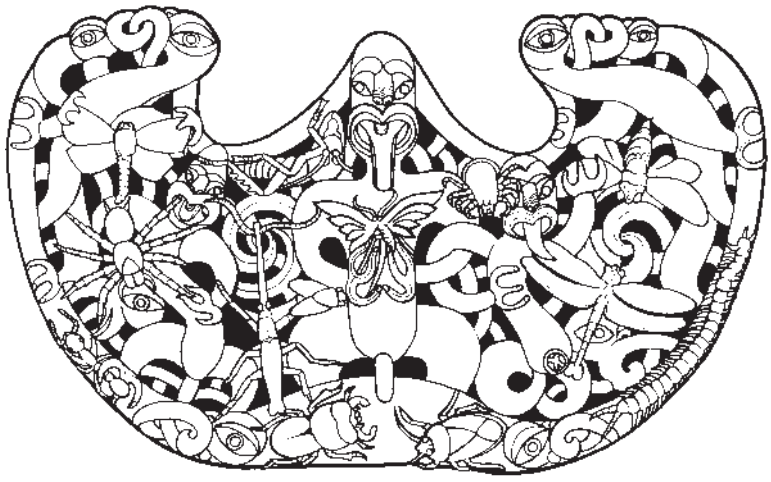

Fauna of New Zealand

Ko te Aitanga Pepeke o Aotearoa

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Harpalini

(Insecta: Coleoptera: Carabidae: Harpalinae)

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POPULAR SUMMARY — HE WHAKARĀPOPOTOTANGA

Class **Insecta**

Order **Coleoptera**

Family **Carabidae**

Subfamily **Harpalinae**

Tribe **Harpalini**

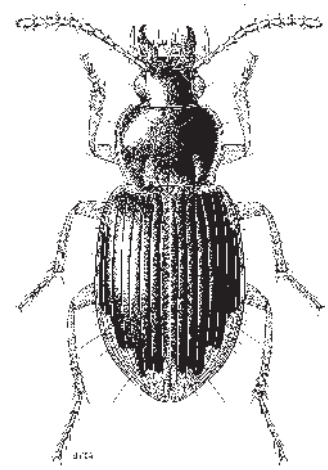

Illustration / Whakaahua: *Lecanomerus sharpi* (Csiki) (Illustrator / Kaiwhakaahua: D. W. Helmore).

Harpaline ground beetles

The tribe Harpalini belongs to the subfamily Harpalinae (Coleoptera: Carabidae), which contains over 19 000 taxa worldwide. Molecular sequence data indicate Harpalinae evolved in the Cretaceous Period (140–65 million years ago).

The Harpalini form a diverse group, including over 240 genera and subgenera, and approximately 2000 species distributed in all biogeographic regions of the world. The present faunal review records 20 genera and 57 species for New Zealand. This should constitute nearly all the fauna.

Compared with larger or warmer regions of the world, e.g., Australia, which has a largely undescribed fauna with over 160 known species, the New Zealand fauna may appear relatively small, but New Zealand is a very special place – a biodiversity 'hot-spot' – with 75% of species (42 out of 57 species) and 55% of genera (11 out of 20 genera) found nowhere else in the world. The remaining fauna that are not endemic to this country are made up of overseas species introduced mainly from Australia. No native species is shared with Australia, although three native genera occur on both sides of the Tasman Sea, which suggests the New Zealand harpaline lineages have evolved mostly in isolation following the breakup of eastern Gondwanaland.

Harpalini are rather stout-bodied ground beetles with relatively short mandibles and other appendages, and a body length of 3–20 mm. They are usually darkly coloured, have only one hair-bearing puncture above each eye, no such puncture at the posterior angles of the pronotum, and elytra that are rounded, not twisted, at the sides near the apex. Some species living in caves or exhibiting strong burrowing habits are characterised by paler bodies and reduced eyes.

As observed in many other carabids, harpaline ground beetles are taxonomically diverse, generally abundant in the field, and demonstrate ecological preferences and a flexible set of responses to environmental factors. Because of these features, the relative ease with which their

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Ngā pītara Harpaline noho papa

Nō te whānau whāiti Harpalinae (Coleoptera: Carabidae) a ngāi Harpalini. Puta noa i te ao, 1900 ōna rōpū. E ai ki ngā raraunga raupapa rāpoi ngota, nō te Takiwā Cretaceous tōna kunenga mai (i te 140–65 miriona tau ki muri).

He iwi matahuhua tonu a ngāi Harpalini – he nui atu i te 240 ngā puninga me ngā puninga iti, he āhua 2000 ngā momo, kei ngā takiwā papawhenua-koiora katoa o te ao. I tēnei tirohanga hou, kua tuhia he mauranga mō ngā puninga e 20 me ngā momo e 57 i Aotearoa. Ko te whakaaro ia, he ruarua noa iho ngā momo kāore i mau i tēnei tatauranga.

Ina whakaritea ki ngā whenua rahi ake, mahana ake o te ao (hei tauira, arā a Ahitereiria me ōna momo 160 e mōhiotia ana, tae atu ki te maha noa atu kāore anō i whakaahuatia ā-kupu) tērā ka whakaarohia he torutoru noa iho ngā momo o Aotearoa. Engari he whenua ahurei tonu a Aotearoa, inā rā, ko tētahi 75% o ngā momo (e 42 o ngā momo e 57) me tētahi 55% o ngā puninga (11 o ngā puninga e 20) i Aotearoa nei, kāore e kitea i whenua kē. Ko ērā atu momo ehara nō konei taketake ake, he rāwaho, ko te nuinga i manene mai i Ahitereiria. Karekau he momo māori o Aotearoa kei Ahitereiria anō e noho ana, engari e toru ngā puninga māori kei ngā whenua e rua nei. E tohu ana tēnei tērā tonu pea i kukune motuhake mai ngā tātai harpaline o Aotearoa i muri i te wehewehenga o te pito rāwhiti o Te Uri Māroa.

He āhua porotaka ngā tinana o ngā pītara noho papa Harpalini, he āhua poto ngā kauwae me ērā atu wāhanga toro whakawaho o te tinana. Ko te roa o te tinana, mai i te 3 ki te 20 mm. He uriuri te tae o te nuinga, kotahi anake te mārua whai weu i runga ake o ia karu, kāore he mārua pēnei i ngā koki whakamuri o te papatua pohomua. He āhua kōpuku ngā pūkoro parirau i ngā kaokao, i te takiwā

(haere tonu)

populations may be sampled by reliable quantitative methods (e.g., pitfall-trapping), and their potential use as bioindicators and biocontrol agents, they represent an attractive study group for biologists investigating evolutionary and ecological hypotheses.

As a result, Harpalini are well represented in New Zealand entomological museums and collections – over 5000 specimens were studied for this project. But despite such high interest, no taxonomic revision of this group has been produced until now.

Before the present revision, 13 genera and 36 species of Harpalini were known from New Zealand, but the authors have found a number of species had been described more than once under different names, and 23 species and 5 genera are new to science.

The geographical distribution of native species was undocumented before this study. We now have a better knowledge of their distribution patterns. The authors have found, for example, that several species are restricted to specific areas of New Zealand – the South Island northwest and the far north of the New Zealand appearing to have been reservoirs, in geological time, of much of the genetic diversity in New Zealand Harpalini, with several species currently restricted to these regions. Of the two main islands of New Zealand, the North Island has the greatest number of species (35 compared with 31 for the South Island), and only 4 native species (*Allocinopus sculpticollis, Triplosarus novaezelandiae, Syllectus anomalus, Euthenarus puncticollis*) are shared between the two islands. Three genera (*Gaioxenus, Parabaris,* and *Kupeharpalus*) are found only on the North Island, whereas two genera (*Hakaharpalus* and the cave-dwelling *Pholeodytes*) are confined to the northwest of the South Island. Two genera are restricted to the Three Kings Islands (*Maoriharpalus*, *Kiwiharpalus*). There is no genus endemic to the Chatham Islands. Stewart Island also has no endemic taxa, but shares 2 native species: *Triplosarus novaezelandiae* (with North Island and South Island), *Euthenarus brevicollis* (with South Island).

Over 50% of native species (25 out of 42 species) are known from 10 populations or fewer. All but one of these very special species are new to science, and all are of potential conservation concern. They are usually taxonomically highly distinctive species with low dispersal power, often geographically localised in threatened habitats, and represented in collections by relatively few specimens collected over many decades, which may indicate rare or highly specialised species.

No formal detailed study of the natural history of individual species of New Zealand Harpalini has ever been conducted, although Larochelle and Larivière (2001, *Fauna of New Zealand* 43) summarised information available from the literature, material in entomological collections, personal communications from carabid collectors, and their own personal field observations.

Most native species are flightless, having vestigial membranous wings (reduced to small wing buds), and live within the confines of native habitats, mostly forests

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o te pito, kāore e kōrino. Heoi, arā ētahi momo noho ana, kari rua rānei kāore e tino uriuri ngā tinana, he iti ake anō hoki ngā karu.

Pērā anō i te maha tonu o ngā carabid, he matahuhua ngā whakarōpūtanga o ngā pītara noho papa harpaline, he huhua anō tā rātou noho ki te taiao. He rerekē ngā kāinga noho e pai ana ki tēnā, ki tēnā, he tāwariwari anō te āhua o tā rātou aro atu ki ngā āhuatanga taiao. Nā ēnei āhuatanga, nā te māmā anō ki te tīpako i ngā taupori i runga i ngā tikanga ine ā-rahi tōtika (pēnei i te hopu ki te tomo), me tō rātou pai anō pea hei tohu koiora, hei kaipatu koiora rānei, he rōpū tēnei e arohia nuitia ana e ngā tohunga koiora e whakamātau ana i ngā whakapae mō te kunenga me te taupuhi kaiao.

Me te aha, he autaia tonu te maha o ngā Harpalini e puritia ana ki ngā whare pepeke me ngā kohinga pepeke i Aotearoa – he nui ake i te 5000 ngā tauira i āta tirohia mō tēnei rangahautanga. Engari ahakoa te aro nui ki tēnei iwi, kātahi anō ka tirohia anō te whakarōpūtanga o ngā hanga nei.

I mua i tēnei o ngā tirohanga, 13 ngā puninga, e 36 ngā momo i mōhiotia i Aotearoa nei. Engari ko tā ngā kaituhi i kite ai, arā ētahi momo i tapaina ki ngā ingoa e rua, neke atu rānei, me ōna anō kupu whakaahua i te taha. Ā, e 23 ngā momo, e 5 ngā puninga kāore i mōhiotia i te ao pūtaiao i mua atu i tēnei.

Waihoki, kāore i tuhia te tohanga o ngā momo māori i mua atu i tēnei rangahautanga. Nā tēnei mahi rangahau kua kaha ake te mōhio ki ō rātou tauira tohatoha. Hei tauira, i kitea arā ētahi momo maha tonu e noho motuhake ana ki ētahi rohe whāiti o Aotearoa – ko te uru-mā-raki o Te Waipounamu me Muriwhenua ētahi tino mātāpuna, ā-wā papawhenua nei, o te matahuhuatanga o te huinga ira o ngā Harpalini o Aotearoa. He maha hoki ngā momo kāore e kitea i waho atu o ēnei takiwā. He maha ake ngā momo i Te Ika a Māui (e 35 ngā momo), tēnā i Te Waipounamu (e 31 ngā momo), ā, e 4 anake ngā momo māori (*Allocinopus sculpticollis, Triplosarus novaezelandiae, Syllectus anomalus, Euthenarus puncticollis*) kei ngā moutere e rua nei. E 3 ngā puninga (*Gaioxenus, Parabaris* me *Kupeharpalus*) kei Te Ika a Māui anake, e 2 (*Hakaharpalus* me *Pholeodytes* – he momo noho ana) kei te uru-mā-raki o Te Waipounamu anake. E 2 ngā puninga kāore e kitea i waho atu o Manawa-tāwhi (*Maoriharpalus*, *Kiwiharpalus*). Karekau he puninga e kitea ana i Rēkohu anake. Waihoki, kāore he rōpū e kitea ana i Rakiura anake, engari e 2 ōna momo māori, ko: *Triplosarus novaezelandiae* (kei Rēkohu, kei Te Ika a Māui me Te Waipounamu), me *Euthenarus brevicollis* (kei Rēkohu me Te Waipounamu).

He nui ake i te 50% o ngā momo māori (e 25 o ngā momo e 42), nō roto i ngā taupori 10, iti ake rānei. E 24 o ēnei momo, kātahi anō ka mōhiotia i te ao pūtaiao, ā, ko te katoa me āta tiaki ka tika kei korehāhā haere. Ko te nuinga, he māmā ki te wehewehe, tētahi i tētahi, i te nui o ngā rerekētanga, kāore e kaha te marara haere, e noho whāiti ana ki ngā ripoinga mōrearea, ā, he ruarua ngā tauira o tēnā, o tēnā kua kohia i roto i ngā tekau tau, e tohu ana he momo onge tonu pea, he tino whāiti rānei ō rātou kāinga noho.

(haere tonu)

(especially along streams) and wet habitats, also tussock grasslands and caves. Most Harpalini species are moisture loving and live at the surface of the soil and in leaf litter; they also live in caves, and occasionally on plants and trees. Dispersal in most native species is achieved by running over the ground; most species are moderate runners, except for the long-legged, fast-running cave species (*Syllectus, Pholeodytes*). In general, Harpalini have relatively short legs and, sometimes, strongly reduced eyes, indicative of strong burrowing habits.

All adventive species are able to fly, having long or fully developed membranous wings, and live mostly in highly modified environments (often around human dwellings), except for *Haplanister crypticus*, which has also managed to invade native forests.

The collecting season of newly emerged adults suggests Harpalini species may mate in the spring or autumn. For most species, adults are active during all months of the year, but are generally less active during cooler months.

No data are available on the feeding preferences of Harpalini native to New Zealand. Larochelle (1990, *Food of carabid beetles of the World*) showed that on a world basis Harpalini feed on both animal and vegetable matter, but tend to favour the latter. The mandibles of *Hakaharpalus, Kiwiharpalus, Syllectus*, *Pholeodytes*, and *Maoriharpalus* are unusually long in native Harpalini, which may suggest a specialised type of feeding. In addition, the strongly notched labrum (upper mouth part at base of mandibles) of *Maoriharpalus* is reminiscent of, although not necessarily equivalent to, the condition observed in the tribe Licinini, where species feed on hard-bodied invertebrates, e.g., snails.

This faunal review was written with a wide audience in mind. It aims to provide an inventory of New Zealand taxa, a concise treatment of their taxonomy, easy-to-follow identification keys, and several illustrations and maps, as well as a summary of all available information on species distribution, ecology, biology, and dispersal power. It is one step in the authors' goal to to reach an overall understanding of the carabid fauna within a reasonable time frame, and to make relatively large amounts of information available for practical use by a wide range of end-users. It is hoped this kind of faunal taxonomy will provide both a solid foundation for studies of other types and the baseline information required by systematists, identifiers, ecologists, and other biologists, as well as by biosecurity and conservation managers.

Contributor **André Larochelle** was born and educated in Québec, graduating in 1974 with a Brevet d'Enseignement spécialisé from the Université du Québec à Montréal. He taught ecology at the Collège Bourget, Rigaud, Québec, up to 1990. With the encouragement of the late carabid specialist Carl H. Lindroth, André very quickly becames interested to the study of ground beetles. From 1975 to 1979 he was the co-editor of two entomological journals, *Cordulia* and *Bulletin d'inventaire des insectes du Québec*. From

(continued overleaf)

Kāore anō i āta rangahaua ngā hītori māori o tēnā, o tēnā momo o ngāi Harpalini i Aotearoa, engari i whakarāpopotohia e Larochelle rāua ko Larivière (2001, *Fauna of New Zealand* 43) ngā pārongo kua tuhia, ngā rauemi i ngā kohinga pepeke, ngā whakawhitinga kōrero ki ngā kaikohikohi carabid, me ō rāua ake kitenga i te taiao.

He rere kore te nuinga o ngā momo māori, he tumu parirau noa iho, he mea hanga ki te kiriuhi, e toe mai ana. Ka mutu, noho ai te nuinga ki ngā ripoinga māori, arā, ki ngā ngahere māori (ko ngā tahataha o ngā kōawa tētahi tino kāinga) tae atu ki ngā kāinga kōreporepo, ngā whenua pātītī taranui me ngā ana. He pai ki te nuinga tēnei mea te haukā, ā, tērā ka noho ki te mata tonu o te whenua, ki ngā rau popo. Arā anō ētahi ko te ana tō rātou wāhi noho, ā, he torutoru ngā momo ka piri tahi ki ngā rākau me ērā atu tipu. Ko te tikanga tītari a te nuinga o ngā momo māori, ko te takahi i te nuku o te whenua; he āhua tere te haere a te nuinga, engari he tere tonu te momo noho ana, waewae roa (*Syllectus, Pholeodytes*). He poto ngā waewae o te nuinga o ngāi Harpalini, ā, he tino ngoikore ngā karu, e tohu ana he kari rua, he noho rua tā rātou mahi.

Katoa ngā momo rāwaho, he mōhio ki te rere, ā, he roa, he pakari rānei ō rātou parirau kiriuhi. Noho ai te nuinga ki ngā taiao kua kaha rawekehia e te ringa tangata (he maha e noho tata ana ki ngā whare), hāunga anō te *Haplanister crypticus*. Kua urutomo anō tēnei nā i ngā ngahere māori.

Ko te wā e kohikohia ai ngā pītara pakeke kātahi anō ka puta ake ki te ao e tohu ana tērā pea ko te kōanga, ko te ngahuru rānei te wā e whakaputa uri ai a ngāi Harpalini. Mō te nuinga o ngā momo, e oreore ana ngā mea pakeke i ngā marama katoa o te tau, engari ka āhua ngoikore ake i ngā marama makariri ake.

Karekau he raraunga mō ngā kai e pai ana ki ngā Harpalini māori. Heoi, nā Larochelle (1990, *Food of carabid beetles of the World*) i whakaatu kai ai ngā Harpalini o te ao i te kiko me te ota, engari ko te ota pea tā rātou tino kai. He roa ake ngā kauwae o *Hakaharpalus, Kiwiharpalus, Syllectus*, *Pholeodytes*, me *Maoriharpalus* i ērā o te nuinga o ngā momo māori, e tohu ana pea he rerekē ngā momo kai kainga ai e rātou. I tua atu i tērā, arā ētahi kāniwha nui i te ngutu o runga o *Maoriharpalus*, e āhua rite ana ki tērā e kitea ana i te iwi Licinini. Ko tā tērā iwi, he kai i ngā hanga tuarā-kore, tinana mārō, pērā i te ngata.

He mea tuhi tēnei tirohanga hou kia mārama ai ngā kōrero ki te tokomaha. E whai ana kia takoto mai he rārangi o ngā rōpū e noho ana ki Aotearoa nei, he whakamārama poto o ō rātou tātai hono, he ara tautohu māmā, he whakaahua, he mahere, tae atu ki tētahi whakarāpopototanga o ngā pārongo e wātea ana mō te tohanga o ngā momo, te taupuhi kaiao, te koiora, me te kaha ki te tītari haere i a rātou anō. He takahanga noa tēnei i roto i te whāinga roa a ngā kaituhi kia whānui noa ake te māramatanga ki ngā carabid i roto i te tekau tau pea e tū mai nei, kia hora he pārongo huhua hei āwhina i ngā tāngata tokomaha i roto i ā rātou kaupapa maha. Ko te tūmanako ia, kia noho tēnei tūmomo whakarōpūtanga hei tūāpapa

(haere tonu)

1986 to 1992, he was honorary curator to the Lyman Entomological Museum and Research Laboratory, McGill University, Québec. In 1992, André moved to New Zealand to work as a research scientist. Currently, he is a Research Associate with the New Zealand Arthropod Collection, Landcare Research, Auckland. André has written over 400 papers on the distribution, ecology, biology, and dispersal power of North American carabids and other insects (including two handbooks on the Heteroptera of Québec). In 1993 he was co-author of a "Catalogue of Carabidae of

America north of Mexico". With his wife, Marie-Claude, he published "A Natural History of Carabidae" for the same region (2003) as well as a catalogue of New Zealand Carabidae (2001) and Heteroptera (2004). His current main research interest is the faunistics and taxonomy of New Zealand ground beetles, which involves a soon-to-be-published identification guide to the tribes and genera of Carabidae from New Zealand.

Contributor **Marie-Claude Larivière** was born and educated in Québec, graduating with a Ph.D. in systematic entomology from McGill University in 1990. For the following 2 years she did postdoctoral research at Agriculture Canada, Ottawa. In 1992, Marie-Claude moved to New Zealand to work as a full-time Hemiptera biosystematist with Landcare Research. From 1994 to 1997 she led the Biosystematics of New Zealand Land Invertebrates programme, and from 1999 to 2004, the Koiora-BioAssist™ project (Biodiversity Assessment using Information Technology and Taxonomy). Marie-Claude is the author of over 70 papers and monographs on the taxonomy, distribution,

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mō ngā mahi rangahau i ētahi atu pepeke, hei puna kōrero hoki mā ngā kaitātai whakapapa, ngā kaitautohu, ngā tohunga taupuhi kaiao, me ētahi atu ringa koiora, tae atu ki ngā kaiwhakahaere haumaru koiora, tiaki taiao.

I whānau mai tērā atu o ngā kaituhi, a **André Larochelle**, i Québec. I reira anō ia e kura ana, ā, nō te tau 1974 ka whakawhiwhia ki tana tohu Brevet d'Enseignement spécialisé, mai i te Whare Wānanga o Québec ki Montreal. Taka mai ki te tau 1990, e whakaako ana ia i te mātauranga taupuhi kaiao i te Kāreti Bourget, i Rigaud, Québec. Nā ngā akiaki a tērā tohunga carabid kua riro nei i te tirohanga kanohi, a Carl H. Lindroth, ka tere tupu tana hiahia ki te rangahau i ngā pītara noho papa. Mai i te 1975 ki te 1979 ko ia tētahi o ngā ētita o ētahi hautaka mātai pepeke e rua, arā, o *Cordulia* me te *Bulletin d'inventaire des insectes du Québec*. Mai i te 1986 ki te 1992, ko ia te kaitiaki utu-kore o te Whare Pupuri, Rangahau Pepeke o Lyman, i te Whare Wānanga o McGill, i Québec. I te tau 1992, ka neke mai a André ki Aotearoa, ka mahi hei kaipūtaiao rangahau. I tēnei wā, e noho ana ia hei Kairangahau i te Kohinga Angawaho o Aotearoa, i Manaaki Whenua ki Tāmaki-makau-rau. He nui ake i te 400 ngā kōrero kua tuhia e André mō te tohanga, te taupuhi kaiao, te koiora, me te tītaringa o ngā carabid me ētahi atu aitanga pepeke o Amerika ki te Raki (tae atu ki ētahi pukapuka e rua e whakaahua ana i ngā Heteroptera o Québec). I te tau 1993 ko ia tētahi o ngā kaituhi i te "Rārangi o ngā Carabidae o Amerika ki te raki o Mēhiko". Ka whakaputaina e rāua ko tana hoa wahine, a Marie-Claude, "Ngā Hītori Māori o ngā Carabidae" mō taua takiwā anō (2003), tētahi rārangi o ngā Carabidae (2001) me ngā Heteroptera (2004) o Aotearoa. Ko te aronga nui o āna rangahau i tēnei wā, ko te āhua me te whakarōpūtanga o ngā pītara noho papa o Aotearoa. Ko tētahi wāhanga nui o ēnei, ko tana pukapuka āwhina i te tautohunga o ngā iwi me ngā puninga Carabidae o Aotearoa, taihoa nei ka puta.

I whānau mai a **Marie-Claude Larivière** i Québec. I reira anō ia e rapu ana i te mātauranga ā, riro noa i a ia tana Tohu Tākutatanga mai i te Whare Wānanga o McGill, i te tau 1990, ko ngā whakapapa pepeke te kaupapa. Mō te rua tau i muri mai, kei Agriculture Canada, i Ottawa, ia e whāwhā ana i ētahi atu rangahautanga. I te tau 1992, ka neke mai a Marie-Claude ki Aotearoa, ka mahi hei kaitātai i ngā whakapapa o ngāi Hemiptera i Manaaki Whenua. Nāna i ārahi Te Tātainga o ngā Whakapapa o ngā Aitanga Tuarā-Kore a Tāne mai i te tau 1994 ki te 1997, me te kaupapa Koiora-BioAssist™ (Te Aromatawai i ngā Koiora i runga i te Whakamahi i te Hangarau Mōhiohio me te Whakarōpūtanga) mai i te tau 1999 ki te 2004. He neke atu i te 70 ngā tuhinga kua puta i a ia e pā ana ki te

(haere tonu)

and natural history of Hemiptera and Carabidae (Coleoptera), including four *Fauna of New Zealand* contributions (Hemiptera—Cixiidae and Pentatomoidea revisions, catalogues—Carabidae and Heteroptera). She has also published on North American Orthoptera and Carabidae. Many of her publications were written in collaboration with her husband André with whom she hopes to soon publish new works on New Zealand Hemiptera and Carabidae. Marie-Claude has a keen interest in biodiversity informatics, especially digital taxonomy, computer imaging, interactive identification, and web-publishing.

whakarōpūtanga, te tohanga me te hītori māori o ngā Hemiptera me ngā Carabidae (Coleoptera), tae atu ki ētahi putanga e whā o *Te Aitanga Pepeke o Aotearoa*. He tuhinga anō kua puta i a ia mō ngā Orthoptera me ngā Carabidae o Amerika ki te Raki. Kua mahi tahi anō rāua ko tana hoa tāne, a André, ki te whakaputa i ngā tuhinga huhua. Ko te tūmanako, taihoa ka puta i a rāua he tuhinga hou mō ngā Hemiptera me ngā Carabidae o Aotearoa. Kei te ngākaunui anō a Marie-Claude ki te pārongo-koiora, tae atu ki te whakarōpūtanga ā-mati, te tārai whakaahua ki te rorohiko, te tautohu i runga i te mahi pāhekoheko, me te pānui kōrero ki te pae tukutuku.

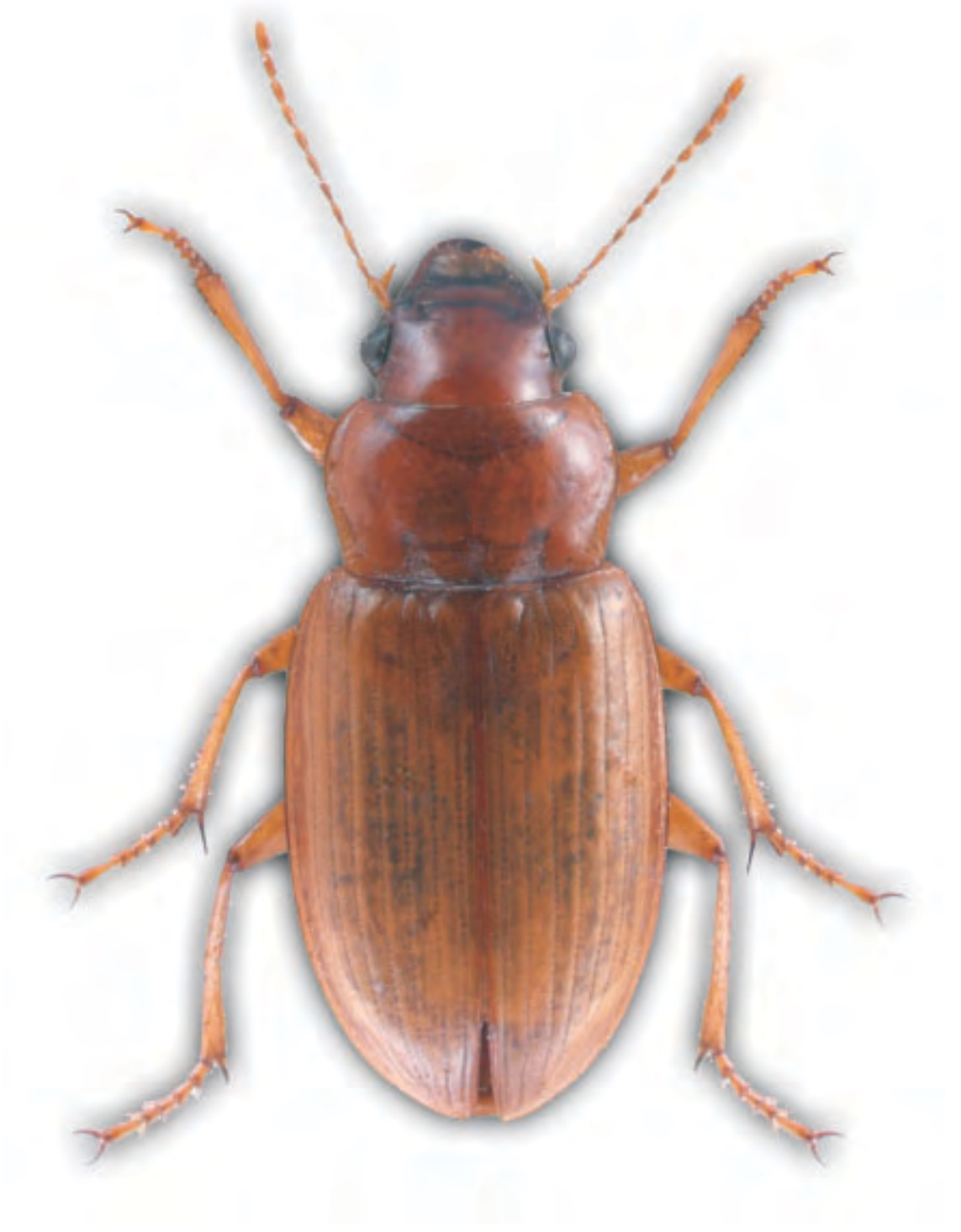
Translation by **H. Jacob**
Tāmaki-makau-rau / Auckland

DEDICATION

"Think where man's glory most begins and ends
And say my glory was I had such friends"

W. B. Yeats 1865-1939: The Municipal Gallery Re-visited (1939)

We are glad to dedicate this revision to our colleague Barry P. Moore (Research Associate, Australian National Insect Collection, Canberra) in acknowledgement of his continued friendship towards New Zealand coleopterists and his generously provided expertise on New Zealand carabids. Over the years Barry has kindly identified ground-beetles for the New Zealand Arthropod Collection and private collectors, at a time when a large proportion of the fauna remained undescribed. His publications on the carabids of New Zealand (e.g., 1980, Anillina; 1996, *Haplanister crypticus*) and Australia (e.g., 1987, Australian catalogue) have provided a solid foundation for our New Zealand catalogue (Larochelle & Larivière, 2001) and future taxonomic revisions. In the preparation of the Harpalini revision, Barry has generously given us much encouragement and support in the identification of adventive species as well as useful comments on some difficult taxonomic problems.



Frontispiece: *Triplosarus novaezelandiae* (Laporte de Castelnau, 1867) (photograph prepared by M.-C. Larivière, Landcare Research)

ABSTRACT

The New Zealand Harpalini fauna (Coleoptera: Carabidae: Harpalinae) is revised. Twenty genera and fifty-seven species are recognised. Five new genera are described: *Maoriharpalus* new genus and *Tuiharpalus* new genus (Anisodactylina), *Hakaharpalus* new genus and *Kupeharpalus* new genus (Pelmatellina), and *Kiwiharpalus* new genus (Stenolophina). The species *Parabaris gourlayi* Britton, 1964 is transferred to *Tuiharpalus* new genus. The original combination *Harpalus australasiae* Dejean, 1829 is reinstated. *Tachys* (?) *cavelli* Broun, 1893 is transferred to the genus *Hakaharpalus*. Twenty-three new species are described: Anisodactylina — *Allocinopus belli* new species, *A. bousqueti* new species, *A. wardi* new species, *Maoriharpalus sutherlandi* new species, *Parabaris hoarei* new species, *P. lesagei* new species, *Tuiharpalus clunieae* new species, *T. crosbyi* new species, *T. hallae* new species, *T. moorei* new species; Pelmatellina — *Hakaharpalus davidsoni* new species, *H. maddisoni* new species, *H. patricki* new species, *H. rhodeae* new species, *Kupeharpalus barrattae* new species, *K. embersoni* new species, *K. johnsi* new species, *Lecanomerus marrisi* new species, *Syllectus gouleti* new species; Stenolophina — *Kiwiharpalus townsendi* new species, *Pholeodytes helmorei* new species, *P. nunni* new species, and *P. palmai* new species . Eight new synonymies are established (valid name listed after equal sign): *Allocinopus ocularius* Broun, 1908 = *Allocinopus sculpticollis* Broun, 1903; *Allocinopus castaneus* Broun, 1912 = *Allocinopus smithi* Broun, 1912; *Hypharpax abstrusus* Bates, 1878 = *Hypharpax australis* (Dejean, 1829); *Lecanomerus fallax* Broun, 1880 = *Lecanomerus insignitus* Broun, 1880; *Lecanomerus fuliginosus* Broun, 1880, *Lecanomerus pallipes* Broun, 1894, and *Lecanomerus incertus* Broun, 1914 = *Lecanomerus latimanus* Bates, 1874; *Syllectus spelaeus* Britton, 1964 = *Syllectus magnus* Britton, 1964. Lectotypes are designated for the following taxa: *Allocinopus smithi* Broun, 1912; *A. castaneus* Broun, 1912; *A. latitarsis* Broun, 1911; *Euthenarus brevicollis* Bates, 1874; *E. puncticollis* Bates, 1874; *Gaioxenus pilipalpis* Broun, 1910; *Harpalus antarcticus* Laporte de Castelnau, 1867, *H. novaezelandiae* Laporte de Castelnau, 1867, *Hypharpax abstrusus* Bates, 1878; *Lecanomerus fallax* Broun, 1880; *L. obesulus* Bates, 1878; *Syllectus anomalus* Bates, 1878; *Triplosarus fulvescens* Bates, 1874. Four adventive species are recorded for New Zealand for the first time: *Gnathaphanus melbournensis* (Laporte de Castelnau, 1867); *Notiobia quadricollis* (Chaudoir, 1878); *Euthenarus bicolor* Moore, 1985; *E. promptus* (Erichson, 1842).

A concise revision of the taxonomy of all taxa is provided. Subtribes, genera, and species are keyed. Descriptions are provided with illustrations emphasising the most important diagnostic features of the external morphology and male genitalia. Information is given on synonymy, type data, material examined, geographic distribution, ecology, biology, dispersal power, and collecting techniques. The composition of the New Zealand Harpalini fauna, with endemism levels of 55% for genera and 75% for species, and its affinities with Australia, New Caledonia, Lord Howe Island, and Norfolk Island are analysed and discussed. Over 50% of native taxa (25 out of 42 species) are known from 10 populations or fewer and may be of potential conservation concern.

Keywords: Coleoptera, Carabidae, Harpalini, new genera, new species, adventive species, taxonomy, keys, distribution, ecology, biology, dispersal power, fauna.

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CHECKLIST OF TAXA

Note: Valid taxa are listed alphabetically (A=Adventive, E=Endemic, N=Native, but not endemic to New Zealand).

CONTENTS

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INTRODUCTION

The tribe Harpalini belongs to the subfamily Harpalinae (Coleoptera: Carabidae) which contains over 19 000 taxa. Molecular sequence data indicate that Harpalinae radiated in the Cretaceous Period (Ober 2002).

The Harpalini form a diverse group, including over 240 genera and subgenera, and approximately 2 000 species distributed in all biogeographic regions of the world. The present faunal review records 20 genera and 57 species for New Zealand. This should constitute the near totality of the fauna.

Compared with New Zealand, the Australian Harpalini are more diverse with over 160 species distributed in about 20 genera (Moore *et al*. 1987), but the fauna remains largely unrevised.

The present work offers a concise faunal taxonomic revision of the New Zealand Harpalini, based on the study of adults contained in local and overseas collections. It represents a first modern attempt to bring together the scattered information dealing with the group.

The goals of this revision are straightforward: to provide an inventory of New Zealand taxa, a concise treatment of their taxonomy, identification keys to genera and species, and a summary of available information on species distribution, ecology, biology, and dispersal power.

It is one step in the authors' overall goal of attaining an overall understanding of the carabid fauna within a reasonable time frame, and to make relatively large amounts of information available for practical use by a wide range of end-users. The methodology involves less gamma taxonomy but more intensive field work, and it is based on the concept of 'practical taxonomy' described by Darlington (1971) which aims to provide "a floor plan for more detailed taxonomic, ecological, zoogeographical, and evolutionary studies."

It is hoped that this kind of faunal taxonomy will provide solid foundations for studies of other types, much in the same way as the work done by Lindroth between 1961 and 1969 for Canada and Alaska, and Darlington between 1962 and 1968 for New Guinea.

In addition to paper-based publications the authors publish the New Zealand Carabidae website (http://www.landcareresearch.co.nz/) which maintains up-to-date information on New Zealand carabids, including digital images, recent literature, as well as additions and corrections to previous publications.

Taxonomic history

There has been little work done on the faunistics of the New Zealand Harpalini since the earliest descriptions of *Hypharpax antarcticus* and *Triplosarus novaezelandiae* by Laporte de Castelnau in 1867. No identification keys or taxonomic overview (except for the catalogue of Larochelle & Larivière 2001 and the checklist of Larochelle *et al.* 2004) have been published until now, but keys including some native taxa have been published by Sloane (1898 and 1920; Australian taxa), Noonan (1973; world Anisodactylina genera), Moore (1977; Australian taxa), and Matthews (1980; South Australian Carabidae genera).

Prior to this revision 13 genera and 36 species of Harpalini were known from New Zealand. Following the work of Laporte de Castelnau (1867–1868), most indigenous genera and species were described before 1920 by Broun (1880–1914; 3 genera, 15 species) and Bates (1874, 1878; 3 genera, 6 species). Britton (1962, 1964a–b) and Moore (1996) provided the most recent descriptions for 2 genera, *Pholeodytes* and *Haplanister* respectively, and 6 species (including 2 in *Parabaris* and *Syllectus*). This formed the bulk of the taxonomic work on New Zealand Harpalini until now. No larval descriptions are yet available for this tribe.

If taxonomic progress has been slow until now, the collecting effort has been more intensive from the 1960s onward, so that New Zealand entomological collections and museums are now replete with Harpalini material from all areas of the country. For this reason, it seemed timely to provide a taxonomic revision for this group, one that includes descriptions and keys that take into account this new information.

The main taxonomic works that have contributed to advancing knowledge on world and New Zealand Harpalini are: Sloane (1898, key to Australian genera); Jeannel (1942, revision of France and world classification); Basilewsky (1950 and 1951, African revision); Lindroth (1968, revision of Canada, Alaska, and northern half of U.S.A.), Darlington (1968, revision of New Guinea); Habu (1973, revision of Japan); Noonan (1973, generic revision and classification of world Anisodactylina; and 1976, world catalogue of supraspecific taxa of Harpalini); Goulet (1974, revision of

genus *Pelmatellus*); Moore (1977, key to Australian subtribes); Matthews (1980, key to South Australian genera); Moore *et al*. (1987, Australian catalogue); Bousquet & Larochelle (1993, Nearctic catalogue); Serrano *et al.* (1994, karyotypical study); Ball & Bousquet (2001, key to supraspecific taxa, North America); Larochelle & Larivière (2001, catalogue of New Zealand Carabidae); Kataev (2002a, new genus of Australian Anisodactylina); Löbl & Smetana (2003, Palaearctic catalogue).

Higher classification

The monophyly of the subfamily Harpalinae, to which belongs the tribe Harpalini, has recently been supported by molecular sequence data (Ober 2002) and larval morphology (Arndt 1998).

According to Bousquet & Larochelle (1993) the taxonomic limits of the tribe Harpalini are fairly stable although the monophyly of this taxon remains to be tested. The main contributor to the higher classification of this group was Noonan (1973, 1976) who studied the taxonomy, phylogeny, and zoogeography of the subtribe Anisodactylina and provided a synopsis of supra-specific taxa of the tribe Harpalini.

The supraspecific classification proposed by Noonan, and based on the earlier work of van Emden (1953), grouping genera into 4 subtribes (Anisodactylina, Harpalina, Pelmatellina, and Stenolophina), is generally accepted worldwide although somewhat difficult to apply in certain cases (e.g., taxonomic limits of Pelmatellina). This classification is followed here. The subtribes Harpalina, Pelmatellina, and Stenolophina still need an analysis such as provided by Noonan (1973) for Anisodactylina.

Subtribe Anisodactylina. Members of this group are distributed worldwide. About 40 genera are known (Kataev 2002a) from two genus-groups (Notiobii and Anisodactyli). According to Ball & Bousquet (2001), the Notiobii are principally in the Southern Hemisphere, showing a Gondwanan distribution pattern, whereas the Anisodactyli occur mostly in the Afrotropical and Holarctic Regions. Most New Zealand genera have the Notiobii character of the complete transverse suture between mentum and submentum. This represents the plesiomorphic state in Anisodactylina. Only the endemic *Gaioxenus* has the transverse suture laterally incomplete (mentum and submentum fused only medially). This is usually regarded as a character of the Anisodactyli, but exceptions have been observed by Noonan (1976) in other Southern Hemisphere taxa, e.g., within species of *Anisostichus* and subgenera of the *Notiobia* lineage, and may represent examples of parallel evolution. Noonan (1973) believed that the subtribe Anisodactylina forms a monophyletic group but he was unable to state that the group is defined on the basis of clearly apomorphic character states.

Subtribe Harpalina. Representatives of this group occur in all zoogeographical regions, mostly in tropical and temperate areas. Approximately 60 genera are known. The taxa occurring in New Zealand were introduced from Australia and the Holarctic.

Subtribe Pelmatellina. Members of this small group exhibit a Gondwanan distribution pattern in Australia, New Zealand, Andean South America, and Central America, with some taxa reaching the southwestern U.S.A. About 8 genera were described before this revision.

Pelmatellina are considered the sister group of Anisodactylina based on the shared spongily pubescent male protarsi (Noonan 1973; Goulet 1974). The current study on New Zealand taxa also agrees with Noonan (1976) on the character of the penultimate segment of the labial palpi which is bisetose (most genera) or trisetose (*Kupeharpalus* new genus) in Pelmatellina; not strictly bisetose as suggested by Goulet (1974). Both Noonan (1973, 1976) and Goulet (1974) indicated that pelmatelline genera differ from anisodactyline genera by the glabrous apex of the prosternal lobe. Four pelmatelline genera are now known from New Zealand, three of which share this character (*Lecanomerus*, *Syllectus*, and *Hakaharpalus* new genus). *Kupeharpalus* new genus provides the exception to this rule in having a prosternal lobe apically pubescent but in other respects sharing the characters of *Lecanomerus*. Further elucidation of character evolution in the Pelmatellina will have to wait until all subtribes of Harpalini are revised on a world basis.

Subtribe Stenolophina. Most species of this subtribe occur in the warm temperate and tropical regions, with 35 genera or so recorded worldwide. The morphology of New Zealand stenolophine genera, including *Kiwiharpalus* new genus, is consistent with the diagnostic characters provided by Noonan (1976) for this subtribe.

Noonan (1976) recorded two small endemic genera in the Australian Region (*Euthenarus* and *Pholeodytes*), to which the current revision adds the new genus *Kiwiharpalus*. Noonan also indicated that species of several other genera occurring in the Australian Region may be primarily centred in the Oriental Region and spreading only to the outer limit of the Australian Region or are Australian-centred taxa that may have originated from Oriental stock.

Ball & Bousquet (2001) placed the North American stenolophine genera into 2 genus-groups, Stenolophi and Polpochili. According to the literature, one important character defining the genus-group Stenolophi is the ventrally pubescent male protarsi as opposed to the absence of such pubescence in Polpochili. The study of this character in taxa indigenous to New Zealand suggests that species of *Pholeodytes* (endemic) and *Euthenarus* (not

endemic) could belong to the Stenolophi. This character could not be studied in *Kiwiharpalus* which is known only from females. However, an Australian revision and a world reclassification and phylogeny of supra-specific taxa of Stenolophina are needed in order to uncover the true evolutionary history of this subtribe.

Geographic distribution and faunal composition

The level of endemism of the New Zealand Harpalini is 75% at the species level (42 out of 57 species) and 55% at the generic level (11 out of 20 genera). The indigenous genera *Hypharpax*, *Lecanomerus*, and *Euthenarus* have representatives in Australia. The genera *Anisodactylus*, *Gnathaphanus*, *Notiobia*, *Harpalus*, *Egadroma,* and *Haplanister* are adventive.

The overall distribution of New Zealand Harpalini is summarised in Table 1.

Species distributions are clearly defined and largely allopatric. Even species of a single genus, occurring in the same general areas of New Zealand are mostly allopatric within these areas (e.g., *Tuiharpalus*, TH–ND; *Kupeharpalus*, ND; *Pholeodytes*, NN; *Hakaharpalus* BR–NN–SD).

Three genera (*Gaioxenus,* 1 species; *Parabaris*, 3 species; *Kupeharpalus*, 3 species) are confined to the North Island. The genus *Allocinopus* (7 native species) occurs mostly on the North Island, except for 2 species, *A. sculpticollis* which is also found on the South Island, and *A. latitarsis* which is endemic to the Chatham Islands (CH). Two genera (*Hakaharpalus*, 5 species; *Pholeodytes*, 5 cave-dwelling species) are found only on the South Island and are restricted to the NN–SD region. Two genera are restricted to the Three Kings Islands (TH): *Maoriharpalus* (1 species) and *Kiwiharpalus* (1 species). There is no genus endemic to the Chatham Islands (CH).

Thirty-five (35) Harpalini species occur on the North Island, with 16 native species restricted to it. Thirty-one (31) species are distributed on the South Island, with 14 native species restricted to it. Only 4 indigenous species are shared between these two main islands (*Allocinopus sculpticollis, Triplosarus novaezelandiae, Syllectus anomalus,* and *Euthenarus puncticollis*). Stewart Island has no endemic taxa, but shares 2 indigenous species: *Triplosarus novaezelandiae* (with North Island and South Island), *Euthenarus brevicollis* (with South Island). Six (6) species occur on the Three Kings Islands (TH), including 4 endemics (*Maoriharpalus sutherlandi, Tuiharpalus crosbyi, T. gourlayi, Kiwiharpalus townsendi*), 1 adventive, and 1 indigenous species in common with the North Island (*Lecanomerus sharpi*). Seven (7) species occur on the Chatham Islands (CH), including 1 endemic (*Allocinopus latitarsis*), 2 natives in common with the South Island (*Hypharpax antarcticus, Lecanomerus latimanus*), and one shared with the North and South Islands (*Euthenarus puncticollis*), and 3 adventives. Harpalini are so far unknown from New Zealand's subantarctic islands.

A total of fourteen (14) adventive species (about 25% of Harpalini) occur throughout New Zealand, mostly in the North Island (Map 7; especially in WN, ND, WI). The majority of adventive species probably originated from Australia apart from 2 *Harpalus* species and *Anisodactylus binotatus* (from the Palearctic Region), and *Haplanister crypticus* (of unknown origin).

The areas of New Zealand so far known to contain the highest diversity (Map 4) are: NN (23 species), ND (21 species), WN (17 species). The areas with the greatest number of New Zealand endemics (Map 5) are: NN (16), ND (13), BP (11).

Some Harpalini are restricted to a single area (Map 6). Currently, the areas with such species are: NN (9), ND (6), TH (4), BR (1), BP (1), CL (1), MC (1), CH (1). The South Island northwest (NN, BR) and the far north of the New Zealand (ND, TH) appear to have been the reservoirs, in geological time, of much of the genetic diversity in New Zealand Harpalini, with several species currently restricted to these regions. This trend is reflected at the generic level with *Hakaharpalus* occurring only in BR–NN–SD, *Pholeodytes* in NN, *Kupeharpalus* in ND, *Maoriharpalus* and *Kiwiharpalus* in TH, and *Tuiharpalus* in TH–ND.

Table 2 shows the genera and species shared with Australia, New Caledonia, Norfolk Island, and Lord Howe Island. Ten (10) species shared with these regions are adventive in New Zealand. Three indigenous genera (*Hypharpax, Lecanomerus, Euthenarus*) are shared with Australia (eastern Australian mainland and Tasmania).

Ecology, biology and dispersal power

No formal detailed study of the natural history of individual species of New Zealand Harpalini has ever been conducted although Larochelle & Larivière (2001) summarised information available from the literature, material in entomological collections, personal communications from carabid collectors, and their own personal field observations.

Native species are mostly subapterous and live within the confines of native habitats, mostly forests (especially along streams) and wet habitats, also tussock grasslands and caves (2 *Syllectus*, 5 *Pholeodytes*). The cave-dwelling species are all troglobitic, except *Syllectus magnus* which is troglophilous, occurring at the entrance of caves. Most Harpalini species are hygrophilous (moisture-loving) living at the surface of the soil and in leaf litter, also in caves

(*Syllectus, Pholeodytes*), and occasionally on plants and trees. Two native species are typically found along coastal lowlands: *Triplosarus novaezelandiae* (on beaches and sand dunes), *Allocinopus belli* (coastal forests). Dispersal in native species is achieved by running over the ground; most species are moderate runners, except for the long-legged, fast-running cave species (*Syllectus, Pholeodytes*). In general Harpalini have relatively short legs and, sometimes, strongly reduced eyes which are indicative of strong burrowing habits.

All adventive species are macropterous and live mostly in highly modified environments (often around human dwellings), except for *Haplanister crypticus* which has managed to invade native forests.

The collecting period of teneral individuals suggests that Harpalini species may be either spring-breeders or summer-breeders. For most species adults are active during all months of the year, but are generally less active during cooler months.

There are no data available on the feeding preferences of Harpalini native to New Zealand. Larochelle (1990), in his review of food preferences of the Carabidae of the world, showed representatives of this tribe to be omnivorous, mostly phytophagous species. Ecomorphological adaptations providing further evidence for this feeding-type in adults and larvae have been documented by Sharova (1960, 1981), Acorn & Ball (1991), and Zetto Brandmayr *et al*. (1998). The mandibles of *Hakaharpalus, Kiwiharpalus, Syllectus*, *Pholeodytes*, and *Maoriharpalus* are unusually long among native Harpalini, which may suggest a specialised type of feeding. In addition, the strongly emarginate labrum of *Maoriharpalus* is reminiscent of, although not necessarily equivalent to, the condition observed in Licinini which feed on hard-bodied invertebrates, e.g., snails.

Conservation status

The Department of Conservation has responsibility for protecting and conserving New Zealand's native plants and animals. The Department's Species Priority Ranking System established by Molloy *et al.* (1994) provides criteria for scoring species according to various levels of threat, so that management and/or recovery plans can be subsequently established. A list of priority invertebrate species for conservation was established in this way by Molloy *et al.* (1994). McGuinness (2001) developed species profiles for species on the list, providing additional descriptive information to initiate or support key conservation actions. In addition, McGuinness (2001) added a number of invertebrates of potential conservation interest to the original list. No Harpalini species has been listed in these documents.

The Department of Conservation's Species Ranking System is summarised in Table 3.

When the above criteria are applied, new knowledge brought forward in the present revision suggests that 24 endemic species of Harpalini (over 50% of native species) known from 10 populations or fewer may be of potential conservation concern.

All but two of these species are new to science and all species are taxonomically highly distinctive, have limited dispersal power, are often geographically localised in threatened habitats, and represented in collections by relatively few specimens collected over many decades, which may indicate rare or highly specialised species.

These species of special interest are: *Allocinopus belli* new species, *A. bousqueti* new species, *A. wardi* new species, *Maoriharpalus sutherlandi* new species, *Parabaris hoarei* new species, *P. lesagei* new species, *Tuiharpalus clunieae* new species, *T. crosbyi* new species, *T. gourlayi* (Britton), *T. hallae* new species, *T. moorei* new species (Anisodactylina); *Hakaharpalus cavelli* (Broun), *H. davidsoni* new species, *H. maddisoni* new species, *H. patricki* new species, *H. rhodeae* new species, *Kupeharpalus embersoni* new species, *K. johnsi* new species, *Lecanomerus marrisi* new species, *Syllectus gouleti* new species (Pelmatellina); *Kiwiharpalus townsendi* new species, *Pholeodytes cerberus* Britton, *P. helmorei* new species, *P. nunni* new species, and *P. palmai* new species (Stenolophina).

MORPHOLOGY AND TERMINOLOGY

The main diagnostic features of Harpalini are: body usually rather stout, with relatively short appendages; head with a single pair of supraorbital setiferous punctures; mandibles usually relatively short, without setae in scrobes; posterior angles of pronotum usually without a setiferous puncture; elytral apex neither truncate nor crossed subapically; median lobe of aedeagus with basal bulb well developed in most taxa, shaft usually strongly arcuate; parameres of aedeagus usually short and broad, conchoid (shell-like) or ovate, similar in shape with right paramere usually smaller.

A more detailed description of the tribe based on New Zealand representatives is available on page 24. Figures 1–31 provide a basic understanding of the morphological structures used to describe and identify Harpalini genera and species. A glossary of technical terms is also provided (Appendix A, p. 89).

Table 1. Summarised distributions for New Zealand Harpalini. Two-letter area codes follow Crosby *et al*. (1976, 1998). A = Adventive taxa.

Species	North Island										South Island		
	ND	AK	CL	WO	BP	TK	TO	HB	GB	RI	WI	WN	WA
Anisodactylina													
Allocinopus angustulus								HB		RI	WI	WN	WA
A. belli					BP								
A. bousqueti					BP				GB				
A. latitarsis													
A. sculpticollis					BP	TK	TO	HB	GB	RI	WI	WN	WA
A. smithi		AK		WO	BP	TK	TO						
A. wardi			CL										
Anisodactylus binotatus[A]												WN	
Gaioxenus pilipalpis			CL	WO	BP	TK	TO			RI	WI	WN	
Gnathaphanus melbournensis[A]									HB				
Hypharpax antarcticus													
H. australis[A]	ND	AK	CL	WO	BP	TK	TO	HB	GB	RI	WI	WN	
Maoriharpalus sutherlandi													
Notiobia quadricollis[A]	ND												
Parabaris atratus	ND	AK	CL	WO	BP	TK			GB				
P. hoarei	ND												
P. lesagei					BP	TK						WN	
Triplosarus novaezelandiae	ND	AK	CL	WO	BP			HB			WI	WN	
Tuiharpalus clunieae	ND												
T. crosbyi													
T. gourlayi													
T. hallae	ND												
T. moorei	ND												
Harpalina													
Harpalus affinis[A]										RI	WI	WN	WA
H. australasiae[A]					BP			HB	GB		WI	WN	WA
H. tardus[A]													
Pelmatellina													
Hakaharpalus davidsoni													
H. maddisoni													
H. patricki													
H. rhodeae													
Kupeharpalus barrattae	ND	AK	CL										
K. embersoni	ND												
K. johnsi	ND	AK	CL		BP								
Lecanomerus atriceps[A]	ND	AK	CL		BP						WI	WN	
L. insignitus	ND												
L. latimanus													
L. marrisi													
L. obesulus													
L. sharpi	ND	AK	CL	WO	BP	TK	TO	HB	GB	RI	WI	WN	WA
L. verticalis[A]	ND	AK	CL	WO	BP				GB		WI	WN	
L. vestigialis[A]	ND	AK	CL	WO	BP			HB	GB		WI	WN	
Syllectus anomalus	ND	AK	CL	WO	BP	TK	TO	HB	GB	RI	WI	WN	WA
S. gouleti													
S. magnus													
Stenolophina													
Egadroma picea[A]	ND	AK	CL										
Euthenarus bicolor[A]	ND	AK	CL	WO	BP		TO	HB	GB				
E. brevicollis													
E. promptus[A]							TO	HB			WI	WN	WA
E. puncticollis	ND	AK	CL	WO		TK	TO	HB	GB	RI	WI	WN	WA
Haplanister crypticus[A]	ND	AK	CL	WO	BP	TK	TO	HB	GB	RI	WI	WN	WA
Kiwiharpalus townsendi													
Pholeodytes cerberus													
P. helmorei													
P. nunni													
P. palmai													
P. townsendi													

Table 1 (continued)

Species	South Island															Offshore Islands	
	SD	NN	MB	KA	BR	WD	NC	MC	SC	MK	OL	CO	DN	FD	SL	SI	
Anisodactylina																	
Allocinopus angustulus																	
A. belli																	
A. bousqueti																	
A. latitarsis																	CH
A. sculpticollis	SD	NN			BR	WD											
A. smithi																	
A. wardi																	
Anisodactylus binotatus[A]								MC	SC		OL	CO	DN				
Gaioxenus pilipalpis																	
Gnathaphanus melbournensis[A]					KA		NC	MC									
Hypharpax antarcticus		NN	MB	KA			NC	MC	SC	MK	OL	CO	DN				CH
H. australis[A]	SD	NN	MB	KA				MC	SC	MK	OL	CO					CH TH
Maoriharpalus sutherlandi																	TH
Notiobia quadricollis[A]																	
Parabaris atratus																	
P. hoarei																	
P. lesagei																	
Triplosarus novaezelandiae	SD	NN				WD		MC					DN		SL	SI	
Tuiharpalus clunieae																	
T. crosbyi																	TH
T. gourlayi																	TH
T. hallae																	
T. moorei																	
Harpalina																	
Harpalus affinis[A]																	
H. australasiae[A]								MC									
H. tardus[A]								MC									
Pelmatellina																	
Hakaharpalus davidsoni		NN															
H. maddisoni		NN															
H. patricki		NN															
H. rhodeae	SD	NN															
Kupeharpalus barrattae																	
K. embersoni																	
K. johnsi																	
Lecanomerus atriceps[A]	SD	NN						MC									
L. insignitus																	
L. latimanus				KA				MC	SC			CO	DN		SL		CH
L. marrisi								MC									
L. obesulus	SD	NN	MB		BR	WD	NC	MC			OL	CO		FD	SL		
L. sharpi																	TH
L. verticalis[A]		NN															
L. vestigialis[A]		NN						MC	SC				DN				CH
Syllectus anomalus	SD	NN	MB	KA	BR	WD	NC	MC					DN	FD	SL		
S. gouleti					BR												
S. magnus		NN			BR												
Stenolophina																	
Egadroma picea[A]																	
Euthenarus bicolor[A]		NN															
E. brevicollis				KA			NC	MC	SC	MK	OL	CO	DN	FD	SL	SI	
E. promptus[A]	SD	NN	MB	KA	BR			MC									
E. puncticollis	SD	NN			BR	WD											CH
Haplanister crypticus[A]		NN						MC	SC								CH
Kiwiharpalus townsendi																	TH
Pholeodytes cerberus		NN															
P. helmorei		NN															
P. nunni		NN															
P. palmai		NN															
P. townsendi		NN															

Table 2. Taxa shared with Australia, New Caledonia, Norfolk Island, and Lord Howe Island. X = present; [ ] = adventive; — = absent.

Species (macropterous)	New Zealand	Australia (mainland)	Tasmania	New Caledonia	Norfolk Island	Lord Howe Island
Anisodactylina						
Gnathaphahus	[X]	X	X	X	[X]	[X]
Gnathaphanus melbournensis	[X]	X	X	—	—	[X]
Hypharpax	X	X	X	—	—	[X]
Hypharpax australis	[X]	X	X	—	—	[X]
Notiobia	[X]	X	X	X	[X]	[X]
Notiobia quadricollis	[X]	X	X	—	—	—
Harpalina						
Harpalus	[X]	X	—	—	—	—
Harpalus australasiae	[X]	X	X	—	—	—
Pelmatellina						
Lecanomerus	X	X	X	X	—	—
Lecanomerus atriceps	[X]	X	—	—	—	—
L. verticalis	[X]	X	X	—	—	—
L. vestigialis	[X]	X	X	—	—	—
Stenolophina						
Egadroma	[X]	X	X	X	[X]	[X]
Egadroma picea	[X]	X	X	X	—	—
Euthenarus	X	X	X	—	[X]	—
Euthenarus bicolor	[X]	X	—	—	[X]	—
E. promptus	[X]	X	X	—	[X]	—

Table 3. Department of Conservation Species Priority Ranking System (Molloy & Davis, 1994; McGuinness, 2001). Designed to categorise threatened species according to their urgency for conservation. (**bold =** criteria more readily applicable to Harpalini based on current taxonomic and biological knowledge)

Plants and animals are scored using 5 factors, encompassing 17 criteria.

1. **Distinctiveness: taxonomic distinctiveness.**
2. **Status: number of populations**; mean population size; size of largest population; **geographic distribution**; condition of largest population; and the population decline rate.
3. **Threats**: legal protection of habitat; **habitat loss rate**; predators/harvest impact; competition; and other factors affecting survival.
4. Vulnerability: habitat and/or diet specificity; reproductive and/or behavioural specialisation; and cultivation/ captive breeding potential.
5. Values: Maori cultural values; Pakeha cultural values.

Invertebrates are then grouped into 3 categories depending on the score they receive from the ranking system.

A: Highest priority threatened species for conservation action.

B: Second priority threatened species for conservation action.

C: Third priority threatened species for conservation action.

In addition, 4 other specialist categories are used:

X: Species that have not been sighted for a number of years and are presumed extinct.

I: Species about which little is known, but based on existing knowledge are considered to be under threat.

O: Species that are threatened in New Zealand but are known to be secure in parts of their range outside New Zealand (no invertebrate so far listed in this category).

M: **Species that are** [apparently] rare or **localised**, and of cultural importance to Maori.

METHODS AND CONVENTIONS

Materials

This revision is based on 12 years of extensive field work carried out by the authors in over 500 localities, a survey of the literature up to May 2004, and the recording of information associated with over 5350 adult specimens from the following entomological museums and collections:

AMNZ Auckland Institute and Museum, Auckland, New Zealand.
ANIC Australian National Insect Collection, Canberra, Australia.
BBNZ B. I. P. Barratt private collection, Dunedin, New Zealand.
BMNH The Natural History Museum, London, U.K.
CMNH Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, U.S.A.
CMNZ Canterbury Museum, Christchurch, New Zealand.
FMNH Field Museum of Natural History, Chicago, Illinois, U.S.A.
ITNZ J. I. Townsend private collection, Levin, New Zealand.
JNNZ J. Nunn private collection, Dunedin, New Zealand.
LUNZ Entomology Research Museum, Lincoln University, Lincoln, New Zealand.
MCSN Musei Civico di Storia Naturale, Genova, Italy.
MNHN Muséum National d'Histoire Naturelle, Paris, France.
MONZ Museum of New Zealand Te Papa Tongarewa, Wellington, New Zealand.
NZAC New Zealand Arthropod Collection, Landcare Research, Auckland, New Zealand.
OMNZ Otago Museum, Dunedin, New Zealand
PHNZ P. Howe private collection, Timaru, New Zealand.
UCNZ Department of Zoology, University of Canterbury, Christchurch, New Zealand.

Specimen-based information from NZAC is being databased and will be made available online on the NZAC NZBUGS website (http://www.landcareresearch.co.nz/).

Collecting and preparation

Adults of Harpalini are generally collected by hand by turning ground debris. However, special techniques are used to collect large series or population samples for quantitative studies. These include (in order of decreasing usage): pitfall trapping, turning logs and stones, raking or sifting the leaf litter (especially for small species), treading vegetation into water, digging at the base of plants (e.g., *Lupinus*), pouring water over ground, treading soil with the feet, sweeping the vegetation, using Malaise traps, collecting with a head lamp or torch (e.g., in caves; on trees at night), light trapping (especially for adventive species), sifting garden compost, and turning drift shore material. Pitfall trapping, especially in forests (along streams) and in coastal dunes is the most reliable method for assessing the presence, community composition, and locomotory activity of harpalines.

Adults are best preserved dry. All life stages can be collected in 70–75% ethanol. If a molecular study is intended, adults as well as immatures can be kept in 95–100% ethanol.

All specimens should be labelled with the locality (including area code: Crosby *et al.* 1976, 1998, and geographical coordinates such as latitude and longitude), collection date, collector's name, and biological data (e.g., general habitat, microhabitat, behaviour).

Most features of the external morphology and the male genitalia can be viewed under an ordinary dissecting microscope. It is necessary to relax and dissect male specimens in order to study their genitalia.

Male genitalia can be dissected as follows. Pinned specimens (individually or in batches) are warmed for 5–10 minutes in hot alcohol (70–75% ethanol). Once softened, each specimen is transferred to a cavity slide containing ethanol. A pair of fine forceps is used to extract the male genitalia from the abdomen. This is done under the microscope by inserting the forceps into the anus, cutting through the lateral membranes that unite the last two tergites and ventrites, pulling out the aedeagus and associated genital ring, separating these structures from each other, and cleaning the aedeagus from any residues and detaching the parameres. The dissected genitalic structures are then transferred to a new cavity slide containing glycerol for further study. After examination, the male genitalia are mounted on cards or points and re-attached to original specimens for permanent storage.

Revision process

The main steps followed in the course of this study are listed here with the hope that this will help future students of Carabidae:

1. Borrowing of adult specimens from all available entomological collections (private and institutional).
2. Labelling of borrowed specimens with the acronyms of the lending collections.
3. Grouping of specimens based on overall similarities and differences in external morphology.

4. Grouping of recognised morphological units by areas of New Zealand (area codes of Crosby *et al*., 1976 & 1998) from North to South, West to East, and by offshore islands. This facilitates the evaluation of structural variation between and within populations across the geographic range of each putative species.
5. Dissection of male genitalia from at least 5 populations per area. Additional specimens sometimes need to be dissected from some areas (e.g., from WA, WN, SD, NN) where a high degree of variation may be observed between and within populations. About 650 male specimens were dissected in the course of this study.
6. Identification of putative species based on male genitalia and drawing of their genitalic features (lateral and dorsal views of aedeagus).
7. Correlation of results from the genitalia study with characters of the external morphology at the species level (corroborated, when possible, by geographical and biological information).
8. Photography of pronotum and whole insect for each species.
9. Description of taxa based on a character list developed from previously published works, the study of population samples in steps 6 and 7, and the drafting of a description for one species (often the type species) from each described genus. This involves the description of each species in detail followed by the transfer of selected characters from the species descriptions to the generic descriptions.
10. Comparing circumscribed species against the types of already described species and application of existing names or new names.
11. Preparing identification keys from descriptions.

Taxonomically relevant characters

The characters presented in the descriptions are subsets of the totality of adult characters (about 100) studied, and represent the most important differences between, or variation amongst, closely related taxa. Characters or states of characters not mentioned in the species descriptions are as described in generic descriptions.

Body length was measured from apex of mandibles to apex of elytra (with the specimen in dorsal view), and is cited as a range.

Characters with the highest diagnostic value at the species level have been photographed or illustrated, including the most diagnostic aspects of the male genitalia. Most illustrations provided in this work represent the most commonly encountered state of a character. The user must allow some degree of variation when working with individual specimens.

The male genitalia offer the most stable characters and the ultimate criteria for species recognition. The second best diagnostic character for the majority of taxa is the configuration of the pronotum.

Although it is necessary to fully dissect male genitalia within the context of taxonomic revisions, it is often enough to partially pull out the apex of the aedeagus with a pin at the time of mounting specimens in order to see enough of the genitalia for identification.

Parameres of the aedeagus were found to vary little between species and were not illustrated. In the Harpalini, the internal sac of the male aedeagus is either armed (provided with scales, teeth, or spines) or unarmed. These conditions have been stated although not illustrated for each species. Illustrating these characters in detail would have required the eversion of the internal sac, which was beyond the scope of this revision. The female genitalia were not studied either. There was sufficient diagnostic information provided by other characters.

Identification keys

Keys are somewhat artificial. They are intended as an aid to identification, not a statement of the authors' opinion on phylogenetic relations. Additional supporting characters (e.g., distribution) have sometimes been included between key couplets to help identification.

Illustrations and digital photographs

Illustrations (except habitus drawings and Fig. 114–225), including maps, were prepared from pencilled drafts that were digitised, finished, and laid out using the software package CorelDraw graphics suite. Colour photographs of whole insects and pronota were captured through a Leica MZ-12 stereomicroscope, a 3CCD video camera, a LeicaDC500 digital camera, and the increased-depth-of-field computer system Auto-Montage (Synoptics U.K.). Further photo-processing was done with the software packages PhotoShop and CorelDRAW graphics suite.

Generic concept

A genus should be a monophyletic group composed of one or more species separated from other genera by a decided gap. The phylogenetic framework to study Australasian Harpalini, however, is insufficiently elaborated to test this hypothesis for New Zealand genera. Consequently, existing generic concepts have in general been accepted. In addition, new genera are proposed for species not fitting the

correlated character complex of species included in already described genera. Recognition of these generic taxa provides new hypotheses that will hopefully be tested by future students of the higher classification of Harpalini; this must be done on a world basis or at least in an Australasian context.

A cladistic analysis, preferably integrating morphological and genetic information, is needed to determine the phylogenetic position of New Zealand genera within the Harpalini. Only then can an attempt be made to decipher the evolutionary history of the New Zealand taxa, e.g., to confirm or reject the hypothesis that certain genera are Gondwana relicts, to reconstruct the sequence of speciation and colonisation events, and to understand their evolution in general or that of their habitat relationships.

Species concept

The species concept used here is biological, inferred from morphological characters (especially male genitalia) hypothesised to constitute barriers to interbreeding and hence to gene flow between the different species. This is corroborated, when possible, by geographic and biological information, but is not tested by genetic or ethological investigations. This species concept requires the assumption that reproductive (genetic) continuity or isolation among natural populations is evidenced by continuity or discontinuity in characters of external morphology and genital structures provided by the study of population samples.

As generally observed in Carabidae, the most important characters to discriminate Harpalini species are the male genital structures, particularly the aedeagus. In the majority of New Zealand genera, many external characters are found to vary within species, or the range of their variation overlaps with that of closely related species, and similarities or differences in external morphology are not always congruent with the study of genitalia. Accurate species identification is generally impossible without an examination of male aedeagus. Therefore, in most cases, females can only be reliably identified by association with males. Fortuitously, identification is facilitated by the fact that New Zealand species are largely allopatric.

Taxonomic arrangement

Further study of Australasian Harpalini is needed before phylogenetic relationships can be hypothesised. In this monograph, subtribes and genera are treated alphabetically while species are arranged according to their similarity in male genitalia and external morphology, which may or may not be indicative of phylogenetic relationships.

Biostatus

This is indicated for all genera and species (A=Adventive; E=Endemic; N=Native, not endemic). The biostatus categories used are defined in the Glossary (Appendix A, p. 89). A combination of criteria was used to assess whether taxa were adventive including: recency of first New Zealand record in the literature and collections; fit of current geographical and ecological distribution with recognised natural patterns, or similarity of such distribution with that of other adventive arthropods; and dispersal ability, especially in relation to flightlessness and distance from the nearest overseas populations.

Type data

The primary types of native species were examined. Such information is listed in the following format: type status (holotype, lectotype, etc.) followed by sex, acronym of entomological collection or museum serving as repository, and original label data with a forward slash (/) indicating a different label. Only type localities are provided for adventive species.

Geographic distribution

For New Zealand distribution records, the area codes of Crosby *et al*. (1976, 1998) are given in alphabetical order for the North Island, South Island, Stewart Island, and the Offshore Islands, respectively. When appropriate, the extralimital distribution (outside New Zealand and its offshore islands) is also included, as well as first New Zealand records of adventive species. Full distributional information is given for species known from ten (10) localities or fewer. Appendix B (p. 91) contains a list of the main collecting localities and their geographic coordinates.

Two-letter abbreviations for the area codes of Crosby *et al*. (1976, 1998) used in this publication are as follows (see Maps 1-3):

New Zealand. North Island: AK, Auckland; BP, Bay of Plenty; CL, Coromandel; GB, Gisborne; HB, Hawke's Bay; ND, Northland; RI, Rangitikei; TK, Taranaki; TO, Taupo; WA, Wairarapa; WI, Wanganui; WN, Wellington; WO, Waikato. **South Island**: BR, Buller; CO, Central Otago; DN, Dunedin; FD, Fiordland; KA, Kaikoura; MC, Mid Canterbury; MK, Mackenzie; NC, North Canterbury; NN, Nelson; OL, Otago Lakes; SC, South Canterbury; SD, Marlborough Sounds; SL, Southland; WD, Westland. **Stewart Island**, SI. **Offshore Islands**: AN, Antipodes Islands; AU, Auckland Islands; BO, Bounty Islands; CA, Campbell Island; CH, Chatham Islands; KE, Kermadec Islands; SN, Snares Islands; TH, Three Kings Islands.

Maps summarising species distributions by areas of New Zealand are provided on pp. 147-153.

Material examined

This indicates the number of specimens examined and the acronym of their repositories.

Ecology, biology, and dispersal power

The information provided is based on specimen label data, field observations from the authors, and the literature. In order to eliminate spurious records an effort was made to summarise available information by using the smallest common denominator amongst the greatest number of observations for each species. The terminology and style of presentation adopted here follows Larochelle & Larivière (2001). Most technical terms are also defined in the glossary (Appendix A, p. 89).

References

Under References, only the most important references are given for each taxon, with an indication of their contents between parentheses.

TAXONOMIC TREATMENTS

Tribe HARPALINI

Diagnosis (New Zealand). Head with a single pair of supraorbital setiferous punctures. Body usually rather stout, with relatively short appendages. Mandibles usually relatively short. Posterior angles of pronotum without a setiferous puncture. Elytral apex neither truncate nor crossed subapically.

Description (New Zealand). Body length: 3.0–20 mm. Mostly pigmented and dark in colour, rarely depigmented and testaceous. Generally glabrous and smooth. Body not pedunculate, usually rather stout, with relatively short appendages. Head with a single pair of supraorbital setiferous punctures. Labrum usually transverse; apex straight or slightly emarginate medially, rarely strongly emarginate (*Maoriharpalus*); anterior margin with 6 setiferous punctures. Clypeus narrower than distance between antennal scapes; apex straight or slightly emarginate medially; each outer distal angle with one setiferous puncture. Mandibles usually relatively short; scrobe without a setiferous puncture. Palpi visibly pubescent, rarely subglabrous; penultimate segment of labial palpi either plurisetose (with 4 setae or more), trisetose (with 3 setae), or bisetose (with 2 setae) on anterior margin. Antennae usually moderately long, reaching pronotal base; pubescence starting generally on antennomere 3, rarely on antennomere 2. Mentum generally with a tooth medially, moderately shorter than lateral lobes. Mentum and submentum usually separated by complete transverse suture. Each pronotal side with a setiferous puncture before middle. Posterior angles of pronotum each without a setiferous puncture. Scutellar striole of elytra usually present, inserted between interneurs 1 and 2. Procoxal cavities uniperforated. Metepimeron visible as a lobe between metepisternum and ventrite 1. Elytra with apex rounded or angulate, not truncate; epipleura simple, not crossed subapically. Abdominal apex hidden from above. Male protarsi and usually mesotarsi laterally dilated and clothed with adhesive setae ventrally; male tarsi either spongily pubescent, biseriately pubescent, or rarely unmodified (i.e., simple as in the female). Aedeagus (i.e., penis, median lobe) usually arcuate in lateral view, either asymmetrical (with ostium deflected laterally) or symmetrical (with ostium dorsal, not deflected laterally) in apical half in dorsal view; basal bulb well developed, feebly elbowed. Internal sac with or without armature (scales, teeth, or spines). Parameres short and wide, conchoid or ovate, slightly different in shape, the right paramere being smaller (i.e., almost as long, slightly narrower).

Remarks. Klimaszewski & Watt (1997) provided a key to the subfamilies and tribes of Carabidae occurring in New Zealand.

Key to subtribes of New Zealand Harpalini (mostly based on males)

1 Penultimate segment of labial palpi plurisetose (with 4 setae or more; Fig. 9) on anterior margin 2

— Penultimate segment of labial palpi trisetose (with 3 setae; Fig. 10) or bisetose (with 2 setae; Fig. 11) on anterior margin 3

2(1) Male protarsi biseriately pubescent (with 2 rows of scale-like setae) ventrally (Fig. 13). Aedeagus asymmetrical, with ostium strongly deflected to the left (Fig. 55) ....(p. 50)... **Harpalina**

— Male protarsi spongily pubescent ventrally (Fig. 12). Aedeagus asymmetrical (with ostium deflected to the right (Fig. 35) or twisted (Fig. 39)) or symmetrical (with ostium dorsal, not deflected laterally (Fig. 32)) ....(p. 26)... **Anisodactylina** (in part)

3(1) Penultimate segment of labial palpi trisetose on anterior margin (Fig. 10) 4

— Penultimate segment of labial palpi bisetose on anterior margin (Fig. 11) 5

4(3) Frons without clypeo-ocular prolongations (Fig. 85) ....(p. 26)... **Anisodactylina** (in part)

— Frons with clypeo-ocular prolongations (Fig. 107) ....(p. 54)... **Pelmatellina** (in part)

5(3) Male protarsi dilated laterally and spongily pubescent ventrally (Fig. 12) ...(p. 54)... **Pelmatellina** (in part)

— Male protarsi dilated laterally and biseriately pubescent ventrally (Fig. 13) or unmodified ....(p. 72)... **Stenolophina**

Alternative key to genera of New Zealand Harpalini

Note. The key to subtribes provided above and keys to genera within each subtribe allow the identification of all Harpalini genera, but because the key to subtribes is mainly based on males, an alternative key to genera, one bypassing subtribes, is here provided for easier identification.

1 Rows of setiferous punctures present on elytral intervals 3, 5, or 7 (Fig. 97, 99), or on interneur 2 (Fig. 98) . 2

— Rows of setiferous punctures absent (Fig. 91) on elytral intervals 3, 5, and 7, and on interneur 2 3

2(1) Metatarsomere 1 as long as metatarsomeres 2+3 (Fig. 188). Forebody (head and thorax) with sparse setiferous micropores dorsally (Fig. 136). Eyes strongly reduced, rather flat (Fig. 96–99). Tempora inflated (Fig. 96–99) ....(p. 46)... ***Tuiharpalus*** new genus

— Metatarsomere 1 as long as metatarsomeres 2+3+4 (Fig. 179). Forebody (head and thorax) without sparse setiferous micropores dorsally. Eyes moderately large, convex (Fig. 89). Tempora not inflated (Fig. 89) ....(p. 36)... ***Gnathaphanus*** Macleay

3(1) Mentum without a tooth medially (Fig. 18) 4

— Mentum with a tooth medially (Fig. 14) 6

4(3) Eyes reaching buccal fissure ventrally (Fig. 21). Frons with clypeo-ocular prolongations (Fig. 109). Body length 6.5 mm or less ....(p. 72)... ***Egadroma*** Motschulsky

— Eyes separated from buccal fissure ventrally (by 1–2x maximum width of antennal scape) (Fig. 19). Frons without clypeo-ocular prolongations (Fig. 91). Body length 10 mm or more 5

5(4) Mandibles (Fig. 91) and antennal scapes (Fig. 182) very long, about 6× their maximum width. Labrum strongly emarginate apically (Fig. 91). Mentum and submentum separated by transverse suture (Fig. 22). Pronotum suborbicular (Fig. 126). [TH] ....(p. 40)... ***Maoriharpalus*** new genus

— Mandibles (Fig. 87) and antennal scapes (Fig. 177) much shorter . Labrum straight or slightly emarginate apically (Fig. 87). Mentum and submentum fused, not separated by transverse suture (Fig. 24). Pronotum rectangular (Fig. 121). [South Island and southern North Island] ....(p. 34)... ***Anisodactylus*** Dejean

6(3) Segment 4 of protarsi and mesotarsi with 2 membranous laminae (Fig. 25). Forebody (head and thorax) much narrower than elytra (Fig. 211–213, 221–225) 7

— Segment 4 of protarsi and mesotarsi without membranous laminae (Fig. 26). Forebody (head and thorax) at most moderately narrower than elytra ... 8

7(6) Elytral interneurs (Fig. 108) complete, consisting of striae. Mentum with medial tooth as long as lateral lobes (Fig. 16) ....(p. 68)... ***Syllectus*** Bates

— Elytral interneurs (Fig. 113) incomplete, consisting of rows of punctures. Mentum with medial tooth longer than lateral lobes (Fig. 15) ....(p. 80)... ***Pholeodytes*** Britton

8(6) Eyes normally developed (Fig. 110). Mandibles shorter (Fig. 110) 9

— Eyes strongly reduced, flat or rather flat, consisting of obliterated facets (Fig. 102, 112). Mandibles very long (about 5–6× their maximum width; Fig. 102, 112) 19

9(8) Ventrites 5+6 with numerous short setae, in addition to paired ambulatory setae (Fig. 28) ....(p. 73)... ***Euthenarus*** Bates

— Ventrites 5+6 without short setae, with paired ambulatory setae only (Fig. 27) 10

10(9) Elytral interneurs incomplete basally and laterally (Fig. 111). Pronotum suborbicular (Fig. 163) ....(p. 77)... ***Haplanister*** Moore

— Elytral interneurs complete (Fig. 104). Pronotum not suborbicular 11

11(10) Umbilicate setiferous series of elytral interval 9 separated into 2 major groups (Fig. 107) 12

— Umbilicate setiferous series of elytral interval 9 not separated into 2 major groups (Fig. 93) 17

12(11) Frons with clypeo-ocular prolongations (Fig. 107) 13

— Frons without clypeo-ocular prolongations (Fig. 92) 14

13(12) Apex of prosternal lobe pubescent. Penultimate segment of labial palpi trisetose on anterior margin (Fig. 10). Eyes widely separated from buccal fissure ventrally (by 1.5–2.0× maximum width of antennal scape; Fig. 19). [North Island: ND] ....(p. 57)... ***Kupeharpalus*** new genus

— Apex of prosternal lobe glabrous (Fig. 2). Penultimate segment of labial palpi bisetose on anterior margin (Fig. 11). Eyes reaching buccal fissure (Fig. 21) or narrowly separated from it ventrally (by 0.3–0.7× maximum width of antennal scape; Fig. 20). [Throughout New Zealand] ....(p. 60)... ***Lecanomerus*** Chaudoir

14(12) Metatarsomere 1 very long, almost as long as metatarsomeres 2+3+4 (Fig. 183) ....(p. 41)... ***Notiobia*** Perty

— Metatarsomere 1 much shorter, at most as long as, or slightly longer than, metatarsomeres 2+3 15

15(14) Elytra fused along suture; hindwings vestigial. Pronotum not subrectangular (Fig. 114–120). Metafemora with 2 long setae on posterior margin ... .(p. 27)... ***Allocinopus*** Broun

— Elytra free along suture; hindwings fully developed. Pronotum subrectangular (Fig. 124–125, 137–139). Metafemora with 4–10 long setae on posterior margin 16

16(15) Metatarsomere 5 with 6–8 setae ventrally. Posterior bead of pronotum complete (Fig. 137–139). [Body length 6–12 mm.] ....(p. 51)... ***Harpalus*** Latreille

— Metatarsomere 5 with 4 setae ventrally. Posterior bead of pronotum incomplete medially (Fig. 124–125). [Body length 4.5–7.0 mm.] ....(p. 37)... ***Hypharpax*** Macleay

17(11) Body shape boat-like, with subtriangular elytra (Fig. 88). Scutellum hidden (Fig. 88). Labrum slightly transverse, almost square, convex apically (Fig. 88) . ...(p. 35)... ***Gaioxenus*** Broun

— Body shape not boat-like, elytra not subtriangular (Fig. 93-95). Scutellum visible (Fig. 93–95). Labrum strongly transverse, subrectangular, straight or slightly emarginate apically (Fig. 93–95) 18

18(17) Body dark in colour. Tarsi pubescent dorsally. Metafemora with 2 long setae on posterior margin. Metatarsomere 1 as long as metatarsomeres 2+3 (Fig. 185) ....(p. 42)... ***Parabaris*** Broun

— Body pale in colour. Tarsi glabrous dorsally. Metafemora with 5–7 long setae on posterior margin. Metatarsomere 1 shorter than metatarsomeres 2+3 (Fig. 187) ....(p. 45)... ***Triplosarus*** Bates

19(8) Pronotum cordate or subcordate (Fig. 140–143). Antennae widening from base to apex (Fig. 199); pubescence starting on antennomere 2 [NN–SD] ....(p. 54)... ***Hakaharpalus*** new genus

— Pronotum quadrate (Fig. 164). Antennae not widening from base to apex (Fig. 220); pubescence starting on antennomere 3 [TH] ....(p. 79)... ***Kiwiharpalus*** new genus

Subtribe ANISODACTYLINA

Diagnosis (New Zealand). Body length: 4.5–20.0 mm. Frons without clypeo-ocular prolongations. Mentum usually with a tooth medially, seldom without a tooth (*Anisodactylus, Gnathaphanus, Maoriharpalus*). Mentum and submentum usually separated by complete transverse suture, seldom by laterally incomplete transverse suture (*Gaioxenus*), or without suture (*Anisodactylus*). Penultimate segment of labial palpi usually plurisetose (with 4 setae or more) on anterior margin, seldom trisetose (with 3 setae; *Allocinopus angustulus, A. smithi, Hypharpax australis, Tuiharpalus clunieae, T. hallae*). Apex of prosternal lobe pubescent. Male protarsi dilated laterally and spongily pubescent ventrally; male mesotarsi usually dilated laterally and spongily pubescent ventrally, seldom unmodified. Metatarsomere 1 of variable length. Umbilicate setiferous series of interval 9 usually continuous, seldom separated into 2 major groups (*Allocinopus, Hypharpax, Notiobia*) with posterior group continuous (not divided further into 2 subgroups). Aedeagus arcuate, asymmetrical (with ostium deflected to the right, twisted or undulated) or symmetrical (with ostium dorsal, not deflected laterally).

Geographic distribution. Worldwide.

References. Noonan 1973: 266–480 (classification; key to genera) and 1976: 8–15 (taxonomy); Larochelle & Larivière 2001: 122–126 (catalogue).

Key to genera of New Zealand Anisodactylina

1 Rows of setiferous punctures present on elytral intervals 3, 5, or 7 (Fig. 97, 99), or on interneur 2 (Fig. 98) . 2

— Rows of setiferous punctures absent (Fig. 91) on elytral intervals 3, 5, and 7, and on interneur 2 3

2(1) Metatarsomere 1 as long as metatarsomeres 2+3 (Fig. 188). Forebody (head and thorax) with sparse setiferous micropores dorsally (Fig. 136). Eyes strongly reduced, rather flat (Fig. 96–99). Tempora inflated (Fig. 96–99) ....(p. 46)... ***Tuiharpalus*** new genus

— Metatarsomere 1 longer, as long as metatarsomeres 2+3+4 (Fig. 179). Forebody (head and thorax) without sparse setiferous micropores dorsally. Eyes moderately large, convex (Fig. 89). Tempora not inflated (Fig. 89) ....(p. 36)... ***Gnathaphanus*** Macleay

3(1) Mentum without a tooth medially (Fig. 18) 4

— Mentum with a tooth medially (Fig. 14) 5

4(3) Mandibles (Fig. 91) and antennal scapes (Fig. 182) very long, about 6× their maximum width. Labrum strongly emarginate apically (Fig. 91). Mentum and submentum separated by transverse suture (Fig. 22). Pronotum suborbicular (Fig. 126). [TH] ....p. 40)... ***Maoriharpalus*** new genus

— Mandibles (Fig. 87) and antennal scapes (Fig. 177) much shorter. Labrum straight or slightly emarginate apically (Fig. 87). Mentum and submentum fused, not separated by transverse suture (Fig. 24). Pronotum rectangular (Fig. 121). [South Island and southern North Island] ....(p. 34)... ***Anisodactylus*** Dejean

5(3) Umbilicate setiferous series of elytral interval 9 separated into 2 major groups (Fig. 85) 6

— Umbilicate setiferous series of elytral interval 9 not separated into 2 major groups (Fig. 93) 8

6(5) Elytra fused along suture; hindwings vestigial. Pronotum moderately transverse (Fig. 114–120) ....(p. 27)... ***Allocinopus*** Broun

— Elytra free along suture; hindwings fully developed. Pronotum very transverse (Fig. 124–125, 127) 7

7(6) Metatarsomere 1 parallel-sided, very long, almost as long as metatarsomeres 2+3+4 (Fig. 183) ....p. 41)... ***Notiobia*** Perty

— Metatarsomere 1 subtriangular, short, only about as long as metatarsomere 2 (Fig. 181) ....(p. 37)... ***Hypharpax*** Macleay

8(5) Body shape boat-like, with subtriangular elytra (Fig. 88). Scutellum hidden (Fig. 88). Labrum slightly transverse, almost square, convex apically (Fig. 88) . ...(p. 35)... ***Gaioxenus*** Broun

— Body shape not boat-like, elytra not subtriangular (Fig. 93–95). Scutellum visible (Fig. 93–95). Labrum strongly transverse, straight or slightly emarginate apically (Fig. 93–95) 9

9(8) Body pale in colour. Tarsi glabrous dorsally. Metafemora with 5–7 long setae on posterior margin. Paraglossae as long as ligula (Fig. 31) ....(p. 45)... ***Triplosarus*** Bates

— Body dark in colour. Tarsi pubescent dorsally. Metafemora with 2 long setae on posterior margin. Paraglossae longer than ligula ....p. 42)... ***Parabaris*** Broun

Genus *Allocinopus* Broun, 1903 [E]

Allocinopus Broun, 1903: 607. Type species: *Allocinopus sculpticollis* Broun, 1903, by monotypy.

Description. Body length: 6.0–11.5 mm. Forebody (head and thorax) without sparse setiferous micropores dorsally. **Head**. Mandibles moderately long, slightly curved forward, blunt apically. Labrum strongly transverse; apex straight or slightly emarginate medially. Eyes moderately large, slightly to strongly convex, widely separated from buccal fissure ventrally (by about 2× maximum width of antennal scape). Tempora not inflated. Frons without clypeo-ocular prolongations. Antennal pubescence starting from basal third or half of antennomere 3. Mentum with a tooth medially, moderately shorter than lateral lobes. Mentum and submentum separated by complete transverse suture. Paraglossae as long as or longer than ligula. Palpi with last segment fusiform, seldom truncate apically (*latitarsis*), with sparse, short or moderately long pubescence; penultimate segment of labial palpi plurisetose or trisetose on anterior margin. **Thorax**. Pronotum cordate or moderately transverse; base straight, as wide as or moderately narrower than elytral base; lateral beads complete; anterior bead incomplete medially; posterior bead complete or incomplete medially. Scutellum visible. Apex of prosternal lobe pubescent. **Legs**. Metafemora with 2 long setae on posterior margin. Male protarsi and mesotarsi dilated laterally and spongily pubescent ventrally. Segment 4 of protarsi and mesotarsi of both sexes without membranous laminae. Tarsi glabrous or pubescent (a few or numerous setae) dorsally; metatarsomere 5 pubescent (4-6 setae) ventrally; metatarsomere 1 as long as, shorter or longer than metatarsomeres 2+3. **Elytra**. Interneurs complete. Rows of setiferous punctures absent on intervals 3, 5, and 7, and on interneur 2. Umbilicate setiferous series of interval 9 separated into two major groups, with posterior group continuous. **Abdomen**. Ventrites 2+3 of male without a setiferous fovea. Ventrites 5+6 of both sexes without

short setae, with paired ambulatory setae only. **Aedeagus**. Lateral view: slightly or strongly arcuate. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally) or asymmetrical (with ostium deflected to the right); dorsal membranous area wide, extending almost to basal bulb; apical disc present. Internal sac armed.

Geographic distribution. New Zealand (endemic).

References. Hudson, 1934: 177 (list); Noonan, 1973: 284–285 and 1976: 8 (taxonomy); Larochelle & Larivière, 2001: 122–123 (catalogue).

Remarks. Apart from variation in the pubescence of the penultimate segment of the labial palpi, *Allocinopus* species show a high degree of similarity in morphological characters, including the male genitalia, suggesting that they form a distinct monophyletic group.

Key to species of *Allocinopus*

1 Metatarsomere 1 short, only slightly longer than metatarsomere 2 (Fig. 175). Palpi truncate apically. Male protarsi and mesotarsi strongly dilated laterally (each tarsomere about 2× wider than long; Fig. 175). [Pronotum (Fig. 119). Chatham Islands] ....(p. 32)... ***latitarsis*** Broun

— Metatarsomere 1 as long as (Fig. 170) or longer (Fig. 173) than metatarsomeres 2+3. Palpi not truncate apically. Male protarsi and mesotarsi not strongly dilated laterally (Fig. 176) 2

2(1) Pronotum cordate (heart-shaped), sides clearly sinuate (Fig. 118, 120). Metepisterna longer than wide 3

— Pronotum not cordate, sides little or not sinuate (Fig. 114–117). Metepisterna as wide as or wider than long 4

3(2) Pronotum (Fig. 118): punctuation weakly developed basally and laterally; basal foveae deep, much longer than wide. Body brownish. Tarsi pubescent dorsally ....(p. 31)... ***wardi*** new species

— Pronotum (Fig. 120): punctuation strongly developed basally and laterally; basal foveae shallow, about as long as wide. Body blackish. Tarsi glabrous dorsally ....(p. 33)... ***sculpticollis*** Broun

4(2) Penultimate segment of labial palpi trisetose (with 3 setae) on anterior margin (Fig 10). Metepisterna wider than long. Metatarsomere 1 as long as metatarsomeres 2+3 (Fig. 170) 5

— Penultimate segment of labial palpi plurisetose (with 4 setae or more) on anterior margin (Fig. 9). Metepisterna as wide as long. Metatarsomere 1 longer than metatarsomeres 2+3 (Fig. 173) 6

5(4) Pronotum (Fig. 114): posterior angles subrectangular; sides slightly sinuate. Aedeagus (Fig. 32, lateral view) with apex straight; symmetrical (in dorsal view) [North Island, north of the Central Volcanic Plateau] ....(p. 28)... ***smithi*** Broun

— Pronotum (Fig. 115): posterior angles obtuse; sides almost straight. Aedeagus (Fig. 33, lateral view) with apex deflected dorsally; asymmetrical (in dorsal view) [North Island, south of the Central Volcanic Plateau] ....(p. 29)... ***angustulus*** Broun

6(4) Base of pronotum (Fig. 117) much narrower than elytral base; posterior angles obtuse; sides not sinuate. Elytral shoulders rounded (Fig. 117). Aedeagus (Fig. 35, dorsal view) with apical disc broadly spatulate .. ..(p. 31)... ***bousqueti*** new species

— Base of pronotum (Fig. 116) slightly narrower than elytral base; posterior angles subrectangular; sides slightly sinuate. Elytral shoulders angulate (Fig. 116). Aedeagus (Fig. 34, dorsal view) with apical disc narrowly spatulate ....(p. 30)... ***belli*** new species

Allocinopus smithi Broun, 1912 [E]

Figures 32, 85, 114, 170; Map p. 147

Allocinopus smithi Broun, 1912: 391. Lectotype (here designated): female (BMNH) labelled "paratype (circular red-bordered label; typed) / 3177. (hand-written) / New Zealand. Broun Coll. Brit. Mus. 1922-482. (typed) / Ratapihipihi. Nov. 1909. (hand-written) / Allocinopus smithi. female. (hand-written) / LECTOTYPE *Allocinopus smithi* Broun, 1912 designated by Larochelle & Larivière 2004 (red label; typed)." Fair condition. Posterior legs without metatarsi. Paralectotype: 1 male (BMNH) bearing blue paralectotype label.

Allocinopus castaneus Broun, 1912: 392. Lectotype (here designated): female (BMNH) labelled "Type (circular red-bordered label; typed) / 3178. female (hand-written) / Hunua. Maketu. (hand-written) / New Zealand. Broun Coll. Brit. Mus. 1922-482. (typed) / Allocinopus castaneus. female. (hand-written) / LECTOTYPE *Allocinopus castaneus* Broun, 1912 designated by Larochelle & Larivière 2004 (red label; typed)." Perfect condition. **New synonym.**

Description. Body length: 6.5–7.0 mm. Moderately convex. Reddish black; head darker; lateral margins of pronotum and elytra paler; antennae, palpi, and legs light reddish. Generally glabrous and smooth. Microsculpture isodiametric and strong on head, moderately transverse and weak on pronotum, very transverse (with microlines) and weak on elytra (in males) or very transverse (with microlines) and strong (in females). Shiny, without metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex

posteriorly. Labrum with apex slightly emarginate medially. Eyes moderately large, slightly convex. Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width; pubescence starting from basal 1/3 of antennomere 3. Paraglossae as long as ligula. Palpi not truncate apically, with sparse, moderately long pubescence; penultimate segment of labial palpi trisetose (with 2 long setae and 1 short seta) on anterior margin. **Thorax**. Pronotum (Fig. 114) very transverse, widest before middle; sides slightly converging toward base, slightly sinuate; base straight, as wide as elytral base; apex concave; lateral depressions widening posteriorly; posterior bead complete medially; anterior angles strongly developed, acute; posterior angles strongly developed, subrectangular; basal foveae shallow, narrow; anterior lateral setiferous puncture not touching lateral beads; punctuation feebly developed. Apex of prosternal lobe with 1-2 long setae and several short setae. Metepisterna wider than long. **Legs**. Tarsi pubescent (with numerous setae) dorsally; metatarsomere 5 pubescent (with 6 setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Widest about middle. Shoulders strongly developed, angulate, with a tooth. Subapical sinuations feeble. Sutural apices angulate-rounded. Scutellar striole present. Interneurs shallow, deepening apically, impunctate. Intervals sparsely punctate, flat, becoming convex apically. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 32). Lateral view: strongly arcuate; apex narrowly pointed, straight. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area very wide, extending almost to basal bulb; apex straight (not deflected laterally) and apical disc present, truncate at tip, with divergent sides. Internal sac armed.

Material examined. 421 specimens, including types (AMNZ, BMNH, ITNZ, JNNZ, LUNZ, MONZ, NZAC, UCNZ).

Geographic distribution (Map p. 147). North Island: AK, BP, TK, TO, WO.

Ecology. Lowland, montane. Wet forests (broadleaf, podocarp): along streams, gullies, and mud flats. Shaded ground; soil covered with dead leaves. Nocturnal; sheltering during the day under stones, in leaf litter, under fallen branches and logs. Gregarious. **Biology**. Seasonality: September–January, March–April, June, August. Tenerals: September–October, December, March–April. Occasionally infested with fungi (Laboulbeniales). **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. Good burrower. **Collecting techniques**. Turning stones and pieces of wood; raking leaf litter; pitfall trapping.

References. Hudson, 1934: 37 (distribution, ecology); Noonan, 1973: 285 (taxonomy); Larochelle & Larivière, 2001: 123 (including *castaneus*; taxonomy, distribution, ecology, biology, dispersal power).

Remarks. Broun described *smithi* from a pair of "mutilated specimens", one of which (a female) is here designated as lectotype. The second specimen represented in the Natural History Museum, London (BMNH) collection is a perfectly preserved male specimen with label information fitting the original description; therefore, it is considered to be the paralectotype. Broun described *castaneus* from two females, one of which could be located in the Natural History Museum, London (BMNH) and is here designated as lectotype. These two lectotypes are designated to preserve stability of nomenclature in the future. The lectotype of *castaneus* although pale in colour conforms morphologically with *smithi*; the two taxa are believed to be conspecific. *Allocinopus smithi* resembles *angustulus* in its general morphology and its trisetose palpi (plurisetose in other *Allocinopus* species). The two species are highly variable morphologically (within and between populations) and the only reliable diagnostic character between them is the male aedeagus. The geographic distribution of these two allopatric species may also assist their identification.

Allocinopus angustulus Broun, 1912 [E]

Figures 33, 115, 171; Map p. 147

Allocinopus angustulus Broun, 1912: 392. Holotype: female (BMNH) labelled "Type (circular red-bordered label; typed) / 3179. female. (hand-written) / New Zeal. Broun Coll. Brit. Mus. 1922-482 (typed) / Forty Mile-Bush. Suter.. (hand-written) / Allocinopus angustulus." Perfect condition.

Description. Body length: 6.0–7.5 mm. Moderately convex. Reddish black; head darker; lateral margins of pronotum and elytra, sutural intervals rufous; antennae, palpi, and legs light reddish. Generally glabrous and smooth. Microsculpture isodiametric and strong on head, moderately transverse and weak on pronotum, very transverse (with microlines) on elytra. Shiny, without metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Labrum with apex slightly emarginate medially. Eyes moderately large, slightly convex. Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width; pubescence starting from basal third of antennomere 3. Paraglossae as long as ligula. Palpi not truncate apically, with sparse, moderately long pubescence; penultimate segment of labial palpi trisetose (with 2 long setae and 1 short seta) on anterior margin. **Thorax**. Pronotum (Fig. 115) strongly transverse, widest before middle; sides slightly converging toward base, not sinuate,

almost straight; base straight, as wide as elytral base; apex concave; lateral depressions widening posteriorly; posterior bead complete medially; anterior angles strongly developed, acute; posterior angles strongly developed, obtuse; basal foveae deep, narrow; anterior lateral setiferous punctures not touching lateral beads; punctuation feebly developed. Apex of prosternal lobe with 1–2 long setae and several short setae. Metepisterna wider than long. **Legs**. Tarsi pubescent (with numerous setae) dorsally; metatarsomere 5 pubescent (with 6 setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Widest about middle. Shoulders strongly developed, angulate, with a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole present. Interneurs shallow, deepening apically, impunctate. Intervals sparsely punctate, flat, becoming convex apically. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 33). Lateral view: strongly arcuate; apex narrowly pointed, slightly deflected dorsally. Dorsal view: asymmetrical (with ostium slightly deflected to the right); dorsal membranous area very wide, extending almost to basal bulb; apex deflected to the right and apical disc present, rounded at tip, almost parallel-sided. Internal sac armed.

Material examined. 143 specimens, including type (BMNH, ITNZ, JNNZ, MONZ, NZAC, UCNZ).

Geographic distribution (Map p. 147). North Island: HB, RI, WA, WI, WN.

Ecology. Lowland, montane. Wet or moist forests (broadleaf, beech): along streams, rills, and gullies. Shaded ground; soil covered with dead leaves. Nocturnal; sheltering during the day under stones (mostly) and in leaf litter. Gregarious. **Biology**. Seasonality: October–March, June–August. Tenerals: February–March. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. Good burrower. **Collecting techniques**. Turning stones, pitfall trapping.

References. Noonan, 1973: 285 (taxonomy); Larochelle & Larivière, 2001: 122 (taxonomy, distribution, ecology, biology, dispersal power).

Remarks. See under *A. smithi*.

Allocinopus belli new species [E]

Figures 34, 116, 172; Map p. 147

Allocinopus belli Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "Whanarua Bay, Bay of Plenty under stone 24-i-62 J.C. Watt (hand-written) / J.C. Watt Collection Ent. Div. DSIR, 1966. (typed) / HOLOTYPE [male symbol] *Allocinopus belli* new species Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 1 female (NZAC), 4 males (MONZ; mounted on same card) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length: 7.5–8.0 mm. Moderately convex. Dark brownish; head darker; antennae and legs (except femora) dark reddish; apical half of tibia light yellowish brown; sides of pronotum and apical half of elytra reddish brown. Generally glabrous and smooth. Microsculpture moderately strong, isodiametric on head, moderately transverse on pronotum, and strongly transverse (with microlines) on elytra. Head slightly shiny, pronotum moderately shiny, elytra very shiny and iridescent; without metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Labrum with apex straight or slightly emarginate medially. Eyes moderately large, slightly convex. Antennae moderately long, reaching elytral base; antennal scape about 2× longer than its maximum width; pubescence starting from middle of antennomere 3. Paraglossae longer than ligula. Palpi not truncate apically, with sparse, moderately long pubescence; penultimate segment of labial palpi plurisetose (with 2–3 long setae and 4 short setae) on anterior margin. **Thorax**. Pronotum (Fig. 116) strongly transverse, widest before middle; sides slightly converging toward base, slightly sinuate; base straight, slightly narrower than elytral base; apex concave; lateral depressions widening posteriorly; posterior bead complete medially; anterior angles strongly developed, acute; posterior angles strongly developed, subrectangular; basal foveae deep, narrow; anterior lateral setiferous punctures not touching lateral beads; punctuation feebly developed. Apex of prosternal lobe with 2 long setae and several short setae. Metepisterna as wide as long. **Legs**. Tarsi pubescent (with numerous setae) dorsally; metatarsomere 5 pubescent (with 4 setae) ventrally; metatarsomere 1 longer than metatarsomeres 2+3. **Elytra**. Widest about middle. Shoulders strongly developed, angulate, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent or present. Interneurs shallow, not deepening apically, impunctate. Intervals impunctate, flat, not convex apically. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 34). Lateral view: strongly arcuate; apex narrowly rounded, slightly deflected dorsally. Dorsal view: asymmetrical (with ostium slightly deflected to the right); dorsal membranous area moderately wide, extending almost to basal bulb; apex deflected to the right and apical disc present, narrowly spatulate. Internal sac armed.

Material examined. 13 specimens, including types (BBNZ, ITNZ, LUNZ, NZAC).

Geographic distribution (Map p. 147). North Island: BP–Papatea. Whanarua Bay.

Ecology. Lowland (coastal). Wet forests (broadleaf): along streams. Shaded ground; soil covered with dead leaves. Nocturnal; sheltering during the day under stones. **Biol-**

ogy. Seasonality: October–November, January. Tenerals: late January. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. Good burrower. **Collecting techniques**. Turning stones.

Remarks. This species closely resembles *A. bousqueti* but can be most easily distinguished from it by characters of the male genitalia. In addition, *A. belli* is typically a coastal species whereas *A. bousqueti* is an inland species. This taxon is named after our friend and colleague Ross T. Bell (University of Vermont, Burlington) for his special help and encouragement in our carabid studies.

Allocinopus bousqueti new species [E]

Figures 35, 117, 173; Map p. 147

Allocinopus bousqueti Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "NEW ZEALAND BP Waioeka Gorge Mangapumarumaru Track 100m 25.XI.1997 Larochelle, Larivière (typed) / Moist broadleaf forest: under stones. (typed) / HOLOTYPE [male symbol] *Allocinopus bousqueti* Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 2 males (1 NZAC, 1 MONZ) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length: 6.5–8.0 mm. Moderately convex. Dark brownish; head darker; antennae and tarsi dark reddish; femora brownish; mandibles mostly brownish; sides of pronotum reddish brown. Generally glabrous and smooth. Microsculpture moderately strong, isodiametric on head, moderately transverse on thorax, and strongly transverse (with microlines) on elytra. Head slightly shiny, pronotum moderately shiny, elytra very shiny and iridescent; without metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Labrum with apex straight or slightly emarginate medially. Eyes moderately large, slightly convex. Antennae moderately long, reaching elytral base; antennal scape about 2× longer than its maximum width; pubescence starting from middle of antennomere 3. Paraglossae longer than ligula. Palpi not truncate apically, with sparse, moderately long pubescence; penultimate segment of labial palpi plurisetose (with 2–3 long setae and 4 short setae) on anterior margin. **Thorax**. Pronotum (Fig. 117) very transverse, widest before middle; sides slightly converging toward base, not sinuate; base straight, moderately narrower than elytral base; apex concave; lateral depressions widening posteriorly; posterior bead complete medially; anterior angles strongly developed, acute; posterior angles moderately developed, obtuse; basal foveae shallow, narrow; anterior lateral setiferous punctures touching lateral beads; punctuation feebly developed. Apex of prosternal lobe with 2 long setae and several short setae. Metepisterna as wide as long. **Legs**. Tarsi pubescent (with numerous setae) dorsally; metatarsomere 5 pubescent (with 4 setae) ventrally; metatarsomere 1 longer than metatarsomeres 2+3. **Elytra**. Widest about middle. Shoulders strongly developed, rounded, without a tooth. Subapical sinuations absent. Sutural apices rounded. Scutellar striole absent or present. Interneurs shallow, deepening apically, impunctate. Intervals impunctate, flat, not convex apically. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 35). Lateral view: strongly arcuate; apex spatulate, slightly deflected dorsally. Dorsal view: asymmetrical (with ostium moderately deflected to the right); dorsal membranous area moderately wide, extending almost to basal bulb; apex deflected to the right and broadly spatulate; apical disc present. Internal sac armed.

Material examined. 16 specimens, including types (JNNZ, LUNZ, NZAC).

Geographic distribution (Map p. 147). North Island: BP–Ruatoria State Forest. Urewera National Park, Waimana Valley, Te Waiiti Stream. Waioeka Gorge. Whinray Scenic Reserve. GB–Morere Springs Scenic Reserve.

Ecology. Lowland. Wet or moist forests (broadleaf): along streams and mud flats. Shaded ground; soil covered with dead leaves. Nocturnal; sheltering during the day under logs, fallen branches and epiphyte crowns, and in leaf litter. **Biology**. Seasonality: October–November, January, April. Tenerals: November, April. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. Good burrower. **Collecting techniques**. Turning stones and pieces of wood.

Remarks. This taxon is named after our close friend and colleague Yves Bousquet (Agriculture and Agri-Food Canada, Ottawa, Canada) for his special help and encouragement in our carabid studies. See also **Remarks** under *A. belli*.

Allocinopus wardi new species [E]

Figures 36, 118, 174; Map p. 147

Allocinopus wardi Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "NEW ZEALAND CL Moehau Ra, Fantail Ck 24.XII. 1993 Larochelle, Larivière (typed) / Stony-gravelly stm edge, forested gully (kohekohe/pepper tree). Under stones. (typed) / HOLOTYPE [male symbol] *Allocinopus wardi* Larochelle & Larivière, 2004 (red label; typed)."

Description. Body length: 5.0 mm (only one specimen seen, head missing). Slightly convex. Brownish; sides of pronotum and elytra reddish brown. Generally glabrous and smooth. Microsculpture strong, very transverse (with microlines) on pronotum and elytra. Very shiny, without metallic lustre. Iridescent. **Head**. [Missing]. **Thorax**. Pronotum (Fig. 118) cordate (heart-shaped), widest before

middle; sides strongly converging toward base, strongly sinuate; base straight, slightly narrower than elytral base; apex concave; lateral depressions widening posteriorly; posterior bead incomplete medially; anterior angles strongly developed, acute; posterior angles strongly developed, subrectangular; basal foveae deep, narrow, very long; anterior lateral setiferous punctures touching lateral beads; punctuation feebly developed. Apex of prosternal lobe with 2 long setae and several short setae. Metepisterna longer than wide. **Legs**. Tarsi pubescent (with several setae) dorsally; metatarsomere 5 pubescent (with 4 setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Widest about middle. Shoulders strongly developed, angulate, without a tooth. Subapical sinuations absent. Sutural apices angulate. Scutellar striole present. Interneurs shallow, impunctate. Intervals impunctate, flat, becoming convex apically. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 36). Lateral view: strongly arcuate; apex blunt, sinuate, deflected ventrally. Dorsal view: asymmetrical (with ostium slightly deflected to the right); dorsal membranous area moderately wide, extending almost to basal bulb; apex deflected to the right; apical disc present, rounded-triangular. Internal sac armed.

Material examined. Holotype (NZAC).

Geographic distribution (Map p. 147). North Island: CL–Moehau Range, Fantail Creek.

Ecology. Lowland. A wet broadleaf forest: along a stream. Shaded ground; soil stony-gravelly, covered with dead leaves. Found dead under a stone. **Biology**. Seasonality: unknown. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner (after leg morphology).

Remarks. The configuration of the male aedeagus is unique among *Allocinopus* species. This is the only species so far recorded from the Coromandels and it seems geographically restricted to that region. This species is named after our good friend and colleague John Ward (Canterbury Museum, Christchurch) for his special encouragement toward the establishment of our new life and career in New Zealand.

Allocinopus latitarsis Broun, 1911 [E]

Figures 37, 119, 175; Map p. 147

Allocinopus latitarsis Broun, 1911: 95. Lectotype (here designated): male (BMNH) labelled "51.male. (rectangular label; hand-written) / Chathams Is. Broun Coll. B.M. 1922-482. (typed) / Pitt Island. -T. Hall- (hand-written) / Allocinopus latitarsis male. (hand-written) / LECTOTYPE *Allocinopus latitarsis* Broun, 1911 designated by Larochelle & Larivière 2004 (red label; typed). " Good condition. Right middle leg without last tarsomere. Paralectotypes: 2 males and 1 female (BMNH) bearing blue paralectotype labels.

Description. Body length: 7.5–11.5 mm. Slightly convex. Brownish; head darker; antennae and tarsi reddish or yellowish; apical half of tibiae light yellowish brown; mandibles mostly brownish; sides of pronotum and elytra reddish brown. Generally glabrous and smooth. Microsculpture absent or barely visible on head and pronotum, weak and moderately transverse on male elytra, strong and isodiametric on female elytra. Very shiny, without metallic lustre. **Head**. Moderately large, as wide across eyes as pronotal apex; flat anteriorly, slightly convex posteriorly. Labrum with apex straight or slightly emarginate medially. Eyes very large and convex. Antennae moderately long, reaching elytral base; antennal scape about 2× longer than its maximum width; pubescence starting from middle of antennomere 3. Paraglossae longer than ligula. Palpi truncate apically, with sparse short pubescence; penultimate segment of labial palpi plurisetose (with 3 long setae and 4 short setae) on anterior margin. **Thorax**. Pronotum (Fig. 119) very transverse, widest before middle; sides strongly converging toward base, not sinuate; base straight, moderately narrower than elytral base; apex concave; lateral depressions widening posteriorly; posterior bead complete; anterior angles moderately developed, obtuse; posterior angles moderately developed, rounded; basal foveae deep, wide; anterior lateral setiferous punctures touching lateral beads; punctuation feebly developed. Apex of prosternal lobe with 2 long setae and several short setae. Metepisterna longer than wide. **Legs**. Tarsi pubescent (with a few setae) dorsally; metatarsomere 5 pubescent (with 4 setae) ventrally; metatarsomere 1 short, slightly longer than metatarsomere 2. Male protarsi and mesotarsi strongly dilated laterally, about 2× wider than long (contrary to other *Allocinopus* species). **Elytra**. Widest about middle. Shoulders strongly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole present. Interneurs shallow, not deepening apically, impunctate. Intervals impunctate, flat, not convex apically. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 37). Lateral view: slightly arcuate; apex narrowly triangular, almost straight. Dorsal view: asymmetrical (with ostium slightly deflected to the right); dorsal membranous area very wide, extending almost to basal bulb; apex slightly deflected to the right; apical disc present, triangular. Internal sac armed.

Material examined. 274 specimens, including types (AMNZ, BBNZ, BMNH, CMNZ, ITNZ, LUNZ, MONZ, NZAC, UCNZ).

Geographic distribution (Map p. 147). Offshore Islands: CH–several localities on Chatham Island, Pitt Island, South East Island, North East Island, The Sisters.

Ecology. Lowland. Wet forests (broadleaf), shrublands, and scrublands. Also pastures, gardens, stream edges, and

coastal rocky faces. Mostly shaded ground; soil usually covered with dead leaves. Nocturnal; sheltering during the day under logs and stones (mostly), under fallen bark, plant debris, in leaf litter; in and around bird nests (*Puffinus*). Gregarious. **Biology**. Seasonality: September–March, July-August. Mating: September. Tenerals: February. Occasionally infested with mites and fungi (Laboulbeniales). **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. Good burrower. Occasional climber (on tree trunks at night). **Collecting techniques**. Turning logs and stones, pitfall trapping.

References. Noonan, 1973: 285 (taxonomy); Watt, 1980: 334 (distribution, ecology); Emberson, 1998: 30; Larochelle & Larivière, 2001: 122 (taxonomy, distribution, ecology, biology, dispersal power).

Remarks. The lectotype of *A. latitarsis* is designated to preserve stability of nomenclature in the future. The aedeagus of this species is morphologically close to that of *A. sculpticollis*, but *A. latitarsis* is unique among *Allocinopus* species in having male protarsi and mesotarsi strongly dilated laterally, and metatarsomeres 1 very short. It is also the only *Allocinopus* species so far recorded from the Chatham Islands and endemic to those islands. The external morphology of this species is highly variable, e.g., body shape and size can vary even within populations.

Allocinopus sculpticollis Broun, 1903 [E]

Figures 38, 86, 120, 176; Map p. 147

Allocinopus sculpticollis Broun, 1903: 608. Holotype: male (BMNH) labelled "Type (circular red-bordered label; typed) / 2624 (hand-written) / male (hand-written) / New Zeal. Broun Coll. Brit. Mus. 1922-482 (typed) / Motueka. Nelson. (hand-written) / Allocinopus sculpticollis. (hand-written)". Good condition. Left posterior leg without last tarsomere.

Allocinopus ocularius Broun, 1908: 344. Holotype: male (BMNH): labelled "Type (circular red-bordered label; typed) / 2625 (hand-written) / New Zeal. Broun Coll. Brit. Mus. 1922-482 (typed) / Manawatu near Gorge. (hand-written) / Allocinopus ocularius. male. (hand-written)". Good condition. Left middle and left posterior legs missing. **New synonym**.

Description. Body length: 9.0–11.0 mm. Moderately convex. Blackish (contrary to other *Allocinopus* species); antennae, palpi, and legs brownish red; mandibles mostly dark red; head with 1–2 reddish spots on disc (contrary to other *Allocinopus* species). Generally glabrous and smooth. Microsculpture strong, transverse (North Island) or isodiametric (South Island). Moderately shiny, without metallic lustre. **Head**. Moderately large, as wide across eyes as pronotal apex; flat anteriorly, slightly convex posteriorly. Labrum with apex slightly emarginate medially. Eyes moderately large and convex. Antennae moderately long, reaching elytral base; antennal scape about 2× longer than its maximum width; pubescence starting from middle of antennomere 3. Paraglossae longer than ligula. Palpi not truncate apically, with sparse short pubescence; penultimate segment of labial palpi plurisetose (with 3 long setae and 4 short setae) on anterior margin. **Thorax**. Pronotum (Fig. 120) cordate (heart-shaped), widest before middle; sides strongly converging toward base, strongly sinuate; base straight, slightly narrower than elytral base; apex concave; lateral depressions widening posteriorly (more than in other *Allocinopus* species); posterior bead complete; anterior angles strongly developed, acutely rounded; posterior angles strongly developed, subrectangular; basal foveae shallow, about as long as wide; anterior lateral setiferous punctures touching lateral beads; punctuation strongly developed (basally and laterally). Apex of prosternal lobe with 2 long setae and several short setae. Metepisterna longer than wide. **Legs**. Tarsi glabrous dorsally; metatarsomere 5 pubescent (with 4 setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Widest about middle. Shoulders strongly developed, angulate, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole present. Interneurs shallow, deepening apically, impunctate. Intervals impunctate, flat, becoming convex apically. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 38). Lateral view: slightly arcuate; apex narrowly pointed, slightly deflected ventrally. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area very wide, extending almost to basal bulb; apex straight (not deflected laterally); apical disc present, rounded-triangular. Internal sac armed.

Material examined. 422 specimens, including types (AMNZ, BMNH, ITNZ, JNNZ, LUNZ, MONZ, NZAC, UCNZ).

Geographic distribution (Map p. 147). North Island: BP, GB, HB, RI, TK, TO, WA, WI, WN. South Island: BR, NN, SD, WD.

Ecology. Lowland, montane. Wet forests (broadleaf, podocarp, beech), swamp forests, and shrublands: along streams and mud flats. Shaded ground; soil covered with dead leaves. Nocturnal; sheltering during the day in burrows dug under stones (mostly) and logs, also hiding under fallen branches and epiphyte crowns, and in leaf litter. Gregarious. **Biology**. Seasonality: October–April. Tenerals: October–April. Occasionally infested with mites and fungi (Laboulbeniales). **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. Good burrower. **Collecting techniques**. Turning stones and logs, pitfall trapping.

References. Hudson, 1934: 37 (distribution, ecology); Noonan, 1973: 285 (taxonomy); Townsend, 1997: 16 and 1998: 11, 21 (distribution); Larochelle & Larivière, 2001: 122–123 (including *ocularius*; taxonomy, distribution, ecology, biology, dispersal power).

Remarks. Examination of the holotype of *A. ocularius* revealed it to be conspecific with *A. sculpticollis*. Body shape and size are highly variable within and between populations, throughout the range of this species. North Island and South Island populations show different types of body microsculpture, but aedeagal characters are constant across all populations examined. See also **Remarks** under *A. latitarsis*.

Genus *Anisodactylus* Dejean, 1829 [A]

Anisodactylus Dejean 1829: 4. Type species: *Carabus binotatus* Fabricius, 1787, designated by Westwood, 1838: 4.

Description (*Anisodactylus binotatus*). Body length: 10.0–12.7 mm. Forebody (head and thorax) without sparse setiferous micropores dorsally. **Head**. Mandibles moderately long, slightly curved forward, blunt apically. Labrum strongly transverse; apex straight or slightly emarginate medially. Eyes moderately large, convex, moderately separated from buccal fissure ventrally (by about maximum width of antennal scape). Tempora not inflated. Frons without clypeo-ocular prolongations. Antennal pubescence starting from basal third of antennomere 3. Mentum without a tooth medially. Mentum and submentum fused, not separated by transverse suture. Paraglossae longer than ligula. Palpi with last segment fusiform, not truncate apically, with sparse, short pubescence; penultimate segment of labial palpi plurisetose on anterior margin. **Thorax**. Pronotum transverse, rectangular; base straight, as wide as elytral base; lateral beads complete; anterior and posterior beads complete. Scutellum visible. Apex of prosternal lobe pubescent. **Legs**. Metafemora with 3–4 long setae on posterior margin. Male protarsi and mesotarsi dilated laterally and spongily pubescent ventrally. Segment 4 of protarsi and mesotarsi of both sexes without membranous laminae. Tarsi glabrous (except metatarsomeres 1+2 with 3–6 setae) dorsally; metatarsomere 5 pubescent (with 8 setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Interneurs complete. Rows of setiferous punctures absent on intervals 3, 5, and 7, and on interneur 2. Umbilicate setiferous series of interval 9 continuous. **Abdomen**. Ventrites 2+3 of male without a setiferous fovea. Ventrites 5+6 of both sexes without short setae, with paired ambulatory setae only. **Aedeagus**. Lateral view: slightly arcuate. Dorsal view: asymmetrical (with ostium deflected to the left), twisted at middle; dorsal membranous area wide, not extending to basal bulb; apical disc present. Internal sac unarmed.

Geographic distribution. North America, Europe, Asia, northern Africa; New Zealand (adventive).

References. Noonan, 1973: 349–380 and 1976: 13 (taxonomy); Larochelle & Larivière, 2001: 123 (catalogue).

Subgenus *Anisodactylus* Dejean, 1829 [A]

Geographic distribution. Same as genus.

Anisodactylus binotatus (Fabricius, 1787) [A]

Figures 39, 87, 121, 177; Map p. 147

Carabus 2notatus Fabricius, 1787: 199. Type locality: Kiel, Germany.

Multiple synonyms exist in the Old World literature for this adventive species.

Description. Body length: 10.0–12.7 mm. Moderately convex. Black; antennae (segments 1–2), palpi (in part), and legs rufous; frons with 2 rufous, more or less confluent spots medially. Generally glabrous and smooth; elytra with outermost intervals and apex of other intervals pubescent and punctate. Microsculpture isodiametric (head, elytra), with somewhat transverse meshes (pronotum). Shiny, without metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Antennae moderately long, reaching about pronotum base; antennal scape about 2× longer than its maximum width. Penultimate segment of labial palpi with 6–7 long setae on anterior margin. **Thorax**. Pronotum (Fig. 121) very transverse, widest about middle; sides converging toward base, not sinuate; apex concave; lateral depressions widening posteriorly; anterior angles strongly developed, rounded; posterior angles strongly developed, subrectangular, with a tooth; basal foveae deep, wide; punctuation strongly developed (basally and laterally). Apex of prosternal lobe with 6–10 long setae and 3–6 short setae. Metepisterna longer than wide. **Elytra**. Widest about middle. Shoulders strongly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices rounded. Scutellar striole present. Interneurs shallow, impunctate. Intervals flat; outer intervals and apex of elytra finely and densely punctate. Interval 3 with setiferous puncture behind middle. **Aedeagus** (Fig. 39). Lateral view: slightly arcuate, very long. Dorsal view: asymmetrical (with ostium slightly deflected to the left), twisted at middle; dorsal membranous area wide, divided into two small parts; apical disc present. Internal sac unarmed.

Material examined. 31 non-type specimens (AMNZ, ITNZ, JNNZ, LUNZ, MONZ, NZAC, OMNZ).

Geographic distribution (Map p. 147). North Island: WN. South Island: CO, DN, MC, OL, SC. Introduced from Europe. First New Zealand record: Spreydon, Christchurch, MC, 1938 (Pilgrim, 1963: 837). Well established.

Ecology. Lowland, upland. Vicinities of cities. Gardens, cultivated fields (maize), pastures, tussock grasslands, dried stream beds, sand dunes, orchards, forests (beech, podocarp). Mostly open ground; soil moderately moist, with grass or weeds. Mostly nocturnal; sheltering during the day under logs, stones, plant debris, and in soil burrows. Sometimes active in the sunshine. **Biology**. Seasonality: September–April, June–July. Tenerals: April. Adult food (in Europe): worms, molluscs, and strawberries; the larva is carnivorous. Occasionally infested with mites. **Dispersal power**. Elytra free along suture. Macropterous. Capable of flight. Moderate runner. Occasional burrower. Clearly effective as a colonist; currently spreading its range both southward and northward. Strongly favored by human activities. **Collecting techniques**. Turning logs and stones, pitfall trapping, using yellow pan traps.

References. Pilgrim, 1963: 837-839 (distribution); Butcher & Emberson, 1981: 60 (distribution, ecology); Johns, 1986: 31 (distribution, ecology); Lindroth, 1986: 370 (distribution, ecology, biology, dispersal power); Larochelle & Larivière, 2001: 123 (taxonomy, distribution, ecology, biology, dispersal power) and 2003: 70–71 (ecology, biology, dispersal power, collecting techniques).

Genus *Gaioxenus* Broun, 1910 E

Gaioxenus Broun, 1910: 7. Type species: *Gaioxenus pilipalpis* Broun, 1910, by monotypy.

Description. Body length: 8.5–9.0 mm. Boat-shaped (contrary to other Harpalini genera). Forebody (head and thorax) without sparse setiferous micropores dorsally. **Head**. Mandibles moderately long, slightly curved forward, blunt apically. Labrum slightly transverse, almost square; apex curved. Eyes moderately large, convex, widely separated from buccal fissure ventrally (by about 1.5× maximum width of antennal scape). Tempora not inflated. Frons without clypeo-ocular prolongations. Antennal pubescence starting from middle of antennomere 3. Mentum with a tooth medially, moderately shorter than lateral lobes. Mentum and submentum separated by laterally incomplete transverse suture. Paraglossae as long as ligula. Palpi with last segment fusiform, not truncate apically, with moderately dense and long pubescence; penultimate segment of labial palpi plurisetose on anterior margin. **Thorax**. Pronotum transverse; base almost straight, as wide as elytral base; lateral beads complete; anterior bead complete (well defined medially); posterior bead complete. Scutellum hidden (contrary to other Harpalini genera). Apex of prosternal lobe pubescent. **Legs**. Metafemora with 2 long setae on posterior margin. Male protarsi and mesotarsi dilated laterally and spongily pubescent ventrally. Segment 4 of protarsi and mesotarsi of both sexes without membranous laminae. Tarsi pubescent (with numerous setae) dorsally; metatarsomere 5 pubescent (with numerous setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Subtriangular (contrary to other Harpalini genera). Interneurs complete. Rows of setiferous punctures absent on intervals 3, 5, and 7, and on interneur 2. Umbilicate setiferous series of interval 9 continuous. **Abdomen**. Ventrites 2+3 of male without a setiferous fovea. Ventrites 5+6 of both sexes without short setae, with paired ambulatory setae only. **Aedeagus** (Fig. 40). Lateral view: strongly arcuate. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area very wide, extending to basal bulb; apical disc present. Internal sac unarmed.

Geographic distribution. New Zealand (endemic; North Island).

References. Hudson, 1934: 177 (list); Noonan, 1976: 9 (taxonomy); Larochelle & Larivière, 2001: 123–124 (catalogue).

Gaioxenus pilipalpis Broun, 1910 E

Figures 40, 88, 122, 178; Map p. 147

Gaioxenus pilipalpis Broun, 1910: 8. Lectotype (here designated): male (BMNH) labelled "Type (circular red-bordered label; typed) / New Zealand. Broun Coll. 1922-482. (typed) / Raurimu Jany. 1909. (hand-written) / (yellow rectangular label without any writing) / Gaioxenus pilipalpis (hand-written) / LECTOTYPE *Gaioxenus pilipalpis* Broun, 1910 designated by Larochelle & Larivière 2004 (red label; typed)." Perfect condition. Paralectotypes: 1 male and 2 females (BMNH) bearing blue paralectotype labels.

Description. Body length: 8.5–9.0 mm. Slighty convex. Piceous; lateral margins of pronotum piceous reddish; labrum and mandibles reddish; palpi brownish red; antennae, tibiae, and tarsi rusty reddish brown; femora sometimes piceous. Generally glabrous and smooth. Microsculpture isodiametric. Dull, without metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Antennae rather long, reaching basal 1/4 of elytra; antennal scape about 2× longer than its maximum width. Penultimate segment of labial palpi with 2 long setae and 2 short setae on anterior margin. **Thorax**. Pronotum (Fig. 122) very transverse, widest at base; sides converging toward apex, not sinuate; apex concave; lateral depressions widen-

ing posteriorly; anterior angles moderately developed, obtuse-rounded; posterior angles strongly developed, subrectangular; basal foveae shallow, narrow; punctuation feebly developed. Apex of prosternal lobe with 3–4 long setae and 7–8 short setae. Metepisterna wider than long. **Elytra**. Widest about middle. Shoulders strongly developed, angulate, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole present. Interneurs shallow, deepening apically, impunctate. Intervals impunctate, flat, becoming convex apically. Interval 3 with a setiferous puncture behind middle. **Aedeagus** (Fig. 40). As for genus.

Material examined. 169 specimens, including types (AMNZ, BMNH, CMNZ, ITNZ, JNNZ, LUNZ, NZAC, UCNZ).

Geographic distribution (Map p. 147). North Island: BP, CL, RI, TK, TO, WI, WN, WO.

Ecology. Lowland, montane, subalpine, alpine. Mostly wet forests (beech, broadleaf, podocarp). Also tussock grasslands. Nocturnal; sheltering during the day often in burrows dug under stones and logs, also hiding under fallen branches and epiphyte crowns. Gregarious. **Biology**. Seasonality: September–April. Tenerals: late December–March. Occasionally infested with mites. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runnner. Good burrower. **Collecting techniques**. Turning stones and logs, pitfall trapping.

References. Larochelle & Larivière, 2001: 123–124 (taxonomy, distribution, ecology, biology, dispersal power).

Remarks. Broun described *Gaioxenus pilipalpis* from 5 specimens, 4 of which could be located in the Natural History Museum, London (BMNH). One of these specimens is designated as lectotype to preserve stability of nomenclature in the future. This species is unique among New Zealand Harpalini in having a boat-shaped body. In the northern part of its range, it occurs at higher elevation, more or less following the distribution of southern beeches (*Nothofagus*).

Genus *Gnathaphanus* Macleay, 1825 [A]

Gnathaphanus Macleay, 1825: 20 (originally proposed with subgeneric rank in *Trechus* Clairville, 1806; first used with generic rank by Chaudoir, 1878: 511). Type species: *Trechus* (*Gnathaphanus*) *vulneripennis* Macleay, 1825, by monotypy.

Pachauchenius Macleay, 1864: 116. Type species: *Pachauchenius laeviceps* Macleay, 1864, by monotypy. Synonymised by Chaudoir, 1878: 511.

Mirosarus Bates, 1878a: 319. Type species: *Mirosarus insularis* Bates, 1878a (=*Gnathaphanus melbournensis* Laporte de Castelnau, 1867), by monotypy. Synonymised by Sloane, 1899: 553.

Description (*Gnathaphanus melbournensis*). Body length: 6.5–7.5 mm. Forebody (head and thorax) without sparse setiferous micropores dorsally. **Head**. Mandibles short, strongly curved forward, blunt apically. Labrum strongly transverse; apex slightly emarginate medially. Eyes moderately large, convex, widely separated from buccal fissure ventrally (by about 1.5× maximum width of antennal scape). Tempora not inflated. Frons without clypeo-ocular prolongations. Antennal pubescence starting from middle of antennomere 3. Mentum without a tooth medially. Mentum and submentum separated by complete transverse suture. Paraglossae longer than ligula. Palpi with last segment fusiform, truncate apically, with sparse, moderately long pubescence; penultimate segment of labial palpi plurisetose on anterior margin. **Thorax**. Pronotum transverse; base slightly emarginate, as wide as elytral base; lateral beads complete; anterior and posterior beads incomplete medially. Scutellum visible. Apex of prosternal lobe pubescent. **Legs**. Metafemora with 2 long setae on posterior margin. Male protarsi and mesotarsi dilated laterally and spongily pubescent ventrally. Segment 4 of protarsi and mesotarsi of both sexes without membranous laminae. Tarsi glabrous dorsally; metatarsomere 5 pubescent (with 6 setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3+4. **Elytra**. Interneurs complete. Rows of setiferous punctures present on interval 3, absent on intervals 5 and 7, and on interneur 2. Umbilicate setiferous series of interval 9 continuous. **Abdomen**. Ventrites 2+3 of male without a setiferous fovea. Ventrites 5+6 of both sexes without short setae, with paired ambulatory setae only. **Aedeagus** (Fig. 41). Lateral view: strongly arcuate. Dorsal view: asymmetrical (with ostium slightly deflected to the right); dorsal membranous area wide, extending almost to basal bulb; apical disc present. Internal sac armed.

Geographic distribution. Australian Region, Oriental Region, and the Pacific Islands to Japan and New Guinea.

References. Sloane, 1899: 553–554 (key to Australian species); Habu, 1973: 56–62 (Japanese taxa); Noonan, 1973: 289–290 and 1976: 9 (taxonomy); Moore *et al*., 1987: 228–232 (synonymy, distribution).

Remarks. This genus is in need of revision.

Gnathaphanus melbournensis (Laporte de Castelnau, 1867) [A] first New Zealand record

Figures 41, 89, 123, 179; Map p. 148

Harpalus melbournensis Laporte de Castelnau, 1867: 97. Type locality: Melbourne, Victoria, Australia.

Harpalus paroensis Laporte de Castelnau, 1867: 98. Type locality: Paroo River, New South Wales, Australia. Synonymised by Chaudoir, 1878: 510.

Harpalus marginicollis Laporte de Castelnau, 1867: 103. Type locality: Melbourne, Victoria, Australia. Synonymised by by Chaudoir, 1878: 510.

Harpalus adelaideae Laporte de Castelnau, 1867: 108. Type locality: Adelaide and Port Lincoln (South Australia), and King George Sound (Western Australia), Australia. Synonymised by by Chaudoir, 1878: 510.

Harpalus planipennis Macleay, 1871: 101. Type locality: Gayndah, Queensland, Australia. Synonymised by Sloane, 1899: 555.

Harpalus angustatus Macleay, 1871: 102. Type locality: Gayndah, Queensland, Australia. Synonymised by Sloane, 1899: 555.

Harpalus aeneonitens Macleay, 1871: 102. Type locality: Gayndah, Queensland, Australia. Synonymised by by Chaudoir, 1878: 510.

Harpalus gayndahensis Macleay, 1871: 102. Type locality: Gayndah, Queensland, Australia. Synonymised by Sloane, 1899: 555.

Harpalus atroviridis Macleay, 1871: 103. Type locality: Gayndah, Queensland, Australia. Synonymised by Sloane, 1899: 555.

Mirosarus insularis Bates, 1878a: 319. Type locality: south or central Tasmania, Australia. Synonymised by Sloane, 1899: 555.

Description. Body length: 6.5–7.5 mm. Slightly convex. Dark brown; antennal base, palpi, and tibiae yellowish. Generally glabrous and smooth, except for sparse punctuation on pronotum and a series of setiferous punctures on interval 3. Microsculpture isodiametric, more or less erased on head. Shiny; pronotum and elytra with bronze lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Antennae moderately long, almost reaching pronotal base; antennal scape about 2× longer than its maximum width. Penultimate segment of labial palpi with 1–2 long setae and 4–5 short setae on anterior margin. **Thorax**. Pronotum (Fig. 123) very transverse, widest about middle; sides converging toward base, not sinuate; apex concave; lateral depressions widening posteriorly; anterior angles strongly developed, rounded; posterior angles moderately developed, broadly rounded; basal foveae deep, wide; punctuation strongly developed (in basal foveae). Apex of prosternal lobe with 2 long setae and several short setae. Metepisterna longer than wide. **Elytra**. Widest behind middle. Shoulders strongly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole present. Interneurs shallow, impunctate. Intervals impunctate, flat. Interval 3 with a series of 5–7 deep, rather large setiferous punctures. **Aedeagus** (Fig. 41). As for genus.

Material examined. 14 non-type specimens (ITNZ, LUNZ, NZAC, PHNZ, UCNZ).

Geographical distribution (Map. p. 148). North Island: HB–Waipatiki Beach. South Island: KA–Clarence River mouth. Kowhai River mouth. NC–Waiau River. MC–Lincoln. Mc[C?]lean's Island. Adventive. Extralimital range: Australia (including Tasmania and Lord Howe Island). First New Zealand record: Mc[?]Clean's Island, 1985 (PHNZ). Well established.

Ecology. Lowland. Cultivated fields (carrots), pastures, and sand dunes. Open ground; dry sandy soil with sparse vegetation (grass, weeds). Nocturnal; sheltering during the day under logs and stones. Gregarious. **Biology**. Seasonality: October, January–March. Omnivorous, probably granivorous (Moore *et al*., 1987). **Dispersal power**. Elytra free along suture. Macropterous. Capable of flight (Moore *et al*., 1987). Moderate runner. Good burrower. **Collecting techniques**. Pitfall trapping, turning logs and stones.

References. Moore *et al*., 1987: 229–230 (synonymy, distribution, ecology, biology, dispersal power).

Remarks. This introduced species is likely to spread into a wider range of modified habitats.

Genus *Hypharpax* Macleay, 1825 N

Hypharpax Macleay, 1825: 22 (originally proposed with subgeneric rank in *Harpalus* Latreille, 1802; first used with generic rank by Lacordaire, 1854: 282). Type species: *Harpalus (Hypharpax) lateralis* Macleay, 1825, by monotypy.

Sagraemerus Redtenbacher, 1868: 13. Type species: *Sagraemerus javanus* Redtenbacher, 1868, by monotypy. Synonymised by Andrewes, 1924: 467.

Description (New Zealand). Body length: 4.5–7.0 mm. Forebody (head and thorax) without sparse setiferous micropores dorsally. **Head**. Mandibles short, strongly curved forward, blunt apically. Labrum strongly transverse; apex straight or slightly emarginate medially. Eyes moderately large, convex, widely separated from buccal fissure ventrally (by about 1.5× maximum width of antennal scape). Tempora not inflated. Frons without clypeo-ocular prolongations. Antennal pubescence starting about middle of antennomere 3. Mentum with a tooth medially, moderately shorter than lateral lobes. Mentum and submentum separated by complete transverse suture. Paraglossae as long as ligula. Palpi with last segment fusiform, truncate or not apically, with sparse, moderately long pubescence; penultimate segment of labial palpi plurisetose or trisetose on anterior margin. **Thorax**. Pronotum transverse, subrectangular; base straight or slightly convex, as wide as or much narrower than elytral base; lateral beads complete; anterior and posterior beads incomplete medially. Scutellum visible. Apex of prosternal lobe pubescent. **Legs**. Metafemora with 4–6 long setae on posterior margin. Male

protarsi and mesotarsi dilated laterally and spongily pubescent ventrally. Segment 4 of protarsi and mesotarsi of both sexes without membranous laminae. Tarsi glabrous dorsally; metatarsomere 5 pubescent (with 4 setae) ventrally; metatarsomere 1 subtriangular, short, only about as long as metatarsomere 2. **Elytra**. Interneurs complete. Rows of setiferous punctures absent on intervals 3, 5, and 7, and on interneur 2. Umbilicate setiferous series of interval 9 separated into two major groups, with posterior group continuous. **Abdomen**. Ventrites 2+3 of male without a setiferous fovea. Ventrites 5+6 of both sexes without short setae, with paired ambulatory setae only. **Aedeagus**. Lateral view: strongly arcuate. Dorsal view: asymmetrical (with ostium deflected to the right); dorsal membranous area wide, extending to basal bulb; apical disc present. Internal sac armed.

Geographic distribution. Australia (including Tasmania and Lord Howe Island), New Guinea, Indonesia, New Zealand.

References. Hudson, 1934: 177 (list); Noonan, 1973: 288–289 and 1976: 9 (taxonomy); Moore *et al*., 1987: 237–240 (list of Australian species); Moore, 1992: 168 (distribution); Larochelle & Larivière, 2001: 124–125 (catalogue).

Remarks. This genus is in need of revision.

Key to species of *Hypharpax*

1 Pronotum (Fig. 125): sides moderately convex; posterior angles obtuse; base straight, as wide as elytral base; basal foveae shallow, wide; base finely punctate. Antennomeres 8–10 almost square. Elytra (Fig. 181) shorter (about 2.3× longer than wide). Penultimate segment of labial palpi plurisetose (Fig. 9). Aedeagus (Fig. 43): apex swollen, button-like. Body length usually less than 5.5 mm. [South Island] ....(p. 38)... ***antarcticus*** (Laporte de Castelnau)

— Pronotum (Fig. 124): sides strongly convex; posterior angles broadly rounded; base slightly convex, much narrower than elytral base; basal foveae deep, rather narrow; base coarsely punctate. Antennomeres 8–10 elongate. Elytra (Fig. 180) longer (about 2.8× longer than wide). Penultimate segment of labial palpi trisetose (Fig. 10). Aedeagus (Fig. 42): apex barely inflated, not button-like. Body length usually over 5.5 mm. [North Island, South Island, Chatham Islands] ....(p. 39)... ***australis*** (Dejean)

Hypharpax antarcticus (Laporte de Castelnau, 1867) [E]

Figures 43, 125, 181; Map p. 148

Harpalus antarcticus Laporte de Castelnau, 1867: 107 (redescribed in 1868: 193). Lectotype (here designated): male (MCSN) labelled "N. Zel. Dunedin (hand-written) / N. Zel. Dunedin (hand-written) Coll. Castelnau (typed) / SYNTYPUS (typed) Harpalus antarcticus Castelnau (hand-written) (red label) / Diaphoromerus antarcticus Cast. teste Chaudoir (hand-written) / LECTOTYPE *Harpalus antarcticus* Laporte de Castelnau, 1867 designated by Larochelle & Larivière, 2005 (red label, typed)." Excellent condition.

Hypharpax antarcticus: Bates, 1874: 272.

Diaphoromerus antarcticus: Chaudoir, 1878: 485.

Hypharpax antarcticus: Hudson, 1934: 37, 177.

Description. Body length: 4.5–5.5 mm. Slightly convex. Green or piceous black; base of antennae (segments 1+2) and tibiae (2/3rd) pale, reddish brown. Generally glabrous and smooth. Microsculpture moderately transverse. Somewhat dull, with aeneous or bronze metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Antennae moderately long, reaching about pronotal base; antennal scape about 2× longer than its maximum width; antennomeres 8–10 almost square. Palpi not narrowly truncate apically; penultimate segment of labial palpi plurisetose (with 2 long setae and 2–3 short setae) on anterior margin. **Thorax**. Pronotum (Fig. 125) very transverse, subrectangular, widest about middle; base straight, as wide as elytral base; sides converging toward base, moderately convex, not sinuate; apex straight; lateral depressions absent; anterior angles feebly developed, rounded; posterior angles strongly developed, obtuse; basal foveae shallow, wide; punctuation feebly developed (basally). Apex of prosternal lobe with 3–4 long setae and numerous short setae. Metepisterna longer than wide. **Elytra**. Widest about middle; approximately 2.3× longer than wide. Shoulders strongly developed, angulate, without a tooth. Subapical sinuations feeble. Sutural apices angulate-rounded. Scutellar striole absent or present. Interneurs shallow, impunctate. Intervals impunctate, flat. Interval 3 with a setiferous puncture behind middle. **Aedeagus** (Fig. 43). Lateral view: as for genus; extremity of apex swollen, button-like. Dorsal view: as for genus; ostium strongly deflected to the right.

Material examined. 108 specimens, including types (AMNZ, CMNZ, ITNZ, LUNZ, MCSN, NZAC, PHNZ, UCNZ).

Geographic distribution (Map p. 148). South Island: CO, DN, KA, MB, MC, MK, NC, NN, OL, SC. Offshore Islands: CH.

Ecology. Lowland, montane, subalpine, alpine. Tussock grasslands, cultivated fields (lucerne, *Festuca*), pastures,

and gardens. Also river banks. Open ground; soil covered with grass or weeds. Mostly diurnal; usually active in the sunshine; sheltering on cloudy days under stones and at the base of tussock clumps. **Biology**. Seasonality: throughout the year. Predators: starlings. **Dispersal power**. Elytra free along suture. Macropterous. Frequent flier. Moderate runner. Regular climber (on plants). Strongly favoured by human activities. **Collecting techniques**. Pitfall trapping, turning stones, sweeping plants.

References. Hudson, 1934: 37 (distribution, ecology); Noonan, 1973: 289 (taxonomy); Johns, 1986: 31 (distribution); Larochelle & Larivière, 2001: 124 (taxonomy, distribution, ecology, biology, dispersal power).

Remarks. Twelve syntypes of *Harpalus antarcticus* were obtained from the Castelnau collection in Genova (MCSN), one of which (a male collected from Dunedin) is here designated as a lectotype to preserve stability of nomenclature in the future. This male is the middle specimen of a series of 3 syntypes glued to the same card.

Although morphologically close, *H. antarcticus* and *H. australis* can be easily diagnosed based on external features and male aedeagus. In addition, *H. antarcticus* does not occur in the North Island.

Hypharpax australis (Dejean, 1829) [A]

Figures 42, 90, 124, 180; Map p. 148

Harpalus australis Dejean, 1829: 385. Type locality: Australia (as Nouvelle-Hollande).

Harpalus inornatus Germar, 1848: 169. Type locality: Adelaide, South Australia. Synonymised by Chaudoir, 1878: 484.

Harpalus coxii Laporte de Castelnau, 1867: 107 (redescribed in 1868: 193). Type locality: Clarence River, New South Wales, Australia. Synonymised by Chaudoir, 1878: 484.

Hypharpax australis: Bates, 1874: 272.

Diaphoromerus australis: Chaudoir, 1878: 484.

Hypharpax australis: Broun, 1880: 51.

Hypharpax abstrusus Bates, 1878c: 23. Lectotype (here designated): male (MNHN) labelled "Auckland N.Z. (handwritten) / Coll. Chaudoir (hand-written) / Ex Musaeo H.W. BATES 1892 (typed) / Hypharpax abstrusus Bates (hand-written) / LECTOTYPE *Hypharpax abstrusus* Bates, 1878 designated by Larochelle & Larivière 2004 (red label; typed)." Perfect condition. **New synonym**.

Hypharpax parvus Chaudoir, 1878: 500. Type locality: Southern Australia. Synonymised by Moore, in Moore *et al*., 1987: 237.

Hypharpax (*Harpalus*) *australis*: Blackburn, 1892: 83.

Hypharpax australis: Hutton, 1904: 351.

Description. Body length: 5.5–7.0 mm. Slightly convex. Green or piceous black; base of antennae (segments 1+2) and tibiae (2/3rd) pale, reddish brown. Generally glabrous and smooth. Microsculpture isodiametric. Somewhat dull with aeneous or bronze metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Antennae moderately long, reaching about pronotal base; antennal scape about 2× longer than its maximum width; antennomeres 8–10 elongate. Palpi narrowly truncate apically; penultimate segment of labial palpi trisetose (with 2 long setae and 1 short seta) on anterior margin. **Thorax**. Pronotum (Fig. 124) very transverse, subrectangular, widest before middle; base slightly convex, much narrower than elytral base; sides converging toward base (more so than in *antarcticus*), strongly convex, not sinuate; apex straight; lateral depressions absent; anterior angles feebly developed, rounded; posterior angles moderately developed, broadly rounded; basal foveae deep, rather narrow; punctuation strongly developed (in basal foveae and basally). Apex of prosternal lobe with 3–4 long setae and numerous short setae. Metepisterna longer than wide. **Elytra**. Widest about middle; approximately 2.8× longer than wide. Shoulders strongly developed, angulate, without a tooth. Subapical sinuations feeble. Sutural apices angulate-rounded. Scutellar striole present. Interneurs shallow, impunctate. Intervals impunctate, flat. Interval 3 with a setiferous puncture behind middle. **Aedeagus** (Fig. 42). Lateral view: as for genus; extremity of apex barely inflated dorsally. Dorsal view: as for genus; ostium slightly deflected to the right.

Material examined. 502 specimens, including *H. abstrusus* type (AMNZ, BBNZ, ITNZ, JNNZ, LUNZ, MNHN, MONZ, NZAC, OMNZ, PHNZ, UCNZ).

Geographic distribution (Map p. 148). North Island: AK, BP, CL, GB, HB, ND, RI, TK, TO, WI, WN, WO. South Island: CO, KA, MB, MC, MK, NN, OL, SC, SD. Offshore Islands: CH, TH. Adventive. Extralimital range: Australia (including Tasmania and Lord Howe Island). First New Zealand records: Mt Albert, AK, 1916 (NZAC); New Zealand (Redtenbacher, 1868: 15), Auckland, AK (MNHN, as *H. abstrusus* Bates, 1878). Well established.

Ecology. Lowland, montane. Sand dunes, pastures, cultivated fields (lucerne, carrot, pea), farmlands, gardens, tussock grasslands, river banks, scrublands. Open ground; sandy or clayey soil covered with grass or weeds. Mostly diurnal; usually active in the sunshine; sheltering on cloudy days in burrows dug at the base of plants, under stones, pieces of wood, logs, dead leaves, *Muehlenbeckia*-clumps, and at the base of *Spinifex* plants. Gregarious. **Biology**. Seasonality: throughout the year, except May–June. Tenerals: February. Omnivorous, probably granivorous (Moore *et al*., 1987). Predators: starlings. Regularly infested with mites. **Dispersal power**. Elytra free along suture. Macropterous. Frequent flier. Moderate runner. Occasional climber (on shrubs and plants). Clearly effective

as a colonist. Strongly favoured by human activities. **Collecting techniques**. Pitfall trapping, digging at the base of plants, turning debris, light trapping.

References. Walker, 1904: 76 (as *abtrusus*; distribution, ecology); Thomson, 1922: 284 (distribution); Pilgrim, 1963: 842 (distribution); Noonan, 1973: 289 (taxonomy); Johns, 1980: 63 (as *abtrusus*; distribution, ecology); Moeed, 1980: 250 (biology); Butcher & Emberson, 1981: 64 (distribution, ecology); Johns, 1986: 31 (distribution, ecology); Moore *et al*., 1987: 237–238 (synonymy, distribution, ecology, biology, dispersal power); Kuschel, 1990: 24, 40 (distribution, ecology, biology, dispersal power); Moore, 1992: 168 (distribution); Patrick *et al*., 1992: 272 (distribution); Townsend, 1997: 16 and 1998:18, 21 (distribution); Emberson, 1998: 30 (distribution, ecology, biology); Larochelle & Larivière, 2001: 125 (taxonomy, distribution, ecology, biology, dispersal power).

Remarks. Bates' original description was based on "a single pair [male symbol, female symbol]" from "Auckland." The male syntype was obtained from the Bates' collection in Paris (MNHN); it is here selected as lectotype to preserve stability of nomenclature in the future. The whereabouts of the female syntype are unknown. This species occurs on both main islands of New Zealand. See also **Remarks** under *H. antarcticus*.

Genus *Maoriharpalus* new genus [E]

Type species. *Maoriharpalus sutherlandi* new species, by present designation.

Description. Body length: 12.0–13.0 mm. Forebody (head and thorax) without sparse setiferous micropores dorsally. **Head**. Mandibles very long (about 6x their maximum width), slightly curved forward, blunt apically. Labrum strongly transverse; apex strongly emarginate medially. Eyes moderately large, convex, widely separated from buccal fissure ventrally (by about 2× maximum width of antennal scape). Tempora not inflated. Frons without clypeo-ocular prolongations. Antennal pubescence starting from basal third of antennomere 3; antennal scape very long (about 5-6x longer than maximum width; contrary to other Anisodactylina genera). Mentum without tooth medially. Mentum and submentum separated by complete transverse suture. Paraglossae longer than ligula. Palpi with last segment cylindrical, truncate apically, with moderately dense, long pubescence; penultimate segment of labial palpi plurisetose on anterior margin. **Thorax**. Pronotum suborbicular; base strongly convex, moderately narrower than elytral base; lateral beads complete; anterior and posterior beads incomplete medially. Scutellum visible. Apex of prosternal lobe pubescent. **Legs**. Metafemora with 3 long setae on posterior margin. Male protarsi and mesotarsi dilated laterally and spongily pubescent ventrally. Segment 4 of protarsi and mesotarsi of both sexes without membranous laminae. Tarsi pubescent (with numerous setae) dorsally; metatarsomere 5 pubescent (with numerous setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Interneurs complete. Rows of setiferous punctures absent on intervals 3, 5, and 7, and on interneur 2. Umbilicate setiferous series of interval 9 continuous. **Abdomen**. Ventrites 2+3 of male without a setiferous fovea. Ventrites 5+6 of both sexes without short setae, with paired ambulatory setae only. **Aedeagus** (Fig. 44). Lateral view: slightly arcuate. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area very wide, extending almost to basal bulb; apical disc absent. Internal sac unarmed.

Geographic distribution. New Zealand (endemic; Three Kings Islands).

Remarks. The generic name is derived from *Maori* (the Polynesian people who colonised New Zealand) and *Harpalus* (the type genus of the tribe Harpalini). This very distinctive monotypic taxon is characterised by long mandibles and antennal scapes, a strongly emarginate labrum, relatively small eyes, and a suborbicular pronotum.

Maoriharpalus sutherlandi new species [E]

Figures 44, 91, 126, 182; Map p. 148

Maoriharpalus sutherlandi Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "Three Kings Is Great I. Nov. 70 NZ. Ent. Div. Exp. (typed) / G. Ramsay (typed) / Castaway Camp (typed) / HOLOTYPE [male symbol] *Maoriharpalus sutherlandi* Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 3 males (2 NZAC, 1 AMNZ) from Great Island, bearing blue paratype labels.

Description. Body length: 12.0–13.0 mm. Slightly convex. Piceous black; antennae (except segment 1), palpi, and tarsi rufous. Generally glabrous and smooth. Microsculpture isodiametric on head, moderately transverse on pronotum, very transverse (with microlines) on elytra. Shiny, without metallic lustre; elytra iridescent. **Head**. Moderately large, narrower across eyes than pronotal apex; excavated anteriorly, flat posteriorly. Antennae very long, reaching middle of elytra; antennal scape elongate, about 5–6× longer than its maximum width. Penultimate segment of labial palpi with 5–6 long setae on anterior margin. **Thorax**. Pronotum (Fig. 126) suborbicular, widest before middle; sides converging toward base, not sinuate; apex convex; lateral depressions widening posteriorly; anterior angles strongly developed, obtuse; posterior angles feebly developed, broadly rounded; basal foveae deep, nar-

row; punctuation feebly developed. Apex of prosternal lobe with 4-6 long setae. Metepisterna wider than long. **Elytra**. Widest about middle. Shoulders well developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole present. Interneurs shallow, deepening apically, impunctate. Intervals impunctate, flat, becoming convex apically. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 44). As for genus.

Material examined. 10 specimens, including types (AMNZ, NZAC).

Geographic distribution (Map p. 148). Offshore Islands: TH-Great Island. South West Island.

Ecology. Lowland. Wet forests (broadleaf, podocarp). Shaded ground. Nocturnal; sheltering during the day under stones. **Biology**. Seasonality: October–November. Tenerals: November. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. **Collecting techniques**.Turning stones.

Remarks. This species is named after our friend O. R. W. Sutherland (former Science Manager, Landcare Research) for his special help and encouragement in establishing our new life and career in New Zealand. The mouthparts indicate that the species may feed on hard-bodied invertebrates like snails.

Genus *Notiobia* Perty, 1830 [A]

Notiobia Perty, 1830: 13. Type species: *Notiobia nebrioides* Perty, 1830, by monotypy.

Description (*Notiobia quadricollis*). Body length: about 8.0 mm. Forebody (head and thorax) without sparse setiferous micropores dorsally. **Head**. Mandibles moderately long, slightly curved forward, blunt apically. Labrum strongly transverse; apex slightly emarginate medially. Eyes moderately large, convex, widely separated from buccal fissure ventrally (by about 2× maximum width of antennal scape). Tempora not inflated. Frons without clypeo-ocular prolongations. Antennal pubescence starting from middle of antennomere 3. Mentum with a tooth medially, moderately shorter than lateral lobes. Mentum and submentum separated by complete transverse suture. Paraglossae as long as ligula. Palpi with last segment fusiform, truncate apically, with sparse, moderately long pubescence; penultimate segment of labial palpi plurisetose on anterior margin. **Thorax**. Pronotum transverse, subrectangular; base straight, as wide as elytral base; lateral beads complete; anterior bead incomplete medially; posterior bead complete. Scutellum visible. Apex of prosternal lobe pubescent. **Legs**. Metafemora with 2 long setae on posterior margin. Male protarsi and mesotarsi dilated laterally and spongily pubescent ventrally. Segment 4 of protarsi and mesotarsi of both sexes without membranous laminae. Tarsi glabrous dorsally; metatarsomere 5 pubescent (with 4 setae) ventrally; metatarsomere 1 parallel-sided, very long, almost as long as metatarsomeres 2+3+4. **Elytra**. Interneurs complete. Rows of setiferous punctures absent on intervals 3, 5, and 7, and on interneur 2. Umbilicate setiferous series of interval 9 separated into two major groups, with posterior group continuous. **Abdomen**. Ventrites 2+3 of male without a setiferous fovea. Ventrites 5+6 of both sexes without short setae, with paired ambulatory setae only. **Aedeagus**. No male seen.

Geographic distribution. Australian Region, Neartic Region, Neotropical Region.

References. Noonan, 1973: 293–338 and 1976: 10–11 (taxonomy). Moore *et al*., 1987: 232–237 (distribution).

Remarks. Australian representatives of this genus are in need of revision.

Subgenus *Anisotarsus* Chaudoir, 1837 [A]

Anisotarsus Chaudoir, 1837: 41. Type species: *Anisotarsus brevicollis* Chaudoir, 1837, designated by Emden, 1953: 519.

Diaphoromerus Chaudoir, 1843: 402. Type species: *Diaphoromerus iridipennis* Chaudoir, 1843, by monotypy.

Eurytrichus LeConte, 1848: 387. Type species: *Feronia terminata* Say, 1823, designated by Emden, 1953: 525.

Stilbolidus Casey, 1914: 171. Type species: *Harpalus mexicanus* Dejean, 1829, by original designation.

Geographic distribution. As for genus.

References. As for genus.

Notiobia (*A*.) *quadricollis* (Chaudoir, 1878) [A] first New Zealand record

Figures 92, 127, 183; Map p. 148

Diaphoromerus quadricollis Chaudoir, 1878: 86. Type locality: northern Australia.

Notiobia (*A*.) *quadricollis*: Noonan, 1976: 10.

Description. Body length: 8.2 mm. Moderately convex. Black; antennomere 1 rufous. Generally glabrous and smooth. Microsculpture isodiametric. Dull, without metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width. Penultimate segment of labial palpi with 2 long setae and 6 short setae on anterior margin. **Thorax**. Pronotum (Fig. 127) very transverse, widest about middle;

sides converging toward base, not sinuate; apex straight; lateral depressions widening posteriorly; anterior angles moderately developed, obtuse; posterior angles strongly developed, subrectangular; basal foveae deep, moderately wide; punctuation strongly developed (in basal foveae). Apex of prosternal lobe with 3–4 long setae. Metepisterna longer than wide. **Elytra**. Widest about middle. Shoulders well developed, angulate, with a tooth. Subapical sinuations moderate. Sutural apices angulate. Scutellar striole present. Interneurs shallow, impunctate. Intervals impunctate, flat. Interval 3 with a setiferous puncture behind middle. **Aedeagus**. No male seen.

Material examined. 1 non-type specimen (NZAC).

Geographic distribution (Map p. 148). North Island: ND–Spirits Bay (1957). Adventive. Extralimital distribution: Australia (mainland). Doubtfully established.

Ecology. One dead specimen found on a beach. **Biology**. Seasonality: unknown. Omnivorous, probably granivorous (Moore *et al.*, 1987). **Dispersal power**. Elytra free along suture. Macropterous. Capable of flight (Moore *et al.*, 1987). Moderate runner (after leg morphology).

References. Moore *et al*., 1987: 236 (synonymy, distribution, ecology, biology, dispersal power).

Remarks. Since no additional specimen of this species has been found following the discovery of a single specimen in 1957, it seems unlikely that natural populations of this species have established themselves in New Zealand.

Genus *Parabaris* Broun, 1881 [E]

Parabaris Broun, 1881: 654. Type species: *Parabaris atratus* Broun, 1881, by monotypy.

Description. Body length: 9.5–20.0 mm. Forebody (head and thorax) without sparse setiferous micropores dorsally. **Head**. Mandibles moderately long, slightly curved forward, blunt apically. Labrum strongly transverse; apex slightly emarginate medially. Eyes moderately large and convex, widely separated from buccal fissure ventrally (by 2–3× maximum width of antennal scape). Tempora not inflated. Frons without clypeo-ocular prolongations. Antennal pubescence starting from basal 1/3 of antennomere 3. Mentum with a tooth medially, moderately shorter than lateral lobes. Mentum and submentum separated by complete transverse suture. Paraglossae longer than ligula. Palpi with last segment fusiform or rather cylindrical, truncate or not apically, with moderately dense and long pubescence; penultimate segment of labial palpi plurisetose on anterior margin. **Thorax**. Pronotum transverse; base straight (*atratus, lesagei*) or emarginate, as wide as or narrower than elytral base; lateral beads complete; anterior bead incomplete medially and ill-defined; posterior bead complete. Scutellum visible. Apex of prosternal lobe pubescent. **Legs**. Metafemora with 2 long setae on posterior margin. Male protarsi dilated laterally and spongily pubescent ventrally. Male mesotarsi dilated laterally and spongily pubescent ventrally (*atratus*) or unmodified (*hoarei, lesagei*). Segment 4 of protarsi and mesotarsi of both sexes without membranous laminae. Tarsi pubescent (with numerous setae) dorsally; metatarsomere 5 pubescent (with numerous setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Interneurs complete. Rows of setiferous punctures absent on intervals 3, 5, and 7, and on interneur 2. Umbilicate setiferous series of interval 9 continuous. **Abdomen**. Ventrites 2+3 of male without a setiferous fovea. Ventrites 5+6 of both sexes without short setae, with paired ambulatory setae only. **Aedeagus**. Lateral view: strongly arcuate. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally) or asymmetrical (with ostium deflected slightly to the right); dorsal membranous area wide, extending to basal bulb or almost; apical disc present. Internal sac armed or unarmed.

Geographic distribution. New Zealand (endemic; North Island).

References. Hudson, 1934: 174 (list); Britton, 1964b: 522–523, 526 (taxonomy); Noonan, 1976: 9 (taxonomy); Larochelle & Larivière, 2001: 125 (catalogue).

Remarks. Although *P. hoarei* appears to be less closely related to *P. atratus* and *P. lesagei* than they are to each other on the basis of morphology, the shared morphological characters defining the genus and the stability of these characters within each species, suggest that they share a common ancestor.

Key to species of *Parabaris*

1 Pronotum (Fig. 130): base emarginate; sides convex, not sinuate. Elytra very iridescent; interval 3 with 2 setiferous punctures subapically. Body dark brown, length 10.5 mm or less ...(p. 44)... ***hoarei*** new species

— Pronotum (Fig. 128–129): base straight; sides sinuate. Elytra moderately iridescent; interval 3 without setiferous puncture subapically. Body black, length 15.5 mm or more 2

2(1) Head narrower across eyes than pronotal apex (Fig. 184). Pronotum (Fig. 128) very transverse. [Body stout, length 16.0–20.0 mm] ....(p. 43)... ***atratus*** Broun

— Head as wide across eyes as pronotal apex (Fig. 185). Pronotum (Fig. 129) moderately transverse. [Body slender, length 15.5–16.5 mm] ....(p. 43)... ***lesagei*** new species

Parabaris atratus Broun, 1881 [E]

Figures 45, 93, 128, 184; Map p. 148

Parabaris atratus Broun, 1881: 655. Holotype: female (BMNH) labelled "Type (circular red-bordered label; typed) / 1144. (typed) / New Zealand. Broun Coll. Brit. Mus. 1922-482. (typed) / Parua. Whangarei (hand-written) / Parabaris atratus. [female symbol] (hand-written)." Poor condition; antennae and legs missing some antennomeres and tarsomeres; forebody (head and thorax) separated from hindbody.

Description. Body stout (compared to *lesagei*), length: 16.0–20.0 mm. Slightly convex. Black; legs piceous black; antennae (except segment 1), palpi, and tarsi rufous. Generally glabrous and smooth. Microsculpture isodiametric on head, moderately transverse on thorax, very transverse (with microlines) on elytra. Shiny, without metallic lustre. Elytra moderately iridescent. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Eyes widely separated from buccal fissure ventrally (by about 2× maximum width of antennal scape). Antennae moderately long, reaching pronotal base; antennal scape elongate, about 4× longer than its maximum width. Palpi cylindrical, slightly truncate apically; penultimate segment of labial palpi with 4–6 long setae on anterior margin. **Thorax**. Pronotum (Fig. 128) very transverse, widest before middle; sides converging toward base, feebly sinuate; base straight, slightly narrower than elytral base (less so than in *lesagei*); apex concave; lateral beads widening about middle (as in *lesagei*); lateral depressions widening posteriorly; anterior angles strongly developed, acutely rounded; posterior angles strongly developed, rectangular; basal foveae deep, wide; punctuation feebly developed. Apex of prosternal lobe with 8–11 long setae. Metepisterna as wide as long. **Legs**. Male mesotarsi dilated laterally and spongily pubescent ventrally. **Elytra**. Widest before middle. Shoulders strongly developed, angulate, with a tooth. Subapical sinuations strong. Sutural apices angulate. Scutellar striole present. Interneurs moderately deep, impunctate. Intervals impunctate, rather flat in basal half, slightly convex in apical half. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 45). Lateral view: strongly arcuate (including apical 1/2), thinner than in other *Parabaris* species; apex narrowly pointed. Dorsal view: asymmetrical (with ostium slightly deflected to the right); dorsal membranous area very wide, extending to basal bulb; apical disc present, rounded-triangular. Internal sac unarmed.

Material examined. 148 specimens, including type (AMNZ, BBNZ, BMNH, CMNZ, ITNZ, JNNZ, LUNZ, MONZ, NZAC, UCNZ).

Geographic distribution (Map p. 148). North Island: AK, BP, CL, GB, ND, TK, WO.

Ecology. Lowland, montane. Wet or moist forests (broadleaf, podocarp, beech) and swamp forests: along mud flats, gullies, and streams. Shaded ground; soil covered with dead leaves. Nocturnal; sheltering during the day under logs (mostly) and stones, and in rotten logs. **Biology**. Seasonality: September–June, August. Tenerals: January, April (mostly). Occasionally infested with mites and fungi (Laboulbeniales). **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. **Collecting techniques**. Pitfall trapping, turning logs and stones, using yellow pan traps.

Reference. Larochelle & Larivière, 2001: 125 (taxonomy, distribution, ecology, biology, dispersal power).

Remarks. This species and *P. lesagei* are closer morphologically than either is to *P. hoarei*.

Parabaris lesagei new species [E]

Figures 46, 129, 185; Map p. 148

Parabaris lesagei Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "NEW ZEALAND WN Kaitoke Regional Park (Waterworks Rd end) 300m 26.XI.1996 Larochelle, Larivière (typed) / Wet broadleaf forest Along stream banks, under stones. (typed) / HOLOTYPE [male symbol] *Parabaris lesagei* Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 2 males (1 NZAC, 1 MONZ), 1 female (NZAC) from the same locality as the holotype, bearing blue paratype labels.

Description. Body slender (compared to *atratus*), length: 15.5–16.5 mm. Slightly convex. Black; legs piceous black; antennae (except segment 1), palpi, and tarsi rufous. Generally glabrous and smooth. Microsculpture isodiametric on head, moderately transverse on thorax, and very transverse (with microlines) on elytra. Shiny, without metallic lustre. Elytra moderately iridescent. **Head**. Moderately large, as wide across eyes as pronotal apex; flat anteriorly, slightly convex posteriorly. Eyes widely separated from buccal fissure ventrally (by about 3× maximum width of antennal scape). Antennae moderately long, reaching pronotal base; antennal scape elongate, about 4× longer than its maximum width. Palpi cylindrical, slightly truncate apically; penultimate segment of labial palpi with 4-6 long setae on anterior margin. **Thorax**. Pronotum (Fig. 129) moderately transverse (less than in *atratus*), widest before middle; sides converging toward base, moderately sinuate; base straight, much narrower than elytral base (more so than in *atratus*); apex concave; lateral beads widening about middle (as in *atratus*); lateral depressions widening posteriorly; anterior angles strongly developed, acutely rounded; posterior angles strongly developed, rectangular; basal foveae deep, wide; punctuation feebly developed. Apex of prosternal lobe with 8–11 long setae. Metepisterna

as wide as long. **Legs**. Male mesotarsi unmodified, neither dilated laterally nor spongily pubescent ventrally. **Elytra**. Widest before middle (as in *atratus*). Shoulders strongly developed, angulate, with a tooth. Subapical sinuations strong. Sutural apices rounded. Scutellar striole present. Interneurs moderately deep, impunctate. Intervals impunctate, flat in basal half, slightly convex in apical half. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 46). Lateral view: strongly arcuate (with apical half rather straight); apex narrowly pointed, with apical disc partially visible dorsally. Dorsal view: asymmetrical (with ostium slightly deflected to the right); dorsal membranous area moderately wide, extending almost to basal bulb; apical disc present, rectangular. Internal sac armed.

Material examined. 11 specimens, including types (AMNZ, ITNZ, JNNZ, LUNZ, MONZ, NZAC).

Geographic distribution (Map p. 148). North Island: BP–Te Koau. TK–Mount Messenger. WN–Belmont. Kaikoke Regional Park. Orongorongo Valley. Otaki Forks. Rimutaka Hill. Rimutaka Forest Park, Junction of Orongorongo River and Turere Stream.

Ecology. Lowland, montane. Wet forests (broadleaf, beech): along streams and gullies. Shaded ground; soil covered with dead leaves. Nocturnal; sheltering during the day under big stones and logs. **Biology**. Seasonality: November–February. Tenerals: March. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. Good burrower. **Collecting techniques**. Turning big stones and logs, pitfall trapping.

Remarks. This species is named after our close friend Laurent LeSage (Agriculture and Agri-Food Canada, Ottawa, Canada) for his special help and encouragement in our life and career. See also **Remarks** under *P. atratus*.

Parabaris hoarei new species [E]

Figures 47, 94, 130, 186; Map p. 148

Parabaris hoarei Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "UNUWHAO SPIRITS BAY 11.I. 57. R.A. CUMBER. (hand-written) / HOLOTYPE [male symbol] *Parabaris hoarei* Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 3 females (2 NZAC, 1 MONZ) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length: 9.5–10.5 mm. Slightly convex. Piceous brown; antennae, palpi, and legs rufous. Generally glabrous and smooth. Microsculpture moderately transverse on head and pronotum, very transverse (with microlines) on elytra. Shiny, without metallic lustre. Elytra very iridescent. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Eyes widely separated from buccal fissure ventrally (by about 2× maximum width of antennal scape). Antennae moderately long, reaching about pronotal base; antennal scape about 2× longer than its maximum width. Palpi fusiform, not truncate apically; penultimate segment of labial palpi with 2–4 long setae and 1–3 short setae on anterior margin. **Thorax**. Pronotum (Fig. 130) very transverse, widest about middle; sides converging toward base, convex; base emarginate, slightly narrower than elytral base; apex slightly concave; lateral beads not widening about middle; lateral depressions widening posteriorly; anterior angles moderately developed, obtuse; posterior angles moderately developed, rounded; basal foveae deep, wide; punctuation feebly developed. Apex of prosternal lobe with usually 3-4 long setae and several short setae. Metepisterna wider than long. **Legs**. Mesotarsi unmodified, neither dilated laterally nor spongily pubescent ventrally. **Elytra**. Widest about middle. Shoulders strongly developed, angulate, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent. Interneurs moderately deep, impunctate. Intervals impunctate, slightly convex. Interval 3 with two setiferous punctures subapically. **Aedeagus** (Fig. 47). Lateral view: strongly arcuate (less so in apical half); apex abruptly narrowed. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area moderately wide, extending to basal bulb; apical disc present, rounded-triangular (shorter than in *atratus*). Internal sac armed.

Material examined. 15 specimens, including types (MONZ, NZAC, UCNZ).

Geographic distribution (Map p. 148). North Island: ND–Kapowairua. Spirits Bay. Tom Bowling Bay. Unuwhao. Waipuna Stream.

Ecology. Lowland. Wet forests (broadleaf). Shaded ground. Nocturnal; sheltering during the day under stones and logs. **Biology**. Seasonality: November–January, August. Tenerals: November, early January. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. **Collecting techniques**. Turning stones and logs.

Remarks. The presence of 2 setiferous punctures subapically on the elytral interval 3, the body shape, brownish colour, and very iridescent elytra set this taxon apart from its congeners. This is the only *Parabaris* species so far recorded from and restricted to the tip of the Aupouri Peninsula. This species is named after our friend and colleague R. J. B. Hoare (Landcare Research, Auckland) for his special help and encouragement in our entomological studies and for his special talent and dedication as a manuscript reviewer.

Genus *Triplosarus* Bates, 1874 [E]

Triplosarus Bates 1874: 270 (redescribed in 1875: 308). Type species: *Triplosarus fulvescens* Bates, 1874 (=*Harpalus novaezelandiae* Laporte de Castelnau, 1867), by monotypy.

Description. Body length: 7.5–10.0 mm. Forebody (head and thorax) without sparse setiferous micropores dorsally. **Head**. Mandibles moderately long, strongly curved forward, blunt apically. Labrum strongly transverse; apex straight or slightly emarginate medially. Eyes moderately large, convex, widely separated from buccal fissure ventrally (by about 1.3× maximum width of antennal scape). Tempora not inflated. Frons without clypeo-ocular prolongations. Antennal pubescence starting from middle of antennomere 3. Mentum with a tooth medially, moderately shorter than lateral lobes. Mentum and submentum separated by complete transverse suture. Paraglossae as long as ligula. Palpi with last segment fusiform, truncate apically, with sparse, short pubescence; penultimate segment of labial palpi plurisetose on anterior margin. **Thorax**. Pronotum transverse; base straight, moderately narrower than elytral base; lateral beads complete; anterior bead incomplete medially; posterior bead complete. Scutellum visible. Apex of prosternal lobe pubescent. **Legs**. Metafemora with 5–7 long setae on posterior margin. Male protarsi and mesotarsi dilated laterally and spongily pubescent ventrally. Segment 4 of protarsi and mesotarsi of both sexes without membranous laminae. Tarsi glabrous dorsally; metatarsomere 5 pubescent (with 6 setae) ventrally; metatarsomere 1 shorter than metatarsomeres 2+3. **Elytra**. Interneurs complete. Rows of setiferous punctures absent on intervals 3, 5, and 7, and on interneur 2. Umbilicate setiferous series of interval 9 continuous. **Abdomen**. Ventrites 2+3 of male without a setiferous fovea. Ventrites 5+6 of both sexes without short setae, with paired ambulatory setae only. **Aedeagus** (Fig. 48). Lateral view: strongly arcuate. Dorsal view: asymmetrical (with ostium strongly deflected to the right); dorsal membranous area very wide, not extending to basal bulb; apical disc present. Internal sac armed.

Geographic distribution. New Zealand (endemic).

References. Hudson, 1934: 176 (list); Noonan, 1973: 285–286 and 1976: 8 (taxonomy); Larochelle & Larivière, 2001: 125–126 (catalogue).

Remarks. This monotypic genus has morphological features not fitting the character complex found in New Zealand Anisodactylina: aedeagus asymmetrical with ostium strongly deflected to the right and pale body colour. It is also the only taxon restricted to coastal sand dune and beach habitats.

Triplosarus novaezelandiae (Laporte de Castelnau, 1867) [E]

Figures 48, 95, 131, 187; Map p. 148

Harpalus novaezelandiae Laporte de Castelnau, 1867: 108 (redescribed in 1868: 194). Lectotype (here designated): male (MCSN) labelled "Auck[land] [N. Zelanda] (hand-written) Coll. Castelnau (typed) / Harp. novae zelandiae. auck. (hand-written)/ Harpalus Novae Zelandiae Cast. (hand-written) / SYNTYPUS (typed) Harpalus novae zelandiae Castelnau (hand-written) (red label) / LECTOTYPE *Harpalus novaezelandiae* Laporte de Castelnau, 1867 designated by Larochelle & Larivière, 2005 (red label, typed)." Excellent condition.

Triplosarus fulvescens Bates, 1874: 271 (redescribed in 1875: 309). Lectotype (here designated): male (MNHN) labelled " Canterby N. Zeald (hand-written) / Triplosarus fulvescens Bates (hand-written) / Ex Musaeo H.W. BATES 1892 (typed) / novaezelandiae cast. comparé au type! (hand-written) / Coll. Chaudoir (hand-written) / LECTOTYPE *Triplosarus fulvescens* Bates, 1878 designated by Larochelle & Larivière 2004 (red label; typed)." Perfect condition. Synonymised by Townsend, 1997: 16.

Triplosarus novae-zealandiae [*sic*]: Broun, 1881: 659 (misspelling).

Description. Body length: 7.5–10 mm. Slightly convex. Pale in colour, testaceous, sometimes moderately dark brown; pronotum with light greenish tinge; antennae, mouthparts, and legs pale. Generally glabrous and smooth. Microsculpture isodiametric. Pronotum shiny; head and elytra dull; head and pronotum with bronze metallic lustre. **Head**. Big, although narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width. Penultimate segment of labial palpi with 4–7 long setae on anterior margin. **Thorax**. Pronotum (Fig. 131) very transverse, widest before middle; sides converging toward base, not sinuate; apex straight; lateral depressions widening posteriorly; anterior angles moderately developed, rounded; posterior angles strongly developed, angulate; basal foveae deep, wide; punctuation feebly developed (slightly more so in basal foveae). Apex of prosternal lobe with 4 long setae and 3–4 short setae. Metepisterna longer than wide. **Elytra**. Widest about middle. Shoulders strongly developed, angulate, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole present. Interneurs shallow, more or less punctate. Intervals impunctate, flat. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 48). As for genus.

Material examined. 173 specimens, including type (AMNZ, BBNZ, CMNZ, ITNZ, JNNZ, LUNZ, MCSN, MNHN, MONZ, NZAC, OMNZ, UCNZ).

Geographic distribution (Map p. 148). North Island: AK, BP, CL, HB, ND, WI, WN, WO. South Island: DN, MC, NN, SD, SL, WD. Stewart Island.

Ecology. Coastal lowland. Sand dunes and sand beaches. Open ground; dry, sandy soil, bare or sparsely vegetated. Crepuscular and nocturnal; sheltering during the day in burrows (mostly), under marram grass (*Ammophila*) and wrack. Gregarious. **Biology**. Seasonality: October–April, August. Tenerals: November (rarely), January–February. **Dispersal power**. Elytra free along suture. Macropterous, probably capable of flight. Moderate runner. Good burrower. **Collecting techniques**. Pitfall trapping, collecting at night with a torch, turning logs.

References. Wakefield, 1873: 298 (distribution, ecology); Hudson, 1934: 176 (list); Pilgrim, 1969: 364 (ecology); Harris, 1970: 48, 55 (distribution, ecology, biology); Noonan, 1973: 286 (taxonomy, dispersal power); Johns, 1986: 31 (distribution, ecology); Townsend, 1994: 11 (distribution, ecology) and 1997: 16 (taxonomy, distribution); Larochelle & Larivière, 2001: 125–126 (taxonomy, distribution, ecology, biology, dispersal power).

Remarks. One male specimen of *Harpalus novaezelandiae* collected from Auckland and labelled "syntypus" was obtained from the Castelnau collection in Genova (MCSN), it is here designated as a lectotype to preserve stability of nomenclature in the future.

Bates' original description of *Triplosarus fulvescens* was based on an unspecified number of specimens of both sexes ("[male symbol, female symbol]"), which apparently came from collectors based in "Auckland?" and "Christchurch". Five specimens were obtained from the Bates collection in Paris (MNHN), one of which (a male) was collected in "Canterby [=Canterbury] N. Zeald" (Christchurch's regional area) and bears a determination label written by Bates; this specimen is here selected as lectotype to preserve stability of nomenclature in the future. The external morphology (including body colour) of *T. novaezelandiae* is highly variable, but the configuration of the male genitalia is constant throughout its range along coastal areas of New Zealand.

Genus *Tuiharpalus* new genus [E]

Type species. *Tuiharpalus moorei* new species, by present designation.

Description. Body length: 8.0–14.0 mm. Forebody (head and thorax) with sparse setiferous micropores dorsally. **Head**. Mandibles short or moderately long, slightly or strongly curved forward, blunt apically. Labrum moderately transverse or strongly transverse (*moorei*); apex straight or slightly emarginate medially. Eyes strongly reduced, rather flat, widely separated from buccal fissure ventrally (by 1.5–2× maximum width of antennal scape). Tempora inflated. Frons without clypeo-ocular prolongations. Antennal pubescence starting from basal half of antennomere 3. Mentum with a tooth medially, moderately shorter than lateral lobes. Mentum and submentum separated by complete transverse suture. Paraglossae as long as ligula (*clunieae, crosbyi, hallae*) or longer. Palpi with last segment fusiform, truncate or not apically, with sparse or moderately dense long pubescence; penultimate segment of labial palpi plurisetose or trisetose (*clunieae, hallae*) on anterior margin. **Thorax**. Pronotum transverse or suborbicular (*clunieae*); base emarginate, as wide as or narrower than elytral base; lateral beads complete; anterior bead absent; posterior bead absent or complete. Scutellum visible. Apex of prosternal lobe pubescent. **Legs**. Metafemora with 2–6 long setae on posterior margin. Pro-, meso-, and metatarsomeres 1–4 of both sexes dilated laterally, and subtriangular (as opposed to *Parabaris*, only male pro- and mesotarsi dilated). Male protarsi spongily pubescent ventrally; mesotarsi spongily pubescent or not (*moorei*) ventrally. Segment 4 of protarsi and mesotarsi of both sexes without membranous laminae. Tarsi pubescent (with numerous setae) dorsally; metatarsomere 5 pubescent (with numerous setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Interneurs complete. Rows of setiferous punctures present on intervals 3, 5 or 7, or on interneur 2. Umbilicate setiferous series of interval 9 continuous. **Abdomen**. Ventrites 2+3 of male without a setiferous fovea. Ventrites 5+6 of both sexes without short setae, with paired ambulatory setae only. **Aedeagus**. Lateral view: strongly arcuate. Dorsal view: asymmetrical (with ostium deflected slightly to the right or undulated (*clunieae*)); dorsal membranous area wide, extending almost to basal bulb; apical disc present or absent. Internal sac armed or unarmed.

Geographic distribution. New Zealand (endemic; Three Kings Islands and North Island).

References. Britton, 1964b: 522–523, 526 (taxonomy; as *Parabaris* (in part)); Noonan, 1976: 9 (taxonomy; as *Parabaris* (in part)); Larochelle & Larivière, 2001: 125 (catalogue; as *Parabaris* (in part)).

Remarks. The generic name is derived from *tui* (a New Zealand honey-eating bird) and *Harpalus* (the type genus of the tribe Harpalini). The characters unifying the species of this new genus, including *T. gourlayi* which is transferred from *Parabaris*, are: forebody (head and thorax) with sparse setiferous micropores dorsally; rows of setiferous punctures on elytra; pro-, meso-, and metatarsi of both sexes dilated laterally, subtriangular. The strongly reduced, rather flat eyes together with the inflated tempora, suggest that representatives of this genus exhibit subterranean behaviour.

Key to species of *Tuiharpalus*

1 Elytral interval 7 with a row of setiferous punctures (Fig. 99). Pronotum (Fig. 136) with lateral depressions strongly explanate throughout. [Head very large; stout body] ....(p. 50)... ***moorei*** new species

— Elytral interval 7 without a row of setiferous punctures (Fig. 96–98). Pronotum (Fig. 132–135) with lateral depressions not strongly explanate throughout. [Head smaller; slender body] 2

2(1) Elytral interneur 2 with a row of setiferous punctures (Fig. 98); intervals 3 and 5 without rows of setiferous punctures (Fig. 98) 3

— Elytral interneur 2 without a row of setiferous punctures (Fig. 96–97); intervals 3 and 5 with rows of setiferous punctures (Fig. 96–97) 4

3(2) Pronotum (Fig. 135) very transverse; anterior angles moderately developed, obtusely rounded; posterior angles moderately developed, obtuse. Piceous black ....(p. 49)... ***hallae*** new species

— Pronotum (Fig. 134) suborbicular; anterior angles strongly developed, acute; posterior angles feebly developed, broadly rounded. Reddish ....(p. 48)... ***clunieae*** new species

4(2) Pronotum (Fig. 133) very transverse; sides slightly converging toward base, slightly sinuate. Body length 12.5 mm or more ....(p. 48)... ***gourlayi*** (Britton)

— Pronotum (Fig. 132) less transverse; sides strongly converging toward base, moderately sinuate. Body length 11.0 mm or less ...(p. 47)... ***crosbyi*** new species

Tuiharpalus crosbyi new species [E]

Figures 49, 96, 132, 188; Map p. 149

Tuiharpalus crosbyi Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "THREE KINGS IS NZ Great I, 45 m 28–30 Nov. 1983 C.F. Butcher (typed) / Pan traps Shore and coastal forest (typed) / HOLOTYPE [male symbol] *Tuiharpalus crosbyi* Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 3 males (2 NZAC, Great Island, Tasman Valley; 1 LUNZ, Great Island), bearing blue paratype labels.

Description. Body length: 10.5–11.0 mm. Slightly convex. Black; pronotal margins, labrum, antennae, palpi, and tarsi rufous. Microsculpture isodiametric on head, moderately transverse on pronotum, and very transverse (with microlines) on elytra. Moderately shiny, without metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Mandibles moderatly long, slightly curved forward. Labrum moderately transverse; apex straight or slightly emarginate medially. Eyes widely separated from buccal fissure ventrally (by at least 2× maximum width of antennal scape). Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width. Paraglossae as long as ligula. Palpi broadly truncate apically, with sparse, moderately long pubescence; penultimate segment of labial palpi plurisetose (with 4–5 long setae and at most 1 short seta) on anterior margin. **Thorax**. Pronotum (Fig. 132) moderately transverse, widest before middle; sides strongly converging toward base (more so than in *gourlayi*), moderately sinuate; base emarginate, moderately narrower than elytral base; apex concave; lateral depressions not explanate; posterior bead absent; anterior angles moderately developed, obtusely rounded; posterior angles strongly developed, subrectangular; basal foveae deep, wide; punctuation fine, evenly distributed. Apex of prosternal lobe with 4 long setae and several short setae. Metepisterna wider than long. **Legs**. Metafemora with 2 long setae on posterior margin. Male mesotarsi spongily pubescent ventrally. **Elytra**. Widest about middle. Shoulders strongly developed, angulate, with a tooth. Subapical sinuations rather strong. Sutural apices angulate. Scutellar striole absent. Interneurs shallow, unevenly impressed, impunctate. Intervals sparsely punctate, flat; intervals 3 and 5 with rows of setiferous punctures. **Aedeagus** (Fig. 49). Lateral view: strongly arcuate; apex broadly triangular. Dorsal view: asymmetrical (with ostium slightly deflected to the right); dorsal membranous area very wide, extending almost to basal bulb; apical disc present, broadly triangular; main shaft straight. Internal sac unarmed.

Material examined. 7 specimens, including types (AMNZ, LUNZ, NZAC).

Geographic distribution (Map p. 149). Offshore Islands: TH-Great Island.

Ecology. Lowland. Wet forests. Shaded ground. Nocturnal; sheltering during the day under stones. **Biology**. Seasonality: November–December, April. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. **Collecting techniques**. Turning stones, pitfall trapping, collecting at night with a torch, using pan traps.

Remarks. This species is morphologically close to *T. gourlayi* with which it co-occurs on the Three Kings Islands. *T. crosbyi* is named after our colleague Trevor K. Crosby (Landcare Research, Auckland) for his contribution as Editor of the *Fauna of New Zealand* series.

Tuiharpalus gourlayi (Britton, 1964) new combination [E]

Figures 50, 97, 133, 189; Map p. 149

Parabaris gourlayi Britton, 1964b: 523. Holotype: male (NZAC) labelled "Type (circular red-bordered label; typed) / Great Island Three Kings 1–3.1.63 E. S. Gourlay (hand-written) / HOLOTYPE [male symbol] *Parabaris gourlayi mihi* (hand-written) E. B. Britton det. 1963 (typed, except for number 3)." Perfect condition. There are 10 paratypes in NZAC and there should be another 3 in BMNH.

Description. Body length: 12.5–14.0 mm. Slightly convex. Black; pronotal margins dark reddish brown; antennae and palpi light reddish brown. Microsculpture shallow, isodiametric on head, shallow isodiametric to slightly transverse on pronotum, very transverse (with microlines) on elytra. Shiny (especially elytra), without metallic lustre. Elytra slightly iridescent. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Mandibles short, strongly curved forward. Labrum moderately transverse; apex slightly emarginate medially. Eyes widely separated from buccal fissure ventrally (by about 2× maximum width of antennal scape). Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width. Paraglossae longer than ligula. Palpi broadly truncate apically, with moderately dense and long pubescence; penultimate segment of labial palpi plurisetose (with 4 long setae and 1 short seta) on anterior margin. **Thorax**. Pronotum (Fig. 133) very transverse, widest before middle; sides slightly converging toward base (less so than in *crosbyi*), slightly sinuate; base emarginate, slightly narrower than elytral base; apex concave; lateral depressions strongly explanate posteriorly; posterior bead absent; anterior angles moderately developed, obtusely rounded; posterior angles strongly developed, subrectangular; basal foveae deep, wide; punctuation fine, evenly distributed. Apex of prosternal lobe with 3–5 long setae and several short setae. Metepisterna wider than long. **Legs**. Metafemora with 4–6 long setae on posterior margin. Male mesotarsi spongily pubescent ventrally. **Elytra**. Widest about middle. Shoulders strongly developed, angulate, with a tooth. Subapical sinuations strong. Sutural apices angulate. Scutellar striole absent. Interneurs shallow, impunctate. Intervals sparsely punctate, flat; intervals 3 and 5 with rows of setiferous punctures. **Aedeagus** (Fig. 50). Lateral view: strongly arcuate; apex narrowly triangular (more so than in *crosbyi*). Dorsal view: asymmetrical (with ostium slightly deflected to the right); dorsal membranous area very wide, extending almost to basal bulb; apical disc present, narrowly triangular; main shaft deflected to the right. Internal sac unarmed.

Material examined. 290 specimens, including types (AMNZ, BMNH, CMNZ, LUNZ, NZAC).

Geographic distribution (Map p. 149). Offshore Islands: TH–Great Island. North East Island.

South West Island. West Island.

Ecology. Lowland. Wet forests (broadleaf). Shaded ground. Nocturnal; sheltering during the day under stones (mostly) and logs, in leaf litter, and in nests of petrel colonies. **Biology**. Seasonality: November–January, May. Tenerals: November–December (mostly), January, April. Regularly infested with mites. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. **Collecting techniques**. Turning stones and logs, collecting at night with a torch, pitfall trapping, raking leaf litter.

References. Britton, 1964b: 526 (distribution); Larochelle & Larivière, 2001: 125 (taxonomy, distribution, ecology, biology, dispersal power).

Remarks. Examination of the type of *Parabaris gourlayi* revealed it to be congeneric with taxa placed in the new genus *Tuiharpalus*. See also **Remarks** under *T. crosbyi*.

Tuiharpalus clunieae new species [E]

Figures 51, 134, 190; Map p. 149

Tuiharpalus clunieae Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "Trounson Kauri Park, Donnelly's Crossing, ND. 25-11-94 J.I. Townsend [hand-written] / HOLOTYPE [male symbol] *Tuiharpalus clunieae* Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 2 females (2 AMNZ, Waipoua Forest) bearing blue paratype labels.

Description. Body length: 9.0–10.0 mm. Forebody (head and thorax) strongly convex; hindbody moderately convex. Reddish (including antennae and palpi). Microsculpture deep, isodiametric on head, moderately transverse on pronotum, and deep, isodiametric on elytra (females) or granulate (males). Shiny, without metallic lustre; elytra dull in males. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Mandibles moderately long, slightly curved forward. Labrum moderately transverse; apex straight or slightly emarginate medially. Eyes widely separated from buccal fissure ventrally (by about 1.5× maximum width of antennal scape). Antennae moderately long, reaching about pronotal base; antennal scape about 2× longer than its maximum width. Paraglossae as long as ligula. Palpi not truncate apically, with sparse long pubescence; penultimate segment of labial palpi trisetose (with 2 long and 1 short seta) on anterior margin. **Thorax**. Pronotum (Fig. 134) suborbicular, widest about middle; sides converging toward base, not sinuate; base emarginate, moderately narrower than elytral base; apex concave; lateral depressions moderately explanate throughout; posterior bead complete; anterior angles strongly developed, acute; posterior angles

feebly developed, broadly rounded; basal foveae shallow, wide; punctuation fine, evenly distributed. Apex of prosternal lobe with 2 long setae and several short setae. Metepisterna as wide as long. **Legs**. Metafemora with 2 long setae on posterior margin. Male protarsomeres 1–4 unusually wide, 3× wider than mesotarsomeres (contrary to other *Tuiharpalus* species, except *hallae*). Male mesotarsi spongily pubescent ventrally. **Elytra**. Widest about middle. Shoulders well developed, rounded, with a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent or present. Interneurs shallow, impunctate, except interneur 2 with a row of setiferous punctures. Intervals sparsely punctate, flat; intervals 3 and 5 without rows of setiferous punctures. **Aedeagus** (Fig. 51). Lateral view: strongly arcuate; apex narrowly pointed. Dorsal view: asymmetrical (with ostium undulated, slightly deflected to the left about middle and to the right subapically); dorsal membranous area moderately wide, extending almost to basal bulb; apical disc present, triangular; main shaft undulated. Internal sac armed.

Material examined. 5 specimens, including types (AMNZ, NZAC).

Geographic distribution (Map p. 149). North Island: ND–Trounson Kauri Park. Waipoua Forest.

Ecology. Lowland. Wet forests (broadleaf, podocarp): along streams. Shaded ground; soil covered with dead leaves. Nocturnal; sheltering during the day under logs. **Biology**. Seasonality: October-November, January. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. **Collecting techniques**. Turning logs.

Remarks. This species is morphologically close to *T. hallae*. Both taxa occur between Kaitaia and the southernmost limit of the Northland region. This taxon is named after our good friend and colleague Leonie H. Clunie (Landcare Research, Auckland) for her special help in our entomological studies.

Tuiharpalus hallae new species [E]

Figures 52, 98, 135, 191; Map p. 149

Tuiharpalus hallae Larochelle & Larivière, new species. Holotype: male (NZAC) labelled " NEW ZEALAND ND Mangamuka Gorge 4.II.2004 Bob Ward / roadside drainage, under leaves / HOLOTYPE [male symbol] *Tuiharpalus hallae* Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 3 females (1 CMNH, 1 NZAC, 1 OMNZ) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length: 12.0–12.5 mm. Forebody (head and thorax) strongly convex, hindbody moderately convex. Piceous black; antennae and palpi rufous. Microsculpture deep, isodiametric on head, moderately transverse on pronotum, and deep, isodiametric on elytra (females) or granulate on elytra (males). Shiny, without metallic lustre; elytra dull in males. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Mandibles moderately long, slightly curved forward. Labrum moderately transverse; apex straight or slightly emarginate medially. Eyes widely separated from buccal fissure ventrally (by about 1.5× maximum width of antennal scape). Antennae moderately long, reaching about pronotal base; antennal scape about 2× longer than its maximum width. Paraglossae as long as ligula. Palpi narrowly truncate apically, with sparse, moderately long pubescence; penultimate segment of labial palpi trisetose (with 2 long and 1 short setae) on anterior margin. **Thorax**. Pronotum (Fig. 135) very transverse, widest about middle; sides converging toward base, not sinuate; base emarginate, as wide as elytral base; apex concave; lateral depressions moderately explanate throughout; posterior bead absent; anterior angles moderately developed, obtusely rounded; posterior angles moderately developed, obtuse; basal foveae shallow, wide; punctuation fine, evenly distributed. Apex of prosternal lobe with 2 long setae and several sparse short setae. Metepisterna as wide as long. **Legs**. Metafemora with 2 long setae on posterior margin. Male protarsomeres 1–4 unusually wide, 3× wider than mesotarsomeres (contrary to other *Tuiharpalus* species, except *clunieae*). Male mesotarsi spongily pubescent ventrally. **Elytra**. Widest about middle. Shoulders strongly developed, rounded, with a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent or present. Interneurs shallow, impunctate, except interneur 2 with a row of setiferous punctures. Intervals sparsely punctate, flat; intervals 3 and 5 without rows of setiferous punctures. **Aedeagus** (Fig. 52). Lateral view: strongly arcuate, apex narrowly pointed (more attenuate than in *clunieae*). Dorsal view: asymmetrical (with ostium slightly deflected to the right); dorsal membranous area moderately wide, extending almost to basal bulb; apical disc absent; main shaft mostly straight, slightly deflected to the right apically. Internal sac armed.

Material examined. 13 specimens, including types (AMNZ, CMNH, NZAC, OMNZ).

Geographic distribution (Map p. 149). North Island: ND–Ahipara Plateau. Mangakahia Valley. Mangamuka Gorge. Okaihau. Omahuta Forest. Parakao. Tangihua Range.

Ecology. Lowland. Wet forests (broadleaf): along mud flats, streams, and seepages. Shaded ground; soil covered with dead leaves. Nocturnal; sheltering during the day in leaf litter and under logs. **Biology**. Seasonality: October–December, February–March. Tenerals: September–October.

Dispersal power. Elytra fused along suture. Subapterous. Moderate runner. **Collecting techniques**. Raking leaf litter, turning logs, pitfall trapping.

Remarks. See under *T. clunieae*. This species is named after our good friend and colleague Grace Hall (Landcare Research, Auckland) for her special help in our entomological studies and for her warm dedication to making us enjoy our life and career in New Zealand. The holotype and two of the paratypes were graciously provided by R.D. Ward (Tennessee, U.S.A.) and J. Nunn (Dunedin).

Tuiharpalus moorei new species [E]

Figures 53, 99, 136, 192; Map p. 149

Tuiharpalus moorei Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "NEW ZEALAND ND Te Paki Res., Te Paki Trig tk, Kauri Bush 13-17. 1995 Dec. Larivière, Larochelle (typed, except month of year) / Taraire-kauri for.: streambank; dark wet litter-rich soil. Under stones. (typed) / HOLOTYPE [male symbol] *Tuiharpalus moorei* Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 1 male (MONZ), 1 female (NZAC) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length: 8.0–8.5 mm. Strongly convex. Piceous brown; forebody (head and thorax) light brown; lateral depressions of pronotum, antennae, palpi, and legs rufous. Microsculpture isodiametric and weak on head, moderately transverse and weak on pronotum, very transverse (with microlines) and shallow on elytra. Very shiny, without metallic lustre. **Head**. Very large, only slightly narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Mandibles moderately long, slightly curved forward. Labrum strongly transverse; apex straight of slightly emarginate medially. Eyes widely separated from buccal fissure ventrally (by about 2× maximum width of antennal scape). Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width. Paraglossae longer than ligula. Palpi not truncate apically, with moderately dense and long pubescence; penultimate segment of labial palpi plurisetose (with 2–3 long setae, and 1–4 short setae) on anterior margin. **Thorax**. Pronotum (Fig. 136) very transverse, widest before middle; sides converging toward base, not sinuate; base emarginate, moderately narrower than elytral base; apex concave; lateral depressions strongly explanate throughout; posterior bead absent; anterior angles strongly developed, subtriangular; posterior angles feebly developed, broadly rounded; basal foveae absent; punctuation fine, evenly distributed. Apex of prosternal lobe with 3 long setae and several short setae. Metepisterna wider than long. **Legs**. Metafemora with 4 long setae on posterior margin. Male mesotarsi not spongily pubescent ventrally. **Elytra**. Widest about middle. Shoulders moderately developed, rounded, without a tooth. Subapical sinuations moderate. Sutural apices angulate. Scutellar striole absent. Interneurs moderately deep, evenly impressed, impunctate. Intervals sparsely punctate, slightly convex; intervals 3, 5, 7 with rows of setiferous punctures. **Aedeagus** (Fig. 53). Lateral view: strongly arcuate; apex obtusely rounded. Dorsal view: asymmetrical (with ostium slightly deflected to the right); dorsal membranous area very wide, extending almost to basal bulb; apical disc present, rounded-triangular; main shaft straight, inflated in apical half. Internal sac unarmed.

Material examined. 6 specimens, including types (AMNZ, NZAC).

Geographic distribution (Map p. 149). North Island: ND–Kohuronaki. Pandora. Te Paki Trig. Unuwhao.

Ecology. Lowland. Wet forests (broadleaf, podocarp): along streams. Shaded ground; soil covered with dead leaves. Nocturnal; sheltering during the day in leaf litter and under stones. **Biology**. Seasonality: November–December, February. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. **Collecting techniques**. Raking leaf litter, pitfall trapping.

Remarks. The presence of series of setiferous punctures on elytral intervals 3, 5, and 7, the stout convex body, ovate elytra, and strongly explanate lateral depressions of the pronotum set this taxon apart from its congeners. This is the only species of *Tuiharpalus* recorded from and restricted to the tip of the Aupouri Peninsula. *Tuiharpalus moorei* is named after our friend and colleague Barry P. Moore (Research Associate, Australian National Collection, Canberra, Australia) for his special help and encouragement in our carabid studies.

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Subtribe HARPALINA

Diagnosis (New Zealand). Body length: 6.0–12.0 mm. Frons without clypeo-ocular prolongations. Mentum with a tooth medially. Mentum and submentum separated by complete transverse suture. Penultimate segment of labial palpi plurisetose (with 4 setae or more) on anterior margin. Apex of prosternal lobe pubescent. Male protarsi and mesotarsi dilated laterally and biseriately pubescent (with 2 rows of scale-like setae) ventrally. Metatarsomere 1 shorter than metatarsomeres 2+3. Umbilicate setiferous series of interval 9 separated into two major groups with posterior group continuous (not divided further into two subgroups). Aedeagus arcuate, asymmetrical with ostium strongly deflected to the left.

Geographic distribution. Worldwide.

References. Noonan, 1976: 28–60 (taxonomy); Moore, 1977: 7–10 (key to Australian genera); Larochelle & Larivière, 2001: 128 (catalogue).

Genus *Harpalus* Latreille, 1802 [A]

Harpalus Latreille 1802: 92. Type species: *Carabus proteus* Paykull, 1790 (=*Carabus affinis* Schrank, 1781), designated by Andrewes, 1935: 19.

Description (New Zealand). Body length: 6.0–12.0 mm. Forebody (head and thorax) with or without sparse setiferous micropores dorsally. **Head**. Mandibles short or moderately long, strongly curved forward, blunt apically. Labrum moderately or strongly transverse; apex straight or slightly emarginate medially. Eyes moderately large, convex, moderately or widely separated from buccal fissure ventrally (by 1–1.5× maximum width of antennal scape). Tempora not inflated. Frons without clypeo-ocular prolongations. Antennal pubescence starting from middle of antennomere 3. Mentum with a tooth medially, moderately or much shorter than lateral lobes. Mentum and submentum separated by complete transverse suture. Paraglossae as long as or longer than ligula. Palpi with last segment fusiform, not truncate apically, with sparse, moderately long pubescence; penultimate segment of labial palpi plurisetose on anterior margin. **Thorax**. Pronotum very transverse; base straight or emarginate, as wide as elytral base; lateral beads complete; anterior bead incomplete medially; posterior bead complete. Scutellum visible. Apex of prosternal lobe pubescent. **Legs**. Metafemora with 4–10 long setae on posterior margin. Male protarsi and mesotarsi dilated laterally and biseriately pubescent ventrally. Segment 4 of protarsi and mesotarsi of both sexes without membranous laminae. Tarsi glabrous (at least tarsomeres 1–4) dorsally; metatarsomere 5 pubescent (with 6–8 setae) ventrally; metatarsomere 1 much shorter than metatarsomeres 2+3 (slightly longer than metatarsomere 2). **Elytra**. Interneurs complete. Rows of setiferous punctures absent on intervals 3, 5, and 7, and on interneur 2. Umbilicate setiferous series of interval 9 separated into two major groups, with posterior group continuous. **Abdomen**. Ventrites 2+3 of male without a setiferous fovea. Ventrites 5+6 of both sexes without short setae, with paired ambulatory setae only. **Aedeagus**. Lateral view: moderately arcuate. Dorsal view: asymmetrical (with ostium strongly deflected to the left); dorsal membranous area very wide, extending only in apical half (stopping well before basal bulb); apical disc present. Internal sac armed or unarmed.

Geographic distribution. Nearctic, Palearctic, Ethiopian, Oriental, and Australian Regions; New Zealand (adventive).

References. Noonan, 1976: 31–38 (taxonomy); Larochelle & Larivière, 2001: 128 (catalogue).

Subgenus *Harpalus* Latreille, 1802 [A]

Harpalus Latreille, 1802: 92 (see above).

Amblystus Motschulsky, 1864: 209. Type species: *Carabus rubripes* Duftschmid, 1812, by original designation. Author of synonymy unknown for this subgenus.

Geographic distribution. Same as genus.

Key to species of *Harpalus*

1 Pronotum (Fig. 137): sides converging toward base; punctuation strongly developed basally and laterally; base emarginate. Elytra with apex and outer intervals pubescent (Fig. 100). [Metallic lustre strong; Fig. 193] ....(p. 51)... ***affinis*** (Schrank)

— Pronotum (Fig. 138–139): sides not converging toward base; punctuation feebly developed basally and laterally; base straight. Elytra with apex glabrous and at most interval 9 pubescent (in addition to umbilicate setiferous series). [Metallic lustre absent or weak] 2

2(1) Body greenish dorsally (Fig. 195). Elytra with interval 9 glabrous (except for umbilicate series of setiferous punctures). Microsculpture strongly developed on head. Paraglossae longer than ligula. Metafemora with 4 long setae on posterior margin. Body length 7.5 mm or less. [Pronotum (Fig. 139)] ....(p. 53)... ***australasiae*** Dejean

— Body not greenish dorsally (Fig. 194). Elytra with interval 9 pubescent (in addition to umbilicate series of setiferous punctures). Microsculpture almost absent on head. Paraglossae as long as ligula (Fig. 31). Metafemora with 8-10 long setae on posterior margin. Body length 8.0 mm or more. [Pronotum (Fig. 138)] ....(p. 52)... ***tardus*** (Panzer)

Harpalus (*H.*) *affinis* (Schrank, 1781) [A]

Figures 54, 100, 137, 193; Map p. 149

Carabus aeneus Fabricius, 1775: 245. Type locality: Germany. Primary homonym of *Carabus aeneus* DeGeer, 1774.

Carabus affinis Schrank, 1781: 212 (replacement name for *Carabus aeneus* Fabricius, 1775). Type locality: Austria.

Harpalus affinis: Author of combination uncertain for this European species.

Description. Body length: 8.2–12.0 mm. Moderately convex. Black; antennae and legs either reddish or blackish. Head and pronotum glabrous and smooth; elytra with outer intervals and apex pubescent. Microsculpture isodiametric

(stronger in males), absent on frons and pronotal disc. Shiny, with strong metallic lustre (often green, otherwise bronze or coppery); elytra duller in females. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Mandibles moderately long. Labrum strongly transverse; apex straight. Eyes widely separated from buccal fissure ventrally (by about 1.5× maximum width of antennal scape). Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width. Mentum with medial tooth moderately shorter than lateral lobes. Paraglossae as long as ligula. Penultimate segment of labial palpi with 2 long setae and 3–4 short setae on anterior margin. **Thorax**. Pronotum (Fig. 137) very transverse, widest about middle; sides converging toward base, not sinuate; base emarginate; apex concave; lateral depressions absent; anterior angles strongly developed, broadly rounded; posterior angles strongly developed, obtuse; basal foveae deep, wide; punctuation strongly developed (basally and laterally). Apex of prosternal lobe with 6–7 long setae and 8–9 short setae. Metepisterna longer than wide. **Legs**. Metafemora with 5 long setae on posterior margin. **Elytra**. Widest behind middle. Shoulders well developed, rounded, without a tooth. Subapical sinuations strong. Sutural apices obtusely angulate in males, acutely angulate in females. Scutellar striole present. Interneurs shallow, impunctate. Intervals impunctate, flat; elytral apex and outer intervals sparsely pubescent. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 54). Lateral view: as for genus; apex short (more so than in *tardus*), harpoon-like. Dorsal view: as for genus; apical disc not much longer than wide. Internal sac unarmed.

Material examined. 70 non-type specimens (AMNZ, ITNZ, JNNZ, MONZ, NZAC, OMNZ, UCNZ).

Geographic distribution (Map p. 149). North Island: RI, WA, WI, WN. Adventive. Extralimital range: Europe, Asia; North America. First New Zealand record: Palmerston North, WI, 1975 (NZAC; Townsend, 1992: 25). Well established.

Ecology. Lowland, montane, subalpine, alpine. Vicinities of cities. Cultivated fields (seradella, pea, wheat, quinoa, buckwheat, phacelia, coriander, barley), pastures, meadows, roadsides, gardens, sand dunes, kiwifruit orchards; glasshouses and houses (occasionally). Open ground; sandy (mostly), silty or clayey soil, covered with grass or weeds. Mostly nocturnal; sheltering during the day in the soil at the base of plants and under stones. **Biology**. Seasonality: throughout the year, except May–June. Spring breeder. Tenerals: February–May. Adult overwinterer. Omnivorous, mostly phytophagous. Adult food, in the field: weed seeds (mostly), aphids, and flies. **Dispersal power**. Elytra free along suture. Macropterous. Frequent flier. Moderate runner. Clearly effective as a colonist. Strongly favored by human activities. **Collecting techniques**. Pitfall trapping, turning stones and logs.

References. Lindroth, 1986: 351 (distribution, ecology, biology, dispersal power); Townsend, 1992: 25–29 (distribution, ecology, biology) and 1994: 9, 11 (distribution, ecology); Sunderland *et al*., 1995: 39–49 (biology); Larochelle & Larivière, 2001: 128 (taxonomy, distribution, ecology, biology, dispersal power) and 2003: 273–274 (ecology, biology, dispersal power, collecting techniques).

Harpalus (*H.*) *tardus* (Panzer, 1797) [A]

Figures 55, 138, 194; Map p. 149.

Carabus tardus Panzer, 1797: 24. Type locality: Germany. Multiple synonyms exist in the Old World literature for this adventive species.

Description. Body length: 8.0–11.0 mm. Moderately convex. Black; antennae, palpi, and legs reddish; femora and tarsi brownish black; sides of pronotum paler. Glabrous and smooth, except elytral interval 9 pubescent throughout. Microsculpture isodiametric (stronger in males), almost absent on head; granulate on female elytra. Shiny, without metallic lustre; elytra dull in females. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Mandibles moderately long. Labrum strongly transverse; apex straight or slightly emarginate. Eyes widely separated from buccal fissure ventrally (by about 1.5× maximum width of antennal scape). Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width. Mentum with medial tooth much shorter than lateral lobes. Paraglossae as long as ligula. Penultimate segment of labial palpi with 2 long setae and 3–4 short setae on anterior margin. **Thorax**. Pronotum (Fig. 138) very transverse, widest in basal half; sides not converging toward base, not sinuate; base straight; apex concave; lateral depressions widening posteriorly; anterior angles strongly developed, broadly rounded; posterior angles strongly developed, subrectangular; basal foveae shallow, narrow; punctuation feebly developed (in basal foveae and around posterior angles). Apex of prosternal lobe with 6–7 long setae and 8–9 short setae. Metepisterna longer than wide. **Legs**. Metafemora with 8–10 long setae on posterior margin. **Elytra**. Widest behind middle. Shoulders well developed, angulate, with a strong tooth. Subapical sinuations feeble. Sutural apices obtusely angulate in males, acutely angulate in females. Scutellar striole present. Interneurs shallow, impunctate. Intervals impunctate, flat; interval 9 pubescent (in addition to umbilicate setiferous series). Interval 3 with a setiferous puncture behind middle. **Aedeagus** (Fig.

55). Lateral view: as for genus; apex long (more so than in *affinis*), harpoon-like (in lateral view). Dorsal view: as for genus; apical disc much longer than wide. Internal sac unarmed.

Material examined. 10 non-type specimens (LUNZ, NZAC).

Geographic distribution (Map. p. 149). South Island: MC–Christchurch, Mount Pleasant. Adventive. Extralimital distribution: Palearctic Region. First New Zealand record: 1995 (Emberson, 2004; LUNZ).

Ecology. Lowland. An open rocky spur with loamy soil covered with grass and herbs. Nocturnal and diurnal; active during the day on bare ground, on pavement, and on roadsides, or sheltering under stones and in burrows. Europe: dunes, grasslands, heaths, and cultivated fields; open ground, with rather dry, sandy soil. **Biology**. Seasonality: September–October, December–January, March. Spring breeder and adult overwinterer (Europe). **Dispersal power**. Elytra free along suture. Macropterous, capable of flight. Moderate runner. **Collecting techniques**. Pitfall trapping.

References. Lindroth, 1986: 362 (ecology, biology); Emberson, 2004 (distribution, ecology, biology, dispersal power).

Subgenus (Uncertain)

Harpalus australasiae Dejean, 1829 reinstatement [A]

Figures 56, 101, 139, 195; Map p. 149

Harpalus australasiae Dejean, 1829: 386. Type locality: Australia (as Nouvelle-Hollande).
Hypharpax australasiae: Bates, 1874: 272.
Diaphoromerus australasiae: Chaudoir, 1878: 480.
Notiobia (*Anisotarsus*) *australasiae*: Noonan, 1973: 296.
Hypharpax australasiae: Moore, in Moore *et al*., 1987: 237; Larochelle & Larivière, 2001: 124.

Description. Body length: 6.0–7.5 mm. Slightly convex. Black; pronotum and elytra greenish; pronotal margins reddish; base of antennae and tibiae testaceous; remainder of legs and palpi dark brown. Generally glabrous and smooth. Microsculpture deep, strongly isodiametric on head, moderately isodiametric on pronotum, slightly transverse on elytra. Shiny, with bronze metallic lustre (males); duller (females). **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Mandibles short. Labrum moderately transverse; apex straight or slightly emarginate medially. Eyes moderately separated from buccal fissure ventrally (by about maximum width of antennal scape). Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width. Mentum with medial tooth moderately shorter than lateral lobes. Paraglossae longer than ligula. Penultimate segment of labial palpi with 2–3 long setae and 1–5 short setae on anterior margin. **Thorax**. Pronotum (Fig. 139) very transverse, widest in basal 1/2; sides not converging toward base, not sinuate; base straight; apex concave; lateral depressions absent; anterior angles strongly developed, broadly rounded; posterior angles strongly developed, subrectangular; basal foveae shallow, narrow; punctuation feebly developed (almost absent). Apex of prosternal lobe with 3–8 long setae and 6–9 short setae. Metepisterna longer than wide. **Legs**. Metafemora with 4 long setae on posterior margin. **Elytra**. Widest about middle. Shoulders strongly developed, angulate, with a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole present. Interneurs shallow, deepening apically, impunctate. Intervals impunctate, flat, becoming convex apically; interval 9 glabrous (except for umbilicate setiferous series). Interval 3 with a setiferous puncture behind middle. **Aedeagus** (Fig. 56). Lateral view: as for genus; apex slender, not harpoon-like. Dorsal view: apical disc moderately longer (about 1.5×) than wide. Internal sac armed.

Material examined. 198 non-type specimens (AMNZ, ITNZ, JNNZ, LUNZ, MONZ, NZAC, OMNZ).

Geographic distribution (Map p. 149). North Island: BP, GB, HB, WA, WI, WN. South Island: MC (Christchurch, 1960). Extralimital range: Australia (including Tasmania). Adventive. First New Zealand records: New Zealand (Redtenbacher, 1868: 15); Napier, HB 1947 (NZAC). Well established.

Ecology. Lowland. Cultivated fields (strawberry), vacant lots, lawns, and sand dunes. Open ground; dry soil covered with sparse vegetation (grass, weeds, herbs). Mostly diurnal; active on plants in the sunshine; sheltering on cloudy days in burrows dug at the base of plants (e.g., *Lupinus*, *Muhlenbeckia*) and under logs. Gregarious. **Biology**. Seasonality: throughout the year, except May–June. Tenerals: January–February. Omnivorous, probably granivorous (Moore *et al*., 1987: 237). Once recorded feeding on strawberry seeds. **Dispersal power**. Elytra free along suture. Macropterous. Occasional flier. Moderate runner. Clearly effective as a colonist. Favoured by human activities. **Collecting techniques**. Pitfall trapping, digging at the base of plants, raking leaf litter, turning seashore debris.

References. Thomson, 1922: 284 (distribution); Pilgrim, 1963: 841 (distribution); Noonan, 1973: 296 and 1976: 10 (taxonomy); Moore *et al*., 1987: 237 (distribution, ecology, biology, dispersal power); Townsend, 1994: 9, 11, 13 (taxonomy, distribution, ecology); Larochelle & Larivière, 2001: 124 (as *Hypharpax*; taxonomy, distribution, ecology, biology, dispersal power).

Remarks. This species has been previously placed in Anisodactylina, but the presence of biseriately pubescent male tarsi and the aedeagal ostium strongly deflected to the left indicate that it belongs to the Harpalina. The species agrees in other morphological characters with members of the genus *Harpalus*.

Subtribe PELMATELLINA

Diagnosis (New Zealand). Body length: 3.2–10.0 mm. Frons usually with clypeo-ocular prolongations, seldom without (*Syllectus gouleti*). Mentum with a tooth medially. Mentum and submentum separated by complete transverse suture. Penultimate segment of labial palpi usually bisetose (with 2 setae), seldom trisetose (with 3 setae, *Kupeharpalus*) on anterior margin. Apex of prosternal lobe usually glabrous, seldom pubescent (*Kupeharpalus*). Male protarsi dilated laterally and spongily pubescent ventrally; male mesotarsi usually dilated laterally, spongily pubescent ventrally (except *Syllectus*), seldom unmodified (neither dilated nor spongily pubescent; *Kupeharpalus johnsi, Lecanomerus marrisi*). Metatarsomere 1 usually as long as metatarsomeres 2+3, rarely shorter (*Lecanomerus atriceps, L. latimanus, L. marrisi*). Umbilicate setiferous series of interval 9 separated into 2 major groups with posterior group either divided further into 2 subgroups or continuous (*Hakaharpalus*, *Kupeharpalus, Lecanomerus insignitus*). Aedeagus usually arcuate, seldom almost straight (some *Syllectus*), symmetrical (with ostium dorsal, not deflected laterally).

Geographic distribution. Mostly Neotropical and Australian Regions; also Nearctic Region.

References. Noonan, 1976: 6–8 (taxonomy); Larochelle & Larivière, 2001: 118–122 (catalogue).

Remarks. All world genera recognised so far within the Pelmatellina have been characterised by the glabrous apex of the prosternal lobe. *Kupeharpalus* (new genus including 3 species) which is apparently very close to *Lecanomerus,* deviates from this taxonomic concept by having the apex of the prosternal lobe pubescent.

Key to genera of New Zealand Pelmatellina

1 Apex of prosternal lobe pubescent. Penultimate segment of labial palpi trisetose on anterior margin (Fig. 10). Eyes widely separated from buccal fissure ventrally (by 1.5–2× maximum width of antennal scape; Fig. 19) [North Island: Northland] ....(p. 57)... ***Kupeharpalus*** new genus

— Apex of prosternal lobe glabrous (Fig. 2). Penultimate segment of labial palpi bisetose on anterior margin (Fig. 11). Eyes reaching buccal fissure (Fig. 21) or narrowly separated from it ventrally (by 0.3–1× maximum width of antennal scape; Fig. 20) 2

2(1) Segment 4 of protarsi and mesotarsi with 2 membranous laminae (Fig. 25). Forebody (head and thorax) much narrower than elytra (Fig. 211–213) ... .(p. 68)... ***Syllectus*** Bates

— Segment 4 of protarsi and mesotarsi without membranous laminae (Fig. 26). Forebody (head and thorax) at most moderately narrower than elytra (Fig. 196–199, 203–210) 3

3(2) Eyes strongly reduced (Fig. 102). Mandibles very long (about 5× their maximum width; Fig. 102). Elytral interneurs absent or incomplete basally (Fig. 102). Pronotum cordate or subcordate (Fig. 140–143) [South Island: NN, SD] ...(p. 54)... ***Hakaharpalus*** new genus

— Eyes normally developed (Fig. 107). Mandibles shorter (Fig. 107). Elytral interneurs complete (Fig. 107). Pronotum neither cordate nor subcordate (Fig. 147–154). [Throughout New Zealand] ....(p. 60)... ***Lecanomerus*** Chaudoir

Genus *Hakaharpalus* new genus [E]

Type species. *Hakaharpalus rhodeae* new species, by present designation.

Description. Body length: 3.7–4.9 mm. Forebody (head and thorax) without sparse setiferous micropores dorsally. **Head**. Dorsal surface excavated anteriorly (as in *Lecanomerus marrisi*). Mandibles very long (about 5× their maximum width), slightly curved forward, acute apically. Labrum strongly transverse; apex slightly emarginate medially. Eyes strongly reduced, flat or slightly convex, consisting of obliterated facets, narrowly separated from buccal fissure ventrally (by 0.7–1× maximum width of antennal scape). Tempora not inflated. Frons with clypeo-ocular prolongations incomplete toward eyes. Antennae widening from base to apex (contrary to other Pelmatellina genera); pubescence starting from antennomere 2. Mentum with a tooth medially, as long as lateral lobes. Mentum and submentum separated by complete transverse suture. Paraglossae longer than ligula. Palpi hirsute (contrary to other Pelmatellina genera), with last segment very inflated, not truncate but needle-shaped apically, with very dense, moderately long pubescence; penultimate segment of labial palpi bisetose on anterior margin. **Thorax**. Pronotum subcordate or cordate; base straight, much narrower than elytral base; lateral beads complete; anterior and posterior beads incomplete medially. Scutellum visible. Apex of prosternal lobe glabrous. **Legs**. Metafemora

with 5 long setae on posterior margin. Male protarsi and mesotarsi dilated laterally and spongily pubescent ventrally. Segment 4 of protarsi and mesotarsi of both sexes without membranous laminae. Tarsi pubescent (with numerous setae) dorsally; metatarsomere 5 pubescent (with 4 setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Interneurs absent or incomplete basally. Rows of setiferous punctures absent on intervals 3, 5, and 7, and on interneur 2. Umbilicate setiferous series of interval 9 separated into two major groups, with posterior group continuous. **Abdomen**. Ventrites 2+3 of male without a setiferous fovea. Ventrites 5+6 of both sexes without short setae, with paired ambulatory setae only. **Aedeagus**. Lateral view: strongly arcuate. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area wide, extending to basal bulb; apical disc absent. Internal sac unarmed.

Geographic distribution. New Zealand (endemic; South Island).

Remarks. The generic name is derived from *haka* (traditional Maori chant of defiance accompanied by stylised movements of hands and feet) and *Harpalus* (the type genus of the tribe Harpalini). A very distinctive genus restricted to the BR–NN–SD regions, which is easily recognised by the more or less heart-shaped pronotum, ovate elytra, palpi hirsute, with the last segment very inflated and needle-shaped apically, strongly reduced eyes, and antennae widening from base to apex. The strongly reduced eyes, long pubescence, and slightly convex body suggest subterranean behaviour similar to that of Anillina (Bembidiini) that live deep in thick leaf litter and/or in soil fissures.

Key to species of *Hakaharpalus*

1 Elytral intervals punctate (Fig. 102). ..... ….. 2

—Elytral intervals impunctate. ..... ….. 4

2(1) Elytra (Fig. 197): interneurs deep (strongly impressed). [Intervals finely punctate. Aedeagus (Fig. 58): apical half almost straight (in lateral view); apex narrowly rounded (in dorsal view). Pronotum (Fig. 141)] ....(p. 56)... ***maddisoni*** new species

—Elytra (Fig. 102, 196): interneurs shallow (weakly impressed) 3

3(2) Microsculpture absent on pronotum and elytra. Elytral intervals finely punctate. Pronotum (Fig. Addendum) sinuate laterally in front of posterior angle. [Male unknown] ....(p. 57, 93)...***cavelli*** (Broun) new combination

—Microsculpture present on pronotum and elytra. Elytral intervals coarsely punctate. Pronotum (Fig. 140) not sinuate laterally in front of posterior angle. [Aedeagus (Fig. 57): apical half slightly curved (in lateral view); apex broadly rounded (in dorsal view)] ....(p. 55)... ***patricki*** new species

4(1) Elytral interneurs absent (Fig. 199). Pronotum (Fig. 143) cordate, slightly sinuate laterally in front of posterior angles; anterior angles feebly developed, rounded. Microsculpture absent on pronotum. Eyes flat. [Aedeagus (Fig. 60)] ....(p. 57)... ***rhodeae*** new species

—Elytral interneurs present, although weakly impressed (Fig. 198). Pronotum (Fig. 142) subcordate, not sinuate laterally in front of posterior angles; anterior angles strongly developed, acute. Microsculpture present on pronotum. Eyes slightly convex. [Aedeagus (Fig. 59)] ....(p. 56)... ***davidsoni*** new species

Hakaharpalus patricki new species [E]

Figures 57, 102, 140, 196; Map p. 150

Hakaharpalus patricki Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "Mt Domett NN. 1250m Nov-Dec 71 G. Kuschel (typed) / moss (typed) / HOLOTYPE [male symbol] *Hakaharpalus patricki* Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 2 males (1 OMNZ, 1 NZAC) and 1 female (NZAC) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length: 4.1–4.5 mm. Slightly convex. Blackish brown; margins and sutures of elytra, as well as antennae, palpi, and legs pale yellowish. Generally glabrous. Elytral intervals coarsely punctate; interneurs shallow (weakly impressed), incomplete basally. Microsculpture absent on head, moderately transverse on pronotum, and very transverse (with microlines) on elytra. Shiny, without metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; excavated anteriorly, slightly convex posteriorly. Eyes strongly reduced, slightly convex, consisting of obliterated facets, narrowly separated from buccal fissure ventrally (by about 0.7× maximum width of antennal scape). Antennal scape about 3× longer than its maximum width. **Thorax**. Pronotum (Fig. 140) subcordate, widest before middle; sides converging toward base, not sinuate; base straight; apex almost straight behind anterior angles; lateral depressions absent; anterior angles strongly developed, acute; posterior angles moderately developed, obtuse; basal foveae shallow, ill-defined; punctuation feebly developed. Metepisterna wider than long. **Elytra**. Widest about middle. Shoulders feebly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices rounded. Scutellar striole absent. Interneurs shallow, impunctate,

incomplete basally. Intervals coarsely punctate, flat. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 57). Lateral view: as for genus; apical half slightly curved. Dorsal view: as for genus; apex broadly rounded.

Material examined. 7 specimens, including types (ITNZ, NZAC).

Geographic distribution (Map p. 150). South Island: NN–Brown Cow (Boulder Lake Track). Calphurnia Peak (near Boulder Lake). Mount Domett.

Ecology. Montane. Wet forests (beech). Shaded ground. Nocturnal; sheltering during the day in leaf litter and moss. **Biology**. Seasonality: November–January. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. **Collecting techniques**. Sifting leaf litter and moss.

Remarks. This taxon is morphologically close to *H. maddisoni*. It is named after our good colleague Brian H. Patrick (Otago Museum, Dunedin) for his encouragement in our New Zealand insect studies.

Hakaharpalus maddisoni new species [E]

Figures 58, 141, 197; Map p. 150

Hakaharpalus maddisoni Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "Surveyers Ck. 380m. Karamea Bluff Nelson. (hand-written) / 13 Oct 70 JI Townsend (hand-written) / HOLOTYPE [male symbol] *Hakaharpalus maddisoni* Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 1 male from same locality as holotype (NZAC) and 1 female (OMNZ) from Karamea Bluff.

Description. Body length: 4.2–4.5 mm. Slightly convex. Blackish brown; margins and sutures of elytra, as well as antennae, palpi, and legs pale yellowish. Generally glabrous. Elytral intervals finely punctate; interneurs deep, incomplete basally. Microsculpture absent on head, moderately transverse on pronotum, and very transverse (with microlines) on elytra. Head shiny; pronotum and elytra dull; dorsal surface without metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; excavated anteriorly, slightly convex posteriorly. Eyes strongly reduced, slightly convex, consisting of obliterated facets, narrowly separated from buccal fissure ventrally (by about 0.7× maximum width of antennal scape). Antennal scape about 3× longer than its maximum width. **Thorax**. Pronotum (Fig. 141) subcordate, widest before middle; sides converging toward base, not sinuate; base straight; apex almost straight behind anterior angles; lateral depressions absent; anterior angles strongly developed, acute; posterior angles moderately developed, obtuse; basal foveae shallow, ill-defined; punctuation feebly developed. Metepisterna wider than long. **Elytra**. Widest about middle. Shoulders feebly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices rounded. Scutellar striole absent. Interneurs deep, impunctate, incomplete basally. Intervals finely punctate, flat. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 58). Lateral view: as for genus; apical half almost straight. Dorsal view: as for genus; apex narrowly rounded.

Material examined. 4 specimens, including types (AMNZ, JNNZ, NZAC).

Geographic distribution (Map p. 150). South Island: NN–Glasgow Range. Karamea Bluff.

Ecology. Montane. Wet forests (beech). Shaded ground. **Biology**. Seasonality: October, January–February. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner.

Remarks. This species is named after our good friend Peter A. Maddison (Field Studies, Waitakere City) for his special help and encouragement in establishing our new life and career in New Zealand. J. Nunn (Dunedin) graciously provided the female paratype. See also **Remarks** under *H. patricki*.

Hakaharpalus davidsoni new species [E]

Figures 59, 142, 198; Map p. 149

Hakaharpalus davidsoni Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "Gowan Bridge Buller gorge Wet moss 24.9.64 J.I. Townsend (hand-written) / HOLOTYPE [male symbol] *Hakaharpalus davidsoni* Larochelle & Larivière, 2004 (red label; typed)." Paratype: 1 female (NZAC) from Mt Arthur, NN, bearing blue paratype label.

Description. Body length: 3.7–4.9 mm. Slightly convex. Reddish or blackish brown; disc of head, pronotum, and elytra darker; antennae, palpi, and legs pale yellowish. Generally glabrous. Elytral intervals impunctate; interneurs shallow (weakly impressed), incomplete basally. Microsculpture absent on head and elytra; shallow and very transverse (with microlines) on pronotum. Shiny, without metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; excavated anteriorly, slightly convex posteriorly. Eyes strongly reduced, slightly convex, consisting of obliterated facets, moderately separated from buccal fissure ventrally (by about maximum width of antennal scape). Antennal scape about 2× longer than its maximum width. **Thorax**. Pronotum (Fig. 142) subcordate, widest before middle; sides converging toward base, not sinuate; base straight; apex almost straight behind anterior angles; lateral depressions absent; anterior angles strongly developed, acute; posterior angles moderately developed, obtuse; basal foveae shallow, ill-defined; punctuation feebly developed. Metepisterna wider than long. **Elytra**. Widest about middle. Shoulders feebly devel-

oped, rounded, without a tooth. Subapical sinuations feeble. Sutural apices rounded. Scutellar striole absent. Interneurs shallow (weakly impressed), impunctate, incomplete basally. Intervals impunctate, flat. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 59). Lateral view: as for genus; apical half strongly curved, wider than in *patricki* and *maddisoni*. Dorsal view: as for genus; apex moderately rounded.

Material examined. 2 type specimens (NZAC).

Geographic distribution (Map p. 149). South Island: NN–Buller Gorge, Gowanbridge. Mount Arthur.

Ecology. Lowland, montane. A forest (beech). **Biology**. Seasonality: September. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner.

Remarks. This species is morphologically closer to *H. patricki* and *H. maddisoni* than to *H. rhodeae*. It is named after Robert L. Davidson (Carnegie Museum, Pittsburgh, Pennsylvania), long time friend and colleague of the first author, for special help and encouragement in his carabid research.

Hakaharpalus cavelli (Broun, 1893) new combination [E]

See Addendum, page 93.

Note. The holotype of the species originally described as *Tachys cavelli* was examined in early April 2005 in the course of another study. The tribal and generic placement of the species was then discovered. Because this *Fauna N.Z.* contribution was in an advanced stage of final production the *H. cavelli* description and notes are in the Addendum.

Hakaharpalus rhodeae new species [E]

Figures 60, 143, 199; Map p. 150

Hakaharpalus rhodeae Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "Maitai Valley Nelson 25.5.90 J.I. Townsend (hand-written) / JI Townsend Collection (typed) / HOLOTYPE [male symbol] *Hakaharpalus rhodeae* Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 2 females (1MONZ, 1 NZAC) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length: 4.0–4.5 mm. Slightly convex. Reddish brown; disc of head, pronotum, and elytra darker; antennae, palpi, and legs pale yellowish. Generally glabrous. Elytral intervals impunctate; inteneurs absent. Microsculpture absent on head and pronotum, very transverse (with microlines) on elytra. Shiny, without metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; excavated anteriorly, slightly convex posteriorly. Eyes strongly reduced, flat, consisting of obliterated facets, moderately separated from buccal fissure ventrally (by about maximum width of antennal scape). Antennal scape about 2× longer than its maximum width. **Thorax**. Pronotum (Fig. 143) cordate, widest before middle; sides converging toward base, slightly sinuate; base straight; apex slightly convex; lateral depressions absent; anterior angles feebly developed, rounded; posterior angles moderately developed, obtuse; basal foveae shallow, ill-defined; punctuation feebly developed. Metepisterna wider than long. **Elytra**. Widest about middle. Shoulders feebly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent. Interneurs absent. Intervals impunctate, flat. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 60). Lateral view: as for genus; apical half straight. Dorsal view: as for genus; apex triangular.

Material examined. 11 specimens, including types (ITNZ, NZAC).

Geographic distribution (Map p. 150). South Island: NN–Maitai Valley. Upper Maitai [Valley]. SD–Port Ligar. Titirangi [Bay].

Ecology. Lowland. Wet forests (broadleaf). Shaded ground. Nocturnal; sheltering during the day in leaf litter. **Biology**. Seasonality: October, March–May. Tenerals: October, March. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. **Collecting techniques**. Sifting leaf litter.

Remarks. The absence of dorsal body microsculpture, the heart-shaped pronotum, and the configuration of the aedeagus set this species apart from its congeners. The species is named after our close friend and colleague Birgit Rhode (Landcare Research, Auckland) for her special help and encouragement in our carabid studies, and for her exceptional dedication as a research assistant to the second author.

Genus *Kupeharpalus* new genus [E]

Type species. *Kupeharpalus barrattae* new species, by present designation.

Description. Body length: 5.0–8.5 mm. Forebody (head and thorax) without sparse setiferous micropores dorsally. **Head**. Mandibles moderately long, slightly curved forward, acute apically. Labrum strongly or moderately transverse; apex straight or slightly emarginate medially. Eyes moderately large, convex, widely separated from buccal fissure ventrally (by 1.5–2× maximum width of antennal scape). Tempora not inflated. Frons with clypeo-ocular prolongations complete or incomplete toward eyes. Antennal pubescence starting on basal 1/2 of antennomere 3. Mentum with a tooth medially, moderately shorter than lateral lobes. Mentum and submentum separated by com-

plete transverse suture. Paraglossae longer than or as long as ligula (*johnsi*). Palpi with last segment fusiform, not truncate apically, sparsely pubescent (with moderately long setae); penultimate segment of labial palpi trisetose on anterior margin. **Thorax**. Pronotum transverse; base straight or emarginate, moderately narrower than or as wide as elytral base; lateral beads complete; anterior bead complete or incomplete medially; posterior bead incomplete medially or complete. Scutellum visible. Apex of prosternal lobe pubescent. **Legs**. Metafemora with 2 long setae on posterior margin. Male protarsi dilated laterally and spongily pubescent ventrally. Male mesotarsi dilated laterally and spongily pubescent ventrally (with spongy pubescence not uniformly distributed, contrary to *Lecanomerus*) or unmodified (*johnsi*). Segment 4 of protarsi and mesotarsi of both sexes without membranous laminae. Tarsi pubescent (with numerous setae) dorsally; metatarsomere 5 pubescent (with 5–8 setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Interneurs complete. Rows of setiferous punctures absent on intervals 3, 5, and 7, and on interneur 2. Umbilicate setiferous series of interval 9 separated into two major groups, with posterior group continuous. **Abdomen**. Ventrites 2+3 of male without a setiferous fovea. Ventrites 5+6 of both sexes without short setae, with paired ambulatory setae only. **Aedeagus**. Lateral view: moderately or strongly arcuate. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area very wide, extending almost to basal bulb; apical disc present or absent. Internal sac armed or unarmed.

Geographic distribution. New Zealand (endemic).

Remarks. The generic name is derived from *Kupe* (the legendary Polynesian navigator to whom is attributed the discovery of New Zealand) and *Harpalus* (the type genus of the tribe Harpalini). Members of this new genus superficially resemble those of *Lecanomerus*, but can be separated from the latter by the following characters: eyes widely separated from buccal fissure; penultimate segment of labial palpi trisetose; apex of proternal lobe pubescent.

Key to species of *Kupeharpalus*

1 Pronotum (Fig. 146): base straight; posterior angles subrectangular; anterior angles obtuse; punctuation strongly developed basally. Paraglossae as long as ligula (Fig. 31) [Body length 6.0 mm or less. Aedeagus (Fig. 63)] ....(p. 59)... ***johnsi*** new species

— Pronotum (Fig. 144–145): base emarginate; posterior angles broadly rounded; anterior angles rounded; punctuation feebly developed basally. Paraglossae longer than ligula [Body length 6.0 mm or more] ... 2

2(1) Pronotum (Fig. 145): sides strongly convex. Body length 6.0–6.5 mm. Aedeagus (Fig. 62): apex triangular [Northland: tip of Aupouri Peninsula] ....(p. 59)... ***embersoni*** new species

— Pronotum (Fig. 144): sides moderately convex. Body length 7.0–8.5 mm. Aedeagus (Fig. 61): apex finger-like [Northland: south of Aupouri Peninsula] ....(p. 58)... ***barrattae*** new species

Kupeharpalus barrattae new species [E]

Figures 61, 103, 144, 200; Map p. 150.

Kupeharpalus barrattae Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "NEW ZEALAND ND Mangamuka Gorge Wlkwy 625m 351228S 1732640E 17.IX.-16.X.1999 Larivière, Larochelle (typed) / Wet broadleaf forest. Pittraps. (typed) / HOLOTYPE [male symbol] *Kupeharpalus barrattae* Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 1 male (MONZ) from the same locality as the holotype, 3 females (1 MONZ, 2 NZAC) from Puketi Forest, ND, bearing blue paratype labels.

Description. Body length: 7.0–8.5 mm. Strongly convex. Piceous brown; antennae, palpi, and legs yellowish. Generally glabrous and smooth. Microsculpture isodiametric on head, moderately transverse on pronotum, very transverse (with microlines) on elytra. Head and pronotum moderately shiny; elytra less shiny, iridescent; without metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Labrum strongly transverse; apex slightly emarginate. Eyes widely separated from buccal fissure ventrally (by about 1.5× maximum width of antennal scape). Frons with clypeo-ocular prolongations incomplete toward eyes. Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width. Paraglossae longer than ligula. Penultimate segment of labial palpi with 2 long setae and 1 short seta on anterior margin. **Thorax**. Pronotum (Fig. 144) very transverse, widest about middle; sides converging toward base, not sinuate, moderately convex; base emarginate, as wide as elytral base; apex slightly concave; lateral depressions widening posteriorly; anterior bead complete; posterior bead incomplete medially; anterior angles moderately developed, rounded; posterior angles strongly developed, broadly rounded; basal foveae shallow, narrow; punctuation feebly developed. Apex of prosternal lobe with 10–20 short setae (without long setae). Metepisterna slightly wider than long, almost square. **Legs**. Male mesotarsi dilated laterally and spongily pubescent ventrally. Metatarsomere 5 pubescent (with 8 setae) ventrally. **Elytra**. Widest about middle. Shoulders strongly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar

striole absent. Interneurs moderately deep, impunctate. Intervals impunctate, slightly convex. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 61). Lateral view: as for genus; moderately arcuate; apex abruptly narrowed into finger-like process. Dorsal view: as for genus; apical disc present, narrow, parallel-sided.

Material examined. 22 specimens, including types (AMNZ, FMNH, MONZ, NZAC).

Geographic distribution (Map p. 150). North Island: AK, CL, ND.

Ecology. Lowland. Wet forests (broadleaf, podocarp). Shaded ground; soil covered with dead leaves. Nocturnal; sheltering during the day in leaf litter, under logs and stones. **Biology**. Seasonality: September–February, May–August. Tenerals: October, May. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. **Collecting techniques**. Pitfall trapping, raking leaf litter, turning logs and stones.

Remarks. This taxon is morphologically close to *K. embersoni* but it is geographically isolated from it, being found south of the Aupouri Peninsula whereas *K. embersoni* is restricted to the tip of the Peninsula. This species is named after Barbara I. P. Barratt (AgResearch, Mosgiel) for her contribution to the building of important reference collections of New Zealand carabids.

Kupeharpalus embersoni new species [E]

Figures 62, 145, 201; Map p. 150

Kupeharpalus embersoni Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "NEW ZEALAND ND Te Paki Res, Sandy Bay 16.II. 1995 Larivière, Larochelle (typed) / Streambank; taraire-kauri for; shaded wet soil, with rich leaf-litter (typed) / HOLOTYPE [male symbol] *Kupeharpalus embersoni* Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 1 male (MONZ), 1 female (NZAC) from same locality as holotype, bearing blue paratype labels.

Description. Body length: 6.0–6.5 mm. Strongly convex. Piceous brown; antennae, palpi, and legs yellowish. Generally glabrous and smooth. Microsculpture isodiametric on head, moderately transverse on thorax, very transverse (with microlines) on elytra. Head and pronotum moderately shiny; elytra less shiny, iridescent; without metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Labrum strongly transverse; apex slightly emarginate. Eyes widely separated from buccal fissure ventrally (by about 1.5×maximum width of antennal scape). Frons with clypeo-ocular prolongations incomplete toward eyes. Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width. Paraglossae longer than ligula. Penultimate segment of labial palpi with 2 long setae and 1 short seta on anterior margin. **Thorax**. Pronotum (Fig. 145) very transverse, widest about middle; sides converging toward base, not sinuate, strongly convex; base emarginate, as wide as elytral base; apex slightly concave; lateral depressions widening posteriorly; anterior bead complete; posterior bead incomplete medially; anterior angles moderately developed, rounded; posterior angles strongly developed, broadly rounded; basal foveae shallow, narrow; punctuation feebly developed. Apex of prosternal lobe with 10–20 short setae (without long setae). Metepisterna slightly wider than long, almost square. **Legs**. Male mesotarsi dilated laterally and spongily pubescent ventrally. Metatarsomere 5 pubescent (with 8 setae) ventrally. **Elytra**. Widest about middle. Shoulders strongly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent. Interneurs moderately deep, impunctate. Intervals impunctate, slightly convex. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 62). Lateral view: as for genus; moderately arcuate; apex broadly triangular. Dorsal view: as for genus; apical disc present, wide, with convergent sides.

Material examined. 12 specimens, including types (AMNZ, MONZ, NZAC).

Geographic distribution (Map p. 150). North Island: ND–Kohuronaki. North Cape. Pandora. Sandy Bay. Tapotupotu Bay.

Ecology. Lowland. Wet forests (broadleaf, podocarp): along streams. Shaded ground; soil covered with dead leaves. Nocturnal; sheltering during the day in leaf litter (mostly) and under logs. **Biology**. Seasonality: November–February, April. Tenerals: February, April. Occasionally infested with mites. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. **Collecting techniques**. Raking leaf litter, turning logs, pitfall trapping.

Remarks. This species is named after Rowan M. Emberson (Lincoln University, Lincoln) for his contribution to the building of important reference collections of New Zealand carabids. See also **Remarks** under *K. barrattae*.

Kupeharpalus johnsi new species [E]

Figures 63, 104, 146, 202; Map p. 150

Kupeharpalus johnsi Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "Kara, Whangarei 16.7.27 (hand-written) / coll. E. Fairburn (hand-written) / HOLOTYPE [male symbol] *Kupeharpalus johnsi* Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 9 males (1 MONZ, 4 NZAC, 4 CMNZ) and 1 female (CMNZ) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length: 5.0–6.0 mm. Strongly convex. Forebody (head and thorax) dark brown; elytra, labrum, antennae, palpi, and legs rufous. Generally glabrous and punctate. Microsculpture absent on forebody, absent or very transverse (with microlines) on elytra. Very shiny, without metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; excavated anteriorly, slightly convex posteriorly. Labrum slightly transverse, almost square; apex straight or slightly emarginate medially. Eyes widely separated from buccal fissure ventrally (by about 2× maximum width of antennal scape). Frons with clypeo-ocular prolongations complete. Antennae moderately long, reaching elytral base; antennal scape about 2× longer than its maximum width. Paraglossae as long as ligula. Penultimate segment of labial palpi with 2 long setae and 1 short seta on anterior margin. **Thorax**. Pronotum (Fig. 146) very transverse, widest before middle; sides converging toward base, slightly sinuate; base straight, moderately narrower than elytral base; apex slightly concave; lateral depressions widening posteriorly; anterior bead incomplete medially; posterior bead complete; anterior angles moderately developed, obtuse; posterior angles strongly developed, subrectangular; basal foveae deep, narrow; punctuation strongly developed (basally). Apex of prosternal lobe with 10–20 short setae (without long setae). Metepisterna wider than long. **Legs**. Male mesotarsi unmodified, neither dilated laterally nor spongily pubescent ventrally. Metatarsomere 5 pubescent (with 5–6 setae) ventrally. **Elytra**. Widest behind middle. Shoulders strongly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent or present. Interneurs moderately deep, impunctate. Intervals impunctate, slightly convex. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 63). Lateral view: as for genus; strongly arcuate; apex narrowly pointed; main shaft much narrower than in other *Kupeharpalus* species. Dorsal view: as for genus; apical disc absent.

Material examined. 36 specimens, including types (AMNZ, CMNZ, JNNZ, MONZ, NZAC).

Geographic distribution (Map p. 150). North Island: AK–Matakana. BP–Kaimai Summit. CL– Coromandel Range. Maumaupaki Track. Tapu-Coroglen Road. ND–Hikurangi. Kara. Parakao. Tangihua Range.

Ecology. Lowland, montane. A moist broadleaf forest, along a stream, with shaded ground covered with thick leaf litter. Gregarious. **Biology**. Seasonality: September–March, July. Tenerals: March. Occasionally infested with mites. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. **Collecting techniques**. Pitfall trapping.

Remarks. This taxon is morphologically isolated from its congeners (see characters in key to species). It is named after Peter M. Johns (Canterbury Museum, Christchurch) for his special help in our entomological studies and for his contribution to the building of important reference collections of New Zealand carabids.

Genus *Lecanomerus* Chaudoir, 1850 N

Lecanomerus Chaudoir, 1850: 446. Type species: *Lecanomerus insidiosus* Chaudoir, 1850, by monotypy.

Thenarotes Bates,1878a: 320. Type species: *Thenarotes tasmanicus* Bates, 1878a, by monotypy. Synonymised by Sloane, 1920: 137.

Odontagonum Darlington, 1956: 8. Type species: *Odontagonum nigrum* Darlington, 1956, by monotypy. Synonymised by Moore, in Moore *et al*., 1987: 225.

Description. Body length: 3.2–10.0 mm. Forebody (head and thorax) without sparse setiferous micropores dorsally. **Head**. Mandibles short or moderately long, slightly or strongly curved forward, acute apically. Labrum strongly or moderately transverse (*atriceps, insignitus, marrisi*); apex straight or slightly emarginate medially. Eyes moderately large, convex, narrowly separated from buccal fissure ventrally (by 0.3–0.5× maximum width of antennal scape), or reaching buccal fissure (*marrisi, sharpi, verticalis*). Tempora not inflated. Frons with clypeo-ocular prolongations complete or incomplete toward eyes (*insignitus, marrisi*). Antennal pubescence starting on antennomere 3 or 2 (*atriceps, vestigialis*). Mentum with a tooth medially, moderately shorter, much shorter (*atriceps*) or about as long as lateral lobes (*marrisi*). Mentum and submentum separated by complete transverse suture. Paraglossae longer than or as long as ligula (*vestigialis*). Palpi with last segment fusiform or cylindrical (*insignitus*), not truncate apically, sparsely pubescent (with very short or moderately long setae), or glabrous (*insignitus, marrisi*); penultimate segment of labial palpi bisetose on anterior margin. **Thorax**. Pronotum transverse; base straight, emarginate (*insignitus, marrisi*) or convex, moderately narrower than or as wide as elytral base; lateral beads complete; anterior bead incomplete medially or complete (*insignitus*); posterior bead incomplete medially. Scutellum visible. Apex of prosternal lobe glabrous. **Legs**. Metafemora with 2 long setae on posterior margin. Male protarsi dilated laterally and spongily pubescent ventrally. Male mesotarsi dilated laterally and spongily pubescent ventrally (with spongy pubescence uniformly distributed, contrary to *Kupeharpalus*) or unmodified (*marrisi*). Segment 4 of protarsi and mesotarsi of both sexes without membranous laminae. Tarsi pubescent (with numerous setae or only a few (*verticalis*)) or glabrous (*insignitus, sharpi*) dorsally; metatarsomere 5 pubescent (with 4–8 setae) ventrally; metatarsomere 1 as long as or shorter than (*atriceps,*

latimanus, marrisi) metatarsomeres 2+3. **Elytra**. Interneurs complete. Rows of setiferous punctures absent on intervals 3, 5, and 7, and on interneur 2. Umbilicate setiferous series of interval 9 separated into two major groups, with posterior group further divided into two subgroups, or, posterior group continuous (*insignitus*). **Abdomen**. Ventrites 2+3 of male without a setiferous fovea. Ventrites 5+6 of both sexes without short setae, with paired ambulatory setae only. **Aedeagus**. Lateral view: slightly to strongly arcuate. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area wide, extending almost to basal bulb; apical disc absent or present. Internal sac armed or unarmed.

Geographic distribution. New Guinea, New Caledonia, Australia (including Tasmania), New Zealand.

References. Hudson, 1934: 176 (list); Noonan, 1976: 7 (taxonomy); Larochelle & Larivière, 2001: 118–121 (catalogue).

Remarks. Sloane (1920: 137) incorrectly synonymised *Lecanomerus* with *Nemaglossa* Solier, 1849, which is a valid genus restricted to Chile (Noonan, 1976: 7). *Lecanomerus* is a highly variable genus which currently includes species with the following combination of characters: eyes reaching buccal fissure or narrowly separated from it; penultimate segment of labial palpi bisetose; apex of prosternal lobe glabrous; clypeo-ocular prolongations complete (incomplete toward eyes in *insignitus, marrisi*); umbilicate setiferous series of interval 9 with posterior group divided into 2 subgroups (continuous in *insignitus*). Australian *Lecanomerus* species are diverse and in great need of revision supported by a cladistic analysis; only then will we be able to define the taxonomic limits of this genus and the generic placement of currently described species in New Zealand and the rest of Australasia.

Key to species of *Lecanomerus*

1 Elytra with sides broadly yellowish (Fig. 206–207) . 2

— Elytra with sides not broadly yellowish (Fig. 203–205, 208–210) 3

2(1) Pronotum (Fig. 151): sides slightly sinuate before strongly developed, acute posterior angles with prominent tooth. Pale outline of elytra somewhat jagged (Fig. 207). [TH, North Island] ....(p. 65)... ***sharpi*** (Csiki)

— Pronotum (Fig. 150): sides not sinuate before moderately developed, obtusely rounded posterior angles, without tooth. Pale outline of elytra more regular, not jagged (Fig. 206). [CH, South Island] ....(p. 64)... ***latimanus*** Bates

3(1) Pronotum (Fig. 147): reddish brown, contrasting with dark head and elytra (Fig. 203); base much narrower than apex. Slender body, somewhat parallel-sided (Fig. 203). Mentum with medial tooth very small, much shorter than lateral lobes (Fig. 17). Body length 3.5 mm or less ....(p. 62)... ***atriceps*** (Macleay)

— Pronotum: not reddish brown; base about as wide as apex. Subovate (somewhat egg-shaped) body. Mentum with medial tooth moderately shorter (Fig. 14) than or about as long as lateral lobes (Fig. 16). Body length 4.0 mm or more (usually over 5 mm) 4

4(3) Pronotum (Fig. 152) sinuate in front of subrectangular posterior angles. Mentum with medial tooth as long as lateral lobes (Fig. 16). Male mesotarsi unmodified (neither dilated laterally (Fig. 208) nor spongily pubescent ventrally) [South Island: Banks Peninsula] ....(p. 66)... ***marrisi*** new species

— Pronotum not sinuate in front of rounded posterior angles. Mentum with medial tooth moderately shorter than lateral lobes (Fig. 14). Male mesotarsi dilated laterally (Fig. 205) and spongily pubescent ventrally (Fig. 12) 5

5(4) Elytra fused along suture; membranous wings vestigial (reduced to wing buds) 6

— Elytra not fused along suture; membranous wings fully developed 7

6(5) Pronotum (Fig. 148): base emarginate; basal foveae shallow, weakly and finely punctate. Frons with clypeo-ocular prolongations incomplete toward eyes (Fig. 105). [North Island: ND] ....(p. 63)... ***insignitus*** Broun

— Pronotum (Fig. 149): base rather straight; basal foveae deep, strongly and coarsely punctate. Frons with clypeo-ocular prolongations complete (Fig. 1). [South Island] ....(p. 63)... ***obesulus*** Bates

7(5) Elytra very iridescent, with subapical sinuations strongly developed (Fig. 30). Pronotum (Fig. 153) widest before middle. Appendages entirely pale reddish. Body slightly convex; length 4.7 mm or more ....(p. 67)... ***verticalis*** (Erichson)

— Elytra slightly iridescent, with subapical sinuations weakly developed (Fig. 29). Pronotum (Fig. 154) widest about middle. Appendages partly pale reddish (parts of antennae, tibiae, and tarsi dark brown). Body strongly convex; length 4.3 mm or less ....(p. 67)... ***vestigialis*** (Erichson)

Lecanomerus atriceps (Macleay, 1871) [A]

Figures 64, 147, 203; Map p. 150

Trechus atriceps Macleay, 1871: 113. Type locality: Gayndah, Queensland, Australia.

Thenarotes atriceps: Blackburn, 1892: 97.

Nemaglossa atriceps: Sloane, 1920: 137.

Nemaglossa (*Thenarotes*) *atriceps*: Pilgrim, 1963: 844.

Lecanomerus atriceps: Moore *et al*., 1987: 225.

Acupalpus javanus Jedlička, 1964: 311. Type locality: Puntjak-Pass, W. Java (probably mislabelled (Kataev, 2002b). Synonymised by Kataev, 2002b: 722.

Description. Body length: 3.2–3.5 mm. Slender, more or less parallel-sided (more so than other *Lecanomerus* species). Slightly convex. Head black; pronotum reddish brown; elytra dark brown; elytral margins and sutures red; antennomeres 1+2, palpi, and legs yellowish; antennomeres 3–11 blackish (contrary to other *Lecanomerus* species). Generally glabrous and smooth. Microsculpture vestigial on forebody (isodiametric on head, moderately transverse on pronotum), and very transverse (with microlines) on elytra. Shiny, without metallic lustre; elytra very iridescent. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Mandibles short, strongly curved forward. Labrum moderately transverse; apex slightly emarginate medially. Eyes narrowly separated from buccal fissure ventrally (by about 0.3×maximum width of antennal scape). Frons with clypeo-ocular prolongations complete. Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width; pubescence starting from apical 1/2 of antennomere 2. Mentum with a very short tooth medially, much shorter than lateral lobes (only about 0.3× as long). Paraglossae longer than ligula. Palpi with last segment fusiform, with sparse, moderately long pubescence. **Thorax**. Pronotum (Fig. 147) moderately transverse, widest before middle; sides converging toward base, not sinuate; base slightly convex, moderately narrower than elytral base, much narrower than pronotal apex (contrary to other *Lecanomerus* species); apex straight; lateral depressions absent; anterior angles slightly developed, obtuse; posterior angles moderately developed, obtusely rounded; basal foveae shallow, wide; punctuation strongly developed and coarse (in basal foveae). Metepisterna longer than wide. **Legs**. Male mesotarsi dilated laterally and spongily pubescent ventrally. Tarsi pubescent (with numerous setae) dorsally; metatarsomere 5 pubescent (with 6 setae) ventrally; metatarsomere 1 shorter than metatarsomeres 2+3. **Elytra**. Widest about middle. Shoulders strongly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent. Interneurs complete, shallow, impunctate. Intervals impunctate, flat. Interval 3 with a setiferous puncture behind middle. Umbilicate setiferous series of interval 9 with posterior group divided into 2 subgroups. **Aedeagus** (Fig. 64). Lateral view: as for genus; strongly arcuate; apex broadly triangular. Dorsal view: as for genus; apical disc absent. Internal sac unarmed. Stouter and smaller than in other *Lecanomerus* species.

Material examined. 89 non-type specimens (AMNZ, BMNH, CMNZ, ITNZ, JNNZ, LUNZ, MONZ, UCNZ).

Geographic distribution (Map p. 150). North Island: AK, BP, CL, ND, WI, WN. South Island: MC, NN, SD. Adventive. Extralimital range: Australia (mainland). First New Zealand records: Swanson, AK, 1916 (NZAC); near Auckland, AK, 1916 (Pilgrim, 1963: 845); Port Waikato, WO, 1958 (May, 1963: 192). Well established.

Ecology. Lowland. Borders of eutrophic marshes and ponds, and slowly running rivers. Wet pastures, paddocks, and gardens. Open ground; soil inundated, covered with dense tall vegetation (e.g., Cyperaceae, *Typha*) or alligator weed mats, or, when non-inundated, soft, wet, muddy or clayey, covered with similar vegetation, leaf litter or nikau sheaths. Occasional in caves. Nocturnal; sheltering during the day in floating plant mats, at the base of plants, in leaf litter, under nikau sheaths, stones, or clay cakes. Gregarious. **Biology**. Seasonality: throughout the year. Tenerals: December (rarely), April, June–July. Predacious (Moore *et al*., 1987: 225). Occasionally infested with mites. **Dispersal power**. Elytra free along suture. Macropterous. Frequent flier. Occasional in seashore drift material, which indicates flight ability. Moderate runner. Occasional climber (on plants). Good burrower. Clearly effective as a colonist. Favoured by human activities. **Collecting techniques**. Treading plant stems or carpets into the water, turning plant debris, sweeping vegetation, light trapping, pitfall trapping.

References. May, 1963: 192 (distribution, ecology); Pilgrim, 1963: 844–845 (distribution); Johns, 1986: 31 (distribution, ecology); Moore *et al*., 1987: 225 (distribution, ecology, biology, dispersal power); Townsend, 1994: 9, 11–12 (distribution, ecology); Larochelle & Larivière, 2001: 119 (taxonomy, distribution, ecology, biology, dispersal power).

Remarks. The reddish brown pronotum contrasting with the dark head and elytra, and the body shape make this species superficially similar to *Euthenarus bicolor*. Both species have often been confused in the past, but they are easily distinguished based on male tarsal characters (tarsi spongily pubescent ventrally in *L. atriceps*, biseriately pubescent in *E. bicolor*) and ventral pubescence (ventrites 5+6 without setae and setiferous fovea of ventrites 2+3 absent in *L. atriceps*).

Lecanomerus insignitus Broun, 1880 E

Figures 65, 105, 148, 204; Map p. 150

Lecanomerus insignitus Broun, 1880: 47. Holotype: male (BMNH) labelled "Type (circular red-bordered label; typed) / 96. (hand-written) / Parua. (hand-written) / New Zeal. Broun Coll. Brit. Mus. 1922-482 (typed) / Lecanomerus insignitus (hand-written)." Perfect condition.

Lecanomerus fallax Broun, 1880: 48. Lectotype (here designated): male (BMNH) labelled "[male symbol] (hand-written) / Type (circular red-bordered label; typed) / 99. (hand-written) / Parua. (hand-written) / Lecanomerus fallax (hand-written) / LECTOTYPE *Lecanomerus fallax* Broun, 1880 designated by Larochelle & Larivière 2004 (red label; typed)." Perfect condition. Paralectotypes: 1 male and 1 female (BMNH) bearing blue paralectotype labels. **New synonym**.

Nemaglossa fallax: Sloane, 1920: 137.

Nemaglossa insignita: Sloane, 1920: 137.

Lecanomerus fallax: Hudson, 1934: 176.

Lecanomerus insignitus: Hudson, 1934: 176.

Description. Body length: 5.0–10.0 mm. Strongly convex. Brownish black; pronotal margins, elytral margins, elytral apex, and appendages brownish red. Generally glabrous and smooth. Microsculpture isodiametric on head, moderately transverse on pronotum, and very transverse (with microlines) on elytra. Moderately shiny, without metallic lustre; elytra very iridescent. **Head**. Rather small, much narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Mandibles moderately elongate, slightly curved forward. Labrum moderately transverse, almost quadrate; apex straight or slightly emarginate medially. Eyes narrowly separated from buccal fissure ventrally (by about 0.7× maximum width of antennal scape). Frons with clypeo-ocular prolongations incomplete toward eyes. Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width; pubescence starting from basal 1/3 of antennomere 3. Mentum with a tooth medially, moderately shorter than lateral lobes. Paraglossae longer than ligula. Palpi with last segment cylindrical, glabrous. **Thorax**. Pronotum (Fig. 148) very transverse, widest about middle; sides converging toward base, not sinuate; base emarginate, as wide as elytral base; anterior bead complete (contrary to other *Lecanomerus* species); apex slightly concave; lateral depressions widening posteriorly; anterior angles moderately developed, rounded; posterior angles strongly developed, broadly rounded; basal foveae shallow, ill-defined; punctuation feebly developed basally. Metepisterna as wide as long. **Legs**. Male protarsi 3x wider than mesotarsi (contrary to other *Lecanomerus* species); male mesotarsi dilated laterally and spongily pubescent ventrally. Tarsi glabrous dorsally; metatarsomere 5 pubescent (with 4 setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3. Metatarsal claws of male 2× larger than pro- and mesotarsal claws (about as wide in other *Lecanomerus* species). **Elytra**. Widest about middle. Shoulders strongly developed, rounded, without a tooth. Subapical sinuations moderate. Sutural apices angulate. Scutellar striole absent. Interneurs moderately deep, impunctate. Intervals impunctate, slightly convex. Interval 3 with a setiferous puncture behind middle. Umbilicate setiferous series of interval 9 with posterior group continuous. **Aedeagus** (Fig. 65). Lateral view: as for genus; slightly arcuate; apex truncate. Dorsal view: as for genus; apical disc present, transverse. Internal sac armed.

Material examined. 35 specimens, including types (AMNZ, BMNH, CMNZ, FMNH, JNNZ, LUNZ, NZAC).

Geographic distribution (Map p. 150). North Island: ND.

Ecology. Lowland. Wet forests (broadleaf, podocarp): along streams. Shaded ground; soil covered with dead leaves. Nocturnal; sheltering during the day in leaf litter and under logs. Gregarious. **Biology**. Seasonality: October–April, July–August. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. **Collecting techniques**. Raking leaf litter, turning logs, pitfall trapping.

Reference. Larochelle & Larivière, 2001: 119 (including *fallax*; taxonomy, distribution, ecology, biology, dispersal power).

Remarks. Broun described *Lecanomerus fallax* from 4 specimens, only 3 of which could be located in the Natural History Museum, London (BMNH). One of these specimens is designated as lectotype to preserve stability of nomenclature in the future. This species may appear superficially similar to *Kupeharpalus barrattae* and *K. embersoni*, but the glabrous apex of the prosternal lobe, the bisetose penultimate segments of the labial palpi, and the eyes narrowly separated from the buccal fissure ventrally, clearly place it in *Lecanomerus*. The body size and external morphology of *L. insignitus* are highly variable but the configuration of the male genitalia is constant throughout the geographical range of this species.

Lecanomerus obesulus Bates, 1878 E

Figures 66, 149, 205; Map p. 151

Lecanomerus obesulus Bates, 1878c: 23. Lectotype (here designated): male (MNHN) labelled " W. Coast S.I., N.Z. (hand-written) / Lecanomerus obesulus Bates (hand-written) / LECTOTYPE *Lecanomerus obesulus* Bates, 1878 designated by Larochelle & Larivière 2004 (red label; typed)." Perfect condition. Paralectotypes: 1 male and 1 female (MNHN) bearing blue paralectotype labels.

Nemaglossa obesula: Sloane, 1920: 137.

Lecanomerus obesulus: Hudson, 1934: 176.

Description. Body length: 5.0–5.3 mm. Moderately convex. Black; margins of pronotum and elytra narrowly reddish; antennomeres 1+2 and basal 1/2 of tibiae reddish; femora blackish. Generally glabrous and smooth. Microsculpture vestigial on forebody (head and thorax), isodiametric on head, moderately transverse on pronotum, very transverse (with microlines) on elytra. Shiny, with slight brassy metallic lustre on elytra; moderately iridescent. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Mandibles short, strongly curved forward. Labrum strongly transverse; apex slightly emarginate medially. Eyes narrowly separated from buccal fissure ventrally (by about 0.5× maximum width of antennal scape). Frons with clypeo-ocular prolongations complete. Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width; pubescence starting from basal third of antennomere 3. Mentum with a tooth medially, moderately shorter than lateral lobes. Paraglossae longer than ligula. Palpi with last segment fusiform, with sparse, very short pubescence. **Thorax**. Pronotum (Fig. 149) very transverse, widest before middle; sides converging toward base, not sinuate; base rather straight, moderately narrower than elytral base; apex concave; lateral depressions absent; anterior angles moderately developed, obtusely rounded; posterior angles moderately developed, broadly rounded; basal foveae deep, wide; punctuation strongly developed and coarse basally. Metepisterna longer than wide. **Legs**. Male mesotarsi dilated laterally and spongily pubescent ventrally. Tarsi pubescent (with numerous setae) dorsally; metatarsomere 5 pubescent (with 6 setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Widest about middle. Shoulders strongly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices rounded. Scutellar striole absent. Interneurs shallow, impunctate. Intervals impunctate, flat. Interval 3 without setiferous puncture. Umbilicate setiferous series of interval 9 with posterior group divided into two subgroups. **Aedeagus** (Fig. 66). Lateral view: as for genus; strongly arcuate; apex acute. Dorsal view: as for genus; apical disc absent. Internal sac armed.

Material examined. 83 specimens, including types (AMNZ, BBNZ, CMNZ, ITNZ, LUNZ, MNHN, MONZ, NZAC, PHNZ, UCNZ).

Geographic distribution (Map p. 151). South Island: BR, CO, FD, MB, MC, NC, NN, OL, SD, SL, WD.

Ecology. Lowland, montane. Forests (beech, podocarp, broadleaf) and scrublands (bog pine). Shaded ground. Nocturnal; sheltering during the day in moss carpets, under stones and logs. Gregarious. **Biology**. Seasonality: September–February, April–June. Tenerals: February–March. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. **Collecting techniques**. Turning moss carpets, stones, and logs.

References. Townsend, 1997: 17 (distribution); Larochelle & Larivière, 2001: 119–120 (taxonomy, distribution, ecology, biology, dispersal power).

Remarks. Bates' original description was based on "numerous examples" from "West Coast, S. [=South] Island." Three syntypes were obtained from the Bates collection in Paris (MNHN), one of which (a male specimen) bears a determination label written by Bates; this specimen is here selected as lectotype to preserve stability of nomenclature in the future. See under *L. latimanus*.

Lecanomerus latimanus Bates, 1874 [E]

Figures 67, 150, 206; Map p. 150

Lecanomerus latimanus Bates, 1874: 271 (redescribed in 1875: 309). Holotype: male (MNHN) labelled "New Zealand. (hand-written) / Lecanomerus latimanus Bates (hand-written) / HOLOTYPE [male symbol] *Lecanomerus latimanus* Bates, 1874 (typed; red label)." Good condition.

Lecanomerus fuliginosus Broun, 1880: 48. Holotype: male (BMNH) labelled "Type (circular red-bordered label; typed) / 98. (typed) / [male symbol] (handwritten) / Taieri (typed) / New Zeal. Broun Coll. Brit. Mus. 1922-482. (typed) / Lecanomerus fuliginosus (hand-written)." Perfect condition. **New synonym**.

Lecanomerus pallipes Broun, 1894: 379. Holotype: male (BMNH) labelled "Type (circular red-bordered label; typed) / 2623. (handwritten) / [male symbol] (hand-written) / Canterbury (typed) / New Zealand. Broun Coll. Brit. Mus. 1922-482. (typed) / Lecanomerus pallipes. (hand-written)." Perfect condition. **New synonym**.

Lecanomerus incertus Broun, 1914b: 151. Holotype: male (BMNH) labelled "Type (circular red-bordered label; typed) / 3512 [male symbol] (hand-written) / New Zeal. Broun Coll. Brit. Mus. 1922-482 (typed) / Mount Hutt Dec^{r}. 1911. (hand-written) / Lecanomerus incertus. [male symbol]. (hand-written)." Perfect condition. **New synonym**.

Nemaglossa latimana: Sloane, 1920: 137.
Nemaglossa fuliginosa: Sloane, 1920: 137.
Nemaglossa pallipes: Sloane, 1920: 137
Nemaglossa incerta: Sloane, 1920: 137.
Lecanomerus incertus: Hudson, 1934: 176.
Lecanomerus latimanus: Hudson, 1934: 176.
Lecanomerus fuliginosus: Hudson, 1934: 176.
Lecanomerus pallipes: Hudson, 1934: 176.

Description. Body length: 4.7–5.9 mm. Slightly convex. Head and pronotum brownish testaceous; elytra blackish with sides broadly yellowish; appendages yellowish. Generally glabrous and smooth. Microsculpture strongly developed, granulate on head, isodiametric on pronotum, and moderately transverse on elytra. Dull; elytra iridescent. **Head**. Moderately large, narrower across eyes than pronotal

apex; flat anteriorly, slightly convex posteriorly. Mandibles short, strongly curved forward. Labrum strongly transverse; apex slightly emarginate medially. Eyes narrowly separated from buccal fissure ventrally (by about 0.5× maximum width of antennal scape). Frons with clypeo-ocular prolongations complete. Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width; pubescence starting from basal 1/3 of antennomere 3. Mentum with a tooth medially, moderately shorter than lateral lobes. Paraglossae longer than ligula. Palpi with last segment fusiform, with sparse, very short pubescence. **Thorax**. Pronotum (Fig. 150) very transverse, widest before middle; sides converging toward base, not sinuate; base straight, moderately narrower than elytral base; apex concave; lateral depressions widening posteriorly; anterior angles strongly developed, obtusely rounded; posterior angles moderately developed, obtusely rounded; basal foveae shallow, narrow, linear; punctuation feebly developed basally. Metepisterna longer than wide. **Legs**. Male mesotarsi dilated laterally and spongily pubescent ventrally. Tarsi pubescent (with numerous setae) dorsally; metatarsomere 5 pubescent (with 6 setae) ventrally; metatarsomere 1 shorter than metatarsomeres 2+3. **Elytra**. Widest about middle. Shoulders strongly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent or present. Interneurs shallow, impunctate. Intervals impunctate, flat. Interval 3 without setiferous puncture behind middle. Umbilicate setiferous series of interval 9 with posterior group divided into two subgroups. **Aedeagus** (Fig. 67). Lateral view: as for genus; strongly arcuate; apex acute. Dorsal view: as for genus; apical disc absent. Internal sac armed.

Material examined. 106 specimens, including types (BMNH, CMNZ, ITNZ, JNNZ, LUNZ, MNHN, NZAC, OMNZ, PHNZ, UCNZ).

Geographic distribution (Map p. 150). South Island: CO, DN, KA, MC, SC, SL. Offshore Islands: CH.

Ecology. Lowland, upland, subalpine, alpine. Tussock grasslands (mostly), herbfields, farmlands, gardens, river banks, screes, forests (beech, broadleaf, podocarp). Open and shaded ground; soil dry or moist, covered with grass or dead leaves. Nocturnal; sheltering during the day at the base of tussock-plants, in moss, mat plants, plant debris, under stones, under and in logs, and in leaf litter. **Biology**. Seasonality: September–June. Tenerals: May. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner. **Collecting techniques**. Inspecting the base of tussock-plants, turning stones, raking leaf litter, pitfall trapping.

References. Barratt & Patrick, 1987: 82 (as *fuliginosus*; distribution, ecology, biology); Townsend, 1997: 17 (as *fuliginosus*; distribution); Emberson, 1998: 30 (as *fuliginosus*; distribution, ecology, biology); Larochelle & Larivière, 2001: 119–120 (including *fuliginosus*, *incertus*, *pallipes*; taxonomy, distribution, ecology, biology, dispersal power.

Remarks. Bates' original description of *Lecanomerus latimanus* was based on "one example from New Zealand." Five specimens were obtained from the Bates collection in Paris (MNHN), only one of which, a male, matches data in the original description. The authors think that this is the specimen used by him for the description, although not labelled as such by Bates; a red holotype label has thus been added to the MNHN specimen. In some populations the elytral sides may be more narrowly yellowish in basal half, but the configuration of the male genitalia is stable. This species resembles *L. sharpi* in its general shape and broadly yellowish elytral sides. *Lecanomerus latimanus* and *L. obesulus* are the most commonly encountered *Lecanomerus* species on the South Island.

Lecanomerus sharpi (Csiki, 1932) [E]

Figures 68, 151, 207; Map p. 151

Lecanomerus marginatus Sharp, 1883: 25. Holotype: male (BMNH) labelled "Lecanomerus marginatus type D.S. Auckland. N. Zeal[d]. (hand-written) / Type H.T. (circular red-bordered label; typed) / Sharp Coll. 1905-313 (typed)." Perfect condition. Primary homonym of *Lecanomerus marginatus* Reed, 1874.

Nemaglossa sharpi Csiki, 1932: 1059 (replacement name for *Lecanomerus marginatus* Sharp, 1883).

Nemaglossa marginata: Sloane, 1920: 137.

Lecanomerus sharpi: Noonan, 1976: 7.

Description. Body length: 5.0–6.0 mm. Slightly convex. Piceous brown; sides of pronotum and elytra broadly yellowish; antennomere 1, femora, basal 1/2 of tibiae, and tarsi yellowish. Generally glabrous and smooth. Microsculpture isodiametric on head, transverse on pronotum and elytra. Shiny, without metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Mandibles short, strongly curved forward. Labrum strongly transverse; apex slightly emarginate medially. Eyes reaching buccal fissure ventrally. Frons with clypeo-ocular prolongations complete. Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width; pubescence starting from basal 1/2 of antennomere 3. Mentum with a tooth medially, moderately shorter than lateral lobes. Paraglossae longer than ligula. Palpi with last segment fusiform, with sparse, very short pubescence. **Thorax**. Pronotum (Fig. 151) very transverse, widest before middle; sides converging toward base, slightly sinuate; base rather straight, moderately narrower than elytral base; apex concave; lateral depressions widening posteriorly; anterior

angles moderately developed, rounded; posterior angles strongly developed, acute, with a prominent tooth (contrary to other *Lecanomerus* species); basal foveae shallow, wide; punctuation feebly developed basally. Metepisterna longer than wide. **Legs**. Male mesotarsi dilated laterally and spongily pubescent ventrally. Tarsi glabrous dorsally; metatarsomere 5 pubescent (with 4 setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Widest about middle. Shoulders strongly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent or present. Interneurs shallow, impunctate. Intervals impunctate, flat. Interval 3 without setiferous puncture. Umbilicate setiferous series of interval 9 with posterior group divided into 2 subgroups. **Aedeagus** (Fig. 68). Lateral view: as for genus; slightly arcuate; apex rounded, inflated. Dorsal view: as for genus; apical disc present, subtriangular. Internal sac armed.

Material examined. 327 specimens, including type (AMNZ, CMNZ, FMNH, ITNZ, JNNZ, LUNZ, MONZ, NZAC, OMNZ, UCNZ).

Geographic distribution (Map p. 151). North Island: AK, BP, CL, GB, HB, ND, RI, TK, TO, WA, WI, WN, WO. Offshore Islands: TH.

Ecology. Lowland. Wet forests (broadleaf, podocarp) and swamp forests: along streams. Shaded ground; soil covered with thick leaf litter. Nocturnal; sheltering during the day in leaf litter and under stones. Gregarious. **Biology**. Seasonality: throughout the year. Occasionally infested with mites. Defense mechanism: feigns death when disturbed. **Dispersal power**. Elytra fused (brachypterous) or free (macropterous) along suture. Moderate runner. **Collecting techniques**. Pitfall trapping, raking leaf litter, baiting pitfall traps, using yellow pan traps.

References. Johns, 1986: 31 (distribution); Kuschel, 1990: 24, 40 (distribution, ecology, biology, dispersal power); Larochelle & Larivière, 2001: 120 (taxonomy, distribution, ecology, biology. dispersal power).

Remarks. See under *L. latimanus*.

Lecanomerus marrisi new species [E]

Figures 69, 106, 152, 208; Map p. 151

Lecanomerus marrisi Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "Peraki-Mt Bossu Rd Banks Peninsula 12.12.63 1800' W.P. Thomas (handwritten) / HOLOTYPE [male symbol] *Lecanomerus marrisi* Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 1 male and 2 females (UCNZ) from Peraki Rd Bush, Banks Peninsula, bearing blue paratype labels.

Description. Body length: 7.0–7.1 mm. Slightly convex. Dark brown; labrum and clypeus reddish; appendages, pronotal margins, sutures, epipleura, and subapical margins of elytra brownish red. Generally glabrous and punctate. Microsculpture absent on head, very transverse (with microlines) on pronotum and elytra. Shiny, without metallic lustre; pronotum and elytra iridescent. **Head**. Moderately large, narrower across eyes than pronotal apex; excavated anteriorly, slightly convex posteriorly. Mandibles moderately long, slightly curved forward. Labrum strongly transverse; apex slightly emarginate medially. Eyes reaching buccal fissure ventrally. Frons with clypeo-ocular prolongations incomplete toward eyes. Antennae moderately long, reaching about elytral base; antennal scape about 2× longer than its maximum width; pubescence starting on basal 1/3 of antennomere 3. Mentum with a tooth medially, as long as lateral lobes. Paraglossae longer than ligula. Palpi with last segment fusiform, glabrous. **Thorax**. Pronotum (Fig. 152) transverse, widest before middle; sides converging toward base, slightly sinuate; base slightly emarginate, moderately narrower than elytral base; apex concave; lateral depressions widening posteriorly; anterior angles strongly developed, obtusely rounded; posterior angles strongly developed, subrectangular; basal foveae shallow, wide; punctuation strongly developed, fine. Metepisterna longer than wide. **Legs**. Male mesotarsi unmodified, neither dilated laterally nor spongily pubescent ventrally. Protarsomeres 1–4 pubescent; meso- and metatarsomeres 1–4 glabrous; pro-, meso-, and metatarsomeres 5 with 5–6 setae dorsally. Metatarsomere 5 pubescent (with 5–6 setae) ventrally; metatarsomere 1 short, only about as long as metatarsomere 2. **Elytra**. Widest about middle. Shoulders strongly developed, rounded, without a tooth. Sides rounded. Subapical sinuations feeble. Sutural apices rounded. Scutellar striole present. Interneurs shallow, impunctate. Intervals impunctate, flat. Interval 3 without setiferous puncture behind middle. Umbilicate setiferous series of interval 9 with posterior group divided into 2 subgroups. **Aedeagus** (Fig. 69). Lateral view: as for genus; slightly arcuate; apex obtuse. Dorsal view: as for genus; apical disc absent. Internal sac unarmed.

Material examined. 5 specimens, including types (ITNZ, NZAC, UCNZ).

Geographic distribution (Map p. 151). South Island: MC–Banks Peninsula (Head of Kaituna Valley; Peraki–Mount Bossu Road; Peraki Road Bush).

Ecology. Lowland. Habitat unknown. **Biology**. Seasonality: December, February–March. Tenerals: March. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner (after leg morphology).

Remarks. The long mentum tooth, anteriorly excavated

head, unmodified male mesotarsi, and pronotum shape set this species apart from its congeners. It is also the only species of *Lecanomerus* which is endemic to the Banks Peninsula. *Lecanomerus marrisi* is named after our colleague John M. W. Marris (Lincoln University, Lincoln) for his special help and encouragement in our entomological studies.

Lecanomerus verticalis (Erichson, 1842) [A]

Figures 70, 153, 209; Map p. 151

Harpalus verticalis Erichson, 1842: 126. Type locality: Tasmania, Australia.

Lecanomerus insidiosus Chaudoir, 1850: 447. Type locality: Swan River and Melbourne, Australia. Synonymised by Moore, in Moore *et al*., 1987: 227.

Lecanomerus flavocinctus Blackburn, 1888b: 188. Type locality: Port Lincoln, South Australia. Synonymised by Moore, in Moore *et al*., 1987: 227.

Lecanomerus occidentalis Sloane, 1898: 464. Type locality: Swan River, Darling Range, Pinjarrah, Donnybrook, Mt Barker, and Albany, Western Australia. Synonymised with *L. flavocinctus* by Sloane, 1911: 835.

Lecanomeus verticalis: Sloane, 1911: 835.

Nemaglossa verticalis: Sloane, 1920: 137.

Nemaglossa insidiosa: Sloane, 1920: 137.

Nemaglossa flavocincta: Sloane, 1920: 137.

Lecanomerus verticalis: Noonan, 1976: 7.

Description. Body length: 4.7–6.5 mm. Slightly convex. Piceous black; sides of pronotum and elytra narrowly pale reddish; appendages pale reddish. Generally glabrous and smooth. Microsculpture strong, isodiametric on head, moderately transverse on pronotum, and very transverse (with microlines) on elytra. Dull, without metallic lustre; elytra very iridescent. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Mandibles short, strongly curved forward. Labrum strongly transverse; apex slightly emarginate medially. Eyes reaching buccal fissure ventrally. Frons with clypeo-ocular prolongations complete. Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width; pubescence starting from apex of antennomere 2. Mentum with a tooth medially, moderately shorter than lateral lobes. Palpi with last segment fusiform, with sparse, very short pubescence. **Thorax**. Pronotum (Fig. 153) very transverse, widest before middle (about middle in *vestigialis*); sides converging toward base, not sinuate; base slightly convex, moderately narrower than elytral base; apex concave; lateral depressions widening posteriorly; anterior angles moderately developed, rounded; posterior angles moderately developed, broadly rounded; basal foveae deep, very wide (touching lateral beads); punctuation developed basally, moderately coarse. Metepisterna longer than wide. **Legs**. Male mesotarsi dilated laterally and spongily pubescent ventrally. Tarsi pubescent (with a few setae) dorsally; metatarsomere 5 pubescent (with 6 setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Widest about middle; slightly more elongate than in *vestigialis*. Shoulders strongly developed, angulate, with a tooth. Subapical sinuations strongly developed. Sutural apices angulate. Scutellar striole absent. Interneurs shallow, impunctate. Intervals impunctate, flat. Interval 3 with a setiferous puncture behind middle. Umbilicate setiferous series of interval 9 with posterior group divided into 2 subgroups. **Aedeagus** (Fig. 70). Lateral view: as for genus; slightly arcuate; basal 1/2 much wider than in *vestigialis*; apex broadly acute. Dorsal view: as for genus; apical disc absent. Internal sac armed.

Material examined. 54 non-type specimens (AMNZ, ITNZ, JNNZ, MONZ, NZAC).

Geographic distribution (Map p. 151). North Island: AK, BP, CL, GB, ND, WI, WN, WO. South Island: NN. Adventive. Extralimital range: Australia (including Tasmania). First New Zealand records: Okauia, WO, 1922 (NZAC); New Zealand (Moore *et al*., 1987: 227). Well established.

Ecology. Lowland, upland. Sand dunes, vacant lots, and gardens. Open ground; dry, sandy soil sparsely vegetated by grass and weeds. Nocturnal; sheltering during the day in burrows dug at the base of plants, under pieces of wood, and in garden rubbish. Gregarious. **Biology**. Seasonality: September–June. Tenerals: October–November, January–February. Predacious (Moore *et al*., 1987: 227). Occasionally infested with mites and fungi (Laboulbeniales). **Dispersal power**. Elytra free along suture. Macropterous. Occasional flier. Moderate runner. Good burrower. Clearly effective as a colonist. Favoured by human activities. **Collecting techniques**. Pitfall trapping, digging at the base of plants, turning pieces of wood.

References. Moore *et al*., 1987: 227 (distribution, ecology, biology, dispersal power); Townsend, 1994: 9, 11 and 1997: 17 (distribution, ecology); Larochelle & Larivière, 2001: 120–121 (taxonomy, distribution, ecology, biology, dispersal power).

Remarks. This species is morphologically close to *L. vestigialis* (see characters in key to species).

Lecanomerus vestigialis (Erichson, 1842) [A]

Figures 71, 107, 154, 210; Map p. 151

Harpalus vestigialis Erichson, 1842: 127. Type locality: Tasmania, Australia.

Acupalpus mastersii Macleay, 1871: 104. Type locality: Gayndah, Queensland, Australia. Synonymised by Moore, in Moore *et al*., 1987: 227.

Lecanomerus stenopus Broun, 1886: 880. Holotype: female (BMNH) labelled "Type (circular red-bordered label; typed) / 1565. (hand-written) / New Zealand Broun Coll. Brit. Mus. 1922-482 (typed) / Howick. Nov^{r}. 1885. (hand-written) / Lecanomerus stenopus. [female symbol]. (hand-written)." Perfect condition. Synonymised by Moore, in Moore *et al*., 1987: 227.

Lecanomerus nitidus Blackburn, 1891: 779. Type locality: Victoria, Australia. Synonymised with *Nemaglossa mastersi* by Sloane, 1920: 137.

Lecanomerus mastersii: Sloane, 1911: 836.

Lecanomerus labralis Broun, 1914b: 151. Holotype: male (BMNH) labelled "Type (circular red-bordered label; typed) / 3511. [male symbol]. (hand-written) / Epsom. Dec^{r}. 1911. (hand-written) / New Zealand Broun Coll. 1922-482 (typed) / Lecanomerus labralis. [male symbol]. (hand-written)." Perfect condition. Synonymised by Moore, in Moore *et al*., 1987: 227.

Nemaglossa mastersi: Sloane, 1920: 137.

Nemaglossa stenopus: Sloane, 1920: 137.

Nemaglossa labralis: Sloane, 1920: 137.

Acupalpus (*Egadroma*) *vestigialis*: Csiki, 1932: 1242.

Lecanomerus vestigialis: Noonan, 1976: 7 and Moore, in Moore *et al*., 1987: 227.

Description. Body length: 4.0–4.3 mm. Strongly convex (more so than *verticalis*). Black; appendages mostly reddish; antennomeres 3–11, apex of tibiae, and tarsi dark brown. Generally glabrous and smooth. Microsculpture isodiametric on head, moderately transverse on pronotum and elytra. Shiny, without metallic lustre; elytra slightly iridescent. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Mandibles short, strongly curved forward. Labrum strongly transverse; apex slightly emarginate medially. Eyes narrowly separated from buccal fissure ventrally (by 0.5× maximum width of antennal scape). Frons with clypeo-ocular prolongations complete. Antennae moderately long, reaching pronotal base; antennal scape about 2× longer than its maximum width; pubescence starting from basal 1/3 of antennomere 3. Mentum with a tooth medially, moderately shorter than lateral lobes. Paraglossae as long as ligula. Palpi with last segment fusiform, with sparse, very short pubescence. **Thorax**. Pronotum (Fig. 154) very transverse, widest about middle (before middle in *verticalis*); sides converging toward base, not sinuate; base rather straight, moderately narrower than elytral base; apex concave; lateral depressions absent; anterior angles moderately developed, obtuse; posterior angles moderately developed, broadly rounded; basal foveae shallow, ill-defined; punctuation feebly developed basally. Metepisterna longer than wide. **Legs**. Male mesotarsi dilated laterally and spongily pubescent ventrally. Tarsi pubescent (with a few setae) dorsally; metatarsomere 5 pubescent (with 6 setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Widest about middle; slightly less elongate than in *verticalis*. Shoulders strongly developed, angulate, with a tooth. Subapical sinuations feebly developed. Sutural apices angulate. Scutellar striole absent or present. Interneurs shallow, impunctate. Intervals impunctate, flat. Interval 3 without setiferous puncture behind middle. Umbilicate setiferous series of interval 9 with posterior group divided into two subgroups. **Aedeagus** (Fig. 71). Lateral view: as for genus; slightly arcuate; basal 1/2 much narrower than in *verticalis*; apex broadly acute. Dorsal view: as for genus; apical disc absent. Internal sac armed.

Material examined. 294 specimens, including Broun's types (AMNZ, BMNH, ITNZ, JNNZ, LUNZ, MONZ, NZAC, PHNZ).

Geographic distribution (Map p. 151). North Island: AK, BP, CL, GB, HB, ND, WI, WN, WO. South Island: DN, MC, NN, SC. Offshore Islands: CH. Adventive. Extralimital range: Australia (including Tasmania). First New Zealand record: Howick, AK, 1880s (Broun, 1886: 880; as *Lecanomerus stenopus*). Well established.

Ecology. Lowland. Sand dunes, cultivated fields (maize, lucerne, hay), pastures, and roadsides. Open ground; sandy soil sparsely or moderately vegetated by grass, weeds, or herbs. Nocturnal; sheltering during the day in leaf litter and in burrows dug around the roots of plants (*Muehlenbeckia, Lupinus, Ammophila*, *Spinifex*). Gregarious. **Biology**. Seasonality: throughout the year. Tenerals: October–January, March. Predacious (Moore *et al*., 1987: 228). Food, in captivity: small scarabaeids and lygaeid nymphs. Occasionally infested with mites and fungi (Laboulbeniales). **Dispersal power**. Elytra free along suture. Macropterous. Occasional flier. Moderate runner. Good burrower. **Collecting techniques**. Pitfall trapping, raking leaf litter, and digging at the base of plants.

References. May, 1965: 202 (biology); Valentine, 1967: 1102 (biology); Harris, 1970: 48, 53, 55 (distribution, ecology); Cameron & Butcher, 1980: 115-116 (distribution, ecology, biology); Moore *et al*., 1987: 227–228 (distribution, ecology, biology, dispersal power); Kuschel, 1990: 24, 40 (distribution, ecology, biology, dispersal power); Townsend, 1994: 9, 11 and 1997: 17 (distribution, ecology); Larochelle & Larivière, 2001: 121 (taxonomy, distribution, ecology, biology, dispersal power).

Remarks. See under *L. verticalis*.

Genus *Syllectus* Bates, 1878 [E]

Syllectus Bates 1878b: 191. Type species: *Syllectus anomalus* Bates, 1878b, by monotypy.

Description. Body length: 4.7–8.0 mm. Forebody (head and thorax) without sparse setiferous micropores dorsally. Forebody (head and thorax) much narrower than elytra

(contrary to other Harpalini genera, except *Pholeodytes*). Antennae and legs very long (contrary to other Harpalini genera, except *Pholeodytes*). **Head**. Mandibles very long (about 5x their maximum width), slightly curved forward, acute apically. Labrum moderately transverse; apex straight or slightly convex. Eyes moderately large and convex, reaching eyes, or, strongly reduced and flat, consisting of obliterated facets and narrowly separated from buccal fissure ventrally (by about 0.5× maximum width of antennal scape). Tempora not inflated. Frons with or without clypeo-ocular prolongations. Antennal pubescence starting from base of antennomere 3. Mentum with a tooth medially, as long as lateral lobes (contrary to a longer medial tooth in *Pholeodytes*). Mentum and submentum separated by complete transverse suture. Paraglossae longer than ligula. Palpi with last segment fusiform, not truncate apically, glabrous or with sparse, moderately long pubescence; penultimate segment of labial palpi bisetose on anterior margin. **Thorax**. Pronotum quadrate (about as long as wide), subrectangular (slightly longer than wide) or elongate (about 1.5x longer than wide; *gouleti*); base straight, much narrower than elytral base; lateral beads complete; anterior bead incomplete medially or absent (*gouleti*); posterior bead incomplete medially or absent (*gouleti*). Scutellum visible. Apex of prosternal lobe glabrous. **Legs**. Metafemora with 2–4 long setae on posterior margin. Male protarsi dilated laterally and spongily pubescent ventrally; mesotarsi slightly dilated, but not spongily pubescent ventrally. Segment 4 of protarsi and mesotarsi of both sexes with 2 membranous laminae (projecting laterally and anteriorly, as in *Pholeodytes*). Tarsi glabrous or with metatarsi partially pubescent dorsally; metatarsomere 5 glabrous or pubescent ventrally; metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Interneurs complete, consisting of striae (contrary to interneurs incomplete, consisting of rows of punctures in *Pholeodytes*). Rows of setiferous punctures absent on intervals 3, 5, and 7, and on interneur 2. Umbilicate setiferous series of interval 9 separated into two major groups, with posterior group further divided into 2 subgroups. **Abdomen**. Ventrites 2+3 of male without a setiferous fovea. Ventrites 5+6 of both sexes without short setae, with paired ambulatory setae only. **Aedeagus**. Lateral view: slightly arcuate or almost straight. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area wide or narrow, extending to basal bulb or almost; apical disc absent. Internal sac armed or unarmed.

Geographic distribution. New Zealand (endemic).

References. Hudson, 1934: 177 (list); Britton, 1964a: 629–631 (taxonomy); Noonan, 1976: 7 (taxonomy); Larochelle & Larivière, 2001: 121–122 (catalogue).

Remarks. Although clearly a member of the subtribe Pelmatellina based on male protarsi that are spongily pubescent ventrally, the genus *Syllectus* superficially resembles the stenolophine genus *Pholeodytes* in having a forebody much narrower than elytra, very long antennae and legs, and segment 4 of protarsi and mesotarsi with membranous laminae. These characters probably indicate an ecomorphological convergence in these cave-inhabiting taxa.

Key to species of *Syllectus*

1 Eyes (Fig. 213) strongly reduced, flat, consisting of obliterated facets. Pronotum (Fig. 157) elongate (about 1.5× longer than wide). Frons without clypeo-ocular prolongations. Interval 3 without setiferous puncture behind middle ....(p. 71)... ***gouleti*** new species

— Eyes (Fig. 108) normally developed. Pronotum (Fig. 155) quadrate (about as long as wide) or subrectangular (slightly longer than wide; Fig. 156). Frons with clypeo-ocular prolongations (Fig. 108). Interval 3 with a setiferous puncture behind middle (Fig. 108)..... 2

2(1) Body length 6.0 mm or less. Eyes reaching buccal fissure ventrally (Fig. 21). Elytra oblong (Fig. 211). Last segment of palpi pubescent [Pronotum (Fig. 155)] ....(p. 69)... ***anomalus*** Bates

— Body length 7.5 mm or more. Eyes not reaching buccal fissure ventrally (Fig. 20). Elytra elliptical (Fig. 212). Last segment of palpi glabrous [Pronotum (Fig. 156)] ....(p. 70)... ***magnus*** Britton

Syllectus anomalus Bates, 1878 [E]

Figures 72, 108, 155, 211; Map p. 151

Syllectus anomalus Bates, 1878b: 192. Lectotype (here designated): male (MNHN) labelled "Auckland N. Zeal. (hand-written) / Syllectus anomalus Bates (hand-written) / LECTOTYPE *Syllectus anomalus* Bates, 1878 designated by Larochelle & Larivière 2004 (red label; typed)." Good condition. Paralectotype: 1 female (MNHN) bearing blue paralectotype label.

Description. Body length: 4.7–6.0 mm. Slightly convex. Black; antennae, palpi, and legs brownish red. Generally glabrous and smooth. Microsculpture moderately transverse, almost absent on head and pronotum, very transverse (with microlines) on elytra. Shiny, without metallic lustre; elytra iridescent. **Head**. Narrow, although as wide across eyes as pronotal apex; flat anteriorly, slightly convex posteriorly. Labrum with apex straight. Eyes moderately large, convex, reaching buccal fissure ventrally. Frons with clypeo-ocular prolongations complete. Antennae moderarely long, reaching elytral base; antennal scape about 2× longer than its maximum width. Last segment of palpi with sparse, moderately long pubescence. **Thorax**.

Pronotum (Fig. 155) quadrate, narrow, widest before middle; sides converging toward base, slightly sinuate; base straight medially, angled forward laterally; apex concave; lateral depressions widening posteriorly; anterior and posterior beads incomplete medially; anterior angles feebly developed, subrectagular; posterior angles strongly developed, subrectangular; basal foveae deep, narrow; punctuation feebly developed. Metepisterna longer than wide. **Legs**. Metafemora with 2 long setae on posterior margin. Tarsi glabrous dorsally; metatarsomere 5 pubescent (with 2 setae) ventrally. **Elytra**. Oblong. Widest behind middle. Shoulders well developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent. Interneurs moderately deep, finely punctate. Intervals impunctate, slightly convex. Interval 3 with a setiferous puncture behind middle. **Aedeagus** (Fig. 72). Lateral view: slightly arcuate; apex broadly triangular; main shaft narrower than in *magnus*. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area very wide, extending almost to basal bulb. Internal sac unarmed.

Material examined. 181 specimens, including types (AMNZ, CMNZ, ITNZ, JNNZ, LUNZ, MNHN, MONZ, NZAC, UCNZ).

Geographic distribution (Map p. 151). North Island: AK, BP, CL, GB, HB, ND, RI, TK, TO, WA, WI, WN, WO. South Island: BR, DN, FD, KA, MB, MC, NC, NN, SD, SL, WD.

Ecology. Lowland, montane, subalpine, alpine. Stream banks (brooks, rills, rivers) crossing cool wet forests (beech, broadleaf), tree plantations (pine), and scrublands; seepage edges, swamps, mud flats, screes, gardens; caves (occasionally). Open or shaded ground; wet, clayey, muddy or gravelly soil, bare or sparsely vegetated with grass. Crepuscular or nocturnal; sheltering during the day under small stones (mostly), clay clods, in heaps of dead leaves and mud, and under logs. Gregarious. **Biology**. Seasonality: September–April, July–August. Tenerals: February–March. Predators: trout. Occasionally infested with mites. **Dispersal power**. Elytra free (macropterous) or fused (brachypterous) along suture. Occasional flier (at dusk and to artifical lights at night). Moderate runner. Occasional climber (on plants, shrubs, trees). **Collecting techniques**. Turning stones, collecting at night with a torch, inspecting heaps of dead leaves and mud, sweeping vegetation, light trapping.

References. May, 1962: 60 and 1972: 571 (distribution, ecology, biology); May, 1963: 192 (ecology); Townsend, 1974: 430 (ecology); Britton, 1964a: 631 (taxonomy); Johns, 1980: 63 (distribution, ecology); Kuschel, 1990: 24, 40 (distribution, ecology, biology, dispersal power); Townsend, 1997: 17 (distribution); Larochelle & Larivière, 2001: 121 (taxonomy, distribution, ecology, biology, dispersal power).

Remarks. Bates' original description was apparently based on specimens from both sexes ("[male symbol] [female symbol]") from "Auckland, New Zealand." Two syntypes (1 male, 1 female) were obtained from the Bates collection in Paris (MNHN); the male specimen which bears Bates' determination label, is here selected as lectotype to preserve stability of nomenclature in the future. This species is more widely distributed than the two other known *Syllectus* species. *Syllectus anomalus* can be found throughout both main islands of New Zealand, mostly outside caves, while the other species are restricted to caves in the Northwest Nelson and Buller areas.

Syllectus magnus Britton, 1964 E

Figures 73, 156, 212; Map p. 151

Syllectus magnus Britton, 1964a: 629. Holotype: male (NZAC) labelled "Type (circular red-bordered label; typed) / NEAR ENTRANCE 'The Drain: 'Profanity Cave' Buller River near Inangahua 21.10.61. Coll. C. Coates. (handwritten) / HOLOTYPE [male symbol] Syllectus magnus mihi (hand-written) E.B. Britton det. 1963 (typed, except for number 3)." Perfect condition. There should be one paratype in BMNH.

Syllectus spelaeus Britton, 1964a: 631. Holotype: male (NZAC) labelled "Type (circular red-bordered label; typed) / Nile River Cave Charleston 27.10.63 P. R. Kettle (handwritten) / HOLOTYPE Syllectus spelaeus mihi (handwritten) E. B. Britton det. 1964 (typed, except for number 4)." Perfect condition. There are 3 paratypes in NZAC. **New synonym**.

Description. Body length: 7.5–8.0 mm. Moderately convex. Brown; head and pronotum reddish brown; elytra entirely dark brown or black with reddish brown sides and sutures; antennae, palpi, and legs pale yellowish brown. Generally glabrous and smooth. Microsculpture well developed, isodiametric on head, moderately transverse on pronotum, and very transverse (with microlines) on elytra. Shiny, without metallic lustre; elytra iridescent. **Head**. Narrow, although as wide across eyes as pronotal apex; flat anteriorly, slightly convex posteriorly. Labrum with apex slightly convex. Eyes moderately large, convex, narrowly separated from buccal fissure ventrally (by about 0.5× maximum width of antennal scape). Frons with clypeoocular prolongations complete. Antennae moderately long, reaching elytral base; antennal scape about 2× longer than its maximum width. Last segment of palpi glabrous. **Thorax**. Pronotum (Fig. 156) subrectangular (slightly longer than wide), narrow, widest before middle; sides converging toward base, slightly sinuate; base straight medially, angled forward laterally; apex straight; lateral depressions widening posteriorly; anterior and posterior beads incom-

plete medially; anterior angles feebly developed, obtuse; posterior angles strongly developed, subrectangular; basal foveae deep, ill-defined; punctuation feebly developed. Metepisterna longer than wide. **Legs**. Metafemora with 2 long setae on posterior margin. Pro- and mesotarsi glabrous dorsally, metatarsi pubescent dorsally; metatarsomere 5 glabrous ventrally. **Elytra**. Elliptical. Widest behind middle. Shoulders feebly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices rounded. Scutellar striole absent. Interneurs moderately deep, almost impunctate. Intervals impunctate, slightly convex. Interval 3 with a setiferous puncture behind middle. **Aedeagus** (Fig. 73). Lateral view: slightly arcuate; apex broadly triangular; wider than in *anomalus*. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area very wide, extending almost to basal bulb, with a medial swelling subapically. Internal sac armed.

Material examined. 51 specimens, including types (BMNH, ITNZ, LUNZ, NZAC, UCNZ).

Geographic distribution (Map p. 151). South Island: BR, NN.

Ecology. Lowland. Cave entrances: in the twilight zone (troglophilous species). In flood debris. **Biology**. Seasonality: September–June. **Dispersal power**. Elytra fused along suture. Subapterous. Fast runner. **Collecting techniques**. Using a head lamp or torch.

References. Britton, 1964a: 631 (including *spelaeus*; distribution, ecology); Townsend, 1974: 430 (as *spelaeus*; ecology) and 1997: 17–18 (including *spelaeus*; distribution, ecology; Larochelle & Larivière, 2001: 121–122 (including *spelaeus*; taxonomy, distribution, ecology, biology, dispersal power).

Remarks. *Syllectus spelaeus* is synonymised with *S. magnus* on the basis of the male genitalia. *Syllectus magnus* is a taxon that varies somewhat morphologically (especially the pronotum and body colour) within and between populations across its range.

Syllectus gouleti new species [E]

Figures 74, 157, 213; Map p. 151

Syllectus gouleti Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "Metro Cave June J.I. Townsend [hand-written] / JI Townsend Collection (typed)/ HOLOTYPE [male symbol] *Syllectus gouleti* Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 1 male (NZAC) and 1 female (LUNZ) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length: 6.5–7.5 mm. Slightly convex. Depigmented (appearing pale in colour). Generally glabrous and smooth. Microsculpture almost absent, isodiametric on head, very transverse (with microlines) on pronotum and elytra. Shiny, without metallic lustre; pronotum and elytra iridescent. **Head**. Narrow, although as wide across eyes as pronotal apex; flat anteriorly, slightly convex posteriorly. Labrum with apex slightly convex medially. Eyes strongly reduced, flat, consisting of obliterated facets, narrowly separated from buccal fissure ventrally (by about 0.5× maximum width of antennal scape). Frons without clypeo-ocular prolongations. Antennae very long, reaching middle of elytra; antennal scape elongate, about 3× longer than its maximum width. Last segment of palpi glabrous. **Thorax**. Pronotum (Fig. 157) elongate (about 1.5× longer than wide), widest about middle; sides converging toward base, slightly sinuate; base straight throughout; apex straight; lateral depressions widening posteriorly; anterior and posterior beads absent; anterior angles feebly developed, rounded; posterior angles strongly developed, subrectangular; basal foveae deep, wide; punctuation feebly developed. Metepisterna longer than wide. **Legs**. Metafemora with 3–4 long setae on posterior margin. Tarsi glabrous dorsally; metatarsomere 5 glabrous ventrally. **Elytra**. Elliptical. Widest behind middle. Shoulders feebly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent. Interneurs moderately deep, impunctate. Intervals impunctate, slightly convex. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 74). Atypical for genus. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area narrow, extending to basal bulb. Internal sac armed.

Material examined. 17 specimens, including types (ITNZ, LUNZ, NZAC).

Geographic distribution (Map p. 151). South Island: BR– Bamboo Cave, Tiropahi Valley. Dry Valley Cave, Bullock Creek, Punakaiki. Fox River Cave. Metro Cave, Charleston. Nile River Cave, Charleston. Tetahi Cave, Charleston. Xanadu Cave, Bullock Creek, Paparoa National Park.

Ecology. Lowland. Caves (troglobitic species). Running on mud banks. **Biology**. Seasonality: January–February, April, July. Tenerals: December. **Dispersal power**. Elytra fused along suture. Subapterous. Fast runner. **Collecting techniques**. Using a head lamp or torch.

Remarks. Although this species superficially resembles members of the genus *Pholeodytes*, it bears the characteristic features of *Syllectus* (principally the ventral pubescence of male tarsi). The aedeagus is however unusual among *Syllectus*. This species is named after our close friend and colleague Henri Goulet (Agriculture and Agri-Food Canada, Ottawa, Canada) for his special help and encouragement in our entomological studies.

Subtribe STENOLOPHINA

Diagnosis (New Zealand). Body length: 3.0–8.3 mm. Frons usually with clypeo-ocular prolongations, seldom without (*Pholeodytes*). Mentum usually with a tooth medially, seldom without (*Egadroma*). Mentum and submentum usually separated by complete transverse suture, seldom by laterally incomplete transverse suture (*Euthenarus*). Penultimate segment of labial palpi bisetose (with 2 setae). Apex of prosternal lobe glabrous or pubescent (*Egadroma, Euthenarus*). Male protarsi dilated laterally and biseriately pubescent ventrally, seldom unmodified (*Haplanister*). Male mesotarsi dilated laterally and biseriately pubescent ventrally (except 2 adventive *Euthenarus* and *Haplanister*). Metatarsomere 1 usually as long as metatarsomeres 2+3, rarely shorter (*Haplanister*, some *Euthenarus* species). Umbilicate setiferous series of interval 9 separated into 2 major groups with posterior group divided further into 2 subgroups or continuous. Aedeagus arcuate, usually symmetrical (with ostium dorsal, not deflected laterally), seldom asymmetrical (with ostium slightly deflected to the left; *Egadroma*).

Geographic distribution. Worldwide.

References. Noonan, 1976: 15–28 (taxonomy); Larochelle & Larivière, 2001: 126–128 (catalogue).

Remarks. The dilatation and pubescence of the male pro- and mesotarsi could not be studied for the genus *Kiwiharpalus* which is only known from females.

Key to genera of New Zealand Stenolophina

1 Eyes (Fig. 112–113) strongly reduced, flat, consisting of obliterated facets. Mandibles very long (5–6× their maximum width; Fig.113). Body depigmented (appearing pale in colour; Fig. 220–225) 2

— Eyes (Fig. 109) normally developed. Mandibles shorter (Fig. 109). Body pigmented (appearing dark in colour) 3

2(1) Segment 4 of protarsi and mesotarsi with 2 membranous laminae (Fig. 25). Elytral interneurs incomplete, consisting of rows of punctures (Fig. 113). Forebody (head and thorax) much narrower than elytra (Fig. 113). Body length 6.0 mm or more [Cave beetles. South Island: NN] ... ...(p. 80)... ***Pholeodytes*** Britton

— Segment 4 of protarsi and mesotarsi without membranous laminae (Fig. 26). Elytral interneurs complete, consisting of striae (Fig. 112). Forebody (head and thorax) at most moderately narrower than elytra (Fig. 112). Body length 3.5mm or less [Offshore Islands: TH] ....(p. 79)... ***Kiwiharpalus*** new genus

3(1) Elytral base and side with interneurs incomplete basally and laterally (Fig. 111). Clypeo-ocular prolongations incomplete toward eyes (Fig. 111). Pronotum (Fig. 163) suborbicular. Apex of prosternal lobe glabrous (Fig. 2) ...(p. 77)... ***Haplanister*** Moore

— Elytral base and side with interneurs complete (Fig. 109–110). Clypeo-ocular prolongations complete (Fig. 110). Pronotum transverse, not suborbicular. Apex of prosternal lobe pubescent 4

4(3) Ventrites 5+6 with numerous short setae, in addition to paired ambulatory setae (Fig. 28). Mentum tooth present (Fig. 14). Ventrites 2+3 of male with a setiferous fovea (Fig. 28) ....(p. 73)... ***Euthenarus*** Bates

— Ventrites 5+6 with paired ambulatory setae only (Fig. 27). Mentum tooth absent (Fig. 18). Ventrites 2+3 of male without a setiferous fovea (Fig. 27) ....(p. 72)... ***Egadroma*** Motschulsky

Genus *Egadroma* Motschulsky, 1855 [A]

Egadroma Motschulsky, 1855: 43. Type species: *Carabus smaragdulus* Fabricius, 1798, by monotypy.
Stenolophus (*Egadroma*): Ganglbauer, 1892: 370.
Acupalpus (*Egadroma*): Csiki, 1932: 1239.
Stenolophus (*Egadroma*): Noonan, 1976: 18.
Egadroma: Serrano *et al*., 1994: 56.

Description (New Zealand). Body length: 5.0–6.5 mm. Forebody (head and thorax) without sparse setiferous micropores dorsally. **Head**. Mandibles short, strongly curved forward, blunt apically. Labrum strongly transverse; apex straight or slightly emarginate medially. Eyes moderately large, convex, reaching buccal fissure ventrally. Tempora not inflated. Frons with clypeo-ocular prolongations complete. Antennal pubescence starting from middle of antennomere 2. Mentum without tooth medially. Mentum and submentum separated by complete transverse suture. Paraglossae longer than ligula. Palpi with last segment fusiform, not truncate apically, almost glabrous; penultimate segment of labial palpi bisetose on anterior margin. **Thorax**. Pronotum transverse; base convex, moderately narrower than elytral base; lateral beads complete; anterior bead incomplete medially; posterior bead absent. Scutellum visible. Apex of prosternal lobe pubescent. **Legs**. Metafemora with 2 long setae on posterior margin. Male protarsi and mesotarsi dilated laterally and biseriately pubescent ventrally. Segment 4 of protarsi and mesotarsi of both sexes without membranous laminae. Tarsi glabrous dorsally; metatotarsomere 5 pubescent ventrally (with 2 setae); metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Interneurs complete. Rows of setiferous punctures absent on intervals 3, 5, and 7, and on interneur 2. Umbilicate setiferous series of interval 9 separated into 2 major groups, with posterior group further divided into 2

subgroups. **Abdomen**. Ventrites 2+3 of male without a setiferous fovea. Ventrites 5+6 of both sexes without short setae, with paired ambulatory setae only. **Aedeagus** (Fig. 75). Lateral view: slightly arcuate. Dorsal view: asymmetrical (with ostium deflected to the left); dorsal membranous area wide, extending almost to basal bulb; apical disc present. Internal sac armed.

Geographic distribution. Ethiopian, Australian, Palearctic, and Oriental Regions, the Pacific Islands; New Zealand (adventive).

References. Noonan, 1976: 18 (taxonomy); Serrano *et al*., 1994: 56 (karyotype, taxonomy); Serrano & Galián, 1998: 198 (karyotype, taxonomy); Larochelle & Larivière, 2001: 126 (catalogue).

Remarks. Serrano *et al.,* (1994: 56) and Serrano & Galián (1998: 198) separated *Egadroma* from *Stenolophus* Dejean on the basis of chromosome number, meiotic behaviour of chromosomes, and geographic distribution, the latter taxon being restricted to the Holarctic Region. The genus *Egadroma* is in need of revision.

Egadroma picea (Guérin-Méneville, 1830) A

Figures 75, 109, 158, 214; Map p. 151

Acupalpus piceus Guérin-Méneville, 1830: Plate 1, Figure 12. Type locality: Port Jakson [=Port Jackson], New South Wales, Australia.

Harpalus dingo Laporte de Castelnau, 1867: 111 (redescribed in 1868: 197). Type locality: Rockhampton, Queensland, Australia. Synonymised by Moore, in Moore *et al*., 1987: 242.

Homalosoma dingo: Gemminger & Harold, 1868: 329.

Stenolophus politus Macleay, 1871: 103. Type locality: Gayndah, Queensland, Australia. Synonymised by Moore, in Moore *et al*., 1987: 242.

Stenolophus dingo: Chaudoir, 1878: 514.

Stenolophus sexualis Fauvel, 1882: 270. Type locality: Ile des Pins and Nouméa, New Caledonia. Synonymised by Sloane, 1920b: 323.

Stenolophus piceus: Cameron & Butcher, 1980: 115.

Stenolophus (*Egadroma*) *piceus*: Moore *et al*., 1987: 242.

Egadroma piceus [*sic*]: Serrano *et al*., 1994: 56.

Description. Body length: 5.0–6.5 mm. Slightly convex. Dark brown; pronotum with wide reddish or yellowish margins; elytra with a reddish spot (more or less distinct) on the shoulder; suture with posterior half yellowish red; antennomeres 2–3, palpi, and legs yellow. Generally glabrous and smooth. Microsculpture isodiametric on head, moderately transverse on pronotum, very transverse (with microlines) on male elytra, granulate on female elytra. Shiny, without metallic lustre; elytra iridescent in males, dull in females. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Antennae moderately long, reaching about elytral base; antennal scape about 3× longer than its maximum width. **Thorax**. Pronotum (Fig. 158) very transverse, widest before middle; sides converging toward base, not sinuate; apex concave; lateral depressions raised, moderately large, slightly widening posteriorly; anterior angles moderately developed, rounded; posterior angles feebly developed, broadly rounded; basal foveae shallow, wide, extending to lateral beads; punctuation strongly developed basally (particularly in basal foveae). Apex of prosternal lobe with 5–6 long setae. Metepisterna longer than wide. **Elytra**. Widest behind midddle. Shoulders strongly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole present. Interneurs shallow, deepening apically, impunctate. Intervals impunctate, flat, becoming convex apically. Interval 3 with a setiferous puncture behind middle. **Aedeagus** (Fig. 75). As for genus.

Material examined. 23 non-type specimens (AMNZ, JNNZ, LUNZ, NZAC).

Geographic distribution (Map p. 151). North Island: AK, CL, ND. Adventive. Extralimital range: New Caledonia, Pacific Islands, Australia (including Tasmania). First New Zealand records: Lake Ohia, ND, 1917 (NZAC) ; Redhill and Woodhill, AK, Rangiputa and Ruakaka, ND (Cameron & Butcher, 1980: 115–116). Well established.

Ecology. Lowland. Sandy pastures and sand dunes. Open ground; dry, sandy, bare or sparsely vegetated soil. Nocturnal; sheltering during the day in soil burrows dug at the base of plants and under logs. **Biology**. Seasonality: September–March, August. Omnivorous, probably granivorous (Moore *et al*., 1987: 242). Food, in captivity: Small scarabaeids. **Dispersal power**. Elytra free along suture. Macropterous. Occasional flier. Moderate runner. Good burrower. Effective as a colonist. Favoured by human activities. **Collecting techniques**. Digging at the base of plants, turning logs and seashore debris, light trapping.

References. Moore *et al*., 1987: 242 (distribution, ecology, biology, dispersal power); Cameron & Butcher, 1980: 115–116 (as *Stenolophus piceus*, distribution, ecology, biology); Larochelle & Larivière, 2001: 126 (taxonomy, distribution, ecology, biology, dispersal power).

Genus *Euthenarus* Bates, 1874 N

Euthenarus Bates 1874: 272 (redescribed in 1875: 310). Type species: *Euthenarus brevicollis* Bates, 1874, designated by Noonan, 1976: 27.

Euthenaris: Csiki, 1932: 1268 (incorrect subsequent spelling).

Description. Body length: 3.8–6.0 mm. Forebody (head and thorax) without sparse setiferous micropores dorsally. **Head**. Mandibles short, slightly curved forward, blunt

apically. Labrum strongly transverse; slightly emarginate medially. Eyes moderately large, convex, reaching or almost reaching buccal fissure ventrally. Tempora not inflated. Frons with clypeo-ocular prolongations complete. Antennal pubescence starting from middle of antennomere 2. Mentum with a tooth medially, moderately shorter than lateral lobes. Mentum and submentum separated by laterally incomplete transverse suture. Paraglossae longer than ligula. Palpi with last segment fusiform, not truncate apically, subglabrous; penultimate segment of labial palpi bisetose on anterior margin. **Thorax**. Pronotum transverse; base convex or straight, moderately narrower than elytral base; lateral beads complete; anterior and posterior beads incomplete medially. Scutellum visible. Apex of prosternal lobe pubescent. **Legs**. Metafemora with 2 long setae on posterior margin. Male protarsi dilated laterally and biseriately pubescent ventrally; male mesotarsi dilated laterally and biseriately pubescent ventrally (*brevicollis, puncticollis*) or unmodified (*bicolor, promptus*). Segment 4 of protarsi and mesotarsi of both sexes without membranous laminae. Tarsi glabrous dorsally; metatarsomere 5 glabrous ventrally; metatarsomere 1 shorter than or as long as (*promptus*) metatarsomeres 2+3. **Elytra**. Interneurs complete. Rows of setiferous punctures absent on intervals 3, 5, and 7, and on interneur 2. Umbilicate setiferous series of interval 9 separated into 2 major groups, with posterior group continuous. **Abdomen**. Ventrites 2+3 of male with a setiferous fovea medially (contrary to other Harpalini genera). Ventrites 5+6 of both sexes with numerous short setae, in addition to paired ambulatory setae (contrary to other Harpalini genera). **Aedeagus**. Lateral view: strongly or moderately arcuate. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area wide or narrow (*promptus*), extending almost to basal bulb; apical disc present or absent. Internal sac armed or unarmed.

Geographic distribution. Australia (including Tasmania and Norfolk Island), New Zealand.

References. Bates, 1874: 273 (taxonomy); Hudson, 1934: 177 (list); Noonan, 1976: 27–28 (taxonomy); Moore, 1985: 252–253 (taxonomy, distribution); Townsend, 1997: 17 (species diagnosis); Larochelle & Larivière, 2001: 126–127 (catalogue).

Remarks. This genus is in need of revision.

Key to species of *Euthenarus*

1 Eyes reaching buccal fissure ventrally (Fig. 21). Femora pale. Male mesotarsi unmodified 2

— Eyes narrowly separated from buccal fissure ventrally (by 0.7× maximum width of antennal scape; Fig. 20). Femora dark. Male mesotarsi dilated laterally (Fig. 215) and biseriately pubescent ventrally (Fig. 13) 3

2(1) Body length 4.0 mm or less. Pronotum (Fig. 161): reddish brown, contrasting with dark head and elytra; posterior angles rounded; base convex [Aedeagus (Fig. 78)] .....(p. 76)... ***bicolor*** Moore

— Body length over 4.0 mm. Pronotum (Fig. 162): piceous brown with paler borders, not contrasting with colour of head and elytra; posterior angles rectangular; base straight [Aedeagus (Fig. 79)] ....(p. 77)... ***promptus*** (Erichson)

3(1) Subapical sinuations of elytra feeble (Fig. 29, laterodorsal view). Pronotum (Fig. 159): posterior angles obtuse-rounded; base strongly convex. Elytral interneurs shallow, almost erased apically [Aedeagus (Fig. 76)] ....(p. 74)...***brevicollis*** Bates

— Subapical sinuations of elytra strong (Fig. 30, laterodorsal view). Pronotum (Fig. 160): posterior angles almost rectangular; base slightly convex. Elytral interneurs deeper, well impressed apically (Fig. 110) [Aedeagus (Fig. 77)] .....(p. 75)... ***puncticollis*** Bates

Euthenarus brevicollis Bates, 1874 [E]

Figures 76, 159, 215; Map p. 152

Euthenarus brevicollis Bates, 1874: 273 (redescribed in 1875: 311). Lectotype (here designated): male (MNHN) labelled "Canterby N. Zeal (hand-written) / Euthenarus brevicollis Bates (hand-written) / LECTOTYPE *Euthenarus brevicollis* Bates, 1878 designated by Larochelle & Larivière 2004 (red label; typed)." Good condition.

Euthenaris brevicollis: Csiki, 1932: 1268 (incorrect subsequent spelling).

Description. Body length: 5.0–6.0 mm. Moderately convex. Head, thorax, and femora piceous black; elytra dark brown; pronotal margins, elytral suture, apical 1/3 of interval 9, antennal base, and base and apex of palpi rufous. Generally glabrous and smooth. Microsculpture isodiametric on head and pronotum, slightly transverse on elytra. Shiny, with aeneous or coppery lustre; elytra iridescent in males, dull in females. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Eyes narrowly separated from buccal fissure ventrally (by about 0.7× maximum of antennal scape). Antennae moderately long, reaching elytral base; antennal scape about 2× longer than its maximum width.

Thorax. Pronotum (Fig. 159) moderately transverse, subrectangular, widest before middle; sides converging toward base, not sinuate; base strongly convex (more so than in *puncticollis*); apex straight; lateral depressions absent; anterior angles feebly developed, rounded; posterior angles moderately developed, obtuse-rounded; basal foveae moderately deep, wide; punctuation strongly developed (in basal foveae). Apex of prosternal lobe with 5–6 long setae. Metepisterna longer than wide. **Legs**. Male mesotarsi dilated laterally and biseriately pubescent ventrally. Metatarsomere 1 shorter than metatarsomeres 2+3. **Elytra**. Widest about middle. Shoulders strongly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent. Interneurs complete, shallow, almost erased apically, impunctate. Intervals impunctate, flat. Interval 3 with a setiferous puncture behind middle. **Aedeagus** (Fig. 76). Lateral view: strongly arcuate; apex narrowly pointed; apical 1/2 of main shaft narrowly triangular. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area very wide, extending almost to basal bulb; apical disc present, rounded at tip, less than 0.5× as long as wide. Internal sac armed.

Material examined. 79 specimens, including type (AMNZ, BBNZ, CMNZ, JNNZ, LUNZ, MNHN, MONZ, NZAC, OMNZ, PHNZ, UCNZ).

Geographic distribution (Map p. 152). South Island: CO, DN, FD, KA, MC, MK, NC, OL, SC, SL. Stewart Island.

Ecology. Lowland, montane, subalpine. Borders of lakes, ponds, and slowly running streams; dried-up stream beds, swamps; wet pastures and cultivated fields. Open ground; wet, muddy, bare or vegetated soil. Nocturnal; sheltering during the day under logs and stones. Gregarious. **Biology**. Seasonality: September–March, June. Tenerals: late January (MK). Occasionally infested with mites. **Dispersal power**. Elytra free along suture. Macropterous. Occasional in seashore drift material, which indicates flight ability. Moderate runner. Good burrower. Occasional climber (on grass, sedges, currants). **Collecting techniques**. Pitfall trapping, turning logs and stones, sweeping plants.

References. Johns, 1986: 31 (distribution, ecology); Townsend, 1997: 17 (taxonomy, distribution); Emberson, 1998: 30 (taxonomy, distribution, ecology, biology); Larochelle & Larivière, 2001: 127 (taxonomy, distribution, ecology, biology, dispersal power).

Remarks. Bates' original description was based on an unspecified number of specimens of both sexes ("[male symbol, female symbol]") from "Lake Coleridge" (situated in the Alps in Canterbury), and collected by C. M. Wakefield. Seven specimens of *E. brevicollis* were obtained from the Bates collection in Paris (MNHN), one of which (a male specimen) bears a determination label written by Bates and a locality label reading "Canterby [=Canterbury] N. Zeal". The other MNHN specimens were collected in "Christchurch" and do not bear a Bates' determination label. In addition, two male specimens collected in Oakden's (near Lake Coleridge) in 1873 were located in the Wakefield material deposited in the Canterbury Museum (CMNZ). The locality labels for the Canterbury specimen (MNHN) and Oakden's specimens (CMNZ) have been written by different hands, which casts doubts about whether Wakefield was also the collector of the Canterbury specimen (MNHN). On the other hand, it is not clear either that the Oakden's specimens collected by Wakefield (CMNZ) were part of the syntype series, i.e., they may or may not have been seen by Bates. Because the Canterbury specimen (MNHN) is more likely to have been part of Bates' original type series — specimens were not always labelled with precise localities in those days — it is here designated as lectotype to preserve stability of nomenclature in the future. This species is morphologically close to *E. puncticollis*, the only other endemic *Euthenarus*.

Euthenarus puncticollis Bates, 1874 [E]

Figures 77, 110, 160, 216; Map p. 152

Euthenarus puncticollis Bates, 1874: 273 (redescribed in 1875: 311). Lectotype (here designated): male (MNHN) labelled "Auckland N. Zeald (hand-written) / Euthenarus puncticollis Bates (hand-written) / LECTOTYPE *Euthenarus puncticollis* Bates, 1878 designated by Larochelle & Larivière 2004 (red label; typed)." Good condition. Paralectotype: 1 female (MNHN) bearing blue paralectotype label.

Euthenaris puncticollis: Csiki, 1932: 1268 (incorrect subsequent spelling).

Description. Body length: 5.0–6.0 mm. Moderately convex. Head, thorax, and femora piceous black; elytra dark brown; pronotal margins, elytral suture, apical 1/3 of interval 9, antennal base, and base and apex of palpi rufous. Generally glabrous and smooth. Microsculpture isodiametric on head and thorax, slightly transverse on elytra. Shiny, with aeneous or coppery lustre; elytra iridescent in males, dull in females. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Eyes narrowly separated from buccal fissure ventrally (by about 0.7× maximum width of antennal scape). Antennae moderately long, reaching elytral base; antennal scape about 2× longer than its maximum width. **Thorax**. Pronotum (Fig. 160) moderately transverse, subrectangular, widest before middle; sides converging toward base, slightly sinuate; base slightly convex (less so than in *brevicollis*); apex straight; lateral depressions absent; anterior angles feebly developed, rounded; posterior angles strongly developed, almost rectangular; basal foveae very deep, wide; punctuation strongly developed

(in basal foveae). Apex of prosternal lobe with 5–6 long setae. Metepisterna longer than wide. **Legs**. Male mesotarsi dilated laterally and biseriately pubescent ventrally. Metatarsomere 1 shorter than metatarsomeres 2+3. **Elytra**. Widest about middle. Shoulders strongly developed, rounded, with a tooth. Subapical sinuations strong. Sutural apices angulate. Scutellar striole absent. Interneurs shallow, moderately deep apically, impunctate. Intervals impunctate, slightly convex. Interval 3 with a setiferous puncture behind middle. **Aedeagus** (Fig. 77). Lateral view: strongly arcuate; apex narrowly pointed (more attenuate than in *brevicollis*); apical half of main shaft not triangular. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area wide, extending almost to basal bulb; apical disc present, rounded at tip, more than 0.5× as long as wide. Internal sac armed.

Material examined. 250 specimens, including types (AMNZ, CMNZ, ITNZ, JNNZ, LUNZ, MNHN, MONZ, NZAC, UCNZ).

Geographic distribution (Map p. 152). North Island: AK, CL, GB, HB, ND, RI, TK, TO, WA, WI, WN, WO. South Island: BR, NN, SD, WD. Offshore Islands: CH.

Ecology. Lowland, montane, subalpine. Borders of lakes, ponds, flax swamps, slowly running rivers and brooks; mud flats and wet pastures. Open ground; wet, muddy (mostly) or sandy soil with sparse vegetation (e.g., *Juncus*). Nocturnal; sheltering during the day in burrows at the base of plants and under embedded branches and logs (mostly); in soil cracks, leaf litter, and moss. Gregarious. **Biology**. Seasonality: throughout the year. Tenerals: October (rarely), February–April, June. Occasionally infested with mites and fungi (Laboulbeniales). **Dispersal power**. Elytra free along suture. Macropterous. Regular in seashore drift material, which indicates flight ability. Moderate runner. Good burrower. Occasional climber (on shrubs and trees). **Collecting techniques**. Digging at base of *Juncus*-tufts, turning embedded branches and logs, pouring water over ground, using pan traps, turning seashore drift material.

References. Barratt & Patrick, 1987: 82 (distribution, ecology); Townsend, 1994: 9, 11–13 (distribution, ecology); Townsend, 1997: 17 (taxonomy, distribution); Larochelle & Larivière, 2001: 127 (taxonomy, distribution, ecology, biology, dispersal power).

Remarks. Bates' original description was based on specimens from both sexes "[male symbol, female symbol]", including "several examples" from "Auckland". Six specimens collected in Auckland were obtained from the Bates collection in Paris (MNHN), two of which (a male and a female) bear a determination label written by Bates; these two specimens are here considered syntypic and labelled as lectotype and paralectotype to preserve stability of nomenclature in the future. See under *E. brevicollis*.

Euthenarus bicolor Moore, 1985[A] first New Zealand record

Figures 78, 161, 217; Map p. 152

Euthenarus bicolor Moore, 1985: 252. Type locality: Black Mt., A.C.T., Australia.

Description. Body length: 3.8–4.0 mm. Moderately convex. Head black; pronotum reddish brown; elytra dark brown; legs, antennal base, and palpi yellowish. Generally glabrous and smooth. Microsculpture vestigial on head and pronotum, very transverse (with microlines) on elytra. Shiny, without metallic lustre; elytra iridescent. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Eyes reaching buccal fissure ventrally. Antennae moderately long, reaching about elytral base; antennal scape about 2×longer than its maximum width. **Thorax**. Pronotum (Fig. 161) moderately transverse, widest before middle; sides converging toward base, not sinuate; base slightly convex; apex straight; lateral depressions absent; anterior angles feebly developed, rounded; posterior angles feebly developed, rounded; basal foveae shallow, wide; punctuation strongly developed (in basal foveae). Apex of prosternal lobe with 5–6 long setae. Metepisterna longer than wide. **Legs**. Male mesotarsi unmodified. Metatarsomere 1 shorter than metatarsomeres 2+3. **Elytra**. Widest about middle. Shoulders strongly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent. Interneurs deep, impunctate. Intervals impunctate, flat. Interval 3 with a setiferous puncture behind middle. **Aedeagus** (Fig. 78). Lateral view: moderately arcuate; apex triangular; apical half of main shaft broadly triangular. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area very wide, extending almost to basal bulb; apical disc absent. Internal sac unarmed. Much smaller and stouter than in other *Euthenarus* species.

Material examined. 144 non-type specimens (AMNZ, LUNZ, NZAC).

Geographic distribution (Map p. 152). North Island: AK, BP, CL, GB, HB, ND, TO, WO. South Island: NN. Adventive. Extralimital distribution: Australia (including Tasmania and Norfolk Island). First New Zealand record: Auckland, AK, 1945 (NZAC). Well established.

Ecology. Lowland. Borders of eutrophic marshes and ponds; swamp forests; borders of slowly running rivers and brooks; mud flats, roadside ditches, and wet vacant lots. Open ground; soft, wet, muddy (mostly) or sandy soil with sparse or moderate vegetation (mostly *Juncus*, also *Carex*, *Typha*, or weeds). Mostly nocturnal; occasionally running during the day in the spring sunshine; usually sheltering during the day in burrows at the base of plants (mostly), in plant debris and leaf litter, under pieces of

wood and stones. Gregarious. **Biology**. Seasonality: September–April, August. Omnivorous (Moore *et al*., 1987). Occasionally infested with mites. **Dispersal power**. Elytra free along suture. Macropterous. Regular flier (to artificial lights at night). Regular in seashore drift material, which also indicates flight ability. Moderate runner. Good burrower. Occasional climber (on rushes and trees). Clearly effective as a colonist. Favoured by human activities. **Collecting techniques**. Pouring water over ground, treading soil with feet, treading vegetation into water, light trapping, sweeping vegetation, turning seashore drift material.

References. Moore, 1985: 253 (taxonomy, distribution, dispersal power). Moore *et al*., 1987: 244 (synonymy, distribution, ecology, biology, dispersal power).

Remarks. The reddish brown pronotum contrasting with the dark head and elytra, and the body shape make this species superficially similar to *Lecanomerus atriceps*. Both species have often been confused in the past, but they are easily distinguished based on male tarsal characters (biseriately pubescent ventrally in *E. bicolor*, spongily pubescent in *L. atriceps*) and ventral pubescence (ventrites 5+6 with numerous setae and male setiferous fovea of ventrites 2+3 present in *E. bicolor*, such pubescence lacking in *L. atriceps*).

Euthenarus promptus (Erichson, 1842) [A] first New Zealand record

Figures 79, 162, 218; Map p. 152

Harpalus promptus Erichson, 1842: 126. Type locality: Tasmania, Australia.

Euthenarus promptus: Sloane, 1920: 138.

Description. Body length: 4.0–6.0 mm. Moderately convex. Head, pronotum, and elytra piceous brown; pronotal borders, elytral suture, apical 1/3 of interval 9, pronotal and elytral epipleura, antennal base, palpi, and legs reddish yellow. Generally glabrous and smooth. Microsculpture strongly transverse dorsally. Shiny, with green metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Eyes reaching buccal fissure ventrally. Antennae moderately long, reaching elytral base; antennal scape about 2× longer than its maximum width. **Thorax**. Pronotum (Fig. 162) moderately transverse, subrectangular, widest before middle; sides converging toward base, slightly sinuate; base rather straight; apex straight; lateral depressions absent; anterior angles feebly developed, angulate; posterior angles strongly developed, rectangular; basal foveae deep, wide; punctuation strongly developed (in basal foveae). Apex of prosternal lobe with 5–6 long setae. Metepisterna longer than wide. **Legs**. Male mesotarsi unmodified. Metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Widest about middle. Shoulders strongly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent. Interneurs shallow, well impressed apically, impunctate. Intervals impunctate, flat. Interval 3 with a setiferous puncture behind middle. **Aedeagus** (Fig. 79). Lateral view: moderately arcuate; apex narrowly truncate; apical 1/2 of main shaft not triangular, inflated ventrally. Dorsal view: symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area narrow, extending almost to basal bulb; apical disc present, triangular. Internal sac armed.

Material examined. 113 non-type specimens (ITNZ, JNNZ, LUNZ, MONZ, NZAC).

Geographic distribution (Map. 152). North Island: HB, TO, WA, WI, WN. South Island: BR, KA, MB, MC, NN, SD. Adventive. Extralimital distribution: Australia (including Tasmania and Norfolk Island). First New Zealand record: The Glen, Nelson, NN, 1950 (NZAC). Well established.

Ecology. Lowland. Stream banks, swamps, roadside banks, and wet pastures. Open ground; wet, sandy soil with sparse vegetation (grass, sedges). Nocturnal; sheltering during the day in burrows at the base of plants (mostly), under plants and logs. According to Moore (1985), this species "is generally associated with wet ground, under or among subaquatic plants." Gregarious. **Biology**. Seasonality: September–March, July–August. Tenerals: March (abundant), July. Omnivorous (Moore *et al*., 1987). **Dispersal power**. Elytra free along suture. Macropterous. Regular flier (to artificial lights at night). Regular in seashore drift material, which also indicates flight ability. Moderate runner. Good burrower. Occasional climber (on rushes and grass). Clearly effective as a colonist. Favoured by human activities. **Collecting techniques**. Pouring water over ground, treading soil with feet, treading vegetation into water, uprooting plants, light trapping, sweeping vegetation, turning seashore drift material.

References. Moore, 1985: 252–253 (taxonomy, distribution, ecology, dispersal power). Moore *et al*., 1987: 245 (synonymy, distribution, ecology, biology, dispersal power).

Genus *Haplanister* Moore, 1996 [A]

Haplanister Moore, 1996: 97. Type species: *Haplanister crypticus* Moore, 1996, by monotypy.

Description. Body length: 3.5–4.1 mm. Forebody (head and thorax) without sparse setiferous micropores dorsally. **Head**. Mandibles short, strongly curved forward, blunt apically. Labrum strongly transverse; apex straight medially. Eyes moderately large, convex, reaching buccal fissure ventrally. Tempora not inflated. Frons with clypeo-ocular

prolongations incomplete toward eyes. Antennal pubescence starting from basal third of antennomere 3. Mentum with a tooth medially, moderately shorter than lateral lobes. Mentum and submentum separated by complete transverse suture. Paraglossae longer than ligula. Palpi with last segment fusiform, not truncate apically, with sparse, moderately long pubescence; penultimate segment of labial palpi bisetose on anterior margin. **Thorax**. Pronotum suborbicular; base convex, moderately narrower than elytral base; lateral beads complete; anterior and posterior beads incomplete medially. Scutellum visible. Apex of prosternal lobe glabrous. **Legs**. Metafemora with 2 long setae on posterior margin. Male protarsi and mesotarsi unmodified, neither dilated laterally nor biseriately pubescent ventrally. Segment 4 of protarsi and mesotarsi of both sexes without membranous laminae. Tarsi glabrous dorsally; metatarsomere 5 pubescent (with 2 setae) ventrally; metatarsomere 1 shorter than metatarsomeres 2+3. **Elytra**. Interneurs incomplete basally and laterally. Rows of setiferous punctures absent on intervals 3, 5, and 7, and on interneur 2. Umbilicate setiferous series of interval 9 separated into 2 major groups, with posterior group continuous. **Abdomen**. Ventrites 2+3 of male without a setiferous fovea. Ventrites 5+6 of both sexes without short setae, with paired ambulatory setae only. **Aedeagus** (Fig. 80). Lateral view: strongly arcuate, especially stout and small (sabot-shaped). Dorsal view: symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area wide, extending almost to basal bulb; apical disc absent. Internal sac unarmed.

Geographic distribution. New Zealand (apparently adventive).

References. Moore, 1996: 97-100 (taxonomy); Larochelle & Larivière, 2001: 127 (catalogue).

Remarks. A highly distinctive genus amongst the Stenolophina, with suborbicular pronotum, incomplete elytral interneurs, and sabot-shaped aedeagus.

Haplanister crypticus Moore, 1996 [A]

Figures 80, 111, 163, 219; Map p. 152

Haplanister crypticus Moore, 1996: 98. Type locality: Hastings, HB (although an adventive species).

Description. Body length: 3.5–4.1 mm. Slightly convex. Dark brown; base of antennae, maxillary palpi, femora, and posterior 1/2 of tibiae light red. Generally glabrous and smooth. Microsculpture isodiametric. Shiny; pronotum and elytra with bronze lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; flat anteriorly, slightly convex posteriorly. Antennae short, not reaching pronotal base; antennal scape about 2× longer than its maximum width. **Thorax**. Pronotum (Fig. 163) suborbicular, widest before middle; sides converging toward base, not sinuate; base strongly convex; apex rather straight; lateral depressions absent; anterior angles moderately developed, obtuse; posterior angles feebly developed, broadly rounded; basal foveae shallow, ill-defined; punctuation feebly developed (in basal foveae). Metepisterna longer than wide. **Elytra**. Widest about middle. Shoulders strongly developed, rounded, without a tooth. Subapical sinuations absent. Sutural apices rounded. Scutellar striole present. Intervals impunctate, flat. Interval 3 with a setiferous puncture behind middle. **Aedeagus** (Fig. 80). Lateral view: as for genus. Dorsal view: as for genus; dorsal membranous area very wide.

Material examined. 258 non-type specimens (AMNZ, ITNZ, JNNZ, LUNZ, MONZ, NZAC, OMNZ, PHNZ, UCNZ).

Geographic distribution (Map p. 152). North Island: AK, BP, CL, GB, HB, ND, RI, TK, TO, WA, WI, WN, WO. South Island: MC, NN, SC. Offshore Islands: CH. Adventive species of unknown origin. First New Zealand records: Napier, HB, 1965 (MONZ); Palmerston North, WI, 1974 (Moore, 1996: 98). Well established.

Ecology. Lowland, montane, subalpine, alpine. Forests (broadleaf, podocarp, beech). Gardens, golf courses, parks, pastures, fields, and alpine meadows. Shaded or open ground. Usually nocturnal; sometimes active in the sunshine; generally sheltering during the day in leaf litter and in moss along logs and fallen trees, also under the loose bark of trees, in rotten wood, and among plant debris. Gregarious. **Biology**. Seasonality: September–April, July. Tenerals: late January. Predators: Starlings (frequent enemies). **Dispersal power**. Elytra free along suture. Macropterous. Frequent flier. Regular in seashore drift material, which indicates flight ability. Moderate runner. Good burrower. Regular climber (on plants, shrubs, and trees). Clearly effective as a colonist. Strongly favored by human activities. **Collecting techniques**. Raking leaf litter, light trapping, turning seashore drift material, using malaise traps, pitfall trapping.

References. Kuschel, 1990: 24, 40 (as *Haplaner* sp., distribution, ecology, biology, dispersal power); Townsend, 1994: 9, 11 (as *Haplaner* sp., distribution, ecology); Moore 1996: 97–99 (distribution, ecology); Emberson, 1998: 30 (distribution, ecology, biology); Larochelle & Larivière, 2001: 127 (taxonomy, distribution, ecology, biology, dispersal power).

Genus *Kiwiharpalus* new genus [E]

Type species. *Kiwiharpalus townsendi* new species, by present designation.

Description. Body length: 3.0–3.5 mm. Forebody (head and thorax) without sparse setiferous micropores dorsally. **Head**. Mandibles very long (about 6× their maximum width), slightly curved forward, acute apically. Labrum moderately transverse; apex straight medially. Eyes strongly reduced, flat, consisting of obliterated facets, narrowly separated from buccal fissure ventrally (by about 0.7× maximum width of antennal scape). Tempora not inflated. Frons with clypeo-ocular prolongations incomplete toward eyes. Antennal pubescence starting from basal 1/3 of antennomere 3. Mentum with a tooth medially, moderately shorter than lateral lobes. Mentum and submentum separated by complete transverse suture. Paraglossae longer than ligula. Palpi with last segment elongate-triangular, not truncate apically, with sparse, moderately long pubescence; penultimate segment of labial palpi bisetose on anterior margin. **Thorax**. Pronotum quadrate (as wide as long); base rather straight, much narrower than elytral base; lateral beads complete; anterior and posterior beads incomplete medially. Scutellum visible. Apex of prosternal lobe glabrous. **Legs**. Metafemora with 2 long setae on posterior margin. Dilatation and ventral vestiture of male pro- and mesotarsi unknown (only females seen). Segment 4 of protarsi and mesotarsi without membranous laminae. Tarsi glabrous dorsally (except tarsomere 5); metatarsomere 5 pubescent (with 2 setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Interneurs complete. Rows of setiferous punctures absent on intervals 3, 5, and 7, and on interneur 2. Umbilicate setiferous series of interval 9 separated into 2 major groups, with posterior group further divided into 2 subgroups. **Abdomen**. Condition of ventrites 2+3 of male unknown (only females seen). Ventrites 5+6 without short setae, with paired ambulatory setae only. **Aedeagus**. No male seen.

Geographic distribution. New Zealand (endemic; Three Kings Islands).

Remarks. The generic name is derived from *kiwi* (the most primitive of New Zealand birds and a major national symbol) and *Harpalus* (the type genus of the tribe Harpalini). This monotypic genus appears to be a genetically highly distinctive taxon with its dorsal surface punctate throughout and without microsculpture, its quadrate pronotum, its small body length (3.0–3.5 mm), and its geographic isolation on the Three Kings Islands.

Kiwiharpalus townsendi new species [E]

Figures 112, 164, 220; Map p. 152

Kiwiharpalus townsendi Larochelle & Larivière, new species. Holotype: female (NZAC) labelled "THREE KINGS IS NZ, Princes I Hinemoa Nov 1983 C. F. Butcher (typed) / Nest of Larus novaehollandiae scopulinus 83[forward slash]131 (typed) / HOLOTYPE [male symbol] *Kiwiharpalus townsendi* Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 2 females (1 AMNZ, 1 NZAC) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length: 3.0–3.5 mm. Moderately convex. Depigmented, testaceous; palpi partly greyish brown. Generally glabrous and punctate (with sparse micropores) dorsally. Microsculpture absent. Shiny, without metallic lustre. **Head**. Big, although narrower across eyes than pronotal apex; flat anteriorly, convex posteriorly. Antennae rather long, reaching basal 1/3 of elytra; antennal scape about 2× longer than its maximum width. **Thorax**. Pronotum (Fig. 164) quadrate (as wide as long), widest before middle; sides converging toward base, not sinuate; apex rather straight; lateral depressions widening posteriorly; anterior angles feebly developed, obtuse; posterior angles moderately developed, rounded; basal foveae deep, wide; punctuation strongly developed. Metepisterna longer than wide. **Elytra**. Widest about middle. Shoulders strongly developed, rounded, without a tooth. Subapical sinuations rather strong. Sutural apices angulate. Scutellar striole absent. Interneurs shallow, unevenly impressed, impunctate. Intervals sparsely punctate, flat. Interval 3 without setiferous puncture behind middle. **Aedeagus**. No male seen.

Material examined. 3 type specimens (AMNZ, NZAC).

Geographic distribution (Map p. 152). Offshore Islands: TH–Princes Islands.

Ecology. Lowland. In a nest of red-billed gull (*Larus novaehollandiae scopulinus*). **Biology**. Seasonality: November. **Dispersal power**. Elytra fused along suture. Subapterous. Slow runner (inferred from body morphology).

Remarks. The strongly reduced eyes, depigmented and flattened body, and long pubescence suggest subterranean behaviour similar to that of Anillina (Bembidiini) that live deep in thick leaf litter and/or in soil fissures. This species is named after J. I. Townsend (Levin) for his contribution to the building of important reference collections of New Zealand carabids.

Genus *Pholeodytes* Britton, 1962 [E]

Pholeodytes Britton, 1962: 665. Type species: *Pholeodytes townsendi* Britton, 1962, by monotypy.

Description. Body length: 6.0–8.3 mm. Forebody (head and thorax) without sparse setiferous micropores dorsally; much narrower than elytra (contrary to other Harpalini genera, except *Syllectus*). Antennae and legs very long (contrary to other Harpalini genera, except *Syllectus*). **Head**. Mandibles very long (about 5× their maximum width), slightly curved forward, acute apically. Labrum moderately transverse; apex convex medially. Eyes strongly reduced, flat, consisting of obliterated facets, narrowly separated from buccal fissure ventrally (by about 0.8× maximum width of antennal scape). Tempora not inflated. Frons without clypeo-ocular prolongations. Antennal pubescence starting from basal 1/4 of antennomere 3. Mentum with a tooth medially, moderately longer than lateral lobes. Mentum and submentum separated by complete transverse suture. Paraglossae longer than ligula. Palpi with last segment fusiform, not truncate apically, glabrous; penultimate segment of labial palpi bisetose on anterior margin. **Thorax**. Pronotum very long (almost 2× longer than wide); base straight, much narrower than elytral base; lateral beads complete; anterior and posterior beads absent (as in *Syllectus gouleti*). Scutellum visible. Apex of prosternal lobe glabrous. **Legs**. Metafemora with 3–4 long setae on posterior margin. Male protarsi dilated laterally and biseriately pubescent ventrally. Male mesotarsi slightly dilated laterally, not biseriately pubescent ventrally. Segment 4 of protarsi and mesotarsi of both sexes with 2 membranous laminae (projecting laterally and anteriorly to about 2/3 the length of apical segment; as in *Syllectus*). Tarsi pubescent (with few setae) dorsally; metatarsomere 5 pubescent (with 7-8 setae) ventrally; metatarsomere 1 as long as metatarsomeres 2+3. **Elytra**. Interneurs incomplete, consisting of rows of punctures (contrary to other Stenolophine genera). Rows of setiferous punctures absent on intervals 3, 5, and 7, and on interneur 2. Umbilicate setiferous series of interval 9 divided into two major groups, with posterior group continuous. **Abdomen**. Ventrites 2+3 of male without a setiferous fovea. Ventrites 5+6 of both sexes without short setae, with paired ambulatory setae only. **Aedeagus**. Lateral view: strongly arcuate. Dorsal view (Fig. 81–84): symmetrical (with ostium dorsal, not deflected laterally); dorsal membranous area wide (with 2 genital swellings), not extending to basal bulb; apical disc absent. Internal sac unarmed.

Geographic distribution. New Zealand (endemic; South Island).

References. Britton, 1962: 665–668 and 1964a: 631 (taxonomy); Noonan, 1976: 27 (taxonomy); Larochelle & Larivière, 2001: 127–128 (catalogue).

Remarks. In addition to characters of the frons, labrum, mentum, pronotum, and elytra, the presence of 2 genital swellings on the aedeagus of *Pholeodytes* species sets this genus apart from all other Stenolophina genera. This genus only occurs in caves in the Northwest Nelson (NN) region. See also **Remarks** under *Syllectus*.

Key to species of *Pholeodytes*

1 Elytral interneurs coarsely punctate (Fig. 225). Pronotum (Fig. 169): basal foveae very deep and wide ....(p. 83)... ***helmorei*** new species

— Elytral interneurs finely punctate (Fig. 224). Pronotum (Fig. 168): basal foveae moderately deep, ill-defined 2

2(1) Pronotum (Fig. 165): apex much wider than base; anterior angles subrectangular. Elytral interneurs deep between base and apex (Fig. 221). Aedeagus (Fig. 81) with genital swellings hook-like ....(p. 81)... ***palmai*** new species

— Pronotum (Fig. 168): apex only slightly wider than base; anterior angles rounded. Elytral interneurs shallow (Fig. 224). Aedeagus with genital swellings not hook-like 3

3(1) Pronotum (Fig. 166): posterior angles acute; sides strongly rounded in apical 1/2. Elytra subelliptical (narrower at base; Fig. 222). Aedeagus (Fig. 82) with genital swellings subtriangular ....(p. 81)... ***cerberus*** Britton

— Pronotum (Fig. 167–168): posterior angles rounded; sides moderately rounded in apical 1/2. Elytra elliptical (base as wide as apex; Fig. 223–224). Aedeagus with genital swellings not subtriangular 4

4(3) Pronotum (Fig. 168): posterior angles obtusely rounded; sides barely sinuate in basal 1/2. Aedeagus (Fig. 84): genital swellings subelliptical ....(p. 82)... ***townsendi*** Britton

— Pronotum (Fig. 167): posterior angles acutely rounded; sides moderately sinuate in basal 1/2. Aedeagus (Fig. 83): genital swellings subrectangular ....(p. 82)... ***nunni*** new species

Pholeodytes palmai new species [E]

Figures 81, 165, 221; Map p. 153

Pholeodytes palmai Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "Pluto's Retreat Cave Kaihoka N.W. Nelson 16.1.75 S.-I. Uéno (hand-written) / HOLOTYPE [male symbol] *Pholeodytes palmai* Larochelle & Larivière, 2004 (red label; typed)." Paratype: 1 male (MONZ) from the same locality as the holotype, bearing blue paratype label.

Description. Body length: 6.5–7.0 mm. Slightly convex. Depigmented (appearing pale in colour), pale yellowish (teneral condition). Generally glabrous and smooth. Microsculpture weak, isodiametric on head, very transverse (with microlines) on pronotum and elytra. Shiny, without metallic lustre. **Head**. Narrow, although as wide across eyes as pronotal apex; flat anteriorly, slightly convex posteriorly. Antennae very long, reaching middle of elytra; antennal scape elongate, about 3× longer than its maximum width. **Thorax**. Pronotum (Fig. 165) widest before middle; sides feebly rounded in apical 1/2, slightly sinuate in basal 1/2; base straight, much narrower than elytral base; apex straight, much wider than base (contrary to other *Pholeodytes* species); lateral depressions widening posteriorly; anterior angles moderately developed, subrectangular; posterior angles strongly developed, subrectangular, not projecting laterally; basal foveae moderately deep, ill-defined; punctuation feebly developed. Metepisterna longer than wide. **Elytra**. Elliptical (base as wide as apex). Widest about middle. Shoulders feebly developed, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent. Interneurs deep between base and apex, finely punctate. Intervals impunctate, slightly convex. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 81). Dorsal view: as for genus; subapical area short; apex moderately wide, rounded; genital swellings hook-like.

Material examined. 3 specimens, including types (ITNZ, MONZ, NZAC).

Geographic distribution (Map p. 153). South Island: NN–Pluto's Retreat Cave, Kaikoka, West Haven Inlet.

Ecology. Lowland. A cave (troglobitic species). **Biology**. Seasonality: unknown (adults). Tenerals: October, January. **Dispersal power**. Elytra fused along suture. Subapterous. Fast runner. **Collecting techniques**. Using a head lamp or torch.

Remarks. This species is named after our friend and colleague Ricardo L. Palma (Museum of New Zealand Te Papa Tongarewa, Wellington) for his special help and encouragement in our entomological studies.

Pholeodytes cerberus Britton, 1964 [E]

Figures 82, 166, 222; Map p. 152

Pholeodytes cerberus Britton, 1964a: 631. Holotype: male (NZAC) labelled "Type (circular red-bordered label; typed) / Fenian Crk. Cave Oparara, Karamea 27.4.63 R Main. (hand-written) / HOLOTYPE [male symbol] Pholeodytes cerberus mihi (hand-written) E.B. Britton det. 1963 (typed, except for number 3)." Perfect condition. There are also 2 paratypes in NZAC.

Description. Body length: 6.0–7.6 mm. Slightly convex. Depigmented (appearing pale in colour), reddish; antennae, palpi, and legs yellowish brown. Generally glabrous and smooth. Microsculpture isodiametric and rather strong on head, very transverse (with microlines) and vestigial on pronotum and elytra. Shiny, without metallic lustre. **Head**. Narrow, although as wide across eyes as pronotal apex; flat anteriorly, slightly convex posteriorly. Antennae very long, reaching middle of elytra; antennal scape elongate, about 3× longer than its maximum width. **Thorax**. Pronotum (Fig. 166) widest before middle; sides strongly rounded in apical 1/2, strongly sinuate in basal 1/2; base straight, much narrower than elytral base; apex straight; lateral depressions widening posteriorly; anterior angles feebly developed, rounded; posterior angles strongly developed, acute, projecting laterally; basal foveae moderately deep, ill-defined; punctuation feebly developed. Metepisterna longer than wide. **Elytra**. Subelliptical (narrower at base). Widest behind middle. Shoulders feebly developed, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent. Interneurs shallow, finely punctate. Intervals impunctate, flat. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 82). Dorsal view: as for genus; subapical area long; apex moderately wide, rounded; genital swellings subtriangular.

Material examined. 9 specimens, including types (ITNZ, LUNZ, NZAC).

Geographic distribution (Map p. 152). South Island: NN–Fenian Creek Cave, Oparara. Honeycomb Hill Caves (east of Karamea Bluff). Ida Cave, Oparara. Oparara. Star-Draft Cave, Oparara.

Ecology. Lowland. Caves (troglobitic species). Found in low roof crevice and on stalactite ceiling; on dry gypsum sand at some distance from dripping or wet areas. **Biology**. Seasonality: March–April. Tenerals: September, January, March–April. Occasionally infested with fungi (Laboulbeniales). **Dispersal power**. Elytra fused along suture. Subapterous. Fast runner. Good climber. **Collecting techniques**. Using a head lamp or torch.

References. Britton, 1964a: 633 (distribution, ecology); May, 1972: 575 (ecology); Johns, 1991: 20 (distribution); Townsend, 1997: 17 (distribution, ecology); Larochelle &

Larivière, 2001: 127-128 (taxonomy, distribution, ecology, biology, dispersal power).

Pholeodytes nunni new species [E]

Figures 83, 167, 223; Map p. 152

Pholeodytes nunni Larochelle & Larivière, new species. Holotype: male (NZAC) labelled "Council Cave Motupipi Takaka 14.6.73 L McRae (hand-written) / HOLOTYPE [male symbol] *Pholeodytes nunni* Larochelle & Larivière, 2004 (red label; typed)." Paratypes: 7 males (1 CMNZ, 2 LUNZ, 3 NZAC, 1 OMNZ) and 6 females (1 CMNZ, 1 LUNZ, 3 NZAC, 1 OMNZ) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length: 7.0–8.0 mm. Slightly convex. Depigmented (appearing pale in colour), reddish brown; antennae, palpi, and legs pale yellow. Generally glabrous and smooth. Microsculpture isodiametric and rather strong on head, very transverse (with microlines) and weak on pronotum and elytra. Shiny, without metallic lustre. **Head**. Narrow, although as wide across eyes as pronotal apex; flat anteriorly, slightly convex posteriorly. Antennae very long, reaching middle of elytra; antennal scape elongate, about 3× longer than its maximum width. **Thorax**. Pronotum (Fig. 167) widest before middle; sides moderately rounded in apical 1/2, moderately sinuate in basal 1/2; base straight, narrower than elytral base; apex straight; lateral depressions widening posteriorly; anterior angles feebly developed, rounded; posterior angles strongly developed, acutely rounded, projecting laterally; basal foveae moderately deep, ill-defined; punctuation feebly developed. Metepisterna longer than wide. **Elytra**. Elliptical (base as wide as apex); elytra broader than in *cerberus*. Widest about middle. Shoulders feebly developed, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent. Interneurs shallow, finely punctate. Intervals impunctate, flat. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 83). Dorsal view: as for genus; subapical area long; apex moderately wide, rounded; genital swellings subrectangular.

Material examined. 83 specimens, including types (ITNZ, LUNZ, NZAC).

Geographic distribution (Map p. 152). South Island: NN–Council Cave, Motupipi, Takaka. Ervin's Cave, Takaka. Gorge Creek Cave, Takaka Valley. Green Link Cave, Canaan Road, Takaka Hill. Kerry-John Cave, Barron Flat, Takaka. Sims Cave, Takaka Valley. Water Supply Cave, Pohara. Weka Cave, Upper Takaka. Worm's Surprise Cave, Barron Flat, Takaka.

Ecology. Lowland, montane. Caves (troglobitic species): on calcite walls. **Biology**. Seasonality: throughout the year, except December. Tenerals: January, March, June. **Dispersal power**. Elytra fused along suture. Subapterous. Fast runner. Good climber. **Collecting techniques**. Using a head lamp or torch.

Remarks. This new taxon corresponds to Britton's (1964a) "*Pholeodytes cerberus* var. A" from Takaka Hill, illustrated and characterised, although not officially described as a subspecies. This species is named after John Nunn (Dunedin) for his contribution to the building of important reference collections of New Zealand carabids.

Pholeodytes townsendi Britton, 1962 [E]

Figures 84, 113, 168, 224; Map p. 153

Pholeodytes townsendi Britton, 1962: 666. Holotype: male (NZAC) labelled "Type (circular red-bordered label; typed) / Twin Forks Cave Paturau NELSON 30.1.61. (hand-written) J.I. Townsend . (typed) / J.I. Townsend Collection (hand-written, in red ink) / HOLOTYPE [male symbol] Pholeodytes townsendi mihi (hand-written) E.B. Britton. det. 1961 (typed, except for number 1 in 1961)." Perfect condition.

There are also 32 paratypes in NZAC (29) and BMNH (3).

Description. Body length: 7.0–8.0 mm. Slightly convex. Depigmented (appearing pale in colour), yellowish brown. Generally glabrous and smooth. Microsculpture isodiametric and rather strong on head, very transverse (with microlines) and weak on pronotum and elytra. Shiny, without metallic lustre. **Head**. Narrow, although as wide across eyes as pronotal apex; flat anteriorly, slightly convex posteriorly. Antennae very long, reaching middle of elytra; antennal scape elongate, about 3× longer than its maximum width.**Thorax**. Pronotum (Fig. 168) widest before middle; sides moderately rounded in apical 1/2, barely sinuate in basal 1/2; base straight, much narrower than elytral base; apex straight; lateral depressions widening posteriorly; anterior angles feebly developed, rounded; posterior angles strongly developed, obtusely rounded, not projecting laterally; basal foveae moderately deep, ill-defined; punctuation feebly developed. Metepisterna longer than wide. **Elytra**. Elliptical (base as wide as apex). Widest about middle. Shoulders feebly developed, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent. Interneurs shallow, finely punctate. Intervals impunctate, flat. Interval 3 without setiferous puncture behind middle. **Aedeagus** (Fig. 84). Dorsal view: as for genus; subapical area long; apex very wide, truncate; genital swellings subelliptical.

Material examined. 89 specimens, including NZAC types (BMNH, ITNZ, JNNZ, LUNZ, NZAC, UCNZ).

Geographic distribution (Map p. 153). South Island: NN-17 caves between Paturau and Heaphy Track areas.

Ecology. Lowland. Caves (troglobitic species): in dry gypsum sand at some distance from dripping or wet areas. **Biology**. Seasonality: September–June. Tenerals: September, November, March–April. Predacious. Food: a small weta. **Dispersal power**. Elytra fused along suture. Subapterous. Fast runner. Good climber. **Collecting techniques**. Using a head lamp or torch.

References. Britton, 1962: 666, 668 (distribution, biology); Townsend, 1963: 96 (distribution, ecology); May, 1972: 575 (ecology); Johns, 1991: 20 (distribution); Townsend, 1997: 17 (distribution, ecology); Larochelle & Larivière, 2001: 128 (taxonomy, distribution, ecology, biology, dispersal power).

Pholeodytes helmorei new species [E]

Figures 169, 225; Map p. 152

Pholeodytes helmorei Larochelle & Larivière, new species. Holotype: female (NZAC) labelled "Coal Flat Cave W. of New Creek Buller, 1.11.75 J. I. Townsend (hand-written) / HOLOTYPE [female symbol] *Pholeodytes helmorei* Larochelle & Larivière, 2004 (red label; typed)." Paratype: 1 female (NZAC) from the same locality as the holotype, bearing blue paratype labels.

Description. Body length: 8.0–8.3 mm. Slightly convex. Depigmented (appearing pale in colour), reddish; antennae, palpi and legs yellowish brown. Generally glabrous and smooth. Microsculpture isodiametric and rather strong on head, very transverse (with microlines) and weak on pronotum and elytra. Shiny, without metallic lustre. **Head**. Narrow, although as wide across eyes as pronotal apex; flat anteriorly, slightly convex posteriorly. Antennae very long, reaching middle of elytra; antennal scape elongate, about 3× longer than its maximum width. **Thorax**. Pronotum (Fig. 169) widest before middle; sides moderately rounded in apical 1/2, not sinuate, obliquely converging in basal 1/2; base straight, much narrower than elytral base; apex straight; lateral depressions widening posteriorly; anterior angles feebly developed, rounded; posterior angles strongly developed, subrectangular, not projecting laterally; basal foveae very deep, wide; punctuation feebly developed. Metepisterna longer than wide. **Elytra**. Subelliptical (narrower at base). Widest behind middle. Shoulders feebly developed, without a tooth. Subapical sinuations feeble. Sutural apices angulate. Scutellar striole absent. Interneurs moderately deep, coarsely punctate; interneur 8 deeply impressed (more so than in other *Pholeodytes* species). Intervals impunctate, slightly convex. Interval 3 without setiferous puncture behind middle. **Aedeagus**. No male seen.

Material examined. 3 specimens, including types (ITNZ, NZAC).

Geographic distribution (Map p. 152). South Island: NN–Coal Flat Cave [=Eggers Cave, J. I. Townsend, personal communication.]

Ecology. Lowland. Cave (troglobitic species). **Biology**. Seasonality: November, July.

Dispersal power. Elytra fused along suture. Subapterous. Fast runner. **Collecting techniques**. Using a head lamp or torch.

Remarks. This species is named after our friend and colleague Desmond W. Helmore (Landcare Research, Auckland) for supporting our entomological studies and for his exceptional talent and contribution as illustrator of New Zealand insects.

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Appendix A. Glossary of technical terms.

adventive — not native; an organism carried into a new habitat by natural means, or by man.

aeneous — with a copper or brass appearance.

allopatric — of or pertaining to taxa occupying different and disjunct geographical areas.

alpine — of or pertaining to land located above the subalpine zone, characterised by grasslands, herb fields and screes, and reaching up to the summer snow line.

ambulatory setae — specialised pairs of setae occurring ventrally on the abdomen.

antennomere — each antennal segment.

apex — end or extremity of a structure or organ.

apical — related to the apex.

appendages — antennae, palpi, and legs together.

armed — displaying scales, spines, or teeth.

attenuate — gradually tapering toward the apex.

bead — a raised border.

biostatus — the status of an organism based on its geographic origin relative to its occurrence in a particular region, e.g., endemic, native, adventive.

biseriately — disposed in two rows.

bisetose — with two setae.

brachypterous — with abbreviated membranous wings, shorter than those of macropterous species but not vestigial like those of subapterous species; incapable of flight.

buccal fissure — lateral mouth opening beneath eye area.

clypeo-ocular prolongations — deep lines between the clypeus and the eyes.

coastal — of or pertaining to the strip of land within the influence of the sea.

conchoid — shell-shaped.

cordate — heart-shaped.

deflected — turned aside.

depigmented — with weak pigmentation (appearing pale in colour).

disc — dorsal central area of a body part.

dispersal power — capacity of self-dispersal.

distal — situated farthest from the centre.

diurnal — active during the day.

emarginate — having a notched edge.

endemic — restricted to a geographic area.

explanate — spread and flattened.

extralimital range — distribution of an organism outside the limits of a specific geographic area (e.g., outside New Zealand).

facet — lens-like division of each compound eye.

family — a category in the taxonomic hierarchy, that includes one or more genera or tribes of common phylogenetic origin, separated from other such groups by a decided gap.

fovea — a small pit or depression.

fusiform — spindle-shaped.

genus — a category in the taxonomic hierarchy, that includes one or more phylogenetically related, and morphologically similar species.

geographic distribution — distribution related to geography, i.e., districts, regions.

glabrous — without hairs or setae (not pubescent).

granivorous — eating grains or seeds.

granulate (of microsculpture) — appearing covered with small grains.

gregarious — living in groups or colonies.

hirsute — densely covered with long shaggy setae.

holotype or **type** — the single specimen designated or indicated as the type specimen of a species by the original author at the time of publication or the only specimen from which the original description was made.

hygrophilous — living in moist or wet environments.

indigenous — see native.

interneur —a longitudinal stria (impressed line) or row of punctures on the elytron.

interval — the space between two interneurs on the elytron.

iridescent — displaying a rainbow-effect coloration.

isodiametric (of microsculpture) — appearing covered with polygons of equal diameter.

lamina — a thin flat scale-like structure.

lectotype — type specimen selected from the syntypes by a subsequent author in the absence of a holotype.

lowland — of or pertaining to land located below the montane zone and generally reaching up to the limit of rimu (*Dacrydium cupressinum*), e.g., about 500 m in central New Zealand.

macropterous — with long or fully developed membranous wings.

medially — situated in the middle.

monophyletic — referring to a group of taxa containing all descendants from a single hypothetical ancestral taxon.

monotypy — the situation when a nominal genus or subgenus is established on the basis of a single species (the type species by monotypy).

montane — of or pertaining to land located above the lowland zone and reaching up to the tree line.

native — occurring naturally in the area under consideration.

nocturnal — active during the night.

omnivorous — feeding on both animal and vegetable matter.

orbicular — circular or spherical.

original designation — the situation when the type of a taxon (genus or subgenus) is designated at the same time as the taxon is established (the type species by original designation).

ostium — membranous opening of the aedeagus.

ovate — egg-shaped.

palpomere — each segment of a palp (palpus).

pedunculate — stalked.

penultimate — next to the last (e.g., penultimate segment, the segment next to the last one).

phytophagous — feeding on plant material.

piceous — pitchy black or black with reddish tinge.

plurisetose — with 4 or more setae.

predacious — eating live animals.

pubescence (adj. **pubescent)** — covering of hair or setae.

punctate — marked with points or punctures.

quadrate — square or nearly so.

rufous — reddish.

scree — accumulation of loose stones on a slope.

scrobe (of mandible) — a lateral depression in the wall of the mandible.

scrubland — vegetation with dense cover and about 1–2 metres tall.

scutellar striole — short stria on each side of the scutellum.

seasonality — period(s) of the year when an animal is active.

setiferous — bearing seta(e).

shrubland — vegetation with sparse or moderate cover and often taller than 2 metres.

spatulate — spoon-shaped.

species — a taxon of the rank of species, the category below the genus in the taxonomic hierarchy; naturally occurring populations with a common heredity; groups of actually or potentially interbreeding populations which are reproductively isolated from other such groups.

spongily — in a sponge-like formation.

stria — elytral interneur in the form of an impressed longitudinal line.

sub- (as a prefix) — rather, almost.

subalpine — of or pertaining to land located above the tree line and characterised by a mountain shrubland (e.g., of *Olearia, Brachyglottis,* and *Dracophyllum*).

subapical sinuation — sinuation of the lateral border of each elytron, near its apex.

subapterous — with vestigial membranous wings (reduced to small wing buds).

supraorbital — above the eye.

sutural — related to the suture.

sutural apex, plural **apices** (of elytron) — inner apex of each elytron.

sutural interval (of elytron) — the first interval next to the suture.

suture (of elytron) — line of contact between the elytra.

synonym — one of two or more scientific names applied to a single taxon.

syntype — any of two or more specimens on which the original description of a taxon was based when a holotype was not designated.

tarsomere — each segment of a tarsus.

taxon, plural **taxa** — a taxonomic grouping of any rank (e.g., a family, a genus, a species) including all its subordinate groups.

teneral — a new or young adult, recently emerged, sexually immature, with softer or paler exoskeleton.

testaceous — reddish brown.

transverse (of microsculpture) — appearing covered with flattened or sublinear shapes.

trisetose — with three setae.

troglobitic — living exclusively in caves.

troglophilous — living usually, but not exclusively in caves.

type or **name-bearing type** — the specimen(s), species or genus that serves as the objective standard of reference determining the application of a name to a taxon.

type locality — the precise geographical site where the type of a species or subspecies was collected.

type species — the species designated as the type of a genus or subgenus.

type specimen — a specimen (e.g., holotype, lectotype, neotype) or one of a series of specimens (syntypes) designated as the type of a species or subspecies.

umbilicate series— row of setiferous punctures along interval 9 on the elytron.

uniperforated — appearing pierced with one hole.

valid name — the name for a particular taxon that is correct according to the provisions of the Code of Zoological Nomenclature.

vestigial — strongly reduced, almost obsolete or absent.

ventrite — each ventral segment of the abdomen.

Appendix B. Geographical coordinates of main localities. Coordinates should read as 00º00'S/ 000º00'E . The two-letter area codes follow Crosby *et al.* (1976, 1998).

Ahipara, ND 3510/17309
Auckland, AK 3651/17446

Banks Peninsula, MC 4340/17245
Barron Flat, Takaka, NN 4105/17246
Belmont, WN 4111/17455
Boulder Lake, NN 4054/17235
Brown Cow, Boulder Lake Track, NN 4045/17234
Buller River, near Inangahua, BR 4150/17153
Bullock Creek, Paparoa National Park, BR .....
..... 4206/17124

Calphurnia Peak, NN 4054/17234
Canaan [Road], Takaka, NN 4057/17254
Canterbury, NC/MC 4330/17200
Capleston, BR 4204/17155
Charleston, BR 4201/17133
Christchurch, MC 4332/17238
Clarence River mouth, KA 4209/17355
Coal Flat, west of New Creek, NN 4148/17156
Coroglen, CL 3655/17541
Coromandel Range, CL 3705/17542

Donnelly's Crossing, ND 3542/17336
Dunedin, DN 4552/17030

Epsom, AK 3654/17446
Fantail Creek, Moehau Range, CL 3631/17520
Forty Mile Bush [Masterton–Woodville], WA .....
..... 4035/17541
Fox River, BR 4203/17130

Glasgow Range, NN 4136/17204
Gorge Creek, Takaka Valley, NN 4056/17251
Gowanbridge, Buller Gorge, NN 4143/17233
Great Island, TH 3410/17208

Hastings, HB 3939/17651
Heaphy Track, NN 4052/17226
Hikurangi, ND 3535/17417
Honeycomb Hill, east of Karamea Bluff, NN .....
..... 4107/17211
Howick, AK 3654/17456

Inangahua, BR 4152/17157

Kaihoka [Lakes], NN 4033/17236
Kaimai Summit [=Saddle], BP 3752/17555
Kaitoke [Regional Park], WN 4105/17511
Kaituna Valley, MC 4345/17241
Kapowairua, Spirits Bay, ND 3426/17252
Kara, ND 3543/17412
Karamea, NN 4115/17206
Karamea Bluff, NN 4131/17201
Kohuronaki, ND 3429/17250
Kowhai River, KA 4224/17338

Lake Coleridge, MC 4322/17132
Lake Ohia, ND 3458/17322
Lincoln, MC 4338/17229

Maitai Valley, NN 4116/17317
Maketu [Stream], Hunua Ranges, AK 3708/17500
Manawatu Gorge, RI/WN 4018/17546
Mangakahia Valley, ND 3537/17350
Mangamuka Gorge, ND 3519/17332
Matakana, AK 3621/17443
Maumaupaki, CL 3658/17534
McClean's Island, MC 4328/17228
Morere Springs Scenic Reserve, GB . 3857/17747
Motueka, NN 4106/17300
Motupipi, Takaka, NN 4051/17251
Mount Arthur, NN 4116/17241
Mount Bossu, Banks Peninsula, MC 4350/17254
Mount Domett, NN 4104/17219
Mount Hutt, MC 4328/17132
Mount Messenger, TK 3854/17456
Mount Pleasant, Christchurch, MC 4120/17358

Napier, HB 3930/17654
Nelson, NN 4113/17317
New Creek, NN 4147/17201
Nile River, BR 4156/17128
North Cape, ND 3425/17303
North East Island, CH 3408/17210W

Okaihau, ND 3519/17346
Okauia, WO 3747/17550
Omahuta Forest, ND 3514/17337
Oparara, NN 4113/17209
Orongorongo Valley, WN 4125/17454
Otaki Forks [=Gorge], WN 4050/17515

Palmerston North, WI 4022/17537
Pandora, ND 3427/17247
Paparoa National Park [=Paparoa Range], BR 4205/17133
Papatea, BP 3740/17751
Parakao, ND 3543/17357
Parua [Bay], ND 3546/17427
Paturau [Trig], NN 4042/17229
Peraki [Saddle], Banks Peninsula, MC 4349/17251
Pitt Island, CH 4421/17609W
Pohara, NN 4050/17253
Port Ligar, SD 4056/17359
Port Waikato, WO 3724/17444
Princes Islands, TH 3410/17202
Puketi Forest, ND 3514/17346
Punakaiki, BR 4207/17120

Rangiputa, ND 3452/17318
Ratapihipihi, TK 3906/17403
Raurimu, TO 3907/17524
Redhill, AK 3704/17459
Rimutaka Forest [=Rimutaka Range], WN 4119/17500
Rimutaka Hill, WN 4107/17513
Ruakaka, ND 3554/17427
Ruatoria State Forest, BP 3747/17812

Sandy Bay, Te Paki Coastal Park, ND 3426/17242
South East Island, CH 4420/17610W
South West Island, TH 3411/17204
Spirits Bay, ND 3427/17247
Spreydon, MC 4333/17237
Swanson, AK 3652/17434

Taieri, DN 4605/17011
Takaka, NN 4051/17248
Takaka Hill, NN 4053/17249
Takaka Valley, NN 4106/17243
Tangihua Range, ND 3553/17407
Tapotupotu Bay, ND 3426/17242
Tapu, CL 3659/17530
Te Koau, BP 3735/17819
Te Paki, ND 3433/17247
The Sisters, CH 4638/16915W
Tiropahi Valley, BR 4157/17126
Titirangi Bay, SD 4101/17409
Tom Bowling Bay, ND 3426/17257
Trounson Kauri Park, ND 3544/17339

Unuwhao, Spirits Bay, ND 3426/17253
Upper Takaka, NN 4102/17249

Waiau River, Upper NC 4243/17243
Waimana Valley, BP 3806/17702
Waioeka Gorge, BP 3810/17718
Waipatiki Beach, HB 3917/17658
Waipoua Forest, ND 3539/17333
Waipuna Stream, Spirits Bay, ND 3426/17252
West Haven Inlet, NN 4036/17235
West Island, TH 3411/17202
Whanarua Bay, BP 3740/17747
Whangarei, ND 3543/17419
Whinray Scenic Reserve, BP 3814/17733
Woodhill, AK 3644/17425

ADDENDUM

***Hakaharpalus cavelli* (Broun, 1893)** [E] new combination

See Figures opposite.

Tachys (?) *cavelli* Broun, 1893: 1400. Holotype: female (BMNH) labelled "Type (circular red-bordered label; typed) / [female symbol] (hand-written) / 2442. (hand-written) / New Zeal. Broun Coll. Britt. Mus. 1922—482. (typed) / Capleston Westland. (hand-written) / Tachys cavelli. (hand-written) / *Hakaharpalus cavelli* (Broun, 1893) new combination Larochelle & Larivière, 2005." Fair condition.

Description. Body length: 4.9 mm. Slightly convex. Brownish; margins and sutures of elytra, as well as antennae, palpi, and legs pale yellowish. Generally glabrous. Elytral intervals finely punctate; interneurs shallow (weakly impressed), incomplete basally. Microsculpture absent on head, pronotum, and elytra. Head, pronotum, and elytra shiny; dorsal surface without metallic lustre. **Head**. Moderately large, narrower across eyes than pronotal apex; excavated anteriorly, slightly convex posteriorly. Eyes strongly reduced, slightly convex, consisting of obliterated facets, narrowly separated from buccal fissure ventrally (by about 1× maximum width of antennal scape). Antennal scape about 3× longer than its maximum width. **Thorax**. Pronotum (Fig. opposite) subcordate, widest before middle; sides converging toward base, sinuate; base straight; apex almost straight behind anterior angles; lateral depressions absent; anterior angles strongly developed, acute; posterior angles moderately developed, obtuse; basal foveae shallow, ill-defined; punctuation feebly developed. Metepisterna wider than long. **Elytra**. Widest about middle. Shoulders feebly developed, rounded, without a tooth. Subapical sinuations feeble. Sutural apices rounded. Scutellar striole absent. Interneurs shallow (weakly impressed), impunctate, incomplete basally. Intervals finely punctate, flat. Interval 3 without setiferous puncture behind middle. **Aedeagus**. No male known.

Material examined. Holotype (BMNH).

Geographic distribution. South Island: BR–Capleston.

Ecology. Lowland. A wet beech forest. **Biology**. Unknown. **Dispersal power**. Elytra fused along suture. Subapterous. Moderate runner (after leg morphology).

Remarks. The tribal and generic placements of this species have remained a mystery for a long time. Examination of the holotype of *Tachys* (*?*) *cavelli* has shown that this taxon belongs neither to the Bembidiini nor to the Zolini as previously thought by a number of carabid workers. Superficially, it may resemble members of the Trechinae genera *Oopterus* (Zolini) or *Molopsida* (Tropopterini) but the absence of setiferous puncture in the mandibular scrobe refers it to the Harpalinae. The authors found this taxon to be congeneric with other species of the newly described genus *Hakaharpalus*, the characteristic features of which are given on p. 54.

Hakaharpalus cavelli (Broun, 1893). Upper: holotype, BMNH (scale line =1 mm.); Lower: pronotum (Photographs: M.-C. Larivière) Holotype photographed with the permission of the Natural History Museum, London.

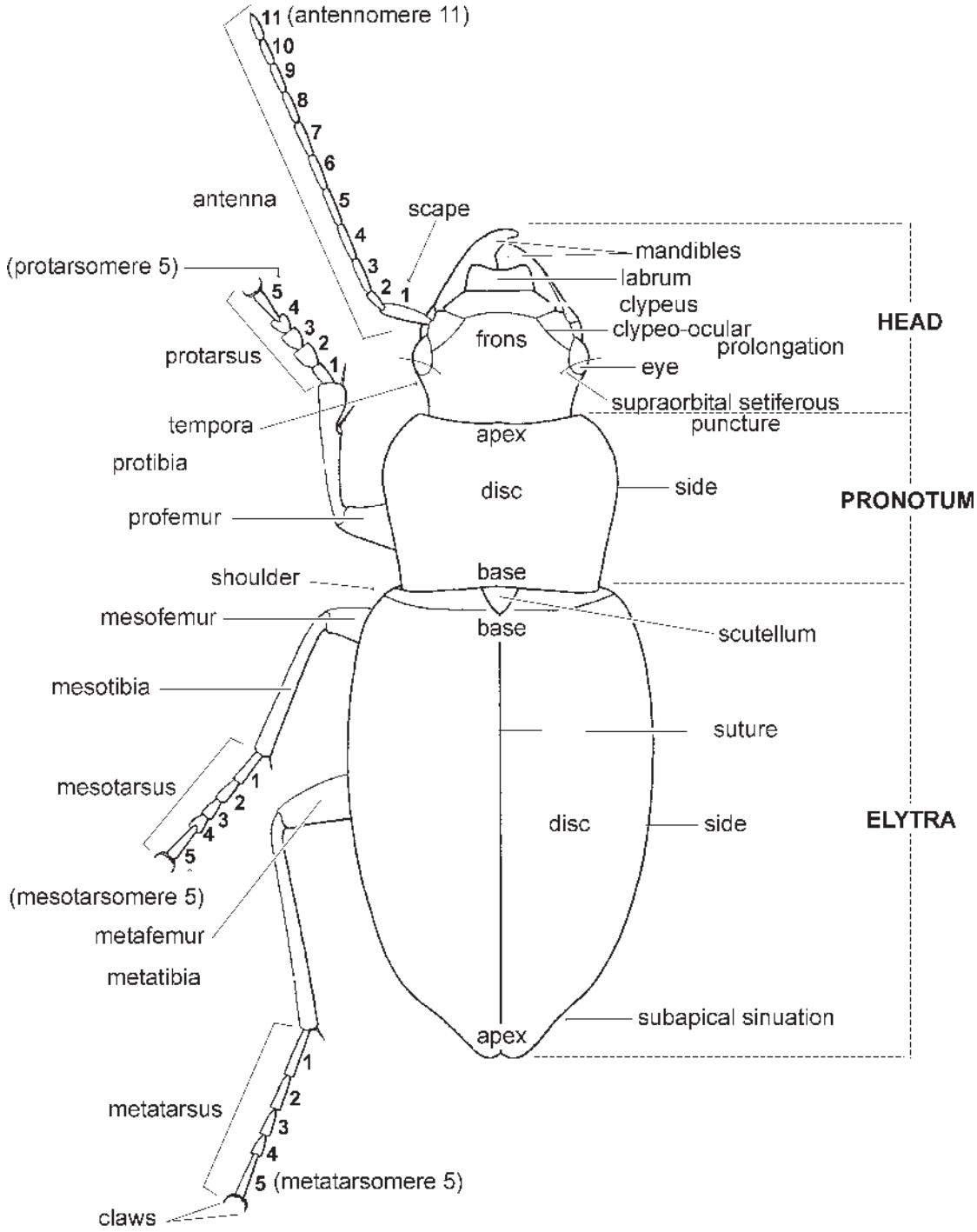


Fig. 1 Schematic dorsal view of carabid.

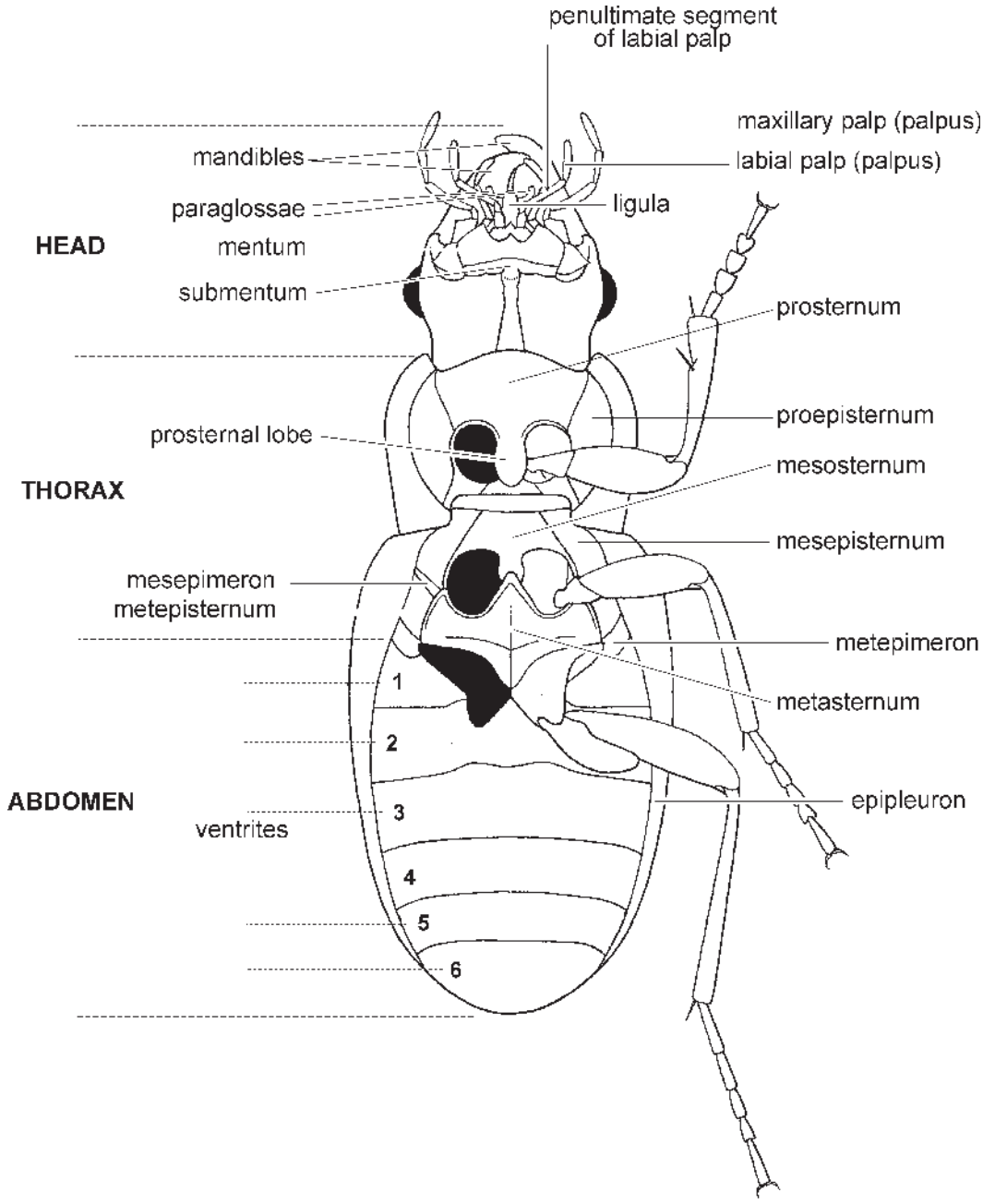
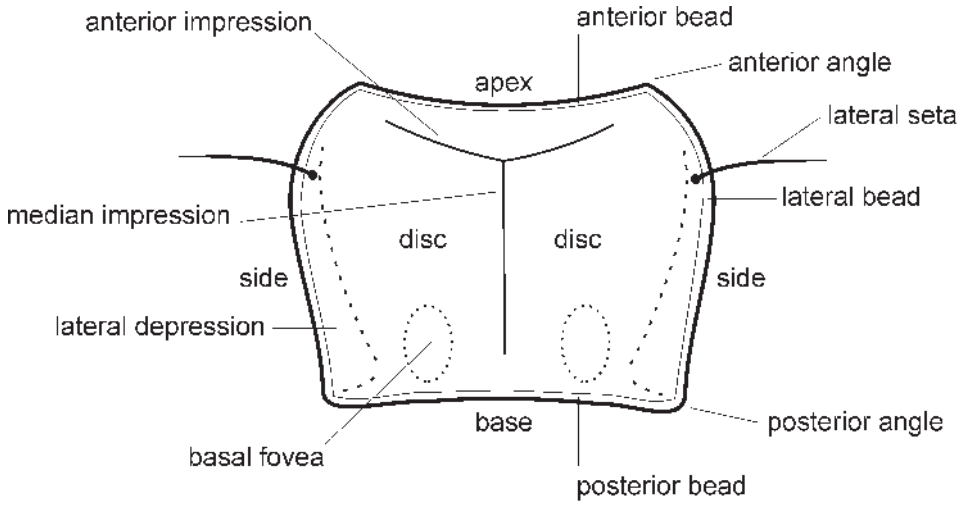
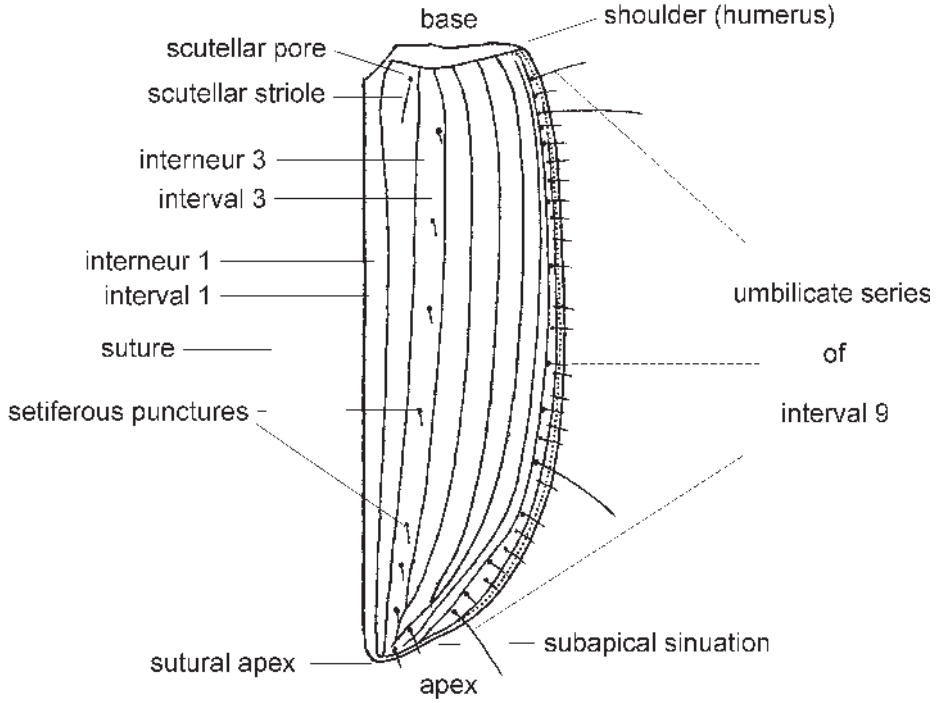


Fig. 2 Schematic ventral view of carabid.



(3)



(4)

Fig. 3, 4 (3) Schematic view of pronotum. (4) Schematic view of right elytron.

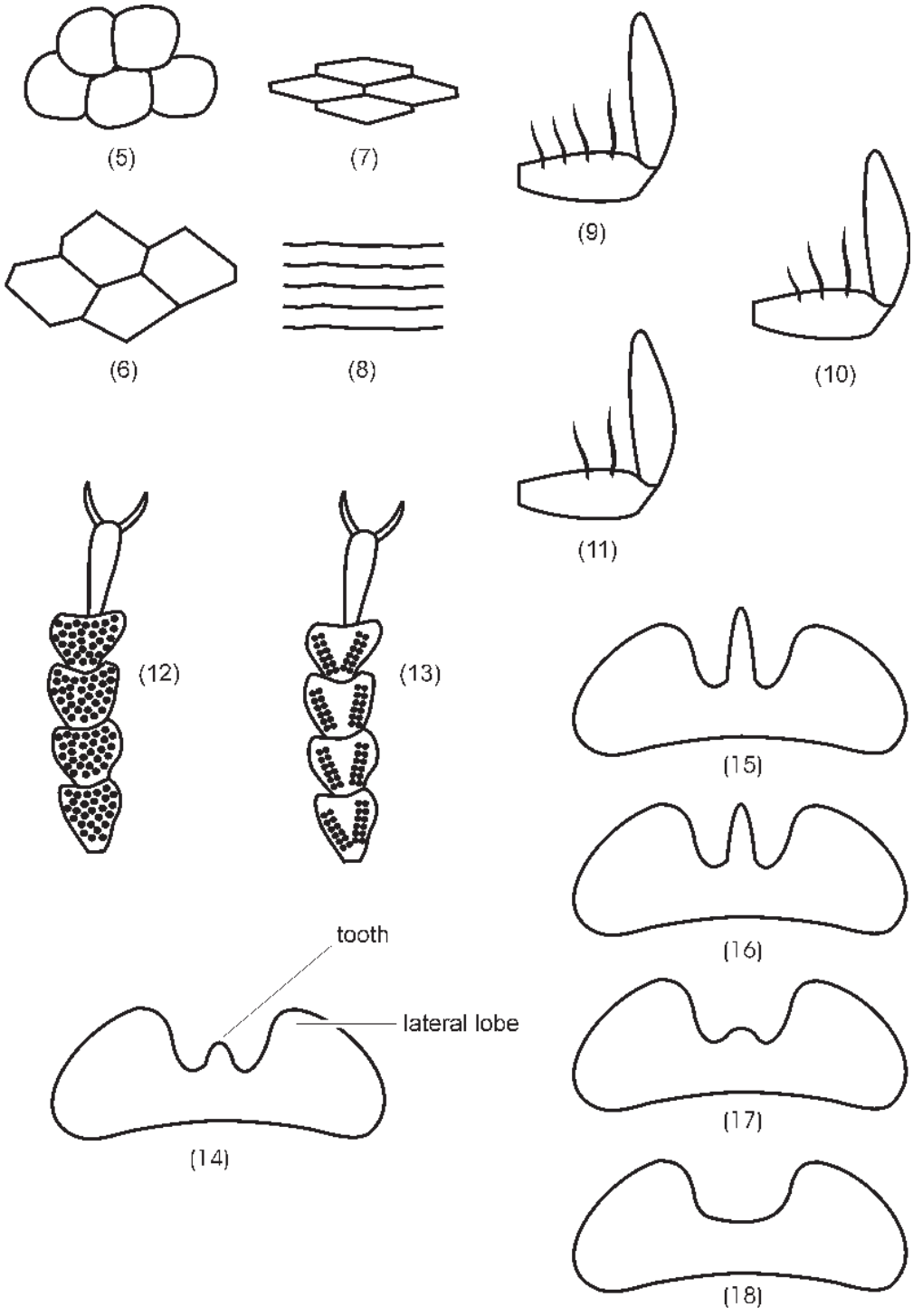


Fig. 5–18 (5-8) Schematic view of microsculpture: (5) granulate; (6) isodiametric; (7) moderately transverse; (8) very transverse. (9-11) Pubescence on anterior margin of penultimate segment of labial palpi: (9) plurisetose; (10) trisetose; (11) bisetose. (12-13) Ventral view of male pro- or mesotarsi: (12) spongily pubescent; (13) biseriately pubescent. (14-18) Medial tooth of mentum: (14) moderately long; (15) longer than lateral lobes; (16) as long as lateral lobes; (17) very short; (18) lacking.

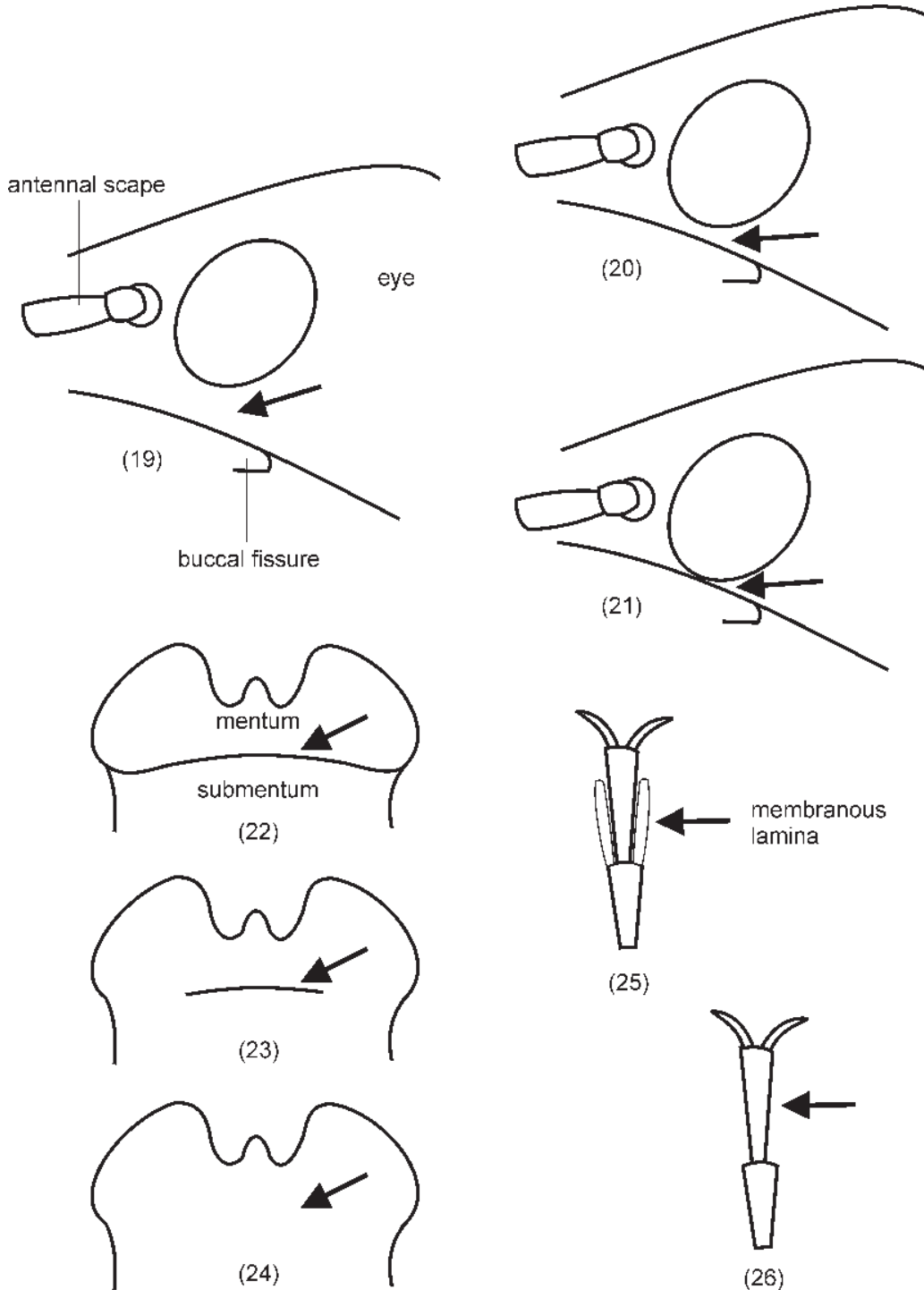


Fig. 19–26 (19-21) Eye and buccal fissure, lateral view: (19) widely separated; (20) narrowly separated; (21) touching (eye reaching buccal fissure). (22-24) Transverse suture between mentum and submentum: (22) complete; (23) incomplete laterally; (24) lacking. (25-26) Membranous laminae of pro- and mesotarsomere 4: (25) present; (26) lacking.

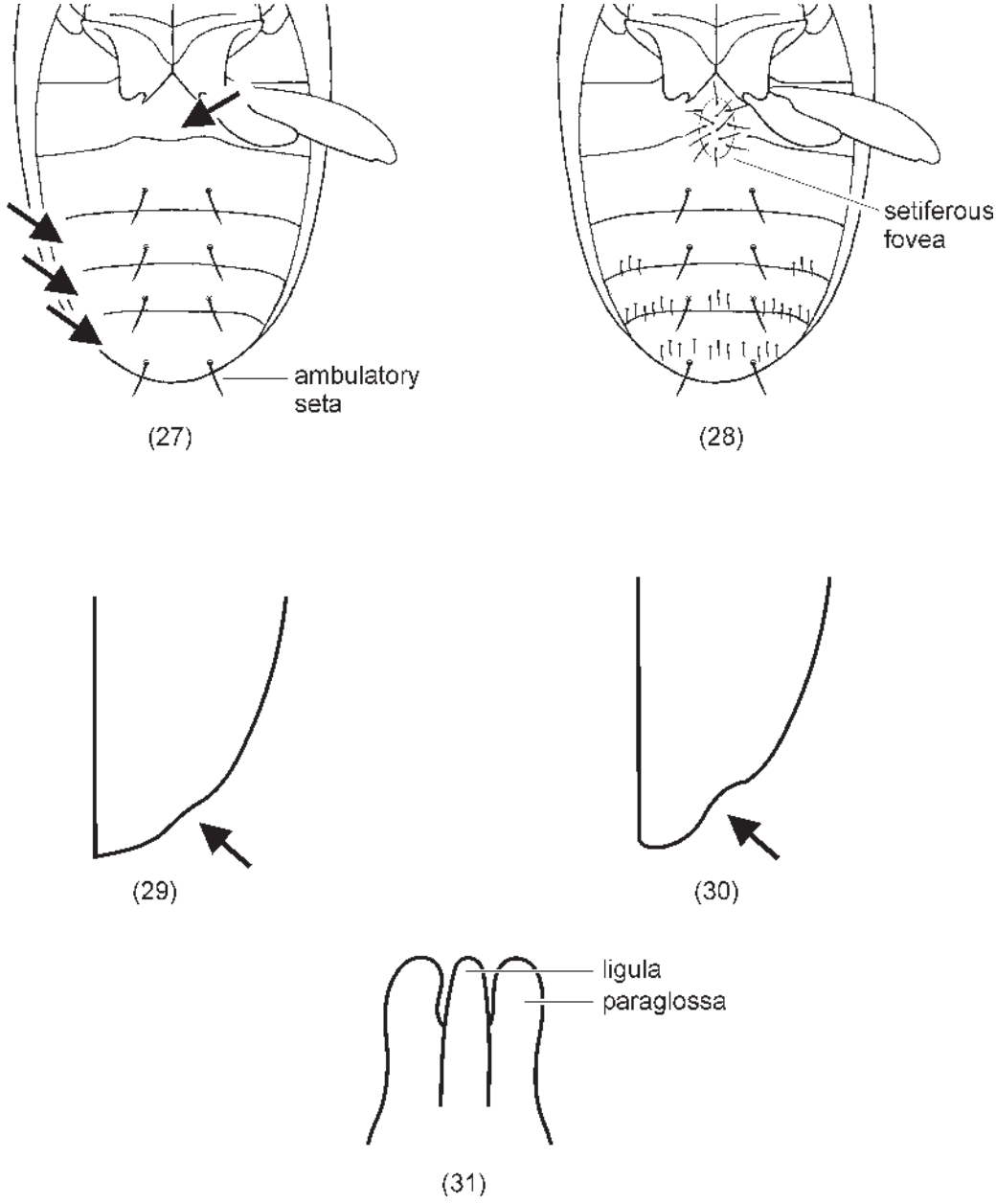
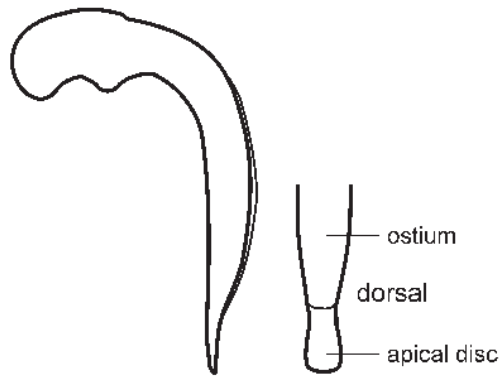
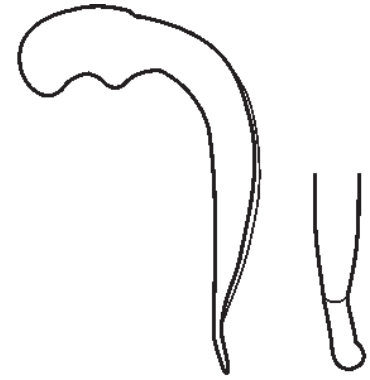


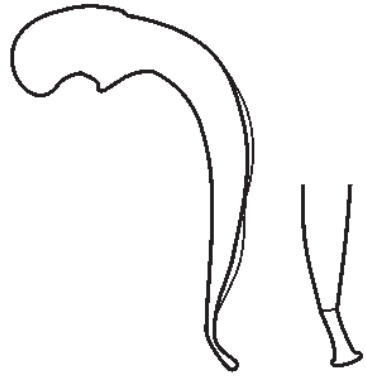
Fig. 27–31 (27-28) Pubescence of venter: (27) paired ambulatory setae only; (28) paired ambulatory setae, numerous short setae, and male setiferous fovea. (29-30) Subapical sinuation of right elytron: (29) weak; (30) strong. (31) Ligula as long as paraglossae.



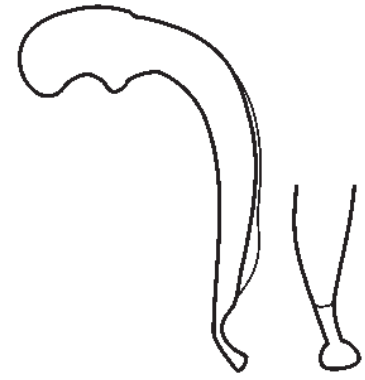
(32) *Allocinopus smithi*



(33) *A. angustulus*



(34) *A. belli*



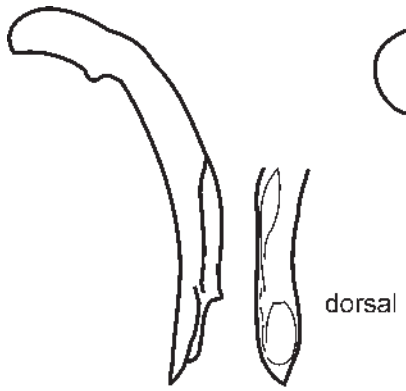
(35) *A. bousqueti*

(36) *A. wardi*

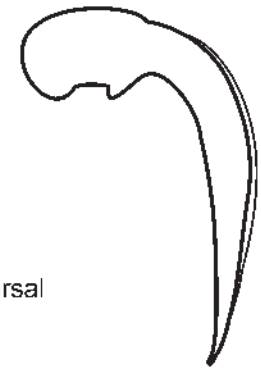
(37) *A. latitarsis*

(38) *A. sculpticollis*

Fig. 32-84 Aedeagus. Lateral view, except when indicated otherwise.



(39) *Anisodactylus binotatus*



(40) *Gaioxenus pilipalpis*

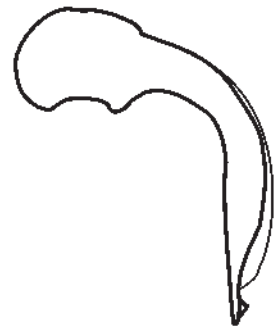
(41) *Gnathaphanus melbournensis*

(42) *Hypharpax australis*

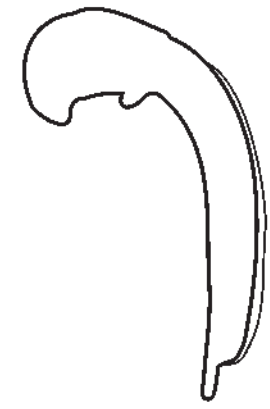
(43) *H. antarcticus*

(44) *Maoriharpalus sutherlandi*

(45) *Parabaris atratus*

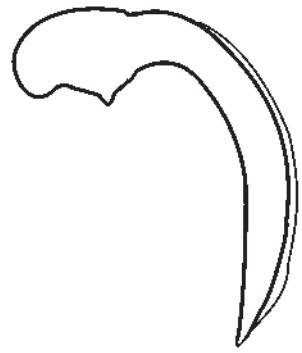


(46) *P. lesagei*

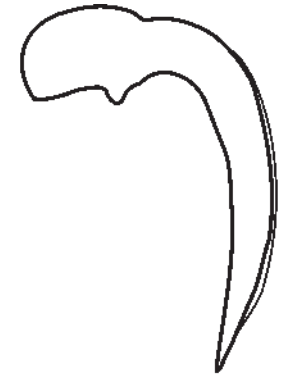


(47) *P. hoarei*

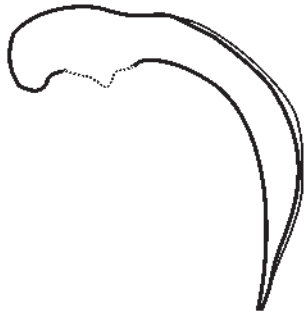
(48) *Triplosarus novaezelandiae*



(49) *Tuiharpalus crosbyi*

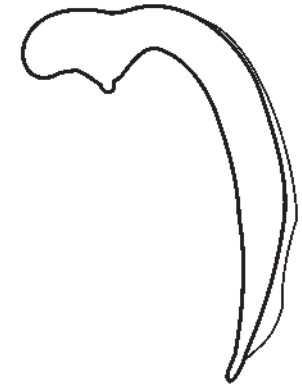


(50) *T. gourlayi*



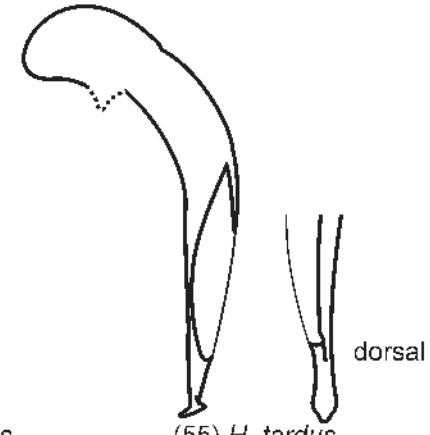
(51) *T. clunieae*

(52) *T. hallae*



(53) *T. moorei*

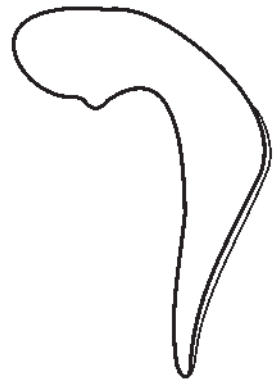
(54) *Harpalus affinis*



(55) *H. tardus*

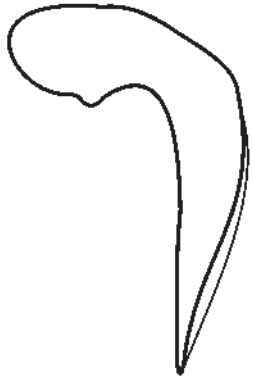
(56) *H. australasiae*

(57) *Hakaharpalus patricki*

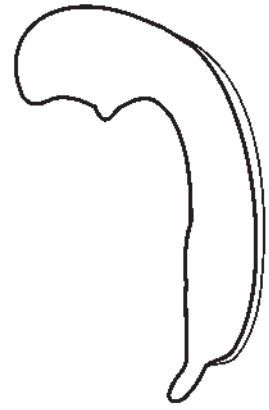


(58) *H. maddisoni*

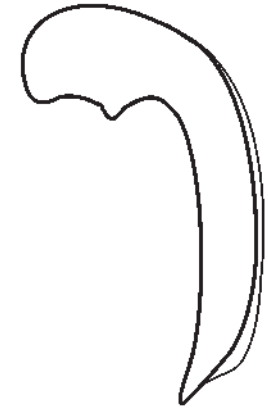
(59) *H. davidsoni*



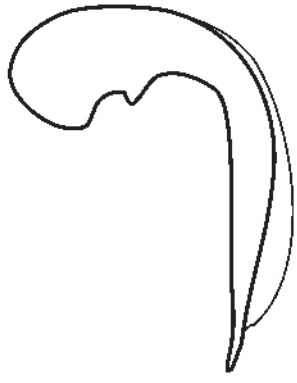
(60) *H. rhodeae*



(61) *Kupeharpalus barrattae*



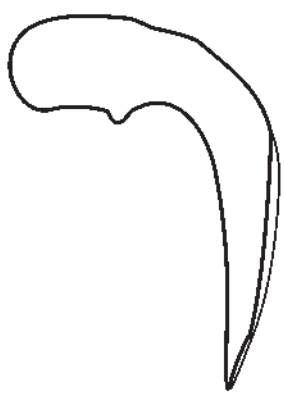
(62) *K. embersoni*



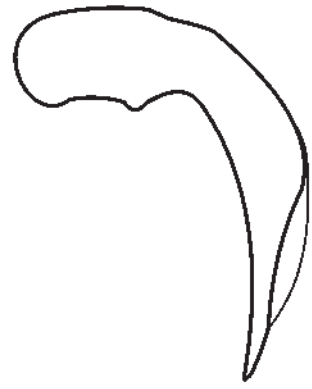
(63) *K. johnsi*

(64) *Lecanomerus atriceps*

(65) *L. insignitus*



(66) *Lecanomerus obesulus*



(67) *L. latimanus*

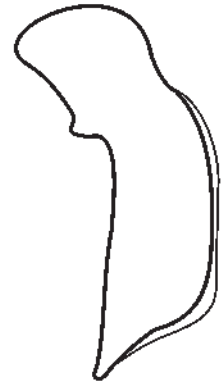
(68) *L. sharpi*

(69) *L. marrisi*

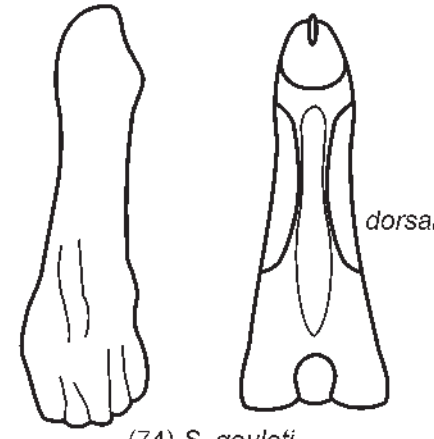
(70) *L. verticalis*

(71) *L. vestigialis*

(72) *Syllectus anomalus*

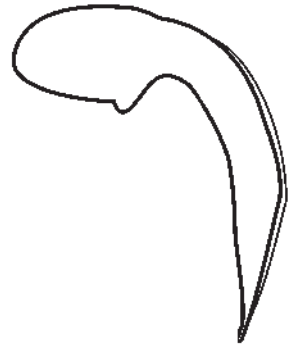


(73) *S. magnus*

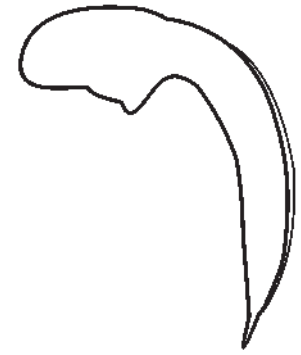


(74) *S. gouleti*

(75) *Egadroma picea*



(76) *Euthenarus brevicollis*

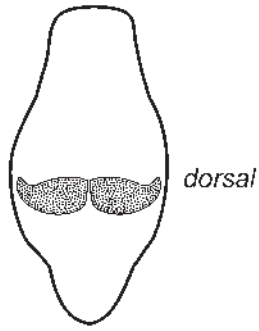


(77) *E. puncticollis*

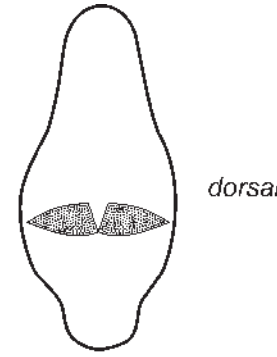
(78) *E. bicolor*

(79) *E. promptus*

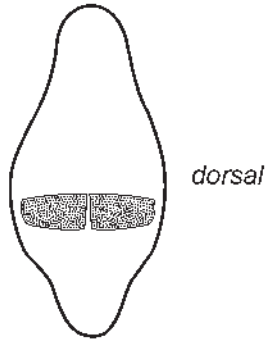
(80) *Haplanister crypticus*



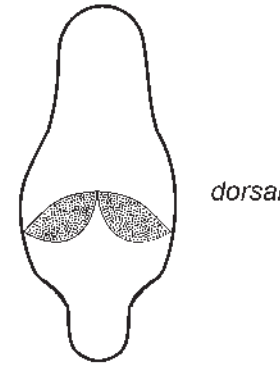
(81) *Pholeodytes palmai*



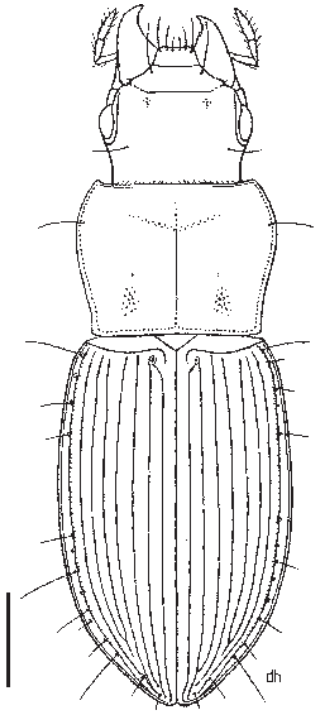
(82) *P. cerberus*



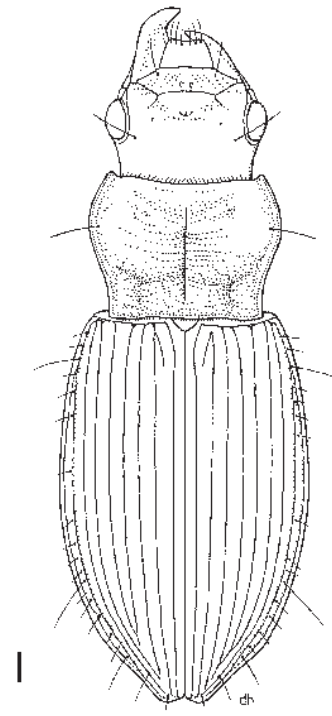
(83) *P. nunni*



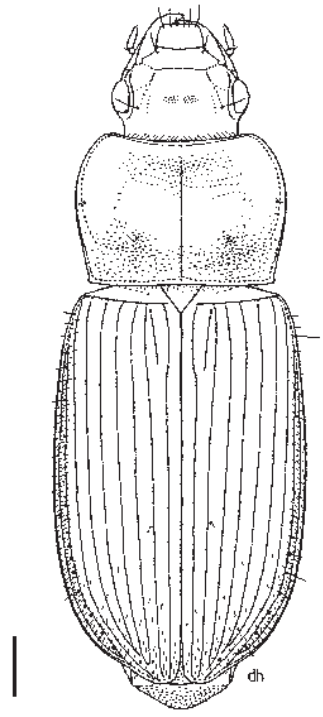
(84) *P. townsendi*



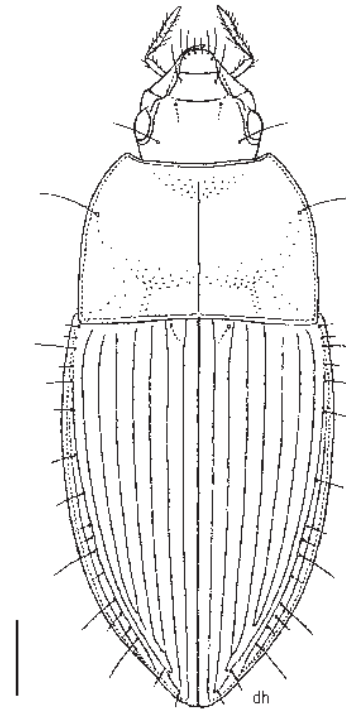
(85) *Allocinopus smithi*



(86) *Allocinopus sculpticollis*

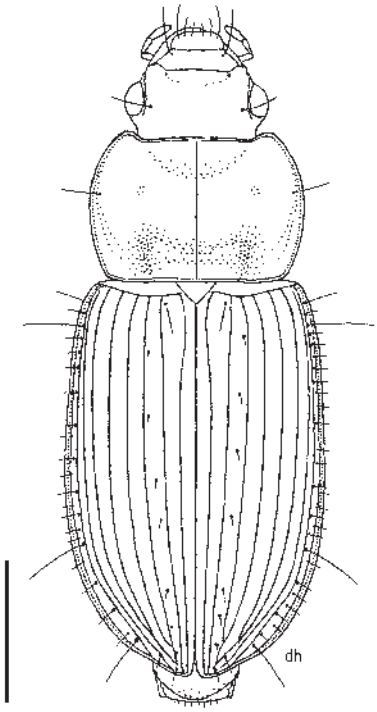


(87) *Anisodactylus binotatus*

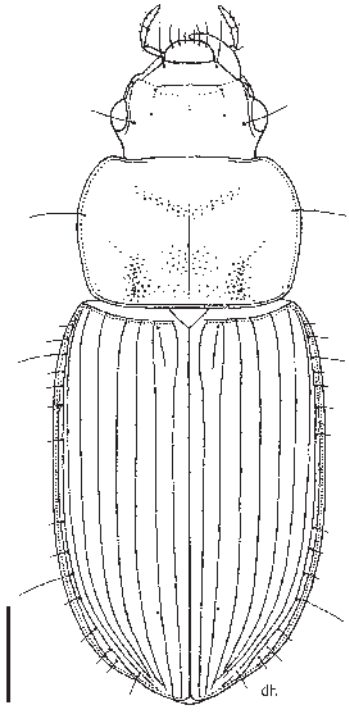


(88) *Gaioxenus pilipalpis*

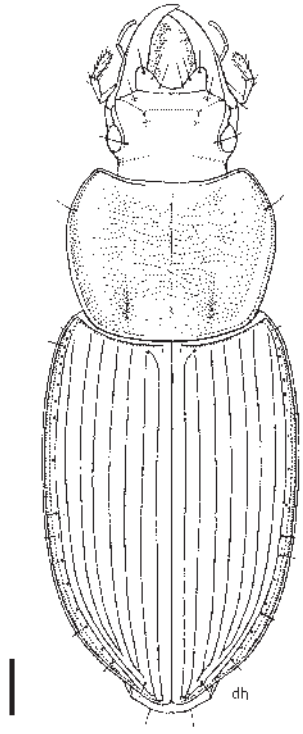
Fig. 85-113 Habitus drawings of representatives of Harpalini (Illustrator: D. W. Helmore). Scale lines are 1 mm.



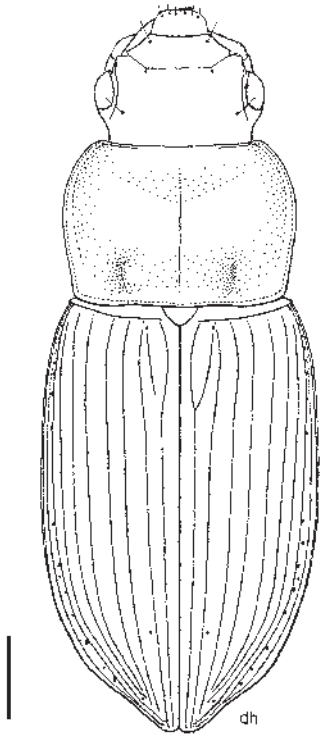
(89) *Gnathaphanus melbournensis*



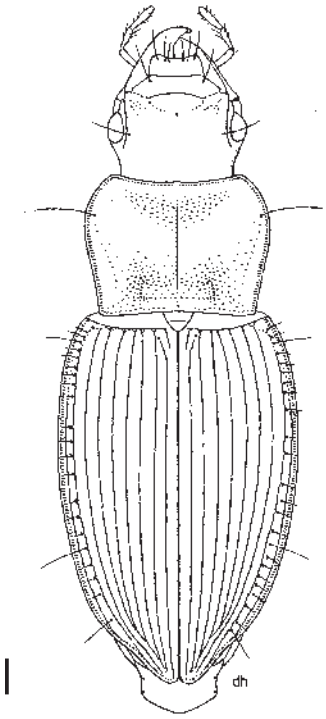
(90) *Hypharpax australis*



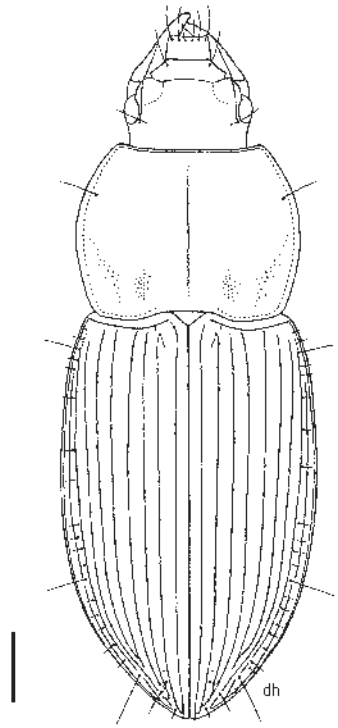
(91) *Maoriharpalus sutherlandi*



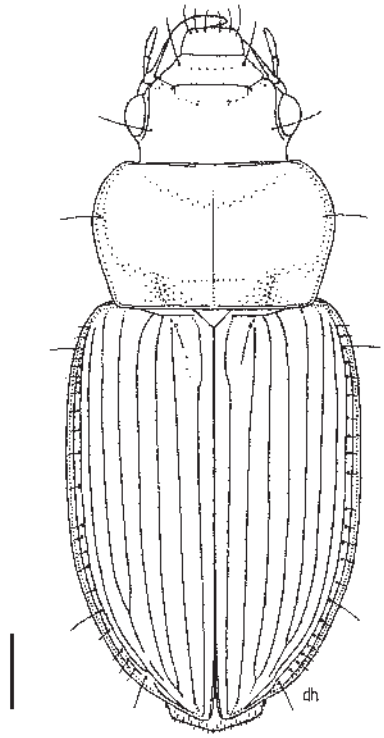
(92) *Notiobia quadricollis*



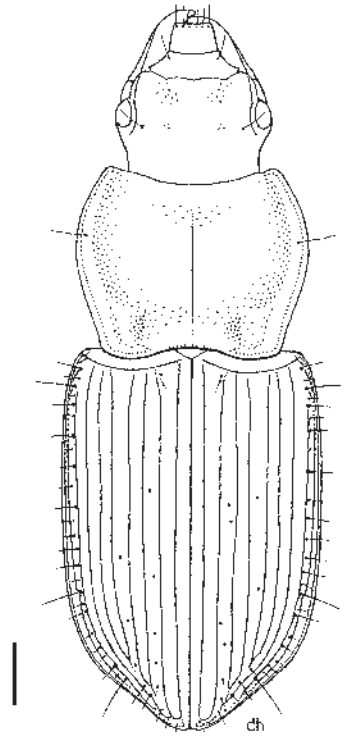
(93) *Parabaris atratus*



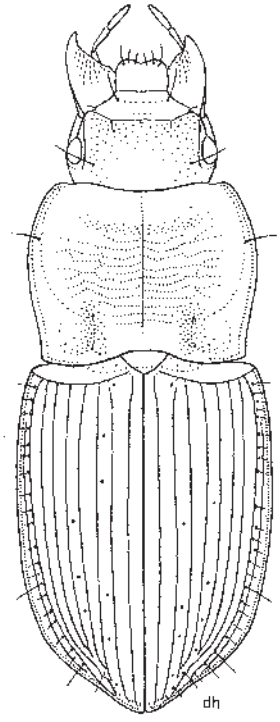
(94) *Parabaris hoarei*



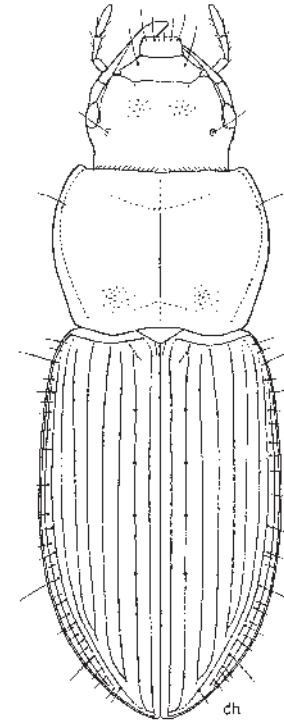
(95) *Triplosarus novaezelandiae*



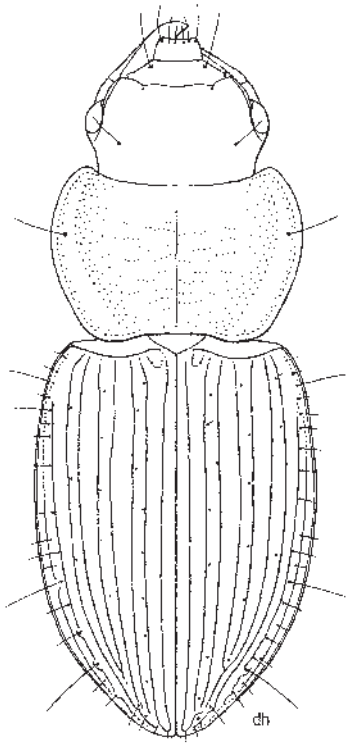
(96) *Tuiharpalus crosbyi*



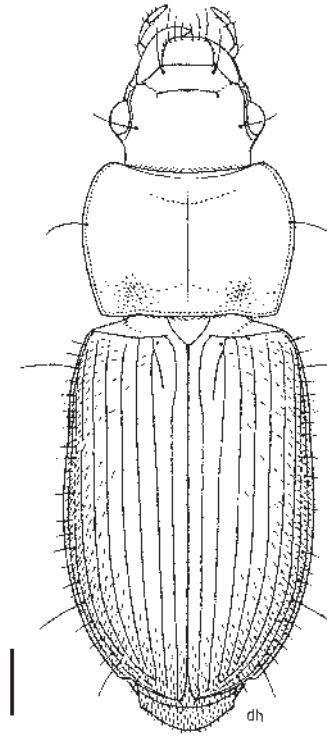
(97) *Tuiharpalus gourlayi*



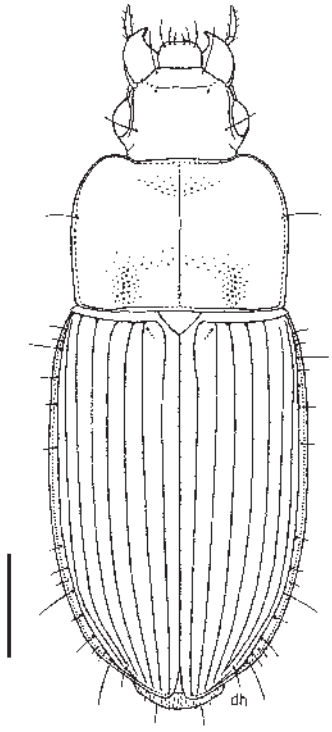
(98) *Tuiharpalus hallae*



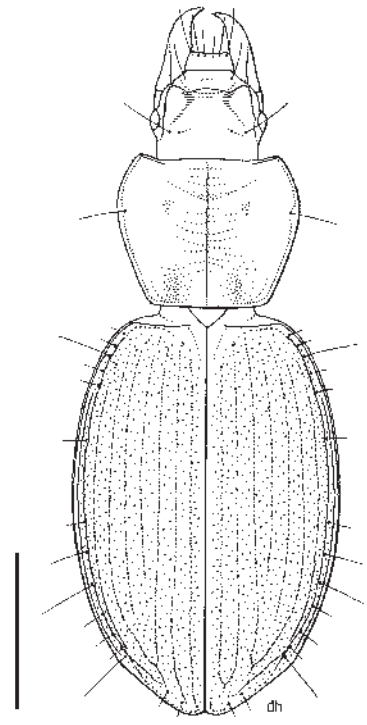
(99) *Tuiharpalus moorei*



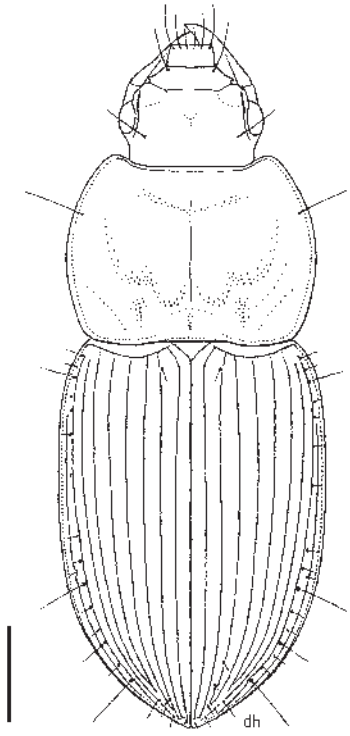
(100) *Harpalus affinis*



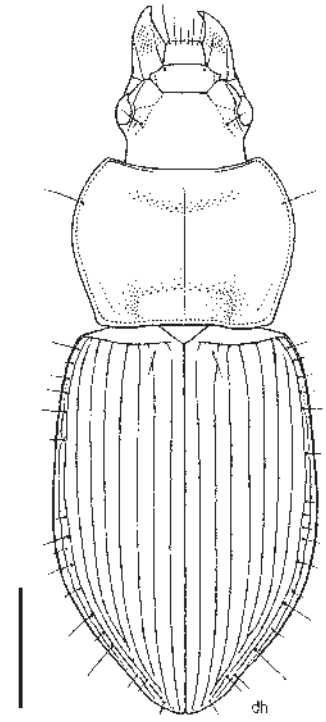
(101) *Harpalus australasiae*



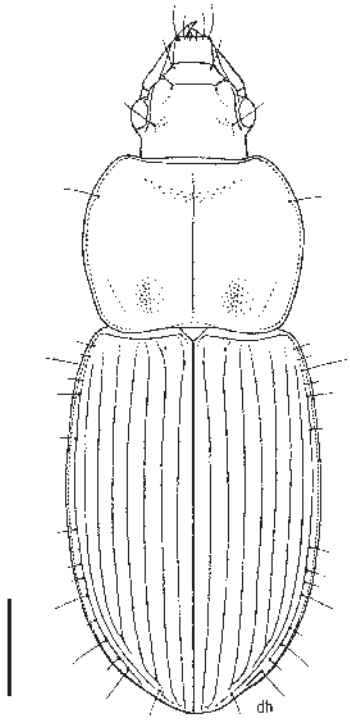
(102) *Hakaharpalus patricki*



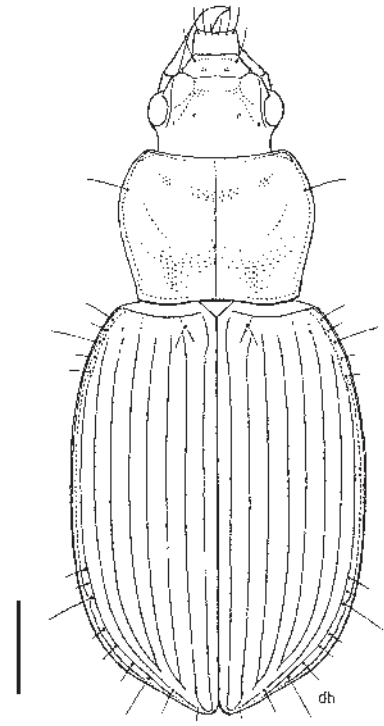
(103) *Kupeharpalus barrattae*



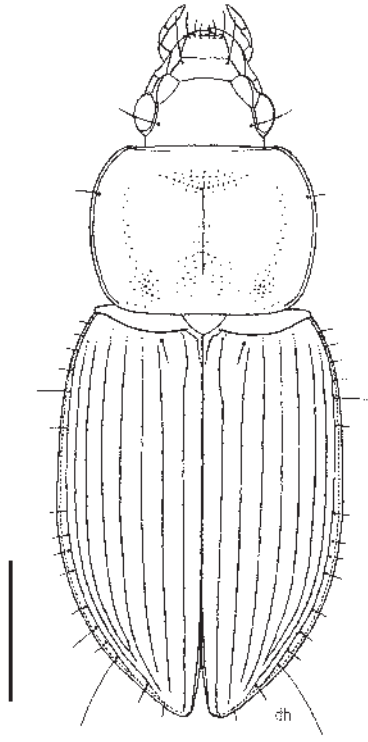
(104) *Kupeharpalus johnsi*



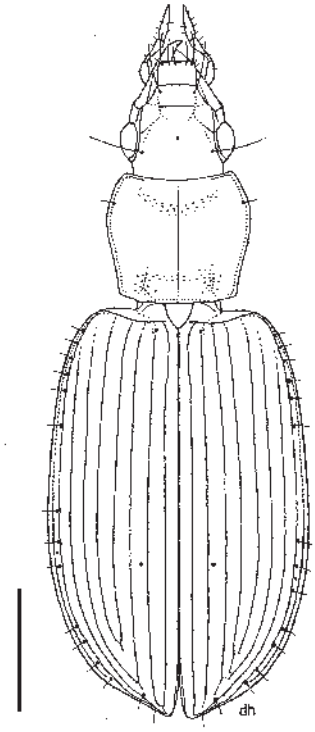
(105) *Lecanomerus insignitus*



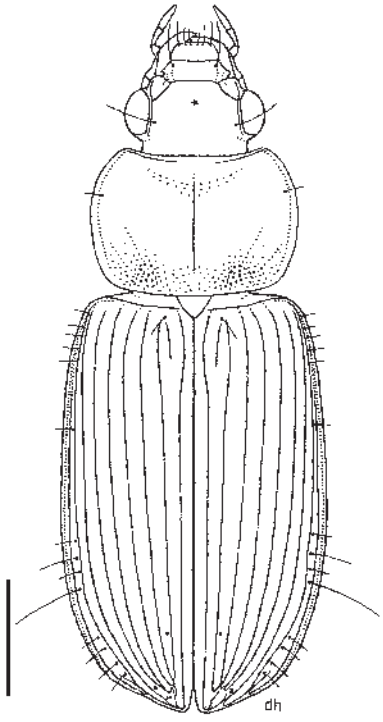
(106) *Lecanomerus marrisi*



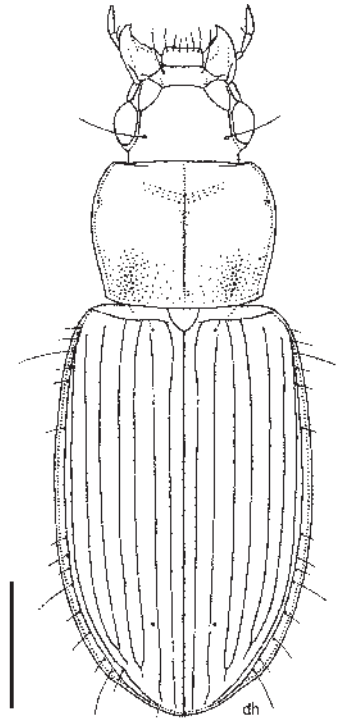
(107) *Lecanomerus vestigialis*



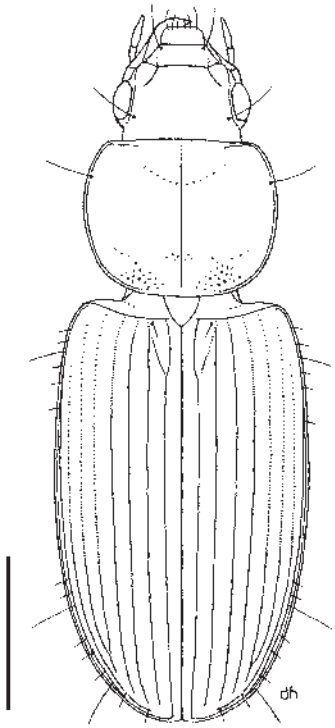
(108) *Syllectus anomalus*



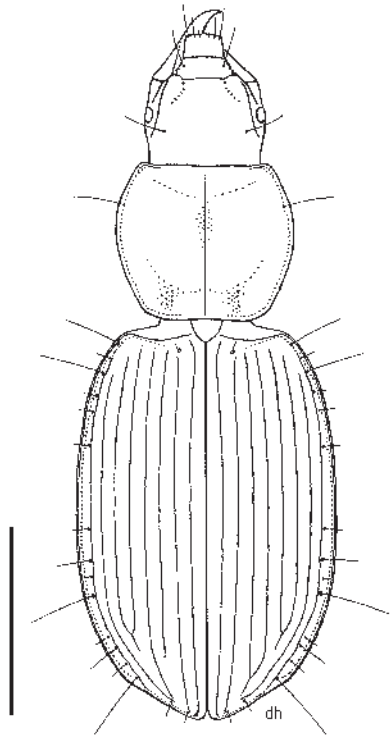
(109) *Egadroma picea*



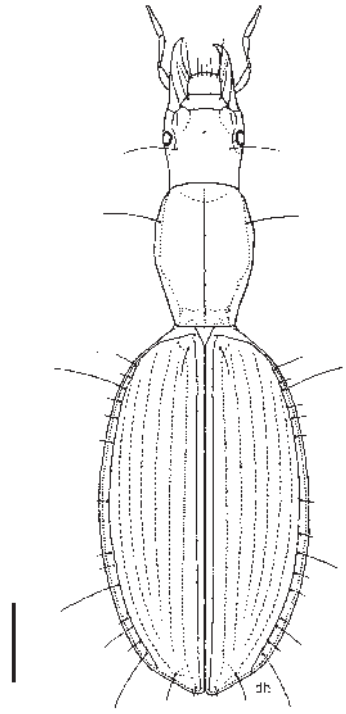
(110) *Euthenarus puncticollis*



(111) *Haplanister crypticus*



(112) *Kiwiharpalus townsendi*



(113) *Pholeodytes townsendi*

(114) *Allocinopus smithi*

(115) *Allocinopus angustulus*

(116) *Allocinopus belli*

(117) *Allocinopus bousqueti*

(118) *Allocinopus wardi*

(119) *Allocinopus latitarsis*

Fig. 114-169 Colour photographs of Harpalini pronota. (Photographer: M.-C. Larivière).

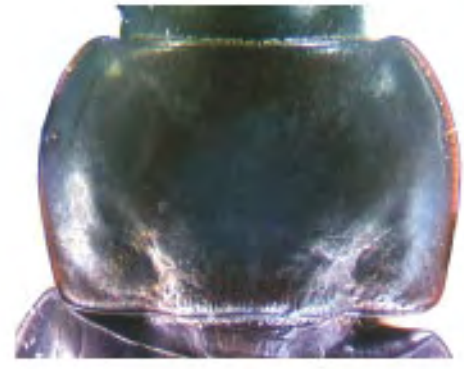
(120) *Allocinopus sculpticollis*

(121) *Anisodactylus binotatus*

(122) *Gaioxenus pilipalpis*

(123) *Gnathaphanus melbournensis*

(124) *Hypharpax australis*

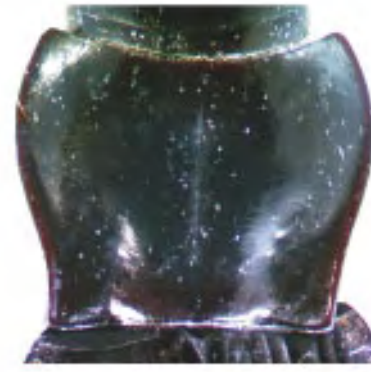


(125) *Hypharpax antarcticus*

(126) *Maoriharpalus sutherlandi*

(127) *Notiobia quadricollis*

(128) *Parabaris atratus*

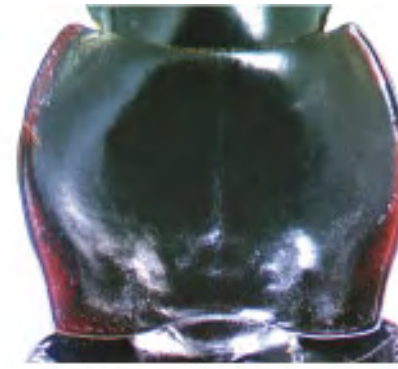


(129) *Parabaris lesagei*

(130) *Parabaris hoarei*

(131) *Triplosarus novaezelandiae*

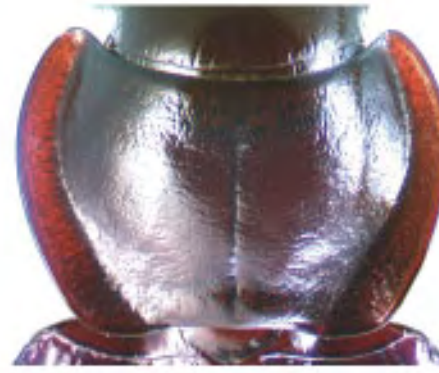
(132) *Tuiharpalus crosbyi*



(133) *Tuiharpalus gourlayi*

(134) *Tuiharpalus clunieae*

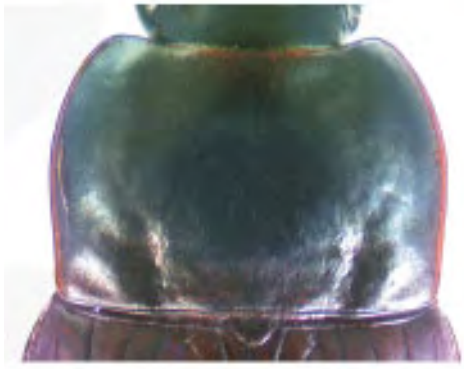
(135) *Tuiharpalus hallae*



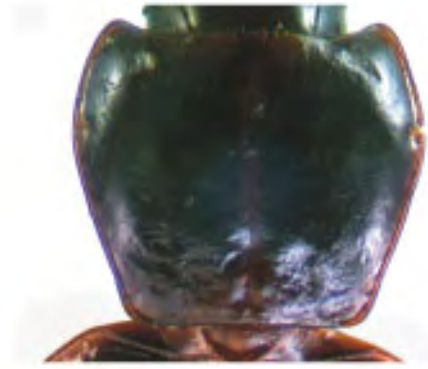
(136) *Tuiharpalus moorei*

(137) *Harpalus affinis*

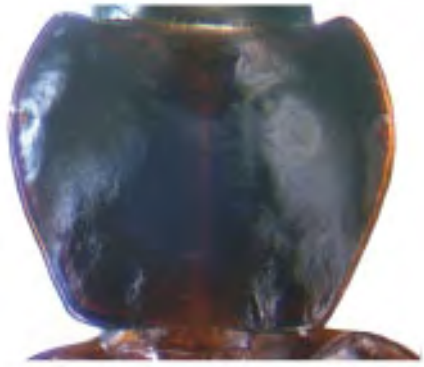
(138) *Harpalus tardus*



(139) *Harpalus australasiae*



(140) *Hakaharpalus patricki*



(141) *Hakaharpalus maddisoni*

(142) *Hakaharpalus davidsoni*

(143) *Hakaharpalus rhodeae*

(144) *Kupeharpalus barrattae*

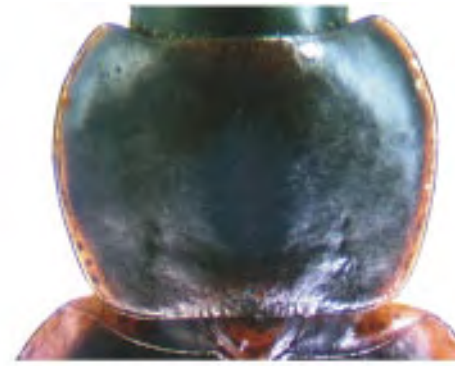
(145) *Kupeharpalus embersoni*

(146) *Kupeharpalus johnsi*

(147) *Lecanomerus atriceps*

(148) *Lecanomerus insignitus*

(149) *Lecanomerus obesulus*

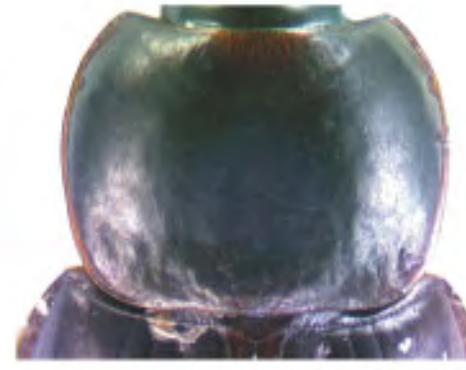


(150) *Lecanomerus latimanus*

(151) *Lecanomerus sharpi*

(152) *Lecanomerus marrisi*

(153) *Lecanomerus verticalis*

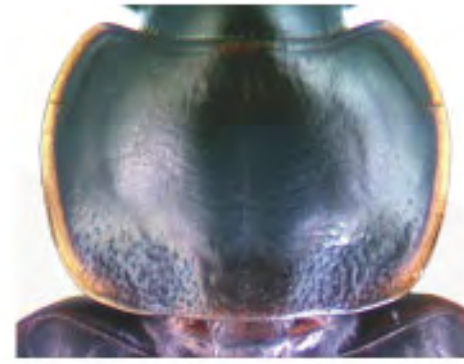


(154) *Lecanomerus vestigialis*

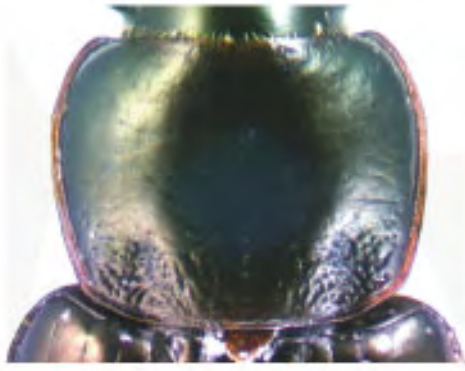
(155) *Syllectus anomalus*

(156) *Syllectus magnus*

(157) *Syllectus gouleti*



(158) *Egadroma picea*



(159) *Euthenarus brevicollis*

(160) *Euthenarus puncticollis*

(161) *Euthenarus bicolor*

(162) *Euthenarus promptus*

(163) *Haplanister crypticus*

(164) *Kiwiharpalus townsendi*

(165) *Pholeodytes palmai*

(166) *Pholeodytes cerberus*

(167) *Pholeodytes nunni*

(168) *Pholeodytes townsendi*

(169) *Pholeodytes helmorei*

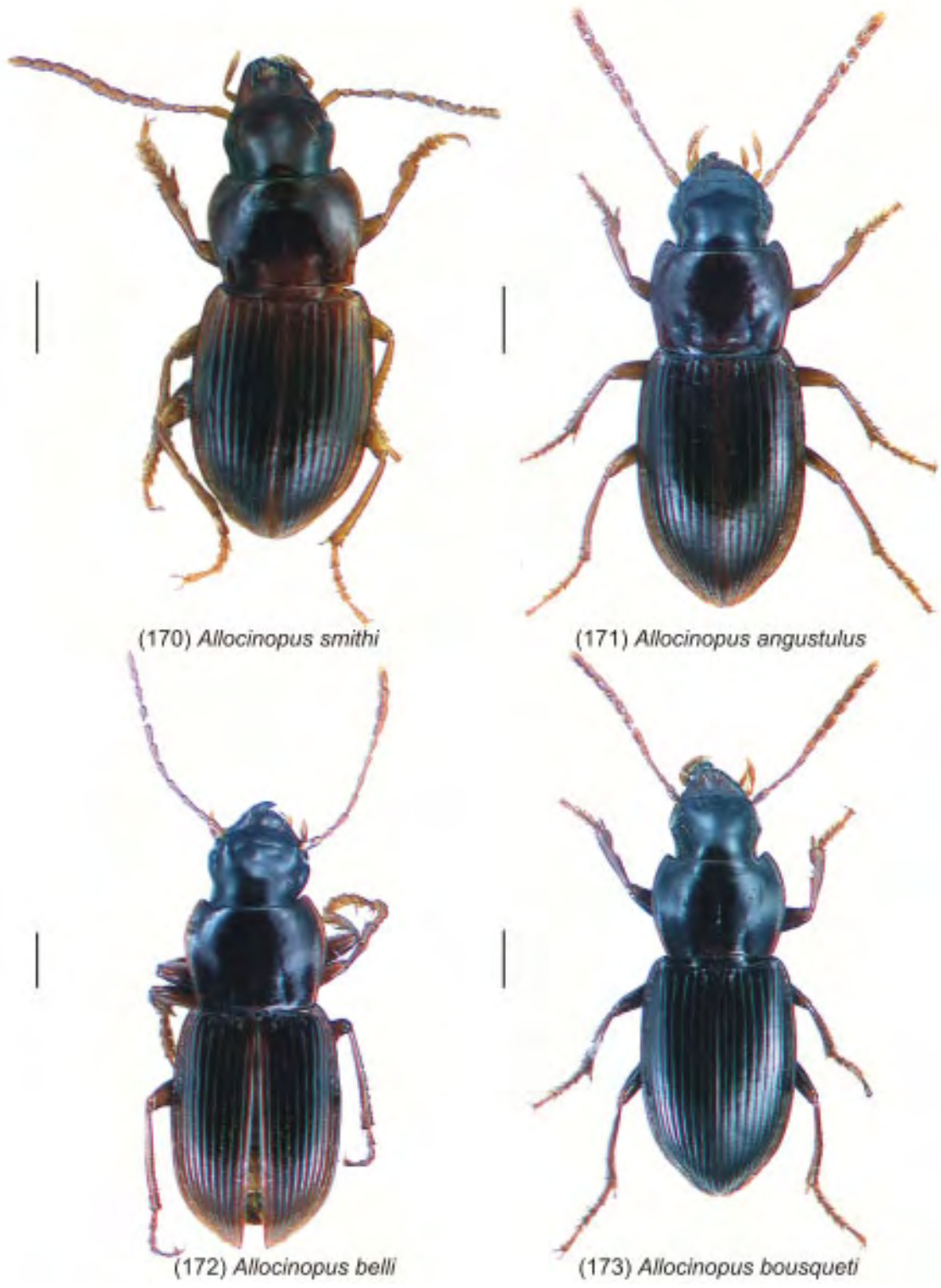


Fig. 170–225 Colour photographs of Harpalini. (Photographer: B. E. Rhode, except Fig. 187 M.-C. Larivière). Scale lines are 1 mm.

(174) *Allocinopus wardi*

(175) *Allocinopus latitarsis*

(176) *Allocinopus sculpticollis*

(177) *Anisodactylus binotatus*

(178) *Gaioxenus pilipalpis*

(179) *Gnathaphanus melbournensis*

(180) *Hypharpax australis*

(181) *Hypharpax antarcticus*

(182) *Maoriharpalus sutherlandi*

(183) *Notiobia quadricollis*

(184) *Parabaris atratus*

(185) *Parabaris lesagei*

(186) *Parabaris hoarei*

(187) *Triplosarus novaezelandiae*

(188) *Tuiharpalus crosbyi*

(189) *Tuiharpalus gourlayi*

(190) *Tuiharpalus clunieae*

(191) *Tuiharpalus hallae*

(192) *Tuiharpalus moorei*

(193) *Harpalus affinis*

(194) *Harpalus tardus*

(195) *Harpalus australasiae*

(196) *Hakaharpalus patricki*

(197) *Hakaharpalus maddisoni*

(198) *Hakaharpalus davidsoni*

(199) *Hakaharpalus rhodeae*

(200) *Kupeharpalus barrattae*

(201) *Kupeharpalus embersoni*

(202) *Kupeharpalus johnsi*

(203) *Lecanomerus atriceps*

(204) *Lecanomerus insignitus*

(205) *Lecanomerus obesulus*

(206) *Lecanomerus latimanus*

(207) *Lecanomerus sharpi*

(208) *Lecanomerus marrisi*

(209) *Lecanomerus verticalis*

(210) *Lecanomerus vestigialis*

(211) *Syllectus anomalus*

(212) *Syllectus magnus*

(213) *Syllectus gouleti*

(214) *Egadroma picea*

(215) *Euthenarus brevicollis*

(216) *Euthenarus puncticollis*

(217) *Euthenarus bicolor*

(218) *Euthenarus promptus*

(219) *Haplanister crypticus*

(220) *Kiwiharpalus townsendi*

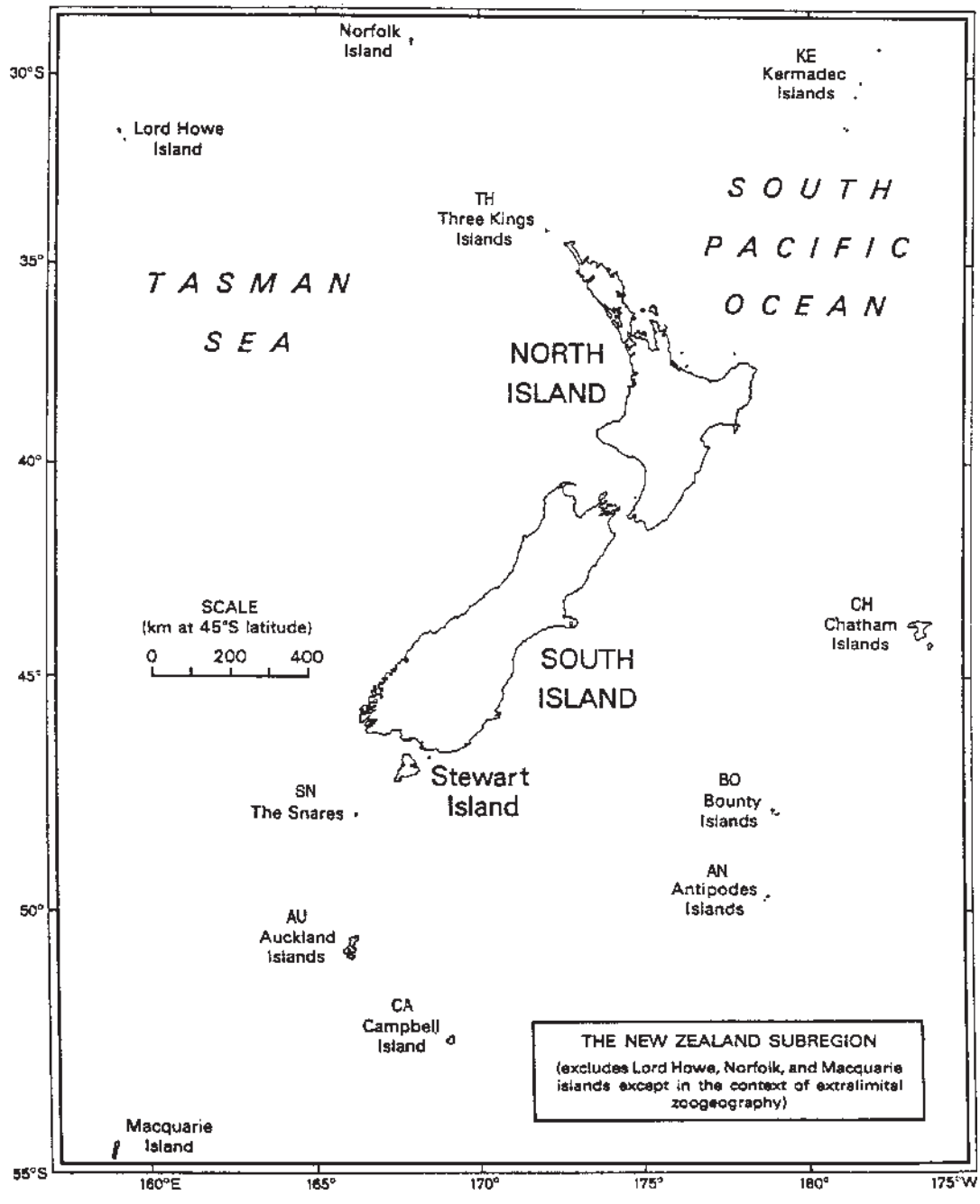
(221) *Pholeodytes palmai*

(222) *Pholeodytes cerberus*

(223) *Pholeodytes nunni*

(224) *Pholeodytes townsendi*

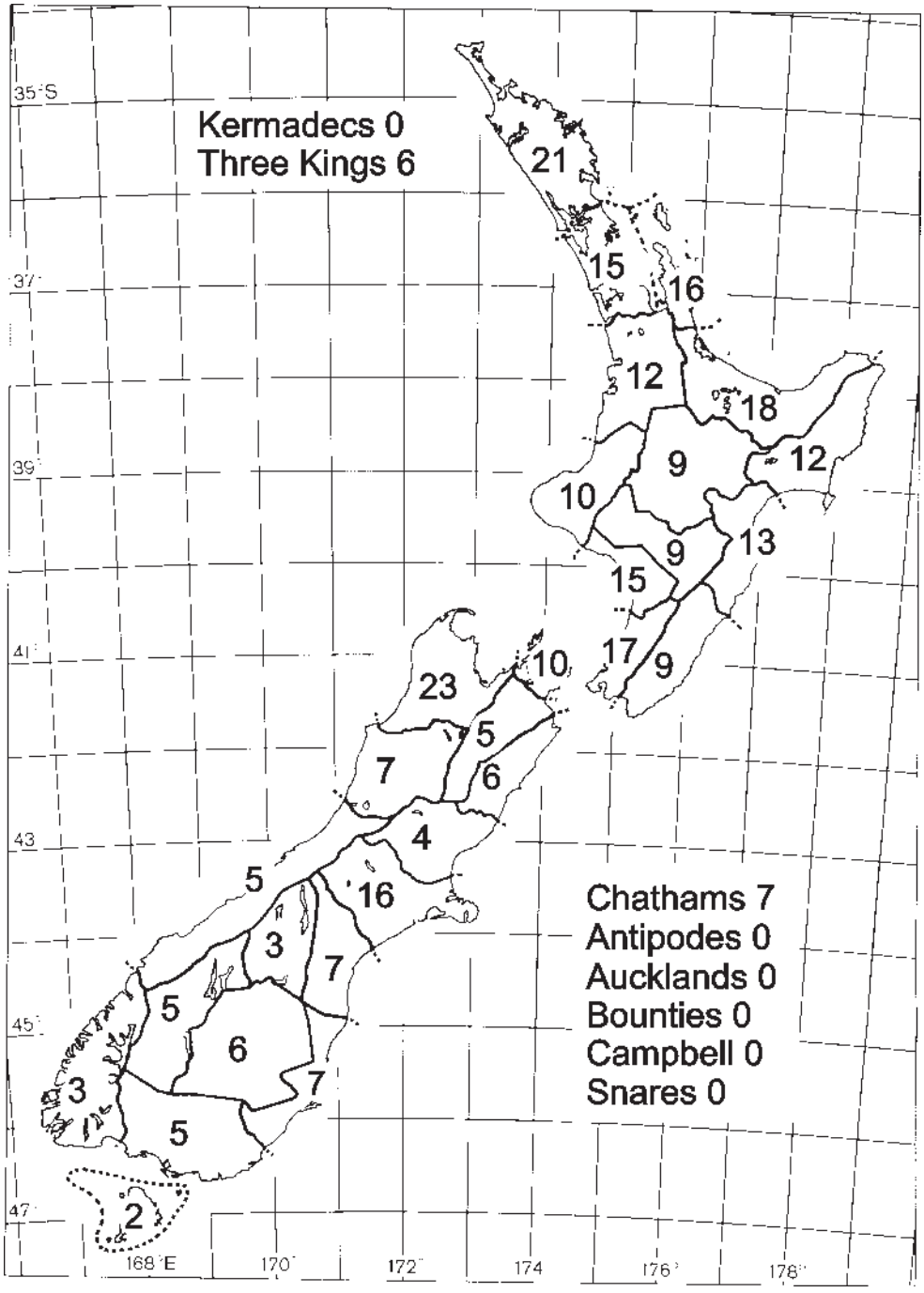
(225) *Pholeodytes helmorei*



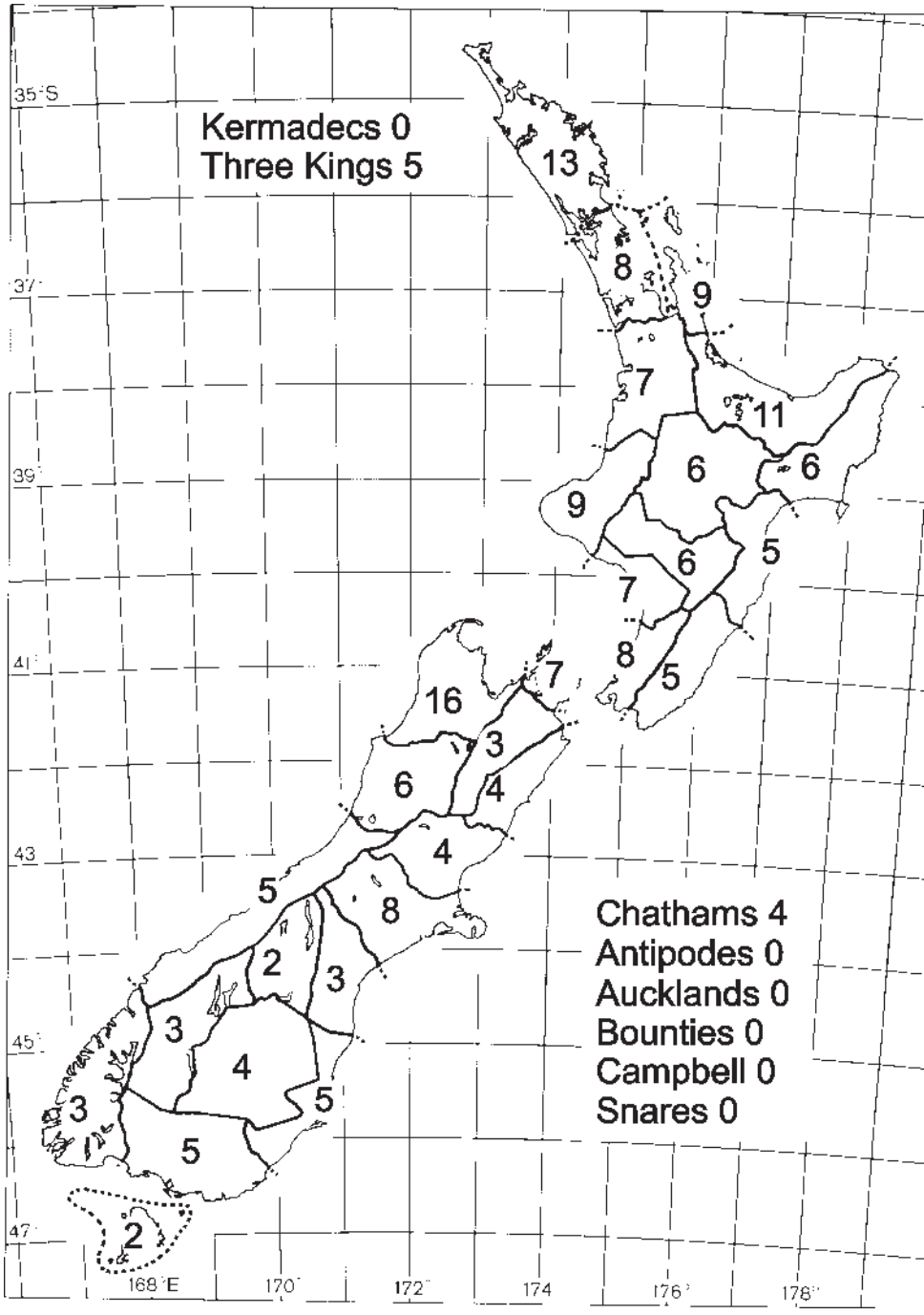
Map 1 The New Zealand subregion.

Map 2 Area codes and collecting localities from mainland New Zealand: North Island.

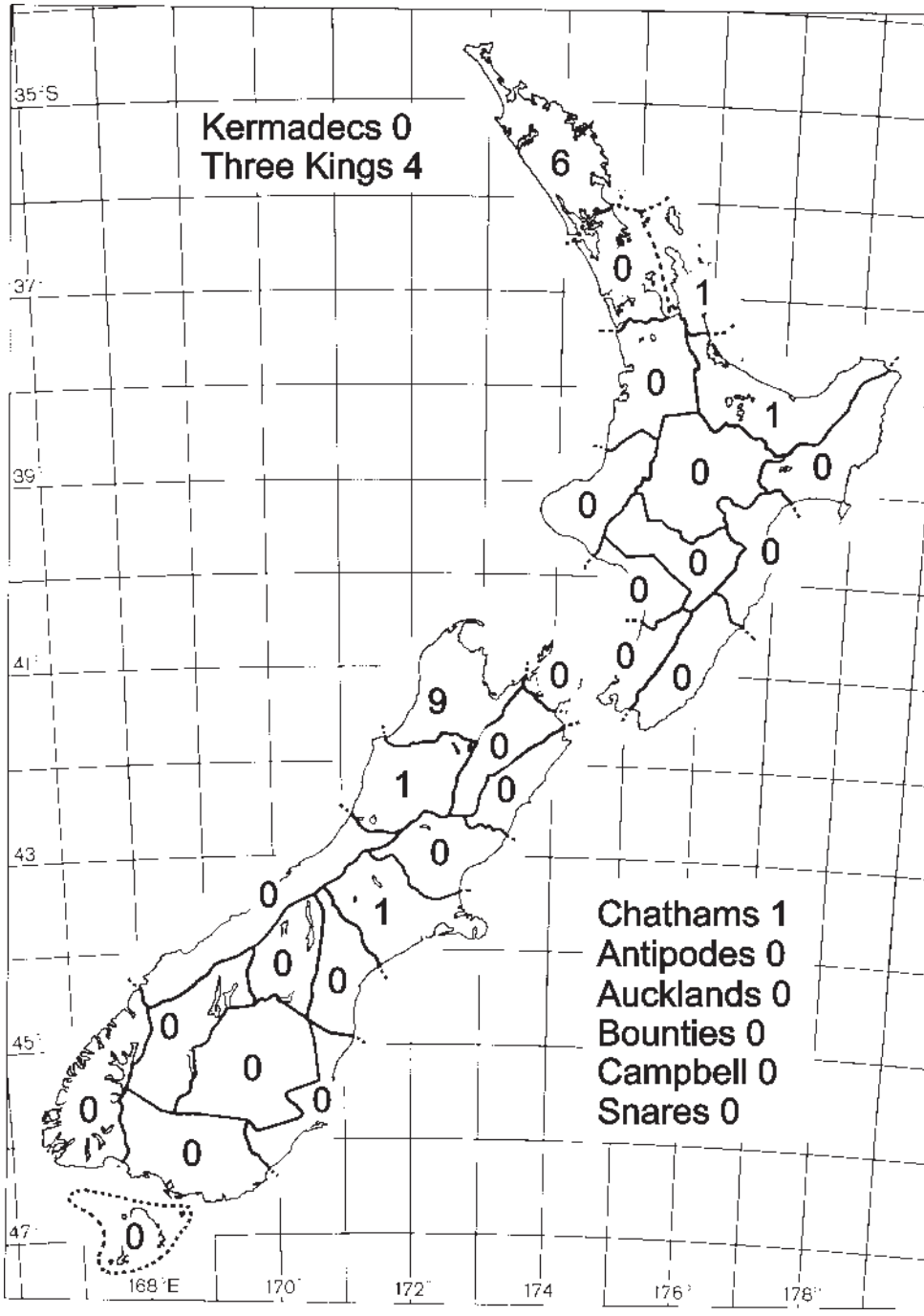
Map 3 Area codes and collecting localities from mainland New Zealand: South Island and Stewart Island.



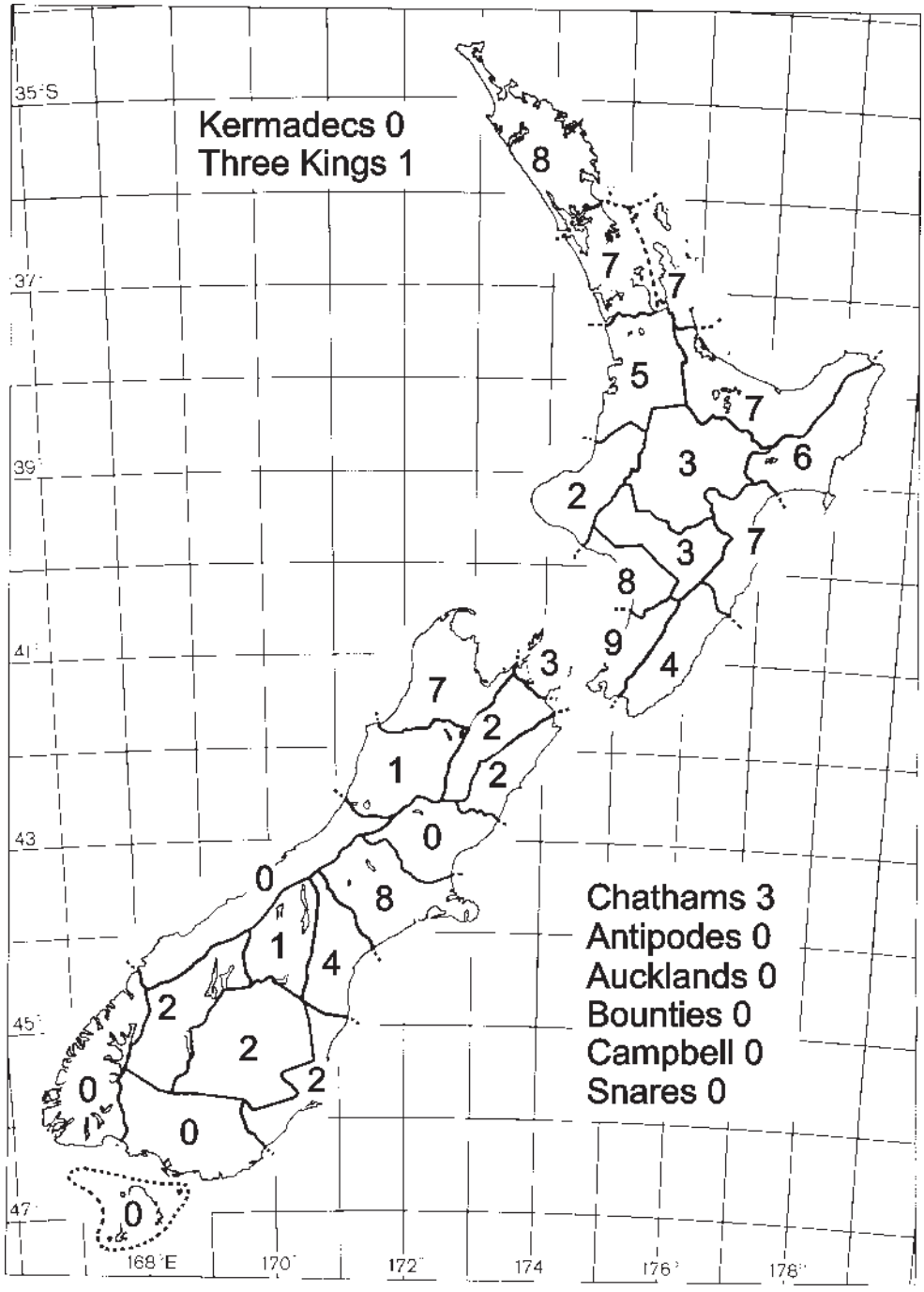
Map 4 Total number of known taxa by areas.



Map 5 Number of known New Zealand endemics by areas.

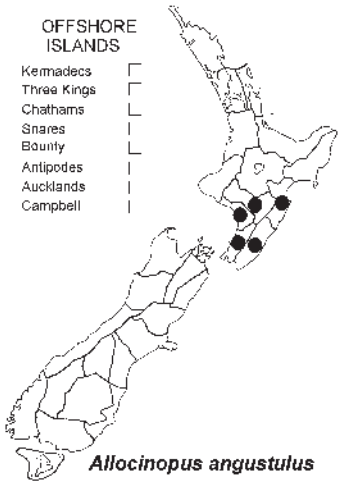


Map 6 Number of native taxa known to be restricted to single areas.

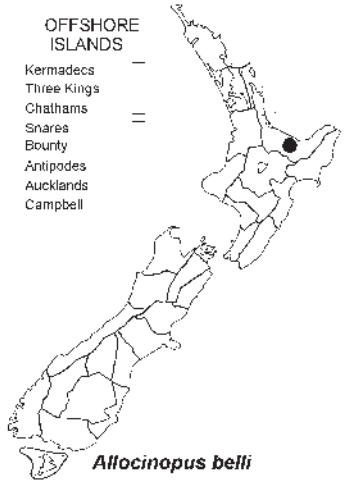


Map 7 Number of known adventive taxa by areas.

Species distribution maps (pp. 147-153). Presented in same order as taxa in body of text. Area boundaries follow area codes of Crosby *et al.* (1976, 1998).



Allocinopus angustulus



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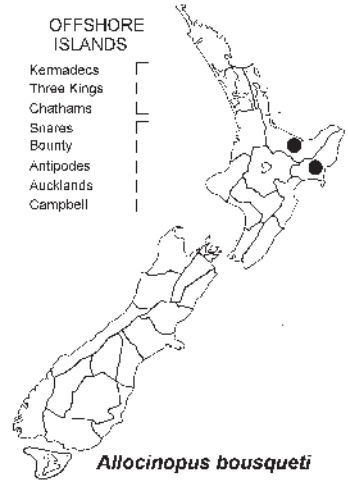

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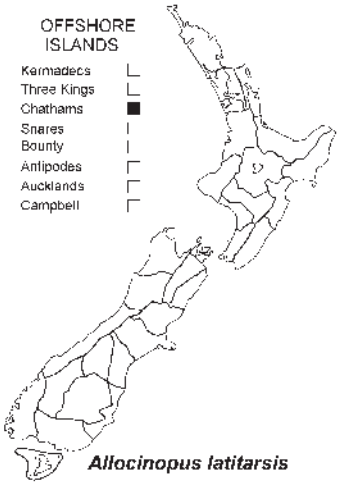

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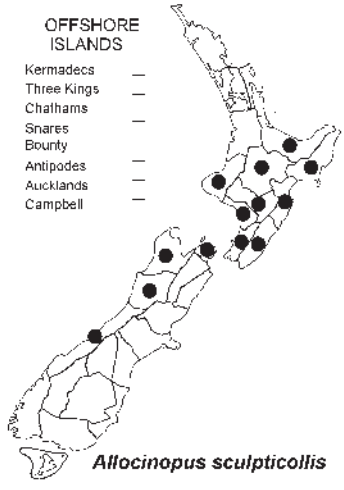

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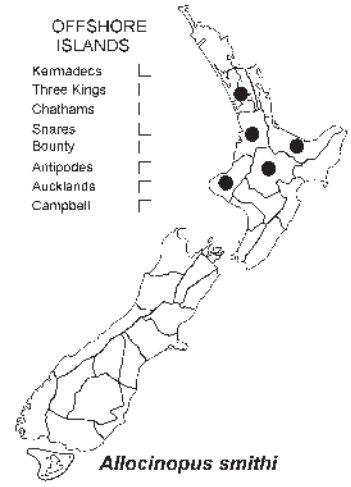

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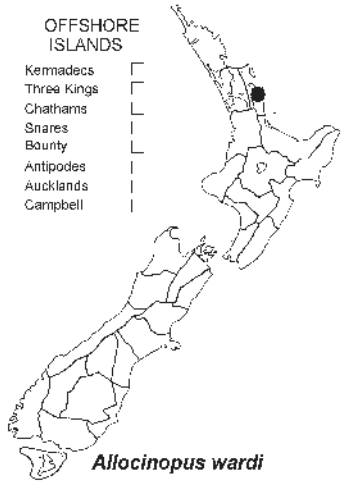

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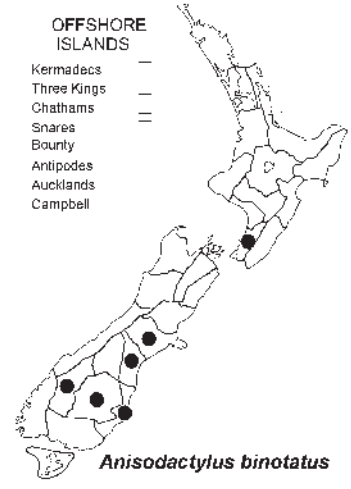

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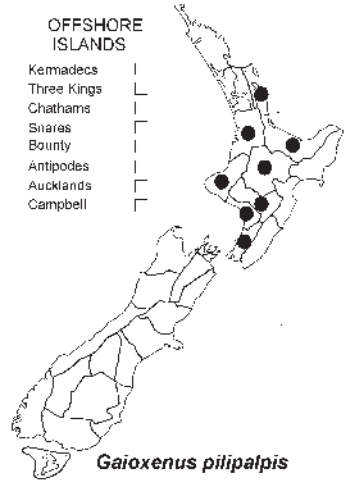

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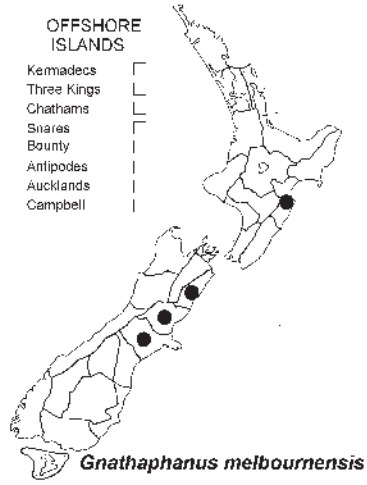

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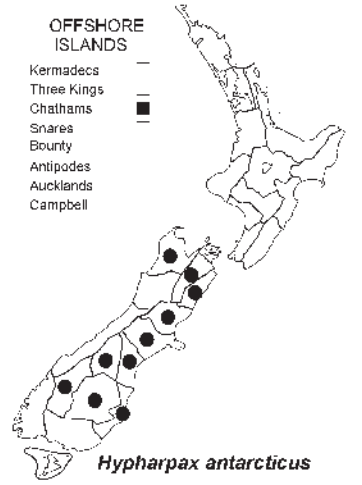

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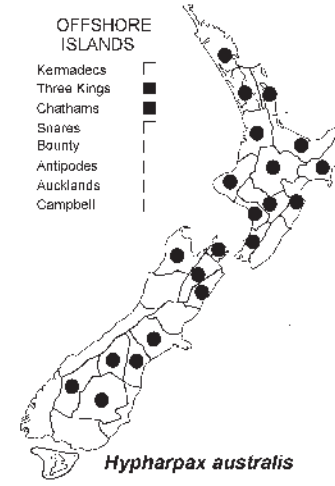

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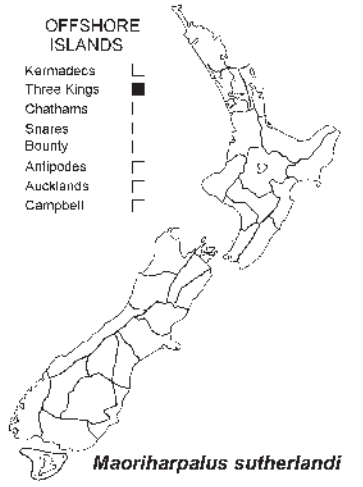

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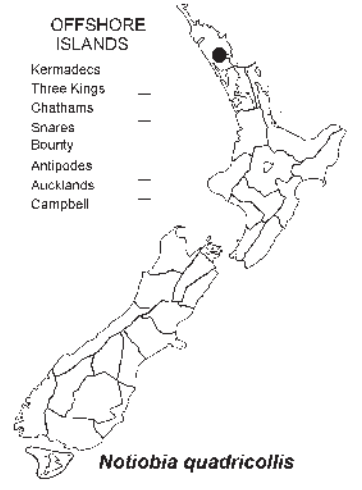

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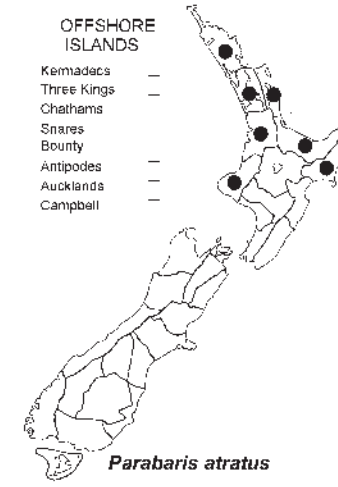

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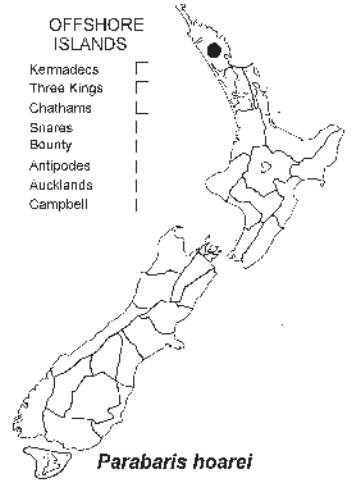

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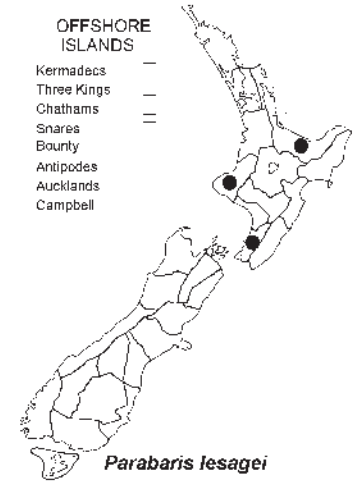

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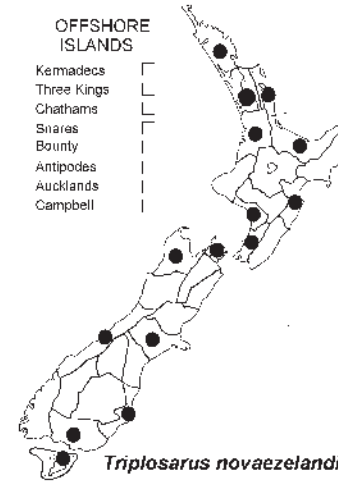

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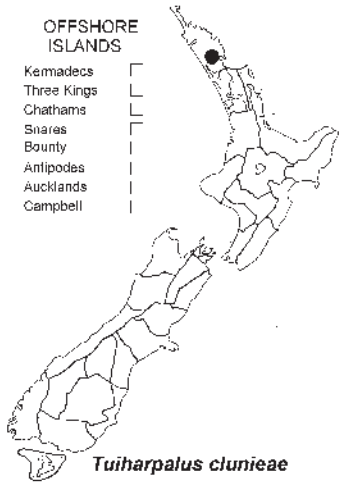

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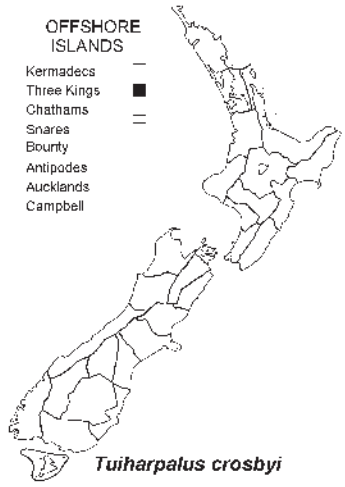

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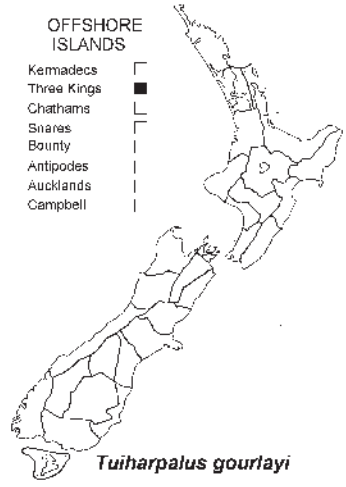

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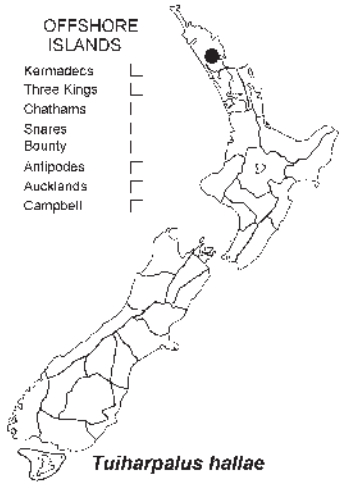

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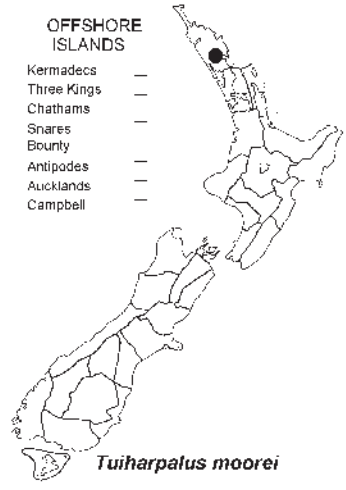

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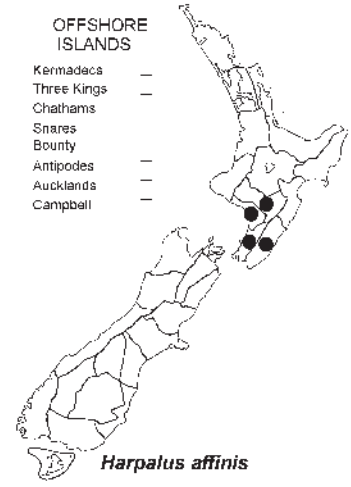

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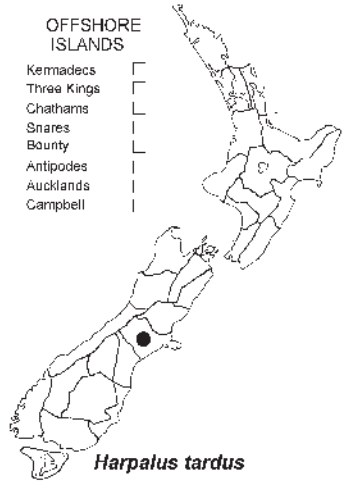

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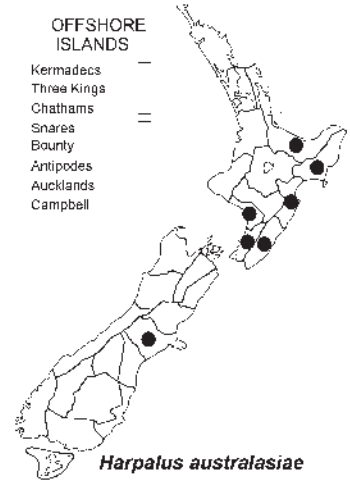

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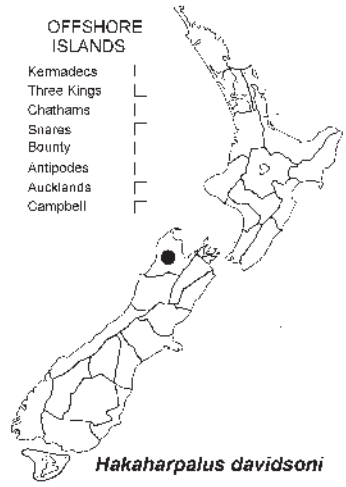

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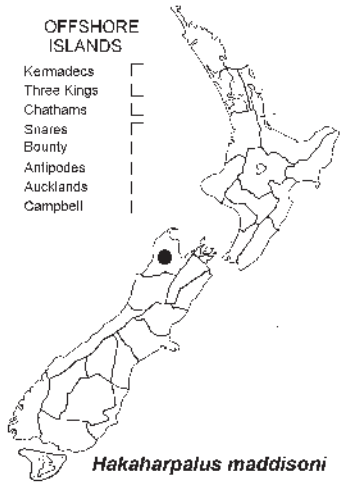

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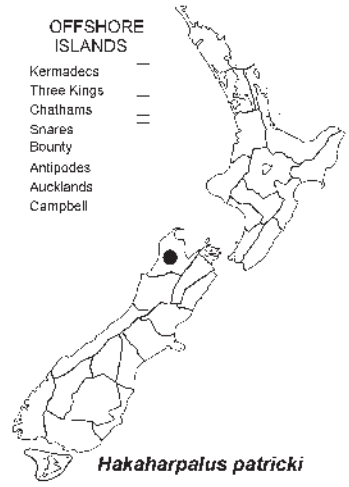

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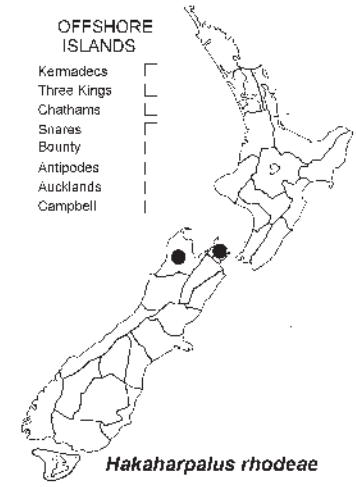

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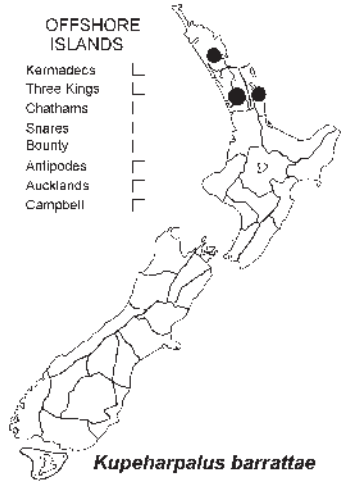

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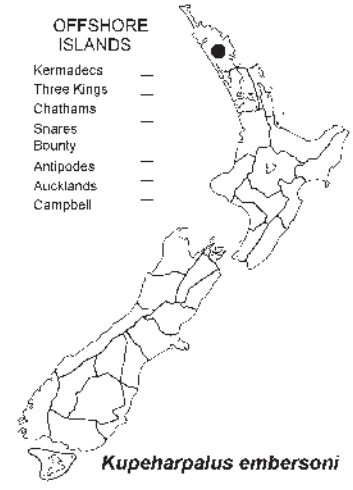

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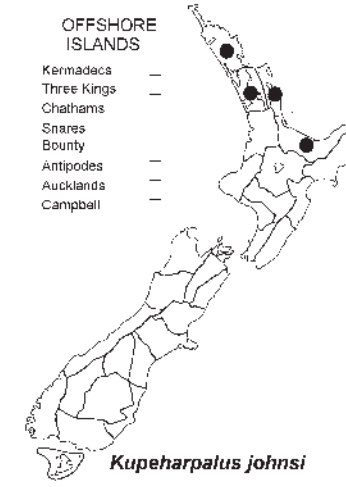
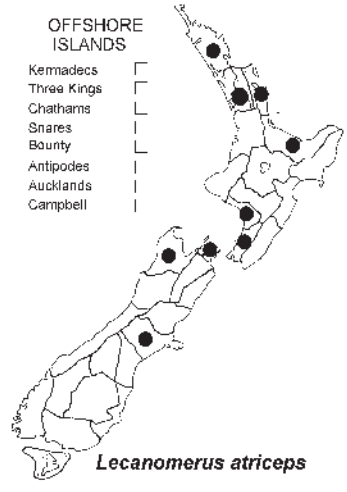


Kupeharpalus johnsi



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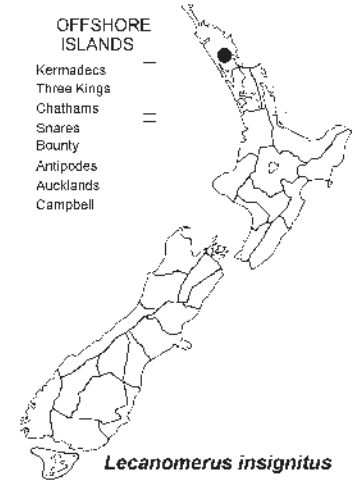

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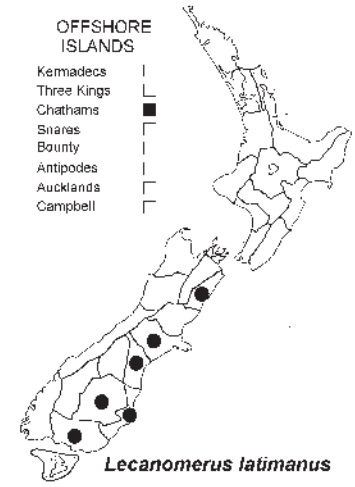

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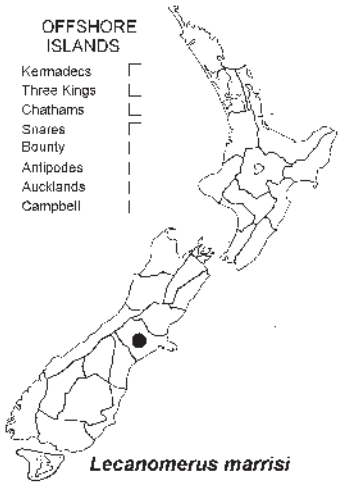

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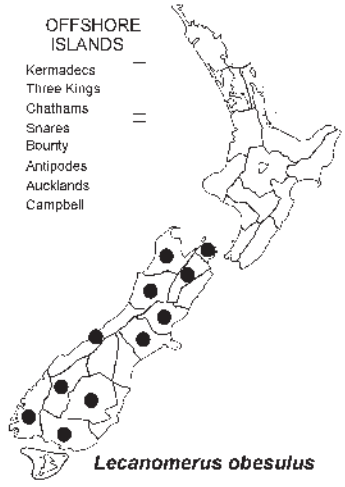

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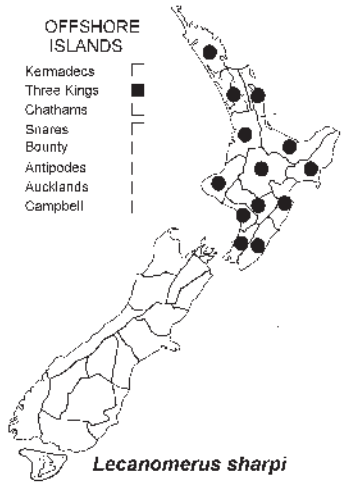

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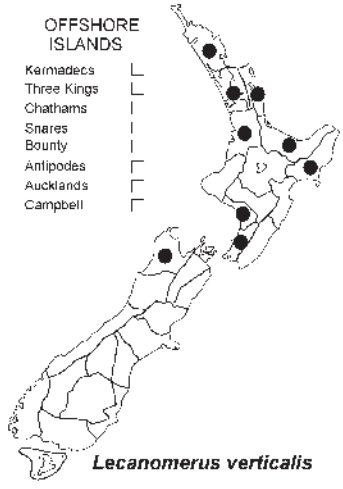

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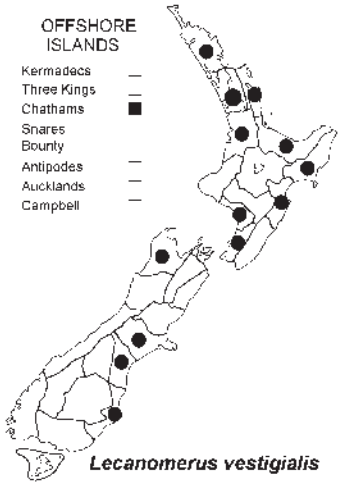

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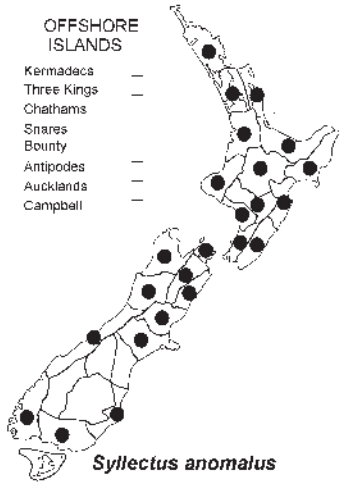

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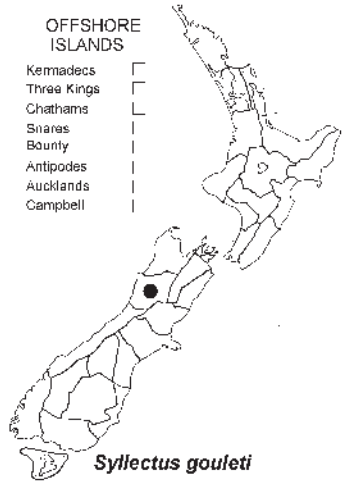

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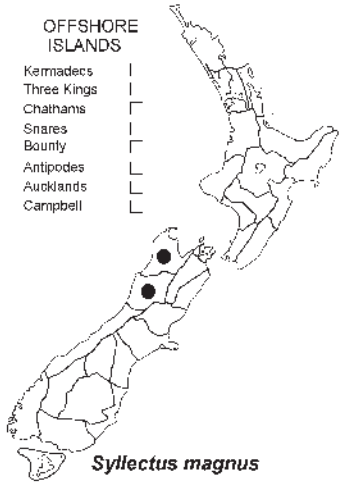

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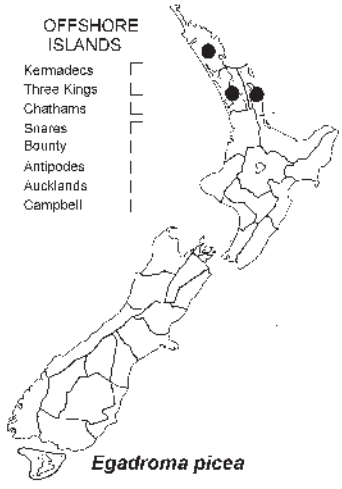

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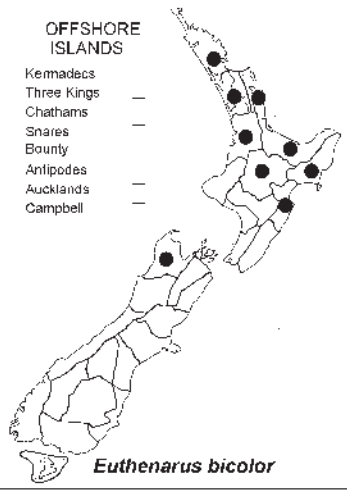

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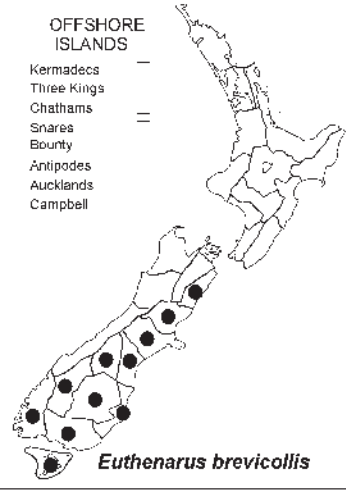

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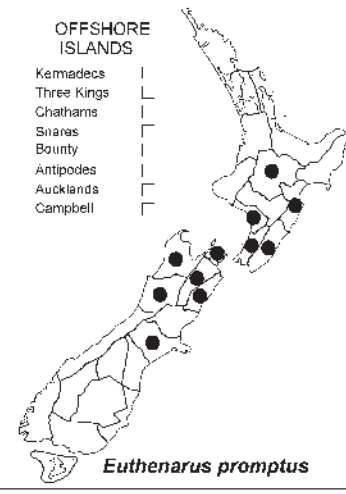

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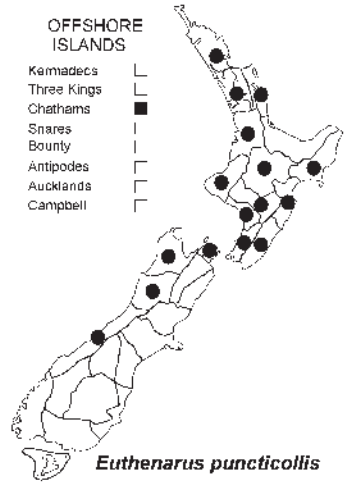

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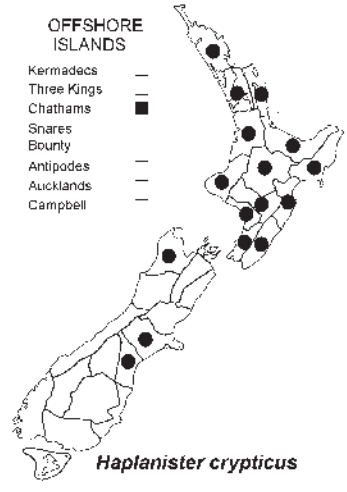

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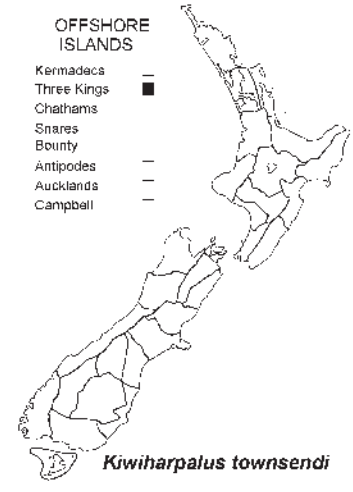
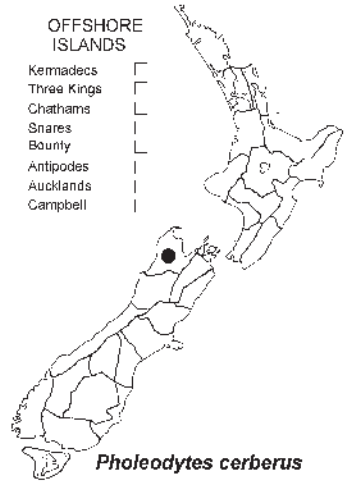


Kiwiharpalus townsendi



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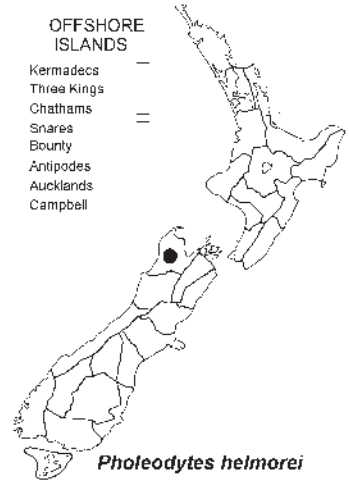

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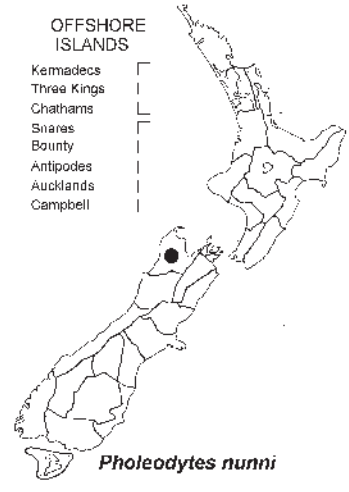

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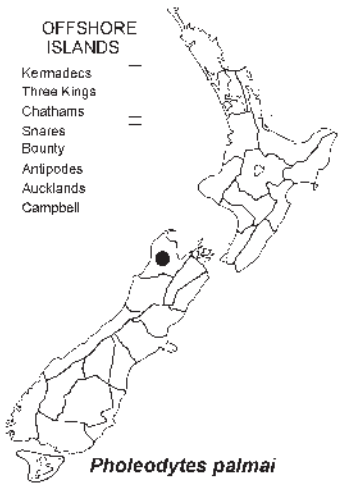

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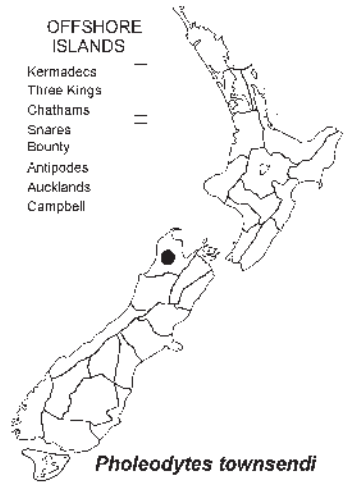

Pholeodytes townsendi

TAXONOMIC INDEX

This index covers the nominal taxa mentioned in the text, regardless of their current status in taxonomy. In the case of synonyms, the combinations of generic and specific names listed are those originally published by authors, and may differ from combinations implicit in current usage. Taxa in **bold** indicate valid taxa. Page numbers in **bold** indicate main catalogue entries. The letter "**f**" after a page indicates a **figure**. The letter "**m**" indicates a **distribution map**. The letter "**p**" indicates a **photograph**.

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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 *Marine Fauna of N.Z.*

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.

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Ko te hunga pīrangi **hoko pukapuka**, me tuhi ki *Fauna of N.Z.*, Manaaki Whenua Press, Manaaki Whenua, Pouaka Poutāpeta 40, Lincoln 8152, Aotearoa.

E rua ngā tūmomo kaihoko: "A" – kaihoko tūmau, ka tukua ia pukapuka, ia pukapuka, me te nama, i muri tonu i te tānga; "B" – ka tukua ngā pānui whakatairanga me ngā puka tono i ōna wā anō.

Te utu (tirohia "Titles in print", whārangi 157). Ko te kōpaki me te pane kuini kei roto i te utu. Me utu te hunga e noho ana i Aotearoa me Ahitereiria ki ngā tāra o Aotearoa. Ko ētahi atu me utu te moni kua tohua, ki ngā tāra Merikana, ki te nui o te moni rānei e rite ana.

E toe ana he pukapuka o ngā putanga katoa o mua. Mehemea e hiahia ana koe ki te katoa o ngā pukapuka, ki ētahi rānei, tonoa mai kia whakahekea te utu. Tekau ōrau te heke iho o te utu ki ngā toa hoko pukapuka.