

The Pselaphini (Coleoptera: Staphylinidae: Pselaphinae) of the Subantarctic and Chatham Islands of New Zealand; Description of Five Species and One Genus

Brittany E. Owens,^{1,4} Richard A. B. Leschen,² and Christopher Carlton³

¹Department of Entomology, Louisiana State University Agricultural Center, 404 Life Sciences Building, Baton Rouge, LA 70803,

²Maanaki Whenua – Landcare Research, New Zealand Arthropod Collection, Private Bag 92 170, Auckland, New Zealand,

³Department of Entomology, Louisiana State University, Baton Rouge, LA, and ⁴Corresponding author, e-mail: brittanyewens@gmail.com

Subject Editor: Bjarte Jordal

Received 4 February, 2019; Editorial decision 30 June 2019

Abstract

The staphylinid subfamily Pselaphinae is generally depauperate at high latitudes. We examine one exception, the tribe Pselaphini, at the southern extreme of its global distribution, the New Zealand subantarctic islands and the Chatham Islands, an archipelago farther north. Currently, only two species are known from remote Campbell Island (*Pselaphotheseus hippolytae* Park and *P. ihupuku* Carlton and Leschen). A new genus, *Pselaphopluteum* **gen. nov.** (type species, *Pselaphopluteum motumaha* **sp. nov.**) and two new species, *Pselaphopluteum motumaha* **sp. nov.** and *Pselaphaulax dracophyllum* **sp. nov.**, from the Auckland Islands, are added to the subantarctic fauna. *Pselaphophus atriventris* Westwood, introduced from Australia, is currently the only species known from the Chatham Islands, although several unidentified species were noted by Emberson (Emberson, R. M. 2002. The beetle (Coleoptera) fauna of the Chatham Islands: additions and corrections. N.Z. Entomol. 25: 69–77.). Three new species are described from the Chatham islands: *Pselaphaulax caeruleus* **sp. nov.**, *Pselaphaulax flavus* **sp. nov.**, and *Pselaphaulax traversi* **sp. nov.** Potential biogeographic implications of these new taxa are discussed within the context of the overall New Zealand fauna of Pselaphini, which is the subject of ongoing study.

Key words: Pselaphini, island, biodiversity, endemic

The tribe Pselaphini is a diverse, monophyletic taxon of pselaphine staphylinid beetles (Staphylinidae: Pselaphinae: Pselaphini) (Newton and Thayer 1995, Parker and Grimaldi 2014). While most genus-group taxa within the subfamily are more diverse in tropical, forested areas, the Pselaphini exhibits high species diversity at higher latitudes (Chandler 2001). Notably, it is the only pselaphine taxon represented in the harsh habitats of remote Campbell Island and other subantarctic islands of New Zealand. Currently, 21 species within six genera of Pselaphini are recorded from the North and South Islands of mainland New Zealand and adjacent islands (Nomura and Leschen 2006, Théry and Leschen 2013). New taxa revealed as part of a broader study of the Pselaphini of New Zealand are here described, including a new genus and two new species known only from the Auckland Islands on the Campbell Plateau (*Pselaphopluteum motumaha* **gen. et sp. nov.**, and *Pselaphaulax dracophyllum* **sp. nov.**), and three new species in currently recognized genera from the Chatham Islands ('Chathams') on the Chatham Rise, all of which are endemic to the Chathams (*Pselaphaulax caeruleus* **sp. nov.**, *P. flavus* **sp. nov.**, and *P. traversi* **sp. nov.**; Fig. 1).

With respect to many taxa, New Zealand exhibits a disharmonic fauna (Buckley et al. 2015), and pselaphines are no different. Only three of the subfamily's six supertribes are represented on the New Zealand mainland and surrounding islands (Nomura and Leschen 2006). Notably, the New Zealand pselaphine fauna comprises a large component of Faronitae (Park and Carlton 2013, 2014, 2015), and an unusually small fauna of social insect inquilines (Nomura and Leschen 2015). The entire supertribe Batrisitae is completely absent from New Zealand, in contrast to its diversity in almost every other major faunal region (also poorly represented in temperate South America; Newton and Chandler 1989). The Goniaceritae and Pselaphitae, taxa known to be especially diverse in temperate areas, are poorly studied in New Zealand and are the focus of ongoing research by the authors and their collaborators.

Twenty-one described species in six genera of Pselaphini occur in New Zealand (Nomura and Leschen 2006, Théry and Leschen 2013). Prior to the present study, two endemic, sympatric species of pselaphines were known from Campbell Island: *Pselaphotheseus ihupuku* Carlton and Leschen and *P. hippolytae* Park (Carlton and Leschen 2008). These

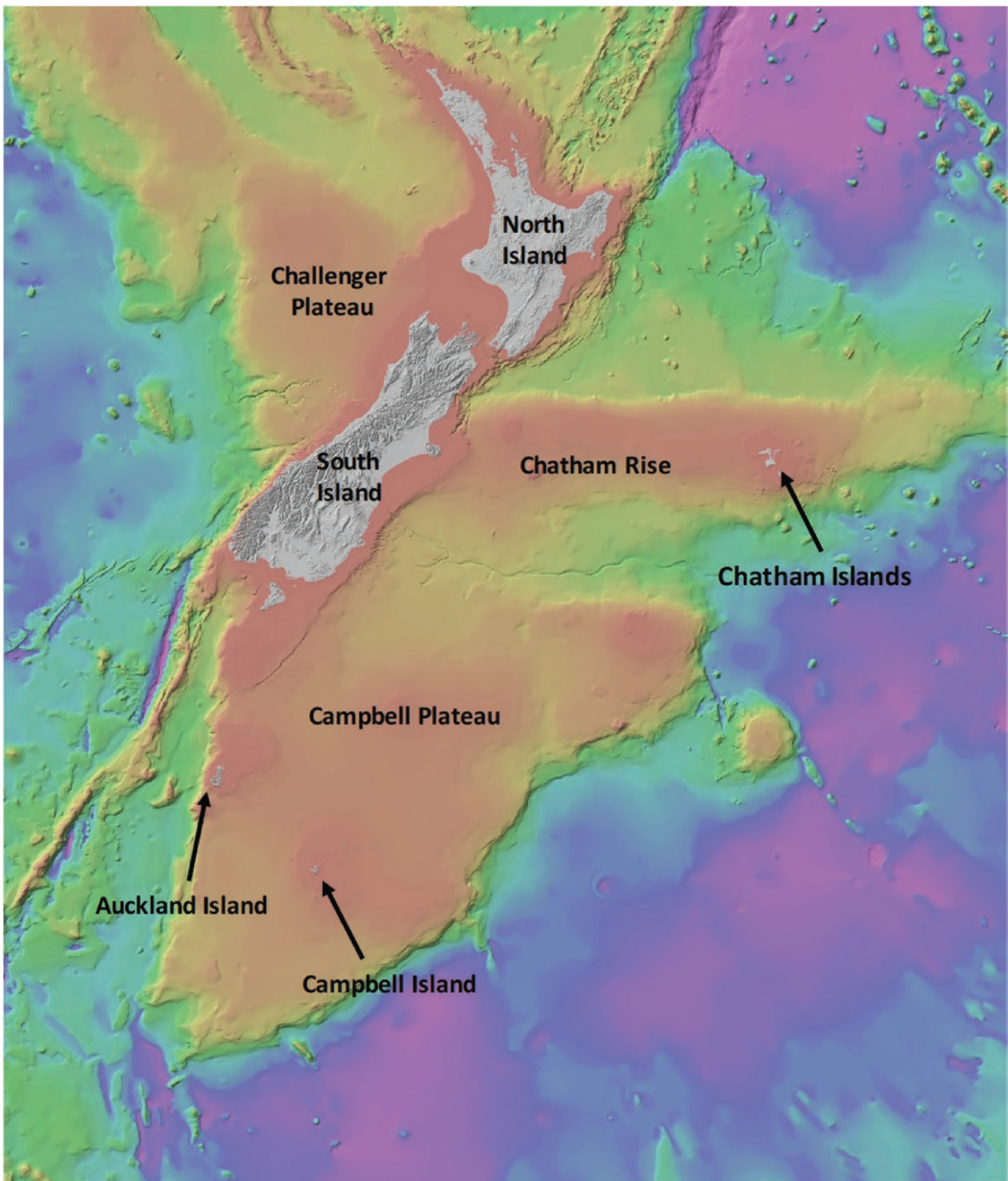


Fig. 1. Map detailing Campbell Plateau generated from NZ 250 m gridded bathymetric dataset and imagery (NIWA; www.niwa.co.nz).

are the only known representatives of the genus *Pselaphotheseus* Park, which is thought to be most closely related to the Australian genus *Pselaphophus* Raffray (Park 1964). The latter is represented in New Zealand by one widespread, introduced species (Carlton and Leschen 2008). *Pselaphophus atriventris* Westwood also represents the only known species from the Chathams. Emberson's (2002) survey of the Chathams' Coleoptera fauna noted two additional undescribed species of *Pselaphaulax* and one specimen of an undetermined genus. The

remaining New Zealand fauna consists of species currently placed into *Pselaphogenius* Reitter and *Pselaphus* Herbst (Nomura and Leschen 2006, Théry and Leschen 2013), although these genera are particularly problematic and generally considered to be non-monophyletic (Chandler 2001, Nomura and Leschen 2006). To date, no global phylogeny is published for the subfamily and the classification of New Zealand Pselaphinae has yet to be studied thoroughly other than a series of papers dealing with the supertribe Faronitae (Park and Carlton 2013, 2014, 2015).

Materials and Methods

External morphological characters of all dry specimens were examined using an Olympus SZH10 dissecting microscope. Dissections of exemplar male specimens were prepared to allow detailed examination of external and internal characters using an Olympus BX50 compound microscope fitted with a drawing tube.

For dissection, point-mounted individuals were removed from insect pins and cleared in 10% KOH solution for 24–48 h. Specimens were washed in several changes of 95% ethanol and separated from points using an insect pin to tease away residual adhesive. Dissection protocols were similar to those of Hanley and Ashe (2003). The abdomen was separated from the head, pronotum, and pterothorax by using insect pins and then split into dorsal and ventral halves for the removal of the aedeagus. For slide-mounted individuals, either Euparal or glycerin mounting medium was used to create permanent or temporary slide mounts, respectively. For permanent mounts, the forebody and abdominal ventrites were arranged ventral side up while the aedeagus and abdominal tergites were mounted dorsal side up. Original labels were affixed to slides.

Measurements were obtained from slide mounts of reference specimens. All measurements are given in millimeters and were taken in the dorsal view. Total body length was measured from the anterior margin of the clypeus to the posterior margin of the last visible abdominal tergite.

Specimens were provided by the following institutions and curators:

- FMNH Field Museum of Natural History, Chicago, IL, United States.
- LSAM Louisiana State Arthropod Museum, Louisiana State University, Baton Rouge, LA, United States.
- LUNZ Entomology Research Museum, Lincoln University, New Zealand.
- NZAC New Zealand Arthropod Collection, Auckland, New Zealand.

Verbatim label data are provided for all specimens examined and they are organized alphabetically by locality. Two back slashes (//) are used to indicate label breaks. The number and sex of specimens are indicated preceding label data (i.e., '(2 males, 1 female)'), and the lending institution is indicated following label data (i.e., '(NZAC)'). For type specimens, deposition in either the LSAM or NZAC is indicated following label data.

Nomenclature

This paper and the nomenclatural acts it contains have been registered in Zoobank (www.zoobank.org), the official register of the International Commission on Zoological Nomenclature. The LSID (Life Science Identifier) number of the publication is: urn:lsid:zoobank.org:pub:F0757F76-EBA2-49F5-9F60-AC7F00F0261F.

Taxonomy

Pselaphaulax Reitter (1909: 218)

Type species

Pselaphus dresdensis Herbst, 1792 (by monotypy).

Redescription. Males

Head: eyes rounded, composed of 15–20 facets. Vertex convex; shallow sulcus beginning at base of vertex, extending to level of vertexal foveae; vertexal foveae large, set into margins of vertexal

depression parallel to middle of eyes; vertexal depression widest between eyes, confluent with sulcus extending to apex of rostrum. Rostral sulcus bounded by lateral, flattened ridges extending to antennal acetabula. Frontal margin of rostrum in dorsal view typically straight to slightly emarginate, with sparse, suberect setae. Antennomere one as long as antennomeres 2–4, antennae otherwise unmodified. Gular mound modified, hemispherical, about as long as wide or narrowed and longer than wide, glabrous; area of head posterior to gular mound flattened, slightly concave, bearing flattened modified scales; gular foveae present, paired. Maxillary palpomere 1 elongate, 1/2 as long as palpomere 2; palpomere 2 narrow, enlarged distally, shorter than head; maxillary palpomere 3 quadrate; maxillary palpomere 4 typically subequal to head, widened in distal 1/3–1/2, apical area smooth to weakly tuberculate, v-shaped sensory patch present, margined by carina. **Thorax:** Pronotum widest at 1/2 length, narrowed anteriorly and posteriorly; basal sulcus present, delimited by lateral antebasal foveae, median antebasal fovea reduced to depression, margined by two short carinae. Prosternum in front of coxae slightly convex, anteriorly with modified flattened setae; lateral procoxal foveae present. Mesoventrite with median shield; lateral mesoventral foveae present in large cavities filled with dense setae, meeting internally; lateral mesocoxal foveae absent; median mesoventral foveae present, paired, meeting internally; mesocoxae separated by extension of meso- and metaventrite. Metaventrite afoveate, variously modified; metacoxae separated by extension of first ventrite. Elytra with three basal foveae, single sutural fovea; single discal stria, sutural striae present; apical fringe of setae present. **Abdomen:** Tergites of usual form for tribe, otherwise unmodified; second tergite without obvious basal foveae, lateral basal sulcus extending along width of tergite, obscured by dense band of setae along posterior edge. First ventrite covered in dense, shining setae; second ventrite variously modified with median depressions, sulci, or projections; ventrites otherwise unmodified.

Females

Similar to males except eyes may be smaller, composed of fewer facets; secondary sexual modifications of the legs or second ventrite absent.

Discussion

Currently, no species in New Zealand have been placed in the genus *Pselaphaulax*. However, in a review of the Australian fauna, Chandler (2001) commented that about one-half of the species currently in the genus *Pselaphus* in New Zealand should be transferred to *Pselaphaulax*, while the other half likely belong to the genus *Pselaphogenius*. An extensive review of the tribe currently underway by the authors has yielded approximately 13 additional undescribed *Pselaphaulax* species in material from the FMNH, LSAM, and NZAC.

New Zealand species in this genus are primarily united by the presence of an antebasal sulcus on the pronotum margined by lateral antebasal foveae, the median antebasal foveae present and delimited by two small carinae, maxillary palpomere 4 widened in the distal 1/3–1/2 with a V-shaped sensory patch margined by a carina, and the gular swelling hemispherical, about as long as wide or more narrow and longer than wide. While several groups in New Zealand likely representing undescribed genera may superficially resemble *Pselaphaulax*, no other groups possess a combination of these character states. All three species from the Chathams and the single subantarctic species possess characters consistent with species of *Pselaphaulax* observed from the mainland.

Pselaphaulax caeruleus, sp. nov. (Fig. 2a–d)

(Zoobank LSID: urn:lsid:zoobank.org:act:1F3D2EB4-1485-4E31-A857-33BB2BD4830B)

HOLOTYPE: (male) CHATHAM IS NZ Chatham I Awatotara 180m// 12 February 1967 G.W.Ramsay litter 67/139 (NZAC).

PARATYPES: (4 males, 3 females) same locality as holotype (NZAC). (1 male, 1 female) CHATHAM.I. N.Z. Awatotara Table land bus.183m 21.feb.1967// G.W.Ramsay Litter 67/139 (NZAC). All types of this species are deposited in the NZAC.

Etymology

The specific epithet is the Latin word for 'blue', commemorating Old Blue, the only remaining adult female Chatham Island robin in 1980. All Chatham Island robins today are descended from this single individual. She lived to be 14 yr old, the longest-lived individual known for her species (Butler and Merton 1992).

Diagnosis

Head with sulcus on rostrum; frontal margin of rounded with small patch of sparse setae; gular mound rounded, glabrous, and sub-hemispherical; maxillary palpomeres elongate, maxillary palpomere 4 subequal to length of head, narrow through 1/2 length, widest just beyond 1/2 length, apical sensory patches present and delineated by faint carina. Pronotum with antebasal sulcus, lateral antebasal fovea, and median basal fovea reduced to pit. Mesoventrite with small patch of setae in concavity towards hind margin of procoxae. Metaventrite with broad depression extending from hind margin of mesocoxae to apex of ventrite between metacoxae. Second ventrite with large shallow oval median depression occupying length of ventrite. Externally, the presence of two patches of fine setae on the thickened apex of the second ventrite distinguishes this species of *Pselaphaulax*

from the other two known from the Chathams. The form of the aedeagus, with the median lobe curved to the right is also unique.

Description. Male

Body length: 2.6–2.8 mm. **Integument:** head, pronotum, elytra, abdomen, and appendages light brown, palpi lighter in color. **Head:** wide, width between eyes greater than 1/2 length of head from base of vertex to apex of rostrum. Eyes rounded, composed of 15–22 facets. Frontal margin of rostrum in dorsal view rounded with sparse suberect setae. Gular mound modified, hemispherical, as long as wide, glabrous; area of head posterior to gular mound flattened, slightly concave, bearing flattened modified scales. Maxillary palpomere 4 as long as head, widened at base and distal 1/2, apical area smooth, shining, V-shaped sensory patches present, margined by carinae. **Thorax:** pronotum basal sulcus broad, well-defined, delimited by lateral antebasal foveae; median fovea reduced to pit. Mesoventrite with median shield bearing patch of spongeose setae in small concavity towards hind margin of procoxae. Metaventrite afoveate, medially depressed; metacoxae separated by extension of first ventrite. Legs unmodified. Elytra with three basal foveae, single sutural fovea; single discal stria, sutural striae present; apical fringe of setae present. **Abdomen:** Tergites of usual form for tribe. First ventrite covered in dense, shining setae; second ventrite with basal sulcus extending width of entire ventrite, sulcus densely setose, large shallow oval median depression occupying length of ventrite, apex of ventrite with small thickened area at middle bearing two patches of fine setae on distal margin. **Genitalia:** aedeagus asymmetrical. Median lobe distally curved to the right, protruding from fleshy dorsal extension. Ventral process downward curved, distally, about as long as median lobe. Parameres present, as long as median lobe.

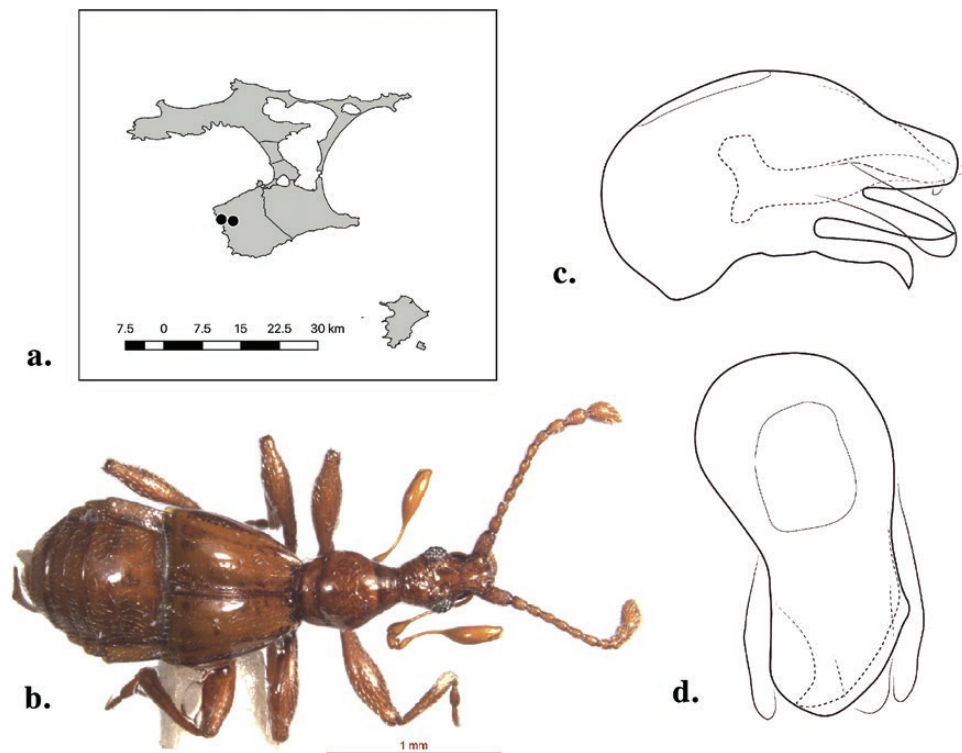


Fig. 2. *Pselaphaulax caeruleus*. (a) distribution map, Chatham Island; (b) male, dorsal habitus; (c) aedeagus, lateral; (d) aedeagus, dorsal.

Females

Integument, Head, Thorax, Abdomen: similar to male except eyes slightly smaller and second ventrite lacking median ovate depression and thickened area at apex.

Distribution

This species is only known from two collection events in the Awatotara Valley on Chatham Island. Extensive searches of museum collections have not yielded any specimens from additional localities, suggesting *P. caeruleus* is endemic to the Chathams.

Pselaphaulax dracophyllum, sp. nov. (Fig. 3a–d)

(urn:lsid:zoobank.org:act:62DBF9E0-A42B-4F7E-9BE9-A5ED2843E353)

HOLOTYPE: (male) New Zealand: AU: Adams I., Magnetic Cove Berlese Dracophyllum bases and litter 20 January 1966 KAJ Wise (NZAC). **PARATYPES:** (1 male, 2 females) NEW ZEALAND AU Adams I, 50°52'5.6"S, 166°1'15.1"E 22 January 2011 to 5 February 2011 G. Elliott, K. Walker// pitfall trap W2, *S. rata/Dracophyllum* forest, white-headed petrel colony// (green label) AMNZ85284// AMNZ85285// AMNZ85288 (AMNZ). (1 female) NEW ZEALAND AU Adams I, 50°52'5.8"S, 166°1'15.3"E 22 January 2011 to 5 February 2011 G. Elliott, K. Walker// pitfall trap W5, *S. rata/Dracophyllum* forest, white-headed petrel colony// (green label) AMNZ85283 AUCKLAND MUSEUM NEW ZEALAND (AMNZ). (1 female) NEW ZEALAND Adams I, 50°51'54"S, 166°02'27"E 19 January 2011 to 3 February 2011 G. Elliott, K. Walker// pitfall trap S3, *S. rata* and *Dracophyllum longifolium* coastal forest (sooty shearwater colony)// (green label) AMNZ85291 AUCKLAND MUSEUM NEW ZEALAND (AMNZ). (1 male) New Zealand: AU: Adams I., Magnetic Cover

Berlese Dracophyllum bases and litter 20 January 1966 KAJ Wise (LSAM). (1 male) New Zealand: AU: Adams I., Magnetic Cove Litter, 18 January 1966 G Kuschel 66/72 (LSAM). (1 male) New Zealand: AU: Adams I., Magnetic Cove Litter, 30 January 1966 G Kuschel, 66/92 (LSAM). (1 male, 1 female) New Zealand: AU: Adams I., Magnetic Cove Litter, 28 January 1966 G Kuschel, 66/84 (LSAM). (1 female) New Zealand: AU: Adams I., Magnetic Cove Stn., litter, 28 January 1966 G Kuschel, 66/84 (LSAM). (1 female) New Zealand: AU: Auckland I., Camp Cove 15 m, 5 January 1973 J Farrell, 73/16 (LSAM). (1 male) New Zealand: AU: Auckland I., Camp Cove, Carnley Harbor, litter 17 February 1973, JS Dugdale 73/94 (LSAM). (1 male, 1 female) New Zealand: AU: Auckland I., Fleming Plateau, 487 m, mats 12 February 1973, JS Dugdale 73/35 (LSAM). (3 males) New Zealand: AU: Auckland I., lookout, Ranui Cove, 54 m, moss 27 February 1973, JS Dugdale 73/93 (LSAM). (1 male) New Zealand: AU: Auckland I., lookout, Ranui Cove, 54 m, litter 27 February 1973, JS Dugdale 73/72 (LSAM). (1 male) New Zealand: AU: Auckland I., Ranui Cove, 15 m, litter, 27 February 1973 JS Dugdale, 73/71 (LSAM). (1 female) New Zealand: Auckland I., Ranui Cove, 304 m, moss and ferns 27 February 1973, JS Dugdale 73/82 (LSAM). (1 male) New Zealand: AU: Auckland I., Ranui Cove, Carnley Harbor, 30 m, litter, 1 March 1973 JS Dugdale, 73/84 (LSAM). (1 male) New Zealand: AU: Auckland I., Tagua Bay, Carnley Harbor, litter 11 February 1973, JS Dugdale 73/91 (LSAM). (1 male) New Zealand: AU: Auckland I., Tagua Bay, Carnley Harbor, moss 11 February 1973, JS Dugdale 73/92 (LSAM). (1 male) New Zealand AU: Ewing I., litter from West edge of *Metrosideros umbellata* *Olearia lyallii* forest 9 February 1973, DS Horning (LSAM). Type specimens are deposited in the LSAM or NZAC, as indicated following label data.

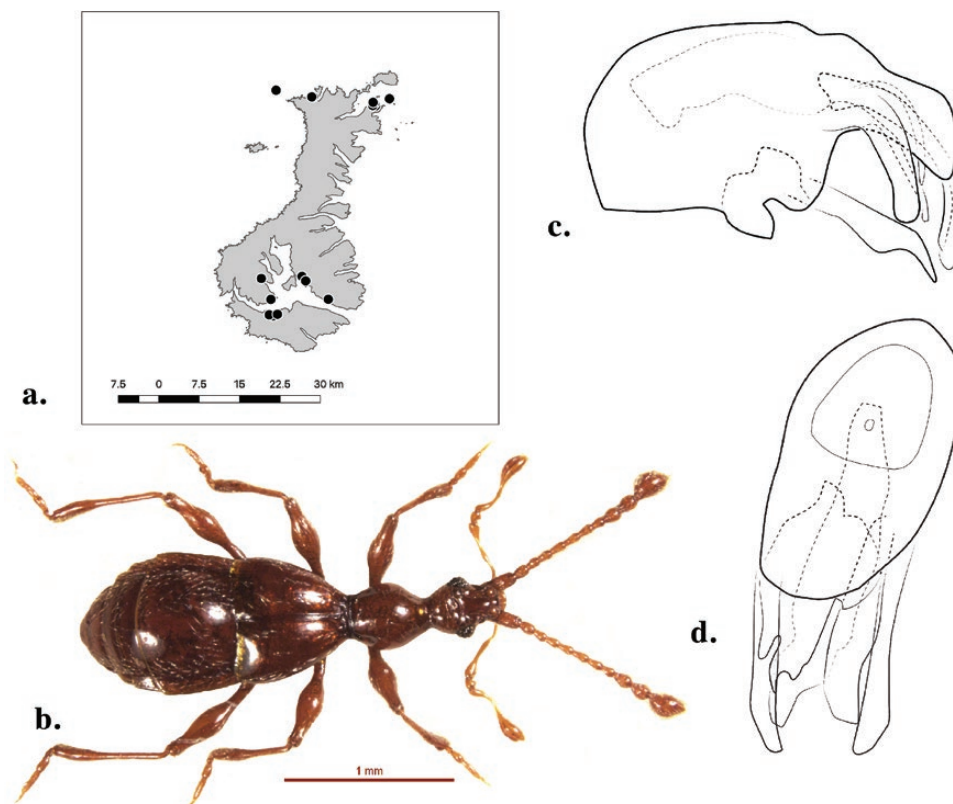


Fig. 3. *Pselaphaulax dracophyllum*. (a) distribution map, Auckland Islands; (b) male, dorsal habitus; (c) aedeagus, lateral; (d) aedeagus, dorsal.

Etymology

The specific epithet for this species refers to the plant genus *Dracophyllum*, (Ericaceae) found in Australia, New Caledonia, and New Zealand. Many members of the type series were collected in leaf litter of these plants.

Diagnosis

Head with sulcus on rostrum; frontal margin of rostrum straight with small patch of sparse setae; gular mound rounded, glabrous, and sub-hemispherical; maxillary palpomeres elongate, maxillary palpomere 4 subequal to length of head, narrow through 1/3 length, widest just beyond 1/2 length, apical sensory patches present and delineated by faint carina. Pronotum with antebasal sulcus, lateral antebasal fovea, and median basal fovea. Metaventricle with broad depression extending from hind margin of mesocoxae to apex of ventrite between metacoxae, sparse short setae along lateral margins. Second ventrite with narrow median longitudinal depression. *Pselaphaulax dracophyllum* is the only species of *Pselaphaulax* known from the Subantarctic Islands of New Zealand. The form of the aedeagus, with the median lobe narrow and associated with two lateral processes, and the heavily sclerotized, complex dorsal process is unique.

Description. Male

Body length: 2.3–2.5 mm. *Integument*: Body and appendages uniformly light reddish-brown to yellowish-brown, impunctate, pubescence on elytra and abdomen sparse. *Head*: Width between eyes equal to 1/2 length of head from base of vertex to apex of rostrum. Eyes rounded, composed of 20–22 facets. Occiput with median sulcus beginning at base and extending anteriorly, confluent with vertexal depression. Vertexal foveae large, setose, set obliquely into margins of vertexal depression parallel to middle of eyes. Vertexal depression slightly wider between eyes, confluent with narrower sulcus extending to apex of rostrum. Rostral sulcus bounded by flattened lateral ridges extending to antennal acetabula. Frontal margin of rostrum straight with a small tuft of short, erect setae in dorsal view. Antennomere one as long as antennomeres 2–3, antennae otherwise unmodified. When viewed laterally, gular mound modified, glabrous and sub-hemispherical. Area of head posterior to gular mound bearing paired gular foveae obscured by small patch of modified flattened setae. Labrum narrower basally and slightly widened at apex. Mandible slightly falcate, bearing two small teeth. Maxillary palpomere 1 narrow, elongate, 1/2 as long as palpomere 2; palpomere 2 narrow, widened distally, less than 1/2 length of head; maxillary palpomere 3 short, triangular-rounded; maxillary palpomere 4 subequal to length of head, narrow through 1/3 length, widest just beyond 1/2 length, apical sensory patches present and delineated by faint carina. *Thorax*: Pronotum widest at 1/2 length, narrowed anteriorly and posteriorly. Lateral basal sulcus present, delimited by lateral antebasal foveae, single median antebasal fovea present. Prosternum in front of coxae slightly convex, sparsely covered in flattened modified setae, lateral procoxal foveae present. Mesoventrite with median shield, lateral mesoventral foveae present in large lateral pits filled with dense spongeose setae, lateral mesocoxal foveae absent, median mesoventral foveae present, paired. Mesocoxae externally separated by extension of meso- or metaventricle. Metaventricle afoveate, median face with a broad depression extending from hind margin of mesocoxae to apex of ventrite between metacoxae, lateral margins of depression sharp, bearing sparse short setae. Metacoxae separated by extension of first ventrite. Elytra with three basal foveae, discal striae absent, sutural

stria present. *Abdomen*: Tergites unmodified. First ventrite covered with dense, shining setae. Second ventrite with basal band of shining modified setae, narrow longitudinal depression extending from base to apex of ventrite. *Genitalia*: Asymmetrical. Basal bulb distinct, dorsal diaphragm present. Parameres paired, lateral. Median lobe narrow, associated with two lightly sclerotized, narrow processes. Ventral process associated with ventral strut, well-developed, downturned at apex. Dorsal process complex, heavily sclerotized.

Females

Difficult to distinguish from males, differing, in addition to genitalia, by eyes comprising fewer facets and absence of the longitudinal depression on second ventrite.

Distribution

This species is known only from the Auckland Archipelago: Adams Island, Auckland Island, and Ewing Island.

Pselaphaulax flavus, sp. nov. (Fig. 4a–d)

(urn:lsid:zoobank.org:act:E47E1BA5-3DAF-48E0-8EAD-78F300AC53FA)

HOLOTYPE: (male) CHATHAM IS NZ Sth East I nr 600' 4 November 1970// J.I.Townsend litter 70/165 (NZAC). **PARATYPE**: (1 female) same locality as holotype (NZAC). Type specimens are both deposited in the NZAC, as indicated.

Etymology

The specific epithet is the Latin word for 'yellow', in reference to Old Yellow, the male half of the last breeding pair of Chatham Island robins in existence in 1980. Together Old Blue (female) and Old Yellow (male) played an integral role in bringing the only known population of their species back from the brink of extinction (Butler and Merton 1992).

Diagnosis

Head with sulcus on rostrum; frontal margin of rounded with small patch of sparse setae; gular mound rounded, glabrous, and sub-hemispherical; maxillary palpomeres elongate, maxillary palpomere 4 as long as head, narrow through 1/3–1/2 length, widest just beyond 1/2 length, apical sensory patches present and delineated by faint carina. Pronotum with antebasal sulcus, lateral antebasal fovea, and median basal fovea reduced to pit. Mesoventrite with small patch of setae in concavity towards hind margin of procoxae. Metaventricle with broad depression extending from hind margin of mesocoxae to apex of ventrite between metacoxae. Second ventrite with large shallow oval median depression occupying length of ventrite, apex thickened. Externally, *P. flavus* is difficult to distinguish from *P. traversi*. The form of the genitalia, with the median lobe curved downwards and extending from an elongate fleshy dorsal process is unique.

Description. Male

Body length: 2.6 mm. *Integument*: head, pronotum, elytra, abdomen, and appendages light brown, palpi lighter in color. *Head*: wide, width between eyes greater than 1/2 length of head from base of vertex to apex of rostrum. Eyes rounded, composed of 20–22 facets. Frontal margin of rostrum in dorsal view rounded with sparse suberect setae. Gular mound modified, hemispherical, about as long as wide, glabrous; area of head posterior to gular mound flattened, slightly concave, bearing flattened modified scales.

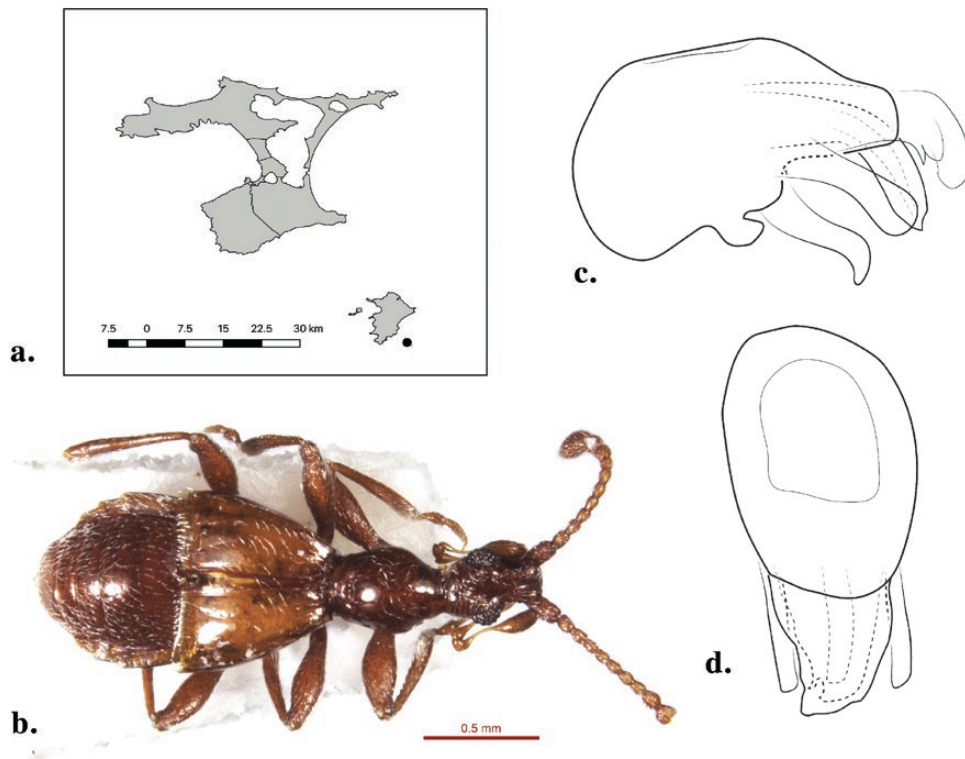


Fig. 4. *Pselaphaulax flavus*. (a) distribution map, Chatham Island; (b) male, dorsal habitus; (c) aedeagus, lateral; (d) aedeagus, dorsal.

Maxillary palpomere 4 as long as head, widened at distal 1/3–1/2, apical area slightly rugose, V-shaped sensory patches present, margined by carina. *Thorax*: pronotum basal sulcus broad, well-defined, delimited by lateral antebasal foveae; median fovea reduced to pit. Mesoventrite with median shield bearing patch of spongeose setae in small concavity towards hind margin of procoxae. Metaventrite afoveate, medially depressed; metacoxae separated by extension of first ventrite. Legs unmodified. Elytra with three basal foveae, single sutural fovea; single discal stria, sutural striae present; apical fringe of setae present. *Abdomen*: First ventrite covered with dense, shining setae; second ventrite with basal sulcus extending width of entire ventrite, sulcus densely setose, large shallow oval median occupying length of ventrite, apex of ventrite with small thickened area at middle. *Genitalia*: aedeagus asymmetrical. Median lobe elongate, curved downwards, protruding from elongate fleshy dorsal extension. Ventral process downward curved, distally, about as long as median lobe. Parameres present, as long as median lobe.

Females

Similar to male except eyes slightly smaller and second ventrite lacking median ovate depression and thickened area at apex.

Distribution

Pselaphaulax flavus is known from a single collection event on South East Island, the third largest island in the Chatham Islands archipelago. No specimens from additional localities have been found in searches of museum collections, suggesting this species is a Chatham's endemic.

Pselaphaulax traversi, sp. nov. (Fig. 5a–d)

(urn:lsid:zoobank.org:act:1CC89129-00AA-4703-ABC9-F8FBCF7BD73A)

HOLOTYPE: (male) CHATHAM IS, NZ Hapupu Res 14 November 1991 J.S. Dugdale Litter 91/62 (NZAC). **PARATYPES**: (3 males, 2 females) same locality (NZAC). (3 males, 3 females) NEW ZEALAND, CI Chatham I, Hapupu National Historical Reserve 4.xii.1992 R.M. Emberson P. Syrett// litter ex. *Corynocarpus laevigatus/Melicytus chathamicus* forest LCNZ 92/9 (LUNZ). (1 male, 1 female) CHATHAM IS, NZ Taiko Camp 5 March 1941 R.P. MacFarlane// Litter 91/8 (NZAC). (1 male) CHATHAM IS NZ Little Mangere I 30 March 1972// K. Horgan litter 72/279 (NZAC). (1 male) New Zealand, CH Little Mangere I 23-26.i.1998 M. & D. Bell, I. Atkinson (LUNZ). (5 males) CHATHAM IS, NZ Te Awatea 10 March 1991 R.C. Craw// litter 91/9 (NZAC). All type specimens are deposited in the NZAC, as indicated.

Etymology

This species is named after the Chatham Island robin or black robin, *Petroica traversi* (Buller) 1872. This endangered, endemic songbird was brought back from the brink of extinction in the 1980s by the extensive conservation efforts and creativity of the New Zealand Wildlife Service. From a total population of five individuals, the species has currently recovered to a stable population of about 250 individuals. This species is now a success story of conservation and is used as a model for fostering programs now used to stabilize other endangered bird species (Butler and Merton 1992).

Diagnosis

Head with sulcus on rostrum; frontal margin of rounded with small patch of sparse setae; gular mound rounded, glabrous, and sub-hemispherical; maxillary palpomeres elongate, maxillary palpomere 4 as long as head, narrow through 1/3–1/2 length, widest just beyond 1/2 length, apical sensory patches present and delineated by faint carina. Pronotum with antebasal sulcus, lateral antebasal fovea, and median basal fovea reduced

to pit. Mesoventrite with small patch of setae in concavity towards hind margin of procoxae. Metaventrite with broad depression extending from hind margin of mesocoxae to apex of ventrite between metacoxae. Second ventrite with large shallow oval median depression occupying length of ventrite, apex thickened. This species is difficult to distinguish from *P. flavus* externally. The form of the genitalia, with the median lobe divided, and the parameres short (less than 1/2 length of the basal bulb) is unique among species known from the Chathams.

Description. Male

Body length: 2.3–2.5 mm. *Integument*: head, pronotum, elytra, abdomen, and appendages light brown, palpi lighter in color. *Head*: wide, width between eyes greater than 1/2 length of head from base of vertex to apex of rostrum. Eyes rounded, composed of 19–20 facets. Frontal margin of rostrum in dorsal view straight with sparse suberect setae. Gular mound rounded, hemispherical, about as long as wide, glabrous; area of head posterior to gular mound flattened, slightly concave, bearing flattened modified scales. Maxillary palpomere 4 as long as head, widened in distal 1/2, apical area weakly tuberculate, V-shaped sensory patch present, margined by carina. *Thorax*: pronotum with basal sulcus faint, delimited by lateral antebasal foveae. Mesoventrite with median shield bearing patch of spongeose setae in small concavity towards hind margin of procoxae. Metaventrite afoveate, medially depressed; metacoxae separated by extension of first ventrite. Legs unmodified. Elytra with three basal foveae, single sutural fovea; single discal stria, sutural striae present; apical fringe of setae present. *Abdomen*: Tergites of usual form for tribe. First ventrite covered in dense, shining setae; second ventrite with basal sulcus extending width of entire ventrite, sulcus densely setose, large shallow oval median depression occupying length of ventrite, apex unmodified. *Genitalia*: aedeagus asymmetrical. Median lobe divided distally, protruding from reduced, fleshy dorsal extension. Ventral process downward curved, distally, about as long as median lobe. Parameres present, short (less than 1/2 length of basal bulb).

Females

Similar to male except eyes slightly smaller and second ventrite lacking median ovate depression and projections at apex.

Distribution

This species is known from four localities on the Chathams. Three known localities are on the main island, Chatham Island: Hapupu Reserve, Taiko Camp (near present-day Tuku Nature Reserve), and Te Awatea reserve. An additional record of this species is from Little Mangere Island, a small island about 45 km off of the southeastern coast of Chatham Island. Extensive searches of museum collections have not yielded specimens from additional localities, suggesting *P. traversi* is endemic to the Chathams.

Pselaphopluteum, gen. nov.

(urn:lsid:zoobank.org:act:AAF23837-74BC-43A0-877F-6FB747C74C87)

Type species

Pselaphopluteum motumaha, sp. nov.

Etymology

The genus name is a combination of the prefix ‘pselaph-’ which is common among other genera in the tribe Pselaphini and ‘pluteum’, the Latin word for ‘shelf’, which refers to the shelf-like form of the gular modifications in members of the genus. Gender neutral.

Diagnosis

Head with large vertexal depression between eyes; frontal margin of rostrum rounded; gular mound greatly expanded and shelf-like; maxillary palpomeres short, maxillary palpomere 4 weakly pedunculate, apical sensory patch absent. Pronotum with antebasal sulcus,

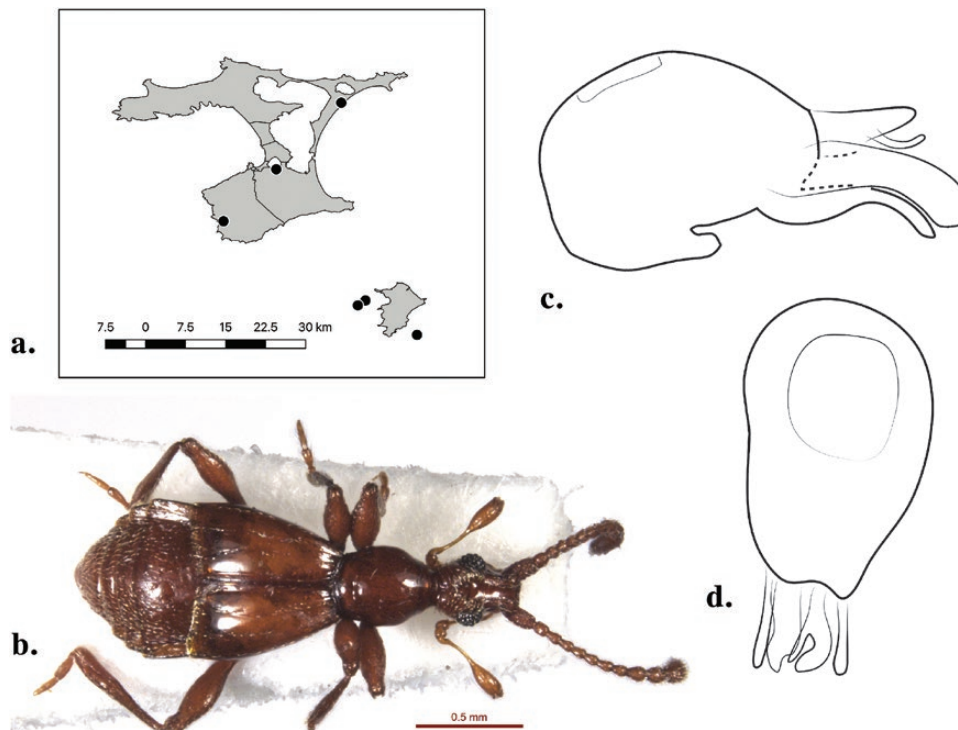


Fig. 5. *Pselaphaulax traversi*. (a) distribution map, Chatham Island; (b) male, dorsal habitus; (c) aedeagus, lateral; (d) aedeagus, dorsal.

lateral antebasal fovea, median basal fovea, and inner basolateral fovea present. The form of the shelf-like gular mound in combination with the shortened, pedunculate maxillary palpomere 4 easily distinguish *Pselaphopluteum* from all other genera of Pselaphini in New Zealand.

Description. Male

Based on male holotype and male specimens of the paratype series of *Pselaphopluteum motumaha*. Body length: 2.5–2.7 mm. *Integument*: Body and appendages light brown, shining. *Head*: Occiput with median sulcus beginning at base and extending anteriorly, confluent with vertexal depression. Vertexal foveae large, setose, set obliquely into margins of broad vertexal depression parallel to middle of eyes. Vertexal depression occupying expanse of vertex between eyes, confluent with narrower sulcus extending to apex of rostrum. Rostral sulcus bounded by carinate lateral ridges extending to anterior margin of rostrum. Frontal margin of rostrum slightly rounded, with small median notch and patch of erect setae in dorsal view. When viewed laterally, gular mound greatly expanded, flattened and shelf-like. Area of head posterior to gular mound smooth, shining, gular foveae present, paired. Labrum narrowed basally and widened at apex. Mandible slightly falcate. Maxillary palpomere 1 narrow, elongate; palpomere 2 narrow, widened distally; maxillary palpomere 3 short, triangular-rounded; maxillary palpomere 4 shorter than length of head, weakly pedunculate, visible sensory patches absent. *Thorax*: Pronotum widest at anterior 1/3, narrowed anteriorly and posteriorly. Lateral basal sulcus present, delimited by lateral antebasal foveae, single median antebasal fovea present, inner basolateral fovea present. Prosternum in front of coxae flattened, nude, lateral procoxal foveae present. Profemur modified, flattened ventrally; protibia narrow and curved along length. Mesoventrite with median shield, lateral mesoventral foveae present in large lateral pits filled with dense spongy setae, lateral mesocoxal foveae absent, median mesoventral foveae present, paired. Mesocoxae approximate, not separated by extension of meso- or metaventrite; mesofemur modified, flattened ventrally; mesotibia narrow and curved along length. Metaventrite afoveate. Metacoxae separated by extension of first ventrite. Elytron with three basal foveae present, discal striae absent, sutural striae present. *Abdomen*: Tergites of usual form for tribe, otherwise unmodified. First ventrite covered in dense, shining setae. Second ventrite with basal band of shining modified setae, narrow median depression extending from base to apex of ventrite, depression bounded laterally by short setae from 1/2 length of ventrite to apex. *Genitalia*: Asymmetrical. Basal bulb distinct, dorsal diaphragm present. Parameres paired, lateral. Median lobe expanded and complex distally. Ventral and accessory processes present.

Distribution

This genus is known only from specimens collected from Adams Island, Auckland Island, and nearby Enderby Island.

Discussion

This genus is most similar to another genus known from the subantarctic islands of New Zealand, *Pselaphotheseus*. Both genera share a number of characters: Head. Occiput with deep sulcus running from base to vertex, the vertexal depression broad and occupying much of the area between the eyes with vertexal fovea opening obliquely in the margins of the depression, maxillary palpomeres 2 and 4 relatively short, with segment 4 lacking apical sensory areas. Thorax. Pronotum with basal sulcus, lateral antebasal foveae and a median antebasal fovea on the pronotum; mesoventral

shield unmodified; each elytron bearing single discal stria and three basal foveae. However, *Pselaphopluteum* is unique among other described genera of Pselaphini in the combination of the following characters, 1) modified gular area in the form of a broad, shelf-like process, 2) maxillary palpal segment 4 short and weakly elongate-pedunculate, 3) the strangely modified form of the broadened femora with a flattened ventral face, and 4) the narrow, laterally-flattened and curved tibiae. This genus is currently recorded only from Auckland, Adams, and Enderby Island suggesting it is endemic to the subantarctic islands of New Zealand.

Pselaphopluteum motumaha, sp. nov. (Fig. 6a–f)

(urn:lsid:zoobank.org:act:98DA5EDD-476C-4C25-A748-3ACAA813AD17)

HOLOTYPE: (male) New Zealand: AU: Auckland I., Camp Cove, Carnley Harbor, litter 18 February 1973, JS Dugdale 73/90//LSAM 0215919 (NZAC). **PARATYPES**: (6 males) New Zealand: AU: Auckland I., Camp Cove, Carnley Harbor, litter 18 February 1973, JS Dugdale 73/90 (LSAM). (1 male) New Zealand: AU: Auckland I., Camp Cove Carnley Harbor, litter 20 February 1973, JS Dugdale 73/35 (LSAM). (1 male) New Zealand: AU: Auckland I., Skua Gull Flat, 243 m, Carnley Harbor, plant, 5 February 1973 JS Dugdale, 73/73 (LSAM). (1 male) New Zealand: AU: Auckland I., Ranui Cove, 304 m, moss and ferns 27 February 1973, JS Dugdale 73/82 (LSAM). (2 males) NEW ZEALAND AU Auckland Is Enderby I Stella Hut 21 March 2000 M Bullans E Edwards R. Leschen leaf litter SUB 087 50°30'S 166°16'E (NZAC). (1 female) NEW ZEALAND AU Adams Is. Fairchilds Garden 22 March 2006 *Dracophyllum*, *Metrosideros Poa* and Megaherb leaf litter R Leschen E Edwards AU 007 S50 50.248 E 165 55.342 (NZAC). (1 male) NEW ZEALAND AU Adams Is Fairchilds Garden 22 March 2006 megaherb leaf litter R Leschen E Edwards AU 006 S50 50.248 E165 55.342 (NZAC). Type specimens are deposited in the LSAM or NZAC, as indicated.

Etymology

The specific epithet is a noun in apposition and refers to the Maori name for Auckland Island, Motu Maha (O'Connor 1999), the literal translation of 'maha' is 'many'.

Diagnosis

Head with large vertexal depression between eyes; frontal margin of rostrum rounded; gular mound greatly expanded and shelf-like; maxillary palpomeres short, maxillary palpomere 4 weakly pedunculate, apical sensory patch absent. Pronotum with antebasal sulcus, lateral antebasal fovea, median basal fovea, and inner basolateral fovea present. Legs for this species are highly modified, all femora broadened with a flattened ventral face and tibiae narrowed and curved along length. The combination of these characters, particularly the form of the shelf-like gular mound in combination with the shortened, pedunculate maxillary palpomere 4 distinguish *Pselaphopluteum motumaha* from all other species of Pselaphini in New Zealand.

Description. Male

Body length: 2.5–2.7 mm. *Integument*: Body and appendages uniformly light brown to yellowish-brown, glabrous, impunctate, pubescence sparse. *Head*: Wide, width between eyes greater than 1/2 length of head from base of vertex to apex of rostrum. Eyes rounded, composed of 13–15 facets. Antennomere one lightly granulate, as long as antennomeres 2–4, antennae otherwise unmodified. Labrum

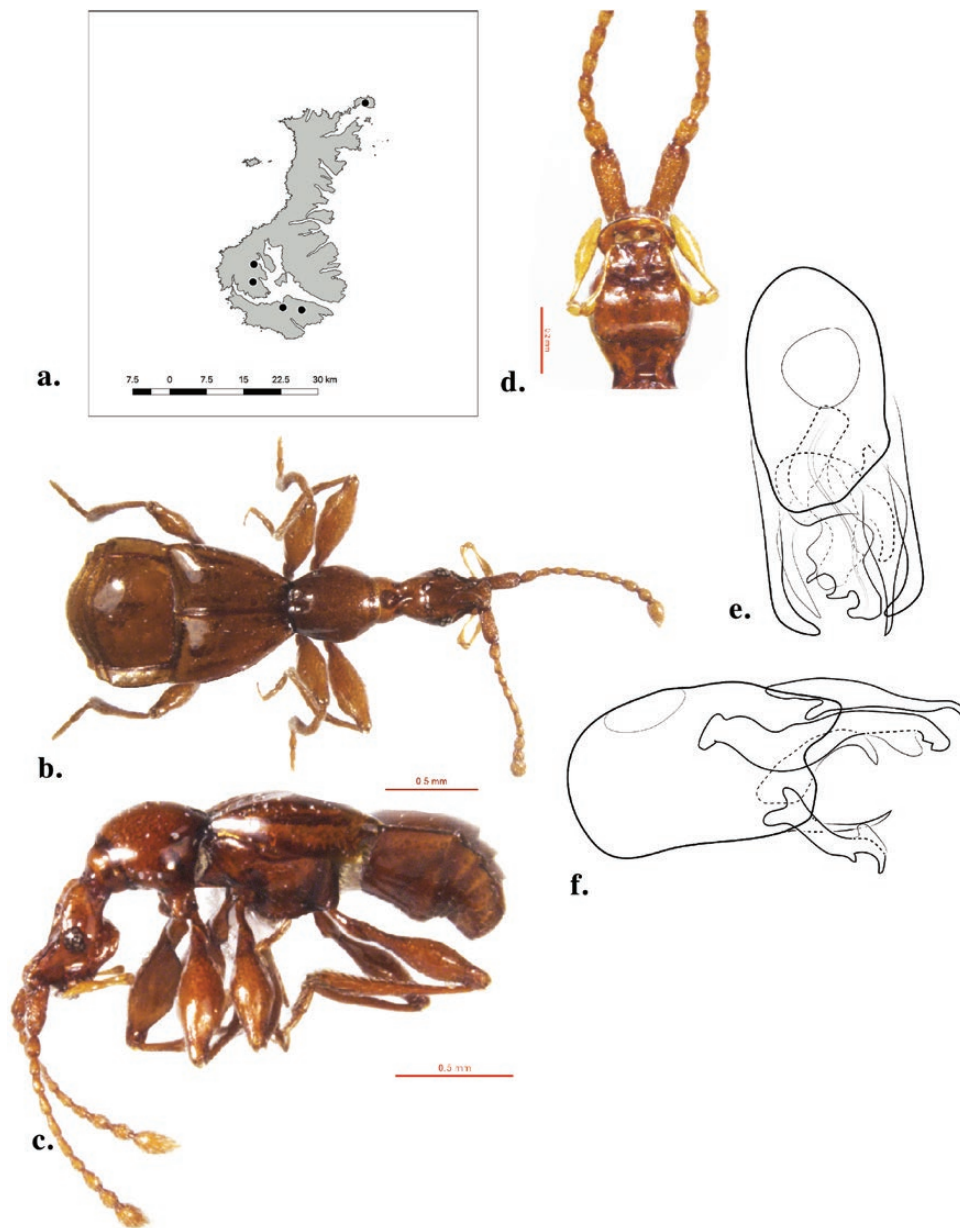


Fig. 6. *Pselaphopluteum motumaha*. (a) distribution map, Auckland Island; (b) male, dorsal habitus; (c) male, lateral view; (d) male, gular region; (e) aedeagus, dorsal; (f) aedeagus, lateral.

narrowed basally and widened at apex. Mandible slightly falcate, bearing two small teeth. Maxillary palpomere 1 narrow, elongate, 1/2 as wide as palpomere 2; palpomere 2 narrow, widened distally, less than 1/2 length of head; maxillary palpomere 3 short, triangular-rounded; maxillary palpomere 4 shorter than length of head, narrow through 1/3 length, widest just beyond 1/2 length, visible sensory patches absent. *Thorax*: Procoxae with frontal rounded process; protrochanter angulate medially; profemur dorsoventrally flattened; protibia laterally compressed and curved along length. Mesocoxae approximate, not separated by extension of meso- or metaventrite; mesofemur broad, flattened on ventral face; mesotibia narrow and curved along length. Median face of metaventrite with longitudinal depression, lateral margins of depression bearing sparse short setae. Metacoxae separated by extension of second ventrite. *Genitalia*: Median lobe expanded and complex distally. Ventral process hooked and bearing flange at apex. Single accessory process on left falcate, incurved. Two accessory processes on right, lower process with

broad base, incurved distally, dorsal-most process extending slightly beyond median lobe, incurved distally.

Females

Difficult to distinguish from males, differing, in addition to genitalia, by the absence of the narrow median depression on second ventrite. Unlike other pselaphines with elaborate gular modifications (*Pselaphtrichus* spp.), both males and females possess the unique gular shelf.

Distribution

This species is known from Adams Island, Auckland Island, and Enderby Island.

Discussion

This species represents the single representative of the monotypic genus, *Pselaphopluteum*. Five male specimens of the type series were dissected, and no variation in the form of the genitalia among individuals was noted.

Discussion

The Campbell Plateau and Chatham Rise underlie the principle oceanic archipelagos south and east of the South Island of New Zealand (Fig. 1). Five island groups are included on the Campbell Plateau and one, The Chatham Islands, on the Chatham Rise. The two are separated by the Bounty Trough, with the Chathams to the north, and the Campbell Island groups to the south. These physiographic provinces split from Gondwana with the rest of ancient New Zealand terrains about 80 million years ago (mya) but may possess a separate and distinct history, having perhaps reconnected and combined with the southern portion of New Zealand some 20 mya (Michaux and Leschen 2005).

High levels of biological diversity and endemism characterize flora and fauna of the Chathams across a variety of taxa, while those of the subantarctic islands are less diverse, but also highly endemic (e.g., Aikman and Miskelly 2004, Gressitt 1964). Both oceanic island groups have been the focus of studies aimed at elucidating biogeographic patterns and sources of flora and fauna of particular islands and of mainland New Zealand (Trewick 2000, Michaux and Leschen 2005, Buckley et al. 2013). One broad explanation for the origins of these faunas is that most of the insular biotas are derived from the northern mainland while a smaller portion may be relictual and therefore more broadly related to older, Gondwanan elements (Kuschel 1964, Godley 1965). However, robust biogeographic studies, particularly those that address the evolution of the Campbell Plateau biota, are limited and research on insects, in particular, is generally lacking. Current knowledge of subantarctic insects is based on written descriptions, such as Kuschel and Chown's (1995) study on weevils and phylogenetic studies of aleocharine staphylinids (Leschen et al. 2002, Ahn et al. 2010, Yamamoto and Maruyama 2017, Orlov et al. 2019), as well as a single meta-analysis (Michaux and Leschen 2005). Otherwise, faunistic and biogeographic work on the Campbell's biota is scarce (Buckley et al. 2015) and genetic studies are few, apart from the single-island study by Leschen et al. (2011).

Taxonomic Considerations

Prior to this publication, the genera *Pselaphotheseus* (endemic to Campbell Islands), *Pselaphophus* (represented by the single introduced species *Pselaphophus atriventris*), *Pselaphogenius*, and *Pselaphus* were the only pselaphine genera recorded from New Zealand (Nomura and Leschen 2006). Of these, *Pselaphus* is highly variable across its global distribution and likely is polyphyletic, especially in New Zealand (Chandler 2001, Nomura and Leschen 2006). In his work on the Australian pselaphine fauna, Chandler (2001) asserted that representatives of the genus *Pselaphus* in New Zealand either belong in *Pselaphogenius* or *Pselaphaulax*, with no true *Pselaphus* occurring in New Zealand. Further observations of specimens by the first author suggest that a number of the New Zealand taxa currently placed into the genus *Pselaphus*, as well as a number of undescribed species, do not fall within the boundaries of *Pselaphogenius* or *Pselaphaulax*, and likely represent new genera. However, working within the current framework of genera known from New Zealand, the new species described from the subantarctic islands and the Chathams (with the exception of *Pselaphopluteum motumaha*) share many characters with the genus *Pselaphaulax* known from Australia (see sections on generic diagnoses and species' comments). For this reason, we place these new species into the genus *Pselaphaulax* as currently recognized in New Zealand.

Conversely, while *Pselaphopluteum* appears most similar to *Pselaphotheseus*, also endemic to the subantarctic islands, these

genera differ in several morphological characters, most obviously in drastic modifications of the gular region into a shelf-like projection and the extensively flattened and broad femora in the former. Delimiting generic boundaries within the Pselaphini is particularly troublesome because many groups are externally similar and characters traditionally used to distinguish genera in other pselaphine tribes (i.e., the arrangement of foveae on the prosternum and meso- and metaventrites) cannot be consistently used to distinguish genera within this tribe. This breakdown of the reliability of the foveal system is found in other groups, notably the New Zealand Trichonychini (Pselaphinae: Euplectitae) (D. S. Chandler, personal communication) and other Australian euplectites (Nomura and Leschen 2015). In the Pselaphini the characters of the head, particularly the modifications of the gular area, the maxillary palpi, the vertexal foveae, and the rostrum, as well as modifications of the shape, sulci, and foveae on the pronotum are more commonly used in combination as distinguishing characters. In the absence of a robust molecular or morphological phylogenetic analyses, the consistent differences seen between *Pselaphopluteum* and *Pselaphotheseus* warrant recognition of the former as a new genus. However, overall similarities in the morphology of the vertexal area of the head, maxillary palpi, pronotum, the meso- and metaventrites suggest these two genera are closely related.

Notes on Head Morphology in *Pselaphopluteum*

Among pselaphines, modifications of the gular region and the maxillary palpi are common in certain lineages and such morphological features are sometimes greatly exaggerated, including spectacular excavations, processes, and setae present on the gular region in most species of *Pselaptrichus* Brendel and the incredibly elongate and variously setose, tuberculate, or sulcate palpomeres of many genera of Bythinini and Pselaphini. While these characters are sometimes restricted to males, and therefore presumed to be sexual secondary characters associated with mating (such as in *Pselaptrichus*), they are sometimes exhibited by both sexes.

In New Zealand Pselaphini, both sexes of most species possess an elongate, pedunculate maxillary palpomere 4 and some form of rounded or rounded-ovate process on the gular area. Of species observed to date, only *Pselaphophus atriventris*, the two species of *Pselaphotheseus*, and *Pselaphopluteum motumaha* possess a shortened maxillary palpomere 4 in both sexes. *Pselaphopluteum* is even more unique in the modification of the gular region into a posteriorly directed shelf-like process and the presence of greatly enlarged flattened femora. In one of the few behavioral studies on pselaphines, Schomann et al. (2008) demonstrated that maxillary palpi play an important role in prey capture and manipulation. Two of the three examples of Pselaphini with a shortened maxillary palpomere 4 in New Zealand occur in the two genera of Auckland Island endemics, suggesting this palpal form may be adapted to feeding in harsh subantarctic island climates. Additionally, the unique form of the shelf-like gular region in *Pselaphopluteum* and the strangely enlarged femora may likewise play a role in prey capture. This combination of unusual features and exaggerated morphology in *Pselaphopluteum* suggests specialization on predatory feeding behaviors in an extreme environment, similar to bizarre adaptations in *Stylogymnusa* Hammond (Staphylinidae: Aleocharinae), an Auckland Island endemic.

Adults of *Stylogymnusa* are the only known extant staphylinids with piercing sucking mouthparts (Hammond 1975, Ashe 2000). To date, we have no knowledge about the exact feeding behaviors of these beetles. Its extinct relative *Electrogymnusa* Wolf-Schwenninger from Baltic amber (Wolf-Schwenninger 2004) bears some similarities

Table 1. Global distributions of genera of Pselaphini

Genera of Pselaphini	Number of species	Number of															
		Nearctic	Neotropical	Chilean/ Argentinian	W. Palearctic	E. Palearctic	Oriental	Pacific	Australian	New Zealand	Afrotropical	S. African	Malagasy				
<i>Afropselaphus Jeannel</i>	23				X	X											
<i>Bellenden Chandler</i>	6					X				X		X					
<i>Curculionellus Westwood</i>	12					X				X		X					
<i>Dicentrius Reitter</i>	10				X												
<i>Geopselaphus Jeannel</i>	24				X	X											
<i>Hirashimanyus Nomura</i>	2					X				X							
<i>Kakadu Chandler</i>	1											X					
<i>Mareeba Chandler</i>	1											X					
<i>Margaris Schaufuss</i>	1											X					
<i>Marydena Chandler</i>	4											X					
<i>Mentraphus Sharp</i>	7				X					X					X		
<i>Nabepselaphus Nomura</i>	6									X							
<i>Neopselaphus Jeannel</i>	10	X															
<i>Peckella Chandler</i>	1											X					
<i>Pselaphaulax Reitter</i>	61				X					X		X					X
<i>Pselaphellus Raffray</i>	7																
<i>Pselaphobius Raffray</i>	1									X							
<i>Pselaphobius Reitter</i>	56				X					X		X					X
<i>Pselaphobius Reitter</i>	6				X					X		X					
<i>Pselaphobius Raffray</i>	19									X							
<i>Pselaphobius Jeannel</i>	23				X												
<i>Pselaphostomus Reitter</i>	2																
<i>Pselaphobius Park</i>	6									X							
<i>Pselaphobius Besuchet</i>	88				X					X							X
<i>Pselaphus Herbst</i>	19									X							
<i>Tyraphus Sharp</i>	19									X							

of the head capsule to *Stylogymnusa* and understanding the feeding behavior may provide insight into the early evolution of basal staphylinids, in particular, the large subfamily Aleocharinae. The presence of unique head characters of another endemic staphylinid to the New Zealand subantarctic region, *Pselaphopluteum*, may be oddly coincidental, or its presence may provide another snapshot of ancient communities that may have been once widespread.

Biogeographic Implications

Beetles are the most speciose insect taxon in the Campbell Plateau region. The beetle fauna is a mixture of species that are mostly shared with and/or derived from the New Zealand mainland, with fewer taxa shared with other subantarctic regions (especially Patagonia), and a few 'isolated monotypic genera' (Michaux and Leschen 2005; Orlov et al. 2019). While the basement rocks of the Campbell Plateau are Paleozoic, the Auckland Islands are the oldest emergent landforms (12–25 my) and the Antipodes the youngest (0.2–0.5). The Bounty (135 ha) and Auckland Islands (61,120 ha), are the smallest and largest, respectively (Michaux and Leschen 2005, Scott et al. 2013).

Globally, taxa within the Pselaphini are much more diverse in temperate than in tropical areas, with the Australian, Oriental, and Western and Eastern Palearctic regions containing the majority of the tribe's genera and species (Table 1), while the Neotropical fauna is notably depauperate for this group. Traditionally, diversity within the Pselaphini has exhibited a strong Gondwanan bias, and this has been viewed as the likely biogeographic origin of this fauna (Jeannel 1950, Hlaváč and Chandler 2005). However, on a broad scale, the scattered presence of Pselaphini taxa in the Indian, Afrotropical, Malagasy, South African, New Caledonian, Tasmanian, and Australian regions presents a confounding mix of Gondwanan and Laurasian faunal elements. Additionally, the conspicuous absence of the tribe from temperate South America (Chile and southern Argentina) leaves a distributional gap that is inconsistent with a Gondwanan explanation of current diversity patterns.

Allopatry on islands, such as the Campbell Island/Auckland Islands split between *Pselaphopluteum* and *Pselaphotheseus*, is common for many groups on the Campbell Plateau (Michaux and Leschen 2005) indicating widespread ancestors endemic to the Plateau itself with regional vicariance resulting in insular allopatric distributions, possibly involving previously exposed island terrains (Leschen et al. 2011). A less common pattern is the presence of sympatric species, such as the two species of *Pselaphotheseus* on Campbell Island (Carlton and Leschen 2001). This also occurs in Carabidae (*Loxomerus* Chaudoir and *Ooapterus* Guérin-Méneville; Laroche and Larivière 2001), aleocharine staphylinids (*Leptusa* Kraatz; Orlov et al. 2019) and Tenebrionidae (*Pseudhelops* Guérin-Méneville Tenebrionidae; Leschen et al. 2011) on Campbell and Auckland Islands. *Pselaphotheseus* and other taxa that are sympatric likely evolved in allopatry (e.g., Leschen et al. 2011). Their natural history requires detailed study to determine whether resource partitioning or other local ecological factors are involved with their co-existence (Carlton and Leschen 2001) or if these species are functionally redundant (Scheffer et al. 2015).

On the Campbell Plateau pselaphines are apparently completely absent from Snares Islands and the Bounty Platform to the east (Bounty and Antipodes Islands). Absence on the Snares Islands and presence on the Auckland Islands is indicative of some 'isolated monotypic genera' such as *Stylogymnusa*, found only on Auckland Islands and sister to the basal group Gymnusini (Ahn and Ashe 2004, Cai et al. 2015, Yamamoto and Maruyama 2017). The small islands of the Bounty Platform lack forest litter habitats, and the absence of trees or shrubs may explain the depauperate fauna of

groups such as pselaphines and other litter-dwelling Coleoptera such as weevils (only one species of weevil is present in the Antipodes; Kuschel 1964, 1971; Marris 2000). Conversely, oceanic barriers to dispersal could also explain the lack of pselaphines on the Bounty Platform, and possibly the Snares.

Seven species of the subfamily Pselaphinae have been recorded from the Chathams including two species of Faronitae (Park and Carlton 2014) and four species belonging to the tribe Pselaphini. Of the latter, two are recorded in Emberson's checklist (2002) as being 'unknown species' of the genus *Pselaphaulax*, with another recorded as an unknown genus. *Pselaphophus atriventris*, a widespread invasive species from Australia introduced to New Zealand (Carlton and Leschen 2008), is the only described species in the tribe currently known from the islands. The three species described herein appear to be endemics to the Chathams, with congeners on the North and South Islands of New Zealand. Evidence of a land bridge between the Chathams and main island exists (Emberson 1998), and this may explain patterns suggesting a recent origin with differential extinctions of the Chathams fauna. Some volcanic islands among the Chathams are estimated to be between seven and four million years old, while most island components are generally considered to be only between one and three million years old (Campbell and Hutching 2007). Emberson (1998) argued for a South Island source for much of the Chatham's Island beetle fauna, while Craw (1988) showed widespread taxa shared with mainland New Zealand.

Pselaphini lineages on the New Zealand mainland and surrounding islands may represent ancient, relictual lineages of a once continuous distribution across Gondwana, or may be part of a much larger widespread dispersal of the tribe. A recent examination of the origin and diversification of the higher Pselaphinae has suggested an earlier origin (Jurassic) for many of these groups, predating a Laurasian-Gondwanan breakup (Parker 2016). Ultimately, closer examination of the world fauna especially for nearby Tasmanian, Australian, and New Caledonian faunas may help shed light on this question.

Acknowledgments

This work was supported in part by National Geographic Society (grant 7925-05 to S.S.), National Science Foundation (grants DEB-9971695 to S.S. and R.L. and DEB-9972083 to A.W., C.C., and R.L.), and core funding for Crown Research Institute from the Ministry of Business, Innovation and Employment's Science and Innovation Group. This publication is approved by the Director, Louisiana Agricultural Experiment Station as manuscript number 2017-XXX-XXXX.

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