apex of M_4; posterior setal margin unmodified, complete; setae on wing stem unmodified; base of wing stem with oval, sclerotized, shallow concave pocket. R_1 reaching costa before middle of wing; R_{2+3} gradually arched to C, lacking swelling; radial fork slightly proximal or opposite to medial fork; M_{1+2} on short petiole; cell dm pentagonal-shaped, produced apically; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 slightly sinuous to wing margin. Halter knob pale brown.

Legs (Fig. 46): coxae yellow; femora yellowish beneath, apex brown; remaining leg segments becoming darker. Fore coxa slightly longer than length of mid and hind coxae combined; anterior margin very sparsely setose, base somewhat inflated; anteroapical margin with comb of 4–5 long tightly positioned setae, twice width of fore femur. Fore trochanter with 2–3 stout ventral setae. Fore femur inflated on basal fourth, creating slight bend; anterior and posterior faces bare; pv margin with row of short setae, quite reduced near middle base with pv row of 5 spine-like setae, nearly subequal to width of femur; pd row becoming more stout and longer apically, subapical setae directed apically; av row of fine short setae, increasing in length apically, biserial at base; 2 apicoventral setae and 1 preapical dorsal seta. Fore tibia subequal in length to femur; apex with anteroapical comb, partially dilated. Tarsomere 1 about 2/3 length of fore tibia, sinuous with 1 outstanding ventral spine-like seta at base; basal half with anteroventral row of stout curved setae, apical half bare except for short, stout preapical seta; pv row of setae, longer than width of tarsomere, becoming stouter apically. Tarsomere 2 shorter than tarsomere 3; anterior face with rows of spine-like setae, 1/2 width of tarsomere. Tarsomere 3 cylindrical, narrow and slightly curved anteriorly. Tarsomere 4 with dorsal margin slightly enlarged; tarsomere 5 dorsoventrally flattened.

Mid coxa and femur lacking modified setae. Mid femur with pair of ventral subapical setae and 1 preapical anterior seta. Mid tibia subequal in length to femur, with 1 ad seta at middle and 2 pd setae; apex with fringe of 3–4 subapical setae, ventral seta longest. Tarsomere 1 slightly more than 1/2 length of tibia, with short erect setae on pv margin; tarsomere 5 partially dorsoventrally flattened.

Hind coxa with 1 long lateral seta. Hind femur somewhat inflated, with pair of ventral subapical setae; basal half with ad row of erect setae; 1 dorsal subapical seta. Hind tibia longer than femur with 2 ad and 2 dorsal setae on apical half; posterior face with long dense mat of setulae; apex slightly dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral seta near base and 1 long posterior seta on basal third and several rows of erect short setae; tarsomere 5 slightly dorsoventrally flattened.

Abdomen: tergites 1–6 brown, with short posteromarginal setae; sternites pale yellow; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 shorter than preceding sternite, anterolateral margin not produced; T8 rectangular, 1/6 length of sternite, with lateral margin expanded; S8 with setae of similar length.

Terminalia (Fig. 133): hypandrium convex, thinly sclerotized apically, apex divided into pair of wide processes, extending to apex of postgonites; gonocoxal apodemes short and slender; postgonite divergent from hypandrium, apex folded and rounded, base fused to hypandrium and medially; apex of phallus arched anteriorly, erect with expanded tip in lateral view, lacking lateral membranous sac. Epandrial lamella narrowed apically, with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; very short, subtriangular, apex curved medially; posterior margin with sparse fringe of setae. Cercus short, lateral and posterior faces well sclerotized, gradually tapered from expanded middle; base of cercus broad, bearing 3 setae; apex expanded medially bearing fringe of stout setae, longer than width of expanded region.

Female. Similar to male except as follows: lacking modifications of palpus; palpus brown, projecting obliquely; apical portion of postpedicel 1.5X longer than base, very slender and tapered; stylus 1/2 length of apical portion of postpedicel. Mesonotum lacking modified anterior basalare; wing venation unmodified, median fork proximal to radial fork; discal cell rectangular. Legs lacking modified setae; tarsomere 1 of foreleg with basoventral seta; mid tibia with 1 ad and 1 pd seta near middle; hind tibia with stout setae. Abdominal tergites brown, posteromarginal setae mid-sized; pleural membrane white; apical segments retracted into segment 7; posterior margin of T7 with fringe of short setulae; lateral margin of S7 straight. Terminalia: very similar to *C. curvatus*.

Distribution. *Ceratomerus ohakunensis* is known only from the central and southern North Island (Map 14).

Etymology. The specific name is derived from the type-locality.

***Ceratomerus tonnoiri* n. sp.**
Map 15, Fig. 90

Type material. Holotype male, "Mt Arthur Tl [41°10′S 172°38′E]/ 27 Dec.1921/ A. Tonnoir/ 4500 ft"; "HOLOTYPE/ *Ceratomerus*/ *tonnoiri*/ Sinclair [red label]" (NZAC).

Recognition. Males are distinguished from other species of this species-group by the long rectangular basal swelling of R_{2+3}, less than half length of vein and laterally flattened palpus.

Description. Wing length 3.5 mm.

Male. Head: round, dark brown, not shiny; face yellow and bare, slightly convergent, subequal to width of antennal sockets; fleshy lobe of lawer face not visible; eye facets slightly enlarged anteriorly below antennae; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; posterior ocelli widely separated, greater than distance to anterior ocellus; postocellar seta slender, 1/2 length of ocellar seta; 3 vertical setae, 1/2 length of ocellar seta; upper postocular setae in single oblique row; 2–3 lower postocellars near eye margin. Antenna brown; length of scape slightly longer than height of eye, with several short dorsal setae and 1 long seta beyond mid-length, 1 lateral seta in basal half, and 1 long subapical ventral seta; pedicel globular with setae confined to apical fringe. Postpedicel brown, clothed in short dense pruinescence, slightly longer than length of labrum; base rectangular, 1/2 length of apical portion, sharply attenuated; apical portion narrow, very slightly tapered; stylus very short, bare, shorter than base of apical portion of postpedicel. Base of labrum lacking dorsal process; palpus yellow, laterally flattened, 1/3 length of labrum with 3 groups of pd stout setae, lacking basal tuft of setae; base with 4–5 stout setae, shorter than width of palpus; middle with several short setae, less than half width of palpus in tight cluster and 1 spine-like seta longer than width of palpus; remaining margin of palpus with row of short setae terminating at tip with 1 spine-like seta, longer than width of palpus; base with 2 short lateral setae on lateral lobe; ventral setae lacking; prementum with row of erect, stout pd setae.

Thorax: mesonotum and postnotum mostly brown, except postpronotal lobe and surrounding area, notopleuron, pair of stripes bordering outer edge of acrostichals extending to second dc, stripe from first to second psut spal, and postalar ridge yellow; pleura and laterotergite yellow; anterior basalare inflated with sickle-shaped process; subalar sclerite not modified. Acrostichals with anterior pair long and erect; biserial, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower short; 2 psut spal; 1 pal, short; 2 sctl; additional setulae on pprn and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 90): infuscate, pterostigma absent; 1 short basal costal seta; costal margin straight; erect costal setae beyond R_1; ventral margin of costa with fine, erect setulae beyond R_1; posterior margin with slight concavity at M_4; posterior setal margin unmodified, complete; setae on wing stem unmodified; base of wing stem with oval, sclerotized, shallow concave pocket. R_1 reaching costa before middle of wing; R_{2+3} arched gradually to C, with long rectangular swelling on basal half, subequal to 1/3 length of vein; medial fork slightly proximal to radial fork; medial fork petiolate, short; cell dm pentagonal-shaped, produced apically; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 slightly curved, arched subapically to wing margin. Halter lost in holotype.

Legs: coxae yellow; femora yellowish beneath, dorsum brown; remaining leg segments becoming darker. Fore coxa slightly longer than length of mid and hind coxae combined; anterior margin very sparsely setose, with slight basal swelling; anteroapical margin with comb of 5–6 long tightly positioned setae, twice width of fore femur. Fore trochanter with 2 ventral setae. Fore femur partially inflated on basal fourth, creating slight bend; anterior and posterior faces bare; pv margin with row of short setae, biserial at base, outer row nearly equal to width of femur; pd row of stout appressed setae, increasingly stouter and longer apically; av row of fine short setae, decreasing in length apically, basal setae longer and stouter; 2 apicoventral setae and 1 preapical dorsal seta. Fore tibia shorter than femur; apex with anteroapical comb, partially dilated. Tarsomere 1 sinuous, nearly 1/2 length of fore tibia, with bare, av preapical depression; 1 outstanding ventral spine-like seta at base, nearly twice width of tibia; basal 2/3 with av row of stout, comb-like curved setae, longer than width of tarsomere; apical half with pv row of slender setae; 1 erect, subapical ventral seta beyond depression, subequal to width of tarsomere. Tarsomere 2 shorter than tarsomere 3; anterior face with rows of spine-like setae, 1/2 width of tarsomere. Tarsomere 3 cylindrical, narrow; tarsomere 4 with anterior margin somewhat produced; tarsomere 5 dorsoventrally flattened.

Mid coxa and femur lacking modified setae. Mid femur with pair of ventral subapical setae and 1 stout, subapical anterior seta. Mid tibia subequal in length to femur, with 1 ad seta at middle and 2 short pv setae at apical

third; apex with fringe of 3–4 subapical setae, ventral seta longest. Tarsomere 1 less than 1/2 length of tibia, with short erect setae on pv margin; tarsomere 5 dorsoventrally flattened.

Hind coxa with 1 long lateral seta. Hind femur somewhat inflated, with pair of ventral subapical setae; basal half with ad row of erect setae; 1 dorsal subapical seta. Hind tibia longer than femur with 2 ad setae on apical half and 1 dorsal seta on apical fourth; posterior face with long dense mat of setulae; apex slightly dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral seta near base, posterior seta apparently absent; tarsomere 5 dorsoventrally flattened.

Abdomen: tergites 1–6 brown, with short posteromarginal setae; sternites pale; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S8 with setae of similar length.

Terminalia (undissected): Surstylus not distinctly differentiated from epandrium; very short, subtriangular, apex curved medially; posterior margin with fringe of setae.

Female. Unknown.

Distribution. *Ceratomerus tonnoiri* is known only from the type-locality on the Mt. Arthur Tablelands (NN, South Island).

Etymology. The specific name is a patronym in honour of the late A.L. Tonnoir, whose collections remain extremely valuable today.

***Ceratomerus wardi* n. sp.**

Map 16, Figs. 23, 91, 134

Type material. Holotype male, "NEW ZEALAND: MC/ Upper Craigie Burn/ 1200m, U.V.-lights/ 21.i.1992/ J.B. Ward, leg."; "HOLOTYPE/ *Ceratomerus*/ *wardi*/ Sinclair [red label]" (CMNZ).

Paratypes: New Zealand: **FD**—2 ♂, Borland Valley, 309 m, 45°46′09″S 167°31′15″E, 11.iii.2010, L. Masner (CNC); 19 ♂, 2 ♀, Waiau R. small tribs, 21.ii.1996, JBW (CMNZ, CNC). **MC**—4 ♂, 1 ♀, same data as holotype (CMNZ). **MC**—1 ♂, Craigieburn Valley, Camp Saddle, 1250 m, 23.i.1992, UV, JBW (CMNZ); 6 ♂, 4 ♀, Mount Hutt, 43°31'S 171°33'E, 1300 m, 19.i.2001, epilobium in creek, pan trap, R.P. Macfarlane (CMNZ). **SI**—1 ♂, Stewart Is, Christmas Village Hut, D48 21261 53729, 16–17.i.2000, 15 m, Ward, Edwards, Beaven (CMNZ). **SL** – 2 ♂, Waimumu Str., Dolamore Pk, 190 m, F45 21872 5428, 23.i.2000, UV, J.B. & G.M. Ward (CMNZ). **WN**—1 ♀, same data as holotype (NZAC).

Recognition. Males are distinguished from species related to *C. curvatus* by uniform spine-like setae of the palpus (without long, stout setae at apex and at midlength), R_{2+3} straight, M_4 emitted from cell dm beyond distal half of cell.

Description. Wing length 2.9–3.2 mm.

Male. Head (Fig. 23): round, dark brown, not shiny; face yellow and bare, slightly convergent, ventral margin of face slightly less than width of antennal sockets, with very small, round fleshy lobe on ventral margin; eye facets slightly enlarged anteriorly below antennae; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; posterior ocelli widely separated, greater than distance to anterior ocellus; postocellar setae slender, 1/2 length of ocellar seta; 3 vertical setae 2/3 length of ocellar seta; upper postocular setae in single oblique row; 2–3 stout lower postocellars near eye margin. Antenna brown; length of scape subequal to height of eye, with several dorsal setae and 1 longer seta at mid-length, several lateral setae and 1 long subapical ventral seta; pedicel somewhat paler, globular, with setae confined to apical fringe. Postpedicel brown, clothed in short, dense pruinescence, slightly longer than length of labrum; base rectangular, shorter than apical portion, sharply attenuated; apical portion narrow, slightly tapered; apical stylus very short, bare, shorter than base of apical portion of postpedicel. Base of labrum lacking dorsal process; palpus yellow, laterally flattened, less than 1/2 length of labrum with row of equal-lengthed marginal setae; lacking basal tuft of setae; base with 1 spine-like lateral seta; prementum with rows of erect, stout pd and pv setae.

Thorax (Fig. 23) mesonotum and postnotum mostly brown, except postpronotal lobe and surrounding area, notopleuron extending onto suture yellowish brown; base of acr and dc rows darker; pleura and laterotergite yellow; anterior basalare inflated with sickle-shaped process, apex brownish yellow; subalar sclerite produced into short, narrow lobe. Acrostichals with anterior pair long and erect; biserial, ending at prescutellar depression and

directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower short; 2 psut spal; 1 pal, short; 2 sctl; additional setulae on pprn and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 91): infuscate, pterostigma absent; 1 short basal costal seta; costal margin straight; erect costal setae beyond R_1; ventral margin of costa with fine, erect setulae beyond R_1; posterior margin with slight concavity at apex of M_4; posterior setal margin unmodified, complete; setae on wing stem unmodified; base of wing stem with oval, sclerotized, shallow, concave pocket. R_1 reaching costa before middle of wing; R_{2+3} gradually arched to C, lacking swelling; radial fork slightly proximal or opposite to medial fork; M_{1+2} on short petiole, shorter than m-m crossvein; cell dm pentagonal-shaped, produced apically; crossvein m-m sinuous; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 arched to wing margin. Halter knob pale brown.

Legs: coxae yellow; femora yellowish beneath, apex brown; remaining leg segments becoming darker. Fore coxa slightly longer than length of mid and hind coxae combined; anterior margin very sparsely setose, base somewhat inflated; anteroapical margin with comb of 3–4 long tightly positioned setae, twice width of fore femur. Fore trochanter with 2–3 ventral setae. Fore femur not inflated basally; anterior and posterior faces bare, with av and pv rows of short setae, increasing in length apically, biserial basally with stout and longer setae; pd row of setae stouter and longer at apex, subapical setae directed apically; 1 preapical dorsal seta. Fore tibia slightly shorter than femur; apex with anteroapical comb, partially dilated; ventrum with biserial row of fine setae. Tarsomere 1 about 2/3 length of fore tibia, sinuous, with pv row of spine-like setae, longer than width of tarsomere. Tarsomere 2 shorter than 2/3 length of tarsomere 3; anterior face with rows of spine-like setae, subequal to width of tarsomere. Tarsomere 3 cylindrical, narrow, straight. Tarsomere 4 with dorsal margin slightly enlarged; tarsomere 5 dorsoventrally flattened.

Mid coxa and femur lacking modified setae. Mid femur with pair of ventral subapical setae and 1 preapical anterior seta. Mid tibia subequal in length to femur, with 1 basal pd seta and 2 pv and 2 av short setae on apical half; apex with fringe of 3–4 subapical setae, ventral seta longest. Tarsomere 1 slightly more than 1/2 length of tibia, with short basal setae and several pv setae; tarsomere 5 partially dorsoventrally flattened.

Hind coxa with 1 long, lateral seta. Hind femur somewhat inflated, with pair of ventral subapical setae; basal half with ad row of erect setae; 1 ad subapical seta. Hind tibia longer than femur with 2 ad and 1 dorsal seta on apical half; posterior face with long, dense mat of setulae; apex slightly dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long, erect ventral seta near base, 1 posterior seta on basal third and several erect short ventral setae; tarsomere 5 slightly dorsoventrally flattened.

Abdomen: tergites 1–6 brown, with short posteromarginal setae; sternites pale yellow; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 shorter than preceding sternite, anterolateral margin not produced; T8 rectangular, with lateral margin expanded; S8 with setae of similar length.

Terminalia (Fig. 134): hypandrium convex, thinly sclerotized apically, apex divided into pair of wide processes, extending to apex of postgonites; gonocoxal apodemes short, narrow; postgonite divergent from hypandrium, apex strongly bent and rounded, base fused to hypandrium and medially; apex of phallus arched anteriorly, erect, with expanded tip in lateral view with basal membranous sac. Epandrial lamella narrowed apically, with broad bacilliform sclerites, bearing pair of setulae; subepandrial sclerite expanded posteriorly, bearing several setae, lacking process. Surstylus not distinctly differentiated from epandrium; very short, subtriangular, apex curved medially; posterior margin with long setae. Cercus short, lateral and posterior faces well sclerotized, gradually tapered; base of cercus broad, bearing several setae; apex with numerous short medial setae.

Female. Similar to male except as follows: lacking modifications of palpus; palpus brown, projecting obliquely; apical portion of postpedicel 1.5X longer than base, very slender and tapered; stylus 1/2 length of apical portion of postpedicel. Mesonotum lacking modified anterior basalare; wing venation unmodified, median fork aligned with radial fork; cell dm rectangular. Legs lacking modified setae; first tarsomere of foreleg with basoventral seta. Abdominal tergites brown, posteromarginal setae mid-sized; pleural membrane dark; apical segments retracted into segment 7; posterior margin of T7 with fringe of short setulae; lateral margin of S7 straight. Terminalia: not dissected.

Distribution. *Ceratomerus wardi* is known from the southern portion of the South Island (Map 16).

Etymology. The specific name is in honour of the late J.B. Ward who contributed vast numbers of stream-side ceratomerines for this study captured during his surveys of Trichoptera.

Ceratomerus dorsatus species-group

This species-group includes four described New Zealand species and is characterized by the following combination of characters: pterostigma present, elongate; unmodified male legs, palpi and wings; proboscis very long and slender; prementum very long and slender; labellum small; ventral pubescence of empodium reduced; surstylus with posterior fringe of setae and hooked tip; globular male terminalia in some species.

It is assumed that species of this group are primarily terrestrial, with most records from forested regions. This group [referred to as the *C. virgatus* group in Sinclair (2003)] was resolved as the sister group to the Chilean species, *C. deansi* Plant (Sinclair 2010).

Ceratomerus aquilonius n. sp.

Map 17, Figs. 92, 135, 136

Type material. Holotype male, "NEW ZEALAND. ND:/ Waipoua For. Pk. Kauri/ for., upper Waikohatu Str., 31.i.-1.ii.1995/ yellow pans, BJ Sinclair"; "HOLOTYPE/ *Ceratomerus*/ *aquilonius*/ Sinclair [red label]" (NZAC).

Paratypes: New Zealand: **AK**—2 ♂, 1 ♀, Nihotupu [36°56′S 174°35′E], 23.ii.1923, A. Tonnoir (ANIC). **CL**—1 ♂, Little Barrier Is., Kauri Gulley, 24.xi.1954, R.A. Harrison (NZAC); 2 ♂, Little Barrier Is., Parihakoakoa Str., 24.xi.1954, K.A.J. Wise (NZAC); 3 ♂, Rd. E. of Tapu, creek, 3.xii.1989, DJB (AMS).

Recognition. This species is distinguished from other species of the *C. dorsatus* group by its small size, darkly coloured thorax with broad pale band from posterior spiracle across upper katepisternum, and darkly coloured fore and midlegs.

Description. Wing length 2.5–3.0 mm.

Male. Head: dark brown, not shiny; face narrow, parallel-sided, less than width of antennal sockets; face light brown, lacking setulae; anterior eye facets below antennae slightly enlarged; ocellar triangle with 2 divergent setae, inserted between posterior ocellus; postocellar seta slender, 1/2 length of ocellar seta; 2 vertical setae shorter than ocellar seta; postocular setae erect and short. Antenna with length of scape slightly shorter than height of eye with short dorsal seta, 1 long ventral seta; pedicel globular with setae confined to apical fringe. Postpedicel long, covered by short dense pruinescence, length more than 1.5X longer than scape, or 2/3 length of labrum; basal half rectangular; apical half gradually tapered; two-segmented arista-like stylus short, 1/4 length of postpedicel; stylus concolourous with remaining segments. Base of labrum lacking dorsal process; proboscis very long, slender, longer than fore femur; palpus brown, slender, 1/5 length of labrum with several dark setae; prementum with short setae only.

Thorax: brown, dull, except pale postalar ridge; pleura brown with broad pale band from posterior spiracle across upper half of katepisternum. Acrostichals biserial, ending at prescutellar depression and directed posteriorly; 5 dc, increasing in length posteriorly with posterior setae long and stout; first dc incurved and offset from line of others; 1 pprn; 1 presut spal; 2 npl; 2 psut spal; 1 pal; 2 sctl; additional setulae interspersed among pprn, npl, dc and presut spal. Antepronotum with pair of long setae.

Wing (Fig. 92): infuscate, membrane with dense microtrichia; pterostigma dark, at middle of cell r_1; 1 long basal costal seta; costal margin with unmodified setulae; posterior margin lacking incision; posterior setal margin complete, setae on wing stem undifferentiated. R_1 reaching costa before middle of wing; R_{2+3} straight, arching smoothly to C; medial fork basal to radial fork; cell dm rectangular, slender; auxiliary cross-vein between R_{2+3} and R_4 lacking. Halter with pale base and dark knob.

Legs: fore and hind coxae pale, mid coxa dark; fore and mid femora pale near base, remaining segments dark; hind femur pale with apical third dark, remaining segments dark. Fore coxa slightly shorter than mid and hind coxae combined. Fore femur not more swollen than other femora with ventral row of stout setae on basal half; av and pv row of short slender setae present; 1 short preapical dorsal seta. Fore tibia slightly shorter than femur; apex with anteroapical comb, not dilated; lacking preapical setae. Tarsomere 1 3/4 length of fore tibia with erect ventral setae; all tarsomeres slender.

Mid coxa lacking modified seta. Mid femur slender, lacking modified ventral setae; apex with fringe of long setae. Mid tibia with 4 dorsal and 4 pd setae widely spaced; 1 pv seta. Tarsomere 1 subequal in length to remaining 4 tarsomeres with biserial row of erect ventral setae.

Hind coxa with long pv seta. Hind femur more swollen than other femora with apical fringe of setae. Hind tibia with 4 ad and 4 dorsal setae widely spaced; posterobasal half with long dense mat of setulae; posterior face

lacking mat of erect setulae; apex partially dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 2 long erect ventral setae near base and several short setae scattered beneath.

Abdomen: all sclerites dark; posteromarginal setae 2/3 length of sclerite; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, posteromarginal setae confined to lateral margin; S7 subequal in length to preceding sternite, anterolateral margin not produced; T8 U-shaped, one-half length of sternite.

Terminalia (Figs. 135, 136): hypandrium convex, with short apical extension; gonocoxal apodemes rounded, not projecting; postgonites divergent, arising from margin of hypandrium (not articulated) and fused apically with lateral divergent processes of phallus; phallus projecting perpendicularly from hypandrium with pair of lateral, divergent subapical processes. Epandrial lamella rounded with triangular lateral process (sometimes reduced to short projection), bearing setulae on inner margin; broad bacilliform sclerite present; subepandrial sclerite lacking lobes. Surstylus straight, slender with hooked tip; posterior margin with fringe of setae. Cercus long, finger-like with long setae on inner margin.

Female. Similar to male except as follows: lacking modified setae on fore femur and posterobasal mat of setulae on hind tibia; mid tibia with apical av and pv seta. Terminalia: undissected.

Distribution. This species is confined to the northern portion of the North Island (Map 17).

Etymology. The specific name is derived from the Latin *aquilonius* (northern), referring to the northern distribution of this species in New Zealand.

Ceratomerus biseriatus **Plant**

Map 18, Fig. 137

Ceratomerus biseriatus Plant, 1991: 1319. Other references: Yang *et al*., 2007: 48 (catalogue); Macfarlane *et al*., 2010: 445 (New Zealand biodiversity).

Type material. Holotype male, "NEW ZEALAND. N.Is.:/ TO: Mt Pureora/ 38º32′S 174º55′E/ swept Forest vegetation/ 800-1000 m a.s.l./ 29.xii.1986. A.R. Plant"; "HOLOTYPE/ Ceratomerus/ biseratus/ Plant [red label]" (NZAC).

Paratypes: New Zealand: **TO**—1 ♂, 1 ♀, same data as holotype (NMW, NZAC) [specimen in NZAC male, not female as listed in Plant (1991)].

Recognition. Distinguished from other species of the *C. dorsatus* group by the broad dorsal band on the pleura, largely dark mesoscutum (prescutellar depression, line of dorsocentrals and lateral margins yellow), and dark hind tibia.

Re-description. Wing length 4.5 mm.

Male. Head: dark brown, not shiny; face narrow, parallel-sided, less than width of antennal sockets; face with pale pruinescence, lacking setulae; anterior eye facets below antennae slightly enlarged; ocellar triangle with 2 long divergent setae, inserted between posterior ocellus; postocellar seta slender, 1/3 length of ocellar seta; 2 vertical setae, outer longer than ocellar seta; postocular setae erect short, stout. Antenna with length of scape 2/3 height of eye with short dorsal setae, 1 long ventral seta; pedicel globular with setae confined to apical fringe. Postpedicel long, covered by short dense pruinescence, length nearly 2X longer than scape, or less than 1/2 length of labrum; basal half rectangular; apical half gradually tapered; two-segmented arista-like stylus short, 1/5 length of postpedicel; stylus concolourous with remaining postpedicel. Base of labrum lacking dorsal process; proboscis very long, slender, longer than fore femur; palpus yellow, slender, 1/7 length of labrum with several dark setae; prementum with short setae only.

Thorax: yellow, dorsum shiny except prescutellar depression, along line dorsocentrals and scutellum; scutum dark except for broad yellow prescutellar stripe from scutellum to penultimate acrostichals, line of dorsocentrals joining pale lateral margins including postpronotal lobe and postalar ridge; scutellum brown, lateral margins pale; postnotum dark medially, dark laterally; laterotergite yellow; pleura bright yellow, dorsal margin with broad dark band from ventral margin of postpronotal lobe to posterior spiracle. Acrostichals biserial, ending at prescutellar depression and directed posteriorly; 5 dc, increasing in length posteriorly with posterior setae long and stout; first dc incurved and offset from line of others; 1 pprn; 1 presut spal; 2 npl; 1 long psut spal; 1 pal; 2 sctl; additional setulae interspersed among pprn, npl, dc, and presut spal. Antepronotum with pair of long setae.

Wing: Infuscate, membrane with dense microtrichia; pterostigma dark, at middle of cell r_1; 1 long basal costal seta; costal margin with unmodified setulae; posterior margin lacking incision; posterior setal margin complete, setae on wing stem undifferentiated. R_1 reaching costa before middle of wing; R_{2+3} slightly divergent from costa, arching smoothly to C; medial fork basal to radial fork; cell dm rectangular, slender; auxiliary cross-vein between R_{2+3} and R_4 lacking. Halter yellow, with white knob.

Legs: fore and midlegs yellow, except apical 2–3 tarsomeres; hind femur and basal half of tarsomere 1 yellow; apex of hind femur, tibia and remaining tarsomeres dark. Fore coxa subequal in length to mid and hind coxae combined. Fore femur not more swollen than other femora with pv row of short dark setae, increasing in length apically; 1 preapical dorsal seta. Fore tibia slightly shorter than femur; apex with anteroapical comb, not dilated, 2 preapical ad and pd setae. Tarsomere 1 more than 2/3 length of fore tibia with pair of ventrobasal setae; all tarsomeres slender.

Mid coxa lacking modified seta. Mid femur somewhat swollen with pv row of short dark setae with 4 long setae intermixed; long setae greater than width of femur; ventral surface with 2–3 rows of short dark setae beneath; lower half of posterior margin bare. Mid tibia with 4 dorsal and 3 pd setae widely spaced; 1 pv seta. Tarsomere 1 subequal in length to remaining 4 tarsomeres with several erect ventral setae.

Hind coxa with unmodified setae. Hind femur more swollen than other femora with pair of ventroapical setae. Hind tibia with 5 ad and 5 dorsal setae widely spaced; posterior face lacking mat of setulae; apex partially dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 2 long erect ventral setae near base and several short setae scattered beneath.

Abdomen: tergite of segments 1–7 dark with yellow anterior margin and pv corner; sternites yellow; posteromarginal setae 2/3 length of sclerite; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 3/4 as long as preceding sternite, anterolateral margin not produced; T8 rectangular, 1/2 length of sternite.

Terminalia (Fig. 137): hypandrium convex, lacking apical extension; gonocoxal apodemes large, projecting anteriorly beyond terminalia; postgonites arising from margin of hypandrium (not articulated) and fused apically with lateral divergent processes of phallus; phallus projecting obliquely anteriorly, with pair of lateral, divergent subapical processes. Epandrial lamella enlarged, round with slender bacilliform sclerites; subepandrial sclerite heavily sclerotized, arching apically towards cercus with forked tip; inner margin with pair of thinly sclerotized flaps near base, bearing apical setulae. Surstylus sickle-shaped, slender, with hooked tip; posterior margin with fringe of setae. Cercus long, slender with cluster of posteroapical setae; posterior wall of cercus well sclerotized, fused basally with lateral process of subepandrial sclerite.

Female. Not examined. Refer to Plant (1991, fig. 3A).

Distribution. *Ceratomerus biseriatus* is known only from the type-locality in the central North Island (TO) (Map 18).

Remarks. The illustration of the male terminalia of this species by Plant (1991, fig. 2F) was based on a non-macerated specimen.

Ceratomerus dorsatus **Collin**

Map 19, Figs. 1, 11, 93, 138–141

Ceratomerus dorsatus Collin, 1928: 19. Other references: Malloch 1931: 428 (new locality); Miller, 1950: 79 (New Zealand catalogue); Smith, 1989: 387 (catalogue); Plant, 1991: 1321 (revision); Pont, 1995: 63 (type catalogue); Yang *et al*., 2007: 49 (catalogue); Sinclair, 2010: 222 (phylogeny); Macfarlane *et al*., 2010: 445 (New Zealand biodiversity).

Type material. Holotype female, “Type/ ♀ [red bordered circle]”; “Ceratomerus/ dorsatus, Collin/ TYPE ♀ [hand written]”; “Ceratomerus/ dorsatus/ ♀ [hand written, orange circle]”; “New Zealand:/ Ohakune./ 1–14.xii.1922./ T.R. Harris./ B.M. 1923--104.” (BMNH).

Additional material. New Zealand: **BR**—2 ♀, Nelson Lakes NP, Lk Rotoroa, Braeburn Tr., *Nothofagus* for., 7.ii.1995 (CNC); 1 ♀, Nelson Lakes NP, Mt. St. Arnaud Ra., 3.ii.1972 (LUNZ); 1 ♀, Lk Rotoroa, 13–20.i.1928 (ANIC); 1 ♂, Rt.7, Lewis Pass NP, Wee Ck., 31.xii.1986 (USNM); 1 ♀, Lewis Pass, 500 m, sweeping bushes, 19.i.1976 (NZAC). **FD**—2 ♀, Fiordland NP, S Borland V, 730 m, 2–6.ii.1982 (LUNZ). **MC**—1 ♂, Banks Peninsula, Armstrong Scenic Res., survey, 6.ii.1981, for. understorey (CMNZ); 1 ♂, Banks Peninsula, Otepatotu Scenic Res., 11.i.1974 (CNC); 1 ♂, 6 ♀, Banks Peninsula, Hinewai Res., Quiet Ck, MT, 13.ii.-7.iii.1994, 12.i.2001

(CMNZ). **NC**—1 ♀, Arthur's Pass, 900 m, 31.xii.1983 (CNC). **NN**—5 ♀, Dun Mt. [41°21'S 173°22'E], 3000 ft., 5–7.i.1922 (ANIC); 1 ♀, 950 m, NW Nelson For. Pk, Mt. Arthur Tablelands, ex blossoms, 17.ii.1995 (CNC); 1 ♂, Mt. Arthur Tableland, i.1924 (ANIC); 1 ♀, same locality, 15.ii.1946 (NZAC); 1 ♀, same locality [41°10′S 172°38′E], 4000 ft., 24.xii.1921 (ANIC); 1 ♀, Nelson, x.1922 (ANIC). **OL**—4 ♀, East Matukituki Valley, MT, forest edge, 31.i.-4.ii.1987 (NZAC) [incl. 3 paratypes of *C. flavus*]. **SI**—1 ♀, Christmas Village Hut, D48 21261 53729, 16–17.i.2000, 15 m (CMNZ). **SL**—1 ♀, Tahakopa Bay Scenic R., G47 2210 54000, 10.i.2000, 10 m (CMNZ). **TK**—1 ♀, Taranaki NP, Pembroke Rd, 1200 m, 9.i.1999 (DEBG). **WD**—1 ♀, Lk. Paringa, 6–10.xii.1960 (NZAC); 1 ♀, Okuku Scenic Res., 9.i.1982 (LUNZ); 2 ♀, Otira [41°51′S 171°35′E], 6,9.ii.1922 (ANIC); 4 ♀, Waiho [43°20′S 170°07′E], 18.i.1922 (ANIC); 1 ♀, Westland NP, Lk. Wombat Tr., 180–240 m, 11.i.1981, swept ferns (LUNZ); 1 ♀, Westland NP, Canavan's Knob, 195 m, 10.i.1982 (LUNZ). **WN**—1 ♀, Tararua Ra., E. Pukemoremore, 750–1000 m, 11.ii.1985 (NZAC).

Recognition. This species is distinguished from other species of the *C. dorsatus* group by the bright yellow pleura, lacking dark markings, and largely dark mesoscutum (prescutellar depression and lateral margins yellow).

Re-description. Wing length 4.0–5.2 mm.

Male. Head: dark brown, not shiny; face narrow, parallel-sided, less than width of antennal sockets; face with pale pruinescence, lacking setulae; anterior eye facets below antennae slightly enlarged; ocellar triangle with 2 long divergent setae, inserted between posterior ocellus; postocellar seta slender, 1/3 length of ocellar seta; 2 vertical setae, outer longer than ocellar seta; postocular setae erect short, stout. Antenna with length of scape slightly less than height of eye with short dorsal setae, 1 long ventral seta; pedicel globular with setae confined to apical fringe. Postpedicel long, covered by short dense pruinescence, length slightly longer than scape, or less than 1/2 length of labrum; basal half rectangular; apical half gradually tapered; two-segmented arista-like stylus short, 1/5 length of postpedicel; stylus concolourous with remaining segments. Base of labrum lacking dorsal process; proboscis very long, slender, longer than fore femur; palpus yellow, slender, 1/6 length of labrum with several dark setae; prementum with short setae only.

Thorax (Figs. 1, 10): yellow, dorsum shiny except lateral margin of prescutellar depressions and scutellum; scutum dark except for broad yellow prescutellar stripe from scutellum to acrostichals, lateral margins including postpronotal lobe and postalar ridge; scutellum brown, including lateral margins; postnotum dark medially, pale laterally; laterotergite yellow; pleura bright yellow, lacking dark band. Acrostichals biserial, ending at prescutellar depression and directed posteriorly; 5 dc, increasing in length posteriorly, with posterior setae long and stout; first dc incurved and offset from line of others; 1 pprn and 1 shorter seta; 1 presut spal; 2 npl; 2 psut spal; 1 pal; 2 sctl; additional setulae interspersed among pprn, npl and presut spal. Antepronotum with pair of long setae.

Wing (Fig. 93): infuscate, membrane with dense microtrichia; pterostigma dark, at middle of cell r_1; 1 long basal costal seta; costal margin with unmodified setulae; posterior margin lacking incision; posterior setal margin complete, setae on wing stem undifferentiated. R_1 reaching costa before middle of wing; R_{2+3} slightly divergent from costa, arching smoothly to C; medial fork basal to radial fork; cell dm rectangular, slender; auxiliary cross-vein between R_{2+3} and R_4 lacking. Halter yellow, with white knob.

Legs: yellow, except extreme tip of hind femur and tibia and apical 3–4 tarsomeres. Fore coxa subequal in length to mid and hind coxae combined. Fore femur not more swollen than other femora, with pv row of short dark setae; 1 preapical dorsal seta. Fore tibia slightly shorter than femur; apex with anteroapical comb, not dilated. Tarsomere 1 more than 1/6 length of fore tibia, lacking modified setae; all tarsomeres slender.

Mid coxa lacking modified seta. Mid femur somewhat swollen with pv row of short dark setae with 4–6 long setae intermixed; long setae greater the width of femur; ventral surface with 2–3 rows of short dark setae beneath. Mid tibia with 4 dorsal and 4 pd setae widely spaced; ventroapical margin with 2–3 setae. Tarsomere 1 subequal in length to remaining 4 tarsomeres, with 1 long erect ventral seta.

Hind coxa with unmodified setae. Hind femur more swollen than other femora with pair of ventroapical setae. Hind tibia with 4 ad and 5 dorsal setae widely spaced; posterior face lacking mat of erect setulae; apex partially dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 2 long erect ventral setae near base and several short setae scattered beneath.

Abdomen: tergite and ventral margin of segments 1–6 dark, remaining yellow; posteromarginal setae 1/2 length of sclerite; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half,

lacking long posteromarginal setae; S7 2/3 as long as preceding sternite, anterolateral margin not produced; T8 rectangular, 1/2 length of sternite.

Terminalia (Figs. 138, 139): hypandrium convex with flap-like apical extension; gonocoxal apodemes subtriangular; postgonites encircling posterior margin of phallus, fused medially; phallus held perpendicular to hypandrium, keel-like. Epandrial lamella rounded with broad bacilliform sclerite; subepandrial sclerite lacking processes. Surstylus straight, slender with hooked tip; posterior margin with fringe of setae. Cercus long, slender with dense brush of posteroapical setae.

Female. Similar to male except as follows: face with brown pruinescence; fore and mid femora lacking rows of ventral setae. Apical segments retracted into segment 7; posterior margin with fringe of long setulae; lateral margin of S7 straight. Terminalia (Fig. 140): T8 with deep U-shaped membranous region along posterior margin, extending 2/3 length of sclerite; anterior margin with fringe of long stout setae, divided medially by small gap; 6 short lateral setae, ventral to anterior fringe; anterior margin with pair of flat rectangular sclerites extending into segment 7. S8 triangular, posterior margin invaginated forming inner sclerite. T10 divided medially, forming pair of triangular sclerites; posterior margin with 4–5 stout spine-like setae; median margin with biserial row of less stout spine-like setae. Cercus with row of 4 stout spine-like setae, similar to posterior setae of T10. Spermathecal receptacle spherical, one-side flattened; no neck visible where duct attached (Fig. 141).

Distribution. *Ceratomerus dorsatus* is widespread, ranging from the southern portion of the North Island south through the South Island to Stewart Island (Map 19).

Remarks. The three female specimens from Little Barrier Island determined by Plant (1991) are not conspecific and represent an undescribed species of the *C. dorsatus* group. Unfortunately, males of the latter undescribed new species have not yet been discovered (see below).

Ceratomerus dorsatus was collected in forest understorey, mostly along trails. Female specimens have been collected at blossoms on the Mt. Arthur Tablelands and in Taranaki National Park (Fig. 1).

***Ceratomerus virgatus* Collin**

Map 20, Figs. 14, 142, 143

Ceratomerus virgatus Collin, 1928: 17. Other references: Miller, 1950: 79 (New Zealand catalogue); Smith, 1989: 387 (catalogue); Plant, 1991: 1320 (revision); Pont, 1995: 173 (type catalogue); Yang *et al*., 2007: 50 (catalogue); Macfarlane *et al*., 2010: 445 (New Zealand biodiversity).

Type material. Holotype male, "Type/ ♂ [red bordered circle]"; "Figure of ♂ Type/ in text of the/ author's description [hand written]"; "Ceratomerus/ virgatus, Collin/ TYPE ♂ [hand written]"; "Ceratomerus/ virgatus/ ♂ [hand written, orange circle]"; "New Zealand:/ Ohakune./ 1–14.xii. 1922./ T.R. Harris./ B.M. 1923--104. [head, left wing, forelegs, abdomen missing]" (BMNH).

Additional material. New Zealand: **BR**—1 ♂, Lk Moana [42°37′S 171°27′E], 16–21.xii.1925 (CMNZ). **NN**—1 ♀, Canaan, Harwoods Hole, 760 m, 1.ii.1978 (NZAC); 1 ♂, Nelson, 23–26.xi.1923 (ANIC). **TO**—2 ♂, 1 ♀, Mt. Pureora, 800–1000 m, 29.xii.1986 (NZAC).

Recognition. This species is recognized by its broad postpedicel, dark pleural stripe from anterior to posterior spiracle, median mesonotal stripe, and dark broad rectangular postsutural supra-alar patch.

Re-description. Wing length 4.5–5.0 mm.

Male. Head: dark brown, not shiny; face narrow, parallel-sided, less than width of antennal sockets; face with pale pruinescence, lacking setulae; anterior eye facets below antennae slightly enlarged; ocellar triangle with 2 long divergent setae, inserted between posterior ocelli; postocellar seta very slender, less than 1/3 length of ocellar seta; 2 vertical setae, outer longer than ocellar seta; postocular setae erect, very short, stout. Antenna with length of scape slightly less than height of eye with short dorsal setae, 1 long ventral seta; pedicel globular with setae confined to apical fringe. Postpedicel (see Plant 1991, fig. 4H) very long, covered by short dense pruinescence, 2/3 length of labrum; base rectangular; apical half gradually tapered; two-articled arista-like stylus very short, 3X longer than wide; stylus concolourous with remaining segments. Base of labrum lacking dorsal process; proboscis very long, slender, longer than fore femur; palpus yellow, slender, 1/6 length of labrum with several dark setae; prementum with short setae only.

Thorax: yellow, dorsum shiny except prescutellar depressions and scutellum; broad with dark median stripe, not as wide as dorsocentrals, from anterior margin to scutellum; dark, broad rectangular psut spal patch; scutellum brown, lateral margins pale; postnotum dark medially, pale laterally; laterotergite dark; pleura with dark dorsal

band from base of postpronotal lobe to posterior spiracle. Acrostichals uniserial, ending at prescutellar depression and directed posteriorly; 5 dc, shorter and finer in front with posterior setae long and stout; first dc somewhat incurved and offset from line of others; 1 pprn; 1 presut spal; 2 npl; 1 psut spal; 1 pal; 2 sctl; additional setulae interspersed among pprn, npl and presut spal. Antepronotum with pair of long setae.

Wing: infuscate, membrane with dense microtrichia; pterostigma dark, at middle of cell r_1; 1 long basal costal seta; costal margin with unmodified setulae; posterior margin lacking incision; posterior setal margin complete, setae on wing stem undifferentiated. R_1 reaching costa before middle of wing; R_{2+3} slightly divergent from costa, arching smoothly to C; medial fork basal to radial fork; cell dm rectangular, slender; auxiliary cross-vein between R_{2+3} and R_4 lacking. Halter with white knob.

Legs: yellow, except extreme tip of hind femur and tibia and apical 2–3 tarsomeres brown. Fore coxa nearly subequal to length of mid and hind coxae combined. Fore femur not more swollen than other femora, lacking modified ventral setae; 1 preapical dorsal seta. Fore tibia slightly shorter than femur; apex with anteroapical comb, not dilated. Tarsomere 1 more than 2/3 length of fore tibia, lacking modified setae; all tarsomeres slender.

Mid coxa lacking modified seta. Mid femur with pv row of short dark setae with longer setae intermixed. Mid tibia with 4 dorsal and 3 pd setae widely spaced. Tarsomere 1 subequal in length to remaining 4 tarsomeres with 1 long, erect ventral seta.

Hind coxa with unmodified setae. Hind femur more swollen than other femora, with pair of ventroapical setae. Hind tibia with 4 ad and 5 dorsal setae widely spaced; posterior face lacking mat of erect setulae; apex partially dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 2 long, erect ventral setae near base and several short setae scattered beneath.

Abdomen; dorsum and lateral margins of tergites 1–6 dark; sternites yellow; posteromarginal setae 1/2 length of sclerite; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 2/3 as long as preceding sternite, anterolateral margin not produced; T8 rectangular, 1/2 length of sternite.

Terminalia (Figs. 142, 143): hypandrium dark on posteromedian face, convex, lacking flap-like extension; gonocoxal apodemes weakly developed; postgonites tusk-like, articulated at base of phallus, folded dorsally along anterior margin of phallus; phallus biarticulated, upper half with slightly recurved tip. Epandrium dark, lacking narrow sclerotized bridge ventral to cercus; epandrial lamella rounded with broad bacilliform sclerites; subepandrial sclerite with pair of long sickle-shaped processes arising from base. Surstylus sickle-shaped with subapical tooth; posterior margin with fringe of setae. Cercus short, broad with extremely dense brush of black, inner apical setae.

Female. Similar to male except as follows: antennal stylus 10X longer than wide; mid femur lacking rows of ventral setae; mid tibia with 1 apical pv seta. Apical segments retracted into segment 7; posterior margin of T7 with fringe of setulae; lateral margin of S7 straight. Terminalia (undissected): T10 split medially into rectangular sclerites, bearing posterior row of spine-like setae and row of similar shaped setae medially. Cercus bearing row of spine-like setae, similar to T10.

Distribution. *Ceratomerus virgatus* is known from the northwestern South Island and central North Island (Map 20).

Remarks. Despite the poor condition of the holotype, this species is recognized by its distinctive thoracic colouration.

Ceratomerus sp.

Ceratomerus dorsatus Plant, 1991: 1321 nec Collin, 1928: 19 (misidentification of female).

Material examined. New Zealand: **CL**—3 ♀ (dried from alc.), Little Barrier Is., Awaroa str., 12.xi.1985, swept from streamside moss, A.R. Plant (NZAC).

Recognition. This species is distinguished from other species of the *C. dorsatus* group on the basis of the following features: darkly coloured scutum, only lateral margin from postpronotal lobe to postalar ridge yellow, lacking yellow bands or vittae; pleura entirely yellow; femora yellow, except apex of hind femur; wing length 3.5 mm.

Remarks. This undescribed species is not named due to the lack of associated males. The material examined was originally determined as conspecific with *C. dorsatus* (Plant 1991).

Ceratomerus exiguus species-group

The *C. exiguus* species-group includes four New Zealand species. The group is defined by the following male characters: mid trochanter with 1–2 spine-like ventral setae, basalare not swollen and postgonites absent.

Ceratomerus alticolus n. sp.

Map 21, Figs. 24, 94, 144, 145

Type material. Holotype male, "NEW ZEALAND WN/ Tararua Ra/ Dundas Hut, 1250m/ 28–29 Nov 1984"; "B.G. Bennett &/ T.K. Crosby/ Malaise trap"; "HOLOTYPE/ *Ceratomerus*/ *alticolus*/ Sinclair [red label]" (NZAC).

Paratypes: New Zealand: **MC**—1 ♂, 1 ♀, Cass [43°02′S 171°46′E], 1.xii.1924, A. Tonnoir (CMNZ). **NN**—1 ♂, Mt. Arthur Tableland [41°10′S 172°38′E], 4500 ft., 25.xii.1921, A. Tonnoir (ANIC). **WN**—2 ♂, 2 ♀, same data as holotype (NZAC).

Recognition. Males of this species are distinguished from others within this species-group by more slender setae on the mid trochanter, unmodified tarsomeres and row of stout, ventral erect setae on apical half of mid tibia.

Description. Wing length 3.5–4.0 mm.

Male. Head: round, dark brown, not shiny; face narrow; pale ventrally, lacking setulae; anterior eye facets below antennae enlarged; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar setae widely separated, nearly posterior to ocelli, 1/2 length of ocellar seta; 3 vertical setae shorter than ocellar seta; upper postocular setae in oblique posterior row, lower half of eye with 3–4 long postocular setae. Antenna brown with scape longer than height of eye; 1 erect dorsal seta near mid-length and several setulae, and 1 long ventral subapical seta; pedicel globular with setae confined to apical fringe. Postpedicel covered by short dense pruinescence, subequal in length to labrum; base rectangular with apical portion slightly longer than base, gradually tapered. Arista-like stylus subequal to basal width of postpedicel; first segment of stylus 2–3X longer than wide. Base of labrum lacking dorsal process; palpus brown, slender, less than 1/5 length of labrum, clothed in fine dark setulae, extending parallel to proboscis; prementum with short setae only.

Thorax: scutum and mediotergite brown; pleura, laterotergite, and narrow lateral margin of mesonotum from postpronotal lobe to postalar (including scutal suture) yellow; lacking modifications near wing base. Acrostichals with anterior pair long and erect; uniserial, alternating left and right, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 long pprn; 1 long presut spal; 2 npl, lower shorter; 2 psut spal; 1 short pal; 2 sctl; additional setae interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 94): unmodified, although some veins may appear slightly thickened; infuscate, pterostigma absent; 1 long basal costal seta; costal margin straight with erect costal setae beyond R_1; posterior margin evenly curved, lacking incision; setae continuous along posterior margin complete, setae on wing stem lengthened; base of wing stem with narrow sclerotized pocket. R_1 reaching costa before middle of wing; R_{2+3} smoothly curved to C; medial fork proximal to radial fork; cell dm rectangular, slender; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 straight. Halter with stem proximally yellow, knob brown.

Legs (Fig. 24): fore and mid coxae yellow, hind coxa and ventral margin of femora yellowish brown, remaining segments increasingly darker. Fore coxa nearly subequal to length of mid and hind coxae combined; anterior margin sparsely setose; base not inflated. Fore trochanter lacking modified setae. Fore femur slightly swollen with av and pv rows of long slender setae, basal setae generally longest and decreasing in length apically; apex with pair of av and pv setae; lacking preapical dorsal seta. Fore tibia subequal in length to femur; apex with anteroapical comb, not dilated; row of long setae beneath. Tarsomere 1 2/3 length of fore tibia, lacking modified setae; remaining tarsomeres unmodified; tarsomeres 4 and 5 strongly dorsoventrally flattened on all legs.

Mid coxa lacking modified seta. Mid trochanter with long ventral thickened seta. Mid femur slightly longer than fore femur; pv face with row of dark setae 1/2 width of femur, directed apically; av face with row of shorter pale setae; apex with pair of long av and pv setae. Mid tibia slightly longer than femur, straight; apical half with

ventral row of stout erect setae, length approximately 2/3 width of tibia; lacking setae. Tarsomere 1 shorter than length of remaining 4 tarsomeres, all segments unmodified.

Hind coxa with 1 long lateral seta. Hind femur one-third longer than mid femur with pair of ventroapical setae; basal 1/3 with ad row of erect setae; 1 short dorsoapical seta. Hind tibia longer than femur with 3 ad and 2 dorsal setae; apex not expanded, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral seta near base and 1 long posterior seta on basal third.

Abdomen: tergites 1–6 dark brown, darker than thorax, with very long posteromarginal setae, longer than length of tergite; sternites paler, concolourous with tergites; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 subequal in length to preceding sternite, anterolateral margin not produced; T8 rectangular, 1/5 length of sternite, widest on lateral margins, narrowed dorsally.

Terminalia (Figs. 144, 145): hypandrium convex, tapered posteriorly to pair of processes surrounding phallus; gonocoxal apodemes small, extending beyond hypandrium; postgonite lacking; phallus strongly curved apically with beak-like apex. Epandrial lamella narrow with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; posterior margin with fringe of long setae; apical half narrow with short hook at apex. Cercus short, broad basally, fleshy, inner posterior margin not expanded, apical half slender.

Female. Similar to male except as follows: postpedicel somewhat shorter and less robust. Fore femur with av row of slender setae, less than width of femur; mid tibia with ad seta on basal third. Abdominal pleural membrane greyish; apical segments retracted into segment 7. Terminalia: undissected.

Distribution. *Ceratomerus alticolus* is known from the southern North Island and the northern third of the South Island (Map 21).

Etymology. The specific name is derived from the Latin *altus* (high) and *-cola* (inhabitant), referring to the elevation of several of the collection localities.

Ceratomerus exiguus Collin

Map 22, Fig. 25

Ceratomerus exiguus Collin, 1928: 20. Other references: Miller, 1950: 79 (New Zealand catalogue); Smith, 1989: 387 (Australasian catalogue); Plant, 1991: 1322 (revision); Pont, 1995: 67 (type catalogue); Yang *et al*., 2007: 49 (catalogue); Macfarlane *et al*., 2010: 445 (New Zealand biodiversity).

Type material. Holotype female, “Type/ ♀ [red bordered circle]”; “Ceratomerus/ exiguus, Collin/ TYPE ♀ [hand written]”; “Ceratomerus/ exiguus/ ♀ [hand written, orange circle]”; “New Zealand:/ Ohakune./ xi. 1923./ T.R. Harris./ B.M. 1924--22.” (BMNH).

Additional material. New Zealand: **BR**—1 ♂, Matakitaki Station, 24692 59140, 450 m, 25.u.1975, str (CMNZ). **MB**—1 ♂, Mt. Richmond For. Pk, Butcher’s Flat, small ck, 5–6.ii.1995, YPT (CNC). **NN**—1 ♂, 2 ♀, NW Nelson For. Pk, Oparara R + ck, 8–9.ii.1995 (NZAC). **RI**—1 ♂, Tongariro NP, Ohakune, Mangawhero R, Podocarp for., YPT, 19–20.ii.1995 (CNC). **SI**—2 ♂, 1 ♀, Stewart Is., Christmas Village Hut, D48 21261 53728, 16–17.i.2000, 15 m, str (CMNZ); 1 ♂, Stewart Is., Murray R bridge, D48 21275 53690, 18–19.i.2000, 5 m, UV (CMNZ).

Recognition. Males are distinguished by the absence of a whorl of long setae at the base of the fore femur, mid femur strongly attenuated at mid-length, and two ventral spines on the mid trochanter. Females have a short arista-like stylus.

Re-description. Wing length 2.5–3.0 mm.

Male. Head: round, dark brown, not shiny; face narrow, somewhat convergent ventrally; face brown, pale ventrally, lacking setulae; anterior eye facets below antennae enlarged; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/2 length of ocellar seta; 3 vertical setae shorter than ocellar seta; upper postocular setae in oblique posterior row, lower half of eye with 3–4 slender postocular setae. Antenna brown with length of scape subequal to height of eye with 1 erect dorsal seta near mid-length and several setulae, and 1 long ventral subapical seta; pedicel globular with setae confined to apical fringe. Postpedicel long, covered by short dense pruinescence, subequal in length to labrum; base rectangular with apical portion slightly longer than length of base, gradually tapered; arista-like stylus bare, subequal to width of base of postpedicel. Base

of labrum lacking dorsal process; palpus brown, slender, less than 1/4 length of labrum, clothed in fine setulae, extending obliquely to proboscis; prementum with short setae only.

Thorax: scutum, dorsal and posterior margin of anepisternum, and mediotergite brown; pleura, laterotergite and postpronotal lobe yellow; lower half of notopleuron yellowish brown; lacking modifications near wing base. Acrostichals with anterior pair long and erect; uniserial, alternating right and left, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 long pprn and 1 long setula; 1 presut spal; 2 npl, lower shorter; 2 psut spal; 1 short pal; 2 sctl; additional setae interspersed among dc. Antepronotum with pair of long setae.

Wing: unmodified, infuscate, pterostigma absent; 1 long basal costal seta; costal margin straight with erect costal setae beyond R_1; posterior margin smooth, lacking incision; posterior setal margin complete, setae on wing stem lengthened; base of wing stem with shallow, sclerotized pocket. R_1 reaching costa before middle of wing; R_{2+3} smoothly curved to C; medial fork proximal to radial fork; cell dm rectangular, slender; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 straight and rather thickened. Halter knob brown.

Legs (Fig. 25): coxae and ventral half of femora yellow, remaining segments increasingly darker. Fore coxa less than length of mid and hind coxae combined; anterior margin sparsely setose; base not inflated. Fore trochanter lacking modified setae. Fore femur slightly swollen with pv row of long slender setae, nearly longer than width of femur; av face with row of short setae; lacking preapical dorsal seta. Fore tibia subequal in length to femur with row of long ventral setae; apex with anteroapical comb, not dilated. Tarsomere 1 2/3 length of fore tibia with 1 long ventral seta at base and pv row of setae, length 1.5X width of tarsomere; remaining tarsomeres unmodified; tarsomere 5 slightly dorsoventrally flattened on all legs.

Mid coxa lacking modified seta. Mid trochanter with 2 long ventral spine-like setae. Mid femur slightly longer than fore femur, somewhat swollen and strongly attenuated at mid-length; av margin with row of slender setae, increasing in length apically; pv face with fringe of very short stout setae at mid-length and apical half with 5 setae, increasing in length apically; apex with pair of long ventral setae. Mid tibia slightly longer than femur with slight dip or partially twisted at mid-length; apical half with pv row of setae twisted half-way, apically setae longer than width of tibia; av margin with row of very short setae; pair of stout, flattened anterior setae projecting perpendicularly beyond mid-length; basal half with 1 ad and 1 pd seta; apex with 1 ad, 1 av, and 1 pv seta. Tarsomere 1 longer than length of remaining 4 tarsomeres with pv row of short stout setae and av row of spine-like setae, subequal in length to width of tarsomere, apical seta twice length of other setae; remaining tarsomeres unmodified.

Hind coxa with 1 long lateral seta. Hind femur 1/3 longer than mid femur with 2 pairs of ventroapical setae; basal fourth with ad row of erect setae; 1 short dorsoapical seta. Hind tibia longer than femur with 3 ad setae and 2 dorsal setae; apex not expanded, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral seta near base and 1 long posterior seta on basal third with shorter setae extended to apex.

Abdomen: tergites 1–6 brown, concolourous with thorax with long posteromarginal setae; sternites paler than tergites; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 subequal in length to preceding sternite, anterolateral margin not produced; S8 with pair of long setae.

Terminalia (undissected; cf. Fig. 146 [*flavus*]): hypandrium convex with several long stout setae; postgonite lacking; phallus strongly curved apically with beak-like apex. Surstylus not distinctly differentiated from epandrium; posterior margin with fringe of long setae, apical half slender with short hook. Cercus short, broad and fleshy, inner posterior margin bearing setae.

Female. Similar to male except as follows: legs lacking modified setae. Abdominal pleural membrane greyish; apical segments retracted into segment 7; posterior margin of T7 with fringe of short setulae; lateral margin of S7 straight. Terminalia: undissected.

Distribution. *Ceratomerus exiguus* is known from Ohakune in the North Island and from the northern part of the South Island (Map 22).

Remarks. Plant (1991) misidentified this species. The male specimen Plant (1991) assigned to *C. exiguus* is not considered conspecific and is identified as *C. simplex* n. sp. This specimen differs from the female type in thoracic colouration and is much smaller in size. Nearly all conspecific male and female *Ceratomerus* examined in

this study have very similar thoracic colour patterns and are relatively similar in size, most important in matching conspecific sexes.

The female specimens that Plant (1991) assigned to *C. exiguus* also are not viewed as conspecific. The female specimens from Whirinaki are *C. brevifurcatus* and the female from Urewera NP is *C. whirinaki* n. sp. The colour pattern of the scutum in these specimens does not match that of the holotype of *C. exiguus*.

The true identity of this species is most problematic given that Collin based the species on a single female specimen. This is confounded by the non-distinctive thoracic colour pattern, thus the only other means of association is to attempt to collect additional specimens at the type locality. Of the five species recorded from Ohakune in this study, only the specimens listed in the material examined match the colouration and size presented in the original description. Consequently, the male collected at the type locality is considered conspecific.

Ceratomerus flavus Plant

Map 23, Figs. 26–28, 49, 50, 95, 146

Ceratomerus flavus Plant, 1991: 1321. Other references: Yang *et al*., 2007: 49 (catalogue); Macfarlane *et al*., 2010: 445 (New Zealand biodiversity).

Type material. Holotype male, "NEW ZEALAND. S.Is.:/ OL: East Matukituki/ Valley: 31.i.-4.ii.1987/ Malaise Traps on Forest/ Edge. J.W. Early [terminalia dissected, stored in glycerin below specimen]"; "HOLOTYPE/ Ceratomerus/ flavus/ Plant [red label]" (NZAC).

Paratypes: New Zealand: **OL**—3 ♀, same data as holotype (NZAC) [= *C. dorsatus*].

Additional material. New Zealand: **MB**—4 ♂, 1 ♀, Mt. Richmond For. Pk, Butcher's Flat, ck & for., 5–6.ii.1995 (CNC); 2 ♀, same locality, Doom Ck., YPT, 5–6.ii.1995 (CNC). **NN**—4 ♂, Aniseed Valley [41°23′S 173°11′E], 22.iii.1922 (ANIC); 1 ♂, 3 ♀, Nelson, 28.xi.1923 (ANIC); 9 ♂, Nelson, 120–160 m, 29–30.xii.1994, UV-light (CMNZ); 1 ♂, NW Nelson For. Pk, Mt Arthur Tblds, 900 m, Quartz Ck, 17.ii.1995 (AMS); 13 ♂, 9 ♀, same locality, *Nothofagus* , Whiskey Ck, 1000 m, 18.ii.1995 (CNC, NZAC); 1 ♂, same locality, *Nothofagus* for., YPT, 1000 m, 17–18.ii.1995 (NZAC). **SD**—1 ♂, Waitohi R. below Dam, P27 25939 59869 [41°19.21′S, 174°00.17′E], 13.xii.2000 (CMNZ); 1 ♂, Waitohi R, 2nd Fork, P27 25941 59882 [41°18.52′S 174°00.26′E], 20–21.i.1998, 40 m (CMNZ).

Recognition. Males are distinguished by the whorl of long slender setae at the base of the fore femur, modified mid tarsomere (tarsomere 3 slightly twisted with basal fan of setae) and single ventral spine on the mid trochanter. Females have an extremely long and slender arista-like postpedicel.

Re-description. Wing length 2.7–3.0 mm.

Male. Head: round, dark brown, not shiny; face wide, parallel-sided, brown, pale ventrally, lacking setulae; anterior eye facets below antennae enlarged; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/2 length of ocellar seta; 4 vertical setae shorter than ocellar seta; upper postocular setae in oblique posterior row, lower two-thirds of eye with 3–4 slender postocular setae. Antenna (Fig. 49) brown with length of scape subequal to height of eye with 1 erect dorsal seta near mid-length and several setulae, and 1 long ventral subapical seta; pedicel globular with setae confined to apical fringe. Postpedicel long, covered by long dense pruinescence, 2X length of labrum; base rectangular with apical portion 3X length of base, very slender; stylus very short or absent. Base of labrum lacking dorsal process; palpus yellow, slender, less than 1/4 length of labrum, clothed in fine pale setulae, extending parallel to proboscis; prementum with short setae only.

Thorax: scutum and mediotergite brown; pleura, laterotergite, postpronotal lobe and lower half of notopleuron yellow; lacking modifications near wing base. Acrostichals with anterior pair long and erect; uniserial, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 long pprn; 1 presut spal; 2 npl, lower shorter; 2 psut spal; 1 short pal; 2 sctl; additional setae interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 95): unmodified, infuscate, pterostigma absent; 1 long basal costal seta; costal margin straight with erect costal setae beyond R_1; posterior margin smooth, lacking incision; posterior setal margin complete, setae on wing stem lengthened; base of wing stem lacking sclerotized pocket. R_1 reaching costa before middle of wing; R_{2+3} smoothly curved to C; medial fork proximal to radial fork; cell dm rectangular, slender; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 straight. Halter knob brown.

Legs (Figs. 26–28, 50): coxae and ventral half of femora yellow, remaining segments increasingly darker. Fore coxa less than length of mid and hind coxae combined; base slightly inflated with several long, slender setae. Fore trochanter lacking modified setae. Fore femur slightly swollen, base with whorl of long, slender posterior setae with bent tips; basal third with 3 long av setae, similar to whorl; av and pv rows of short slender setae; lacking preapical dorsal seta. Fore tibia subequal in length to femur; apex with anteroapical comb, not dilated. Tarsomere 1 3/4 length of fore tibia with long ventral seta at base; remaining tarsomeres unmodified; tarsomere 5 slightly dorsoventrally flattened on all legs.

Mid coxa lacking modified seta. Mid trochanter with long, ventral spine-like seta. Mid femur slightly shorter than fore femur, somewhat swollen; pv face with row of dark setae, of which basal half are shorter than width and appressed, and 3–4 setae of apical half nearly erect, longer than width of femur; apex with pair of long ventral setae. Mid tibia longer than femur, somewhat curved with slight notch at mid-length; apical half with av and pv rows of setae, short to subequal in length to width of tibia; basal half with pv row of appressed setae extending onto ventral face of notch; basal half with 1 dorsal and 1 pd seta; apex with 1 ad seta. Tarsomere 1 longer than length of remaining 4 tarsomeres, slender, slightly curved beyond mid-length; apex of tarsomere 2 with several long av setulae; tarsomere 3 subequal in length to second, partially curved with swollen base bearing fan of long setae (Fig. 27).

Hind coxa with 1 long lateral seta. Hind femur 1/3 longer than mid femur with pair of ventroapical setae; basal fourth with ad row of erect setae; lacking dorsal subapical seta. Hind tibia longer than femur with 1 ad seta near mid-length and 1 preapical ad seta; 1 dorsal seta at mid-length and 1 subapical dorsal seta; apex partially expanded, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long, erect ventral seta near base and several long posterior setae on basal third.

Abdomen: tergites 1–6 brown, paler than thorax, with long, posteromarginal setae; sternites paler than tergites; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 subequal in length to preceding sternite, anterolateral margin not produced; T8 rectangular, 1/6 length of sternite, widest on lateral margins, and reduced to thin strip dorsally; S8 with pair of long setae.

Terminalia (Fig. 146): hypandrium convex with pair of short, rounded posterolateral extensions; gonocoxal apodemes small, extending beyond hypandrium; postgonite lacking; phallus strongly curved apically with beak-like apex. Epandrial lamella narrow with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; posterior margin with fringe of long setae, apex with short hook. Cercus short, broad and fleshy, inner posterior margin expanded somewhat medially, bearing setae.

Female. Similar to male except as follows: apical portion of postpedicel sparsely clothed in pruinescence, very slender, greatly lengthened, nearly 5X length of base. Lacking modified leg setae. Abdominal pleural membrane greyish; apical segments retracted into segment 7; posterior margin of T7 with sparse fringe of short setulae, confined to dorsal margin; lateral margin of S7 straight. Terminalia: T8 narrow dorsally, expanded laterally; fringe of short setae present; anterior margin with pair of small flat dorsolateral sclerites. S8 triangular, posterior margin invaginated forming inner sclerite. T10 divided medially, forming pair of rectangular sclerites; posterior margin with row of stout setae; inner median margin with several less stout setae. Cercus rounded with 2–3 stout apical setae, similar to posterior setae of T10; lateral margin with slender long setae. Spermathecal receptacle spherical with short narrow neck.

Distribution. *Ceratomerus flavus* is known from extreme north of the South Island and a disjunct southern population (Map 23).

Remarks. Female paratypes designated by Plant (1991) are not conspecific and are actually *C. dorsatus*. The illustration of the male terminalia of the holotype of *C. flavus* was based on an unmacerated specimen (Plant 1991, fig. 2E).

Some variation was noted with slightly larger-sized specimens (wing length 3.2 mm). Among the latter specimens, the antenna is more robust, especially the base of the postpedicel, the thoracic colour pattern is similar, and the leg chaetotaxy is similar, but longer and stouter. The male terminalia is characterized by a longer and narrower surstylus, the apical half of cercus is narrower and longer (lateral view) and the female terminalia also differs in connection of the sclerites of segment 8 and setation of T10.

***Ceratomerus fontinalis* n. sp.**
Map 24, Figs. 29, 96, 147

Type material. Holotype male, "NEW ZEALAND: NN/ Hwy 67 N. Waimarie/ roadcut spring/ 8.i.1995; B.J. Sinclair"; "HOLOTYPE/ *Ceratomerus*/ *fontinalis*/ Sinclair [red label]" (NZAC).

Paratypes: New Zealand: **BR**—1 ♂, Eight Mile Ck, Matakitaki Valley, M29 24544 59229, 22.xii.2000, 300 m, J.B. & G.M. Ward (CMNZ); 1 ♂. Fuchsia Ck, E branch Buller Gorge, UV, K29 24008 58281, 30.xi.1999, 60 m, J.B. & G.M. Ward (CMNZ). **KA**—2 ♂, Wairere Stm, Hwy 1, 25567 58616 [42°27.12′S 173°34.04′E], 3 m, 1.i.1995, J.B. & G.M. Ward (CMNZ). **NN**—4 ♂, 1 ♀, same data as holotype (CNC, NZAC).

Recognition. Males are distinguished from *C. flavus* by lacking modified mid tarsomeres and the presence of long pubescence on the postpedicel.

Description. Wing length 3.0 mm.

Male. Head: round, dark brown, not shiny; face wide, parallel-sided, pale brown, lacking setulae; anterior eye facets below antennae enlarged; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; posterior ocelli widely spaced, greater than distance to anterior ocellus; postocellar seta slender, at most 1/2 length of ocellar seta; 3–4 vertical setae, shorter than ocellar seta; upper postocular setae in oblique posterior row, lower 2/3 of eye with 3–4 slender postocular setae. Antenna (Fig. 29) brown with length of scape slightly shorter than height of eye, with 1 erect dorsal seta near mid-length and several setulae, and 1 long ventral seta beyond mid-length; pedicel globular with setae confined to apical fringe. Postpedicel long, covered by very long dense pruinescence, more than 2X length of labrum; base rectangular, sharply attenuated with apical portion more than 3X length of base, very slender and arista-like; apical stylus very short. Base of labrum lacking dorsal process; palpus yellow, slender, less than 1/4 length of labrum, clothed in fine pale setulae, extending parallel to proboscis; prementum with short setae only.

Thorax: scutum and mediotergite brown; pleura, laterotergite, postpronotal lobe and lower half of notopleuron yellow; lacking modifications near wing base. Acrostichals with anterior pair long and erect; biserial to alternating uniserial, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 long pprn; 1 presut spal; 2 npl, lower shorter; 2 psut spal; 1 short pal; 2 sctl; additional setae interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 96): same as *C. flavus*. Halter knob brown.

Legs: coxae and ventral half of femora yellow, remaining segments increasingly darker. Fore coxa less than length of mid and hind coxae combined; anterior margin sparsely setose, except 2–3 long anterior setae on basal half; base slightly inflated. Fore trochanter lacking modified setae. Fore femur slightly swollen, base with whorl of long, slender posterior setae (interrupted medially) with bent tips; basal third lacking long av setae; av and pv rows of short slender setae; lacking preapical dorsal seta. Fore tibia subequal in length to femur; apex with anteroapical comb, not dilated. Tarsomere 1 3/4 length of fore tibia, with long ventral seta at base; remaining tarsomeres unmodified; tarsomere 5 slightly dorsoventrally flattened on all legs.

Mid coxa lacking modified seta. Mid trochanter with long, ventral spine-like seta at apex. Mid femur slightly shorter than fore femur, somewhat swollen; pv face with row of dark setae, basal half shorter than width and appressed with 3–4 setae of apical half nearly erect, longer than width of femur; setae of av row slender and short; apex with pair of long ventral setae. Mid tibia longer than femur, somewhat curved with slight swelling basal to mid-length, bearing row of stout appressed setae; apical half with pv row of setae, shorter than width of tibia; basal half with 1 dorsal and 1 pd seta; 1 dorsal seta near mid-length; apex with 1 ad and 1 pd seta. Tarsomere 1 not longer than length of remaining 4 tarsomeres, all tarsomeres unmodified.

Hind coxa with 1 long lateral seta. Hind femur 1/3 longer than mid femur with pair of ventroapical setae; basal fourth with ad row of erect setae; 1 dorsal subapical seta. Hind tibia longer than femur with 1 ad seta on basal half, 1 ad seta on apical half and 1 preapical ad seta; 1 dorsal seta at mid-length and 1 subapical dorsal seta; apex partially expanded, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral seta near base and 1 long posterior seta on basal third.

Abdomen: tergites 1–6 brown, slightly paler than thorax with long posteromarginal setae; sternites paler than tergites; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 subequal in length to preceding sternite, anterolateral margin not produced; T8 rectangular, 1/6 length of sternite, widest on lateral margins, reduced to thin strip dorsally; S8 with pair of long setae.

Terminalia (Fig. 147): hypandrium convex with pair of short, rounded posterolateral extensions; gonocoxal apodemes small, extending beyond hypandrium; postgonite lacking; phallus strongly curved apically with beak-like apex. Epandrial lamella narrow with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus slender, prolonged apically, but not distinctly differentiated basally from epandrium; posterior margin with several long setae, apex with short hook. Cercus broad basally, prolonged apically; posterior margin sclerotized, not expanded, bearing 2 pairs of short setae near base.

Female. Similar to male except as follows: apical portion of postpedicel sparsely clothed in pruinescence, very slender, greatly lengthened, nearly 6X length of base. Lacking modified leg setae. Abdominal pleural membrane greyish; apical segments retracted into segment 7. Terminalia: undissected.

Distribution. *Ceratomerus fontinalis* is known from several localities in the northwestern South Island (Map 24).

Etymology. The specific name is derived from the Latin *fontinalis* (of a spring), referring to the habitat of the type specimens.

Ceratomerus longifurcatus species-group

The *C. longifurcatus* species-group includes eight New Zealand species, characterized by the following combination of male characters: palpi prolonged with rows of stout setae; basalare enlarged and shiny; face sometimes with small fleshy knob-like swelling; usually with shallow to deep notch in posterior margin of wing at apex of M_4.

The *C. longifurcatus* group was resolved as the sister group to the *C. prodigiosus* group on the basis of the modified male palpus, basalare projection and sclerotized basal wing "pocket" (Sinclair 2010).

Ceratomerus brevifurcatus Plant

Map 25, Figs. 51–53, 97, 98, 148, 156, 157

Ceratomerus brevifurcatus Plant, 1991: 1327. Other references: Yang *et al*., 2007: 49 (catalogue); Sinclair, 2010: 222 (phylogeny); Macfarlane *et al*., 2010: 445 (New Zealand biodiversity).

Type material. Holotype male, "NEW ZEALAND. N.Is.:/ CL: Kau[a]eranga River/ Thames. Malaise trap/ 5.i.1972. H.A. Oliver"; "HOLOTYPE/ Ceratomerus/ brevifurcatus/ Plant [red label]" (NZAC).

Additional material. New Zealand: **AK**—1 ♂, 1 ♀, Huia, Karamatura Valley, 3.xi.1967 (NZAC); 7 ♂, 3 ♀, Pohuehue Scenic Res., Warkworth, for. str, 1.ii.1995 (CNC); 1 ♂, 1 ♀, Marawhara Str, at Whakatai str, Piha, 15 m, Q11 26411 64725, 15 m, UV-trap, 18.xii.1998 (CMNZ). **BP**—1 ♂, 2 km past Oponae, Waioeka Gorge, 28.viii.1976 (NZAC); 7 ♂, 7 ♀, Waiotuma Str, 29481 63868 [37°36.70′S, 177°57.68′E], UV-lights, 5 m, 29.i.1993 (CMNZ). **CL**—4 ♂, 3 ♀, Coromandel Ra., W. Kirikiri Saddle, 100 m, 2.xi.1977 (NZAC); 1 ♂, Little Barrier Is., West Landing, sweeping intertidal zone, 21.ii.1976 (NZAC); 1 ♀, Little Barrier Is., 24.xi.1954 (NZAC). **GB**—10 ♂, 12 ♀, Hicks Bay, str nr wharf, 29781 63900, 2, 3.ii.1993, UV-light (CMNZ); 2 ♂, Mangaowira str trib, Paoneone, 29820 63804, 30 m, 30.i.1993 (CMNZ). **ND**—1 ♂, Waipapa R, Puketi For., 1.xii.1989, YPT (AMS); 9 ♂, 4 ♀, Waipoua For. Pk, Kauri for., Waikohatu Str, YPT/ sweeping, 31.i.-1.ii.1995 (AMS, CNC); 1 ♀, ditto, except Merowhanara Str (CNC). **TK**—1 ♀, Hwy 40, W Ohura, cascading ck, 2.ii.1995 (NZAC). **TO**—6 ♂, 4 ♀, Whirinaki For. Pk, Minginui, Whirinaki R, YPT/ sweeping, 20–21.ii.1995 (CNC). **WN**—5 ♂, 3 ♀, Cloustonville, Akatarawa R, YPT, 3–4.ii.1995 (CNC); 6 ♂, 5 ♀, Rimutaka For. Pk, Catchpool Ck, YPT, 4–5.ii.1995 (AMS); 2 ♂, Wellington [41°17′S 174°46′E], 10.iii.1923 (ANIC).

Recognition. Males are recognized by their lack of labral tubercle, cell dm triangular, wing margin at apex of M_4 with deep incision forming a subbasal lobe, R_{2+3} lacking swelling, and M_{1+2} dipped posteriorly toward incision. Although the scutal colouration is variable, females are generally distinguishable by a short, erect costal seta at apex of Sc, dark median stripe and medial fork slightly proximal to radial fork.

Re-description. Wing length 2.7–3.0 mm.

Male. Head (Figs. 51, 53): somewhat flattened, dark greyish brown, not shiny; face narrow, parallel-sided, narrower than antennal sockets; face yellow, bare, lacking short fleshy lobe; anterior eye facets below antennae enlarged; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/3 to 1/2 length of ocellar seta; 3 vertical setae shorter than ocellar seta; postocular setae in single row along margin of eye, lower half of eye with 1–2 erect stout setae. Antenna brown, somewhat paler at base of scape; length

of scape longer than height of eye with several short dorsal setae and 1 long seta beyond mid-length, 1 long, subapical ventral seta and 1 long ventrolateral seta; pedicel pale brown, globular with setae confined to apical fringe. Postpedicel dark brown, clothed in short dense pruinescence, 1.5X longer than length of labrum; base rectangular, 0.5X length of apical portion; apical portion narrow, slightly tapered; stylus reduced to very short bare apex. Base of labrum lacking dorsal process; palpus yellow, slender, more than half length of labrum with large concavity at mid-length; base with short, dense ad tuft of setae; apical third with lateral large patch of short setae; ventral margin with long setae at mid-length (Fig. 53); prementum with short, slender ad setae and stout, short ventral setae.

Thorax: ground colour yellow with dark median stripe, wider than acrostichal row, from anterior margin to prescutellar depression; posterior to third dc, scutum mostly brown; broad, lateral dark patches extending from base of wing to presut spal; apical margin of scutellum yellowish brown; postnotum dark medially, sometimes paler laterally; laterotergite, pleura, postpronotal lobe and lower half of notopleuron yellow; anterior basalare inflated into anvil-shaped process; subalar sclerite not modified. Acrostichals with anterior pair long and erect; biserial, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower 1/3 length of upper; 2 psut spal; 1 pal, short; 2 sctl; additional setulae on pprn and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 97): infuscate, pterostigma absent; 1 long basal costal seta and 1 shorter dorsal seta at apex of Sc; costal margin straight; erect costal setae beyond R_1; ventral margin of costa with fine erect setae beyond R_1; posterior margin with deep incision at apex of M_4 and subbasal lobe with rounded apex; apex of incision with dense patch of microtrichia on dorsal face; posterior setal margin very short at base of lobe; setae on wing stem undifferentiated; base of wing stem with round, sclerotized, deeply concave pocket. R_1 reaching costa before middle of wing; R_{2+3} curved gradually towards wing margin; medial fork opposite radial fork; M_{1+2} strongly bent opposite incision; cell dm triangular, short; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 straight, then sharply deflected at incision, not reaching wing margin. Halter knob yellowish brown.

Legs (Figs. 52, 61): coxae and basal half of femora yellow, apical half of femora increasingly darker; remaining leg segments brown. Fore coxa subequal in length to mid and hind coxae combined; anterior margin very sparsely setose; small anterior tubercle at mid-length; dorsoapical margin with short stout seta. Fore trochanter with 2 posterior setae. Fore femur arched, more swollen than other femora with deep posterobasal concavity; posterior face with setae confined to 2 rows (lower row increasing in length apically) and 1 basal seta; basal third with row of erect pd setae; inner anterior margin bare, except with av row of fine short setae; 1 preapical dorsal seta. Fore tibia slightly shorter than femur; apex with anteroapical comb, not dilated; basal third with 2–3 long ventral setae and apical third with 3 pv setae, both sets of setae longer than width of tibia. Tarsomere 1 half length of fore tibia, slightly curved with 1 basal seta longer than width of tibia, middle half with dense fringe of short setae; pv margin with several short erect setae; apex swollen. Tarsomere 2 nearly square-shaped, as wide as apex of tarsomere 1. Tarsomere 3 slightly more than half length of tarsomere 1 with subbasal narrowing; base with pv comb of short setae and 5 erect av setae; apical margin with 2 stout ad setae. Tarsomere 4 cylindrical, shorter than flattened tarsomere 5.

Mid coxa lacking modified seta. Mid femur with av and pv rows of fine setae, less than width of femur; anterior face with row of dark setae, increasing in length apically to greater than width of femur; apex with pair of ventral setae; 1 dorsal seta at midlength. Mid tibia subequal in length to femur with 3–4 apical setae and 2 dorsal setae on basal half; basal third with 4 long, erect av setae, 3X width of tibia; apical half with av row of slender setae, subequal to width of tibia. Tarsomere 1 3/4 length of tibia with av row of erect stout setae, slightly longer than width of tarsomere; posterior face with row of erect setae subequal in length to width of tarsomere. Remaining tarsomeres unmodified; tarsomere 5 dorsoventrally flattened.

Hind coxa with 1 long lateral seta. Hind femur somewhat inflated with pair of ventroapical setae; basal half with ad row of erect setae; 1 dorsal subapical seta. Hind tibia longer than femur with 3 ad and 2 dorsal widely spaced setae; apical 2/3 of posterior face with long dense mat of setulae; apex not dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral seta near base, 1 long pv seta on basal third and several rows of erect short setae; tarsomere 5 dorsoventrally flattened.

Abdomen: tergites 1–6 dark, concolourous with mesonotum with long posteromarginal setae; sternites yellow; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long

posteromarginal setae; S7 3/4 length of preceding sternite, anterolateral margin not produced; T8 rectangular, 1/6 length of sternite; S8 with pair of long subapical setae.

Terminalia (Fig. 148): hypandrium convex, lacking posterior extension; gonocoxal apodeme slender, oblique; postgonite straight, strongly divergent from hypandrium, articulated at base of phallus, apex membranous; phallus slightly curved anteriorly, erect. Epandrial lamella triangular, narrowed apically with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; posterior margin with fringe of setae, very slender on apical half. Cercus short, expanded subapically; median margin with fringe of stout short setae.

Female. Similar to male except as follows: head round, lacking modifications of antenna, labrum and palpus; palpus projecting obliquely. Anterior basalare lacking; wing unmodified (Fig. 98), medial fork slightly proximal to radial fork. Fore femur not as swollen; ventral face with rows of short dark av and pv setae; mid tibia with 3 ad and 3 pd setae; hindleg similar. Abdomen with pleural membrane white, apical segments retracted into segment 7; posterior margin of T7 with dense fringe of short setulae; lateral margin of S7 straight. Terminalia (Fig. 156): T8 narrow, dorsally expanded laterally; dense fringe of long setae present; anterior margin with pair of narrow, flat dorsolateral sclerites. S8 triangular, posterior margin invaginated forming inner membranous chamber. T10 divided medially, forming pair of rectangular sclerites; clothed in long curved setae, setae on posterior margin stouter. Cercus rounded with double row of many closely placed, stout curved setae, similar to posterior setae of T10. Spermathecal receptacle spherical with short broad neck (Fig. 157).

Distribution. *Ceratomerus brevifurcatus* is widespread on the North Island (Map 25).

Ceratomerus lobipennis n. sp.

Map 26, Figs. 30, 99, 151

Type material. Holotype male, "NEW ZEALAND: MB/ Mt. Richmond For. Pk./ Butcher's Flat, 5.ii.1995/ B.J. Sinclair/ cascading creek"; "HOLOTYPE/ *Ceratomerus*/ *lobipennis*/ Sinclair [red label]" (NZAC).

Paratypes: New Zealand: **MB**—2 ♂, 1 ♀, same data as holotype, YPT, 5–6.ii.1995 (NZAC). **BR**—1 ♂, Nelson Lakes NP, Lk Rotoroa, Braeburn Tr., 7.ii.1995, BJS (AMS); 1 ♂, Nelson Lakes NP, Lk Rotoiti, Black Valley str., YPT, 15–16.ii.1995, BJS (AMS). **MB**—1 ♂, Dog Str, Hanmer, Waterfall tr. at 2nd bridge, 23.i.1998, J.B. & G.M. Ward (CMNZ). **NC**—1 ♂, Andrews Str. trib, 580 m, 24120 58008 [42°59.61′S 171°47.87′E], 5.iii.1993, JBW (CMNZ). **TO**—2 ♂, 1 ♀, Pureora For. Pk., Kakaho str., Link Rd. 2.ii.1995, BJS (AMS); 1 ♂, Whirinaki For. Pk., Minginui, 20–21.ii.1995, Whirinaki R., YPT, BJS (NZAC). **WN**—3 ♂, Cloustonville, Akatarawa R., YPT/ sweeping, 3–4.ii.1995, BJS (CNC); 2 ♀, Rimutaka For. Pk., Catchpool Ck., YPT, 4–5.ii.1995, BJS (NZAC).

Recognition. Males are recognized by their brown head and mesonotum, pleura yellow, wing margin at apex of M_4 with deep incision and sclerotized, sculptured anal lobe, and R_{2+3} lacking small swelling.

Description. Wing length 4.0–4.5 mm.

Male. Head: round, brown, dusted with pruinescence; face yellowish brown, narrower than antennal sockets, parallel-sided; face bare with short, round yellow fleshy lobe; anterior eye facets below antennae enlarged; anterior ocellus nearly in line with posterior ocelli; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/2 length of ocellar seta; 3 vertical setae, subequal in length to postocellar seta; upper postocular setae in oblique row from margin of eye, lower half of eye with 2 long setae; pair of setae dorsolateral to base of scape lacking. Antenna brown; scape longer than height of eye with several dorsal and lateral setae, and 1 long, subapical ventral seta; pedicel brown with proximal margin somewhat paler, globular with setae confined to apical fringe. Postpedicel brown, clothed in short dense pruinescence, longer than length of labrum; base rectangular, 1/2 length of apical portion; apical portion narrow, slightly tapered; stylus short, bare, subequal to base of apical portion of postpedicel. Base of labrum lacking dorsal process; palpus yellow, 2/3 length of labrum, base with ventral concavity, remainder cylindrical with round tip; bearing stout pd and posterior setae, mostly shorter than width of palpus; ventral margin near middle with 5–8 erect stout setae, longer than width of palpus; base lacking tuft of appressed setae; postmentum with stout ad and pd setae longer than width of labium; ventral setae shorter than width of labium.

Thorax: mseonotum and postnotum dark brown, except antepronotum, postpronotal lobe and outer margin, lower half of notopleuron and postalar ridge yellow; pleura and laterotergite yellow; anterior basalare inflated with yellow, convex oval process; subalar sclerite not modified. Acrostichals with anterior pair long and erect; biserial,

ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower short; 2 psut spal; 1 pal, short; 2 sctl; additional setulae on pprn, and long setae interspersed among dc. Antepronotum with pair of short setae.

Wing (Fig. 99): infuscate, pterostigma absent; 1 long basal costal seta; costal margin straight; erect costal setae beyond R_1; ventral margin of costa with erect setae beyond R_1; posterior margin with deep incision at apex of M_4 and broad subbasal lobe with rounded apex, ventral surface clothed in fine dense microtrichia; anal lobe with sclerotized margin and small shallow notch; dorsal row of dense macrotrichia posterior to M_4; posterior setal margin complete and normal length, except margin of anal lobe; several setae at base of notch; setae on wing stem not modified; base of wing stem with deep, narrow, sclerotized concave pocket. R_1 reaching costa before middle of wing; R_{2+3} curved gradually towards wing margin, lacking swelling; radial fork divergent; radial fork proximal or opposite to medial fork; M_{1+2} straight; cell dm rectangular; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 thickened, extending to apex of incision. Halter with base of shaft yellow, knob brownish.

Legs (Fig. 30): fore and mid coxae, anterior 2/3 of mid and hind femora, basal half of fore tibia yellow; hind coxa yellowish brown; posterior third of mid and hind femora brown; remaining leg segments dark brown. Fore coxa subequal in length to mid and hind coxae combined; base inflated; mid-length lacking tubercle; anterobasal half very sparsely setose; dorsoapical margin with 1 stout seta. Fore trochanter with unmodified setae. Fore femur arched, greatly swollen with pv concavity and swelling on posterior face near middle; posterior face with sparse row of slender setae, longest around concavity; base with 5 erect, stout dorsal setae; anterior face mostly bare, except av row of slender setae, at most 1/2 width of femur; apex with pair of ventral setae; 1 preapical dorsal seta. Fore tibia stout, shorter than femur; apex with anteroapical comb, dilated anteriorly; apical half with pv row of long slender setae, some nearly twice width of tibia; base with long dorsal seta, nearly 3X width of tibia. Tarsomeres very stout and broad; tarsomere 1 2/3 length of fore tibia, ventral face strongly sinuous, bearing av comb of 6–8 stout, blunt flattened setae on basal fourth, longer than width of tarsomere; middle with pv row of long, apically sinuous slender setae, length twice width of tarsomere; apical half with deep concavity and 1 stout, pv, flattened blunt seta; apex with 3 dorsal setae and 1 pd seta length twice width of tarsomere. Tarsomere 2 cylindrical, wider and 1/2 length of tarsomere 1; with multiple rows of short, stout ad setae, shorter than width of tarsomere, apex with 2 short, tooth-like setae on anterior face. Tarsomere 3 more slender, 1/2 length of preceding tarsomere; with polished inner face. Tarsomere 4 round with ad margin flattened; tarsomere 5 dorsoventrally flattened.

Mid coxa and femur lacking modified setae. Apex of mid femur with pair of ventral setae; 1 pd seta on apical third. Mid tibia shorter than femur with fringe of 4–5 subapical setae; 2 ad setae, 1 pd seta on basal third and 2 short pv setae on apical half. Tarsomere 1 more than 1/2 length of tibia with pv row of erect setae, shorter than width of tarsomere; tarsomeres 4 and 5 dorsoventrally flattened.

Hind coxa with 1 long lateral seta. Hind femur swollen, somewhat bow-shaped with pair of ventroapical setae; basal half with ad row of erect setae; 1 dorsal subapical seta. Hind tibia longer than femur with 3 ad widely spaced and 2 dorsal setae on apical half; apex partially dilated, bearing posteroapical comb; posterior face with mat of short pale setulae. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long, erect ventral seta near base and 1 long posterior seta on basal third and several rows of erect short setae; tarsomere 5 dorsoventrally flattened.

Abdomen: tergites 1–6 brownish grey, paler than mesonotum with long posteromarginal setae; sternites paler than tergites; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 shorter than length of preceding sternite, anterolateral margin not produced; T8 very narrow, lateral margin expanded; S8 with several pairs of subapical setae.

Terminalia (Fig. 151): hypandrium convex, posterior margin membranous, pair of lateral processes with sclerotized tips at apex of membranous zone; phallus arched anteriorly, erect, partially expanded apically. Postgonite divergent from hypandrium, apex folded and rounded, secondarily fused to hypandrium; base of postgonite and hypandrium greatly thickened and darkly pigmented. Epandrial lamella broad with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; short, triangular and tapered; posterior margin with fringe of short setulae. Cercus short, sclerotized laterally; tapered medially, with several stout setae.

Female. Similar to male except as follows: lacking modifications of antenna, labrum and palpus; palpus pale brown, projecting obliquely; apical portion of postpedicel subequal to base, slender and tapered; stylus nearly equal in length to apical portion of postpedicel, second flagellomere very long, nearly equal in length to third

flagellomere. Mesonotum lacking modified anterior basalare; wing venation unmodified, radial fork divergent; median fork slightly distal to radial fork. Foreleg lacking modified setae; tarsomere 1 of foreleg with row of stout ventral setae. Abdominal pleural membrane brown; apical segments retracted into segment 7; posterior margin of T7 with dense fringe of short setulae; lateral margin of S7 straight. Terminalia: T8 with dense fringe of long setae; anterior margin with pair of long flat sclerites extending into segment 7. S8 rectangular, clothed in short setae. T10 divided medially, forming pair of rectangular sclerites; clothed in curved setae, setae on posterior margin stouter. Cercus rounded with double row of curved setae, similar to posterior setae of T10. Spermatheca spherical with short wide neck.

Distribution. *Ceratomerus lobipennis* is known from the North Island and northern South Island (Map 26).

Etymology. The specific name is derived from the Latin *lobus* (elongated projection) and *penna* (wing), referring to the broad sclerotized projection on the anal lobe of the male wing.

Ceratomerus longifurcatus Collin

Map 27, Figs. 54, 55, 100, 152, 153

Ceratomerus longifurcatus Collin, 1931: 352. Other references: Miller, 1950: 79 (New Zealand catalogue); Smith, 1989: 387 (Australasian catalogue); Plant, 1991: 1327 (revision); Pont, 1995: 101 (type catalogue); Yang *et al*., 2007: 49 (catalogue); Macfarlane *et al*., 2010: 445 (New Zealand biodiversity).

Type material. Holotype male, "Type/ ♂ [red bordered circle]"; "Type of/ Ceratomerus/ longifurcatus/ Collin 1931. [hand written]"; "New Zealand:/ Queenstown./ 4.i.1923/ C.C. Fenwick./ B.M. 1923–150" (BMNH).

Additional material. New Zealand: **BR**—1 ♂, No Catchem Str., Rainbow Valley, UV lights, 6.i.1996 (CMNZ). **NC**—2 ♂, 1 ♀, Arthur's Pass NP, Bealey R., 14.ii.1995 (NZAC). **OL**—2 ♂, 1 ♀, Makarora R, Kiwi Flat, G38 22161 56676, 370 m, UV lights, 15.xii.1999 (CMNZ); 1 ♂, Route Burn, at lodge, 21358 55993, 460 m, UV lights, 3.xii.1990 (CMNZ). **WD**—3 ♂, 1 ♀, Fox Glacier Access Rd, stream, 15.i.1999 (CMNZ); 1 ♂, 1 ♀, Landsborough Valley, 400 m, 20–30.i.1995 (CMNZ); 3 ♂, 2 ♀, Westland NP, Franz Josef Glacier, YPT, cascading stream, 10–11.ii.1995 (CNC); 2 ♂, 1 ♀, Westland NP, Franz Josef Glacier, cascading stream, 10.ii.1995 (CNC).

Recognition. Males are recognized by the dark, greyish brown head and thorax, lack of labral tubercle, wing margin at apex of M_4 with deep incision, forming a small, subbasal triangular lobe, and R_{2+3} with small swelling near middle. Females may be distinguished by their greyish brown, pruinescent mesonotum, contrasting with the bright yellow fore coxa.

Re-description. Wing length 4.0–4.3 mm.

Male. Head: round, greyish brown, dusted with pruinescence; face narrower than antennal sockets, slightly convergent, pale grey, nearly yellow on ventral margin; face bare, lacking short fleshy lobe; anterior eye facets below antennae enlarged; anterior ocellus nearly in line with posterior ocelli; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/3 length of ocellar seta; 4 vertical setae, 1/2 length of ocellar seta, outer third 1/2 or less length of other vertical setae; upper postocular setae in oblique row from margin of eye, lower half of eye with 3 erect setae; pair of setae dorsolateral to base of scape. Antenna brown, lower third of scape paler; length of scape slightly longer than height of eye with several dorsal setae and 1 long, subapical ventral seta and several long lateral setae; pedicel brown with proximal margin somewhat paler, globular with setae confined to apical fringe. Postpedicel dark brown, clothed in short dense pruinescence, slightly longer than length of labrum; base rectangular, 1/2 length of apical portion; apical portion narrow, nearly parallel-sided; stylus very short, bare, shorter than base of apical portion of postpedicel. Base of labrum lacking dorsal process; palpus yellow, subequal to half length of labrum, apical fourth tapered to narrow tip, bearing 4 erect stout setae; palpus somewhat compressed at midlength, lacking basal tuft of setae, bearing lateral ad and ventral row of stout setae; postmentum with ad setae shorter than width of labium and stout ventral setae, longer than width of labium.

Thorax: entirely dark greyish brown, clothed in fine pruinescence; postpronotal lobe somewhat paler; anterior basalare inflated with brownish yellow anvil-shaped process; subalar sclerite not modified. Acrostichals with anterior pair long and erect; biserial, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower short; 2 psut spal; 1 pal, short; 2 sctl; additional setae on pprn, and interspersed among psut spal and dc. Antepronotum with pair of long setae.

Wing (Fig. 100): infuscate, pterostigma absent; 1 basal costal seta; costal margin straight; erect costal setae beyond R_1; ventral margin of costa with fine erect setae beyond R_1; posterior margin with deep incision at apex of

M_4 and subbasal lobe with rounded apex; apex of incision lacking dense microtrichia; posterior setal margin complete and of normal length; 2 long setae on wing stem; base of wing stem with narrow, sclerotized concave pocket. R_1 reaching costa before middle of wing; R_{2+3} curved gradually towards wing margin with small swelling on basal half; radial fork parallel until margin of wing; medial fork slightly proximal to radial fork; M_{1+2} short, straight; cell dm rectangular; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 slightly curved to apex of incision. Halter yellowish brown.

Legs (Figs. 54, 55): fore coxa, anterior surface of fore and mid femora, anterior 2/3 of hind femur and base of fore tibia yellow; mid and hind coxae pale with greyish tinge; posterior surface of femora yellowish brown, apex of hind femur brown; remaining leg segments dark brown. Fore coxa subequal in length to mid and hind coxae combined; base strongly inflated; anterobasal half very sparsely setose; dorsoapical margin with several stout setae. Fore trochanter with several dark setae. Fore femur arched, swollen with shallow, pv concavity fringed with dorsal multiple row of short dark setae, which extend as single row of setae to apex; ventral half of posterior face with pv row of setae only; base with 3 erect, stout dorsal setae, one setae nearly as long as width of femur; anterior face mostly bare, except for av row of fine short setae; 1 preapical dorsal seta. Fore tibia shorter than femur; apex with anteroapical comb, dilated anteriorly; apical 2/3 with row of erect pv setae beneath, twice as long as width of tibia; apical 2/3 with row of av setae, 1.5X width of tibia; dorsal margin with row of setae subequal in length to width of tibia. Tarsomere 1 half length of fore tibia, ventral face sinuous, bearing 3 stout basal setae longer than width of tarsomere; pv margin with row of short stout setae, slightly longer than tarsomere; av margin with very short row of setae, nearly 1/4 width of tarsomere; apex swollen with several stout ventral setae. Tarsomere 2 1/3 length of tarsomere 1; ventral margin with double row of erect setae. Tarsomere 3 with brush of stout posterior setae, longer than width of tarsomere. Tarsomeres 4 and 5 strongly dorsoventrally flattened, ventral surface with very short setulae.

Mid coxa and femur lacking modified setae. Apex of mid femur with pair of ventral setae; 3 short dorsal setae on distal half. Mid tibia shorter than femur with fringe of 4–5 subapical setae; basal half with 2 ad setae and 1 pd and 1 av seta. Tarsomere 1 2/3 length of tibia with pv row of erect setae, shorter than width of tarsomere; tarsomeres 4 and 5 dorsoventrally flattened.

Hind coxa with 1 long lateral seta. Hind femur swollen with pair of ventroapical setae; basal third with ad row of erect setae; 1 dorsal subapical seta. Hind tibia longer than femur with 3 widely spaced ad setae and 1 dorsal seta on apical third; apex not dilated, bearing posteroapical comb; posterior face with mat of short pale setulae. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral seta near base and 1 long posterior seta on basal third and several rows of erect short setae; tarsomeres 4 and 5 dorsoventrally flattened.

Abdomen: tergites 1–6 greyish brown, paler than mesonotum with long posteromarginal setae; sternites paler; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 slightly subequal in length to preceding sternite, anterolateral margin not produced; T8 rectangular, 1/6 length of sternite with lateral margin expanded, narrower in middle; S8 with several pairs of subapical setae.

Terminalia (Figs. 152, 153): hypandrium convex, posterior margin with pair of short lateral processes; gonocoxal apodeme long and slender; postgonite straight, strongly divergent from hypandrium, articulated at base of phallus, apex expanded and rounded; phallus arched anteriorly, erect, partially expanded apically. Epandrial lamella rectangular with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; very short and triangular, posterior margin with fringe of short setulae. Cercus short, apex tapered, bearing short setae.

Female. Similar to male except as follows: lacking modifications of antenna, labrum and palpus; palpus pale brown, projecting obliquely; apical portion of postpedicel 1.3X longer than base, slender and tapered; stylus 2/3 length of apical portion of postpedicel, second flagellomere very long, nearly equal in length to third flagellomere. Mesonotum lacking modified anterior basalare; wing venation unmodified, radial fork parallel-sided; median fork slightly proximal to radial fork. Foreleg lacking modified setae; tarsomere 1 of foreleg with long basoventral seta; hind tibia with 2 dorsal setae. Abdominal pleural membrane brown; apical segments retracted into segment 7; posterior margin of T7 with dense fringe of short setulae; lateral margin of S7 straight. Terminalia (undissected): T8 with dense fringe of long setae. T10 divided medially, forming pair of rectangular sclerites; clothed in curved

setae, setae on posterior margin stouter. Cercus rounded, with cluster of curved setae, similar to posterior setae of T10.

Distribution. *Ceratomerus longifurcatus* is known from the western side of the South Island (Map 27).

***Ceratomerus mayae* n. sp.**

Map 28, Fig. 101

Type material. Holotype male, "swept by stream/ Mt. Holdsworth/ 1000ft./ Tararua Ra [New Zealand: WN]/ 18 Nov 1968/ B.M. May."; "HOLOTYPE/ *Ceratomerus*/ *mayae*/ Sinclair [red label]" (NZAC).

Recognition. This species is very similar to *C. longifurcatus*, but differs in having the middle of R_1 swollen and strongly dipped toward R_{2+3}, and incision on posterior margin of the wing nearly at right angles to the margin, rather than oblique.

Description. Wing length 3.3 mm.

Male. Head: round, greyish brown, dusted with pruinescence; face narrower than antennal sockets, slightly convergent; pale brown, nearly yellow on ventral margin; face bare, lacking short fleshy lobe; anterior eye facets below antennae enlarged; anterior ocellus nearly in line with posterior ocelli; ocellar triangle with 2 long divergent setae, inserted anterolateral to posterior ocellus; postocellar seta slender, 1/2 length of ocellar seta; 3 vertical setae, 2/3 length of ocellar seta; upper postocular setae in oblique row from margin of eye, lower half of eye with 3 erect setae; pair of setae dorsolateral to base of scape, near eye margin. Antenna lost in holotype. Base of labrum lacking dorsal process; palpus yellow, 2/3 length of labrum, apical fourth tapered to narrow tip, bearing several subapical, erect stout setae; palpus somewhat compressed at midlength, lacking basal tuft of setae, bearing lateral and ad stout setae; postmentum with stout ad setae longer than width of labium.

Thorax: entirely dark, greyish brown, clothed in fine pruinescence; postpronotal lobe and postalar ridge paler; anterior basalare inflated, with brownish yellow anvil-shaped process; subalar sclerite not modified. Acrostichals with anterior pair long and erect; biserial, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl; 2 psut spal; 1 pal, short; 2 sctl; additional setae on pprn, and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 101): infuscate, pterostigma absent; 1 basal costal seta; costal margin straight; erect costal setae beyond R_1; ventral margin of costa lacking erect setae; posterior margin with moderate incision at apex of M_4, nearly right angles to wing margin; subbasal lobe not produced; apex of incision lacking dense microtrichia; posterior setal margin complete and of normal length; 2 long setae on wing stem; base of wing stem with narrow, sclerotized concave pocket. R_1 reaching costa before middle of wing with swelling near midlength, dipped stongly toward R_{2+3}; R_{2+3} curved gradually towards wing margin with large circular swelling on basal half; radial fork parallel until margin of wing; medial fork slightly proximal to radial fork; M_{1+2} short, straight; cell dm rectangular; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 short with slight curve to apex of incision. Halter bright yellowish brown.

Legs: coxae, basal third of fore tibia and femora yellow, except apex of hind femur brownish; remaining leg segments dark. Fore coxa subequal in length to mid and hind coxae combined; base inflated; anterobasal half very sparsely setose; dorsoapical margin with several dark setae. Fore trochanter with several dark setae. Fore femur swollen with shallow pv concavity fringed with posterior row of short dark setae, increasing in length apically; base of femur round, knob-like, bearing row of 3 long dark setae in line with posterior row; ventral to setae row of 4 compressed stout setae; anterior face mostly bare, except av row of fine short setae; 1 preapical dorsal seta. Fore tibia shorter than femur; apex with anteroapical comb, dilated anteriorly; ventral margin with biserial row of erect setae, as long as 1.5X width of tibia; dorsal margin with row of setae subequal in length to width of tibia. Tarsomere 1 half length of fore tibia, slightly sinuous, bearing pv row of stout setae, 1.5X width of tarsomere; av margin with row of shorter setae; apex slightly inflated with several stout ventral setae. Tarsomere 2 1/3 length of tarsomere 1 with double row of erect setae beneath. Tarsomere 3 longer than wide with brush of stout posterior setae, longer than width of tarsomere; dorsal margin with several stout subapical setae. Tarsomeres 4 and 5 strongly dorsoventrally flattened, ventral surface with very short setulae.

Mid coxa and femur lacking modified setae. Apex of mid femur with pair of ventral setae. Mid tibia shorter than femur with 1 long, subapical ventral seta; basal half with 2 ad setae. Tarsomere 1 2/3 length of tibia; tarsomeres 4 and 5 dorsoventrally flattened.

Hind coxa with 1 long lateral seta. Hind femur swollen with pair of ventroapical setae; basal third with ad row of erect setae; 1 dorsal subapical seta. Hind tibia longer than femur with 3 widely spaced ad setae; apex slightly dilated, bearing posteroapical comb; apical 2/3 of posterior face with mat of short pale setulae. Hind tarsomeres longer than tibia; tarsomere 1 lacking (?) ventral seta, bearing several rows of erect short setae; tarsomeres 4 and 5 dorsoventrally flattened.

Abdomen: segments 1–6 greyish brown, concolourous with mesonotum, clothed with pale setae; sternites and tergites lacking modified setae and ridges.

Terminalia (undissected): pale brown; surstylus short, subtriangular; remaining components not visible.

Female. Unknown.

Distribution. *Ceratomerus mayae* is known only from the type-locality in the southern North Island (WN) (Map 28).

Etymology. The specific name is a patronym in honour of the late Brenda M. May, who collected the holotype.

Remarks. *Ceratomerus mayae* appears most closely related to *C. longifurcatus* on the basis of wing venation and wing modifications.

***Ceratomerus mirandus* n. sp.**

Map 29, Figs. 31, 32, 102, 154

Type material. Holotype male, "NEW ZEALAND: BR/ Lewis Pass, Dans Ck/ to Foleys Ck, UV/ 27-28.x.1996/ Ward, Patrick, Morris"; "HOLOTYPE/ *Ceratomerus*/ *mirandus*/ Sinclair [red label]" (NZAC).

Paratypes: **BR**—2 ♂, 3 ♀, same data as holotype (CMNZ). **MC**—1 ♂, Bowyers Str., 450 m, Sharplin Falls Car Pk, 23823 57298, 12.xi.1998, J.B. & G.M. Ward (CMNZ); 35 ♂, 24 ♀, Hanmer, Dog Str. Trib, 24977 58559, 400 m, UV light, 28.v.1991, JBW (CMNZ; NZAC; CNC); 6 ♂, 3 ♀, Thomas R, 800 m, water intake, 24041 57772 [43°12.31′S 171°41.77′E], 6–10.v.1991, JBW (CMNZ). **NC**—1 ♂, Arthur's Pass NP, Bealey River, 14.ii.1995, 800 m, BJS (CNC); 1 ♂, 2 ♀, Arthur's Pass, Halpin Stream, 19.v.1970, PMJ; swept str. (CMNZ). **WD**—1 ♂, nr Fox Glacier, Rocky Ck, 5.xi.1995, JBW & Patrick (CMNZ).

Recognition. Males are recognized by the dark greyish brown head and thorax, wing margin at apex of M_4 with deep incision and sclerotized, sculptured anal lobe, and R_{2+3} lacking small swelling.

Description. Wing length 5.5–6.0 mm.

Male. Head (Fig. 31): oval, greyish brown, dusted with pruinescence; face greyish brown, narrower than antennal sockets, slightly convergent; face bare, with short, round yellow fleshy lobe; anterior eye facets below antennae enlarged; anterior ocellus nearly in line with posterior ocelli; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/2 length of ocellar seta; 4 vertical setae, 1/2 to 2/3 length of ocellar seta, third seta reduced and slender; upper postocular setae in oblique row from margin of eye, lower half of eye with 3 erect setae; pair of setae dorsolateral to base of scape lacking. Antenna brown, base of scape paler; scape greatly lengthened, twice length of height of eye with several dorsal and lateral setae and 1 long subapical ventral seta; pedicel brown with proximal margin somewhat paler, globular with setae confined to apical fringe. Postpedicel dark brown, clothed in short dense pruinescence, slightly longer than length of labrum; base rectangular, 2/3 length of apical portion; apical portion narrow, tapered; stylus very short, bare. Base of labrum lacking dorsal process; palpus yellow, subequal to half length of labrum, apical half flattened medially, tapered to narrow tip, bearing dorsal row and pv row of stout setae; palpus concave at mid-length with ad knob and ventral row of 5 stout setae, longer than width of palpus; base with pv tuft of appressed, parallel setae; postmentum with ad setae shorter than width of labium and stout ventral setae, longer than width of labium.

Thorax (Fig. 31): dark, greyish brown, except for antepronotum, postpronotal lobe, dorsal margin of pleura and postalar ridge yellow; clothed in fine pruinescence; anterior basalare inflated into brownish yellow anvil-shaped process; subalar sclerite not modified. Acrostichals with anterior pair long and erect; biserial, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower short; 2 psut spal; 1 pal, short; 2 sctl; additional setulae on pprn, and long setae interspersed among dc. Antepronotum with pair of short setae.

Wing (Fig. 102): infuscate, pterostigma absent; 1 long basal costal seta; costal margin straight; erect costal setae beyond R_1; ventral margin of costa with erect setae beyond R_1; posterior margin with deep incision at apex of

M_4 and broad subbasal lobe with rounded apex, ventral surface clothed in fine dense microtrichia; anal lobe with sculptured sclerotized margin, bearing dense setae; dorsal row of dense macrotrichia posterior to M_4; posterior setal margin complete and of normal length; setae on wing stem not modified; base of wing stem with deep, narrow sclerotized concave pocket. R_1 reaching costa before middle of wing; R_{2+3} curved gradually towards wing margin, lacking swelling; radial fork divergent; medial fork proximal to radial fork; M_{1+2} bent opposite incision; cell dm short, rectangular; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 thickened, extending to apex of incision. Halter yellowish brown.

Legs (Fig. 32): fore coxa, anterior surface of fore and mid femora, anterior 2/3 of hind femur and base of fore tibia yellow; mid and hind coxae pale with greyish tinge; posterior surface of femora yellowish brown, apex of hind femur brown; remaining leg segments dark brown. Fore coxa longer than length of mid and hind coxae combined; base strongly inflated; mid-length with small ad tubercle; anterobasal half very sparsely setose; dorsoapical margin with 1 stout seta. Fore trochanter with unmodified setae. Fore femur arched, greatly swollen with pv concavity and swelling on posterior face near middle; base with posterior pair of hooked processes; posterior face sparsely setose with short pv row of setae near apex; base with 2 erect, stout dorsal setae; anterior face mostly bare, except av row of setae, most stout and longest on margin of concavity; apex with pair of ventral setae; 1 preapical dorsal seta. Fore tibia stout, shorter than femur; apex with anteroapical comb, strongly dilated anteriorly; densely clothed in long setae, especially along av margin. Tarsomeres very stout and broad; tarsomere 1 half length of fore tibia, ventral face sinuous, bearing ventral comb of 6–8 stout blunt setae on basal third, subequal to width of tarsomere; av margin with pair of combs of stout setae; pv margin with row of long setae near middle, longer than width of tarsomere; 1 pd subapical seta. Tarsomere 2 inflated, wider than tarsomere 1; anterior face with several rows of stout erect setae. Tarsomere 3 not longer than wide with polished, sculptured anterior face. Tarsomere 4 square, basal half with white membranous zone on anterior face; tarsomere 5 dorsoventrally flattened.

Mid coxa and femur lacking modified setae. Apex of mid femur with pair of ventral setae. Mid tibia shorter than femur with fringe of 4–5 subapical setae; basal half with 1 pd seta. Tarsomere 1 1/2 length of tibia with pv row of erect setae, shorter than width of tarsomere; tarsomeres 4 and 5 dorsoventrally flattened.

Hind coxa with 1 long lateral seta. Hind femur slender with pair of ventroapical setae; basal half with ad row of erect setae; 1 dorsal subapical seta. Hind tibia longer than femur with 2 ad and 2 dorsal setae on apical half; apex dilated, bearing posteroapical comb; posterior face with mat of short pale setulae. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral seta near base and 1 long posterior seta on basal third and several rows of erect short setae; tarsomeres 4 and 5 dorsoventrally flattened.

Abdomen: tergites 1–6 brownish grey, paler than mesonotum with long posteromarginal setae; sternites concolourous with tergites; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 shorter than length of preceding sternite, anterolateral margin not produced; S8 with several pairs of subapical setae.

Terminalia (Fig. 154): hypandrium convex, posterior margin membranous, lacking extension; postgonite curved, divergent from hypandrium, apex rounded sharply arched; phallus arched anteriorly, erect, partially expanded apically. Epandrial lamella broad. Surstylus not distinctly differentiated from epandrium; long and tapered; posterior margin with fringe of short setulae. Cercus long, lateral and apical margins sclerotized; outer apex with stout setae; inner margin bearing long stout setae; inner base with several setae.

Female. Similar to male except as follows: head round, lacking modifications of antenna, labrum and palpus; palpus pale brown, projecting obliquely; apical portion of postpedicel longer than base, slender and tapered; stylus slightly shorter than apical portion of postpedicel, second flagellomere 3X longer than wide. Mesonotum lacking modified anterior basalare, brown in colour; wing venation unmodified, median fork slightly distal or proximal to radial fork. Legs lacking modified setae; tarsomere 1 of foreleg with long basoventral seta; hind tibia with 2 stout pd setae and 1 preapical ad seta. Abdominal tergites dark brown, pleural membrane brownish; apical segments retracted into segment 7; posterior margin of T7 with dense fringe of short setulae; lateral margin of S7 straight. Terminalia (not dissected): T8 narrow dorsally, expanded laterally; dense fringe of long setae present. S8 triangular, posterior margin invaginated forming inner sclerite. T10 divided medially, forming pair of rectangular sclerites; with numerous spine-like setae on posterior margin, remaining sclerite more sparsely clothed. Cercus rounded, with cluster of stout spine-like setae, similar to posterior setae of T10.

Distribution. *Ceratomerus mirandus* is known from the central South Island (Map 29).

Etymology. The specific name is derived from the Latin *mirandus* (wonderful, strange), referring to its bizarre morphological modifications.

***Ceratomerus notatus* n. sp.**

Map 30, Figs. 16, 33, 56–58, 103, 155, 158

Type material. Holotype male, "NEW ZEALAND: MB/ Mt. Richmond For. Pk./ Butcher's Flat, 5.ii.1995/ BJ Sinclair/ ex. cascading creek"; "HOLOTYPE/ *Ceratomerus*/ *notatus*/ Sinclair [red label]" (NZAC).

Paratypes: New Zealand: **BR**—33 ♂, 31 ♀, Nelson Lks NP, Lk Rotoiti/ *Nothofagus* + ck, 15–16.ii.1995, YPT, BJS (AMS, BMNH); 4 ♂, 5 ♀, same locality, Lk Rotoroa, Braeburn Tr., 7–8.ii.1995 (CNC); 3 ♂, same locality, Lk Rotoroa, Black Valley Str., YPT, 15–16.ii.1995 (ANIC); 16 ♂, 18 ♀, Lk Rotoiti, E side streams, 4.i.1996, J.B. & G.M. Ward (CMNZ). **MB**—22 ♂, 9 ♀, same data as holotype (NZAC); 10 ♂, 5 ♀, same locality, small ck, YPT, 5-6.ii.1995 (CNC); 2 ♂, 1 ♀, same locality, Doom Ck, YPT, 5–6.ii.1995 (AMS); 2 ♂, 4 ♀, same locality, *Nothofagus* for., 5–6.ii.1995 (NZAC); 1 ♂, 1 ♀, Pelorus R trib., waterfall 1, 60 m, 027 25575 59889, 18.xii.2000, J.B. & G.M. Ward (CMNZ). **MC**—1 ♂, Awa Awa Rata Res., K36 23912 53375, 540 m, 18.iii.2000, U lights, JBW (CMNZ). **NN**—1 ♂, 1 ♀, Abel Tasman NP, 800 m, Harwoods Hole, sphagnum/ *Nothofagus*, YPT, 6–7.ii.1995, BJS (CNC); 1 ♂, Aniseed Valley, 22.iii.1922, A. Tonnoir (ANIC); 2 ♂, 2 ♀, Nelson, 120–160 m, UV-light, 29–30.xii.1994, JBW (CMNZ); 1 ♂, 2 ♀, Nelson, Smith Ford Br., Maitai R./trib. 21.xii.1994, JBW (CMNZ); 1 ♂, Whangamaoa Sc. Res., small cks, bush, 320 m, 17.xii.1996, R.P. Macfarlane (CMNZ); 1 ♀, Hwy 67 N Waimarie, roadcut spring, 8.ii.1995, BJS (NZAC). **SI**—2 ♂, 3 ♀, Stewart Island, Christmas Village Hut, D48 21261 53729, 15 m, 16–17.i.2000, JBW, Edwards, Beaven (CMNZ); 1 ♂, Smoky Beach W end, UV lights, D48 21144 53769, 14.i.2000, J.B. & G.M. Ward, E. Edwards (CMNZ). **WD**—1 ♂, 2 ♀, Westland NP, Franz Josef Glacier, Lk Wombat Tr., 10.ii.1995, BJS (NZAC).

Additional material examined. New Zealand: **BR**—20 ♂, 15 ♀, Matakitaki R. tribs, W Bank Rd., Murchison, 14.iii.1993, JBW (CMNZ). **FD**—1 ♂, Waiau R. small tribs, 21.ii.1996, JBW (CMNZ).

Recognition. Males are recognized by lack of a labral tubercle, scutum with broad median stripe, discal cell subrectangular with apex convex, wing margin at apex of M_4 with shallow incision, lacking subbasal lobe, M_1, M_2, and R_5 with long erect microtrichia, and R_{2+3} with long, narrow swelling near base. Females may be distinguished by the broad median stripe and darkened supra-alar region of the scutum, similar to that of the male.

Description. Wing length 3.5–3.7 mm.

Male. Head (Fig. 33): round, dark brown; face yellow and bare, slightly convergent, narrower than antennal sockets, with small, round fleshy lobe on ventral margin; anterior eye facets below antennae enlarged; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/3 to 1/2 length of ocellar seta; 3 vertical setae, 1/2 length of ocellar seta; upper postocular setae in single oblique row; 2 lower postocellars stout near eye margin. Antenna brown (Fig. 56); length of scape slightly longer than height of eye with several short dorsal setae and 1 long seta beyond mid-length, 1 long subapical ventral seta; pedicel somewhat paler, globular with setae confined to apical fringe. Postpedicel brown, clothed in short dense pruinescence, slightly longer than length of labrum; base rectangular, 1/2 length of apical portion; apical portion narrow, slightly tapered; stylus very short, bare, shorter than base of apical portion of postpedicel. Base of labrum lacking dorsal process; palpus yellow, sinuous, 1/2 length of labrum, somewhat flattened, lacking basal tuft of setae; pd margin with biserial row of stout setae, increasing in length apically (Fig. 57); apex of palpus with 4 very stout spine-like setae, outer 2–3 twice length of inner setae; prementum with short, stout ventral setae at mid-length and row of stout dorsal setae.

Thorax: mesonotum mostly yellow, except for narrow, brown, central stripe slightly wider than acrostical row and expanded in prescutellar depression to margin of dc extending to apex of scutellum; presutural and postsutural regions with brown light brown patch; lateral margin of scutellum pale brown; postnotum with triangular, median patch and lateral margin brown; pleura and laterotergite yellow; anterior basalare inflated with sickle-shaped process, base of process brownish yellow; subalar sclerite not modified. Acrostichals with anterior pair long and erect; biserial, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower short; 2 psut spal; 1 pal, short; 2 sctl; additional setulae on pprn. Antepronotum with pair of long setae.

Wing (Fig. 103): infuscate, anal lobe darker, pterostigma absent; 1 long basal costal seta; costal margin straight; erect costal setae beyond R_1; ventral margin of costa with fine erect setulae beyond R_1; posterior margin with shallow incision at apex of M_4, lacking subbasal lobe; apex of incision lacking dense microtrichia; posterior setal margin very short from basal lobe to tip of wing, except incision; many stout setae on wing stem; base of wing stem with round, darkly sclerotized deeply concave pocket. R_1 reaching costa well before middle of wing; R_{2+3} divergent from costa, with long slender swelling near base, beyond swelling gradually curved towards wing margin; medial fork slightly proximal to radial fork; M_{1+2} very short, straight; cell dm subrectangular, apex convex; M_1, M_2, and R_5 with long erect microtrichia; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 slightly sinuous, terminating at base of incision. Halter knob brownish.

Legs: coxae and femora yellow, except extreme tip of hind femur dark; legs otherwise brown. Fore coxa slightly shorter than length of mid and hind coxae combined; anterior margin very sparsely setose, lacking swelling at mid-length; anterior, apical margin with long setae. Fore trochanter with 1 ventral seta. Fore femur straight, inflated with bare posterior face with setae confined to pd margin; pv margin with row of short even-lengthed setae; base with patch of stout, apically directed setae, shorter than width of femur; anterior face mostly bare, except for av row of fine short setae, longer than pv setae; 2 apicoventral setae and 1 preapical dorsal seta. Fore tibia shorter than femur; apex with anteroapical comb, not dilated; 1 row of erect short setae beneath. Tarsomere 1 more than 1/2 length of fore tibia, slightly sinuous with bare preapical depression; 1 anterovental seta at base, longer than width of tibia; basal 2/3 with ventral row of stout curved setae, longer than width of tarsomere and av row of very short, stout peg-like setae; 1 erect ventral seta beyond depression, subequal to width of tarsomere. Tarsomere 2 slightly shorter than tarsomere 3; av margin with row of stout setae, 1/2 width of tarsomere. Tarsomere 3 cylindrical and straight. Tarsomeres 4 and 5 somewhat dorsoventrally flattened.

Mid coxa and femur lacking modified setae. Mid femur with short pd seta just beyond middle; apex with pair of ventral subapical setaeristles and 1 stout ad seta. Mid tibia subequal in length to femur with 3 pairs of ad and pd setae; apex with fringe of 3–4 subapical setae, ventral seta longest; proximal half with 1 short av seta; distal half with 1 av and 2 pv short setae. Tarsomere 1 less than 1/2 length of tibia, lacking distinctive setae; tarsomere 5 partially dorsoventrally flattened.

Hind coxa with 1 long lateral seta. Hind femur swollen with pair of ventral subapical setae; basal half with ad row of erect setae; 1 dorsal subapical seta. Hind tibia longer than femur with 3 ad widely spaced setae and 1 short dorsal seta on apical fourth; apical 2/3 of posterior face with long dense mat of setulae; apex slightly dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral seta near base and 1 long posterior seta on basal third and several rows of erect short setae; tarsomere 5 slightly dorsoventrally flattened.

Abdomen: tergites 1–6 brown, dorsum of tergites 2–5 nearly black with short posteromarginal setae; sternites pale yellow; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 subequal in length to preceding sternite, anterolateral margin not produced; T8 rectangular, 1/6 length of sternite, with lateral margin expanded; S8 with setae of similar length.

Terminalia (Figs. 155, 158): hypandrium convex, posteriorly thinly sclerotized, apex divided into pair of wide processes; gonocoxal apodeme long and slender; postgonite divergent from hypandrium, apex folded and rounded, base secondarily fused to hypandrium and medially; apex of phallus arched anteriorly, erect with expanded tip in lateral view, flanked by membranous sac. Epandrial lamella broad with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; very short, subtriangular, apex curved medially; posterior margin with fringe of setae. Cercus short, outer face well sclerotized, gradually tapered from expanded middle; expanded medially bearing fringe of stout setae, longer than width of expanded region.

Female. Similar to male except as follows: head round, lacking modifications of antenna, labrum and palpus; palpus brown, projecting obliquely; apical portion of postpedicel slightly longer than base, very slender and tapered; stylus slightly shorter than apical portion of postpedicel, second flagellomere short. Mesonotum lacking modified anterior basalare, brown in colour; wing venation unmodified, median fork slightly proximal to radial fork. Legs lacking modified setae; tarsomere 1 of foreleg with long basoventral seta; hind tibia with 2 stout pd setae. Abdominal tergites dark brown, pleural membrane white; apical segments retracted into segment 7; posterior margin of T7 with dense fringe of short setulae; lateral margin of S7 straight. Terminalia: T8 narrow dorsally, expanded laterally; dense fringe of long setae present; anterior margin with pair of long flat dorsolateral sclerites.

S8 triangular, posterior margin invaginated forming inner sclerite. T10 divided medially, forming pair of rectangular sclerites; with 7 spine-like setae on posterior margin, remaining sclerite more sparsely clothed. Cercus rounded, with cluster of 7 closely placed, stout spine-like setae, similar to posterior setae of T10; apical margin with 5 long slender setae. Spermathecal receptacle spherical with short wide opening.

Distribution. *Ceratomerus notatus* is widespread on the South Island (Map 30).

Etymology. The specific name is derived from the Latin *notatus* (mark), referring to the broad median stripe on the dorsal of the scutum.

***Ceratomerus subnotatus* n. sp.**

Map 31, Fig. 104

Type material. Holotype male, "NEW ZEALAND: NC/ Arthur's Pass NP/ Bealey R. Tr., 800m/ 11-12.ii.1995, yellow/ pans, B.J. Sinclair"; "HOLOTYPE/ *Ceratomerus*/ *subnotatus*/ Sinclair [red label]" (NZAC).

Recognition. Males are recognized by lacking a labral tubercle, scutum lacking median stripe, discal cell subrectangular and apex convex, and R_{2+3} lacking swelling.

Description. Wing length 3.5 mm.

Male. Head: round, dark brown; face yellow and bare, slightly convergent, narrower than antennal sockets, with small, round fleshy lobe on ventral margin; anterior eye facets below antennae enlarged; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; posterior ocelli widely spaced, greater than length to anterior ocellus; postocellar seta slender, 1/3 to 1/2 length of ocellar seta; 3 vertical setae, 1/2 length of ocellar seta; upper postocular setae in single oblique row; 2 lower, slender postocellars near eye margin. Antenna brown; length of scape subequal to height of eye with several short dorsal setae and 1 long seta before mid-length, 1 long, subapical ventral seta; pedicel globular with setae confined to apical fringe. Postpedicel brown, clothed in short dense pruinescence, slightly longer than length of labrum; base rectangular, 1/2 length of apical portion, sharply attenuated; apical portion narrow, slightly tapered, arista-like; stylus very short, bare, shorter than base of apical portion of postpedicel. Base of labrum lacking dorsal process; palpus yellow, broad, apical half somewhat swollen, apex truncate; 0.25X length of labrum, lacking basal tuft of setae; pd margin with biserial row of stout setae, length less than width of palpus; apex of palpus with many spine-like setae, pv setae nearly subequal to length of palpus; prementum with row of stout dorsal setae, mid-length with 3–4 stout perpendicularly projecting setae, some longer than width of prementum.

Thorax: mesonotum mostly brown, anterior margin between and including postpronotal lobes, margin of notopleuron, supralar ridge and lateral margin of scutellum yellow; postnotum mostly brown with dark central stripe and lateral yellow patches; pleura and laterotergite yellow; anterior basalare inflated into sickle-shaped process; subalar sclerite not visible. Acrostichals with anterior pair long and erect; biserial, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower short; 2 psut spal; 1 pal, short; 2 sctl; additional setulae on pprn and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 104): infuscate, anal lobe darker, pterostigma absent; 1 long basal costal seta; costal margin straight; erect costal setae beyond R_1; ventral margin of costa with fine erect setulae beyond R_1; posterior margin with slight concavity at apex of M_4, lacking subbasal lobe; apex of concavity with unmodified marginal setae; posterior setal margin with short setae, except 2 stout setae on wing stem; base of wing stem with round, darkly sclerotized deeply concave pocket. R_1 reaching costa well before middle of wing; R_{2+3} gradually curved towards wing margin, lacking basal swelling; medial fork lacking petiole, proximal to radial fork; M_{1+2} arising directly from cell dm; cell dm subrectangular, apex convex, ventral margin concave; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 slightly sinuous. Halter knob pale.

Legs: coxae and ventrum of femora yellow, except apex of femora darkened; remaining leg segments brown. Fore coxa subequal to length of mid and hind coxae combined; anterior margin very sparsely setose, lacking swelling at mid-length; anterior apical margin with broad comb of 5 long black setae. Fore trochanter with 2 ventral setae. Fore femur straight, inflated with bare posterior face with setae confined to pd margin; pv margin with row of short even-lengthed setae; base with patch of stout apically directed setae, shorter than width of femur; anterior face obscurred, not visible; 2 apicoventral setae and 1 preapical dorsal seta. Fore tibia shorter than femur; apex with anteroapical comb, not dilated; 1 row of erect setae beneath, nearly subequal to width of tibia. Tarsomere 1 more

than 1/2 length of fore tibia, slightly sinuous with bare preapical constriction; 1 anteroventral seta at base, shorter than width of tibia; basal two-thirds with ventral row of 8 stout curved setae, longer than width of tarsomere, decreasing in length apically; av row of very short stout setae; 1 erect ventral seta beyond depression, subequal to width of tarsomere. Tarsomere 2 slightly shorter than tarsomere 3; av margin with row of stout setae, 1/2 width of tarsomere. Tarsomere 3 cylindrical and straight.Tarsomeres 4 and 5 somewhat dorsoventrally flattened.

Mid coxa and femur lacking modified setae. Mid femur with pair of ventral subapical setae and 1 stout ad seta. Mid tibia subequal in length to femur with 1 pd seta on basal third; apex with fringe of 3–4 subapical setae, ventral seta longest. Tarsomere 1 less than 1/2 length of tibia, lacking distinctive setae; tarsomere 5 dorsoventrally flattened.

Hind coxa with 1 long lateral seta. Hind femur swollen, with pair of ventral subapical setae; basal half with ad row of erect setae; 1 dorsal subapical seta. Hind tibia longer than femur with 2 ad widely spaced setae and 1 long anterior preapical seta; apical 2/3 of posterior face with long, dense mat of setulae; apex slightly dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral seta near base and 1 long posterior seta on basal third and several rows of erect short setae; tarsomere 5 dorsoventrally flattened.

Abdomen: sternites and tergites 1–6 brown, with short posteromarginal setae 1/2 length of tergite; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 subequal in length to preceding sternite, anterolateral margin not produced; S8 with setae of similar length.

Terminalia (undissected): Similar to *C. notatus*.

Female. Unknown.

Distribution. *Ceratomerus subnotatus* is known only from the type-locality in the central South Island (NC) (Map 31).

Etymology. The specific name is derived from the Latin *sub* (somewhat) and *notatus*, alluding to the structural similarity between this species and *C. notatus*.

***Ceratomerus whirinaki* n. sp.**

Map 32, Figs. 59–61, 105, 159

Ceratomerus exiguus Plant, 1991: 1322, nec Collin, 1928: 20 (misidentification of female).

Type material. Holotype male, "NEW ZEALAND: Whirinaki/ For. Pk., Minginui/ 20.ii.1995; Whirinaki/ R., B.J. Sinclair"; "HOLOTYPE/ *Ceratomerus*/ *whirinaki*/ Sinclair [red label]" (NZAC).

Paratypes: New Zealand: **BP—**1 ♀, Urewera NP, Manangaatiuhi [as Manangaatiuhuia] str., 19.iv.1987, A.R. Plant (NZAC). **TO**—8 ♂, 4 ♀, same data as holotype, 20–21.ii.1995, sweeping/ YPT (AMS, CNC, NZAC). **WN**—1 ♂, Cloustonville, Akatarawa R & Valley, 3.ii.1995, BJS (CNC); 1 ♂, Mt. Holdsworth, Tararua Ra, 1000 m, stream, 18.xi.1968, B.M. May (NZAC).

Recognition. Males are recognized by lack of a labral tubercle, discal cell trapezoidal, wing margin at apex of M_4 with deep incision, forming a subbasal lobe, and R_{2+3} with small swelling near middle. Females are possibly distinguished by the largely yellow pleura with faint upper dark streak and yellow postpronotal lobe.

Description. Wing length 3.2–3.5 mm.

Male. Head: somewhat flattened along face, brown, not shiny; face narrow, parallel-sided, narrower than antennal sockets, yellow, bare, lacking short fleshy lobe; anterior eye facets below antennae enlarged; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/3 length of ocellar seta; 3 vertical setae, 1/2 length of ocellar seta; postocular setae in single row along margin of eye, lower half of eye lacking modified setae. Antenna brown (Fig. 59), lower third of scape yellow; length of scape longer than height of eye with several short dorsal setae and 1 long seta beyond mid-length, 1 long subapical ventral and 1 long ventrolateral seta; pedicel brown with proximal margin pale, globular, with setae confined to apical fringe. Postpedicel dark brown, clothed in short dense pruinescence, slightly longer than length of labrum; base rectangular, 2/3 length of apical portion; apical portion narrow, slightly tapered; stylus very short, bare, shorter than base of apical portion of postpedicel. Base of labrum lacking dorsal process; palpus yellow, slender, more than half length of labrum, cylindrical, lacking basal tuft of setae; middle with long lateral and ventral setae longer than width of palpus; prementum with short, slender ad setae and stout, short ventral setae.

Thorax: mesonotum, postnotum, and dorsal margin of laterotergite brown; pleura, lower 3/4ers of laterotergite, postpronotal lobe and lower half of notopleuron yellow; anterior basalare inflated with flat oval process; subalar sclerite not modified. Acrostichals with anterior pair long and erect; biserial, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower shorter, but stout; 2 psut spal; 1 short pal; 2 sctl; additional setulae on pprn and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 105): infuscate, pterostigma absent; 1 basal costal seta short and slender; costal margin straight; erect costal setae beyond R_1; ventral margin of costa with fine erect setulae beyond R_1; posterior margin with deep incision at apex of M_4 and small triangular subbasal lobe; apex of incision lacking dense microtrichia; posterior setal margin very short from proximal to incision to tip of wing; 2 long setae on wing stem; base of wing stem with round, sclerotized deeply concave pocket. R_1 reaching costa before middle of wing; R_{2+3} curved gradually towards wing margin, with small swelling in middle of vein; medial fork proximal to radial fork; M_{1+2} strongly bent opposite incision; cell dm trapizoidal; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 straight, apex split at incision, not reaching wing margin. Halter knob brownish.

Legs (Figs. 60, 61): coxae and femora yellow, except extreme tip of hind femur dark; remaining leg segments brown. Fore coxa slightly longer than mid and hind coxae combined; anterior margin very sparsely setose; very small, anterior swelling at mid-length; dorsoapical margin with short stout seta. Fore trochanter with 1 posterior seta. Fore femur arched, swollen with shallow posterobasal concavity; posterior face with setae confined to 2 rows (lower row decreasing in length apically) and 1 basal seta; base with 3 erect dorsal setae; anterior face mostly bare, except for av row of fine short setae; 2 apicoventral setae and 1 preapical dorsal seta. Fore tibia shorter than femur; apex with anteroapical comb, not dilated; row of erect setae beneath, distal setae longer than width of tibia. Tarsomere 1 half length of fore tibia, slightly curved with 1 basal seta longer than width of tibia; basal 2/3 with pv row of stout, apically curved setae, longer than width of tarsomere; apex partially swollen, with several erect ventral setulae. Tarsomere 2 longer than wide, shorter than tarsomere 3; av margin with erect setulae. Tarsomere 3 partially curved. Tarsomeres 4 and 5 dorsoventrally flattened, ventral surface with very short setulae.

Mid coxa and femur lacking modified setae. Apex of mid femur with pair of ventral setae; dorsal seta lacking. Mid tibia subequal in length to femur, with fringe of 4–5 subapical setae; basal half with 2 ad and 1 pd setae. Tarsomere 1 2/3 length of tibia, with pv row of erect stout setae, shorter than width of tarsomere; tarsomeres 4 and 5 dorsoventrally flattened.

Hind coxa with 1 long lateral seta. Hind femur swollen, with pair of ventroapical setae; basal third with ad row of erect setae; 1 dorsal subapical seta. Hind tibia longer than femur with 3 ad and 2 dorsal widely spaced setae; posterior face with long dense mat of setulae; apex not dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral seta near base and 1 long posterior seta on basal third and several rows of erect short setae; tarsomere 5 dorsoventrally flattened.

Abdomen: tergites 1–6 brown, paler than mesonotum, with long posteromarginal setae; sternites yellow, becoming darker apically; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 slightly longer than preceding sternite, anterolateral margin not produced; T8 rectangular, 1/6 length of sternite, with lateral margin expanded; S8 with pair of long, subapical setae.

Terminalia (Fig. 159): hypandrium convex, posterior margin membranous, lacking extension; gonocoxal apodemes long and slender; postgonite straight, strongly divergent from hypandrium, articulated at base of phallus, apex rounded; phallus arched anteriorly, erect with spatulate tip in lateral view. Epandrial lamella triangular, narrowed apically with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; posterior margin with fringe of short setae, very slender on apical half. Cercus short, outer face well sclerotized, gradually tapered from expanded middle; median margin with fringe of long stout setae, nearly subequal in length to apical half of cercus.

Female. Similar to male except as follows: head round, lacking modifications of antenna, labrum and palpus; palpus brown, projecting obliquely; apical portion of postpedicel 1.5X longer than base, slender and tapered; stylus more than half length of apical portion of postpedicel, second flagellomere 5X longer than wide. Mesonotum mostly dark with postpronotal lobe and lower half of notopleuron yellow; pleura yellow with faint upper dark streak; lacking modified anterior basalare; wing venation unmodified, median fork proximal to radial fork. Legs

lacking modified setae; tarsomere 1 of foreleg with long basoventral seta; mid tibia with 3 ad and 3 pd setae; hindleg similar. Abdominal pleural membrane brownish; apical segments retracted into segment 7; posterior margin of T7 with dense fringe of short setae; lateral margin of S7 straight. Terminalia (undissected): T8 narrow dorsally, expanded laterally; dense fringe of long setae present. T10 divided medially, forming pair of rectangular sclerites; clothed in short curved setae, setae on posterior margin stouter. Cercus rounded with cluster of many closely placed, stout curved setae, similar to posterior setae of T10.

Distribution. *Ceratomerus whirinaki* is known from the central and southern North Island (Map 32).

Etymology. The specific name is derived from the type-locality.

Remarks. See Remarks section under *C. exiguus*.

Ceratomerus mangamuka species-group

This species-group includes two New Zealand species and is characterized primarily by the lengthened pedicel, unlike any other New Zealand species of *Ceratomerus*. This character is apparently a synapomorphy shared with *C. longicornis* Sinclair (Ecuador) and the *C. ordinatus* species-group (Australia) (Sinclair 2010).

Ceratomerus mangamuka n. sp.

Map 41, Figs. 106, 160

Type material. Holotype male, "NEW ZEALAND: ND/ Mangamuka Gorge/ 9.v.1974/ G. Kuschel"; "HOLOTYPE/ *Ceratomerus*/ *mangamuka*/ Sinclair [red label]" (NZAC).

Paratype: New Zealand: **ND**—1 ♂ (dried from alc.), same data as holotype (NZAC).

Recognition. *Ceratomerus mangamuka* is distinguished from all other New Zealand species, except its sister species, by the lengthened pedicel. It is separated from *C. spinosus* by its petiolate medial fork and vein R_{2+3} extending to the costa.

Description. Wing length 3.5 mm.

Male. Head: subrectangular, flattened at antennal sockets; dark brown, not shiny; face pale yellow, lacking setulae, broad, wider than antennal sockets; frons lacking setae; anterior eye facets below antennae not enlarged; ocellar triangle with pair of divergent ocellar setae inserted anterior to posterior ocelli; posterior ocelli widely separated, greater than distance to anterior ocellus; postocellar seta slender, 2/3 length of ocellar seta; 2 pairs of long vertical setae, outer setae longer and stouter than postocellar seta; lower half of eye lacking long overlapping postocular setae. Antenna brown with scape nearly 1.5X longer than eye height with 1 dorsal seta beyond middle and 1 short ventral seta near middle; pedicel lengthened, slightly less than half length of scape with apical fringe of long setae. Postpedicel covered by long dense pruinescence, slightly longer than length of labrum; rectangular base slender, 1/3rd length of apical portion; apex lengthened, stout arista-like stylus; stylus very short, tapered to rounded tip. Base of labrum lacking dorsal process; palpus yellowish brown, parallel to labrum, 1/4 length of labrum with many long, dark divergent setae; prementum with 6–8 slender erect setae along dorsolateral margin.

Thorax: mesonotum, and postnotum mostly brown, except lateral margin of mesonotum, postpronotal lobe and area slightly posterior to lobe, and supraalar ridge pale, sometimes nearly yellow; pleura yellowish brown, darker on ventral half. Laterotergite with 2–3 short setulae. Lacking modified sclerites at base of wing. Acrostichals with anterior pair long and erect, biserial to prescutellar depression and directed posteriorly; 4 dc increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower weak and short; 2 psut spal; 1 short and slender pal; 2 sctl, some additional setulae interspersed among dc and pprn. Antepronotum with pair of long setae.

Wing (Fig. 106): infuscate, pterostigma absent; 1 basal costal seta; costal margin straight, swollen at apex of R_1; erect costal setae apparently lacking; lacking ventral costal setulae; posterior margin unmodified, lacking incisions, lobes and setae unmodified; veins of ventral side of wing whitish, veins on dorsal side alternating dark and pale. Posterior base of wing stem lacking long setae, not stouter than preceding setae; base of wing lacking sclerotized concave pocket. R_1 reaching costa before middle of wing; R_{2+3} curved sharply to costa just beyond costa swelling, beyond middle of wing; radial fork long, proximal to medial fork; medial fork on short petiole; M_1 slightly sinuous, divergent at wing margin; M_2 distinctly arched just before wing margin; cell dm subtriangular, somewhat convex apically; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 gradually arched to wing margin. Halter knob pale brown.

Legs: coxae and proximal half of femora pale; remaining leg segments becoming darker apically. Fore coxa slightly longer than length of mid and hind coxae combined; distinctly inflated near middle on basal half; short sparse setae on inner anterior face; lacking long stout marginal setae. Fore trochanter with slender setulae. Fore femur strongly swollen at base, with av and pv rows of dark setae, basal setae stouter and nearly half width of femur; dorsal seta lacking. Fore tibia slightly shorter than femur; slender, distal half with pv row of erect slender setae, longer than width of tibia; apex with anteroapical comb. Tarsomere 1 slightly sinuous on ventrum, about 1/2 length of fore tibia; distal half with dense patch of stout ventral setae. Tarsomeres 2–3 with roughened, pv ridge; tarsomeres 4–5 dorsoventrally flattened, dorsoapical margin of tarsomere 5 with short median lobe; empodium much wider than pulvillus.

Mid coxa lacking modified seta. Mid femur slender with pair of subapical ventral setae. Mid tibia slender, shorter than femur; apex with 1 stout ventromarginal seta. Tarsomere 5 flattened with dorsoapical lobe.

Hind coxa with lacking long lateral seta. Hind femur straight, slender; basal third lacking ad row of erect setae; pair of preapical ventral setae; preapical dorsal seta lacking. Hind tibia stout, subequal in length to femur; posterior face with long dense mat of setulae; pv comb slightly inflated; lacking setae. Hind tarsomeres shorter than tibia; 1 short indistinct ventrobasal seta on tarsomere 1 with 1 pv seta on basal third; tarsomere 5 flattened with small dorsoapical marginal lobe.

Abdomen: sclerites brown with short posteromarginal setae, lacking ridges and modified setae; central region of T7 membranous; S7 longer than preceding sclerite; posterolateral corners slightly prolonged, articulating on S8. T8 slender with dark anterior margin.

Terminalia (Fig. 160): hypandrium convex with short apical extension between postgonites; gonocoxal apodeme lacking; postgonites slender parallel processes, slightly arched posteriorly, arising from base of phallus; phallus thin, sharply arched anteriorly, nearly at right angles, lacking subapical processes. Posterior margin of epandrial lamella expanded and divergent from hypandrium, exposing inner posterior surface; broad bacilliform sclerite present; subepandrial sclerite horizontal, forming shelf beneath phallus, lacking lobes. Surstylus stout with broad base, attenuated near middle, tapered to narrow apex; inner ridge setose. Cercus heavily sclerotized, finger-like, apex sharply recurved posteriorly; apex flattened, broad with brush of apical setae; outer and inner lateral margin with several long, stout setae.

Female. Unknown.

Distribution. *Ceratomerus mangamuka* is known only from the type-locality in the far north of the North Island (ND) (Map 41).

Etymology. The specific name is derived from the type-locality.

Ceratomerus spinosus n. sp.

Map 42, Figs. 15, 62, 107, 161–163

Ceratomerus sp. 12: Sinclair, 2010: 222 (phylogeny).

Type material. Holotype male, "NEW ZEALAND: TK/ Hwy 40, W of Ohura/ 2.ii.1995, cascading/ ck., B.J. Sinclair"; "HOLOTYPE/ *Ceratomerus*/ *spinosus*/ Sinclair [red label]" (NZAC).

Paratypes: New Zealand: **TK**—1 ♂, 3 ♀, same data as holotype (CNC, NZAC).

Recognition. This species is distinguished from all other New Zealand species, except its sister species *C. mangamuka*, by the lengthened pedicel. It is separated from *C. mangamuka* by the row of erect spines on the labrum of the male, the medial fork arising directly from cell dm or from a very short petiole, and males with aberrant vein R_{2+3}.

Description. Wing length 3.5–3.7 mm.

Male. Head (Fig. 15): subrectangular, flattened at antennal sockets; dark brown, not shiny; face pale yellow, lacking setulae, broad, wider than antennal sockets; frons lacking setae; anterior eye facets below antennae not enlarged; ocellar triangle with pair of divergent ocellar setae inserted anterolateral to posterior ocelli; posterior ocelli widely separated, greater than distance to anterior ocellus; postocellar seta slender, 2/3 length of ocellar seta; 2 pairs of long vertical setae, longer and stouter than postocellar seta; lower half of eye with 3 long postocular setae overlapping eye. Antenna brown with scape 1.5X longer than eye height with 1 dorsal seta beyond middle and 1 long ventral seta near middle; pedicel lengthened, slightly less than 1/2 length of scape with apical fringe of long setae. Postpedicel covered by long dense pruinescence, slightly longer than length of labrum; rectangular base

slender, 1/3 length of apical portion; apex lengthened, stout arista-like stylus; apical segments very short, tapered to rounded tip. Base of labrum lacking dorsal process; palpus yellowish brown, parallel to labrum, 1/4 length of labrum with approx. 8 long dark setae; prementum with 6–8 spine-like erect setae along dorsolateral margin.

Thorax: mesonotum, and postnotum mostly brown, except lateral margin of mesonotum, postpronotal lobe and region posterior, and supraalar ridge pale, sometimes nearly yellow; pleura yellowish brown, darker on ventral half. Laterotergite with 2–5 short setulae. Lacking modified sclerites at base of wing. Acrostichals with anterior pair long and erect biserial to prescutellar depression and directed posteriorly; 4 dc increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower weak and short; 2 psut spal; 1 short and slender pal; 2 sctl, some additional setulae interspersed among dc and pprn. Antepronotum with pair of long setae.

Wing (Fig. 107): infuscate, pterostigma absent; 1 basal costal seta; costal margin straight, swollen at apex of R_1; erect costal setae beyond R_1; lacking ventral costal setulae; posterior margin unmodified, lacking incisions, lobes and setae unmodified; veins of ventral side of wing whitish, veins on dorsal side alternating dark and pale. Posterior base of wing stem with several long setae, not stouter than preceding setae; base of wing lacking sclerotized, concave pocket. R_1 reaching costa before middle of wing; R_{2+3} terminating just beyond radial fork with short perpendicular auxiliary crossvein to C; radial fork long, proximal to medial fork; medial fork not petiolate, arising separately from cell dm; M_2 strongly arched to wing margin; cell dm produced apically with rounded apex; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 curved strongly to wing margin at distal 2/3. Halter knob pale brown.

Legs (Fig. 62): coxae and proximal half of femora pale; remaining leg segments becoming darker apically. Fore coxa slightly shorter than length of mid and hind coxae combined; short sparse setae on inner anterior face; apex with 4–5 dark, spine-like marginal setae. Fore trochanter with slender setulae. Fore femur strongly swollen at base with av and pv rows of dark setae, basal setae stouter and nearly subequal to width of femur; 1 dorsal seta on apical 3/4. Fore tibia shorter than femur; unusually thickened, widest on middle half with pv row of slender setae, longer than width of tibia; apex with anteroapical comb. Tarsomere 1 (Fig. 62) sinuous, about 1/2 length of fore tibia; basal half with dense patch of stout ventral setae; apex with short posterior setae. Tarsomere 2 with flattened, oval ventral projection on distal half, flanked by pv row of dark setae; tarsomeres 3–5 subequal in length to first, posterior margin with longer setae than anterior margin; tarsomeres 4–5 dorsoventrally flattened, dorsoapical margin of fifth with short median lobe; empodium much wider than pulvillus.

Mid coxa lacking modified seta. Mid femur slender with pair of subapical ventral setae. Mid tibia slender, much shorter than femur; apex with 3–4 stout marginal setae. Tarsomere 5 flattened, with dorsoapical lobe.

Hind coxa with lacking long lateral seta. Hind femur straight, slender; basal third lacking ad row of erect setae; pair of preapical ventral setae; preapical dorsal seta lacking. Hind tibia stout, subequal in length to femur; posterior face with long dense mat of setulae; pv comb slightly inflated; 1 short preapical anterior seta. Hind tarsomeres shorter than tibia; 1 short indistinct ventrobasal seta on tarsomere 1 with 1 pv seta near middle; tarsomere 5 flattened with small dorsoapical marginal lobe.

Abdomen: sclerites brown with short posteromarginal setae, lacking ridges and modified setae; central region of T7 membranous; S7 longer than preceding sclerite, posterolateral corners slightly prolonged, articulating on S8. T8 slender with dark anterior margin.

Terminalia (Fig. 163): hypandrium convex with short apical extension; gonocoxal apodeme lacking; postgonites slender apically, divergent, arched posteriorly, arising from base of phallus; phallus thin, arched posteriorly from hypandrium, lacking subapical processes. Posterior margin of epandrial lamella expanded and divergent from hypandrium, exposing inner posterior surface; broad bacilliform sclerite present; subepandrial sclerite lacking lobes. Surstylus slender, arched slightly anteriorly with small basal lobe; sclerotized with short scattered setae. Cercus long, finger-like apex expanded; well sclerotized with long setae on posterior margin.

Female. Similar to male except as follows: face, mesonotum and pleura generally darker; antennal segments somewhat shorter; palpus brown with only setulae; prementum lacking modified setae. Coxae and femora darker, lacking modified setae and segments; fore femur slightly swollen; tarsomere 5 similar to male; hind tibia with 2 ad setae beyond middle. Wings with veins normal, except medial fork sometimes not petiolate, arising either on short stem or separately from common point proximal to radial fork; crossvein dm-m sinuous. Apical segments retracted into segment 7; posterior margin with fringe of short setulae; lateral margin of S7 straight. Terminalia (Fig. 161): T8 with deep U-shaped membranous region along posterior margin, extending 3/4 length of sclerite; anterior

margin with fringe of long stout setae; anterior margin with broad, median, rectangular plate-like apodeme extending into segment 7. S8 triangular, posterior margin invaginated forming inner sclerite. T10 divided medially, forming pair of rectangular sclerites; 3 transverse rows of setae: anterior row of 3 slender setae; median row of 4 spine-like setae and posterior margin with 4 spine-like setae with 3-4 more slender setae. Cercus with row of 3–4 spine-like setae, similar to posterior setae of T10 and posterior margin with row of stout setae. Spermathecal receptacle spherical with short wide neck where duct attached (Fig. 162).

Distribution. *Ceratomerus spinosus* is known only from the type-locality, collected in a small cascading stream near the roadside in the western North Island (TK) (Map 42).

Etymology. The specific name is derived from the Latin *spinosus* (thorny), referring to the spines along the margin of the labium and anteroapical margin of the male fore coxa.

Ceratomerus prodigiosus species-group

The *Ceratomerus prodigiosus* species-group includes eight New Zealand species characterized by the following male characters: anterior facets of eye below antennae generally not enlarged; labrum bearing a large hooked tubercle; palpi long with tuft of black setae; wing venation highly modified with shortened discal cell, M_4 sinuous reaching margin in basal half of wing.

The *C. prodigiosus* group was resolved as the sister group to the *C. longifurcatus* group on the basis of the modified male palpus, basalare projection and sclerotized basal wing "pocket" (Sinclair 2010).

Ceratomerus flexuosus n. sp.

Map 33, Figs. 63, 64, 108, 164

Type material. Holotype male, "NEW ZEALAND: NC/ Arthur's Pass NP/ Bealey River/ 14.ii./ 1995, 800m/ B.J. Sinclair"; "HOLOTYPE/ *Ceratomerus*/ *flexuosus*/ Sinclair [red label]" (NZAC).

Paratypes: New Zealand: **BR**—1 ♂, No Catchem str, Rainbow Valley, 8.i.1996, UV-lights, J.B. Ward & G.M. Ward (CMNZ). **NC—**1 ♂, 2 ♀, same data as holotype (NZAC); 1 ♂, Arthur's Pass NP, Bealey R. Tr., 800 m, YPT, 11–12.ii.1995, BJS (AMS); 2 ♂, Arthur's Pass NP, Otira R., YPT, 11–12.ii.1995, BJS (CNC); 1 ♀, Arthur's Pass, 28.xii.1931, S. Lindsay (CMNZ). **WD—**2 ♂, 1 ♀, Waiho [43°20′S 170°07′E], 18.i.1922, A. Tonnoir (ANIC); 1 ♂, Westland NP, Franz Josef Glacier, cascading ck, 10.ii.1995, BJS (CNC).

Additional material. 1 ♀, Mt. Aspiring NP, 2.ii.1987, J.W. Early (NMW—paratype of *C. earlyi*). This specimen is possibly conspecific on the basis of a broad, dark median scutal stripe, but it is much smaller in size and hence only tentatively assigned to this species (see also under *C. prodigiosus*).

Recognition. Males are recognized by their greyish heads, large labral tubercle, base of postpedicel yellow of inner and ventral half, apex of R_{2+3} with C-shaped arch and S-shaped M_4.

Description. Wing length 4.1–4.3 mm.

Male. Head (Fig. 63): flattened, greyish brown including ocellar triangle, face broad, convergent, slightly wider than width of antennal sockets, pale yellow, with short, apical fleshy curved lobe; anterior eye facets below antennae not enlarged; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/6 length of ocellar seta; 4 vertical setae, middle 2 short median and outer setae slightly shorter than ocellar seta; upper postocular setae in oblique posterior row; lower half of eye with 3 stout, erect postocular setae. Antenna with length of scape 1.5X height of eye with 1 long erect dorsal seta near mid-length and many dorsal and lateral setae of variable lengths, 1 long ventral subapical seta; scape brown; pedicel brown, globular with setae confined to apical fringe. Postpedicel very long, covered by long dense pruinescence, length nearly 1.5X longer than labrum; base rectangular, ventral half and inner margin yellow with dorsal margin dark; apex brown, 3X length of base, gradually tapered; stylus very short, bare, 1/4 basal width of postpedicel. Base of labrum with large, rectangular dorsal process, bearing apical hook; palpus yellow, slender, half length of labrum with dense tuft of setae at mid-length and long dorsal and ventral setae on apical half (Fig. 64); palpus with 1 long, stout subapical dorsolateral seta; prementum with long lateral setae.

Thorax: scutum and postnotum brown, except yellow postpronotal lobe extending to presut spal and first dc, notopleuron and postalar ridge; clothed in fine pruinescence; laterotergite and pleura yellowish brown; anterior basalare inflated into broad anvil-shaped process; subalar sclerite not produced. Acrostichals with anterior pair

long and erect; biserial to irregular uniserial, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower shorter; 2 psut spal; 1 pal; 2 sctl; additional setulae on pprn and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 108): lightly infuscate, pterostigma absent; 1 long basal costal seta; costal margin straight with erect costal setae beyond R_1; ventral margin of costa lacking erect setae beyond R_1; posterior margin expanded proximal to apex of M_2; posterior setal margin complete, setae near wing base thickened; base of wing stem with concave sclerotized pocket. R_1 reaching costa before middle of wing; apical half of R_{2+3} thickened, arched very close to C before sharply diverging to form C-shaped apex; medial fork and radial fork parallel; R_{4+5} with slight dip prior to radial fork; cell dm triangular, broad; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 S-shaped, zig-zagging to wing margin. Halter knob pale yellow.

Legs: coxae and femora yellow, tibiae yellowish brown, remaining segments increasingly darker. Fore coxa subequal to length of mid and hind coxae combined; lower half bare except for marginal setae; upper half sparsely setose; basal third distinctly inflated. Fore femur greatly narrowed, slightly twisted at base, apical 2/3 swollen, slightly more than other femora; ventral half of posterior margin bare; base with 1 stout ventral seta, longer than width of femur and several minute setulae; pv row of short setae present; apical half with av row of minute setulae; 1 preapical dorsal seta projecting obliquely. Fore tibia slightly longer than length of femur; apex with anteroapical comb, not dilated; basal 2/3 with pv row of erect slender setae, length less than width of tibia; 1 short subapical dorsal seta. Tarsomere 1 2/3 length to fore tibia, partially attenuated at mid-length; basal half armed ventrally with row of 5 curved setae and 1 spine-like basal seta longer than width of tarsomere; apical half expanding apically with ventral row of 10 short stout erect setae; apex not produced dorsally. Apical half of tarsomere 2 and remaining tarsomeres flattened, ventral surface pale and devoid of dark setae; tarsomere 4 1.5X longer than tarsomere 3.

Mid coxa lacking modified seta. Mid femur lacking modified setae with pair of ventroapical setae and 1 short preapical dorsal seta. Mid tibia longer than femur with 1 ad and 1 pd seta on basal third; 1 av, 1 pv and 1 long ventral apical seta. Tarsomere 1 shorter than length of remaining 4 tarsomeres with 1 short ventral seta; tarsomeres 4 and 5 slightly flattened.

Hind coxa with 1 long lateral seta. Hind femur more swollen than other femora with pair of ventroapical setae and 1 preapical dorsal seta; basal third with ad row of erect setae. Hind tibia longer than femur with 2 ad setae on basal 2/3, 1 dorsal seta on apical third and 1 preapical anterior seta; posterior face with long dense mat of setulae; apex slightly dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral seta near base and 1 posterior seta on basal third.

Abdomen: tergites brown; tergites 1–6 with long posteromarginal setae; sternites yellowish brown; sternites and tergites lacking modified setae and ridges; anterior margin of T6 with broad band of dark dense pruinescence; T7 lacking long posteromarginal setae; S7 3/4 length of preceding sternite with anterolateral margin not produced; S8 with 2 long posteromarginal setae; T8 rectangular narrow, lateral margin expanded.

Terminalia (Fig. 164): hypandrium convex with broad, bilobed posterior extension; gonocoxal apodeme slender, oblique; postgonite with rounded tip, arching out and around apex of hypandrium, articulated at base of phallus; phallus curved anteriorly, erect with slender expanded apex. Epandrial lamella narrow with broad bacilliform sclerite; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; posterior margin with long setae, similar in size to other epandrial setae. Cercus short, broad; posterior and lateral margins sclerotized.

Female. Similar to male except as follows: lacking secondary sexual modifications of antenna, base of labrum and prementum, thorax, wing and forelegs. Lower postocular setae slender; apical half of postpedicel subequal to base, stylus subequal to half length of postpedicel; radial fork distal to medial fork. Abdominal apical segments retracted into segment 7; posterior margin of T7 with dense short fringe of setulae; lateral margin of S7 straight. Terminalia: not dissected.

Distribution. *Ceratomerus flexuosus* is known from the western side of the South Island (Map 33).

Etymology. The specific name is derived from the Latin *flexuosus* (full of turns), referring to highly convoluted venation of the male wing.

Remarks. The anterior margin of male tergite 6 bears a broad band of dark dense pruinescence that is possibly glandular in function.

***Ceratomerus macfarlanei* n. sp.**

Map 34, Figs. 109, 165

Type material. Holotype male, "NEW ZEALAND: MC/ Mount Hutt / 43°31′S/ 171°33′E, 1300 m/ 19.i.2001, *Epilobium*/ in creek, pan trap/ R.P. Macfarlane"; "HOLOTYPE/ Ceratomerus/ macfarlanei/ Sinclair [red label]" (CMNZ).

Paratypes: New Zealand: **MC—**12 ♂, 11 ♀, same data as holotype (CMNZ, CNC, NZAC).

Recognition. Males are recognized by their greyish heads, indistinct scutal vittae, R_{2+3} without swelling and sinuous M_4.

Description. Wing length 2.8–3.2 mm.

Male. Head: flattened, greyish brown including ocellar triangle, pale above antennae; face broad, convergent, slightly wider than width of antennal sockets, pale yellow, with short, round knob-like fleshy lobe; anterior eye facets below antennae slightly enlarged; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/6 length of ocellar seta; 3 vertical setae slightly shorter than ocellar seta; upper postocular setae in oblique posterior row; lower half of eye (beneath eye) with 3 stout, erect postocular setae. Antenna with length of scape less than 1.5X height of eye with 1 long erect dorsal seta near mid-length and many dorsal and lateral setae of variable lengths, 1 long ventral subapical seta; scape brown; pedicel brown, globular with setae confined to apical fringe. Postpedicel dark, elongate, covered by long dense pruinescence, length nearly 1.5X longer than labrum; base rectangular; apex portion 1.5X length of base, gradually tapered; stylus very short, bare, 1/4 basal width of postpedicel. Base of labrum with large downwards curved protuberance below fleshy knob with bifid apex; palpus yellow, slender on proximal half, 2/3 length of labrum with dense tuft of setae at mid-length; apex expanded with stout outer setae and inner lower cluster of setae; prementum elongate with short lateral setae.

Thorax: scutum and postnotum brown; dark lines beneath dc and acrostichal rows; clothed in fine pruinescence; laterotergite and pleura yellowish brown; anterior basalare inflated, slightly elevated and prolonged anteriorly and posteriorly; subalar sclerite not produced. Acrostichals with anterior pair long and erect; biserial to uniserial, alternating right and left irregular, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower shorter; 2 psut spal; 1 pal; 2 sctl; additional setulae on pprn and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 109): lightly infuscate, pterostigma absent; 1 long basal costal seta; costal margin straight, with erect costal setae beyond R_1; ventral margin of costa lacking erect setae beyond R_1; posterior margin not expanded proximal to apex of M_2; posterior setal margin complete, setae near wing base thickened; base of wing stem with concave sclerotized pocket. R_1 reaching costa before middle of wing; apical half of R_{2+3} not thickened, gradually arched to C; medial fork proximal to radial fork; R_{4+5} straight prior to radial fork; cell dm somewhat triangular, narrow; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 S-shaped to wing margin. Halter knob yellowish brown.

Legs: coxae and femora yellow, tibiae yellowish brown, remaining segments increasingly darker. Fore coxa shorter than length of mid and hind coxae combined; lower half bare except for marginal setae; upper half sparsely setose; basal third not inflated. Fore femur lengthened, straight, subequal in length to mid femur; lacking modified setae; 1 preapical pd seta. Fore tibia shorter than length of femur; apex with anteroapical comb, not dilated; ventrum with biserial row of fine slender setae, length less than width of tibia; 1 short subapical dorsal seta. Tarsomere 1 longer than remaining tarsomeres combined, partially attenuated at mid-length; basal half armed ventrally with row of slightly curved setae descreasing in length apically, basal setae longer than width of tarsomere; apical half with ventral row of short stout setae. Tarsomeres 2–4 cylindrical, not flattened; tarsomere 5 slightly dorsoventrally flattened.

Mid coxa lacking modified seta. Mid femur lacking modified setae, with pair of ventroapical setae and 1 short preapical dorsal seta. Mid tibia subequal in length to femur with 2–3 ad setae and 1 long ventral apical seta. Tarsomere 1 shorter than length of remaining 4 tarsomeres; tarsomeres 4 and 5 slightly flattened.

Hind coxa with 1 long lateral seta. Hind femur somewhat broader than other femora with pair of ventroapical setae and 1 preapical dorsal seta; basal third with ad row of erect setae. Hind tibia longer than femur with 2–3 dorsal setae and 1 preapical ad seta; posterior face without mat of setulae; apex not dilated, bearing posteroapical

comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long, erect ventral seta near base and 1 posterior seta on basal third.

Abdomen: tergites brown; tergites 1–6 with long posteromarginal setae; sternites yellowish brown; sternites and tergites lacking modified setae and ridges; anterior margin of T5 and T6 with broad band of dark dense pruinescence; T7 lacking long posteromarginal setae with broad U-shaped membranous posteromedial region; S7 subequal to length of preceding sternite with anterolateral margin not produced; T8 rectangular narrow, lateral margin expanded.

Terminalia (Fig. 165): hypandrium convex with broad, bilobed posterior extension; gonocoxal apodeme slender, oblique; postgonite with rounded tip, arching out and around apex of hypandrium, articulated at base of phallus; phallus curved anteriorly, erect with slender expanded apex. Epandrial lamella narrow with broad bacilliform sclerite; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; posterior margin with long setae, similar in size to other epandrial setae. Cercus short, broad; posterior and lateral margin sclerotized.

Female. Similar to male except as follows: lacking secondary sexual modifications of antenna, base of labrum and prementum, thorax, wing and forelegs. Lower postocular setae slender; apical half of postpedicel subequal to base, stylus subequal to half length of postpecicel; cell dm longer than male. Abdominal apical segments retracted into segment 7; posterior margin of T7 with dense, short fringe of setulae; lateral margin of S7 straight. Terminalia: not dissected.

Distribution. This species is known only from the type-locality, in inland Canterbury, on the South Island (MC) (Map 34).

Etymology. The specific name is a patronym in honour of the late R.P. Macfarlane, who collected the type series and who kindly contributed collections of many valuable and interesting ceratomerines.

Ceratomerus melaneus Plant

Map 35, Figs. 110, 166

Ceratomerus melaneus Plant, 1991: 1325. Other references: Yang *et al*., 2007: 49 (catalogue); Macfarlane *et al*., 2010: 445 (New Zealand biodiversity).

Type material. Holotype male, "NEW ZEALAND. S.Is.: WD:/ Castle Rock Hut, Westland/ National Park. 4000'/ Malaise trap in subalpine/ scrub/ herbfield/ tussock/ 14–16.i.1986. J.W. Early"; "HOLOTYPE/ Ceratomerus/ melaneus/ Plant [red label]" (NZAC).

Paratypes: New Zealand: **WD**—2 ♀, same data as holotype (NMW, NZAC).

Additional material. **New Zealand**: **MC**—6 ♂, 2 ♀, Craigieburn Valley, Camp Saddle, 1250 m, UV light, 23.i.1992 (CMNZ, CNC).

Recognition. This species is distinguished from among species of the *C. prodigiosus* group by the brown scutum, without stripes; antenna brown; R_{2+3} of male wing with distinct swelling near mid-length; and cell dm rectangular.

Re-description. Wing length 3.3–3.7 mm.

Male. Head: somewhat flattened, brown, not shiny; face broad, parallel-sided, subequal to width of antennal sockets, with pale pruinescence and short, tapered fleshy apical knob; anterior eye facets below antennae not enlarged; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/5 length of ocellar seta; 3 stout and 1 slender, shorter vertical seta; upper postocular setae in oblique posterior row; lower half of eye with 2 short, erect stout postocular setae. Antenna with length of scape subequal to height of eye with 1 long erect dorsal seta and sparse setulae, and 1 long ventral subapical seta; pedicel globular with setae confined to apical fringe. Postpedicel covered by long dense pruinescence, slightly shorter than 2X length of labrum; base rectangular, brown; apex 3X length of base, stout gradually tapered; arista-like stylus very short, bare, slightly longer than apex of postpedicel. Base of labrum with rectangular swelling, lacking apical hook; palpus yellow, slender, half length of labrum, apical third flattened; dense tuft of short setae at basal third, apical half clothed in stout setae, some longer than width of palpus; palpus with 1 long, stout subapical dorsolateral seta; prementum with unmodified setae.

Thorax: scutum and postnotum brown, except yellowish brown postpronotal lobe, anterior half of notopleuron and postalar ridge; clothed in fine pruinescence; laterotergite and pleura yellowish brown; anterior

basalare inflated into broad anvil-shaped process; subalar sclerite with flattened horn-like process. Acrostichals with anterior pair long and erect, uniserial, alternating right and left, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower shorter; 2 psut spal; 1 pal; 2 sctl; additional setulae on pprn and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 110): lightly infuscate, pterostigma absent; 1 long basal costal seta; costal margin straight with erect costal setae beyond R_1; ventral margin of costa with fine erect setae beyond R_1; posterior margin with very slight shallow dip at apex of M_4; posterior setal margin complete, 1–2 setae at base of wing thickened; base of wing stem with concave sclerotized pocket. R_1 reaching costa before middle of wing; basal third of R_{2+3} with small swelling smoothly arched to C; medial fork proximal to radial fork; R_5 straight; discal cell rectangular, slender; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 bent at right angles from discal cell and strongly bent again at mid-length before arching towards wing margin. Halter knob white.

Legs: yellow, becoming darker on apical tarsomeres. Fore coxa less than length of mid and hind coxae combined; anterior margin sparsely setose, except for 2–3 anteromedial basal setae; basal third indistinctly inflated. Fore femur more swollen basally than mid femur; posterior face sparsely setose; 2 long stout ventrobasal setae, 2X width of femur with pv row of setae, length nearly equal to width of femur; av row of setae present, becoming longer and more slender apically; 1 preapical dorsal seta. Fore tibia slightly shorter than femur; apex with anteroapical comb, not dilated. Tarsomere 1 2/3 length of fore tibia, lacking mid-length attenuation; pv row of setae with basal half long and erect, longer than width of tarsomere, apical half comprising very short spine-like setae. Remaining tarsomeres somewhat flattened, ventral surface sparsely setose; tarsomere 4 longer than third.

Mid coxa lacking modified seta. Mid femur lacking modified setae with pair of ventroapical setae and 1 short preapical dorsal seta. Mid tibia longer than femur with 3 ad and 3 pd setae widely spaced and 1 long ventroapical seta. Tarsomere 1 shorter than length of remaining 4 tarsomeres, lacking erect ventral seta; tarsomere 5 flattened.

Hind coxa with 1 long lateral seta. Hind femur more swollen than other femora with pair of ventroapical setae and 1 preapical dorsal seta; basal third with ad row of erect setae. Hind tibia longer than femur with 3 ad widely spaced setae and 1 preapical dorsal seta; posterior face with long dense mat of setulae; apex slightly dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral seta near base and 1 posterior seta on basal third.

Abdomen: sclerites brown; tergites 1–6 with long posteromarginal setae; sternites and tergites lacking modified setae and ridges; anterior margin of male T5 and T6 with broad band of dark, dense pruinescence; T7 lacking long posteromarginal setae.

Terminalia (Fig. 166): hypandrium convex with tapering posterior extension subequal to length of phallus. Postgonite divergent from phallus, apex rounded. Epandrial lamella narrow, lacking lobes. Surstylus not distinctly differentiated from epandrium; posterior margin with fringe of setae. Cercus short, slender, fleshy, apex pointed; posterior margin more thickly sclerotized.

Female. Similar to male except as follows: Head round, face brown, lacking modifications of labrum and palpus; postocular setae slender; apical portion of postpedicel slightly longer than base, more slender and strongly tapered; stylus present, nearly equal in length to apical half of postpedicel; segment 1 of stylus 6X longer than wide. Pleura dull brown, except anterior margin yellow; lacking modified posterior basalare; wing venation unmodified. Leg setae stouter, lacking modified ventral setae of foreleg. Abdominal pleural membrane brownish; apical segments retracted into segment 7; posterior margin of T7 with dense fringe of setulae; lateral margin of S7 straight. Terminalia (not dissected): T10 and cercus clothed in stout setae.

Distribution. *Ceratomerus melaneus* is known from the central South Island (Map 35).

Remarks. The anterior margins of male tergites 5 and 6 each have a broad band of dark dense pruinescence that is possibly glandular in function.

Ceratomerus montanus n. sp.

Map 36, Figs. 111, 167–169

Type material. Holotype male, "Mt. Arthur Tl [41°10′S 172°38′E]/ 25 Dec. 1921/ A. Tonnoir/ 4500 ft" "HOLOTYPE/ *Ceratomerus*/ *montanus*/ Sinclair [red label] [missing apical antennal articles]" (NZAC).

Paratypes: New Zealand: **NN—**1 ♂, 3 ♀, same data as holotype (ANIC); 3 ♀, NW Nelson For. Pk., Mt. Arthur Tableland, 900–1000 m, *Nothofagus* for., Quartz/Whiskey Cks, 17–18.ii.1995, BJS (CNC, NZAC); 1 ♀, Mt. Arthur Tablelands, i.1924, A. Philpott (ANIC).

Recognition. Males are recognized by their yellowish heads, large labral tubercle, base of postpedicel mostly yellow, thorax with narrow median stripe, and mid-length of R_{2+3} thickened and strongly arched near costa. Females are characterized by a narrow median stripe and lateral stripes confined posterior to transverse suture.

Description. Wing length 3.7–4.3 mm.

Male. Head: flattened, yellowish brown, with brown stripe from ocellar triangle extending down posterior margin of head, face broad, parallel-sided, slightly wider than width of antennal socket, pale yellow, with short, apical fleshy curved lobe; anterior eye facets below antennae not enlarged; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/6 length of ocellar seta; 3–4 vertical setae, penultimate seta very short and slender, outer seta often longer than ocellar setae; upper postocular setae in oblique posterior row; lower half of eye with 3 spine-like, erect postocular setae. Antenna with length of scape 1.5X height of eye with 1 long erect dorsal seta and many dorsal and lateral setae of variable lengths, 1 long ventral subapical seta; scape yellow; pedicel yellow, globular with setae confined to apical fringe. Postpedicel very long, covered by long dense pruinescence, length nearly 1.5X longer than labrum; base rectangular, yellow, except for dark dorsal margin; apex brown, 3X length of base, gradually tapered; stylus very short, bare, 1/4 basal width of postpedicel. Base of labrum with large, erect dorsal process, bearing apical hook; palpus yellow, slender, half length of labrum with dense tuft of setae at mid-length and long dorsal and ventral setae on apical half; palpus with 1 long, stout subapical dorsolateral seta; prementum with long lateral setae.

Thorax: yellow, with narrow (slightly wider than acrostichals), brown median stripe, from anterior margin onto scutellum (apical margin yellow), expanded slightly on prescutellar depression; very pale lateral stripe from suture to pal; postnotum with broad, brown, median stripe; laterotergite and pleura yellow; anterior basalare inflated into broad anvil-shaped process; subalar sclerite with short flat process. Acrostichals with anterior pair long and erect; biserial to uniserial, alternating right and left, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower shorter; 2 psut spal; 1 pal; 2 sctl; additional setulae on pprn and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 111): lightly infuscate, pterostigma absent; 1 long basal costal seta; costal margin slightly expanded prior to R_{2+3} with erect costal setae beyond R_1 and ventral margin of costa with fine erect setae beyond R_1; posterior margin bilobed with narrow lobe at apex of M_2 and proximal swelling to M_4; posterior setal margin complete, setae near wing base not thickened; base of wing stem with concave, sclerotized pocket. R_1 reaching costa before middle of wing; mid-length of R_{2+3} thickened, strongly curved towards C, nearly touching before gradually curving to wing margin; medial fork distal to radial fork; R_5 slightly curved; cell dm triangular, slender, dm-m crossvein arched; auxiliary cross-vein between R_{2+3} and R_4 lacking; medial fork nearly at right angles with M_1, sinuate and M_2 with preapical curve; M_4 sinuate, bent at right angles from cell dm. Halter knob pale yellow.

Legs: yellow, gradually darker on apical tarsomeres. Fore coxa subequal to length of mid and hind coxae combined; lower half bare except for marginal setae; upper half sparsely setose; basal third distinctly inflated. Fore femur greatly narrowed, slightly twisted at base, apical 2/3 swollen, slightly more than other femora; ventral half of posterior margin bare; base with 2 stout ventral setae, longer than width of femur; pv row of short setae present, longest near base; apical half with av row of minute setulae; 1 preapical dorsal seta projecting obliquely. Fore tibia slightly shorter than length of femur; apex with anteroapical comb, not dilated; basal 2/3 with pv row of erect stout setae, length less than width of tibia; basal half with row of short av setae; 1 short subapical dorsal seta present. Tarsomere 1 3/4 length of fore tibia, partially attenuated at mid-length; basal half armed with pv row of 6 short setae and 1 spine-like basal seta, 2X longer than width of tarsomere and with av row of oblique slender setae; apical half expanding apically with pv row of short erect setae; apex with anteroapical seta. Remaining tarsomeres flattened, ventral surface pale and devoid of dark setae; tarsomere 4 slightly longer than tarsomere 3.

Mid coxa lacking modified seta. Mid femur lacking modified setae with pair of ventroapical setae and 1 short preapical dorsal seta. Mid tibia longer than femur with 3 ad and 3 pd widely-spaced setae; several short pv and av setae and 1 long ventroapical seta present. Tarsomere 1 shorter than length of remaining 4 tarsomeres, with 1 short ventral seta; tarsomeres 4 and 5 slightly flattened.

Hind coxa with 1 long lateral seta. Hind femur more swollen than other femora with pair of ventroapical setae and 1 preapical dorsal seta; basal third with ad row of erect setae. Hind tibia longer than femur with 3 ad widely-spaced setae and 1 preapical dorsal seta; posterior face with long dense mat of setulae; apex slightly dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral setae near base and 1 posterior seta on basal third.

Abdomen: tergites brown; tergites 1–6 with long posteromarginal setae; sternites yellowish brown; sternites and tergites lacking modified setae and ridges; anterior margin of T6 with broad band of dark dense pruinescence; T7 lacking long posteromarginal setae; S7 3/4 length of preceding sternite with anterolateral margin not produced; S8 with 2 long posteromarginal setae; T8 rectangular and narrow, lateral margin expanded.

Terminalia (Fig. 169): hypandrium convex with broad, bilobed posterior extension; gonocoxal apodeme slender, oblique; postgonite with rounded tip, arching out and around apex of hypandrium, articulated at base of phallus; phallus curved anteriorly, erect, with slender, rounded apex. Epandrial lamella narrow with broad bacilliform sclerite; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; posterior margin with long stout setae, several larger than medial epandrial setae. Cercus short and broad, posterior margin sclerotized; several stout subapical and apical setae.

Female. Similar to male except as follows: lacking secondary sexual modifications of antenna, base of labrum and prementum, thorax, wing and forelegs. Lower postocular setae slender; apical half of postpedicel subequal to base, stylus subequal to half length of postpedicel; radial fork proximal to medial fork. Abdominal apical segments retracted into segment 7; posterior margin of T7 with dense short fringe of setulae; lateral margin of S7 straight. Terminalia (Fig. 167): T8 narrow dorsally, expanded laterally; dense fringe of long stout setae present; anterior margin with pair of small, flat dorsolateral sclerites. S8 triangular, posterior margin invaginated forming inner sclerite. T10 divided medially, forming pair of rectangular sclerites; clothed in long curved setae, setae on posterior margin stouter. Cercus rounded with cluster of many closely placed, stout curved setae, similar to posterior setae of T10. Spermathecal receptacle spherical with long pigmented neck blending into duct (Fig. 168).

Distribution. *Ceratomerus montanus* is known only from the Mt. Arthur Tablelands in the northern South Island (NN) (Map 36).

Etymology. The specific name is derived from the Latin *montanus* (of mountains), referring to where the type material was collected.

Ceratomerus prodigiosus Collin

Map 37, Figs. 65, 66, 112, 113, 170, 171

Ceratomerus prodigiosus Collin, 1928: 20. Other references: Miller, 1950: 79 (New Zealand catalogue); Smith, 1989: 387 (Australasian catalogue); Plant, 1991: 1326 (revision); Pont, 1995: 136 (type catalgue); Yang *et al*., 2007: 50 (catalogue); Sinclair, 2010: 222 (phylogeny); Macfarlane *et al*., 2010: 445 (New Zealand biodiversity).

Ceratomerus earlyi Plant, 1991: 1322 **n**. **syn.** Other references: Macfarlane *et al*., 2010: 445 (New Zealand biodiversity).

Type material. *C. prodigiosus*: Holotype male, "Type/ ♂ [red bordered circle]"; "Ceratomerus/ prodigiosus/ TYPE ♂ Collin [hand written]"; "Ceratomerus/ prodigiosus/ ♂ [hand written, orange circle]"; "N. Zealand/ Ohakune/ III. 1923/ T.R. Harris [hand written]" (BMNH).

C. earlyi: Holotype female, "NEW ZEALAND. S.Is.: OL:/ Mt. Aspiring National Park/ Pearl Flat. Swept from/ forest 2.ii.1987/ J.W. Early"; "HOLOTYPE/ Ceratomerus/ earlyi/ Plant [red label]" (NZAC).

Additional material. **New Zealand**: **BR**—2 ♂, Lake Brunner [42°37′S 171°27′E], 3.ii.1922 (ANIC). **KA**—1 ♂, 1 ♀, Goose Bay, 4.ii.1925 (CMNZ); 1 ♂, Kaikoura [42°25′S 173°41′E], 22.ii.1922 (ANIC). **NC**—1 ♂, Arthur's Pass NP, Bealey R, 800 m, 14.ii.1995 (CNC). **MC**—1 ♀, Staveley, 12.xii.1977 (NZAC); 1 ♀, W. Staveley, Hwy 72, 2.xii.1977 (NZAC). **NN**—1 ♀, Hwy 67 N. Waimarie, roadcut spring, 8.ii.1995 (CNC). **RI**—1 ♀, Tongariro NP, Ohakune, Mangawhero R, YPT, Podocarp for., 19–20.ii.1995 (NZAC). **WD**—1 ♂, Haast R/ Harris Ck, Greenstone Ck/ Glitterburn, 3.xi.1994 (CMNZ); 2 ♂, 1 ♀, Otira, 6.ii.1922 (ANIC); 6 ♂, 4 ♀, Waiho [43°20′S 170°07′E], 18.i.1922 (ANIC); 11 ♂, 7 ♀, Westland NP, Franz Joseph Glacier, cascading ck, 10.ii.1995 (AMS, CNC). **WN**—5 ♂, 2 ♀, Tararua Ra., River forks, 730 m, 7.ii.1985 (NZAC).

Notes on Synonymy. Plant (1991) based *C. earlyi* upon two female specimens. Additional collections of ceratomerines from alpine creeks enabled both sexes to be associated. On the basis of thoracic colouration and chaetotaxy, the holotype of *C. earlyi* is considered to be conspecific with *C. prodigiosus*, whereas the paratype of *C. earlyi* is conspecific with *C. flexuosus* (see Additional material under the latter species).

Recognition. Males of *C. prodigiosus* are recognized by the large labral tubercle and strongly bent M_4. Females may be distinguished by the broad median stripe and darkened supra-alar region of the scutum.

Re-description. Wing length 3.3–3.5 mm.

Male. Head (Fig. 65): somewhat flattened, dark greyish brown, not shiny; face broad, slightly wider than antennal sockets, yellow, with short, apical fleshy lobe; anterior eye facets below antennae not enlarged; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/3 length of ocellar seta; 3 vertical setae, subequal in length to ocellar seta; upper postocular setae in oblique posterior row, lower half of eye with 3 erect, stout postocular setae. Antenna brown with length of scape slightly longer than eye height with many short dorsal setae, 1 long ventral subapical seta; pedicel pale brown, globular with setae confined to apical fringe. Postpedicel very long, covered by long dense pruinescence, length nearly 2X length of labrum; base rectangular with yellow ventral margin; apex nearly 3X length of base, gradually tapered; stylus absent. Base of labrum with large rectangular dorsal process, bearing apical hook; palpus yellow, slender, more than half length of labrum with dense tuft of setae at mid-length and patches of dorsal and ventromedial apical setae (Fig. 66); prementum with short setae only.

Thorax: yellow, dorsum with fine pruinescence; broad, dark, greyish median stripe, not as wide as dorsocentrals, from anterior margin to prescutellar depression; broad dark patches covering spal, prescutellar depression and scutellum; apical margin of scutellum yellowish; postnotum dark medially, pale spot laterally; laterotergite and pleura yellow; anterior basalare inflated into anvil-shaped process; subalar sclerite with short knob. Acrostichals with anterior pair long and erect; biserial to uniserial, alternating right and left, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower shorter; 2 psut spal; 1 pal; 2 sctl; additional setulae on pprn and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 112): infuscate, pterostigma absent; 1 long basal costal seta; costal margin with pronounced bend prior to end of R_{2+3}; erect costal setae beyond R_1; ventral margin of costa with fine erect setae beyond R_1; posterior margin lacking incision; posterior setal margin complete, setae on wing stem undifferentiated; base of wing stem with round, sclerotized deeply concave pocket. R_1 reaching costa before middle of wing; R_{2+3} strongly curved towards end of Sc, then becoming thicker, curves widely to C enclosing an ovate space; medial fork distal to radial fork; cell dm triangular, slender; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 bent at right angles from cell dm and at about mid-length, bent again almost to right angles towards wing margin. Halter with light brown knob.

Legs: coxae and femora yellow, except extreme tip of hind femur; remaining leg segments brown. Fore coxa less than length of mid and hind coxae combined; anterior margin sparsely setose, except for 2–3 anteromedial basal setae; basal third somewhat swollen. Fore femur not more swollen than other femora with slight dorsal bend at basal third; inner ventral margin bare; 1 long, stout pv basal seta and 1 preapical dorsal seta. Fore tibia slightly shorter than femur; apex with anteroapical comb, not dilated; basal half with pv row of erect slender setae, length less than width of tibia. Tarsomere 1 more than 3/4 length of fore tibia, slightly attenuated at mid-length; armed ventrally with row of 6 curved setae decreasing in length apically, longer than width of tarsus; apical half with second row of 7 short straight setae, shorter than width of tarsus; remaining tarsomeres dilated, tarsomere 3 widest, tarsomere 4 longer than 3; ventral margin of tarsomeres 3 and 4 pale.

Mid coxa lacking modified seta. Mid femur lacking modified setae with pair of ventroapical setae. Mid tibia longer than femur with 3 ad and 3 pd setae widely spaced and 1 long ventroapical seta. Tarsomere 1 shorter than length of remaining 4 tarsomeres with 1 long erect, ventral seta; tarsomeres 4 and 5 slightly flattened.

Hind coxa with unmodified setae. Hind femur more swollen than other femora with pair of ventroapical setae; basal third with ad row of erect setae. Hind tibia longer than femur with 3 widely spaced ad setae and 1 dorsal seta on apical half; posterior face with long dense mat of setulae; apex slightly dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect ventral setae near base and 1 long pv seta on basal third.

Abdomen: tergites 1–6 dark with long posteromarginal setae; sternites becoming darker apically; sternites and tergites lacking modified setae and ridges; anterior margins of T5 and T6 with broad band of dark dense pruinescence; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 3/4 length of preceding sternite, anterolateral margin not produced; T8 rectangular, 1/4 length of sternite with wide, median posterior notch.

Terminalia (Figs. 170, 171): hypandrium convex with broad posterior extension; gonocoxal apodeme slender, oblique; postgonite nearly horizontal, arched out and around phallus, tusk-like, articulated at base of phallus; phallus slightly curved, erect with pair of lateral shelf-like processes on basal third. Epandrial lamella narrow with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; posterior margin with fringe of stout setae. Cercus short, broad and fleshy, posterior margin more thickly sclerotized.

Female. Similar to male except as follows: Head round, lacking modifications of antenna, labrum and palpus; apical portion of postpedicel 1.3X longer than base, strongly tapered; stylus present, longer than base of postpedicel; first segment of stylus not longer than wide; lacking modified ventral setae of legs; lacking modified anterior basalare; wing venation unmodified (Fig. 113). Abdominal pleural membrane greyish; apical segments retracted into segment 7; posterior margin of T7 with dense fringe of short setulae; lateral margin of S7 straight. Terminalia: T8 narrow dorsally, expanded laterally; dense fringe of long setae present; anterior margin with pair of small, flat dorsolateral sclerites. S8 triangular, posterior margin invaginated forming inner sclerite. T10 divided medially, forming pair of rectangular sclerites; clothed in long, curved setae, setae on posterior margin stouter. Cercus rounded with cluster of many closely placed, stout curved setae, similar to posterior setae of T10. Spermathecal receptacle spherical with long, pigmented neck blending into duct.

Distribution. *Ceratomerus prodigiosus* is widespread on the South Island and southern half of the North Island (Map 37).

Remarks. The anterior margins of the male tergites 5 and 6 each bear a broad band of dark dense pruinescence that are possibly glandular in function.

Ceratomerus rivalis n. sp.

Map 38, Figs. 12, 34, 67–69, 114, 172, 173

Type material. Holotype male, "NEW ZEALAND: NC/ Arthur's Pass NP/ alpine zone/ Twin Ck./ 11.ii.1995/ B.J. Sinclair"; "HOLOTYPE/ Ceratomerus/ rivalis/ Sinclair [red label]" (NZAC).

Paratypes: New Zealand: **MC**—1 ♀, Cass [43°02′S 171°46′E], ii.1925, A.L. Tonnoir (CMNZ); 3 ♀, Craigie Burn, tribs, 1050 m, UV, JBW (CMNZ); 2 ♀, Upper Craigie Burn, 1200 m, UV lights, 23.i.1992, JBW (CMNZ); 1 ♀, Dry Stm trib, Hwy 73, 24053 57707 [43°15.83′S 171°42.62′E], 775 m, 27.xi.1997, UV, JBW (CMNZ). **MK**—1 ♂, Hermitage area, Hooker Valley, MT, 3–4.iv.1977, J.S. Dugdale (NZAC). **NC**—3 ♀, Arthur's Pass, 2.i.1943, E.S. Gourlay (NZAC); 1 ♀, Arthur's Pass, 17.iii.1973, C.E. Holmes (CMNZ); 18 ♂, 17 ♀, Arthur's Pass NP, Bealey R, 800 m, 14.ii.1995, BJS (AMS, CNC, NZAC); 3 ♀, same locality, Bealey R Tr., 800 m, 11.ii.1995, BJS (CNC); 4 ♂, 2 ♀, same locality, Bealey R Tr., YPT, 800 m, 11–12.ii.1995, BJS (NZAC); 13 ♂, 9 ♀, same data as holotype (CNC, NZAC). **WD**—7 ♂, 5 ♀, Otira [42°51′S 171°35′E], 7–8.ii.1922, A.L. Tonnoir (ANIC); 1 ♂, 2 ♀, Arthur's Pass NP, Otira R., YPT, 11–12.ii.1995, BJS (CNC); 1 ♀, Waiho [43°20′S 170°07′E], 20.i.1922, A. Tonnoir (ANIC).

Recognition. Males are recognized by their yellow heads, large labral tubercle, yellow scutum, lacking vittae, wavy M_4, and streak of long microtrichia across discal cell. Females have a broad, dark median vitta with lateral dark patches above the notopleuron and posterior to transverse suture.

Description. Wing length 4.3–4.5 mm.

Male. Head (Figs. 34, 68): flattened, yellow, ocellus with dark outer ring; face broad, parallel-sided, nearly twice width of antennal sockets, pale yellow, with short, apical fleshy sickle-shaped lobe; anterior eye facets below antennae not enlarged; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/5 length of ocellar seta; 4 vertical setae, middle 2 short median and outer setae slightly shorter than ocellar seta; upper postocular setae in oblique posterior row; lower half of eye with 2 short, stout erect postocular setae. Antenna with length of scape 1.6X height of eye with many dorsal setae of variable lengths, 1 long ventral subapical seta; scape yellow with dorsoapical third brown; pedicel yellow, globular with setae confined to apical fringe. Postpedicel very long, covered by long dense pruinescence, slightly longer than labrum; base rectangular, yellow with dorsal margin dark, apex brown, 3X length of base, gradually tapered; stylus very short, bare, shorter than basal width of postpedicel. Base of labrum with large, erect dorsal process, bearing apical hook (Fig. 69); palpus yellow, slender, half length of labrum with dense tuft of setae at mid-length and long dorsal setae on apical half; palpus with 1 long, stout subapical dorsolateral seta; prementum with long lateral setae.

Thorax: entirely yellow, lacking dark stripes; prescutellar depression with fine pruinescence; postnotum with faint, dark, median posterior stripe; laterotergite and pleura yellow; anterior basalare inflated into broad bilobed process; subalar sclerite with flattened horn-like process. Acrostichals with anterior pair long and erect; biserial to uniserial, alternating right and left, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower shorter; 2 psut spal; 1 pal; 2 sctl; additional setulae on pprn and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 114): lightly infuscate, pterostigma absent; dorsal surface with oblique streak of long microtrichia from anal lobe, across discal cell to base of cell R_{2+3}; 1 long basal costal seta; costal margin straight with erect costal setae beyond R_1 and ventral margin of costa with fine erect setae beyond R_1; posterior margin bilobed with shallow dip at apex of M_2 and M_4; posterior setal margin complete, setae near wing base thickened; base of wing stem with concave sclerotized pocket. R_1 and R_{2+3} reaching costa before middle of wing; basal third of R_{2+3} with short swelling, smoothly arched to C; medial fork distal to radial fork; R_5 slightly curved; cell dm triangular, slender; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 bent at right angles from cell dm, undulating towards wing margin. Halter knob yellowish white.

Legs: yellow, except extreme tip of hind femur and apical 2–3 tarsomeres. Fore coxa subequal to length of mid and hind coxae combined; anterior margin sparsely setose, except for 2–3 anteromedial basal setae; basal third distinctly inflated. Fore femur not more swollen than other femora with swelling beyond mid-length; posterior margin of basal half sparsely setose; 2 stout pv setae present, longer than width of femur; 1 preapical dorsal seta projecting obliquely. Fore tibia 2/3 length of femur; apex with anteroapical comb, not dilated; basal 2/3 with ventral row of erect slender setae, length less than width of tibia. Tarsomere 1 (Fig. 67) subequal in length to fore tibia, strongly attenuated at mid-length; basal half armed ventrally with row of 8 curved setae decreasing in length apically, basal setae longer than width of tarsus; apical half expanding apically with ventral row of very short setae; apex produced dorsally, slender, clothed in pubescence; 2 anteroapical stout setae present. Remaining tarsomeres somewhat flattened, ventral surface pale and devoid of dark setae; tarsomere 4 with av row of very short setae, tarsomere 4 subequal in length to third.

Mid coxa lacking modified seta. Mid femur lacking modified setae with pair of ventroapical setae and 1 short preapical dorsal seta. Mid tibia longer than femur with 3 ad and 3 pd setae widely spaced and 1 long ventroapical seta. Tarsomere 1 shorter than length of remaining 4 tarsomeres, lacking erect ventral seta; tarsomeres 4 and 5 slightly flattened.

Hind coxa with 1 long lateral seta. Hind femur more swollen than other femora with pair of ventroapical setae and 1 preapical dorsal seta; basal third with ad row of erect setae. Hind tibia longer than femur with 3 widely spaced ad setae and 1 preapical dorsal seta; posterior face with long dense mat of setulae; apex slightly dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long, erect ventral seta near base and 2 widely- spaced posterior setae.

Abdomen: tergites yellowish brown; tergites 1–6 with long posteromarginal setae; sternites yellow; sternites and tergites lacking modified setae and ridges; anterior margin of T5 and T6 with broad band of dark dense pruinescence; anterior margin of T7 with narrow pale band of pruinescence, lacking long posteromarginal setae; S7 3/4 length of preceding sternite, with anterolateral margin not produced; S8 with 2 long posteromarginal setae; T8 very slender, expanded laterally.

Terminalia (Figs. 172, 173): hypandrium convex with tapered, bilobed posterior extension subequal to length of phallus; gonocoxal apodeme slender, oblique. Postgonite arched obliquely and divergent from phallus, apex rounded, articulated at base of phallus. Phallus strongly curved, erect, lacking shelf-like processes. Epandrial lamella narrow, lacking lobes with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; posterior margin lacking distinct fringe of setae. Cercus short, broad and membranous, posterior margin more thickly sclerotized.

Female. Similar to male except as follows: lacking secondary sexual modifications of antenna, base of labrum and prementum, thorax, wing and forelegs. Lower postocular setae slender; apical half of postpedicel twice length of base, stylus subequal to 1/3 length of postpedicel; radial fork proximal to medial fork; radial fork normally distal to medial fork. Scutum with broad (extending half way between acrostichals and dc) brown median stripe from anterior margin to apical margin of scutellum, expanding to dc on prescutellar depression; pale brown, lateral stripe from presut spal to wing base, interrupted at suture; postnotum with broad dark median stripe, lateral

margins pale brown; laterotergite and pleura yellow; Abdominal apical segments retracted into segment 7; posterior margin of T7 with sparse, short fringe of setulae; lateral margin of S7 straight. Terminalia: T8 narrow dorsally, expanded laterally; dense fringe of long stout setae present; anterior margin with pair of small, flat dorsolateral sclerites. S8 triangular, posterior margin invaginated forming inner sclerite. T10 divided medially, forming pair of rectangular sclerites; clothed in long curved setae, setae on posterior margin stouter. Cercus rounded with cluster of many closely placed, stout curved setae, similar to posterior setae of T10. Spermathecal receptacle spherical, no neck visible where duct attached.

Distribution. *Ceratomerus rivalis* is known from the central South Island (Map 38).

Etymology. The specific name is derived from the Latin *rivalis* (of a brook), referring to the habitat of many of the type specimens.

Remarks. A large series of this species was swept from overhanging vegetation along the Bealey River, a large, cool cascading montane river. A possible gynandromorph or specimen with mixed male and female features was discovered among this large series. It appeared to be a mostly female specimen with male terminalia, or exhibiting distinct anterior/posterior division of female and male components. Everything anteriorly appears to be female, including abdominal segments 1–5. Tergite 6 has a median, circular pruinescent spot on the anterior margin, as found in males of *C. rivalis*. Abdominal segments 7–11 are normal male with symmetrical terminalia. This specimen is viewed as a gynandromorph due to the clear distinction between male and female parts; it does not show demasculinity or structures intermediate between those of males and females (Brust 1966). Published records of gynandromorphs are rather rare in Brachycera (Wheeler 1992) and this record represents the first gynandromorph recognized in the Empidoidea, although supposed intersexes (e.g., Plant 1990b) and massive sex anomalies (e.g., Daugeron *et al*. 2011) have been reported.

***Ceratomerus trivittatus* n. sp.**

Map 39

Type material. Holotype male, "NEW ZEALAND: BR/ Nelson Lakes NP; Lk./ Rotoroa; Braeburn Tr./ *Nothofagus* for.; 7.ii./ 1995; B.J. Sinclair"; "HOLOTYPE/ *Ceratomerus*/ *trivittatus*/ Sinclair [red label]" (NZAC).

Paratypes: New Zealand: **BR**—1 ♂, Nelson Lakes NP, Lake Rotoroa, Braeburn Tr., creek, 7–8.ii.1995, YPT, B.J. Sinclair (CNC).

Recognition. Males are recognized by the large labral tubercle, which is lacking an apical lobe, the rectangular discal cell, and apically arched M_4.

Description. Wing length 3.3 mm.

Male. Head: dark brown, not shiny; face narrow, parallel-sided, subequal to size of antennal socket, yellow, with short, apical fleshy lobe; anterior eye facets below antennae not enlarged; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/3 length of ocellar seta; 3 vertical setae, shorter than ocellar seta; upper postocular setae reduced to 2 long setae; lower half of eye with 3 erect, short postocular setae. Antenna brown with length of scape slightly longer than height of eye with 1 long and several short dorsal setae, 1 long ventral subapical seta; pedicel globular with setae confined to apical fringe. Postpedicel long, covered by long dense pruinescence, length slightly longer than labrum; basal third rectangular, brown; apex strongly tapered, apical half arist-like; stylus short, 1/6 length of postpedicel. Base of labrum with dorsal process, lacking apical hook; palpus yellow, slender, 2/3 length of labrum with apical half bent and tapered to slender tip, bearing long lateral seta; midlength of palpus with patch of short setulae; anteromedial margin of apical half of palpus with short dense setae, increasing in length apically; prementum with short setae only.

Thorax: yellow, dorsum with fine pruinescence; dark median stripe, slightly wider than acrostichals, from anterior margin to tip of scutellum; broad, lateral stripe on supra-alar from presut spal to postalar ridge; lateral apical margin of scutellum yellow; postnotum with dark lateral and medial (continuation of median stripe) stripes fusing posteriorly; laterotergite and pleura yellow; anterior basalare inflated, forming rectangular lobe; subalar sclerite elevated as short knob. Acrostichals with anterior pair long and erect; biserial, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower shorter; 2 psut spal; 1 pal; 2 sctl; additional setulae on pprn and interspersed among dc. Antepronotum with pair of long setae.

Wing: infuscate, pterostigma absent; 1 long basal costal seta; costal margin smoothly arched; erect costal setae beyond R_1; ventral margin of costa with fine erect setae beyond R_1; posterior margin lacking incision; posterior setal margin complete, setae on wing stem undifferentiated; base of wing stem with circular cell inflated, deeply concave. R_1 reaching costa before middle of wing; R_{2+3} straight, parallel to C; medial fork distal to radial fork; cell dm rectangular, slender; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 straight, strongly bent at apical third towards wing margin. Halter with light brown knob.

Legs: coxae, base of femora and ventral margin of fore femur yellow, remaining leg segments brown. Fore coxa less than length of mid and hind coxae combined. Fore femur not more swollen than other femora with inner ventral margin bare; 2 short basoventral setae; pv margin with row of black setae, increasing in length apically; 1 preapical dorsal seta. Fore tibia slightly longer than femur; apex with anteroapical comb, not dilated; basal half with pv row of erect slender setae, length less than width of tibia; apical half with pv row of stout oblique setae, decreasing in length apically; setae near midlength longer than width of tibia. Tarsomere 1 slightly longer than half length of fore tibia, not attenuated at mid-length; armed ventrally with row of stout setae decreasing in length apically, basal setae longer than width of tarsus; remaining tarsomeres cylindrical, except flattened tarsomere 5.

Mid coxa lacking modified seta. Mid femur lacking modified setae with 1 preapical dorsal seta and pair of ventroapical setae. Mid tibia longer than femur with 2 av and 3 pd setae widely spaced; apex with long ventroapical seta. Tarsomere 1 shorter than length of remaining 4 tarsomeres; tarsomere 5 slightly flattened.

Hind coxa with unmodified setae. Hind femur more swollen than other femora with pair of ventroapical setae; basal third with ad row of erect setae. Hind tibia longer than femur with 2 widely spaced ad setae and 1 dorsal seta on apical half; mid-length with short ventral seta; posterior face with long mat of setulae; apex slightly dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long, erect ventral seta near base and 1 long pv seta on basal third.

Abdomen: tergites 1–6 dark with long posteromarginal setae; sternites becoming darker apically; sternites and tergites lacking modified setae and ridges.

Terminalia: (undissected) small, not larger than abdomen diameter; epandrium with long setae on ventral margin.

Female. Unknown.

Distribution. *Ceratomerus trivittatus* is known only from the type-locality on the South Island (BR) (Map 39).

Etymology. The specific name is derived from the Latin *vittatus* (bound with a ribbon), referring to the three vittae or stripes on the scutum.

Ceratomerus vittatus Plant

Map 40, Figs. 115, 174

Ceratomerus vittatus Plant, 1991: 1324. Other references: Yang *et al*., 2007: 50 (catalogue); Macfarlane *et al*., 2010: 445 (New Zealand biodiversity).

Type material. Holotype male, "NEW ZEALAND. S.Is.:/ WD: Castle Rock Hut/ Westland National Park/ 4000' - Malaise trap in subalpine scrub/ herbfield/ tussock/ 14–16.i.1986. J.W. Early"; "HOLOTYPE/ Ceratomerus/ vittatus/ Plant [red label]" (NZAC).

Paratype: New Zealand: **WD—**1 ♀, same data as holotype (NZAC).

Additional material. New Zealand: **WD**—1 ♂, 1 ♀, Otira [42°51′S 171°35′E], 8.ii.1922 (ANIC).

Recognition. This species is distinguished by a yellow scutum with a narrow, brown median stripe, base of postpedicel brown, and male wing with distinct subapical swelling on R_{2+3} and trapezoidal-shaped cell dm.

Description. Wing length 3.3–3.7 mm.

Male. Head: somewhat flattened, brownish yellow, not shiny, ocellar triangle brown; face broad, parallel-sided, subequal to width of antennal sockets, with pale pruinescence and short, fleshy apical knob; anterior eye facets below antennae not enlarged; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, 1/4 length of ocellar seta; 3 stout (longer and stouter than ocellar seta) and 1 slender shorter vertical seta; upper postocular setae in oblique posterior row; lower half of eye with 3 erect, stout postocellar setae. Antenna with length of scape longer than height of eye with 1 long erect dorsal seta and sparse setulae, and 1 long ventral subapical seta; pedicel globular with setae confined to apical fringe. Postpedicel covered

by long dense pruinescence, slightly longer than length of labrum; base rectangular, brown; apex 4X length of base, slender, strongly tapered; stylus absent. Base of labrum with rectangular swelling with apical hook; palpus yellow, slender, half length of labrum, inner surface flattened; apical third tapered to point; dense tuft of short setae at basal third, apical half clothed in stout setae, longer than width of palpus; palpus with 1 long, stout subapical dorsolateral seta; prementum with unmodified setae.

Thorax: yellow with narrow (slightly wider than acrostichals), brown median stripe, from anterior margin to apical margin of scutellum, expanded slightly on prescutellar depression; pale lateral stripe from presut spal to wing base; postnotum with brown median stripe; laterotergite and pleura yellow; anterior basalare inflated into broad anvil-shaped process; subalar sclerite with flattened horn-like process. Acrostichals with anterior pair long and erect, uniserial, alternating right and left, ending at prescutellar depression and directed posteriorly; 4 dc, anterior dc very short similar to setulae; posterior dc increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower shorter; 2 psut spal; 1 pal; 2 sctl; additional setulae on pprn and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 115): lightly infuscate, pterostigma absent; 1 long basal costal seta; costal margin straight with erect costal setae beyond R_1; ventral margin of costa with fine erect setae beyond R_1; posterior margin smooth, lacking shallow notches; posterior setal margin complete and unmodified; base of wing stem with concave sclerotized pocket. R_1 reaching costa before middle of wing; R_{2+3} with small subapical swelling, smoothly arched to C; medial fork proximal to radial fork; R_5 straight; discal cell trapezoidal in shape, upper vein of cell reduced; auxiliary cross-vein between R_{2+3} and R_4 lacking, R_4 with short stump vein; M_4 divergent from cell dm, strongly arched to wing margin at apical third. Halter knob yellow.

Legs: yellow, becoming darker on apical tarsomeres. Fore coxa less than length of mid and hind coxae combined; anterior margin sparsely setose, except for 2–3 anteromedial basal setae; basal third not inflated. Fore femur slender, not more swollen than mid femur; posterior margin setose; 4–5 long, stout ventrobasal setae present with pv row of setae, increasing in length apically, length less than width of femur; av row of setae present, short and more slender; 1 preapical dorsal seta. Fore tibia slightly shorter than femur; apex with anteroapical comb, not dilated; basal half of short, erect ventral setae; 1 preapical dorsal seta. Tarsomere 1 2/3 length of fore tibia with shallow mid-length attenuation; basal half with long, erect stout pv setae, basal setae longer than width of tarsomere; apical half with pv row of short stout setae, less than half width of tarsomere. Apical tarsomeres decreasing in length apically; tarsomeres 4 and 5 somewhat flattened.

Mid coxa lacking modified seta. Mid femur lacking modified setae with pair of ventroapical setae and 1 short preapical dorsal seta. Mid tibia longer than femur with 3 av, 3 ad, and 3 pd setae widely spaced and 1 long ventroapical seta. Tarsomere 1 shorter than length of remaining 4 tarsomeres, lacking erect ventral seta; tarsomere 5 flattened.

Hind coxa with 1 long lateral seta. Hind femur more swollen than other femora with fringe of apical setae and 1 preapical dorsal seta; basal third with ad row of erect setae. Hind tibia longer than femur with 3 ad widely spaced setae and 1 preapical dorsal seta; posterior face with long dense mat of setulae; apex slightly dilated, bearing posteroapical comb. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long, erect ventral seta near base and 1 posterior seta on basal third.

Abdomen: sclerites yellowish brown; tergites 1–6 with long posteromarginal setae; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 3/4 length of preceding sternite, anterolateral margin not produced; T8 rectangular, 1/3 length of sternite with narrow, median posterior notch.

Terminalia (Fig. 174): hypandrium convex with broad posterior extension; gonocoxal apodeme slender, oblique; postgonite arched out and around apex of hypandrium, articulated at base of phallus; phallus curved anteriorly, erect with slender expanded apex. Epandrial lamella narrow with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; posterior margin with long stout setae. Cercus short, broad and membranous, posterior margin more thickly sclerotized.

Female. Similar to male except as follows: Head round, face brown, lacking modifications of labrum and palpus; postocular setae slender; apical portion of postpedicel longer than in males, strongly tapered; stylus absent. Thorax lacking modified anterior basalare; anterior dc stout and long; wing venation unmodified. Leg setae more stout, lacking modified ventral setae of foreleg; hind tibia with 2 dorsal setae. Abdominal tergites brown; apical

segments retracted into segment 7; posterior margin of T7 with dense fringe of setulae; lateral margin of S7 straight. Terminalia not examined.

Distribution. *Ceratomerus vittatus* is known from the central South Island (Map 40).

UNPLACED NEW ZEALAND SPECIES

The *Ceratomerus* species-group assignments of the following three New Zealand species remain undetermined.

Ceratomerus akatarawa n. sp.

Map 43, Figs. 35, 175–177

Ceratomerus sp. 23: Sinclair, 2010: 222 (phylogeny).

Type material. Holotype male, "NEW ZEALAND: WN/ Cloustonville/ Akatarawa Valley/ Fern Gully, creek/ 3–4.ii.1995, yellow/ pans, B.J. Sinclair"; "HOLOTYPE/ *Ceratomerus*/ *akatarawa*/ Sinclair [red label]" (NZAC).

Paratype: New Zealand: **WN**—1 ♂, same data as holotype (CNC).

Recognition. Males are distinguished from all other New Zealand ceratomerines by the following combination of characters: pterostigma lacking; erect, stout costal setae lacking; ocellar setae inserted near eye margin beyond anterior ocellus; legs unmodified, hind tibia gradually expanded with broad apical posteroventral comb; and broadly divergent radial fork.

Description. Wing length 3.2 mm.

Male. Head: dark brown, not shiny; face brown, lacking setae and processes, wider than antennal sockets; frons with pair of setulae at base of antennae; anterior eye facets below antennae not enlarged; ocellar triangle lacking setae, displaced forward beyond anterior ocellus near eye margin (Fig. 35); postocellar seta absent; 2 pairs of long vertical setae; lower half of eye with long, overlapping postocular setae. Antenna (Fig. 35) with scape slightly shorter than height of eye with 3–4 dorsal setae and 1 long ventral seta; pedicel globular with apical fringe of long setae. Postpedicel covered by dense pruinescence, subequal to length of labrum; rectangular base subequal to apical portion; apex broad, gradually tapered to stylus, concolourous with remaining antenna; first segment of stylus short, width shorter than length; stylus longer than base of postpedicel. Base of labrum lacking dorsal process; palpus brown, oblique to labrum, 1/5 length of labrum with dark setulae; prementum with short setae only.

Thorax: mesonotum and postpronotum dark brown with brownish pruinescence; postpronotal lobe, notopleuron and postalar ridge pale brown; pleura light brown; anterior margin of anepimeron and dorsal margin of katepisternum yellowish brown; laterotergite brown. Lacking modified sclerites at base of wing. Acrostichals with anterior pair long and erect, uniserial, alternating right and left to prescutellar depression and directed posteriorly; 4 dc increasing in length toward scutellum; 1 pprn; 1 presut spal; 2 npl, lower weak and short; 0 psut spal; 1short and slender pal; 2 sctl, some additional setulae interspersed among dc. Antepronotum with several pairs of setulae.

Wing: infuscate, pterostigma lacking; 1 basal costal seta; costal and posterior margins straight with unmodified setulae and lobes or incisions absent; posterior margin of wing stem with unmodified setae. Wing venation unmodified; C lacking erect stout setae; R_1 ending in costa before middle of wing; R_{2+3} parallel to C for nearly full length, before arching to wing margin; R_4 diverging strongly from R_5, subtriangular; medial fork proximal to radial fork by nearly twice length of R_5; M_{1+2} straight; cell dm subrectangular; auxiliary cross-vein between R_{2+3} and R_4 lacking; base of wing lacking sclerotized posket; M_4 gradually arched to wing margin. Halter knob pale brown.

Legs: coxae pale brown; remaining leg segments brown. Fore coxa shorter than length of mid and hind coxae combined; sparse setae on inner anterior margin, some longer than width of coxa. Fore trochanter with slender setulae. Fore femur slender with av and pv rows of slender pale setae; basal setae longer than width of femur. Fore tibia slightly shorter than femur; apex with anteroapical comb, not dilated, lacking setae. Tarsomere 1 straight, not swollen, about 1/3 length of fore tibia; fine short setae beneath. Tarsomeres 2–4 decreasing in length; tarsomere 5 longer than preceeding segment, dorsoventrally flattened, dorsoapical margin appears grooved; empodium greatly expanded apically.

Mid coxa lacking modified seta. Mid femur slender with pair of ventroapical setae. Mid tibia slender, slightly shorter than femur, lacking setae. Tarsomere similar to fore tarsomeres.

Hind coxa with unmodified setae and lacking lateral seta. Hind femur straight, slightly wider than other femora; av margin with row of long slender setae, longer than width of femur; basal third lacking erect dorsal setae; lacking preapical dorsal seta. Hind tibia 3/4 length of femur; somewhat flattened, very narrow at base, gradually expanding apically to wide pv comb; posterior face with mat of very long erect setulae; length of comb subequal to or longer than basal width of tarsomere 1; lacking setae. Hind tarsomeres shorter than tibia, similar to fore tarsomeres; tarsomere 1 lacking ventrobasal seta.

Abdomen: tergites and sternites dark brown, lacking posteromarginal setae; sclerites lacking ridges and modified setae; central region of T7 membranous; S7 longer than preceding sclerite, posterior margin with deep U-shaped membranous cleft; posterolateral extension reaching anterior margin of S8; T8 divided medially into pair of subtriangular lateral sclerites.

Terminalia (Figs. 175–177): highly modified; hypandrium large, wide, with short dorsolateral process articulating with median phallic process; gonocoxal apodeme stout and horizontal. Phallus comprises anterior pair of long slender processes, extending beyond apex of phallus; phallus slender, slightly curved posterior with membranous tubular distiphallus. Postgonites bird head-shaped with narrow beak-like process directed anteriorly; articulated with hypandrium. Epandrial lamella expanded laterally with anterior lobe slender and bearing anterior fringe of long stout setae; posterior lobe slender and tapered with dorsal row of very short stout setae, apex with long curved seta. Surstylus boot-shaped, bearing pd fringe of setae nearly as long as height of surstylus. Cercus plate-like, well sclerotized with 2 lateral lobes and pair of dorsal lobes with wide setose base; ventral half with small central hold.

Female. Unknown.

Distribution. *Ceratomerus akatarawa* is known only from the type-locality, a small low elevation gully stream, shaded by tree ferns in the southern tip of North Island (WN) (Map 43). The two specimens were collected in yellow pan traps. This is the type-locality of two other apparently rare species (i.e., *C. latipalpus*, *C. setifacies*), both also only known from this small stream. *Hydropeza akatarawa* Sinclair & McLellan is also known primarily from this stream and nearby valley (Sinclair & McLellan 2004).

Etymology. The specific name is derived from the type-locality.

Remarks. The relationship to other New Zealand species of *Ceratomerus* remains uncertain, and *C. akatarawa* differs from all known New Zealand species by the greatly enlarged male terminalia, broadly divergent R_4, and displaced ocellar setae. This species is possibly related to the *C. ordinatus* group by possession of overlapping postocellar setae. Antepronotal setae reduced to several pairs of setulae are also found in the latter group, but this character state is probably plesiomorphic. The dorsal margin of the fifth tarsomere appears modified, somewhat similar to the *C. ordinatus* group, but further study is required.

Ceratomerus brevinervis n. sp.

Map 44, Figs. 116, 178

Type material. Holotype male, "NEW ZEALAND: MB/ Mt. Richmond For. Pk. / Butcher's Flat/ Nothofagus; 5–6.ii./ 1995/ B.J. Sinclair"; "HOLOTYPE/ *Ceratomerus*/ *brevineris*/ Sinclair [red label]" (NZAC).

Paratypes: New Zealand: **MB**—2 ♂, same data as holotype (NZAC). 1 ♂, Pelorus Bridge Scenic Res., alluvial Podocarp for., 6.ii.1995, BJS (CNC). **NN**—1 ♂, Dobson Valley nr. Nelson, str, 5.v.1973, J.S. Dugdale (NZAC).

Recognition. This species is distinguished from all other New Zealand species of *Ceratomerus* by a very short M_4, slightly longer than dm-m crossvein.

Description. Wing length 2.3 mm.

Male. Head: round, dark brown, not shiny; face pale yellow, lacking setulae, narrow below antennal sockets, parallel-sided, slightly expanded apically; frons lacking setae; anterior facets of eye below antennae enlarged; ocellar triangle with pair of divergent ocellar setae inserted anterior to posterior ocelli; postocellar seta 1/2 length of ocellar seta; 3 pairs of long vertical setae, longer than postocellar seta and stouter; postocular setae aligned along outer margin of eye, lacking long overlapping setae on lower margin. Antenna brown with scape slightly shorter than of eye with 1 dorsal seta at middle and several shorter setae, 1 long preapical ventral seta; pedicel globular

with apical fringe of long setae. Postpedicel covered by dense pruinescence, lightly longer than length of labrum; rectangular base one-half length of apical portion; apex narrow, slightly tapered to stylus, concolourous with remaining antenna; stylus bare, short, subequal to base of apical portion of postpedicel; length basal segment of stylus subequal to width. Base of labrum lacking dorsal process; palpus yellow or somewhat darker toward apex, parallel to labrum, almost one-third length of labrum, with dark setulae; prementum with unmodified setae.

Thorax: scutum yellowish brown, with brown median stripe along acrostichal row, expanding in prescutellar depression to dc margin, continuing to apex of scutellum; pleura and laterotergite yellow. Anterior basalare and subalar sclerite somewhat swollen, lacking distinct process. Acrostichals with anterior pair long and erect, biserial to prescutellar depression and directed posteriorly; 4 dc increasing in length toward scutellum; 1 pprn; 1 presut spal; 2 npl, lower weak and short; 2 psut spal; 1 short and slender pal; 2 sctl, some additional setulae on postpronotal lobe and interspersed among dc. Antepronotum with pair of long setae.

Wing (Fig. 116): infuscate, pterostigma absent; 1 long basal costal seta; costal margin straight; erect costal setae beyond R_1 and erect, ventral costal setulae; posterior margin unmodified, lacking incisions, lobes and setae unmodified. Posterior base of wing stem with 2 stout setae; base of wing with weak, slender sclerotized concave pocket. R_1 reaching costa well before middle of wing; R_{2+3} gradually arched to C; medial fork opposite to slightly proximal to radial fork; M_{1+2} straight; cell dm subtrangular, long, expanded apically; auxiliary crossvein between R_{2+3} and R_4 lacking; M_4 straight to wing margin, slightly longer than dm-m crossvein. Halter knob pale brown.

Legs: coxae, femora, and mid and hind femora yellow, remaining leg segments brown. Fore coxa slightly shorter than length of mid and hind coxae combined; short, sparse setae on inner anterior margin; apical margin with row of stout setae. Fore trochanter with several setae. Fore femur swollen with biserial pv row of dark, stout short setae, on basal third, ventral most row continuing to apex; av margin with row of slender pale setae; pair of preapical ventral setae; 1 preapical dorsal seta. Fore tibia shorter than femur; apex with dilated anteroapical comb; 1 short, subapical dorsal seta. Tarsomere 1 straight, cylindrical, 3/4 length of fore tibia; rows of stout erect setae beneath, shorter than width of tarsomere. Tarsomeres 2–4 decreasing in length; tarsomere 5 subequal to preceeding segment, dorsoventrally flattened, dorsoapical margin straight; empodium subequal in width to pulvillus.

Mid coxa lacking modified seta. Mid femur slender with pair of subapical ventral setae and 1 subpical ad seta. Mid tibia slender, subequal in length to femur; basal 2/3 with 2 ad setae; 1 preapical ventral seta; distal half with 2 short pv setae. Tarsomeres longer than tibia, similar to fore tarsomeres.

Hind coxa with 1 long lateral seta. Hind femur straight, swollen; basal third with ad row of erect setae; pair of preapical ventral setae; 1 preapical dorsal seta. Hind tibia slightly longer than femur; pv comb slightly inflated, comb longer than width of tarsomere 1; 3 ad setae and 1 dorsal seta on apical fourth; posterior face with long dense mat of setulae. Hind tarsomeres longer than tibia; tarsomere 1 with 1 long erect, ventral setae near base and 1 long posterior seta on basal third and several rows of erect short setae; tarsomere 5 dorsoventrally flattened.

Abdomen: tergites brown, sternites paler with posteromarginal setae; sclerites lacking ridges and modified setae; central region of T7 membranous; S7 longer than preceding sclerite, anterolateral margin prolonged to margin of S8; T8 very narrow medially, lateral margin expanded; S8 with several pairs of subapical setae.

Terminalia (Fig. 178): hypandrium convex, posterior margin lacking processes; gonocoxal apodeme projecting beyond hypandrium; phallus arched anteriorly, erect, apex bent posteriorly. Postgonite divergent from hypandrium, apex partially expanded and rounded, articulated at base of phallus. Epandrial lamella broad with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus not separated from epandrium; very slender, sickle-shaped, sclerotized, lacking setae, tapered to narrow tip. Cercus well sclerotized with long, stout inner apical and posteroapical setae; posterobasal margin expanded with 3–4 setae.

Female. Unknown.

Distribution. *Ceratomerus brevinervis* is known from three localities in the northern South Island (MB) (Map 44).

Etymology. The specific name is derived from the Latin *brevis* (short) and *nervis* (tendon), referring to the short vein M_4.

Remarks. *Ceratomerus brevinervis* is related to the *C. prodigiosus* species-group on the basis of presence of erect setulae on the ventral surface of the costa, and the swollen basalare and subalar sclerites, but the wing venation is not highly modified. The male cercus and surstylus appear similar to *C. minutus* and *C. simplex*.

***Ceratomerus burgersi* n. sp.**

Map 45, Figs. 36–38, 117, 179–181

Type material. Holotype male, "NEW ZEALAND: NN/ Go Ahead Ck. 50m/ 18.i.-3.v.1998/ N25 24913 60352/ I.A. Burgers"; "HOLOTYPE/ *Ceratomerus*/ *burgersi*/ Sinclair [red label]" (CMNZ).

Paratype: New Zealand: **NN**—25 ♂, 29 ♀, same data as holotype (CMNZ, NZAC, CNC).

Additional material examined. **New Zealand**: **BR**—1 ♀, Lewis Pass, Dans Ck to Foleys Ck, UV, 27–28.x.1996, Ward, Patrick, Morris (CMNZ).

Recognition. This species is distinguished by the long, upwardly directed palpi in both sexes, highly modified male fore tarsomeres and the highly modified male wing.

Description. Wing length 2.6–3.1 mm.

Male. Head (Fig. 36): round, brown, thinly dusted with pruinescence; face broad and bare, wider than antennal sockets, slightly divergent, concave, obscured by enlarged palpi, anterior facets of eye below antennae enlarged; ocellar triangle with 2 long divergent setae, inserted anterior to posterior ocellus; postocellar seta slender, very short, 1/6 length of ocellar seta; frons bare; 3 vertical setae, 1/2 length of ocellar seta, inner seta 2/3 length of other vertical setae; upper postocular setae in oblique row from margin of eye, lower half of eye with 3 setae. Antenna brown, inner apex of scape paler; length of scape subequal to height of eye, arched not straight with 1 stout anterodorsal seta, lacking ventral setae; pedicel brown, globular with prolonged base, with setae confined to outer apical fringe. Postpedicel dark brown, clothed in short, dense pruinescence, slightly longer than length of labrum; base rectangular, less than 1/2 length of apical portion; apical portion narrow, nearly parallel-sided; stylus very short, not distinctly differentiated from postpedicel. Base of labrum lacking dorsal process. Palpus whitish yellow, digitiform, longer than height of head, directed straight dorsally between antennal bases, clothed in short dark setae; base with short appendix, bearing crown of gold-coloured setae. Postmentum with ad setae shorter than width of labium.

Thorax: entirely brown, clothed in fine pruinescence; anterior basalare somewhat inflated, shiny reddish brown; subalar sclerite not modified. Acrostichals with anterior pair long and erect; biserial, ending at prescutellar depression and directed posteriorly; 4 dc, increasing in length posteriorly; 1 pprn; 1 presut spal; 2 npl, lower short; 2 psut spal; 1 pal, short; 2 sctl. Antepronotum with pair of short setulae.

Wing (Fig. 117): infuscate, pterostigma absent; 1 basal costal seta; costal margin straight; hook-like spur at apex of R_1 with shallow distal notch extending as fold dissecting basal third of wing, distorting vein positions, outlined by line of dense microtrichia; erect costal setae beyond R_1; ventral margin of costa lacking setae; posterior margin with shallow incision at basal third; apex of incision with dense microtrichia; posterior setal margin complete and of normal length; 2 long setae on wing stem; base of wing stem lacking concave pocket. R_1 reaching costa at basal fourth; R_{2+3} curved gradually towards wing margin, lacking swelling; radial fork parallel, divergent at wing margin; medial fork well distal to radial fork; M_{1+2} straight, longer than half length of medial fork; cell dm subrectangular; auxiliary cross-vein between R_{2+3} and R_4 lacking; M_4 slightly straight to near wing margin. Halter pale brown.

Legs (Fig. 38): brown, concolourous with thorax. Fore coxa subequal in length to mid and hind coxae combined; anterior face bare; anterolateral and apex clothed with short, dense stout setae. Fore trochanter with anteroventral row of short fine setae. Fore femur flattened and somewhat concave along anterior margin, lacking setae, greatly inflated at mid-length with biserial row of short, fine anteroventral setae, extended as single row of setae beyond swelling. Fore tibia 2/3 length of femur; apex with anteroapical comb; with row of erect pv setae beneath; anterior face with mat of setulae on apical half. Tarsomere 1 2/3 length of fore tibia, anterior face with subbasal hook-like process above deep anterior excavation; tufted knob near mid-length; apical half with deep posteroventral excavation. Remaining tarsomeres highly complex and usally tightly folded preventing detailed examination

Mid coxa and femur lacking modified setae. Apex of mid femur with pair of ventral setae. Mid tibia shorter than femur, with broad subapical dorsal notch; fringe of 4–5 stout subapical setae; basal half with 1 ad and 1 pd seta. Tarsomere 1 3/4 length of tibia with pd row of erect setae on proximal half, slightly longer than width of tarsomere; tarsomeres 4 and 5 dorsoventrally flattened.

Hind coxa lacking long lateral seta. Hind femur slender with pair of ventroapical setae; basal third with ad row of erect setae; 1 dorsal subapical seta. Hind tibia subequal in length with femur with 1 ad seta near mid-length

and 1 dorsal subapical seta; apex dilated, bearing posteroapical comb; apical half of posterior face with mat of short pale setulae. Hind tarsomeres shorter than tibia; tarsomere 1 with 1 long erect ventral seta near base; tarsomeres 4 and 5 dorsoventrally flattened.

Abdomen: sclerites 1–6 brown, with long posteromarginal setae; sternites and tergites lacking modified setae and ridges; T7 thinly sclerotized on posterior half, lacking long posteromarginal setae; S7 slightly subequal in length to preceding sternite, anterolateral margin not produced; T8 rectangular, 1/6 length of sternite with lateral margin expanded, narrower in middle; S8 with several pairs of subapical setae.

Terminalia (Fig. 179): hypandrium convex, posterior margin truncate, extending little beyond epandrium; gonocoxal apodeme long and slender laterally; postgonite gently arched, flanking phallus, apex expanded and rounded; phallus arched anteriorly, erect, partially expanded apically. Epandrial lamella subtriangular with broad bacilliform sclerites; subepandrial sclerite lacking process. Surstylus not distinctly differentiated from epandrium; elongate and straight, posterior margin with fringe of short setae. Cercus short, apex expanded, bearing short setae.

Female. Similar to male except as follows: palpus shorter, not reaching postpedicel (Fig. 37). Mesonotum lacking modified anterior basalare; wing venation unmodified, radial fork parallel-sided; median fork proximal to radial fork. Foreleg lacking modified setae; mid tibia and tarsomere 1 unmodified; hind tibia with 2 dorsal setae. Abdominal pleural membrane brown; apical segments retracted into segment 7; posterior margin of T7 with dense fringe of short setulae; lateral margin of S7 straight. Terminalia (Fig. 181): T8 narrow dorsally, expanded laterally; dense fringe of long stout setae present; anterior margin with pair of large, flat dorsolateral sclerites. S8 triangular, with dense posterolateral setae; posterior margin invaginated forming inner sclerite. T10 divided medially, forming pair of rectangular sclerites; clothed in long curved setae, setae on posterior margin stouter; small rounded sclerite below posteroventral corner. Cercus rounded with cluster of many closely placed, stout curved setae, similar to posterior setae of T10. Spermathecal receptacle spherical (Fig. 180) with long, pigmented neck blending into duct.

Distribution. *Ceratomerus burgersi* is known from the northern South Island (Map 45).

Etymology. This species is named in honour of I.A. Burgers, the primary collector of this unique species.

PHYLOGENY

Position of Ceratomerinae within the Empidoidea

Chvála (1983) suggested that the subfamilies Clinocerinae and Ceratomerinae were closely related and perhaps formed a monophyletic group, although no supporting characters were provided. Sinclair (1995) first proposed that the Ceratomerinae were most closely related to his newly defined Trichopezinae and Brachystomatinae, supported by two synapomorphies: female tergite 7 with posterior fringe of setae and female cercus directed in an upright position. This arrangement was later supported in a morphological phylogenetic analysis of the entire Empidoidea (Sinclair & Cumming 2006). In a molecular phylogenetic analysis, Collins & Wiegmann (2002) also often recovered this clade of three subfamilies (although usually including *Hesperempis* Melander), leading them to consider that it represented a natural group. In a subsequent molecular analysis primarily inferred from CAD sequences, Moulton & Wiegmann (2007) did not resolve this grouping. Unfortunately molecular studies have not thoroughly investigated this classification. The analyses had few included representative genera and this should be one of the priorities of future family-level phylogenetic studies of the Empidoidea.

The Ceratomerinae is distinctly monophyletic, characterized by lengthened scape and pedicel bearing a conus or condyle inserted into the postpedicel, and long narrow wings (Sinclair & Cumming 2006). No ceratomerine fossils are known and the subfamily is absent from the African continent (Sinclair 2010). The Santonian-age (70–80 MYA) fossil species of *Apalocnemis* Philippi (subfamily Trichopezinae) provides an estimate of a minimum age for the Ceratomerinae (Sinclair 2010).

Phylogeny of the New Zealand Ceratomerinae

The main objective of the present cladistic analysis was to infer the phylogeny of the New Zealand Ceratomerinae and not all the transantarctic relationships of the subfamily, which were explored by Sinclair (2010). In the present analysis, New Zealand taxa representing all species groups and unplaced species were added to the dataset of

Sinclair (2010), although several extralimital taxa (*C. apterus* Sinclair, *C. penai* Sinclair, *C. victoriae* Sinclair, *C. connexus* Collin, *C. paraconnexus* Sinclair) were removed because the species groups were represented by other species or to omit the difficulties with inapplicable scorings. In addition, several characters were dropped or re-defined and several new characters added. A cladistic analysis was preformed on the character state matrix (Table 3), which generated 60 most parsimonious trees (tree length = 137; CI = 0.54; RI = 0.72; RC = 0.39). Strict consensus of these trees produced a largely unresolved *Ceratomerus*, with the following monophyletic clades: (*albistylus* + *attenuatus* + *orientalis* + *paradoxus*) + *irramus*; *brevifurcatus* + *brevinervis* + *curvatus* + *notatus* + *prodigiosus*; *deansi* + *dorsatus*; *falcatus* + *longicornis*; *masneri* + *mediocris* (Fig. 182). *A posteriori* character weighting using successive approximations according to the rescaled consistency index (RC) produced a single tree, which was one of the 60 original most parsimonious cladograms (Fig. 183), and for this reason was chosen as representative and used to trace the character distributions.

As in the earlier analysis of Sinclair (2010), the monophyly of Ceratomerinae is very strongly supported (Figs. 182, 183) by five synapomorphies [dichoptic male (1.1); scape more than twice as long as pedicel (2.1); conus present (3.1); R_1 ending proximal to mid-length of wing (41.1); epandrial lamellae separate dorsally (55.1)]. *Glyphidopeza* is sister to the remaining Ceratomerinae and the remaining Ceratomerinae form another very well supported clade supported by six synapomorphies [inner basal face of scape flattened (5.1); pseudotracheae absent (21.1); four dorsocentral setae (28.2); M_{1+2} petiolate, two veins emitted distally from cell dm (43.1); cell bm poorly defined or absent (45.1); cell cua absent (46.1)]. *Zealandicesa* is resolved as sister to a weakly defined *Ceratomerus*, rather than nested within the latter genus as presented in Sinclair (2010). *Zealandicesa* is a very distinct monophyletic genus, endemic to New Zealand (Sinclair 1997).

The present analysis did not result in any unique synapomorphies clearly defining the genus *Ceratomerus*, which was also the result in Sinclair (2010). *Ceratomerus* is divided into a basal trichotomy, with three clades as shown on both the consensus tree (Fig. 182) and the chosen cladogram (Fig. 183): (1) *C. akatarawa*, (2) *C. mediocris* + *C. masneri*, (3) remaining species of *Ceratomerus*. *Ceratomerus akatarawa* remains an enigma on the basis of unique male terminalia, absence of pterostigma and any male secondary sexual characters that define most New Zealand *Ceratomerus*. The *C. mediocris* and *C. masneri* groups are clearly defined groups which could readily be recognized as new genera, but only if the remaining *Ceratomerus* could be clearly defined. The third clade in the basal trichotomy is a monophyletic group defined by a single synapomorphy [hind tarsomere 1 with 1–2 ventral basal setae (53.1)]. On the basis of the present analaysis, these three clades could be viewed as distinct genera. To fully test this question of genus groupings, all taxa in Sinclair (2010) were scored for the present list of characters and added to the matrix and re-analyzed. The trees generated resulted again in an unresolved definition of *Ceratomerus*, even if the wingless species *C. apterus* is omitted from the analysis. Given the continued poor resolution of the monophyly of *Ceratomerus*, I remain reluctant to erect new genera. New morphological characters are needed for further investigation, and the analysis needs to be expanded with molecular data.

In Figure 183, three groupings are resolved within the third clade of *Ceratomerus* defined by character state 53. The Ecuadorian species, *C. longicornis* Sinclair forms a clade with *C. falcatus* (representing the *C. ordinatus* group of Australia (Sinclair 2003)) primarily by a lengthened pedicel (4.1). In Sinclair (2010) *Ceratomerus spinosus* (= sp. 12) was included in this clade, but in the present analysis this species is grouped with the New Zealand species and the lengthened pedicel is considered to have evolved independently. The pterostigma at the apex of cell r_1 (36.1) unites the remaining Australian species of *Ceratomerus* and Neotropical species. Within this second group, *C. irramus* is sister to the remaining species, excluded by two synapomorphies [shortened prescutellar bristles (26.1); truncate pterostigma (37.1)].

The final grouping comprises almost entirely New Zealand taxa, defined by a single synapomorphy [hind tarsomere 1 with posterior basal seta (54.1)]. Within this clade, the Chilean species, *C. deansi* Plant and *C. dorsatus* (the latter species representing the *C. dorsatus* group) are sisters, defined by two synapomorphies [postpronotum with two setae (24.1); wing microtrichia long (34.1)]. The *C. crassinervis* and *C. exiguus* (represented by *C. flavus*) groups are united by a single synapomorphy, absence of postgonites (56.1). However, not all members of the *C. crassinervis* group lack postgonites, which may indicate that this group is paraphyletic in relation to the *C. exiguus* group. *Ceratomerus burgersi* remains unassigned with no informative synapomorphies linking it with any other species group, presumably due to its highly autapomorphic male wing and palpi of both sexes. The *C. mangamuka* group (represented by *C. spinosus*) appears related to other species with modified male palpi. The unassigned

Ceratomerus brevinervis is sister to the clade that includes the *C. longifurcatus, prodigiosus* and *curvatus* groups, supported by two synapomorphies [erect costal setae (39.1); wing with basal "pocket" (47.1)]. The *C. prodigiosus* group and *C. longifurcatus* groups (represented by *C. brevifurcatus* and *C. notatus*) are sisters, supported by a single synapomorphy [long, slender male palpi (17.2)].

BIOGEOGRAPHY

Origin of New Zealand Ceratomerinae

Transantarctic relationships within the Ceratomerinae were first suggested by Paramonov (1959) and several different transantarctic patterns in the subfamily were outlined and discussed by Sinclair (2010). Although no fossil ceratomerines are known, the Santonian-age fossil of the brachystomatid *Apalocnemis* (Grimaldi & Cumming 1999), provides evidence for an hypothesis that the Ceratomerinae may have been widespread on former Gondwanan continents following the separation of southern South America from Africa in the Early Cretaceous (135 MYA).

As presented in Sinclair (2010) and illustrated in the present analysis (Fig. 183), the intercontinental relationships among ceratomerine genera, including absence from Africa, are generally congruent with the classic Southern Gondwana Pattern: Africa (New Zealand (southern South America, Australia) (Sanmartín & Ronquist 2004). The endemic New Zealand genera *Glyphidopeza* and *Zealandicesa*, are sister group to the remaining Ceratomerinae and these "basal groups" provide support for the ancient Gondwanan origin of the New Zealand ceratomerines.

Further evidence supporting the vicariant origin of the New Zealand Ceratomerinae is the absence of a direct trans-Tasman connection and the resolution of the Inverted Southern Pattern (Australia (southern South America, New Zealand) or an amphinotic tract (Sanmartín & Ronquist 2004; Cranston 2005; Bickel 2009), as illustrated by the *C. deansi* + *C. dorsatus* group clade (see discussion in Sinclair (2010)). In the absence of fossils, a closer relationship of the New Zealand biota with that of South America rather than with Australia indicates older vicariant origins that trace back to Gondwana (Craig *et al.* 2012). Such Gondwanan origins have been proposed for many New Zealand freshwater insects, but the availability of freshwater habitats during the Oligocene Drowning is in question (Buckley *et al*. 2015). Geological evidence during this time indicates major peneplaining and marine erosion of the New Zealand landmass. However, fossil evidence and molecular dating of clades suggest that New Zealand was not entirely submerged during this period, and freshwater habitats remained available, although possibly much reduced (Cranston *et al*. 2010; Craig *et al*. 2015). Many modern New Zealand Ceratomerinae are associated with emergent rocks in running water habitats and standing water margins.

New Zealand regional patterns

The Ceratomerinae occur on all three main islands (North, South and Stewart islands), but are absent from Great Barrier Island and all distant offshore islands. Knowledge of the distributional range of New Zealand Ceratomerinae is mostly in the initial stages, with 16 of 45 species of *Ceratomerus* known only from their holotype locality. Understanding species' ranges will require greater collection efforts using a variety of methods. Despite the limited data available, *Glyphidopeza* is presently only known from the northern half of the South Island. *Zealandicesa* includes one species confined to the South Island, one species only known from the North Island and five species known from both the South and North Islands. In *Ceratomerus*, 23 species are restricted to the South Island, 14 species are restricted to the North Island and 8 species occur on both North and South Islands. The *C. mangamuka* species-group is currently known only from the North Island, whereas all other species groups are recorded from both the North and South Islands. The distribution of many species extending from the South Island across Cook Strait into the lower North Island can potentially be explained by the Cenozoic South Island—lower North Island land connection (Buckley *et al*. 2015). There was a series of land connections throughout the Miocene and Pliocene to as recently as less than one million years ago with the formation of the modern Cook Strait. These land connections would have readily facilitated faunal exchange within this region. Stewart Island was connected

to South Island during lower sea-levels created at the time of glaciation maxima (Craig *et al*. 2012). The occurrence of five widespread species of *Ceratomerus* on Stewart Island would be expected given the past land connections.

From initial examination, there appear to be at least two areas of endemism and high diversity of species of *Ceratomerus*. In the Akatarawa Valley (WN) in the southern North Island, there are three species currently known only from this region (*C. akatarawa, C. latipalpus, C. setifacies*) and six more widespread species also recorded there (*C. alticolus, C. brevifurcatus, C. dorsatus, C. lobipennis, C. ohakunensis, C. whirinaki*). The second locality with high species diversity at this stage of our knowledge is the Mt. Arthur Tablelands (NN) in the northwestern South Island. There are two species known only from this region (*C. montanus, C. tonnoiri*) and three widespread species (*C. alticolus, C. dorsatus, C. flavus*).

Analysis of species distribution patterns is difficult at this stage, given the limited data available. One pattern that is emerging is a disjunct distribution or gap on the South Island (e.g., *C. latinervis, C. exiguus, C. flavus*), where this absence of distribution records has been thought to indicate restriction of biota during the past (Trewick & Wallis 2001). More detailed studies are required to thoroughly understand these patterns, combined with surveys of new localities for ceratomerines.

The alpine habitat of mountains has not been well surveyed specifically for Empidoidea, including Ceratomerinae. In Ecuador, the wingless species *C. apterus* is known from 4000 m, so the existence of unique alpine species in New Zealand is a possibility. The origin of alpine habitats above the tree line is relatively recent, having become established less than 1.5 MYA (Buckley *et al*. 2015).

FUTURE EMPHASIS

There are now 54 species of Ceratomerinae known in New Zealand, including 45 species of *Ceratomerus*. Additional new species are to be expected with more widespread use of yellow pan traps and UV light techniques. Setting out yellow pan traps along small isolated watersheds and possibly alpine zones is to be encouraged and also widespread sampling to obtain fresh specimens for future molecular studies. Major gaps in our understanding of the Ceratomerinae remain. The immature stages urgently need to be discovered and associated with adults, and molecular techniques hold promise in achieving this goal. Mating and feeding behaviours are mostly unknown and new observations should be encouraged. Finally, study of the females of *Ceratomerus* is needed and a key to females is required.

ACKNOWLEDGMENTS

I am greatly indebted to the following for loan of specimens and assistance with type specimens: D.J. Bickel (AMS), P.S. Cranston (ANIC), J. Chainey (BMNH), R.P. Macfarlane and J.B. Ward (CMNZ), S.A. Marshall (DEBU), J. Marris (LUNZ), C. Daugeron (MNHN), A.R. Plant (NMW), T.K. Crosby and R.J.B. Hoare (NZAC), and N.E. Woodley (USNM). I especially wish to thank Dan Bickel for encouragement and discussions during the initial phase of this project in the mid 1990s as a Postdoctoral Fellow at the Australian Museum. Research facilities were made available by the Australian Museum. Scanning electron micrographs were taken by G. Avern (AMS) and R.J.B. Hoare assisted in locality data determinations. Digital images were produced by Victoria Nowell (CNC), Scott Brooks (CNC) kindly assisted with technological issues and Steve Marshall kindly provided habitus photographs of *Ceratomerus*. Initial research and field work was partially supported by a postdoctoral fellowship from the Natural Sciences and Engineering Research Council of Canada. A Canacoll Foundation grant supported field work in New Zealand. Collecting permits were obtained through the Director of Protected Species Policy Division (Wellington). Adrian Plant and Jeff Cumming (CNC) kindly reviewed the manuscript.

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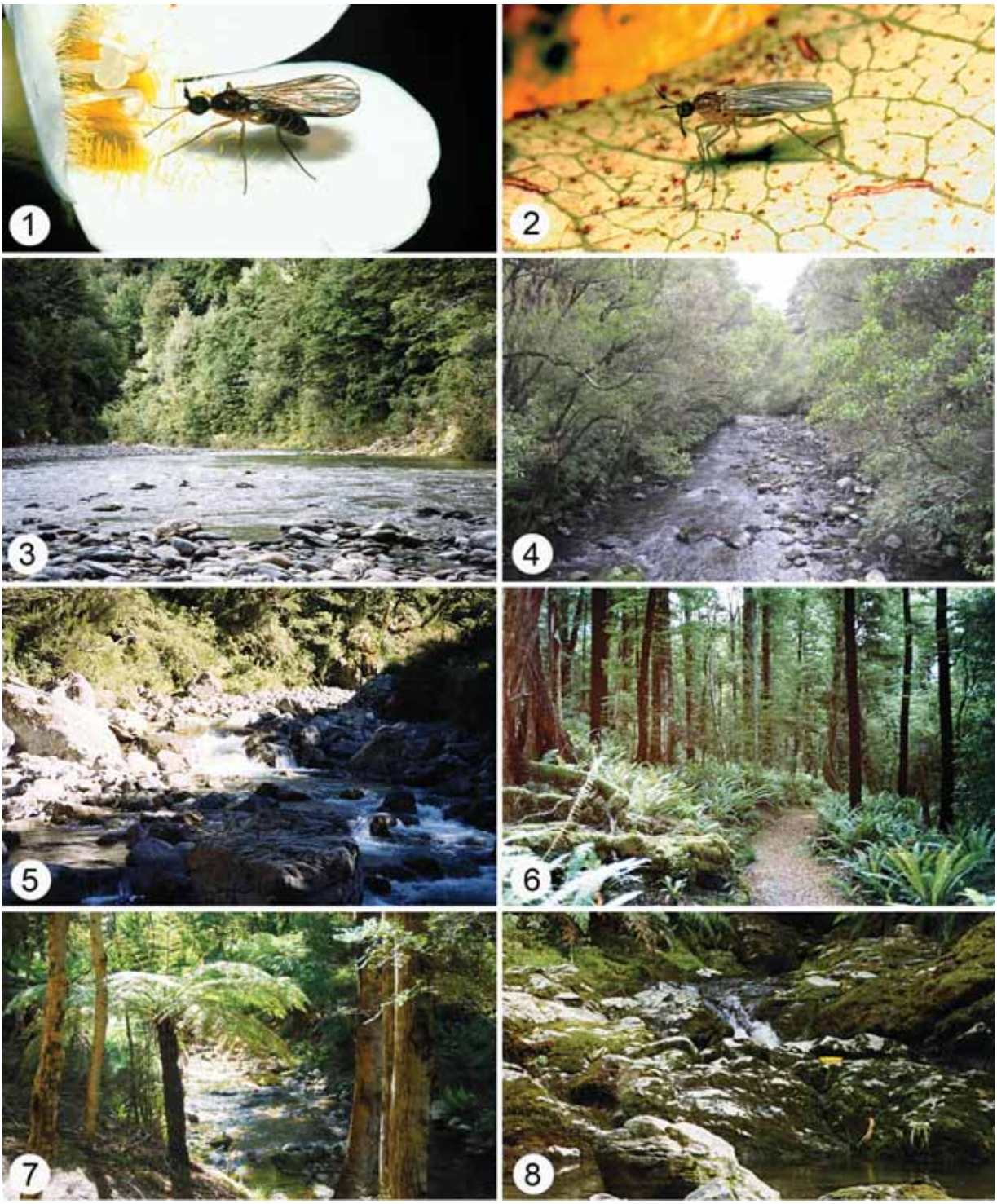
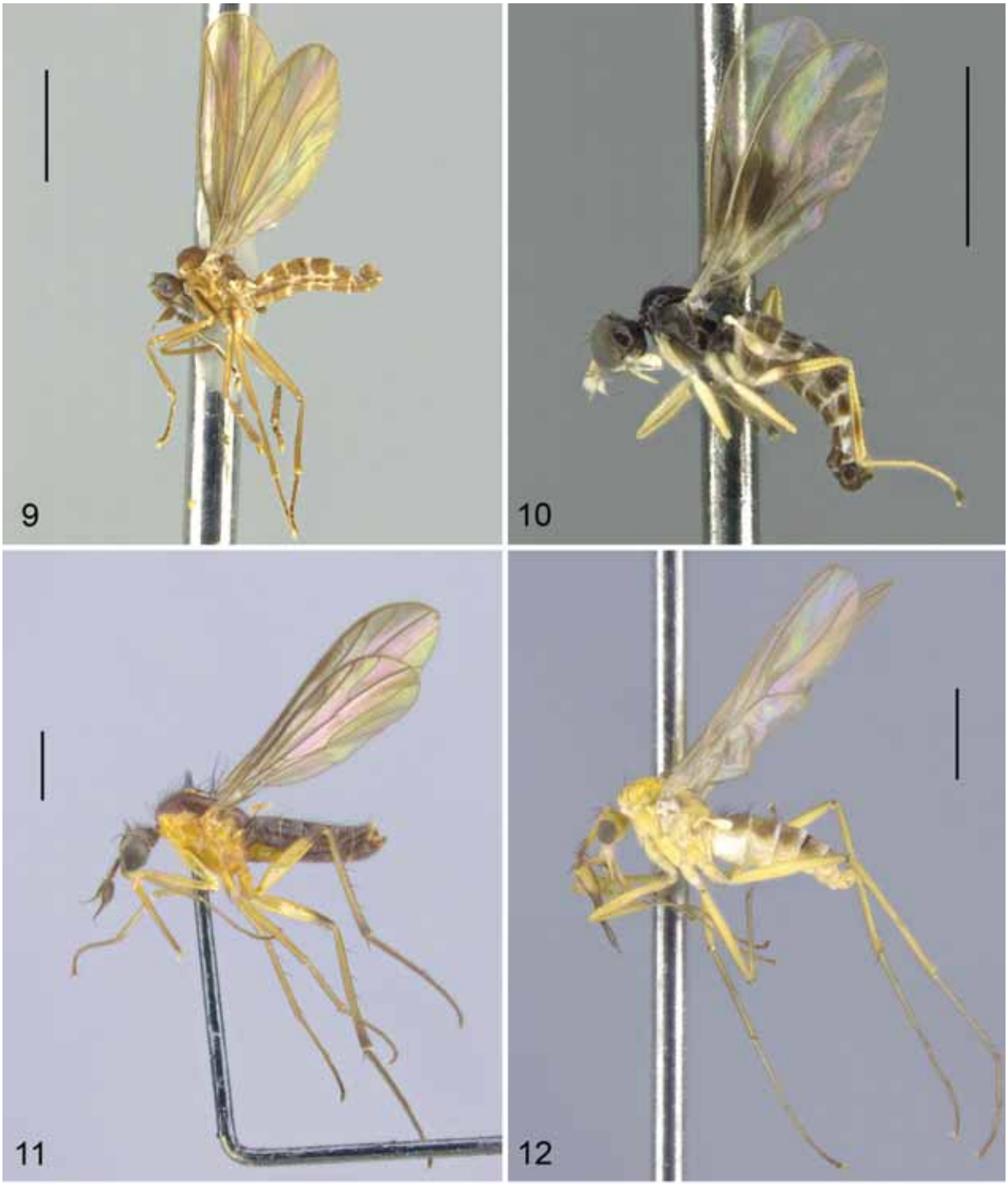
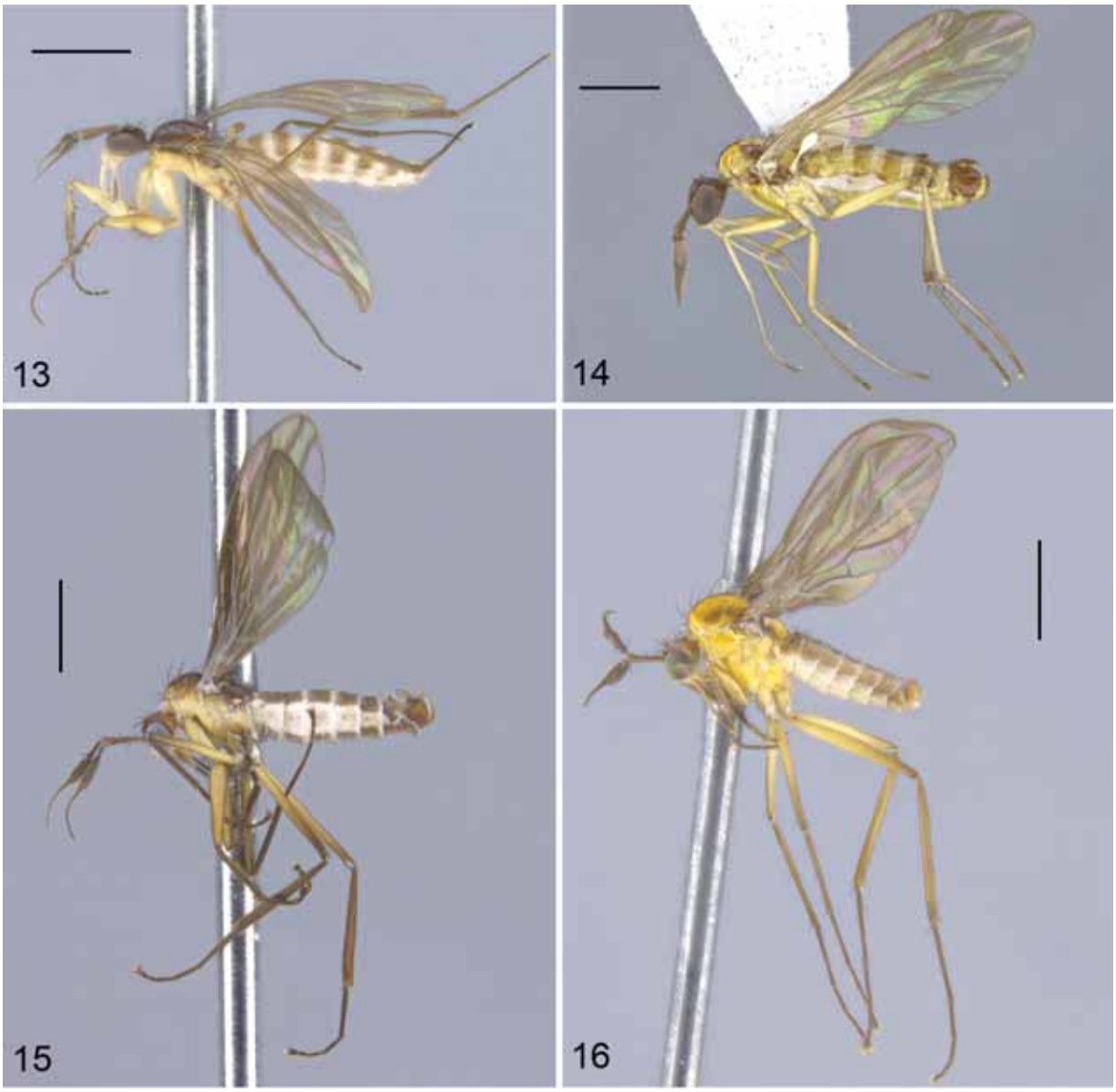


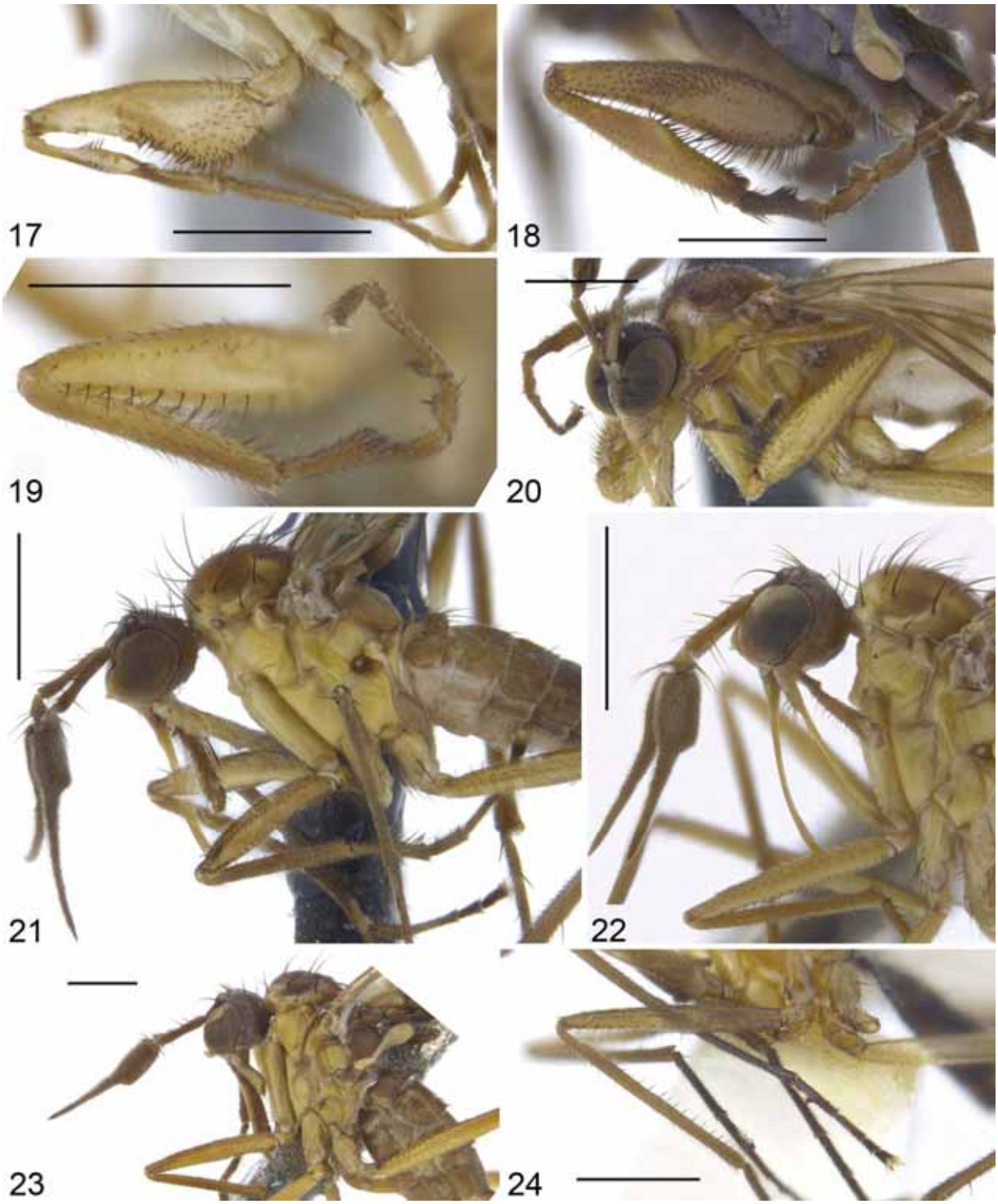
Figs. 1–8. Habitus and habitat images of New Zealand *Ceratomerus*. 1, *C. dorsatus*, female; 2, *Ceratomerus* sp., female (*C. dorsatus* group); 3, Mt. Richmond Forest Park, Deep Creek; 4, Tongariro National Park, Mangawhero River (photograph: J. Lawson); 5, Arthur's Pass National Park, Bealey River; 6, Nelson Lakes National Park, *Nothofagus* forest; 7, Rimutaka Forest Park, Catchpool Valley (photograph: L. Honey); 8, Mt. Richmond Forest Park, tributary of Deep Creek with yellow pan trap.



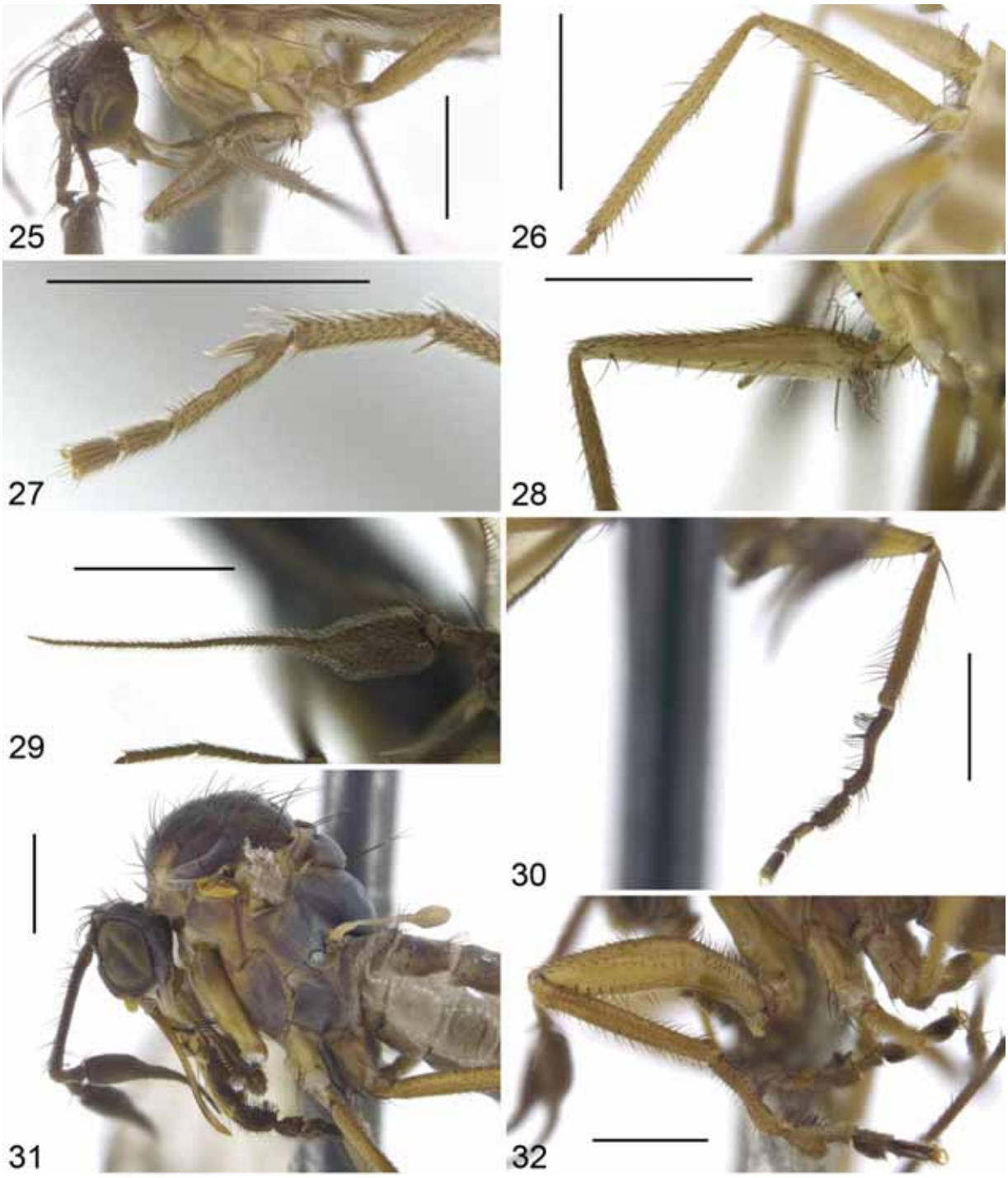
Figs. 9–12. Habitus images of New Zealand Ceratomerinae. 9, *Glyphidopeza longicornis*, male; 10, *Zealandicesa setosa*, male; 11, *Ceratomerus dorsatus*, female; 12, *C. rivalis*, male. Scale bar = 1 mm.



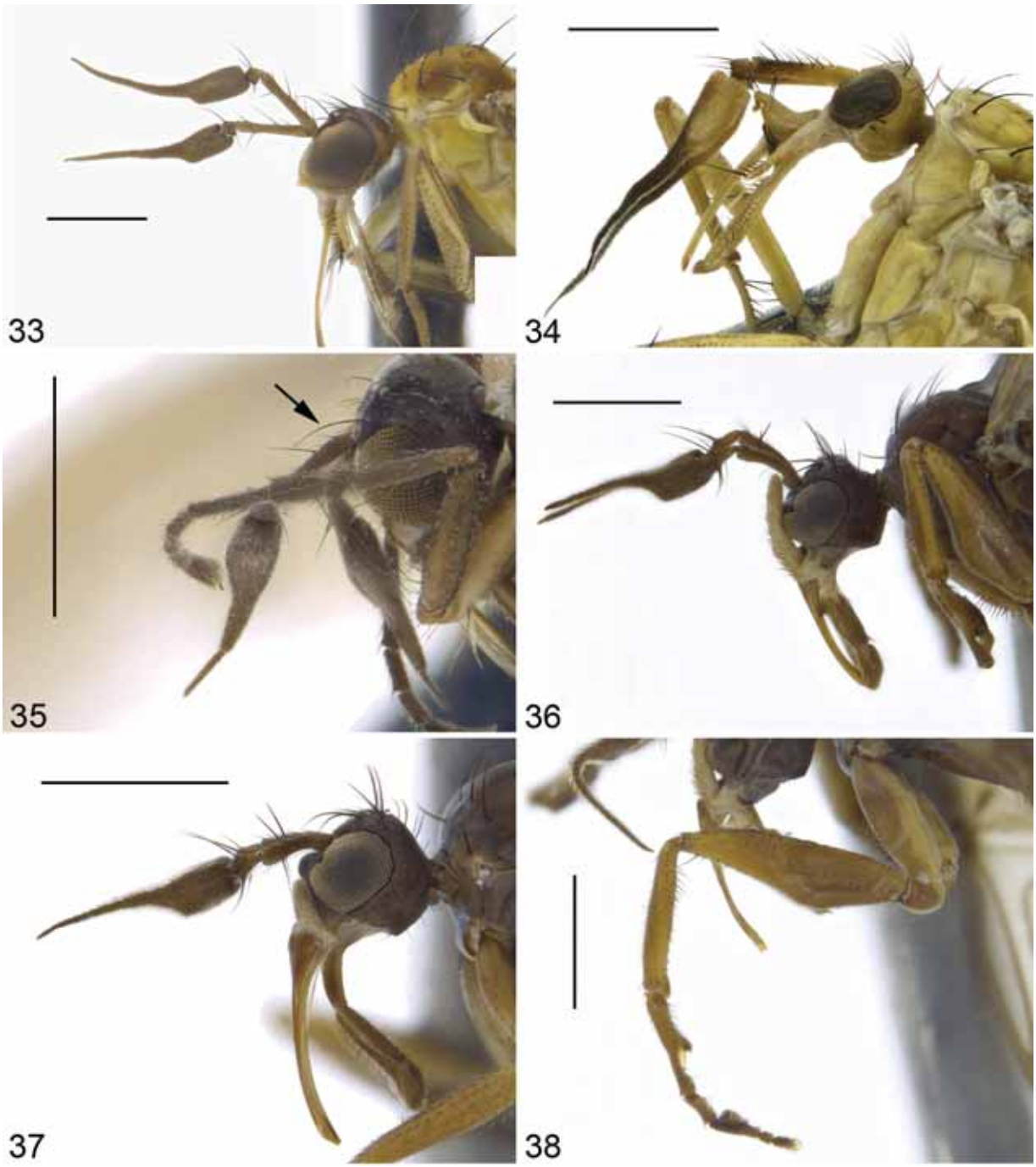
Figs. 13–16. Male habitus images of New Zealand *Ceratomerus*. 13, *C. crassinervis*; 14, *C. virgatus*; 15, *C. spinosus*; 16, *C. notatus*. Scale bar = 1 mm.



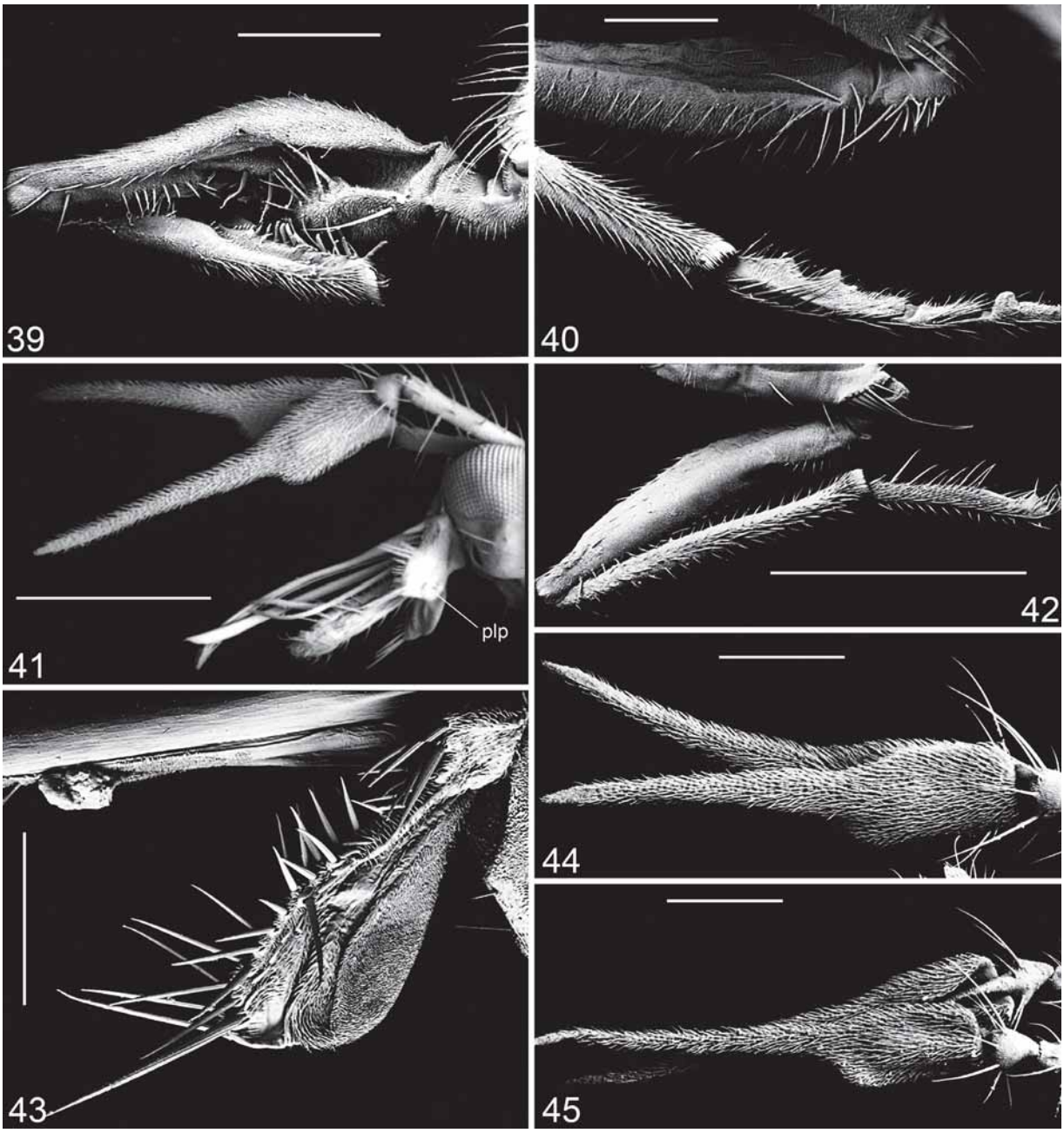
Figs. 17–24. Digital images of *Ceratomerus*. 17, *C. collini*, male left foreleg, posterior view; 18, *C. morrisi*, male left foreleg, posterior view; 19, *C. planti*, male left foreleg, posterior view; 20, *C. setifacies*, male head and left foreleg, posterior view; 21, *C. curvatus*, male head and thorax, lateral view; 22, *C. latinervis*, male head and thorax, lateral view; 23, *C. wardi*, male head and thorax, lateral view; 24, *C. alticolus*, male left midleg, posterior view. Scale bar = 0.5 mm.



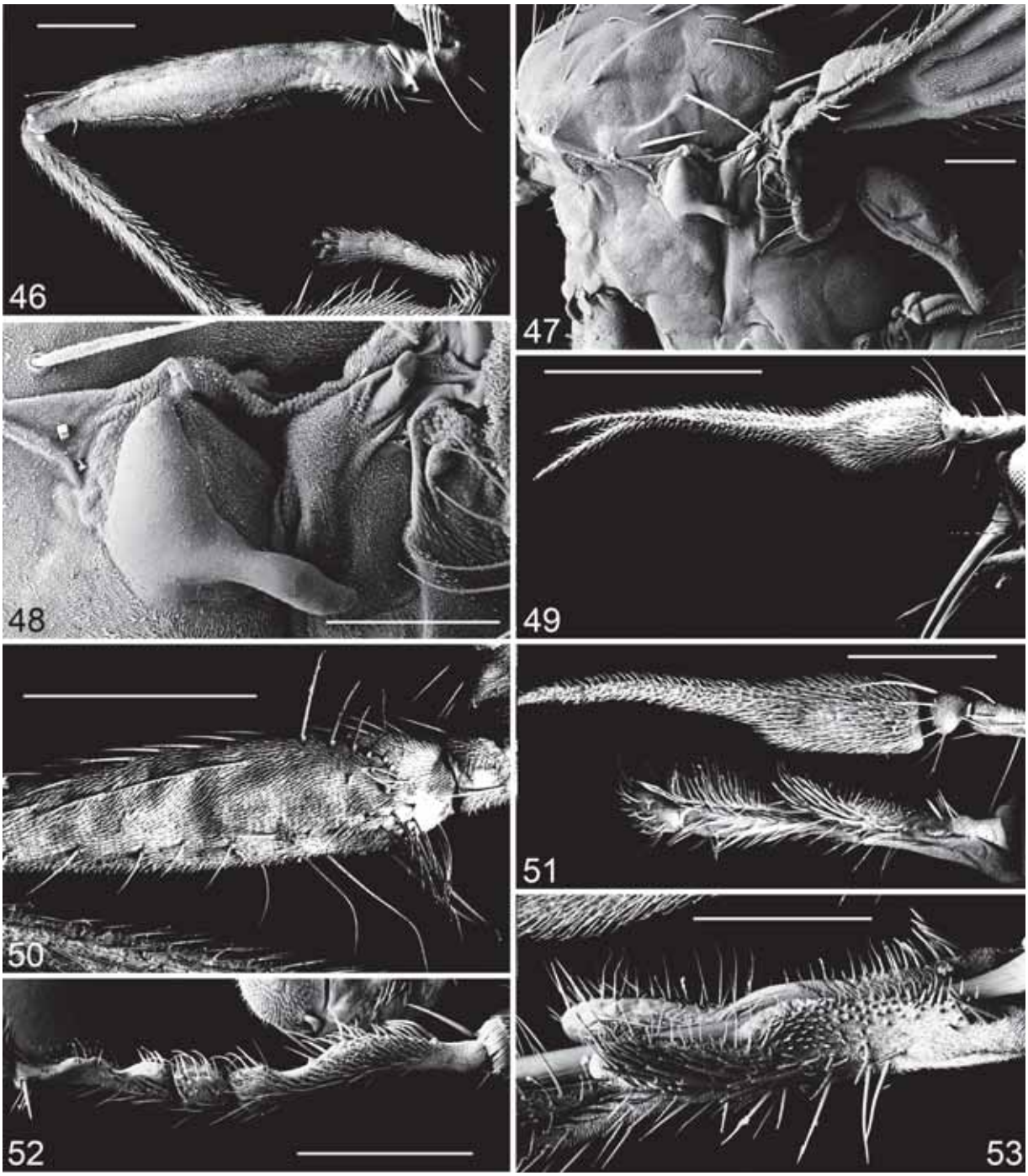
Figs. 25–32. Digital images of *Ceratomerus*. 25, *C. exiguus*, male left midleg, posterior view; 26, *C. flavus*, male left midleg, posterior view; 27, *C. flavus*, male left mid tarsus, dorsal view; 28, *C. flavus*, male left foreleg; posterior view; 29, *C. fontinalis*, male left antenna, outer view; 30, *C. lobipennis*; male right foreleg, anterior view; 31, *C. mirandus*, male head and thorax, lateral view; 32, *C. mirandus*, male left foreleg, posterior view. Scale bar = 0.5 mm.



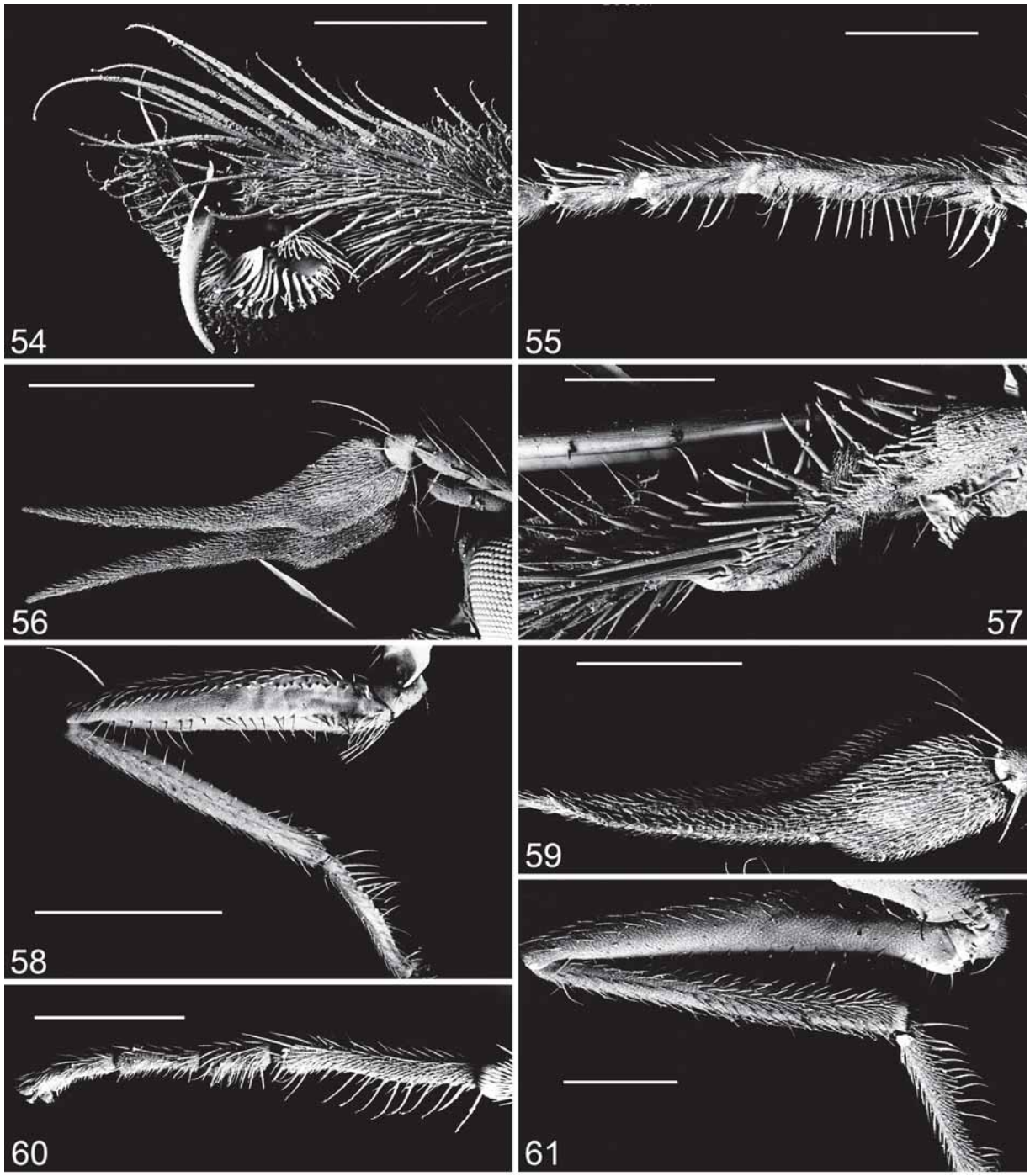
Figs. 33–38. Digital images of *Ceratomerus*. 33, *C. notatus*, male head, lateral view; 34, *C. rivalis*, male head, lateral view; 35, *C. akatarawa*, male antennae, arrow pointing to ocellar seta, dorsolateral view; 36, *C. burgersi*, male head, lateral view; 37, *C. burgersi*, female head, lateral view; 38, *C. burgersi*, male left foreleg, posterior view. Scale bar = 0.5 mm.



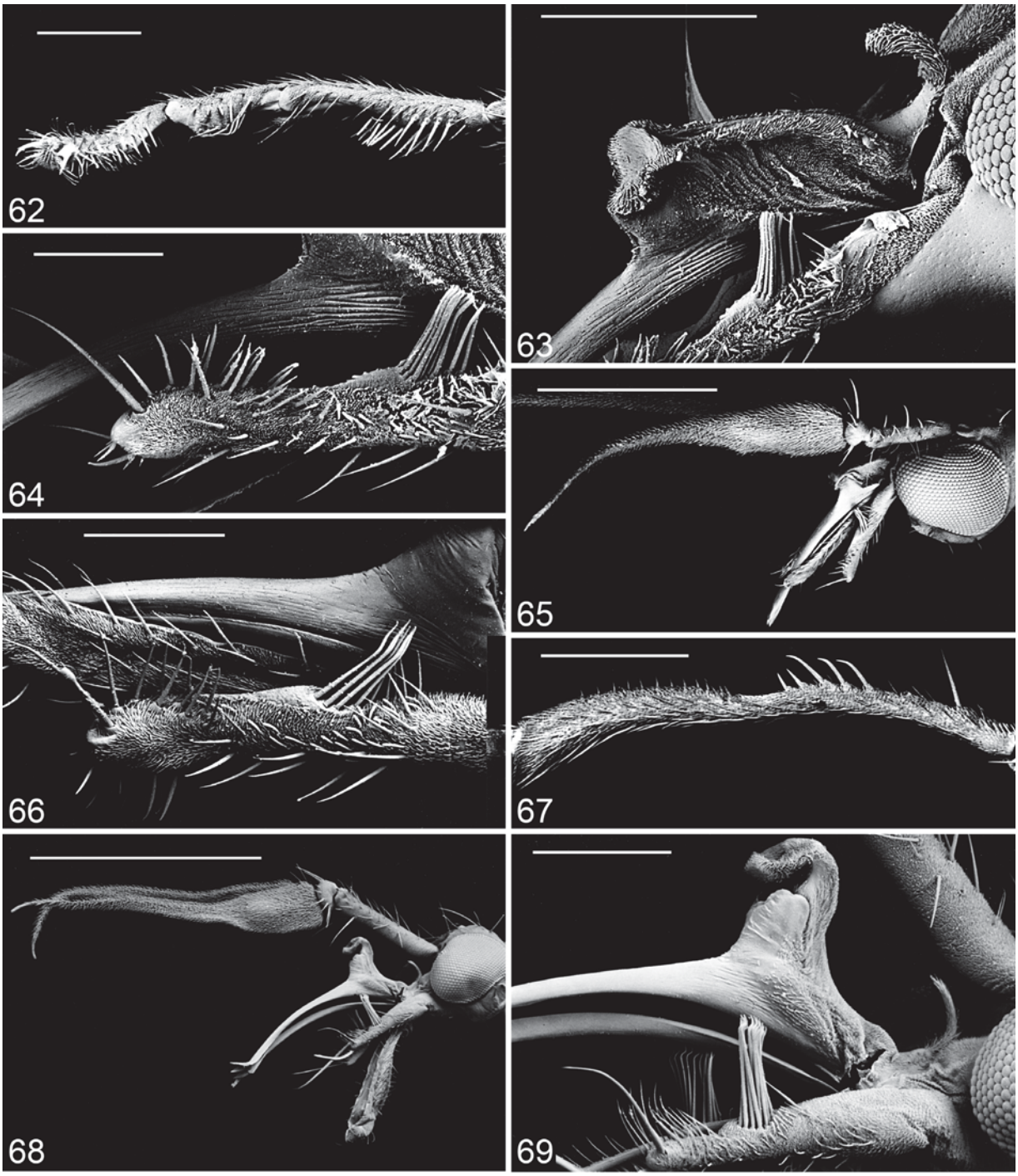
Figs. 39–45. Scanning Electron photographs of male *Ceratomerus*. 39, *C. crassinervis*, fore femur, anterior view (scale bar = 200 μm); 40, *C. tarsalis*, foreleg, anterior view (scale = 200 μm); 41, *C. curvatus*, head, lateral view (scale = 500 μm); 42, *C. curvatus*, foreleg, anterior view (scale = 200 μm); 43, *C. dugdalei*, palpus, lateral view (scale = 100 μm); 44, *C. latinervis*, antennae, lateral view (scale = 200 μm); 45, *C. ohakunensis*, antennae, lateral view (scale = 200 μm). Abbreviation: plp—palpus.



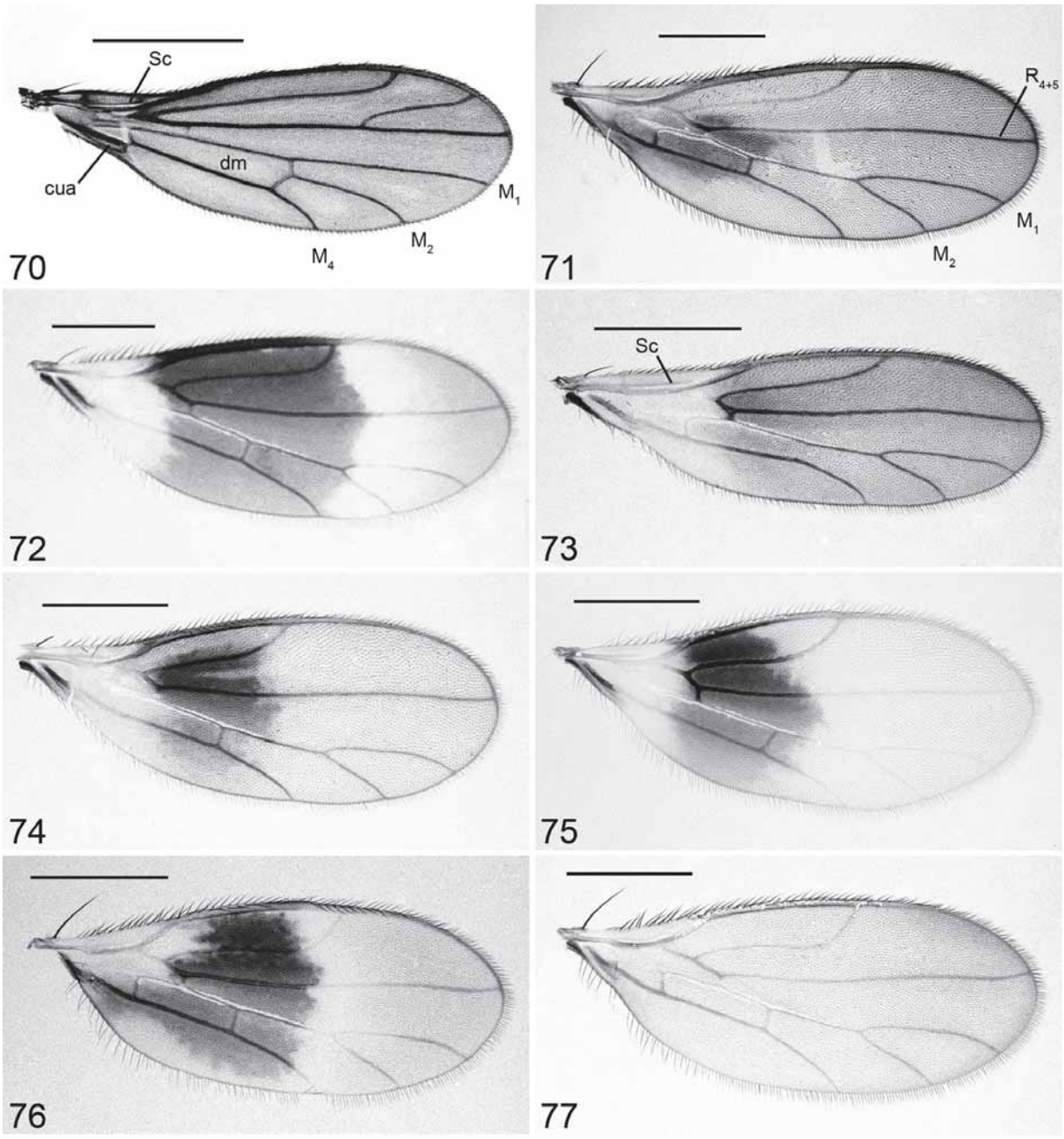
Figs. 46–53. Scanning Electron photographs of male *Ceratomerus*. 46, *C. ohakunensis*, foreleg, anterior view (scale = 200 μm); 47, *C. ohakunensis*, thorax, lateral view (scale = 200 μm); 48, *C. ohakunensis*, anterior basalare, lateral view (scale = 100 μm); 49, *C. flavus*, antennae, lateral view (scale = 500 μm); 50, *C. flavus*, fore femur, posterior view (scale = 200 μm); 51, *C. brevifurcatus*, antenna, proboscis, lateral view (scale = 200 μm); 52, *C. brevifurcatus*, fore tarsus, anterior view (scale = 100 μm); 53, *C. brevifurcatus*, palpus, lateral view (scale = 100 μm).



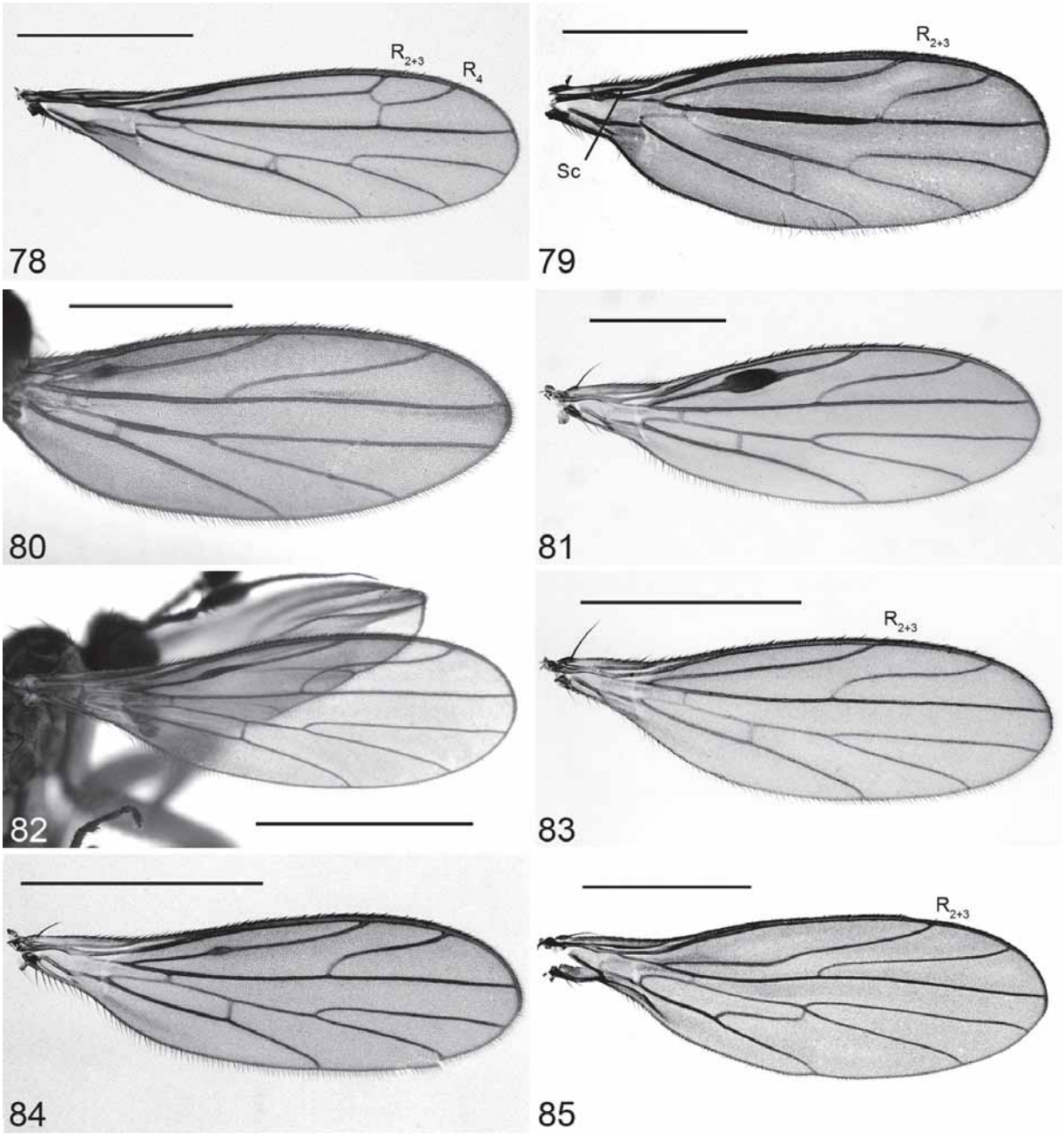
Figs. 54–61. Scanning Electron photographs of male *Ceratomerus*. 54, *C. longifurcatus*, tarsomere 5 and acropod, lateral view (scale = 50 µm); 55, *C. longifurcatus*, fore tarsus, posterior view (scale = 200 µm); 56, *C. notatus*, antennae, lateral view (scale = 500 µm); 57, *C. notatus*, palpus, lateral view (scale = 100 µm); 58, *C. notatus*, foreleg, posterior view (scale = 500 µm); 59, *C. whirinaki*, antennae, lateral view (scale = 200 µm); 60, *C. whirinaki*, fore tarsus, anterior view (scale = 200 µm); 61, *C. whirinaki*, foreleg, anterior view (scale = 200 µm).



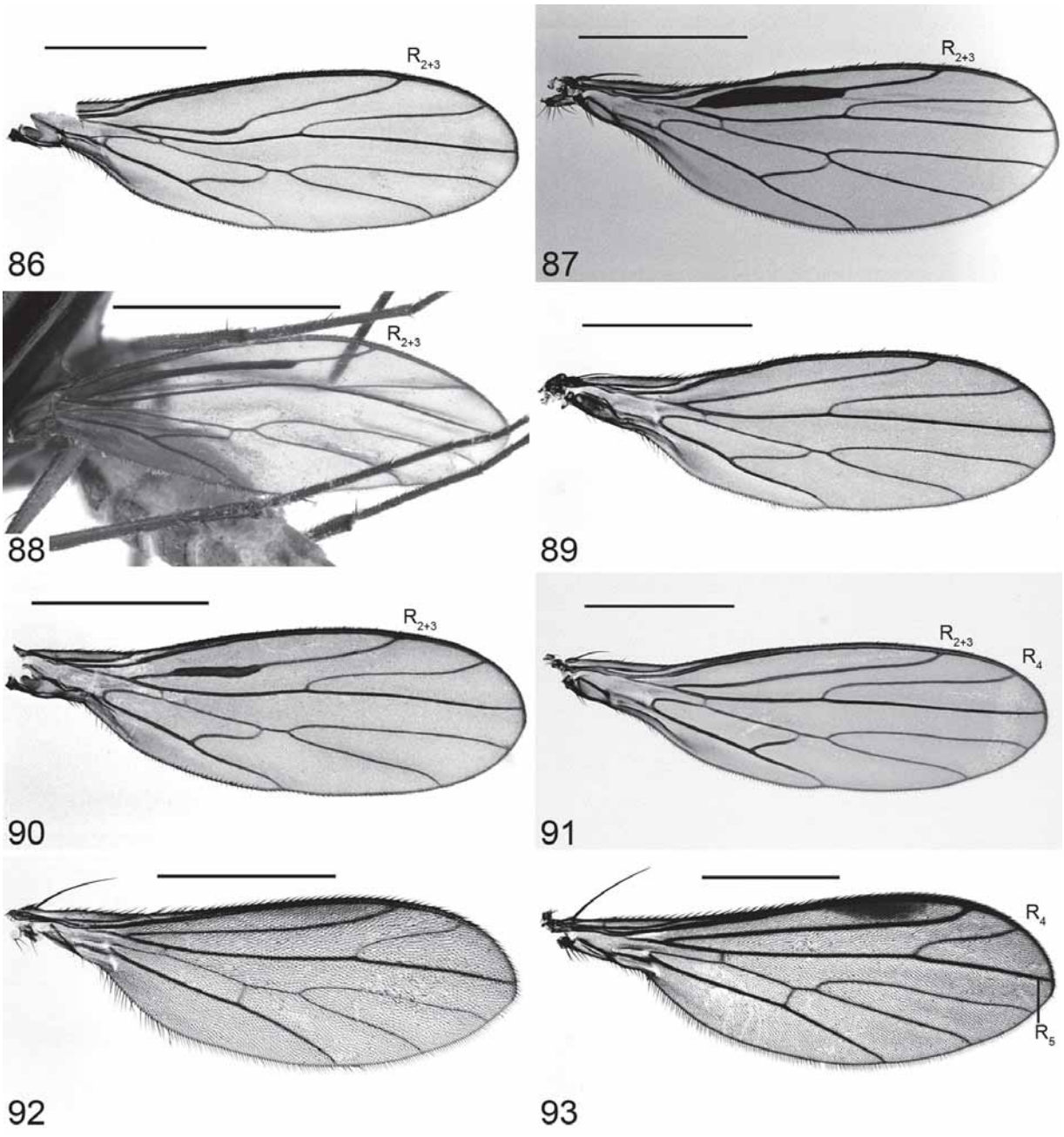
Figs. 62–69. Scanning Electron photographs of male *Ceratomerus*. 62, *C. spinosus*, fore tarsus, posterior view (scale = 200 μm); 63, *C. flexuosus*, base of labrum and palpus, dorsolateral view (scale = 200 μm); 64, *C. flexuosus*, palpus, lateral view (scale = 100 μm); 65, *C. prodigiosus*, head, dorsolateral view (scale = 500 μm); 66, *C. prodigiosus*, palpus, lateral view (scale = 100 μm); 67, *C. rivalis*, fore tarsomere 1, posterior view (scale = 200 μm); 68, *C. rivalis*, head, anterior view (scale = 1 mm); 69, *C. rivalis*, palpus and base of labrum, lateral view (scale = 200 μm).



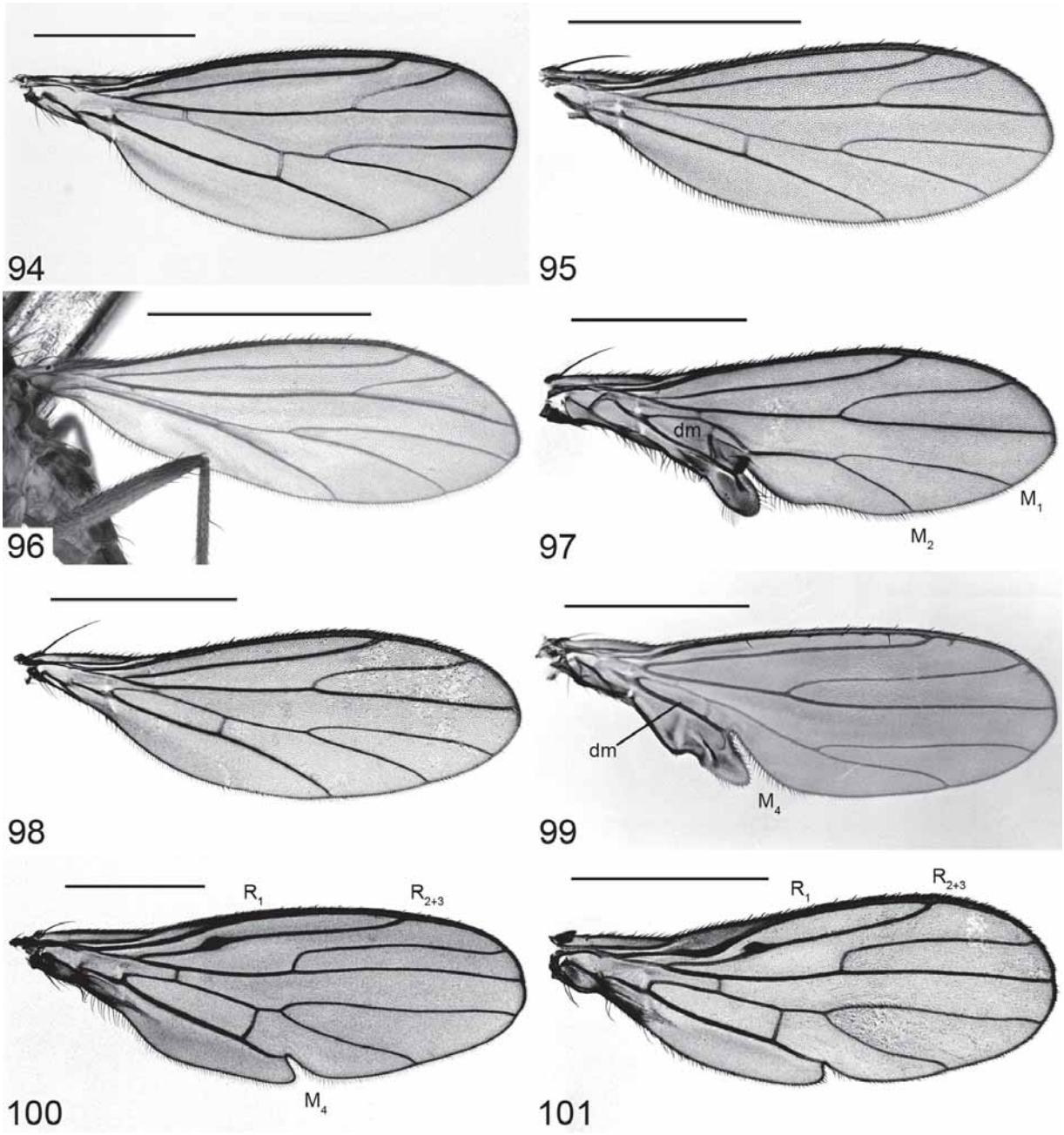
Figs. 70–77. Wings of *Glyphidopeza* and *Zealandicesa*. 70, *G. fluviatilis*, male; 71, *Z. aequabilis*, female; 72, *Z. fascipennis*, male; 73, *Z. masneri*, male; 74, *Z. setosa*, male; 75, *Z. singularis*, male; 76, *Z. tararua*, female; 77, *Z. tararua*, male. Scale bar = 0.5 mm. Abbreviations: cua—anterior cubital cell; dm—discal medial cell; M_1, M_2, M_4—medial veins; R_{4+5}—radial vein; Sc—subcostal vein.



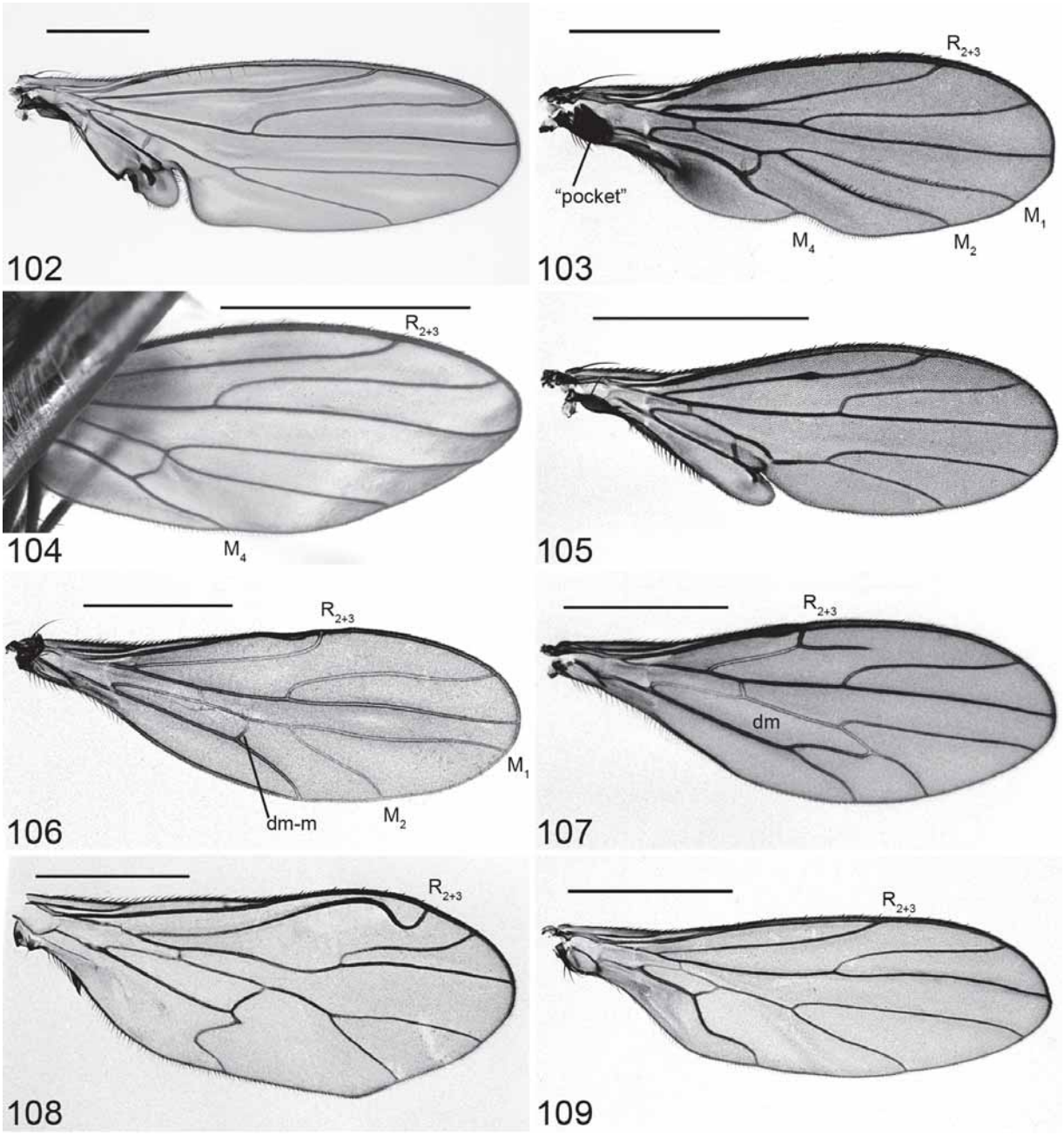
Figs. 78–85. Wings of *Ceratomerus*. 78, *C. collini*, female; 79, *C. crassinervis*, male; 80, *C. minutus*, male; 81, *C. oparara*, male; 82, *C. planti*, male; 83, *C. simplex*, male; 84, *C. tarsalis*, male; 85, *C. curvatus*, male. Scale bar = 1.0 mm, except Figs. 80, 81 where scale bar = 0.5 mm. Abbreviations: R_{2+3}, R_4—radial veins; Sc—subcostal vein.



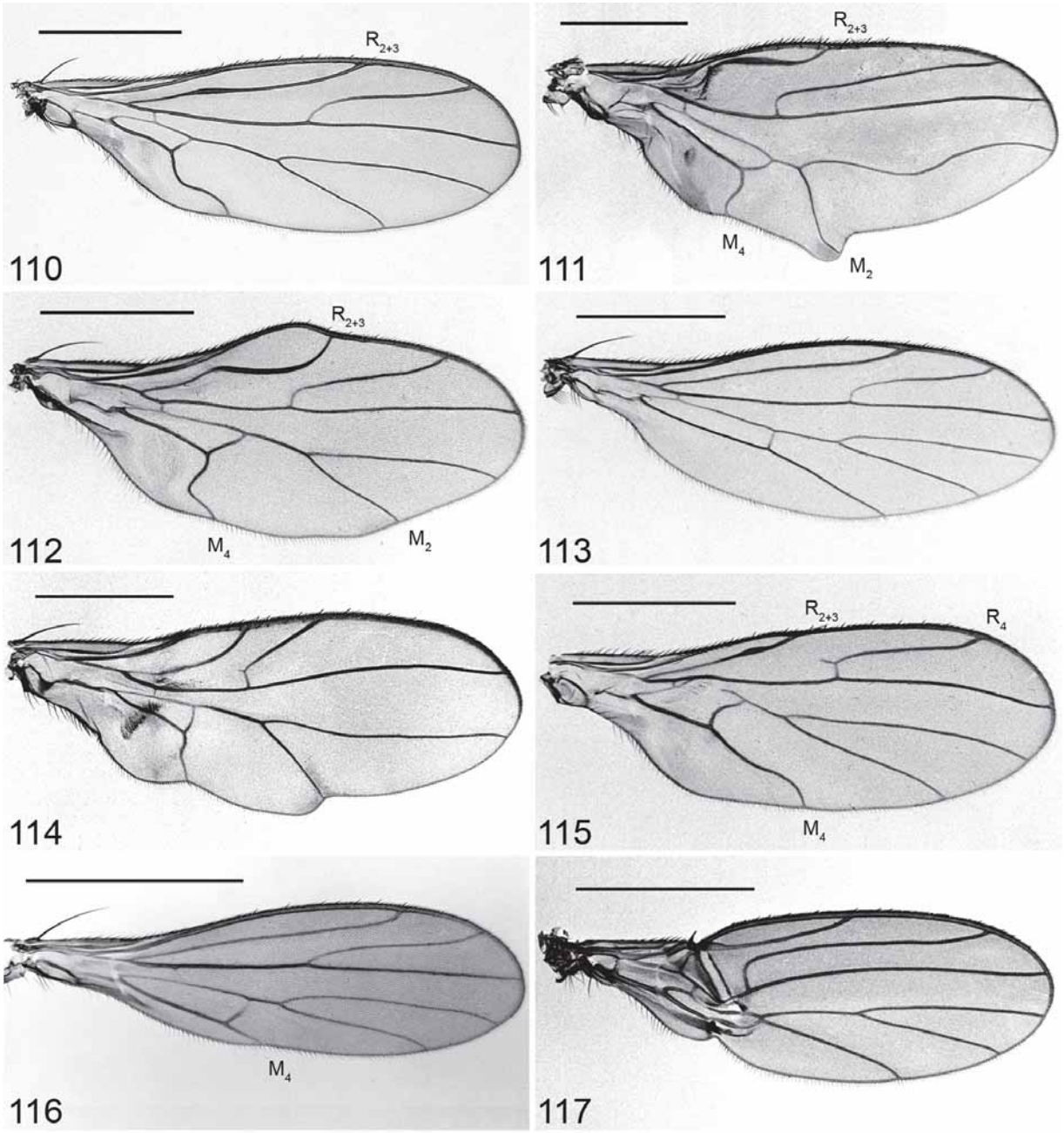
Figs. 86–93. Male wings of *Ceratomerus*. 86, *C. dugdalei*; 87, *C. latinervis*; 88, *C. latipalpus*; 89, *C. ohakunensis*; 90, *C. tonnoiri*; 91, *C. wardi*; 92, *C. aquilonius*; 93, *C. dorsatus*. Scale bar = 1.0 mm. Abbreviations: R_{2+3}, R_4, R_5—radial veins.



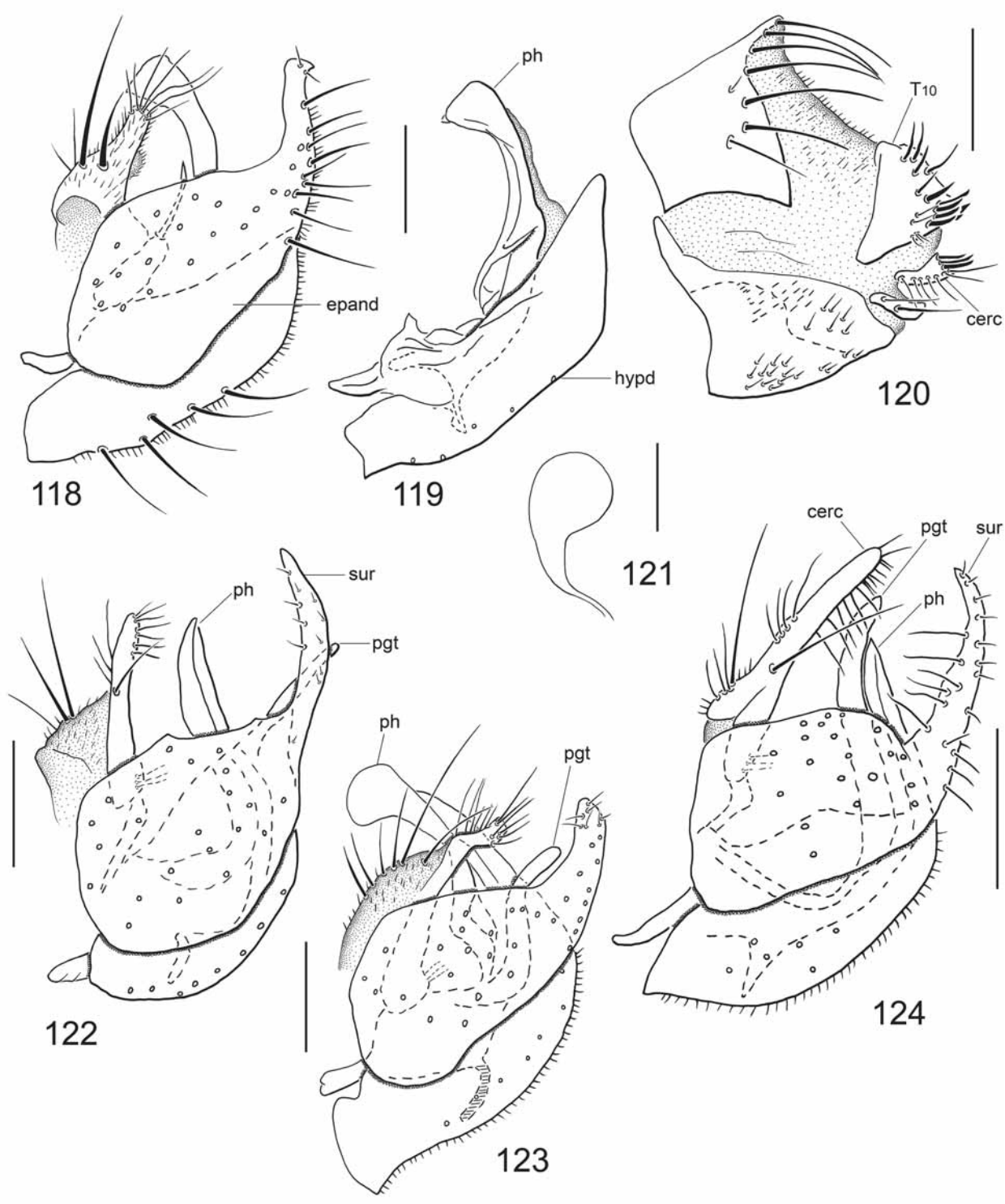
Figs. 94–101. Wings of *Ceratomerus*. 94, *C. alticolus*, male; 95, *C. flavus*, male; 96, *C. fontinalis*, male, oblique-lateral view; 97, *C. brevifurcatus*, male; 98, *C. brevifurcatus*, female; 99, *C. lobipennis*, male; 100, *C. longifurcatus*, male; 101, *C. mayae*, male. Scale bar = 1.0 mm. Abbreviations: dm—discal medial cell; M_1, M_2, M_4—medial veins; R_1, R_{2+3}—radial veins.



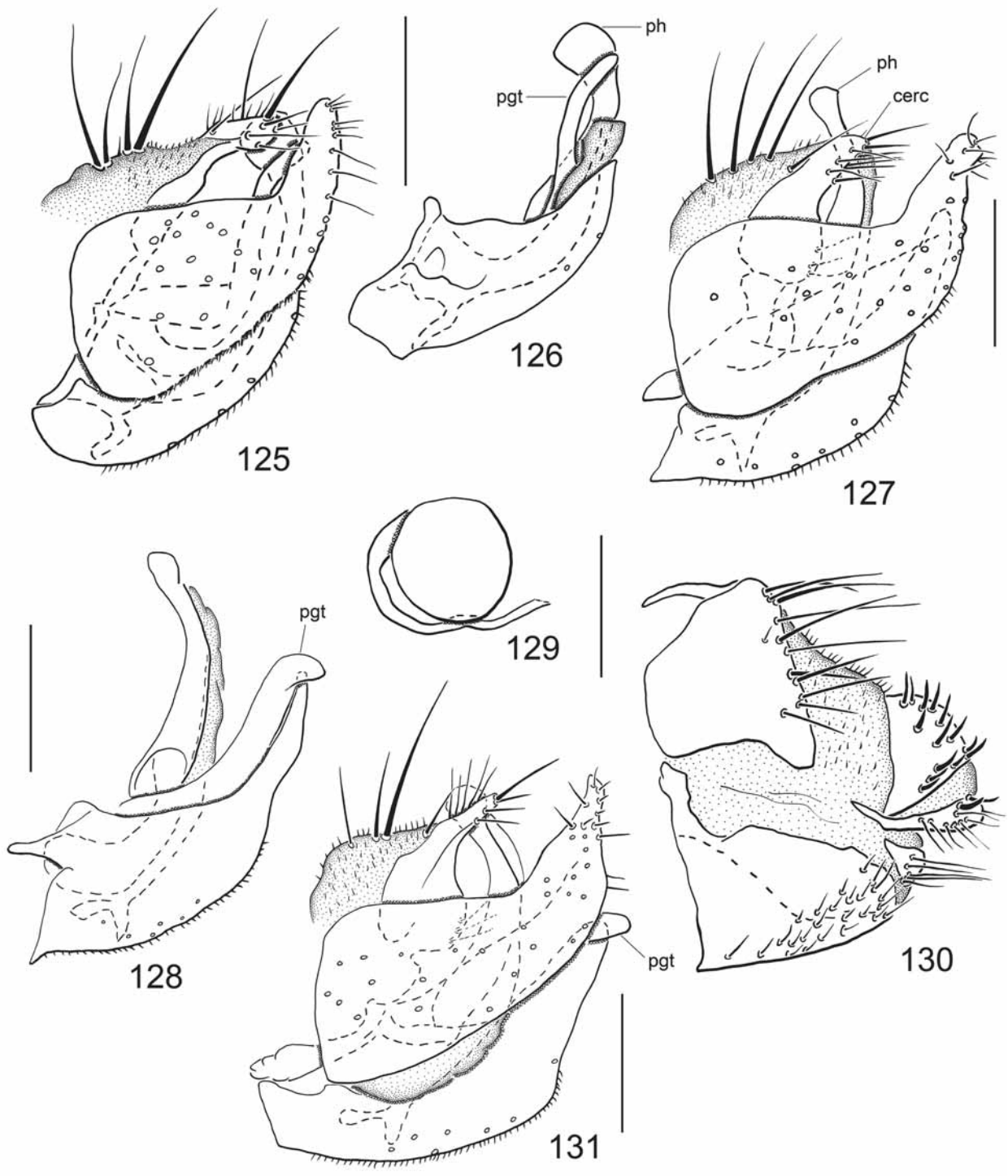
Figs. 102–109. Male wings of *Ceratomerus*. 102, *C. mirandus*; 103, *C. notatus*; 104, *C. subnotatus*; 105, *C. whirinaki*; 106, *C. mangamuka*; 107, *C. spinosus*; 108, *C. flexuosus*; 109, *C. macfarlanei*. Scale bar = 1.0 mm. Abbreviations: dm-m—discal medial crossvein; M_1, M_2, M_4—medial veins; R_{2+3}—radial vein.



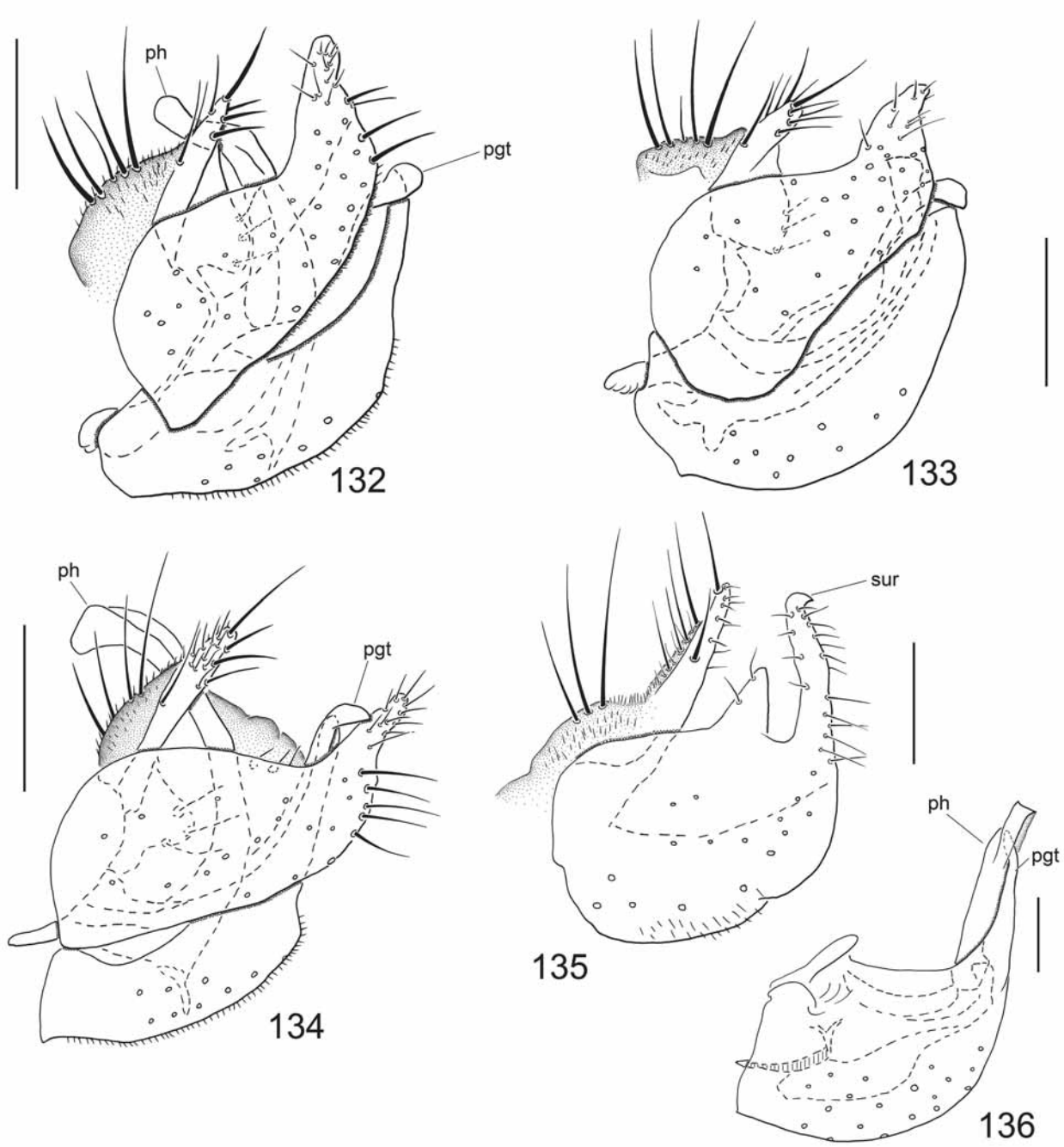
Figs. 110–117. Wings of *Ceratomerus*. 110, *C. melaneus*, male; 111, *C. montanus*, male; 112, *C. prodigiosus*, male; 113, *C. prodigiosus*, female; 114, *C. rivalis*, male; 115, *C. vittatus*, male; 116, *C. brevinervis*, male; 117, *C. burgersi*, male. Scale bar = 1.0 mm. Abbreviations: M_1, M_2, M_4—medial veins; R_{2+3}, R_4—radial veins.



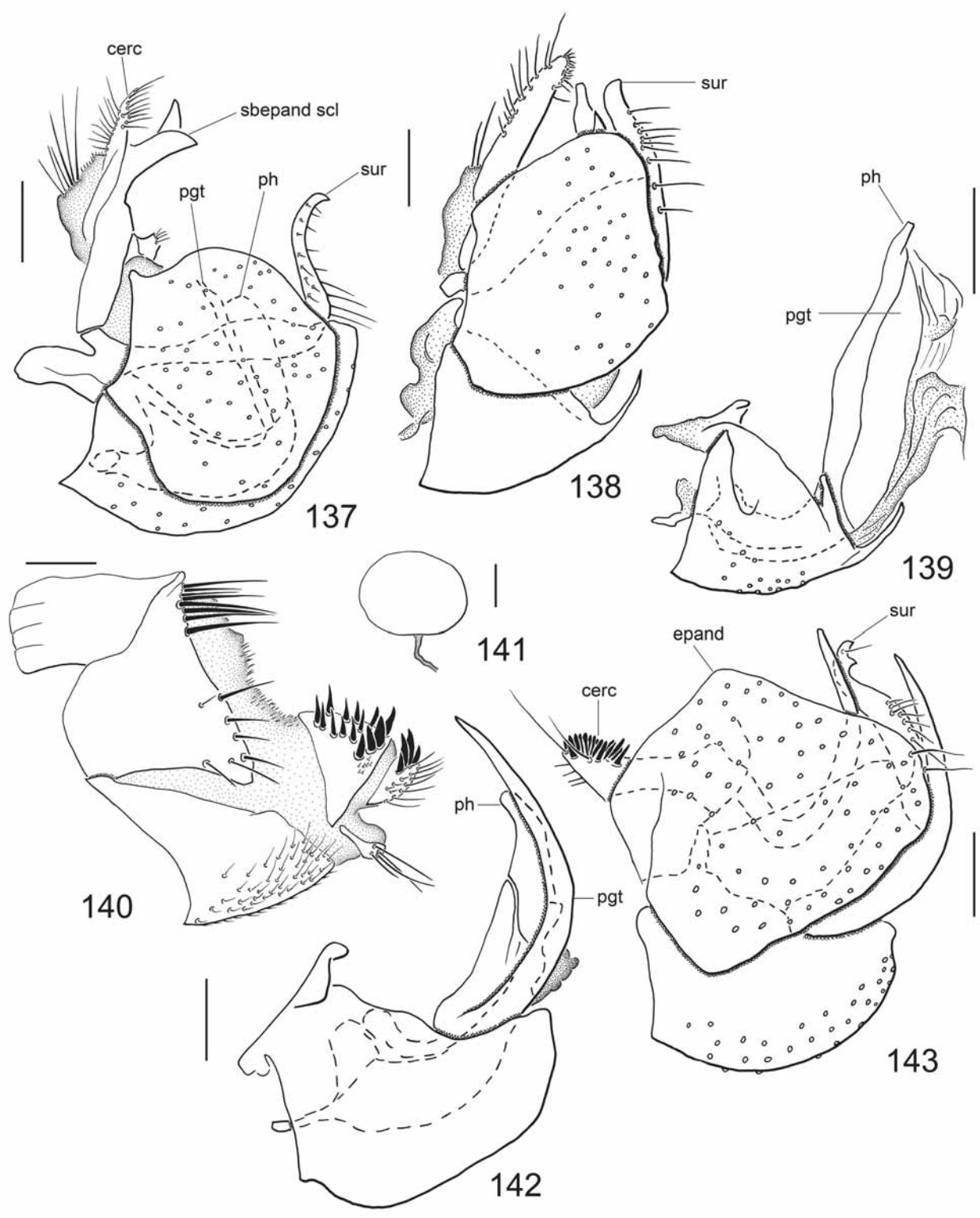
Figs. 118–124. Male and female terminalia of *Ceratomerus*, lateral view. 118, *C. crassinervis*, male; 119, *C. crassinervis*, hypandrium and phallus; 120, *C. crassinervis*, female; 121, *C. crassinervis*, spermatheca; 122, *C. minutus*, male; 123, *C. setifacies*, male; 124, *C. simplex*, male. Scale bars = 0.1 mm. Abbreviations: cerc—cercus; epand—epandrium; hypd—hypandrium; pgt—postgonite; ph—phallus; sur—surstylus; T - tergite.



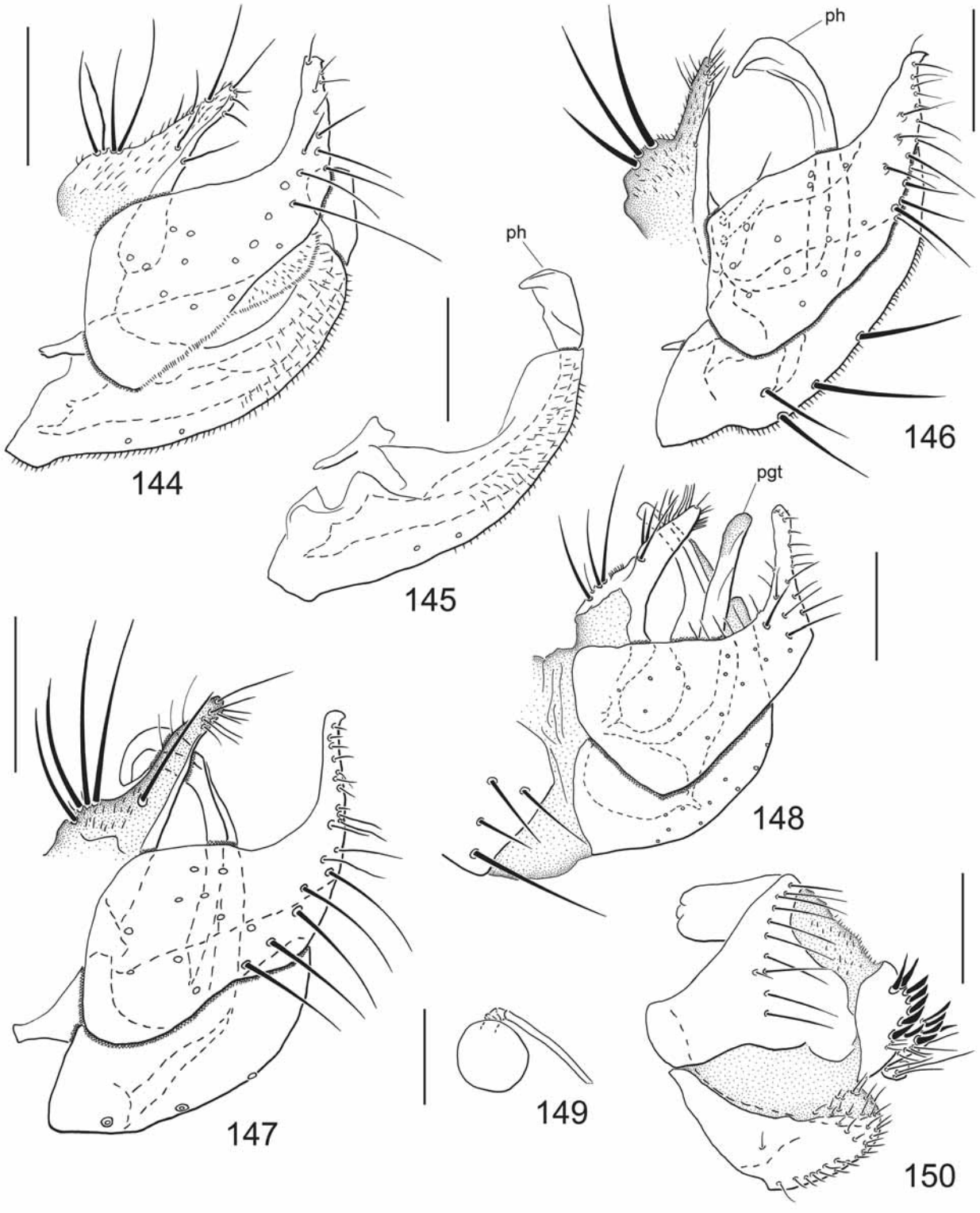
Figs. 125–131. Male and female terminalia of *Ceratomerus*, lateral view. 125, *C. tarsalis*, male; 126, *C. tarsalis*, hypandrium, postgonite and phallus; 127, *C. curvatus*, male; 128, *C. curvatus*, hypandrium, postgonite and phallus; 129, *C. curvatus*, spermatheca; 130, *C. curvatus*, female; 131, *C. dugdalei*, male. Scale bars = 0.1 mm. Abbreviations: cerc—cercus; pgt—postgonite; ph—phallus.



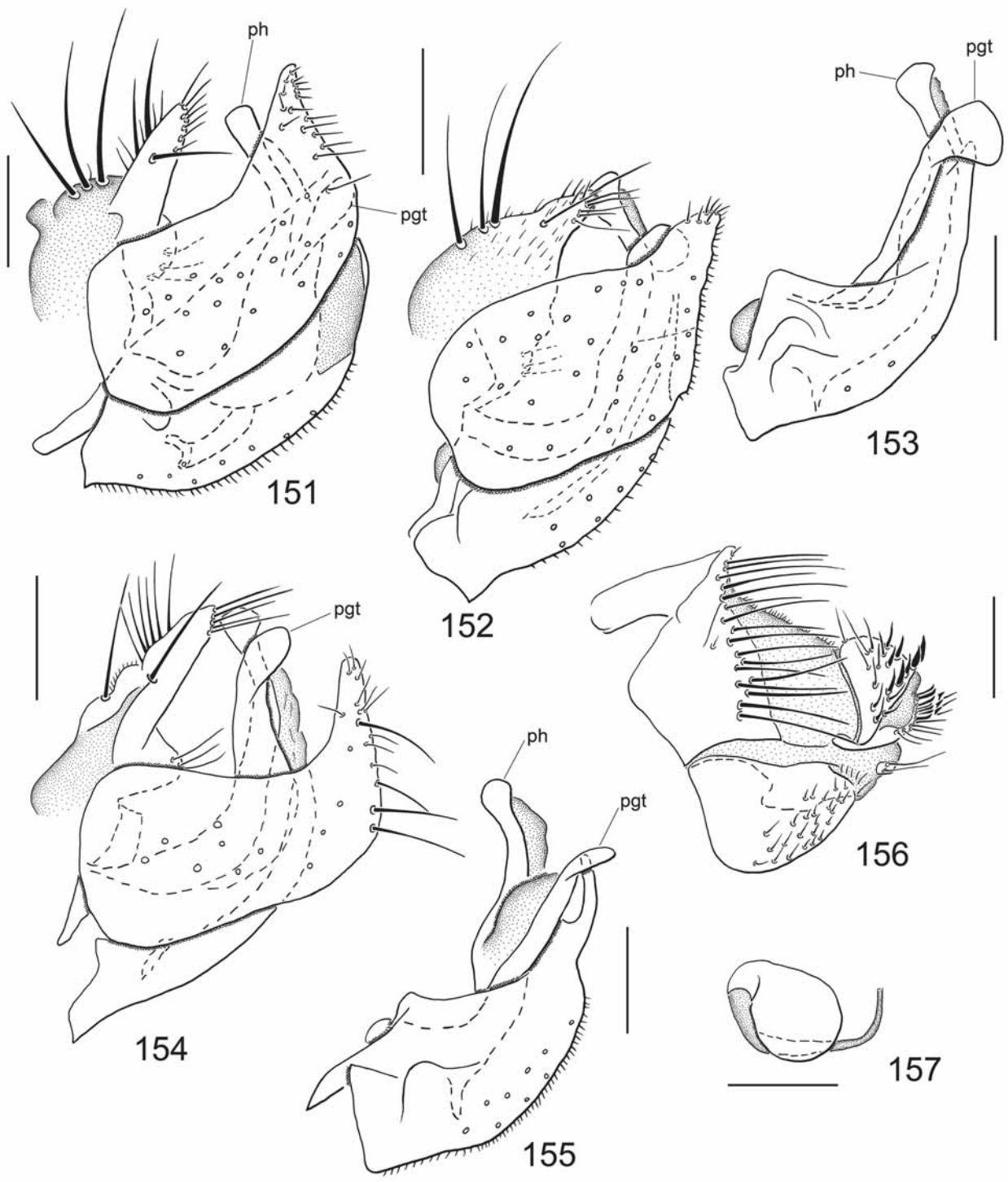
Figs. 132–136. Male terminalia of *Ceratomerus*, lateral view. 132, *C. latinervis*; 133, *C. ohakunensis*; 134, *C. wardi*; 135, *C. aquilonius*, epandrium and cercus; 136, *C. aquilonius*, hypandrium and phallus. Scale bars = 0.1 mm. Abbreviations: pgt—postgonite; ph—phallus; sur - surstylus.



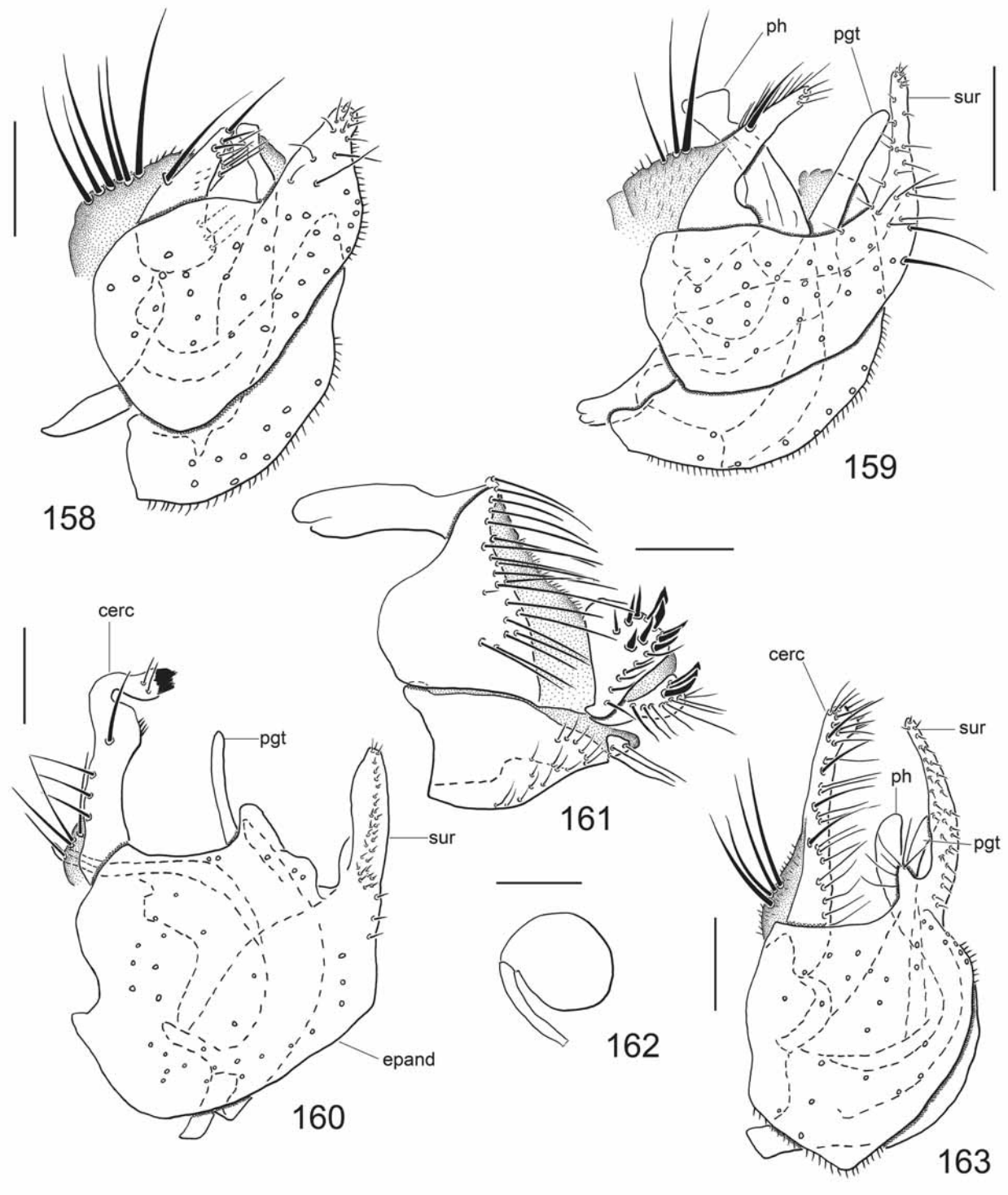
Figs. 137–143. Male and female terminalia of *Ceratomerus*, lateral view. 137, *C. biseriatus*, male; 138, *C. dorsatus*, male; 139, *C. dorsatus*, hypandrium, postgonite and phallus; 140, *C. dorsatus*, female; 141, *C. dorsatus*, spermatheca; 142, *C. virgatus*, hypandrium, postgonite and phallus; 143, *C. virgatus*, male. Scale bars = 0.1 mm. Abbreviations: cerc—cercus; pgt—postgonite; ph—phallus; sbepand scl—subepandrial sclerite; sur - surstylus.



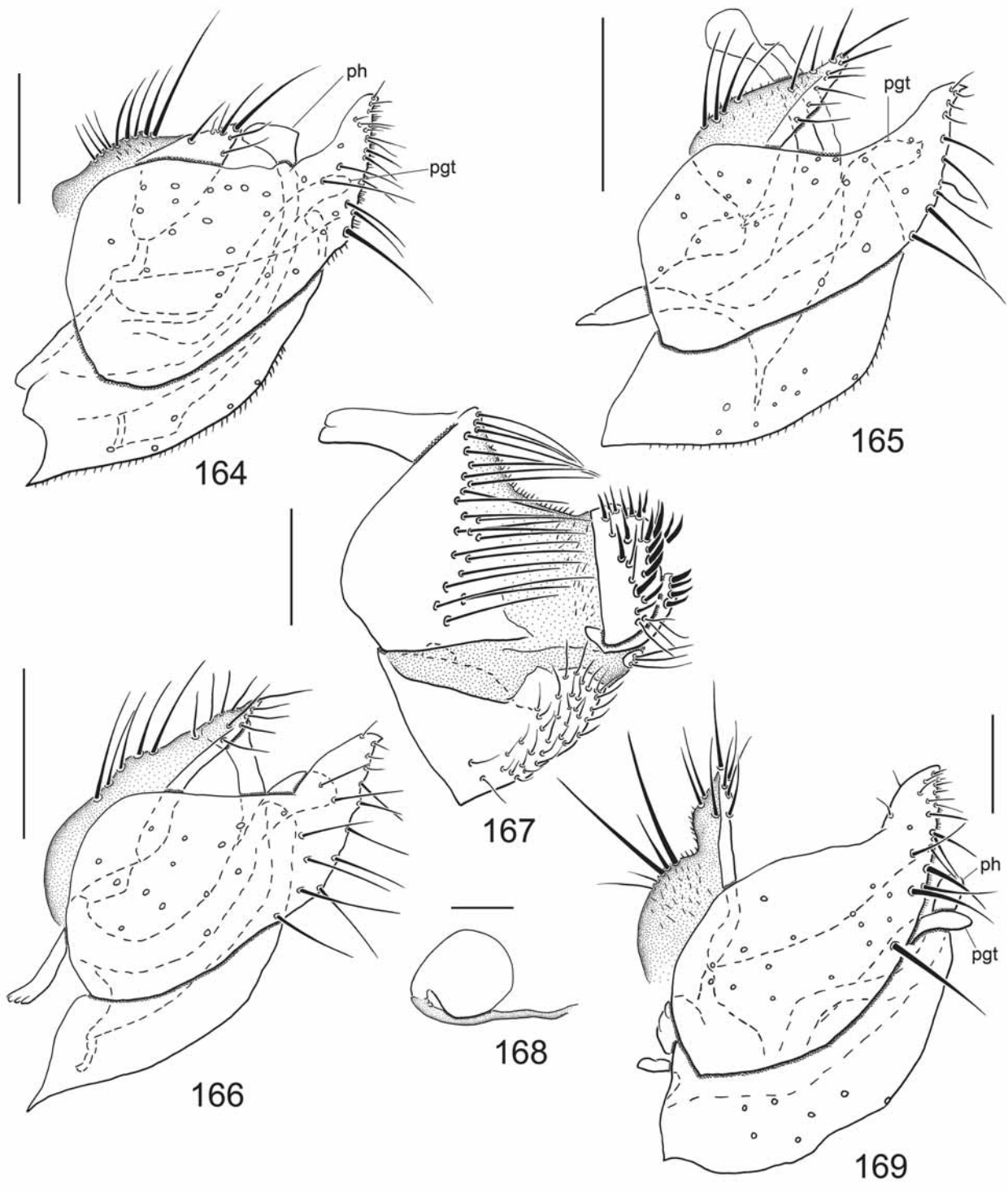
Figs. 144–150. Male and female terminalia of *Ceratomerus*, lateral view. 144, *C. alticolus*, male; 145, *C. alticolus*, hypandrium and phallus; 146, *C. flavus*, male; 147, *C. fontinalis*, male; 148, *C. brevifurcatus*, male; 149, *C. flavus*, spermatheca; 150, *C. flavus*, female. Scale bars = 0.1 mm. Abbreviations: pgt—postgonite; ph—phallus.



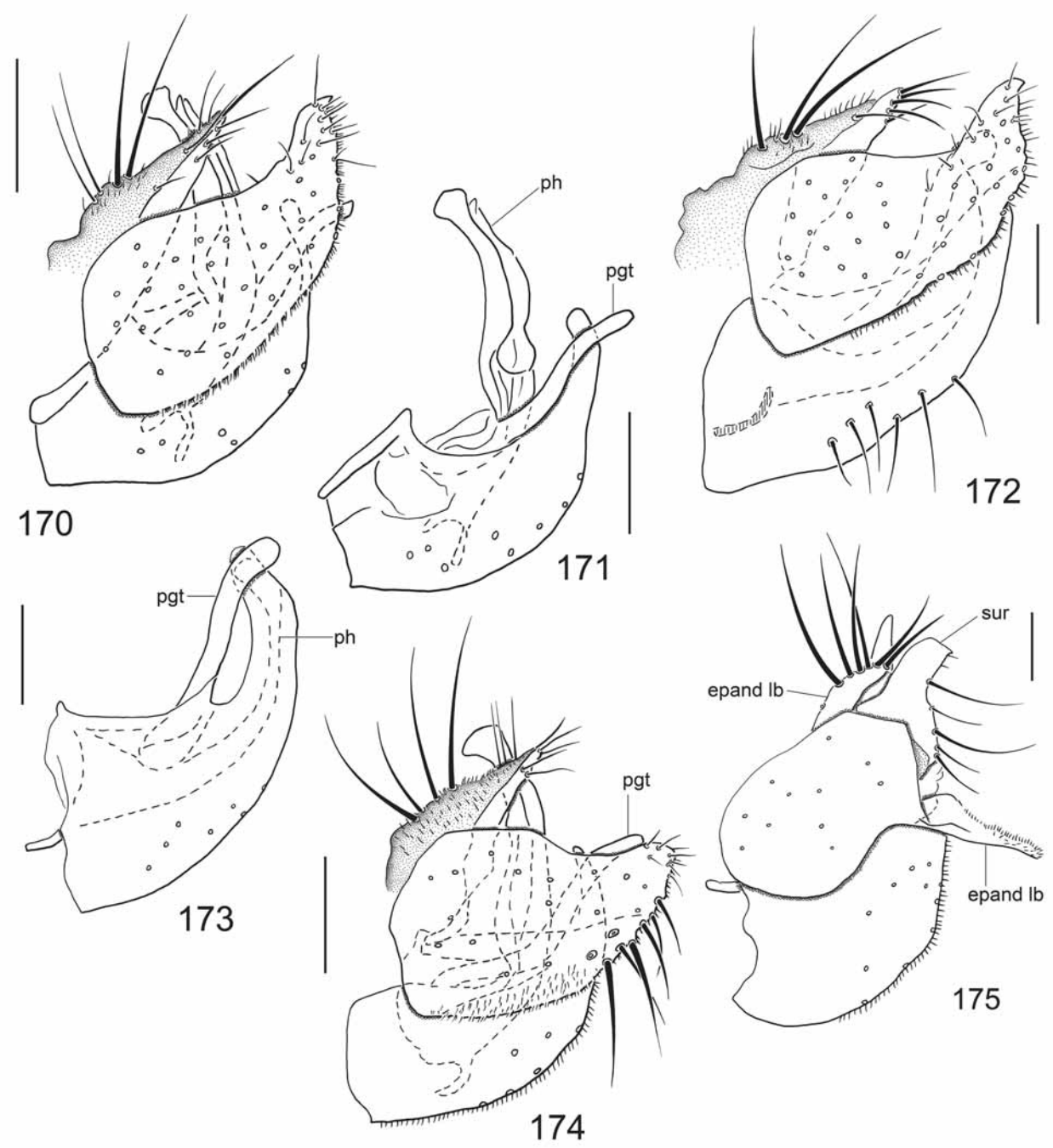
Figs. 151–157. Male and female terminalia of *Ceratomerus*, lateral view. 151, *C. lobipennis*, male; 152, *C. longifurcatus*, male; 153, *C. longifurcatus*, hypandrium , postgonite and phallus; 154, *C. mirandus*; 155, *C. notatus*, hypandrium, postgonite and phallus; 156, *C. brevifurcatus*, female; 157, *C. brevifurcatus*, spermatheca. Scale bars = 0.1 mm. Abbreviations: pgt—postgonite; ph—phallus.



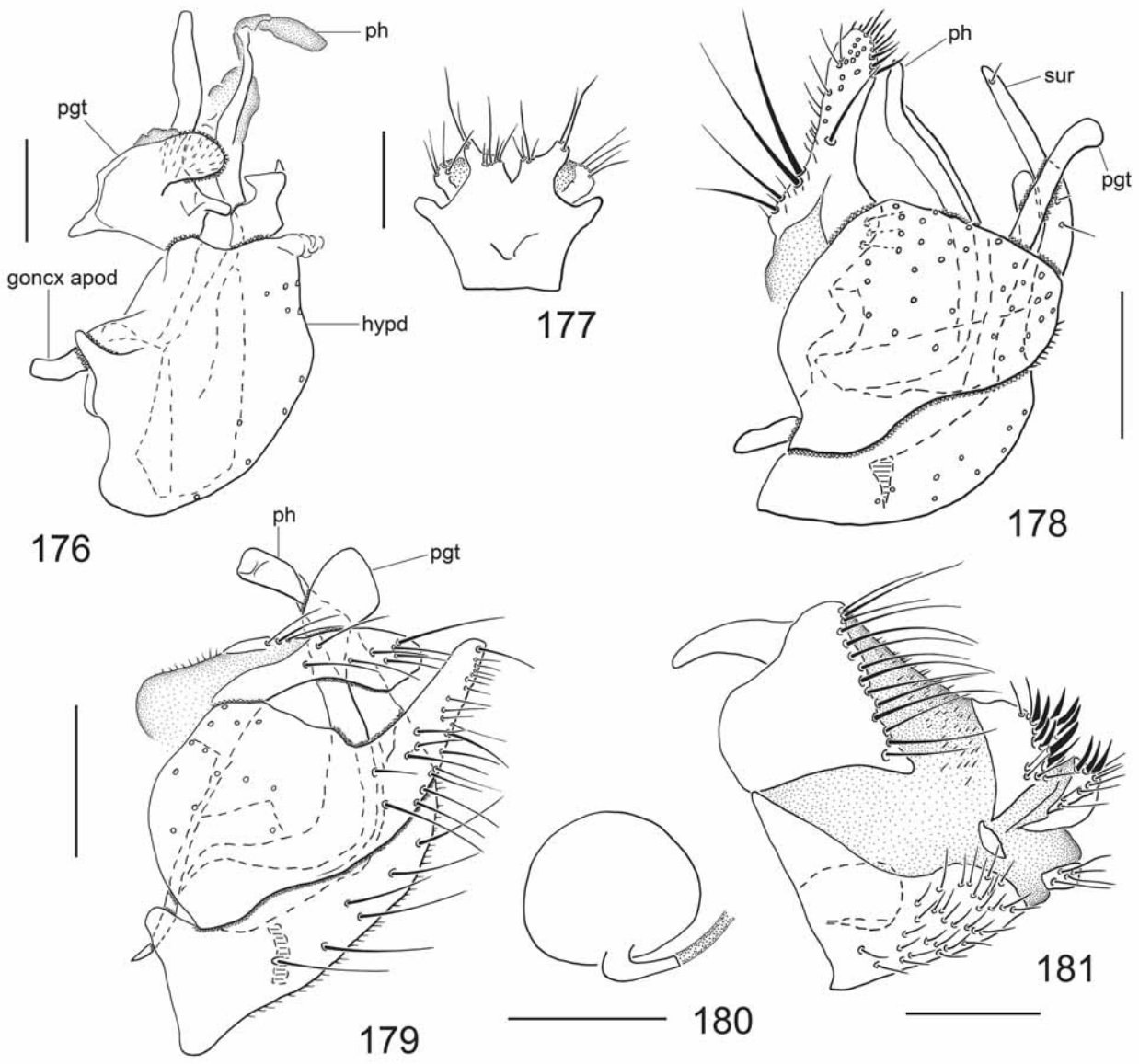
Figs. 158–163. Male and female terminalia of *Ceratomerus*, lateral view. 158, *C. notatus*, male; 159, *C. whirinaki*, male; 160, *C. mangamuka*, male; 161, *C. spinosus*, female; 162, *C. spinosus*, spermatheca; 163, *C. spinosus*, male. Scale bars = 0.1 mm. Abbreviations: cerc—cercus; epand—epandrium; pgt—postgonite; ph—phallus; sur—surstylus.



Figs. 164–169. Male and female terminalia of *Ceratomerus*, lateral view. 164, *C. flexuosus*, male; 165, *C. macfarlanei*, male; 166, *C. melaneus*, male; 167, *C. montanus*, female; 168, *C. montanus*, spermatheca; 169, *C. montanus*, male. Scale bars = 0.1 mm. Abbreviations: pgt—postgonite; ph—phallus.



Figs. 170–175. Male terminalia of *Ceratomerus*, lateral view. 170, *C. prodigiosus*; 171, *C. prodigiosus*, hypandrium, postgonite and phallus; 172, *C. rivalis*; 173, *C. rivalis*, hypandrium, postgonite and phallus; 174, *C. vittatus*; 175, *C. akatarawa*. Scale bars = 0.1 mm. Abbreviations: epand lb—epandrial lobe; pgt—postgonite; ph—phallus; sur—surstylus.



Figs. 176–181. Male and female terminalia of *Ceratomerus*, lateral view, except Fig. 177. 176, *C. akatarawa*, hypandrium, postgonite and phallus; 177, *C. akatarawa*, male cercus, posterior view; 178, *C. brevinervis*, male; 179, *C. burgersi*, male; 180, *C burgersi*, spermatheca; 181, *C burgersi*, female. Scale bars = 0.1 mm. Abbreviations: gcx apod—gonocoxal apodeme; hypd—hypandrium; pgt—postgonite; ph—phallus; sur—surstylus.

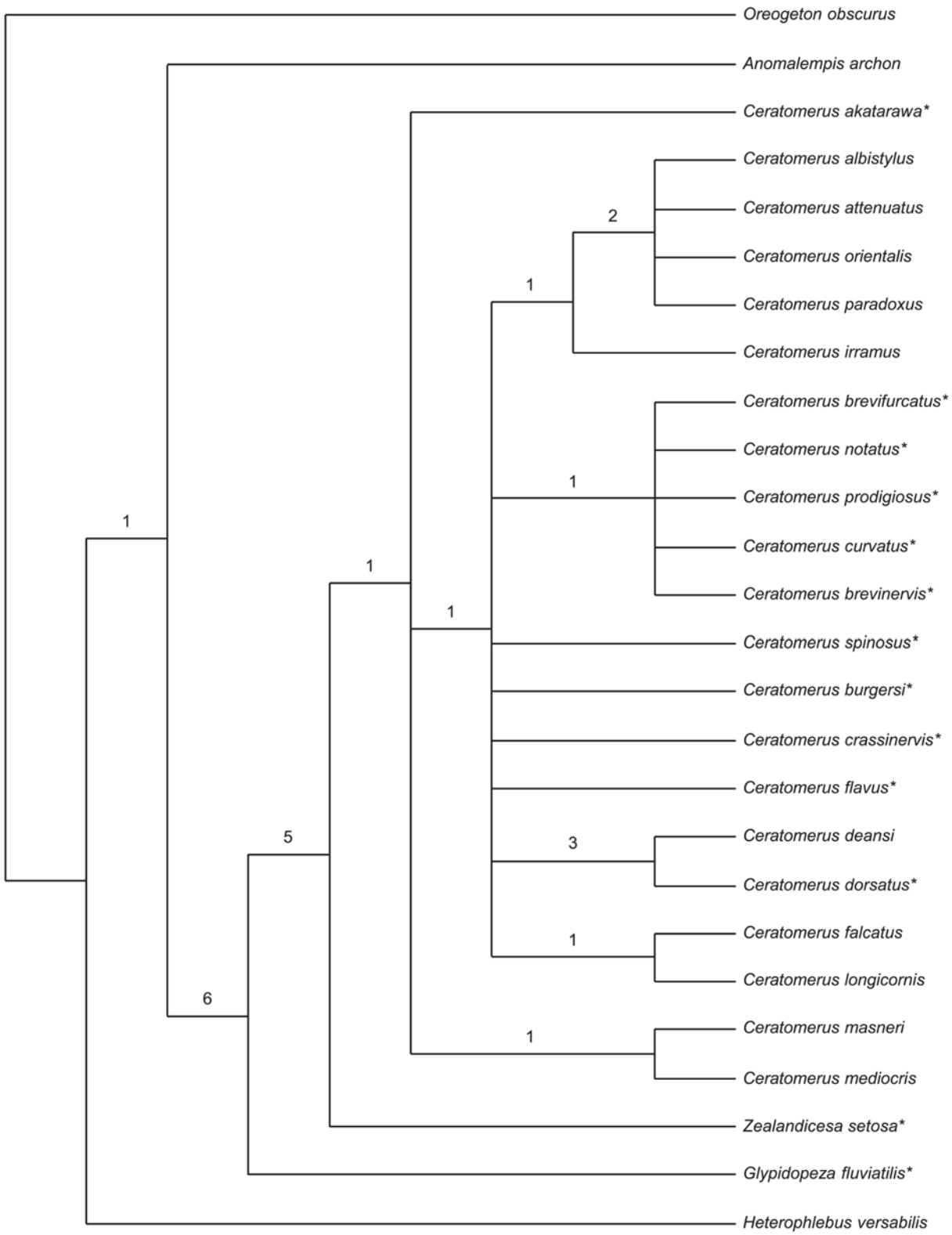


Fig. 182. Strict consensus of the 60 most parsimonious cladograms produced by analysis of the data matrix (Table 3). Bremer support values are listed above each internode. * identifies New Zealand taxa.

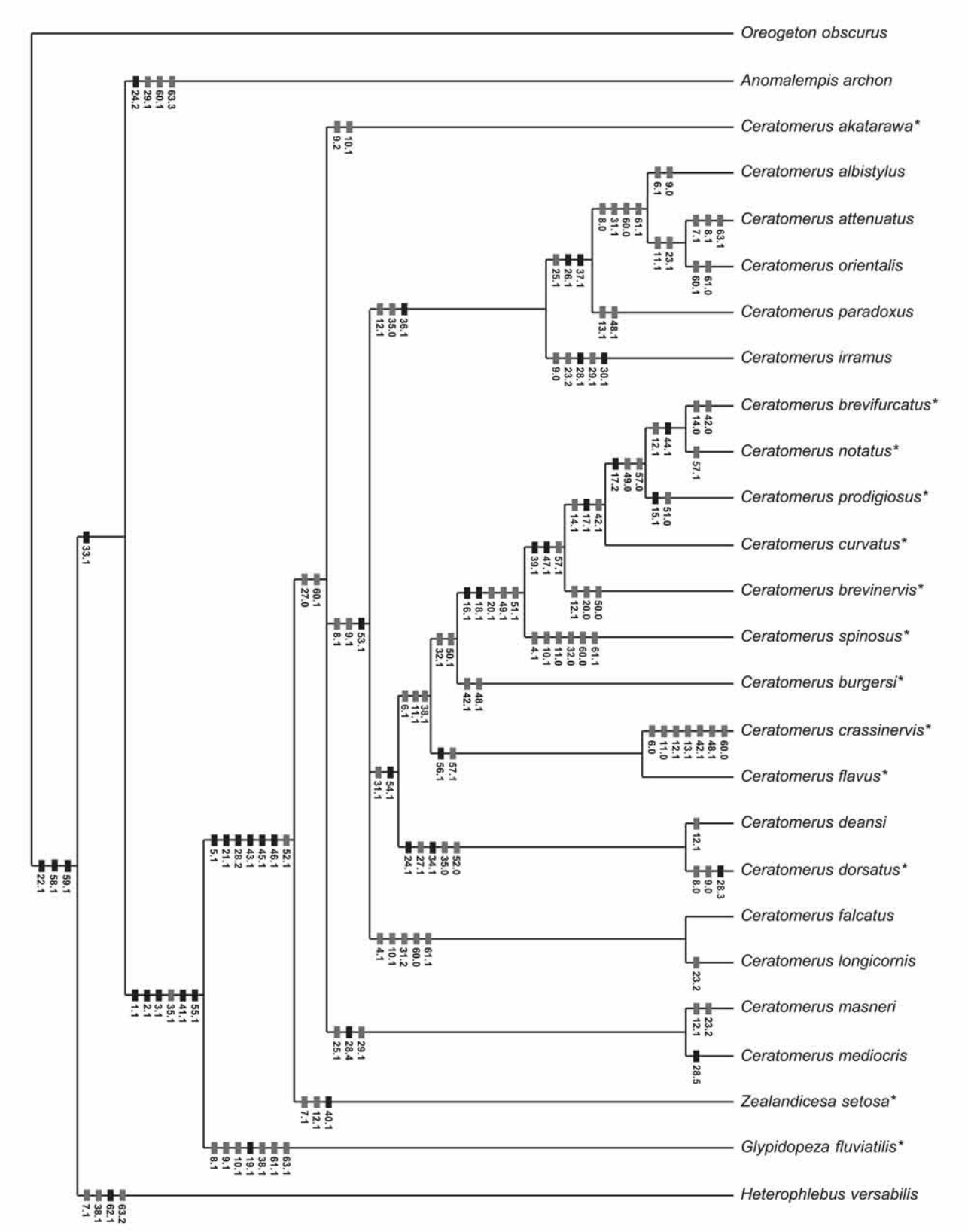
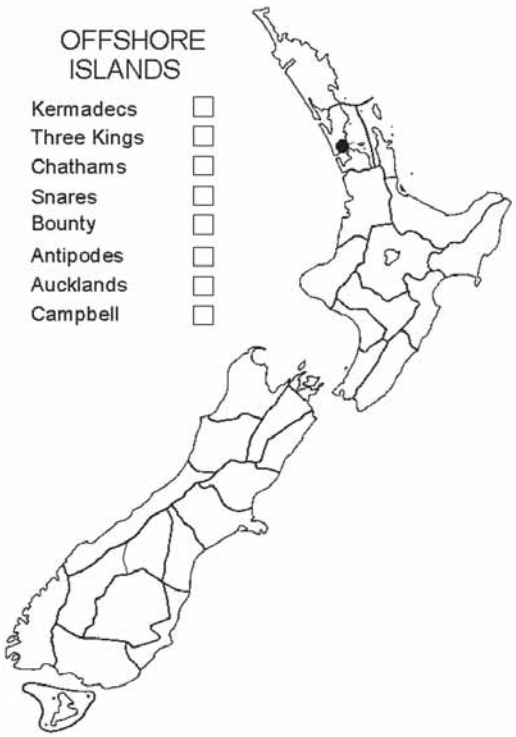
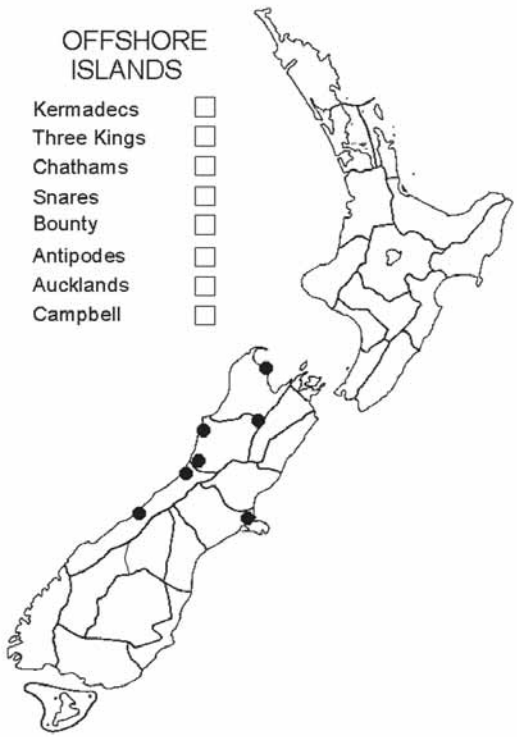


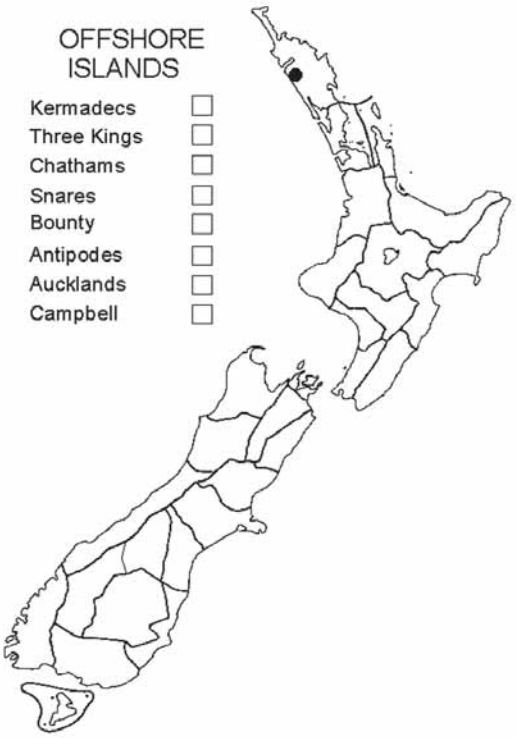
Fig. 183. One of 60 most parsimonious cladograms produced by analysis of the data matrix (Table 3) and the single tree obtained by successive approximations (tree length = 137). Character distributions shown by black hash marks for uniquely derived states and grey hash marks for homoplasious states. * identifies New Zealand taxa.



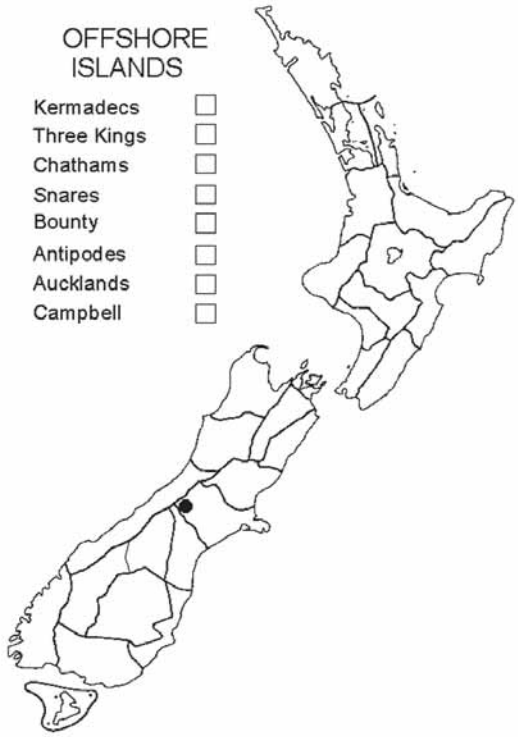
Map 1 Collection localities, *Ceratomerus collini*



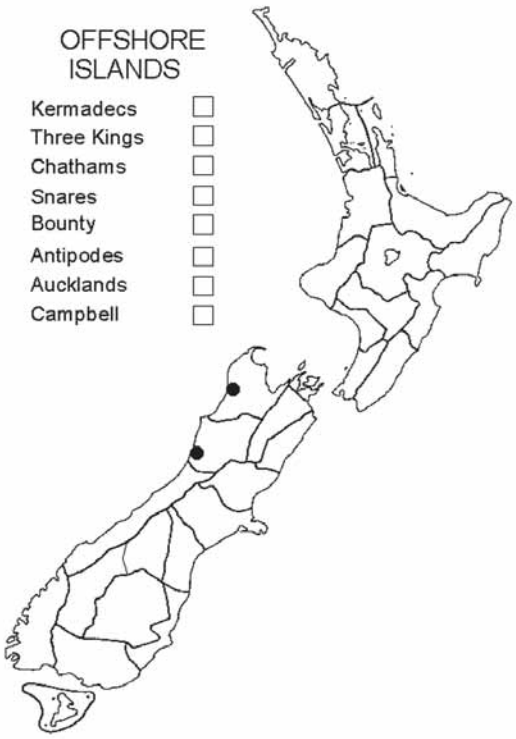
Map 2 Collection localities, *Ceratomerus crassinervis*



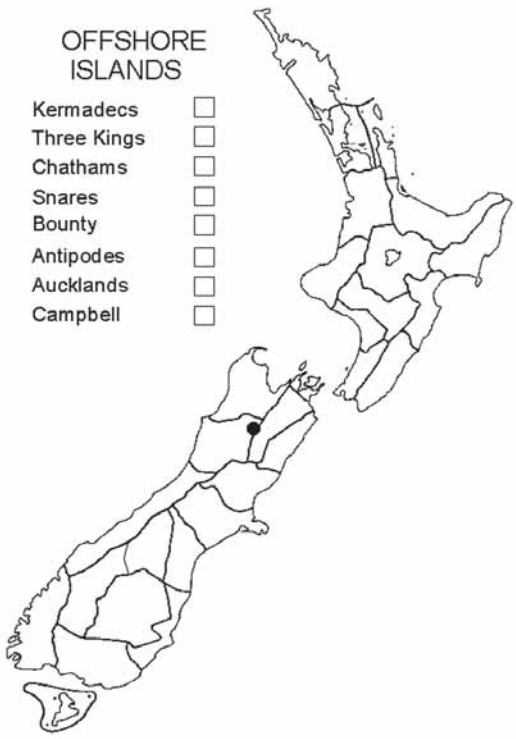
Map 3 Collection localities, *Ceratomerus minutus*



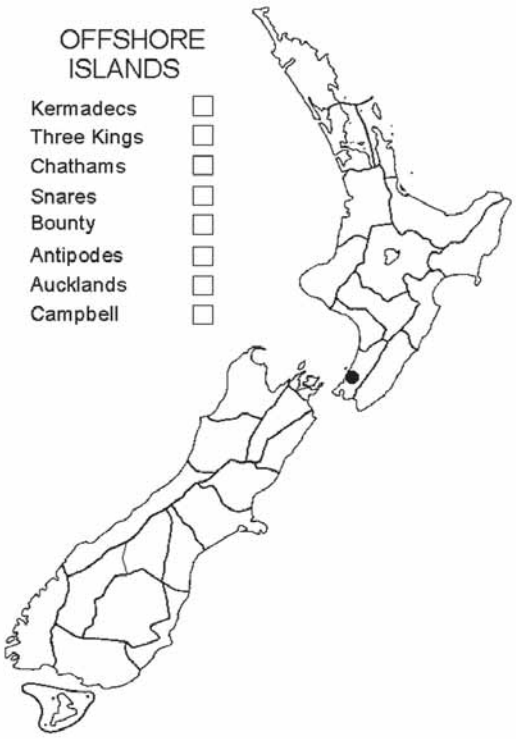
Map 4 Collection localities, *Ceratomerus morrisi*



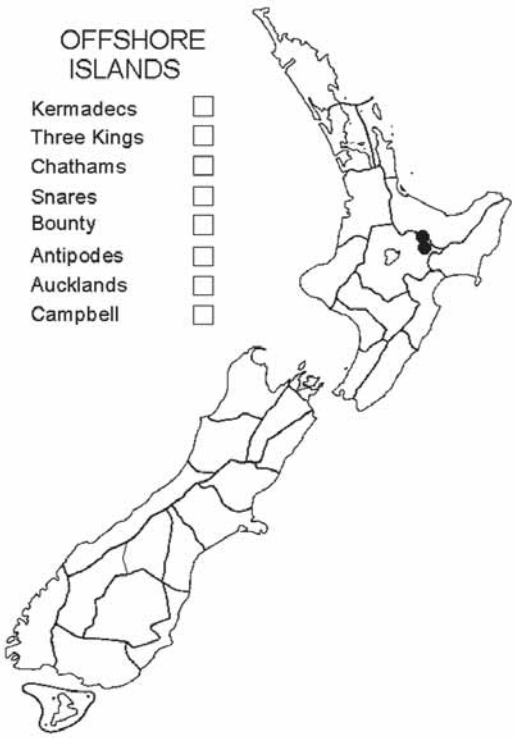
Map 5 Collection localities, *Ceratomerus oparara*



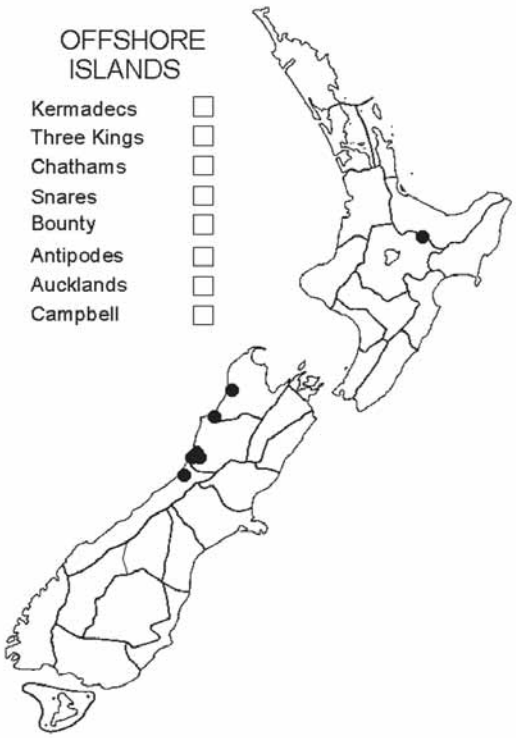
Map 6 Collection localities, *Ceratomerus planti*



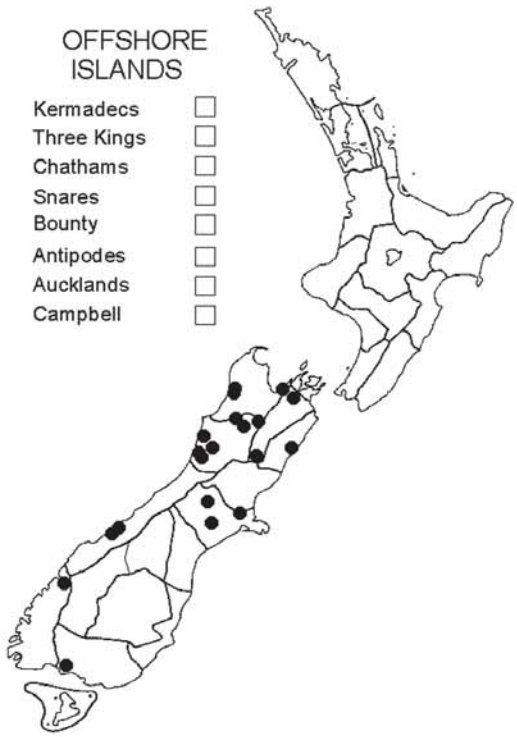
Map 7 Collection localities, *Ceratomerus setifacies*



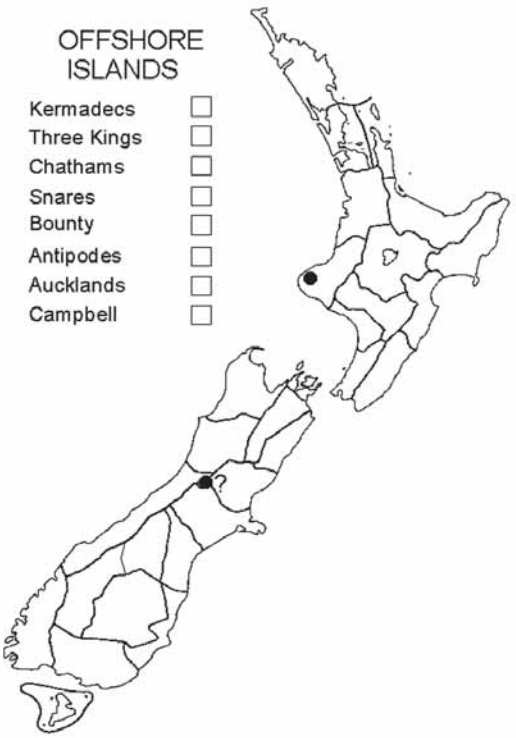
Map 8 Collection localities, *Ceratomerus simplex*



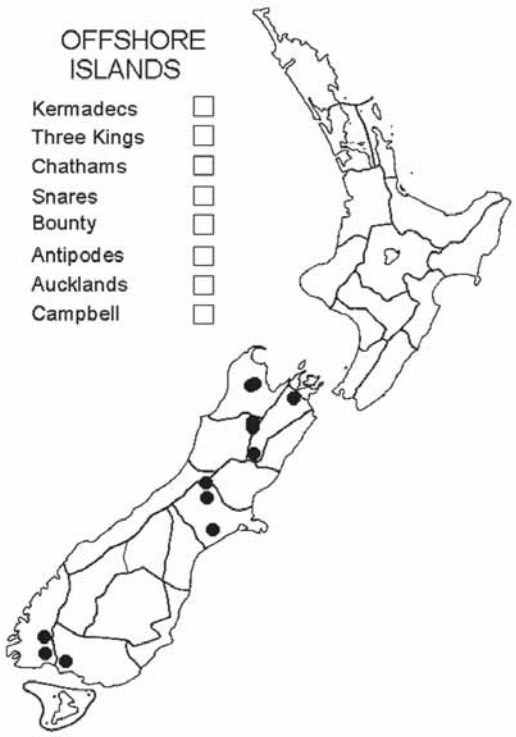
Map 9 Collection localities, *Ceratomerus tarsalis*



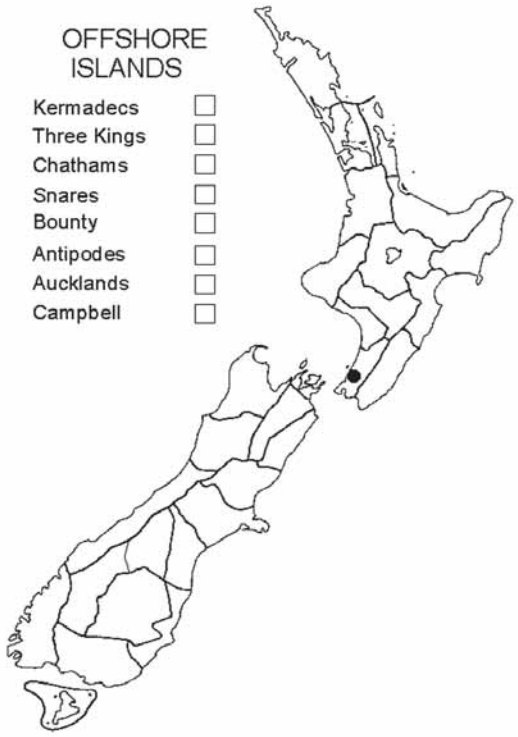
Map 10 Collection localities, *Ceratomerus curvatus*



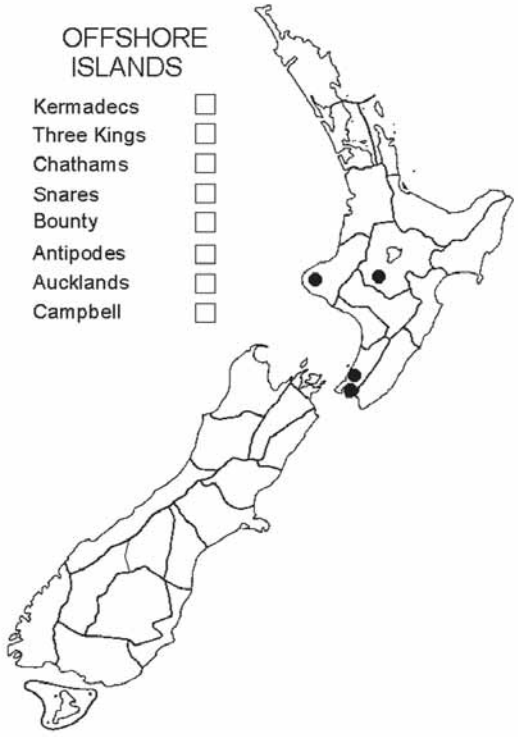
Map 11 Collection localities, *Ceratomerus dugdalei*



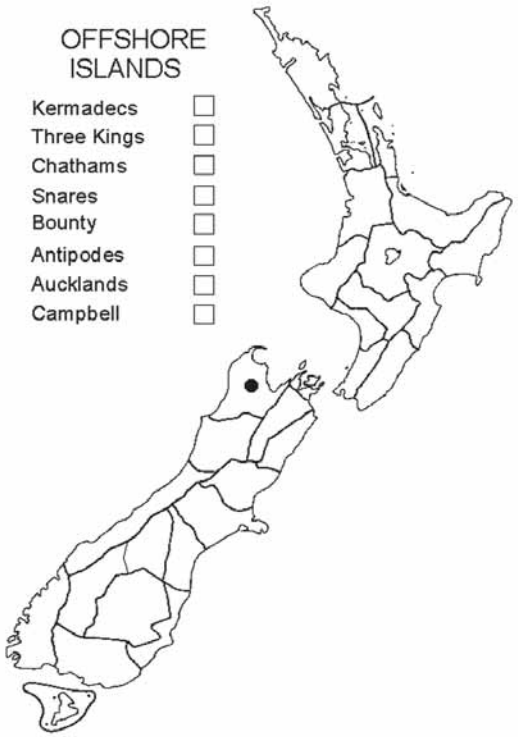
Map 12 Collection localities, *Ceratomerus latinervis*



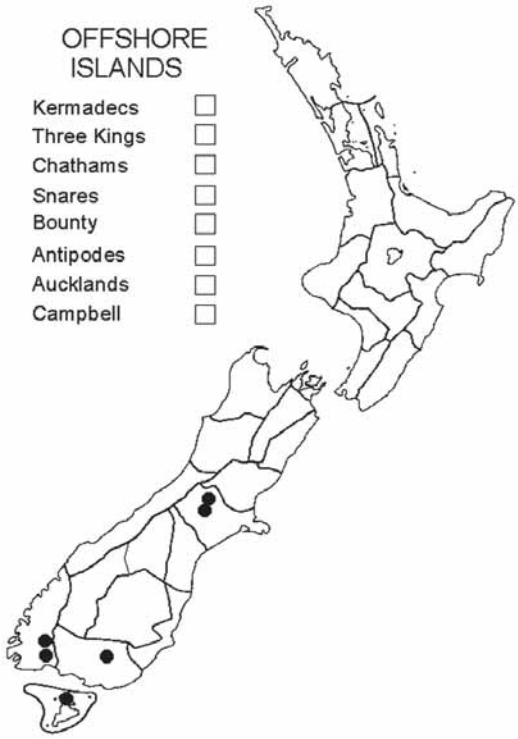
Map 13 Collection localities, *Ceratomerus latipalpus*



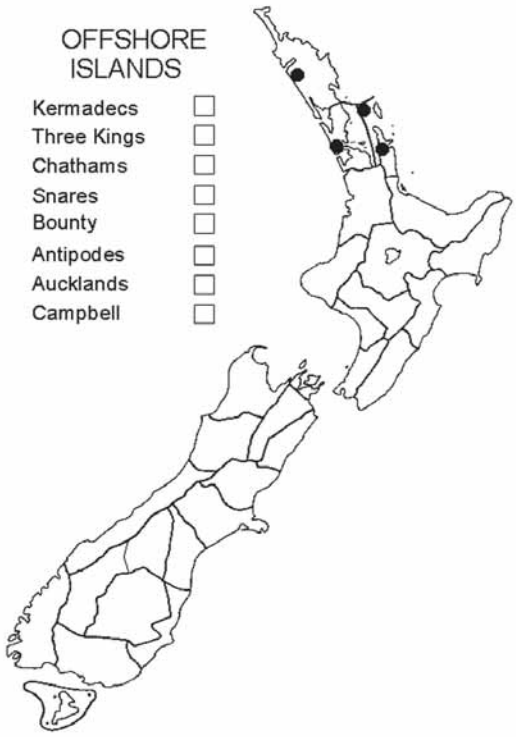
Map 14 Collection localities, *Ceratomerus ohakunensis*



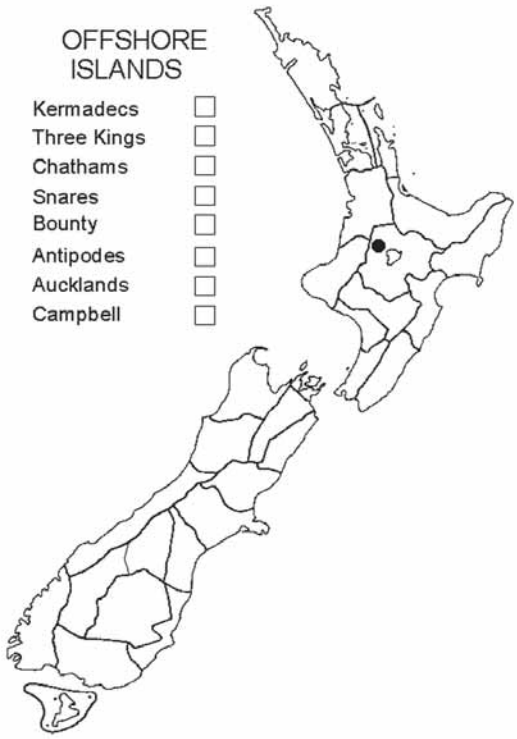
Map 15 Collection localities, *Ceratomerus tonnoiri*



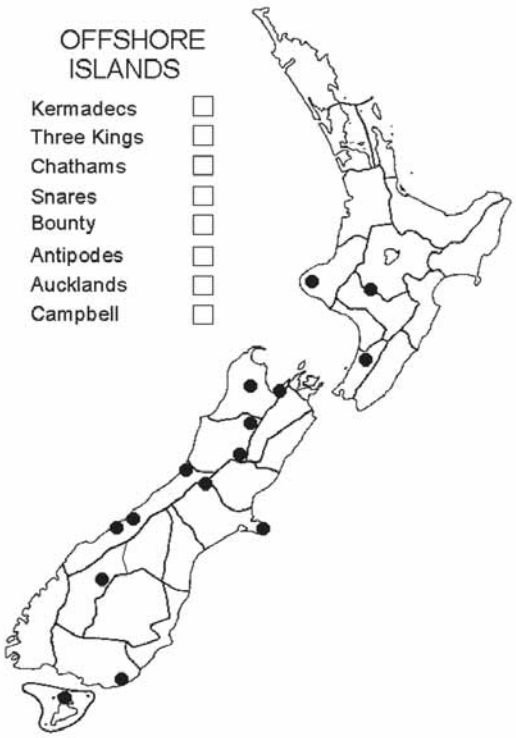
Map 16 Collection localities, *Ceratomerus wardi*



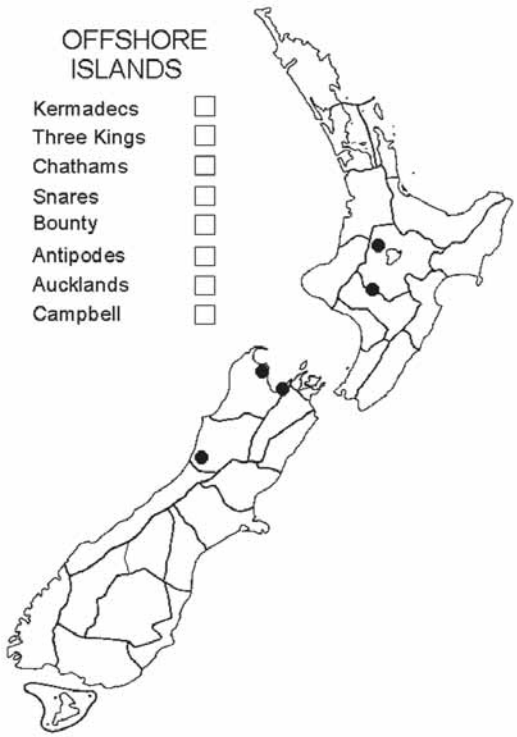
Map 17 Collection localities, *Ceratomerus aquilonius*



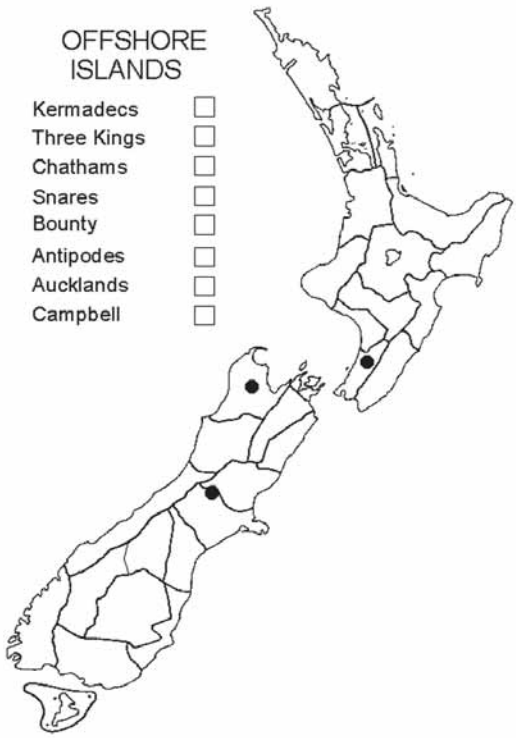
Map 18 Collection localities, *Ceratomerus biseriatus*



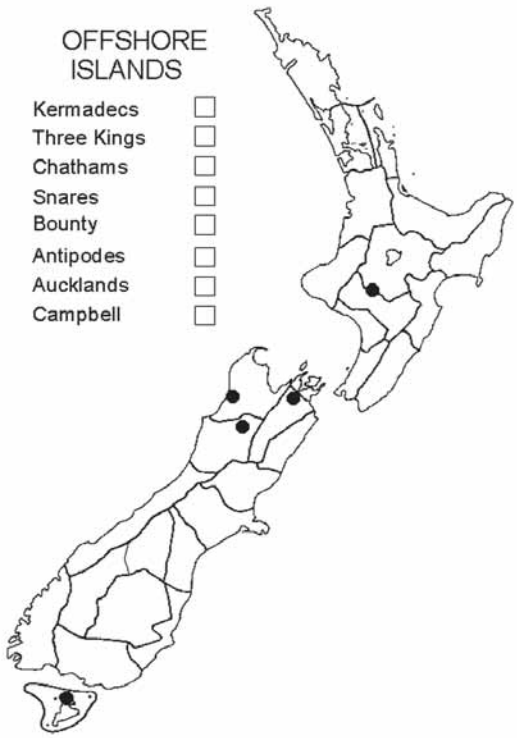
Map 19 Collection localities, *Ceratomerus dorsatus*



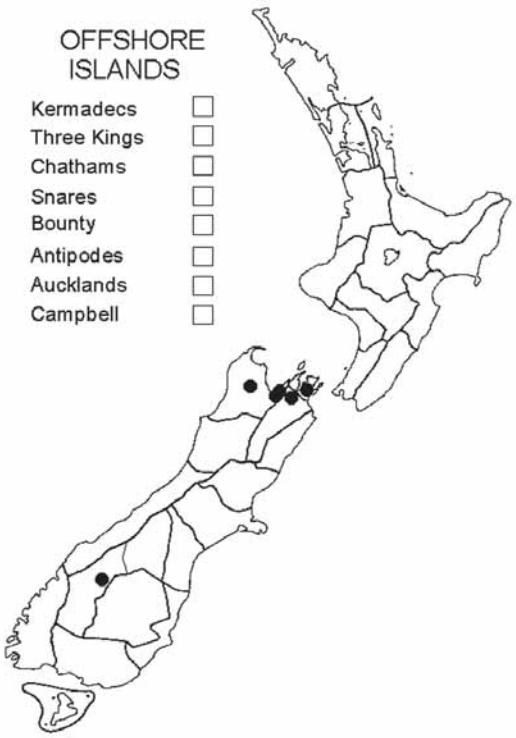
Map 20 Collection localities, *Ceratomerus virgatus*



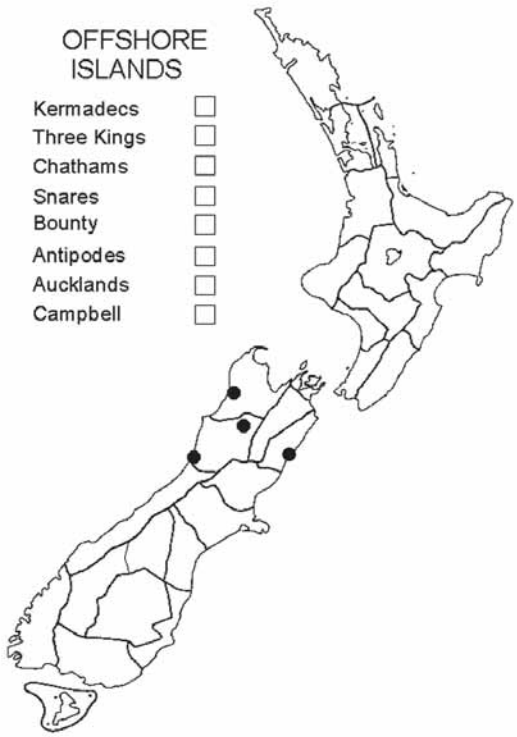
Map 21 Collection localities, *Ceratomerus alticolus*



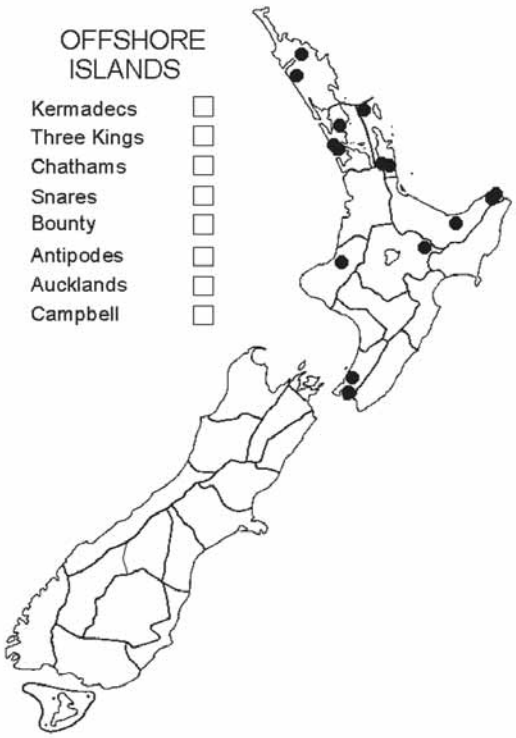
Map 22 Collection localities, *Ceratomerus exiguus*



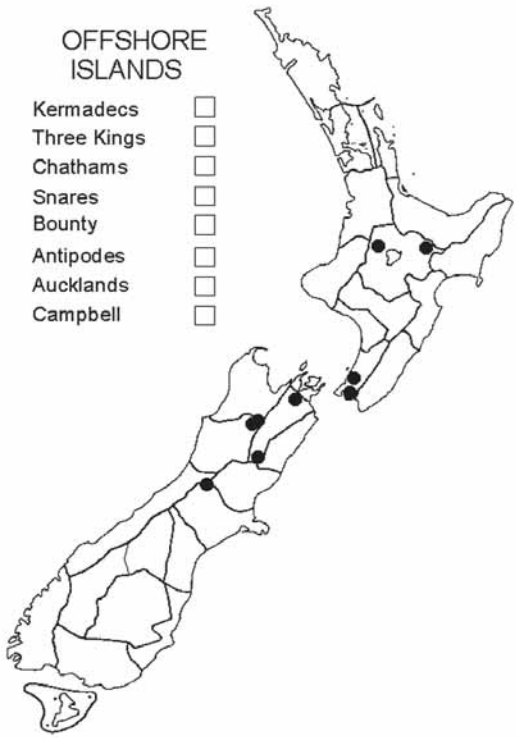
Map 23 Collection localities, *Ceratomerus flavus*



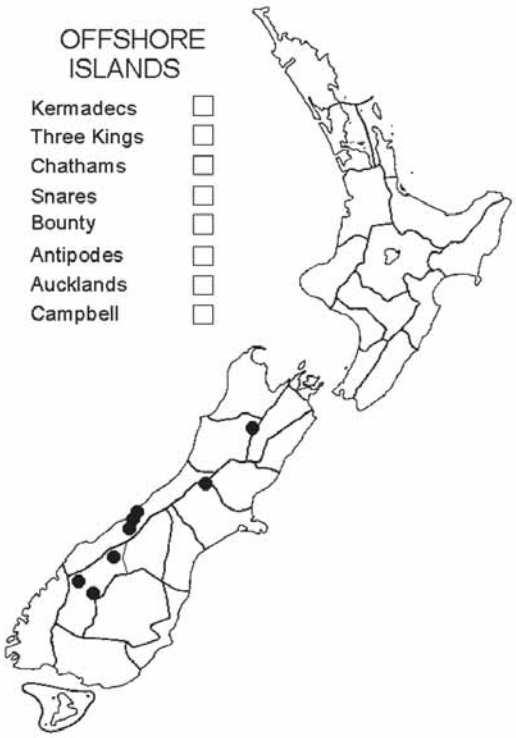
Map 24 Collection localities, *Ceratomerus fontinalis*



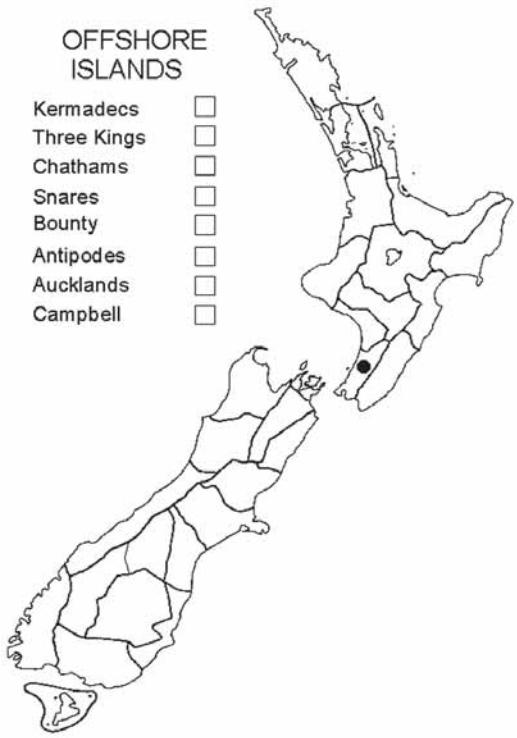
Map 25 Collection localities, *Ceratomerus brevifurcatus*



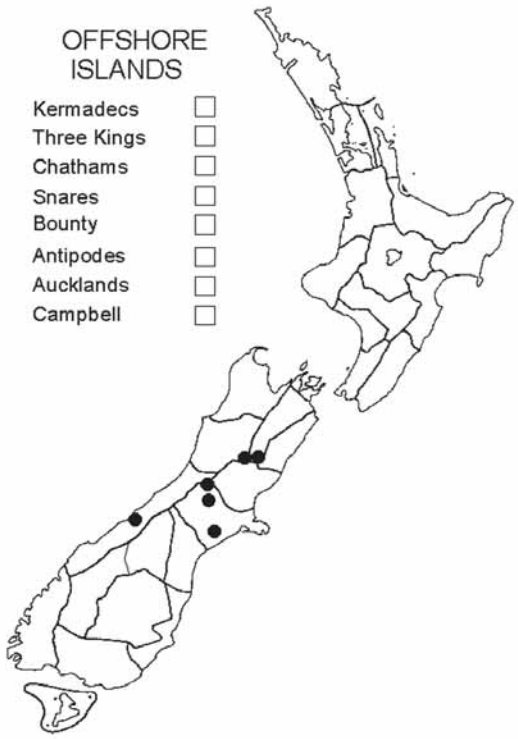
Map 26 Collection localities, *Ceratomerus lobipennis*



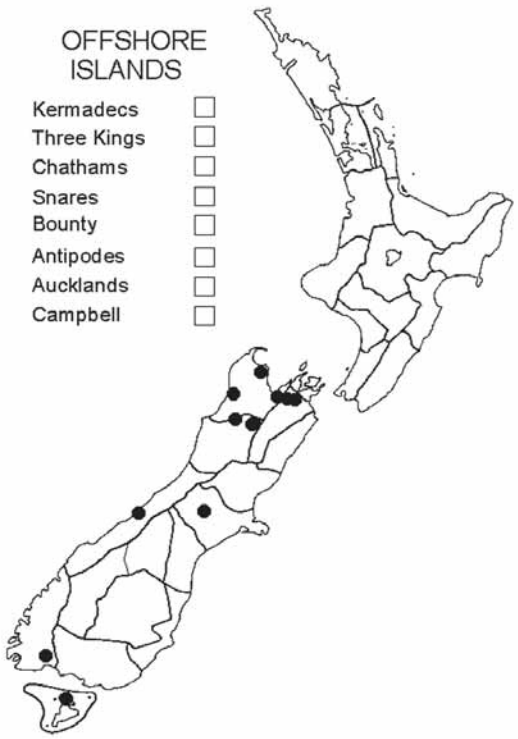
Map 27 Collection localities, *Ceratomerus longifurcatus*



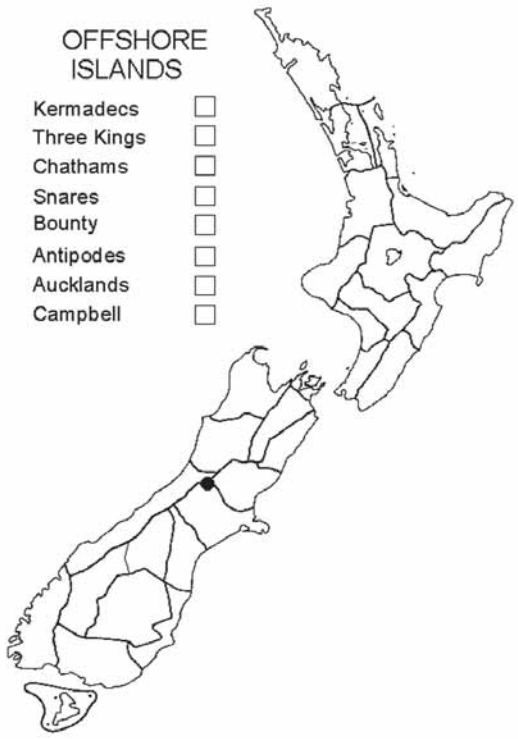
Map 28 Collection localities, *Ceratomerus mayae*



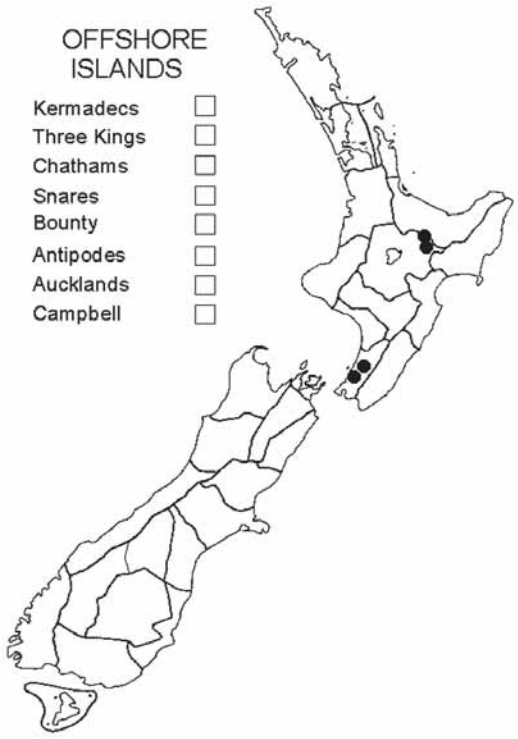
Map 29 Collection localities, *Ceratomerus mirandus*



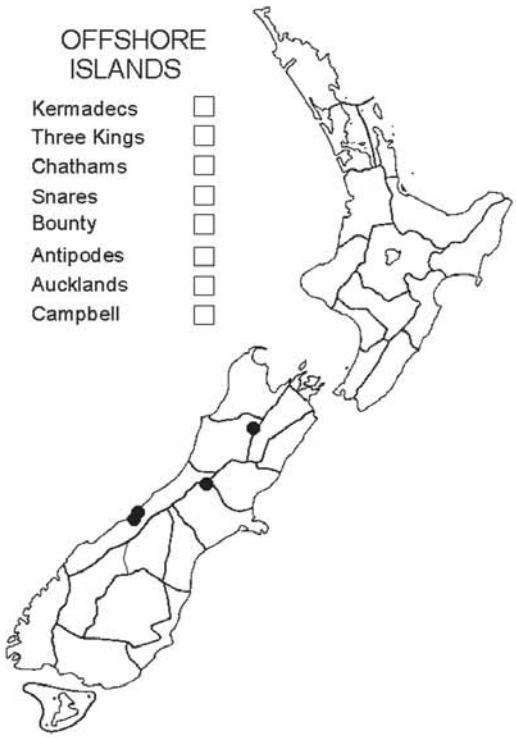
Map 30 Collection localities, *Ceratomerus notatus*



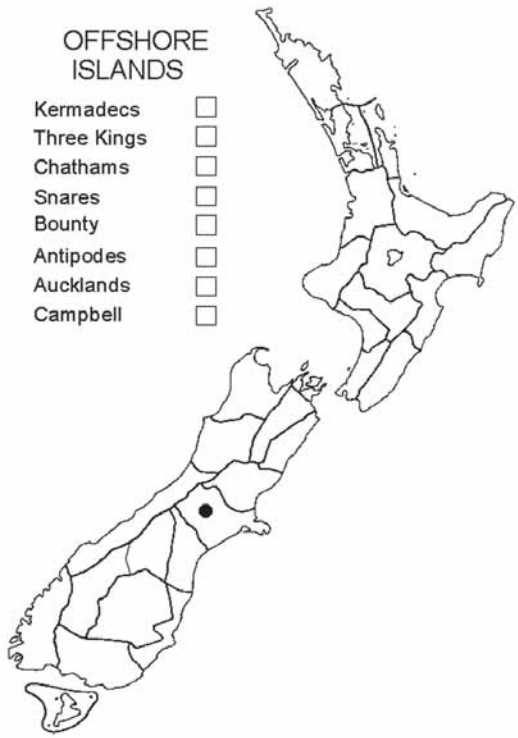
Map 31 Collection localities, *Ceratomerus subnotatus*



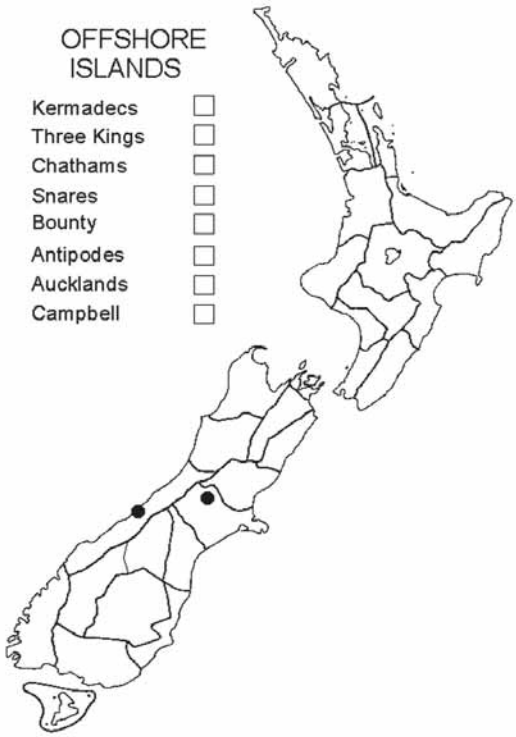
Map 32 Collection localities, *Ceratomerus whirinaki*



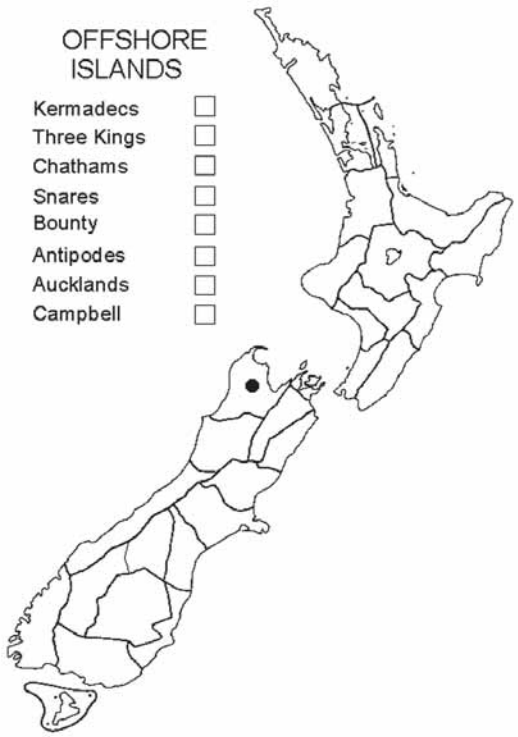
Map 33 Collection localities, *Ceratomerus flexuosus*



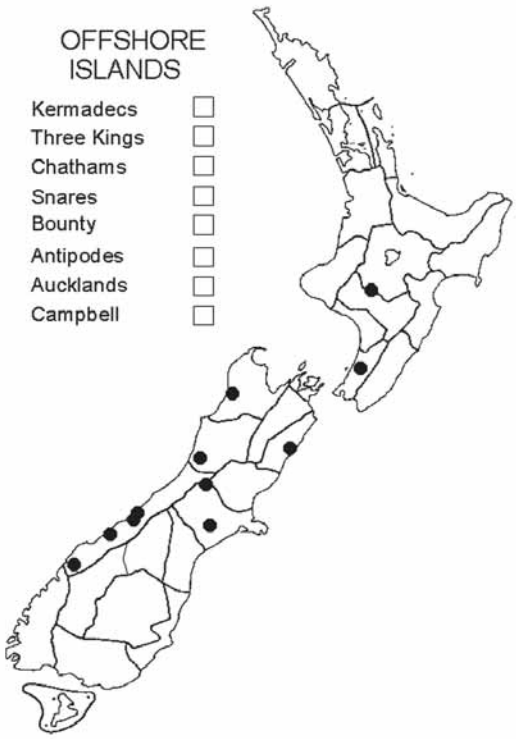
Map 34 Collection localities, *Ceratomerus macfarlanei*



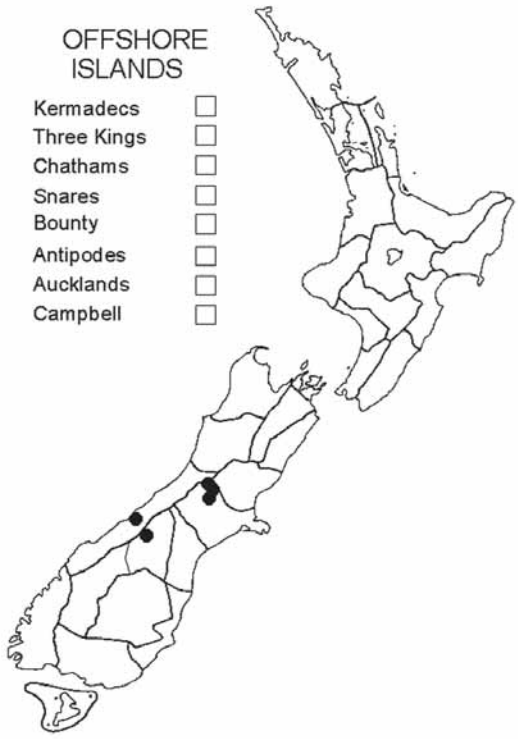
Map 35 Collection localities, *Ceratomerus melaneus*



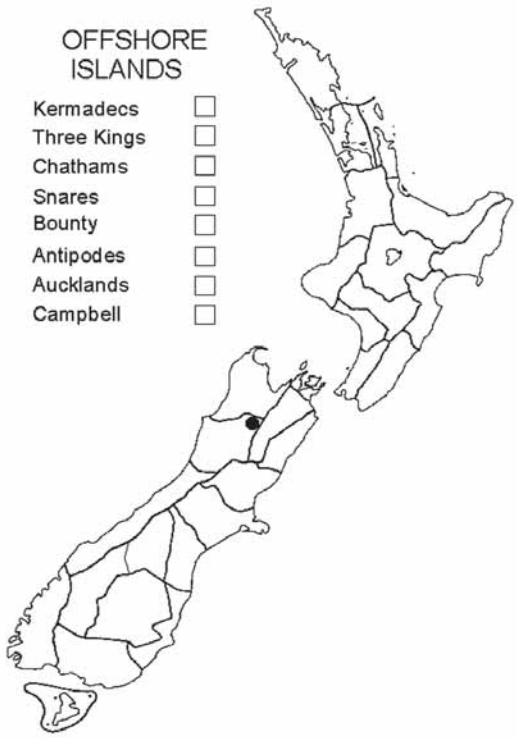
Map 36 Collection localities, *Ceratomerus montanus*



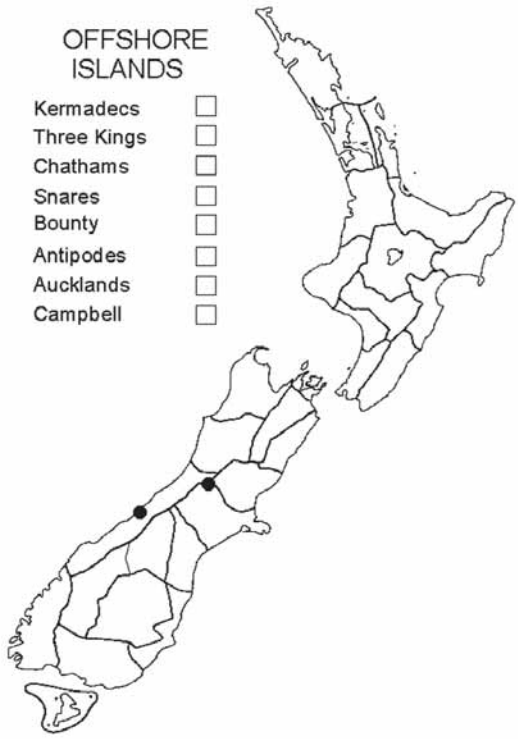
Map 37 Collection localities, *Ceratomerus prodigiosus*



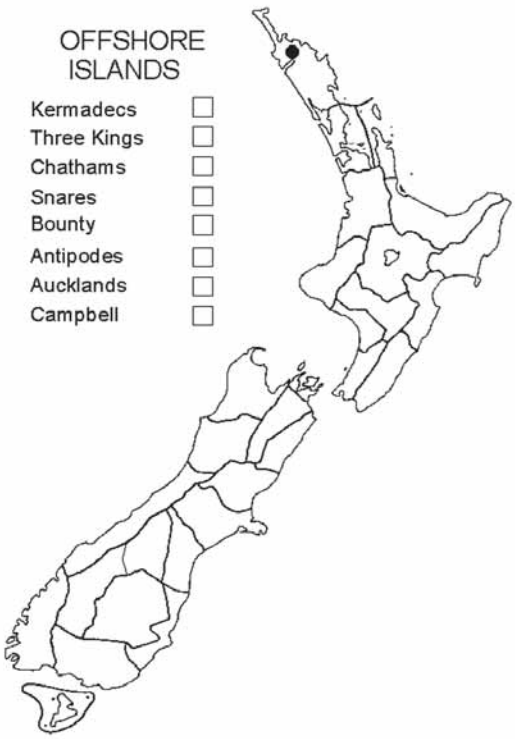
Map 38 Collection localities, *Ceratomerus rivalis*



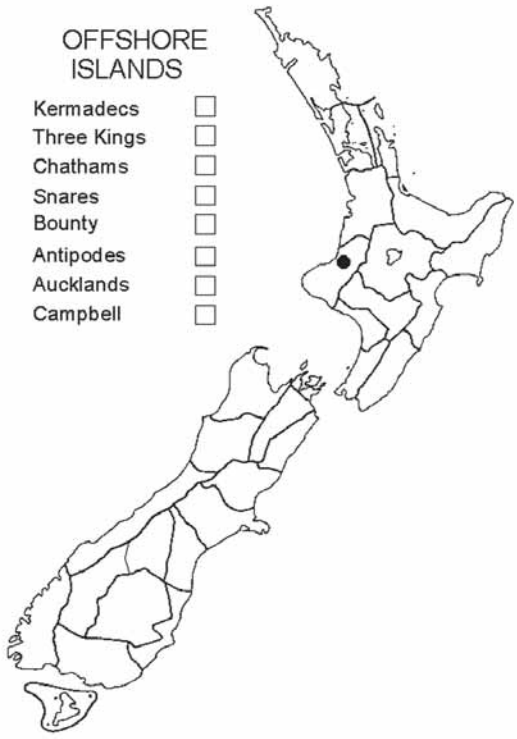
Map 39 Collection localities, *Ceratomerus trivittatus*



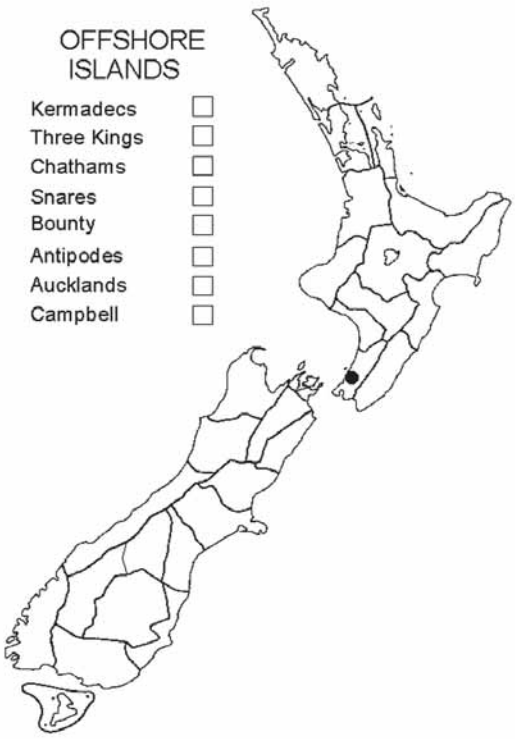
Map 40 Collection localities, *Ceratomerus vittatus*



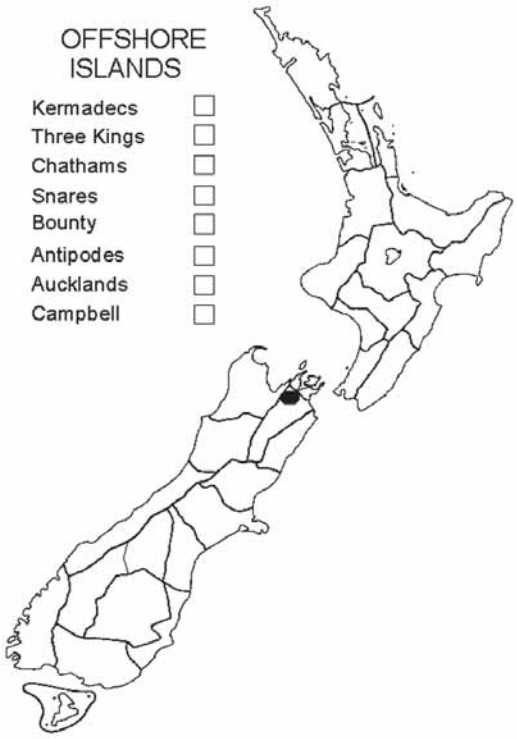
Map 41 Collection localities, *Ceratomerus mangamuka*



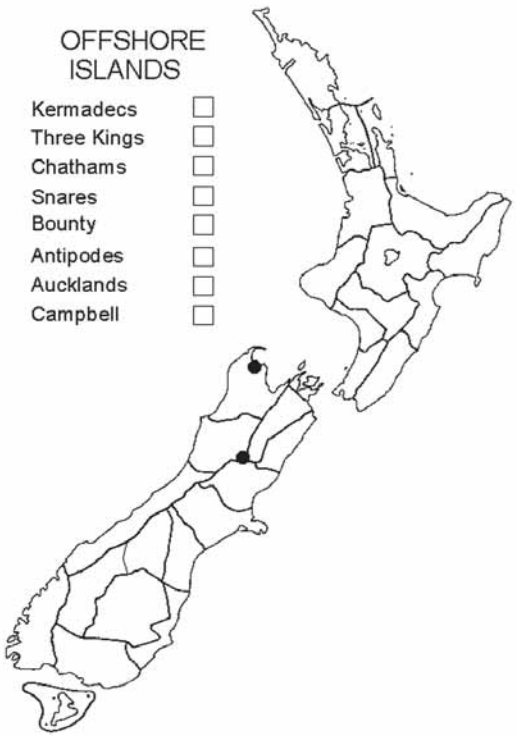
Map 42 Collection localities, *Ceratomerus spinosus*



Map 43 Collection localities, *Ceratomerus akatarawa*



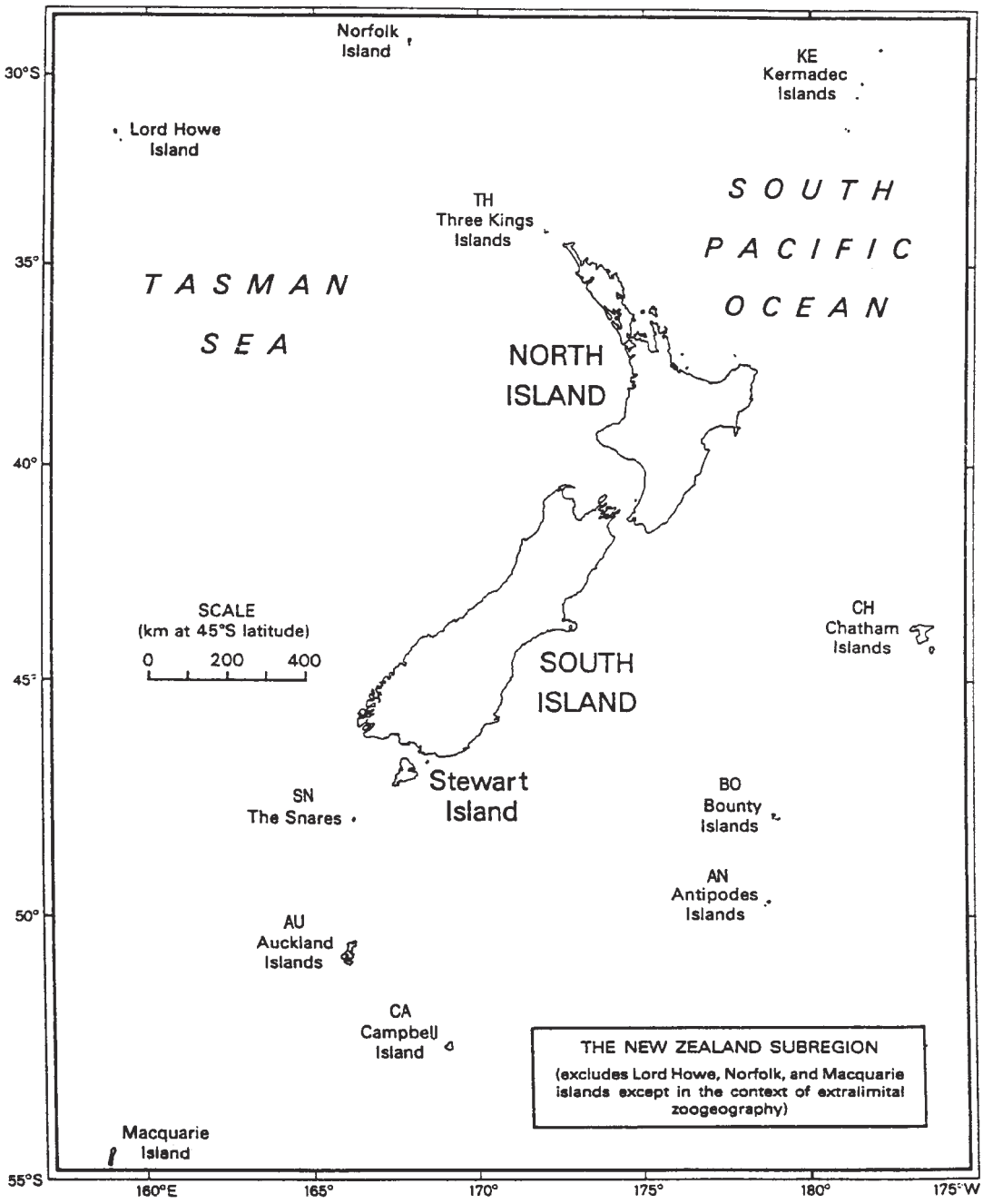
Map 44 Collection localities, *Ceratomerus brevinervis*



Map 45 Collection localities, *Ceratomerus burgersi*

Taxonomic index

Taxa in **bold** type denote those described in this monograph. Page numbers in **bold** type denote a description, and numbers in *italic* type indicate an illustration or diagram. The letter "**k**" after a page indicates an identification key; "**m**", a distribution map.


Norfolk Island
KE Kermadec Islands
Lord Howe Island
TH Three Kings Islands
SOUTH PACIFIC OCEAN
TASMAN SEA
NORTH ISLAND
SOUTH ISLAND
Stewart Island
SCALE (km at 45°S latitude)
0 200 400
CH Chatham Islands
SN The Snares
BO Bounty Islands
AN Antipodes Islands
AU Auckland Islands
CA Campbell Island
Macquarie Island
THE NEW ZEALAND SUBREGION
(excludes Lord Howe, Norfolk, and Macquarie islands except in the context of extralimital zoogeography)
30°S
35°
40°
45°
50°
55°S
160°E
165°
170°
175°
180°
175°W

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Kua whakatūria tēnei huinga pukapuka hei whakahauhau i ngā tohunga whai mātauranga kia whakaputa i ngā kōrero poto, engari he whaikiko tonu, e pā ana ki ngā aitanga pepeke o Aotearoa. He tōtika tonu te āhua o ngā tuhituhi, engari ko te tino whāinga, kia mārama te marea ki ngā tohu tautuhi o ia ngārara, o ia ngārara, me te roanga atu o ngā kōrero mō tēnā, mō tēnā.

He titiro whāiti tā tēnei pukapuka ki ngā mea noho whenua, kāore he tuarā; i pēnei ai i te mea kei te mōhio whānuitia ngā mea whai tuarā, ā, ko ngā mea noho moana, koirā te tino kaupapa o te huinga pukapuka *NIWA Biodiversity Memoirs.*

Ka āhei te tangata ki te **whakauru tuhituhinga** mehemea kei a ia ngā tohungatanga me ngā rauemi e tutuki pai ai tana mahi. Heoi anō, e wātea ana te Kohinga Angawaho o Aotearoa hei āta tirotiro mā te tangata mehemea he āwhina kei reira.

Me whāki te kaituhi i ōna whakaaro ki tētahi o te Kāhui Ārahi Whakarōpūtanga Tuarā-Kore, ki te Ētita rānei i mua i te tīmatanga, ā, mā rātou a ia e ārahi mō te wāhi ki tana tuhinga.