

Fig. S1. Apical spine numbering, terminology and position on Rhaphidophoridae, after Fitness *et al.* (2015). Dorsal view, showing cross-sectional relationship of each potential spine on femora and tibiae. Positions are indicated as <u>prolateral</u> (anterior facing), <u>ret</u>rolateral (posterior facing), <u>inferior</u> (ventral facing) and <u>superior</u> (dorsal facing).

English translation of the original descriptions from the French language in:

Pictet A. & de Saussure H. 1893. De quelques orthoptères nouveaux. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft* 8: 301-303.

Pharmacus gen. nov.

Shape slender; head perpendicular, vertex sloping and fastigium short, grooved, two-pointed and facing forward, its continuation between the antennae very narrow, in the shape of a spine, not quite reaching the vertex. Antennae strong, hairy, distant at the base. Eyes oval, with straight inner edge.

Pronotum strongly arched, compressed (*laterally*), the anterior edge arched and jutting forward over the occiput, the posterior edge straight, the posterior corners right-angled or sub-acute, rounded below. Sternum quite large.

Legs hairy, long and wiry, except for the femora, which are somewhat bulging in the proximal half. Coxae distant from one another; the anterior ones armed with a spine on the anterior edge. Fore and mid tibiae unarmed above, armed below with few spines in the distal half. Hind femora slender and linear in almost the whole distal half, armed with occasional spines on the inner edge; hind tibiae armed along their whole length with rather strong spines, and with four apical spurs; the two superior spurs longer than the inferior ones; tibiae rounded below and armed with few spines near the apex; the first two segments of the hind tarsi ending above with two short spines.

Suranal plate rather large and rounded; cerci extending beyond its rear edge, even though they are only of mediocre length. Subgenital plate longer than the pronotum, its outline lanceolate, triangular in appearance from below, finely streamlined; the extremity entirely squeezed into the shape of a triangular blade and showing above an elliptic horizontal plate mounted on the edge of the blade. Styli inserted in front of the middle of the plate, large, cylindrical, pointed at the apex.

This genus strongly resembles *Pachyrhamma* Brunner von Wattenwyl; it differs from it notably because of distance between the two antennae and between the coxae, the absence of an apical spine on the fore femur, the two-pointed fastigium, the size of the antennae, the size of the cerci, and the shape of the subgenital plate.

Pharmacus montanus sp. nov.

Male

Body length 11mm
Pronotum 3.5mm
Hind femur 10mm

3. Insect entirely black; the head and the underside of the scape of the antennae chestnut brown; mandibles and their articulations testaceous with brown patches; sternum and ventral regions testaceous. The lateral edges of the pronotum are finely hemmed, almost straight or slightly curved, the anterior angles rounded and obtuse. The first two pairs of femora are unarmed below; the hind femora are armed with one or two very small spines on the inner edge. The fore and middle tibiae are armed with three pairs of very small, testaceous spines in the lower half, including the apical pair. The hind tibiae are flattened above, with two longitudinal ribs, each armed with 16 to 18 black spines with a red tip. The interior dorsal spur does not reach to the middle of the metatarsus. The apex of the hind tibiae is armed below with three small spines, two of which are on the inner edge. All metatarsi are reddish.

The subgenital plate is slightly keeled underneath; above, the elliptical plate that forms the second half is undercut, sub-punctuated (?), truncated at the base, then notched or split diagonally from top to bottom; the basal half (of the subgenital plate) is divided into two by a groove and ends in two rounded and divergent stumps.

Origin: New Zealand: Mount Cook, collected by Mr Maoring [Mannering] at an elevation of 7000 feet.

We also have a male nymph that seems to fall within the same genus, but presents the following differences¹:

Body testaceous yellow, brownish above. Antennae strong, mostly brown but with occasional yellow segments. Legs not as long; hind femora more bulging, getting thinner only in the apical third, the interior edge armed with a strong spine just before the extremity. Spines on the hind tibia very short. Fore and mid tibiae have the inferior edges covered with short hair, but without any proper spines. Legs and cerci tessellated brown.

Note: The description of this nymph appears to be a first mention of *Notoplectron brewsterense* (Richards, 1972) comb. nov.

English translation of the original description from the German language in:

Karny H. 1935. Die Gryllacrididen des Pariser Museum und der Collection L. Chopard. *Eos* 10(3-4): 383-385.

Isoplectron cochleatum sp. nov.

1 \circlearrowleft (Holotype), 1 \circlearrowleft (Allotype), New Zealand, Nelson, Filhol, 1876. 1 \circlearrowleft , 1 \hookrightarrow (Paratypes), no location given.

	Body length	Length of pronotum	Fore femur length	Mid femur length	Hind femur length	Hind tibia length	Length of ovipositor
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
♂ Holotype	16	3.7	7.5	7.6	?	?	-
♀ Allotype	9.5	2.8	4.2	4	9	8	6
♂ Paratype	18.3	4	?	?	?	?	-
♀ Paratype	10.3	4.2	5.4	4.5	?	?	10

The overall coloration of the body is shown in Figure 44 (♂ Paratype): the light areas are yellow-brown, while the dark areas are black or nearly black. The Holotype shows the same coloration. The ♀ Paratype shows the same colour pattern, only the dark regions are larger in places and less clearly delimited, giving the whole animal a darker look overall. The ♀ Allotype finally looks evenly coloured grey-brown when observed superficially; yet it shows a similar colour pattern when observed under a magnifying glass, only more faded out and less sharply delimited, the dark areas grey-brown and nowhere nearly as dark as in the other specimen. The noticeably less pronounced colour

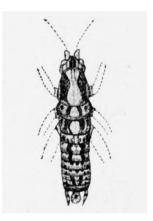


Fig. 44. - *Isoplectron cochleatum* Male Paratype. Enlarged one and a half times.

pattern can probably be explained by the fact that this is certainly a juvenile individual; I chose it nonetheless as Allotype, because it is the only one of the four specimen that has its hind legs. And as an asides, I am convinced that the four specimen belong to the same species. The colour of the legs is rust brown, marbled with very blurry and faded dark grey spots. The near end of the

femora is mainly light coloured, while the distal half is predominantly dark. The ovipositor is rusty yellow, barely darker at the tip.

The overall body build corresponds to the plump forms (of Rhaphidophoridae); in New Zealand it reminds of *Talitropsis* or *Neonetus* (see the figures in Brunner). It does not at all resemble the long-legged genera (*Pachyrhamma*, *Macropathus*, etc.) and from these at a first glance it differs even more strongly than from *Onosandrus*. This species (*I. cochleatum*) has nothing to do with the genus *Onosandrus* though, not only because of the shape of the legs, but also because of the immediately obvious sharp, deep longitudinal groove that divides the fastigium into two. The face has a broad oval shape when observed frontally; the frons is very wide, dark, entirely crossed in the middle by a yellow band that broadens at the lower end. The dark region of the frons is much reduced in the \mathcal{P} Paratype; the whole frons appears light-coloured. Cheeks and mandibles are light coloured, while the clipeus and the labium are darker than the mandibles, but lighter than the dark region of the frons; in the \mathcal{P} Paratype they are just as light as the mandibles. The palpus is relatively short and stout.

The pronotum is about as long as it is wide at its posterior edge; it is narrower in front, and has weakly rounded anterior and posterior margins. The lateral lobes are much longer than they are wide, with an almost linear, strongly inclined anterior margin, which gradually turns into the broadly rounded, obtuse-angled anterior corner. The inferior margin is weakly arced, distinctly ascending towards the rear, with a posterior corner that is strongly rounded and rightangled. The posterior margin of the pronotum is linear and does not have a shoulder-bight (?). The anterior coxae have a short, strong, sharp spine. The anterior femora are covered with rather appressed, short, thick hair; the knee pads are rounded and unarmed. The anterior tibiae are entirely unarmed above (even without apical thorns!), while underneath they have a pair of spines in the middle, one pair not far from the apex and one pair at the apex. The middle legs are very much like the anterior ones, only the interior knee pads are armed with a not very long but obvious, needle shaped, mobile spine, and the middle tibiae also have an interior dorsal apical spine. The hind femora are plump, cricket-like, about as long as the body, the apical end short and not too much narrower (than the basal end); in the distal half they are armed underneath and outside with three minute, then two somewhat larger, tooth-shaped, pointy spines. The inferior inner edge of the hind femora is armed near the apex with three spines about equal in size, only marginally larger than the larger ones on the outer edge. The hind tibiae are armed with seven pointy spines on the outside, eight on the inside; the first few spines are very small, while the remaining ones are well developed, the interior ones as long as the width of the tibia, the exterior ones a little shorter. The tarsi are short and compact. The hind metatarsi and the second tarsal

segments are armed dorsally with two well developed, large, pointy, paired apical spines; otherwise they are entirely unarmed.

The last tergite in the male is very thin on the sides, and is cut out with a deep arc over the base of each cercus; further inside it is shaped like a large, roughly equilateral triangle, transversely supported at the end. At the end and above there is a swelling oriented upwards, with a deep apical groove in the middle, on either side of which protrudes a knob oriented upwards and backwards. The cerci are cylindrical, thick and not very long, blunt at the end, barely reaching beyond the end of the subgenital plate. The styli are about one third in length and width compared to the cerci. The male subgenital plate is approximately square in the basal part, with blunt posterior corners, where the styli are inserted. From here it becomes suddenly narrower and on both sides strongly arced (almost semi-circular) on the edges, then it widens again in the shape of a spoon, forming a near circular apical lobe. The subgenital plate is divided in the middle on its whole length by a very sharp, almost leaf-vein lake longitudinal keel projecting downwards. This keel forks right at the base, forming a small, about equilateral triangle.

The ovipositor looks the same as in *Talitropsis* (see the figure in Brunner). The female subgenital plate is short, small, cut out at a right angle from the base to the extremity, with equilateral triangular lobes.

In light of its body build and spines on the legs this species belongs without doubt to the genus *Isoplectron*. It differs from other known species in this genus in its very distinctive genitalia.



Fig. S2. Pharmacus montanus Pictet and de Saussure, 1893, adult ♂. Holotype. Collected by George Mannering in the surrounds of Aoraki / Mount Cook (MHNG ARTO-24289). Image courtesy of Peter J. Schwendinger, Curator, Department of Arthropodology and Entomology I, MHNG.

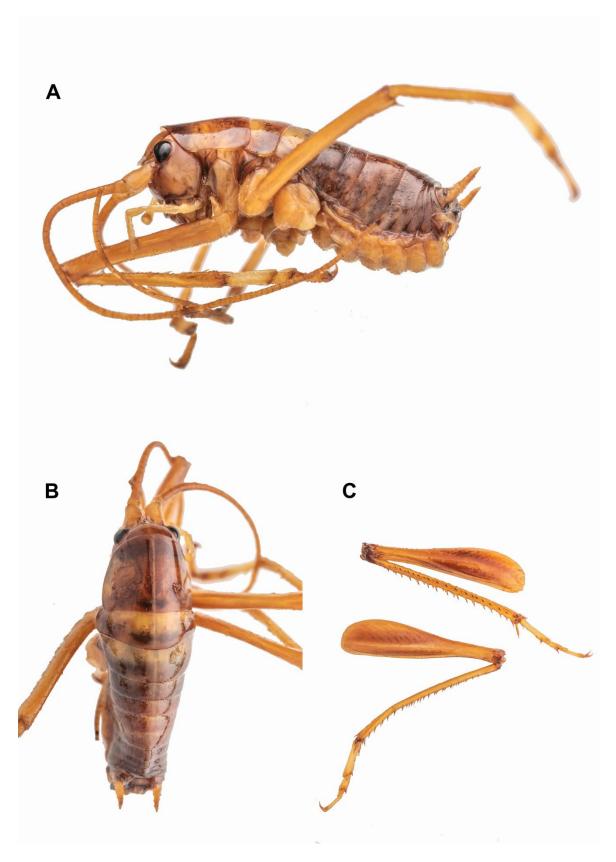


Fig. S3. *Pharmacus dumbletoni* Richards, 1972, adult ♂. Holotype. Collected by L.J. Dumbleton on Mount Mahanga, Spenser Mountains, in October 1950 (NZAC 03015679). A. Lateral view B. Dorsal view. C. Hind legs, lateral (exterior) view.



Fig. S4. *Pharmacus chapmanae* Richards, 1972. Bevan Col, Matukituki Valley. A. Holotype, adult ♂ (OMNZ IV7927; prev. OMNZ A70:6). B. Allotype, adult ♀ (OMNZ IV7924; prev. OMNZ A70:8).

Table S1. Material examined of *Pharmacus montanus* Pictet and de Saussure, 1893. All specimens collected in New Zealand. Collector abbreviations: DH = Danilo Hegg, GM = George Mannering, LJD = Lionel Jack Dumbleton.

Entomological Region	Material	Locality	Coordinates	Elevation m a.s.l.	Micro-habitat	Collecting method	Date	Collector	Institution code	Specimen code
MK (Mackenzie)	10	Mount Cook region	43.75°S, 170.06°E	2,100				GM	MHNG	ARTO-24289
BR (Buller)	18	Mount Mahanga, Spenser Mountains	42.102°S, 172.635°E	2,100			Oct. 1950	LJD	NZAC	03015679 (<i>Pharmacus dumbletoni</i> holotype)
MK (Mackenzie)	1♀	Mt Annette, Sealy Range	43.75129°S, 170.06210°E	2,200	Summit rocks, above glacier	Night search	25 Feb. 2017	DH	MPN; GenBank	CW3303; OM293693
MK (Mackenzie)	1♂,1♀				Same as above				MPN	CW3302, CW3323
MK (Mackenzie)	18	Mueller Hut Track, Sealy Range	43.71504°S, 170.06982°E	1,500	Under large boulder	Night search + insect net	24 Feb. 2017	DH	MPN; GenBank	CW3300; OM293692
MK (Mackenzie)	3්්්, 2nymphs				Same as above				MPN	CW3299, CW3532 – 3535
MK (Mackenzie)	1nymph	Mt Wakefield, Mount Cook Range	43.70707°S, 170.12170°E	1,660	On bluffs	Night search + insect net	18 Mar. 2017	DH	MPN; GenBank	CW3330; OM293695
MK (Mackenzie)	4♀♀, 1nymph				Same as above				MPN	CW3331, CW3406, CW3660 – 3662
MK (Mackenzie)	1♀, 1nymph	Mt Wakefield, Mount Cook Range	43.71989°S, 170.12771°E	1,750	On rocky ridge	Night search + insect net	13 May 2017	DH	MPN	CW3516, CW3699
NC / WD (North Canterbury / Westland)	1nymph	Lake Anna, Mt Franklin, Arthur's Pass	42.87567°S, 171.65048°E	1,720	On bluffs	Night search	23 Dec. 2017	DH	MPN; GenBank	CW3650; OM293702
NC / WD (North Canterbury / Westland)	1♂,1♀				Same as above				MPN	CW3988, CW3989
BR (Buller)	1♂	Gloriana Peak, Spenser Mountains	42.27437°S, 172.48992°E	1,750	On bluffs	Night search + insect net	5 Feb. 2017	DH	MPN; GenBank	CW3262; OM293689
BR (Buller)	1♂, 1♀, 2nymphs				Same as above				MPN	CW3263 – 3266
BR (Buller)	4♂♂,2♀♀			Same as above			25 Apr. 2017	DH	MPN	CW3656 – 3659, CW3665, CW3666
NN (Nelson)	19	Poverty Basin, Mount Owen	41.54712°S, 172.52864°E	1,640	On bluffs	Night search + insect net	8 Jan. 2019	DH	MPN; GenBank	CW4275; OM293708
NN (Nelson)	4♂♂, 1♀, 4nymphs				Same as above				MPN	CW4272, CW4273, CW4446 – 4450, CW4456, CW4457

Table S1 Continued. Material examined of *Pharmacus montanus* Pictet and de Saussure, 1893. All specimens collected in New Zealand. Collector abbreviations: DH = Danilo Hegg, GM = George Mannering, LJD = Lionel Jack Dumbleton

Entomological Region	Material	Locality	Coordinates	Elevation m a.s.l.	Micro-habitat	Collecting method	Date	Collector	Institution code	Specimen code
MK (Mackenzie)	1nymph				Same as above				MPN	CW4875
BR (Buller)	19	Sunset Saddle / Mt Hopeless, Travers Range	41.91926°S, 172.73519°E	1,900	In rocky chasm	Visual search in daylight	31 Dec. 2020	DH	MPN	CW5183

Table S2. Material examined of *Pharmacus cochleatus cochleatus* (Karny, 1935) comb. nov.. All specimens collected in New Zealand. Collector abbreviations: MAC = Margaret Ann Chapman, HF = Henri Filhol, DH = Danilo Hegg.

Entomological Region	Material	Locality	Coordinates	Elevation m a.s.l.	Micro-habitat	Collecting method	Date	Collector	Institution code	Specimen code
Unknown	1♂	Unknown	Unknown				1876	HF	MNHN	EO-ENSIF4926 (Holotype)
Unknown	10	Unknown	Unknown				1876	HF	MNHN	EO-ENSIF4928 (Paratype)
OL / WD (Otago Lakes / Westland)	1♂	Bevan Col, Matukituki Valley	44.393°S, 168.689°E	1,850			Dec. 1958	MAC	OMNZ	IV7927 (<i>P. chapmanae</i> holotype)
OL / WD (Otago Lakes / Westland)	1 ♀				Same as above				OMNZ	IV7924 (<i>P. chapmanae</i> allotype)
OL / WD (Otago Lakes / Westland)	13	Bevan Col, Matukituki Valley	44.39424°S, 168.68760°E	1,850	Rock bluffs	Night search + insect net	29 Jan. 2021	DH	MPN; GenBank	CW5179; OM293736
OL / WD (Otago Lakes / Westland)	1♂,1♀				Same as above				MPN	CW5178, CW5180
OL (Otago Lakes)	1♀, 1nymph	100m below Bevan Col, Matukituki Valley	44.39546°S, 168.68503°E	1,750	Rock slabs	Casual find while climbing	29 Jan. 2021	DH	MPN	CW5181, CW5182
OL (Otago Lakes)	13	Sentinel Peak, Lake Hāwea	44.40236°S, 169.23499°E	1,760	On rocks on sides of snow couloir	Casual find, Photograph only	20 Dec. 2015	DH	iNaturalist	<u>2494265</u>
OL (Otago Lakes)	13	Sentinel Peak, Lake Hāwea	44.41029°S, 169.24003°E	1,580	Rocky ridge	Night search + insect net	5 Dec. 2020	DH	MPN; GenBank	CW5134; OM293731
OL (Otago Lakes)	2♂♂, 2nymphs				Same as above				MPN	CW5132, CW5133, CW5135, CW5136
OL (Otago Lakes)	19	Luna Basin, Major Peak, Wakatipu	44.92490°S, 168.47476°E	1,470	On large rocks in alpine basin	Night search	9 Apr. 2016	DH	MPN; GenBank	CW2985; OM293686
OL (Otago Lakes)	3♂♂,1♀				Same as above				MPN	CW2979, CW2981, CW2999, CW3000
MK (Mackenzie)	19	Dasler Pinnacles, Naumann Range	43.95237°S, 169.86241°E	1,800	On rock bluffs	Night search	14 Jan. 2017	DH	MPN; GenBank	CW3284; OM293691
MK (Mackenzie)	3♂♂				Same as abvove				MPN	CW3283, CW3285, CW3296
MK (Mackenzie)	1♂	Mt Edgar Thomson, Ben Ōhau Range	43.78252°S, 170.05561°E	2,350	On mixed rock- snow ridge	Casual find while climbing	28 Jan. 2017	DH	MPN; GenBank	CW3278; OM293690
WD (Westland)	19	Topheavy, Mt Brewster, Haast Pass	44.06548°S, 169.42843°E	2,000	On rocky ridge above glacier	Night search	18 Feb. 2017	DH	MPN; GenBank	CW3322; OM293694

Table S2 Continued. Material examined of *Pharmacus cochleatus cochleatus* (Karny, 1935) comb. nov.. All specimens collected in New Zealand. Collector abbreviations: MAC = Margaret Ann Chapman, HF = Henri Filhol, DH = Danilo Hegg.

Entomological Region	Material	Locality	Coordinates	Elevation m a.s.l.	Micro-habitat	Collecting method	Date	Collector	Institution code	Specimen code
WD (Westland)	2♂♂,5♀♀				Same as above				MPN	CW3277, CW3279 – 3282, CW3324, CW3325
OL (Otago Lakes)	19	Lochnagar, Richardson Mountains	44.59627°S, 168.56400°E	2,080	On rocks on sides of snow couloir	Casual find while climbing	21 Sep. 2019	DH	MPN; GenBank	CW4590; OM293726
CO (Central Otago)	1♂	Mt Pisa, Pisa Range	44.88278°S, 169.19500°E	1,650	On rocky tors	Night search + insect net	27 Feb. 2018	DH	MPN; GenBank	CW3831; OM293705
CO (Central Otago)	4♂♂,5♀♀, 2nymphs				Same as above				MPN	CW3795 – 3797, CW3828 – 3830, CW3847 – 3851
OL (Otago Lakes)	1nymph	Coronet Peak, Queenstown	44.91774°S, 168.73423°E	1,540	On rock formations	Night search + insect net	18 Jan. 2019	DH	MPN; GenBank	CW4288; OM293709
OL (Otago Lakes)	5♂♂,3♀♀				Same as above				MPN	CW4414 – 4418, CW4432 – 4434
OL (Otago Lakes)	2♂♂	Earnslaw Burn	44.67482°S, 168.39371°E	1,280	Rocky ridge and cliffs	Night search + insect net	13 Nov. 2020	DH	MPN; GenBank	CW5149, CW5150; OM293733, OM293734
OL (Otago Lakes)	1♂,1♀, 2nymphs				Same as above				MPN	CW5151 – 5154
OL (Otago Lakes)	1 nymph	Turret Head, Earnslaw Burn	-44.65757°S, 168.37977°E	2,300	On rocky ridge	Causal find while climbing	2 Feb. 2021	DH	MPN; GenBank	CW5176; OM293735
OL (Otago Lakes)	1 nymph				Same as above		,		MPN	CW5175
OL (Otago Lakes)	3♂♂,1♀, 1nymph	Turret Head, Earnslaw Burn	44.65681°S, 168.38646°E	2,100	On rock bluffs	Night search + insect net	2 Feb. 2021	DH	MPN	CW5244 – 5247, CW5177
OL (Otago Lakes)	1♀	Roys Peak, Wānaka	44.69477°S, 169.04644°E	1,500	Rock bluffs	Night search + insect net	19 Nov. 2020	DH	MPN; GenBank	CW5137; OM293732
OL (Otago Lakes)	5♂♂,2♀♀, 2nymphs				Same as above				MPN	CW5138 – 5144, CW5147, CW5148
OL (Otago Lakes)	1♂,2♀♀, 5nymphs	Albertburn Saddle	44.39752°S, 168.87310°E	1,600	Rock bluffs	Night search + insect net	5 Feb. 2021	DH	MPN	CW5170 – 5174, CW5238 – 5240
OL (Otago Lakes)	2♂♂,1♀	East Matukituki / Albert Burn divide	44.36994°S, 168.8887°E	1,830	Rock bluffs	Night search + insect net	6 Feb. 2021	DH	MPN	CW5241 – 5243
OL (Otago Lakes)	2 ♀♀	French Ridge, Matukituki Valley	44.42520°S, 168.69874°E	1,800	Rocky ridge	Night search + insect net	20 Feb. 2021	DH	MPN	CW5207, CW5208

Table S3. Material examined of *Pharmacus cochleatus nauclerus* subsp. nov.. All specimens collected in New Zealand. Collector abbreviations: DH = Danilo Hegg.

Entomological Region	Material	Locality	Coordinates	Elevation m a.s.l.	Micro-habitat	Collecting method	Date	Collector	Institution code	Specimen code
WD (Westland)	18	Skippers Range	44.50459°S, 168.12086°E	1,400	Rock bluffs	Night search	7 Feb. 2019	DH	NMNZ	AI.052288 (Holotype) (Previously MPN CW4412)
WD (Westland)	1nymph				Same as holotype				MPN; GenBank	CW4361; OM293710
WD (Westland)	2♀♀				Same as holotype				MPN	CW4379, CW4380
WD (Westland)	1♀	Skippers Range High Point	44.43914°S, 168.16515°E	1,600	Scree and rock bluffs	Night search	3 Feb. 2019	DH	NMNZ	AI.052289 (Paratype) (Previously MPN CW4376)
WD (Westland)	1nymph				Same as paratype				MPN; GenBank	CW4363; OM293711
WD (Westland)	1♂,1♀, 1nymph	Skippers Range	44.42005°S, 168.15399°E	1,360	Rock bluffs	Night search	2 Feb. 2019	DH	MPN	CW4366, CW4378, CW4413
WD (Westland)	10	Skippers Range	44.46821°S, 168.10095°E	1,200	Rock bluffs	Night search	6 Feb. 2019	DH	MPN; GenBank	CW4374; OM293713
WD (Westland)	2♂♂,1♀		Same as above							CW4377, CW4410, CW4411

Table S4. Material examined of *Pharmacus cochleatus fiordensis* subsp. nov.. All specimens collected in New Zealand. Collector abbreviations: DH = Danilo Hegg, TJ = Tony Jewell.

Entomological Region	Material	Locality	Coordinates	Elevation m a.s.l.	Micro-habitat	Collecting method	Date	Collector	Institution code	Specimen code
FD (Fiordland)	1♂	Gertrude Saddle, Darran Mountains	44.74521°S, 168.01649°E	1,300	On rock bluffs	Night search	25 Mar. 2017	DH	NMNZ; GenBank	AI.052286 (Holotype) (Previously MPN CW3413); OM293697
FD (Fiordland)	1nymph				Same as holotype				MPN	CW3412
FD (Fiordland)	10	Mount Luxmore, Kepler Mountains	45.38929°S, 167.59154°E	1,350	Rock bluffs	Night search + insect net	22 Mar. 2019	DH	NMNZ	AI.052287 (Paratype) (Previously MPN CW4398)
FD (Fiordland)	10				Same as paratype				MPN; GenBank	CW4397; OM293718
FD (Fiordland)	3 nymphs			MPN	CW4547 – 4549					
FD (Fiordland)	19	Homer Saddle, Darran Mountains	44.760°S <i>,</i> 167.983°E	1,200	In dry cracks in rock bluff	Hand collected, in daylight	Jan. 2014	ΤJ	MPN	CW2611
OL (Otago Lakes)	19	Emily Peak, Ailsa Mountains	44.74594°S, 168.20446°E	1,800	On snowgrass	Casual find, Photograph only	14 Feb. 2015	DH	iNaturalist	<u>2421936</u>
OL (Otago Lakes)	10	Ocean Peak, Ailsa Mountains	44.75041°S, 168.17270°E	1,300	On large rocks in alpine basin	Night search	29 Oct. 2016	DH	MPN; GenBank	CW3135; OM293687
OL (Otago Lakes)	1♂,3♀♀, 1nymph				MPN	CW3133, CW3134, CW3136, CW3137, CW4127				
OL (Otago Lakes)	19	Humboldt Mountains	44.74356°S, 168.21742°E	1,800	On rock bluffs	Night search	8 Apr. 2017	DH	MPN; GenBank	CW3405; OM293696
OL (Otago Lakes)	18				Same as above				MPN	CW3411

Table S5. Material examined of *Pharmacus cochleatus rawhiti* subsp. nov.. All specimens collected in New Zealand. Collector abbreviations: DH = Danilo Hegg

Entomological Region	Material	Locality	Coordinates	Elevation m a.s.l.	Micro-habitat	Collecting method	Date	Collector	Institution code	Specimen code
CO (Central Otago)	10	Mt Tūwhakarōria, Hector Mountains	45.12771°S, 168.82939°E	2,000	On large boulder	Night search + insect net	25 Apr. 2019	DH	NMNZ	AI.052290 (Holotype) (Previously MPN CW4429)
CO (Central Otago)	19				Same as holotype				MPN; GenBank	CW4395; OM293717
CO (Central Otago)	3♂♂,1♀				Same as holotype				MPN	CW4396, CW4428, CW4430, CW4431
CO (Central Otago)	19	James Peak, Hector Mountains	45.26417°S, 168.81555°E	1,600	Cracks in rock tors	Night search + insect net	17 Feb. 2018	DH	NMNZ	Al.052291 (Paratype) (Previously MPN CW3833)
CO (Central Otago)	2♂♂				Same as paratype				MPN; GenBank	CW3769, CW3838; OM293704, OM293706
CO (Central Otago)	2♂♂,3♀♀, 1nymph				Same as paratype				MPN	CW3770, CW3832, CW 3834 – 3837
CO (Central Otago)	19	Gem Lake, Umbrella Mountains	45.57097°S, 169.10525°E	1,300	Boulder field	Night search + insect net	13 Apr. 2019	DH	MPN; GenBank	CW4465; OM293720
CO (Central Otago)	5♂♂,1♀				Same as above				MPN	CW4466 – 4471
CO (Central Otago)	19	Blue Lake Creek, Garvie Mountains	45.46778°S, 168.95290°E	1,280	On rock tors	Night search + insect net	21 Apr. 2019	DH	MPN; GenBank	CW4425; OM293719
CO (Central Otago)	6♂♂,3♀♀, 3nymphs				Same as above				MPN	CW4424, CW4426, CW4427, CW4458 – 4464, CW4510, CW4511
OL (Otago Lakes)	1nymph	Cerberus, Livingstone Mountains	45.28570°S, 168.14069°E	1,460	On rocky outcrop	Night search	26 Jun. 2020	DH	MPN; GenBank	CW4895; OM293730
OL (Otago Lakes)	19	Mt Turnbull, Thomson Mountains	45.13566°S, 168.32134°E	1,600	On rock bluffs	Night search + insect net	15 Jan. 2021	DH	MPN; GenBank	CW5193; OM293737
OL (Otago Lakes)	8 877, 2 99				Same as above				MPN	CW5184 – 5192, CW5194
CO (Central Otago)	2♂♂,1♀	Lake Alta, The Remarkables	45.06176°S, 168.81096°E	1,820	On large boulder	Night search + insect net	26 Mar. 2021	DH	MPN	CW5219 – 5221

Table S6. Material examined of *Pharmacus cristatus* sp. nov.. All specimens collected in New Zealand. Collector abbreviations: DH = Danilo Hegg, TJ = Tony Jewell

Entomological Region	Material	Locality	Coordinates	Elevation m a.s.l.	Micro-habitat	Collecting method	Date	Collector	Institution code	Specimen code
WD (Westland)	18	Skippers Range High Point	44.43914°S, 168.16515°E	1,520	On rock bluffs	Night search	3 Feb. 2019	DH	NMNZ	AI.052292 (Holotype) (Previously MPN CW4561)
WD (Westland)	19				Same as holotype				NMNZ	AI.052293 (Paratype) (Previously MPN CW4486)
WD (Westland)	19				Same as holotype				MPN; GenBank	CW4485; OM293723
WD (Westland)	1♂, 1♀, 2nymphs				Same as holotype				MPN	CW4365, CW4376, CW4484, CW4562
WD (Westland)	18	Skippers Range	44.46821°S, 168.10095°E	1,200	On rock bluffs	Night search	6 Feb. 2019	DH	MPN; GenBank	CW4563; OM293725
WD (Westland)	1nymph	Skippers Range	44.50459°S, 168.12086°E	1,400	On rock bluffs	Night search	7 Feb. 2019	DH	MPN; GenBank	CW4364; OM293712
FD (Fiordland)	2♂♂	Homer Saddle, Darran Mountains	44.760°S, 167.983°E	1,200	In dry cracks in rock bluff	Hand collected, in daylight	Jan. 2014	ĽΤ	MPN; GenBank	CW2607, CW2610; OM293684, OM293685
FD (Fiordland)	1♀, 1nymph				Same as above				MPN	CW2608, CW2609
FD (Fiordland)	1nymph	Gertrude Saddle, Darran Mountains	44.74521°S, 168.01649°E	1,300	On rock bluffs	Night search	25 Mar. 2017	DH	MPN; GenBank	CW3415A; OM293698
FD (Fiordland)	2්්්්, 2nymphs				Same as above				MPN	CW3398, CW3399, CW3414, CW3415B
FD (Fiordland)	13	Mistake Creek, Earl Mountains	44.85123°S, 168.02471°E	1,000	Under boulder	Night search	21 Apr. 2017	DH	MPN; GenBank	CW3431; OM293700

Table S7. Material examined of *Pharmacus notabilis* sp. nov.. All specimens collected in New Zealand. Collector abbreviations: DH = Danilo Hegg, TJ = Tony Jewell

Entomological Region	Material	Locality	Coordinates	Elevation m a.s.l.	Micro-habitat	Collecting method	Date	Collector	Institution code	Specimen code
CO (Central Otago)	1♂	Remarkables Ski-field Access Road	45.02651°S, 168.79748°E	1,220	Boulders in road escarpment	Night search + insect net	12 May 2017	DH	NMNZ	AI.052296 (Holotype) (Previously MPN CW3528)
CO (Central Otago)	10				Same as holotype				MPN; GenBank	CW3509; OM293701
CO (Central Otago)	3♂♂,3♀♀, 5nymphs				Same as holotype				MPN	CW3510 – 3513, CW3524 – 3527, CW3529 – 3431
CO (Central Otago)	10	Two Mile Hut, Hector Mountains	45.17392°S, 168.80270°E	1,460	Large boulders	Night search + insect net	26 Apr. 2019	DH	NMNZ	AI.052297 (Paratype) (Previously MPN CW4394)
CO (Central Otago)	1♂				Same as paratype				MPN; GenBank	CW4391; OM293716
CO (Central Otago)	2♂♂, 1nymph				Same as paratype				MPN	CW4392, CW4393, CW4500
CO (Central Otago)	2♂♂	Remarkables North ridge	45.0413°S, 168.7977°E	1,600	Cracks in rock bluffs		Jan. 2013	ŢĴ	MPN; GenBank	CW2587, CW2589; OM293682, OM293683
CO (Central Otago)	1♂,5♀♀				Same as above				MPN	CW2588, CW2590 – 2594

Table S8. Material examined of *Pharmacus senex* sp. nov.. All specimens collected in New Zealand. Collector abbreviations: DH = Danilo Hegg, SAT = Steve Trewick, TJ = Tony Jewell.

Entomological Region	Material	Locality	Coordinates	Elevation m a.s.l.	Micro-habitat	Collecting method	Date	Collector	Institution code	Specimen code
CO (Central Otago)	18	Near Obelisk, Old Man Range	45.32567°S, 169.20826°E	1,680	Cracks in rock tors	Night search + insect net	1 Dec. 2017	DH	NMNZ	AI.052294 (Holotype) (Previously MPN CW3867)
CO (Central Otago)	8순순, 7우우, 4nymphs				Same as holotype				MPN	CW3860 – 3866, CW3868 – 3879,
CO (Central Otago)	19	Old Woman Range	45.23048°S, 169.05058°E	1,630	Cracks in rock tors	Night search + insect net	3 May 2019	DH	NMNZ	AI.052295 (Paratype) (Previously MPN CW4408)
CO (Central Otago)	1♂				Same as paratype				MPN; GenBank	CW4389; OM293715
CO (Central Otago)	4♂♂,3♀♀, 3nymphs				MPN	CW4386 – 4388, CW4390, CW4406 – 4407, CW4409, CW4491 – 4493				
CO (Central Otago)	10	The Obelisk, Old Man Range	45.323°S, 169.207°E	1,680	Cracks in rock tors		21 Jan. 2014	SAT	MPN; GenBank	CW279; OM293676
CO (Central Otago)	1♂				Same as above				MPN; GenBank	CW284B; OM293677
CO (Central Otago)	19				Same as above				MPN; GenBank	CW285; OM293678
CO (Central Otago)	1♂, 2♀♀, 1nymph				Same as above				MPN	CW278A, B, CW280, CW284A
CO (Central Otago)	19	Near Obelisk, Old Man Range	45.334°S, 169.210°E	1,650	Cracks in rock tors		Jan. 2013	ŢĴ	MPN; GenBank	CW2580; OM293680
CO (Central Otago)	1♂				Same as above				MPN; GenBank	CW2582; OM293681
CO (Central Otago)	1♂,1♀				MPN	CW2581, CW2583				
CO (Central Otago)	1♂	Dunstan, Dunstan Mountains	45.04471°S, 169.37418°E	1,670	Cracks in rock tors	Night search + insect net	10 May 2019	DH	MPN; GenBank	CW4382; OM293714
CO (Central Otago)	4강강, 4우우, 4nymphs				Same as above				MPN	CW4381, CW4383 – 4385, CW4402 – 4405, CW4506 – 4509

Table S9. Material examined of *Pharmacus concinnus* sp. nov.. All specimens collected in New Zealand. Collector abbreviations: DH = Danilo Hegg, MT = Mike Thorsen

Entomological Region	Material	Locality	Coordinates	Elevation m a.s.l.	Micro-habitat	Collecting method	Date	Collector	Institution code	Specimen code
OL (Otago Lakes)	1♂	Symmetry Peaks, Eyre Mountains	45.27797°S, 168.59113°E	1,500	Rock tor	Night search + insect net	12 May 2018	DH	NMNZ	Al.052298 (Holotype) (Previously MPN CW3853)
OL (Otago Lakes)	1♀				Same as holotype				NMNZ	AI.052299 (Paratype) (Previously MPN CW3843)
OL (Otago Lakes)	1nymph				Same as holotype				MPN; GenBank	CW4023A; OM293707
OL (Otago Lakes)	1♂, 1♀, 4nymphs		Same as holotype						MPN	CW3842, CW3852, CW4023B–E
OL (Otago Lakes)	19	Eyre Peak, Eyre Mountains	45.33260°S, 168.47225°E	1,500	On rock bluffs	Night search + insect net	16 Feb. 2019	DH	MPN; GenBank	CW4477; OM293722
OL (Otago Lakes)	4♂♂,3♀♀, 1nymph				Same as above				MPN	CW4367, CW4476, CW4478 – 4483
OL (Otago Lakes)	19	Mount Dick, Eyre Mountains	45.26572°S, 168.69083°E	1,550	On rock bluffs	Night search + insect net	16 Mar. 2019	DH	MPN; GenBank	CW4472; OM293721
OL (Otago Lakes)	4♂♂,3♀♀, 2nymphs				Same as above				MPN	CW4473 – 4475, CW4501 – 4504, CW4592, CW4593
OL (Otago Lakes)	19	Billy Creek, Eyre Mountains	45.30540°S, 168.45460°E	1,400	On rock bluffs	Casual find	23 Feb. 2020	MT	MPN; GenBank	CW4874; OM293727
OL (Otago Lakes)	1 9				Same as above				MPN	CW4873

Table S10. Material examined of *Pharmacus perfidus* sp. nov.. All specimens collected in New Zealand. Collector abbreviations: DH = Danilo Hegg

Entomological Region	Material	Locality	Coordinates	Elevation m a.s.l.	Micro-habitat	Collecting method	Date	Collector	Institution code	Specimen code
SL (Southland)	1♂	Spence Peak, Takitimu Mountains	45.70540°S, 167.85058°E	1,450	On rocky ridge	Night search + insect net	30 Mar. 2019	DH	NMNZ	AI.052300 (Holotype) (Previously MPN CW4497)
SL (Southland)	19	Same as holotype							NMNZ	Al.052301 (Paratype) (Previously MPN CW4488)
SL (Southland)	10	Same as holotype							MPN; GenBank	CW4490; OM293724
SL (Southland)	5♂♂,2♀♀, 3nymphs	Same as holotype							MPN	CW4487, CW4489, CW4494 – 4496, CW4498, CW4499, CW4553 – 4555
SL (Southland)	10	Clare Peak, Takitimu Mountains	45.63303°S, 167.94057°E	1,300	On rock bluffs	Night search + insect net	23 May 2020	DH	MPN; GenBank	CW4877; OM293729
SL (Southland)	3♂♂, 1nymph	Same as above							MPN	CW4878 – 4881
SL (Southland)	1්ල් [dead]	Clare Peak, Takitimu Mountains	45.63516°S, 167.91564°E	1,340	On snow slope	Casual find while climbing	6 June 2021	DH	MPN	CW5257

Table S11. Material examined of *Pharmacus vallestris* sp. nov.. All specimens collected in New Zealand. Collector abbreviations: DH = Danilo Hegg

Entomological Region	Material	Locality	Coordinates	Elevation m a.s.l.	Micro-habitat	Collecting method	Date	Collector	Institution code	Specimen code
OL (Otago Lakes)	18	French Ridge, Matukituki Valley	44.42560°S, 168.69784°E	1,650	On rocky ridge	Night search + insect net	20 Feb. 2021	DH	NMNZ	AI.052302 (Holotype) (Previously MPN CW5214)
OL (Otago Lakes)	1♂,1♀	Same as holotype							MPN	CW5213, CW5215
OL (Otago Lakes)	1♀, 1nymph	French Ridge, Matukituki Valley	44.42520°S, 168.69871°E	1,700	On rocky ridge	Night search + insect net	22 Nov. 2020	DH	MPN	CW5145, CW5146
OL (Otago Lakes)	19	Matukituki River West Branch	44.41637°S, 168.69130°E	1,100	Under boulder	Night search	6 May 2017	DH	NMNZ; GenBank	AI.052303 (Paratype) (Previously MPN CW3430); OM293699
OL (Otago Lakes)	1♂	Same as paratype							MPN; GenBank	CW3700; OM293703

Table S12. Alpine locations searched, where no *Pharmacus* were found

Entomological Region	Locality	Coordinates	Elevation m a.s.l.	Date	Species of Rhaphidophoridae found
FD (Fiordland)	Merrie Range, Tamatea Peak	45.692°S, 167.168°E	1,600	4 Jan. 2018	Notoplectron brewsterense (Richards, 1972) comb. nov.
SL (Southland)	Blue Mountains	45.898°S, 169.380°E	870	7 Dec. 2019	_
DN (Dunedin)	Silverpeaks	45.746°S, 170.453°E	760	Multiple searches 2016 – 2020	Setascutum pallidum Richards, 1972
CO (Central Otago)	Rock and Pillar Range, Summit Rock	45.425°S, 170.071°E	1,450	Multiple searches 2016 – 2020	Talitropsis chopardi (Karny, 1937)
CO (Central Otago)	Rock and Pillar Range, Museum Rock	45.461°S, 170.048°E	1,380	Multiple searches 2016 – 2020	Talitropsis chopardi (Karny, 1937)
CO (Central Otago)	Old Man Range, Waikaia Bush Rd	45.448°S, 169.228°E	1,300	Apr. 2019	_
CO (Central Otago)	Old Man Range, near Duffers Saddle	45.163°S, 169.077°E	1,300	27 Nov. 2016, 7 May 2017	Setascutum pallidum Richards, 1972
CO / OL (Central Otago / Otago Lakes)	Crown Range Road, high point	44.983°S, 168.940°E	1,150	14 Nov. 2020	Setascutum pallidum Richards, 1972
CO (Central Otago)	Mt St Bathans	44.718°S, 169.77°E	1,650	8 Mar. 2019	Isoplectron sp.
CO (Central Otago)	St Bathans Range, Hidden Lake	44.646°S, 169.763°E	1,600	9 Mar. 2019	Talitropsis chopardi (Karny, 1937); Isoplectron sp.
CO (Central Otago)	St Marys Range, Mt Kyeburn	44.954°S, 170.312°E	1,200	16 Jan. 2017, 16 Apr. 2017	Setascutum pallidum Richards, 1972; Isoplectron sp.
SC (South Canterbury)	Mt Peel	43.863°S, 171.181°E	1,400	19 Apr. 2019	Petrotettix serratus Richards, 1972
MC (Mid Canterbury)	Mt Somers	43.607°S, 171.363°E	1,300	12 Dec. 2020	Petrotettix serratus Richards, 1972
MC (Mid Canterbury)	Taylor Range, Round Hill Creek	43.431°S, 171.297°E	1,450	4 Dec. 2016	Petrotettix serratus Richards, 1972
MC (Mid Canterbury)	Craigieburn Range, Hamilton Peak	43.113°S, 171.688°E	1,900	11 Feb. 2017	Petrotettix serratus Richards, 1972
MC (Mid Canterbury)	Torlesse Range, The Gap	43.253°S, 171.780°E	1,600	20 Nov. 2016	Petrotettix serratus Richards, 1972

Table S12. Continued. Alpine locations searched, where no *Pharmacus* were found

Entomological Region	Locality	Coordinates	Elevation m a.s.l.	Date	Species of Rhaphidophoridae found
NC (North Canterbury)	Organ Range, Mt Skedaddle	42.680°S, 172.508°E	1,650	20 Dec. 2016	Petrotettix serratus Richards, 1972
KA (Kaikōura)	Seaward Kaikōura Range, Kahutara Saddle	42.322°S, 173.430°E	1,300	4 Jan. 2017; 1 Apr. 2017	Petrotettix serratus Richards, 1972; Pleioplectron rodmorrisi Hegg et al. 2019
KA (Kaikōura)	Inland Kaikōura Range, Tapuae-o-Uenuku	41.996°S, 173.663°E	1,500 to 2,400	5 Apr. 2018	Petrotettix nigripes Richards, 1972; Pleioplectron rodmorrisi Hegg et al. 2019
MB (Marlborough)	Mt Altimarloch	41.753°S, 173.776°E	1,650	23 Oct. 2016, 6 Jan. 2017	Petrotettix nigripes Richards, 1972; Macropathus sp.
MB (Marlborough)	Richmond Range, Mt Richmond	41.474°S, 173.395°E	1,700	21 Oct. 2018	Petrotettix nigripes Richards, 1972
BR (Brunner)	Paparoa Range, Croesus Knob	42.290°S, 171.378°E	1,200	5 Apr. 2019	-
BR (Brunner)	Paparoa Range, Mt Faraday	42.037°S, 171.575°E	1,400	12-13 Feb. 2021	-
BR (Brunner)	Paparoa Range, Buckland Peaks	41.882°S, 171.640°E	1,300	8 Dec. 2018	-
NN (Nelson)	Mt Arthur, Kahurangi NP	41.220°S, 172.682°E	1,700	12 Jan. 2021	Macropathus filifer Walker, 1869
TK (Taranaki)	Taranaki, Fanthams Peak	39.310°S, 174.067°E	1,950	12 Mar. 2020	_
TK (Taranaki)	Taranaki, Summit Crater	39.298°S, 174.063°E	2,450	13 Mar. 2020	-