Chandlerea and Nunnea (Coleoptera: Staphylinidae: Pselaphinae), Two New Genera from New Zealand with Descriptions of Three New Species

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Chandlerea and Nunnea (Coleoptera: Staphylinidae: Pselaphinae), two new genera from New Zealand with descriptions of three new species

Jong-Seok Park* and Christopher E. Carlton

Abstract
Two new genera and three new species of New Zealand endemic pselaphine staphylinid beetles belonging to the supertribe Faronitae are described as follows: Chandlerea Park & Carlton, gen. nov., including C. donaldi Park & Carlton, sp. nov.; and Nunnea Park & Carlton, gen. nov., including N. johni Park & Carlton, sp. nov., and N. kuscheli Park & Carlton, sp. nov. A key to species, habitus photographs, line drawings of diagnostic characters and distribution maps for all species are provided.

Key Words: taxonomy; biogeography; Faronitae; Faronini

Results
Chandlerea Park & Carlton  gen. nov.

Nunnea Park & Carlton  gen. nov.

Materials and Methods
Thirty-one specimens were studied from the Field Museum of Natural History (Chicago, IL, USA) and New Zealand Arthropod Collection (Auckland, New Zealand), we noticed 3 distinct morpho-types within the supertribe Faronitae (Coleoptera: Staphylinidae: Pselaphinae) possessing enlarged abdominal segments VI, a character that has previously been used to characterize genus boundaries (Park & Carlton 2013, 2014). Based on morphological study, these morpho-species also have different foveal patterns, and cannot be assigned to other existing faronite genera. Moreover, one morpho-species can be easily separated from the others by the presence of enlarged male antennomeres 7, anterior frontal fovea on the anterior-dorsal aspect of the head, and the absence of basolateral fovea on abdominal sternites V–VI. Based on these features, we describe 2 new genera, Chandlerea gen. nov. and Nunnea gen. nov., and 3 new species, C. donaldi sp. nov., N. johni sp. nov. and N. kuscheli sp. nov.

Four specimens were mounted on permanent slides to aid in observation of internal characters and fine external characters not apparent using a dissecting microscope. Permanent microscopic slides were prepared using the techniques described by Hanley & Ashe (2003). Terminology for the foveal system and enumeration of abdominal sclerites follows Chandler (2001). Numbering of abdominal sclerites indicates actual segment counts (i.e., not ventrites) for consistency with Chandler’s system, but meso- and metathoracic ventral sclerites are referred to as ventrites (sensu Beutel & Leschen 2010).

New Zealand maps were produced by modifying the map of Crosby et al. (1976) and adding appropriate symbols using Adobe Photoshop®. The area codes of the New Zealand sub regions follow the system of Crosby et al. (1998). Multiple specimens from the same locality are indicated by a single symbol.

Each figure of an aedeagus illustrates the organ in dorsal view with the median lobe oriented forward (up on page). Right and left are indicated based on this orientation, not the morphological orientation when inside the body, which would be reversed.

Results
Chandlerea Park & Carlton gen. nov.
http://zoobank.org/8C34C897-2B57-465D-9CB3-280AA3F71AD7
Type species: *Chandlerea donaldi* sp. nov., here designated (monotypy)

**DIAGNOSIS**

The members of *Chandlerea* may be separated from other faronite genera by the following combination of characters: small, body length 1.8 mm (Fig. 1); male antennomere 7 enlarged and subquadrate with round depression (Fig. 1); frontal rostrum prominent and frontal sulcus linear, reaching apex of rostrum (Fig. 4); anterior and posterior frontal foveae present, anterior frontal fovea covered by rostrum (Fig. 4). Frontal posterior sulcus deep and round (Fig. 4). Eyes large and prominent, two-thirds length of temples (eye : temple = 2 : 3) (Fig. 4). Thorax. Prosternum as long as wide, widest at midpoint of prosternum (Fig. 6). Hind wings fully developed. Meso- metaventrite trapezoidal, longer than wide (Fig. 8). Abdomen. Abdominal tergite IV with pair of transverse patches of microtrichia reaching middle (Fig. 1). Abdominal segment VI enlarged, at least twice longer than VII (Fig. 10). Abdominal sternite IV with distinct basolateral foveae, lacking on V–VI (Fig. 10). Aedeagus. Median lobe oval and dorsal process transverse (Fig. 12). Phallobase symmetrical and rounded (Fig. 12). Parameres asymmetrical and slender with many apical setae (Fig. 12).

**DISTRIBUTION**

New Zealand.

**ETYMOLOGY**

This genus is named for a world-renowned beetle specialist and one of the most influential specialists of Pselaphinae during modern time, Donald S. Chandler.

**REMARKS**

Females are unknown.

*Chandlerea donaldi* sp. nov. (Figs. 1, 4, 6, 8, 10, 12 and 16)

http://zoobank.org/ECB8FBC6-476F-4EFE-BD7E-E54D404A90B5

**DESCRIPTION OF MALE**

Length 1.8 mm. Body reddish brown, maxillary palpi, elytra, and legs paler (Fig. 1). Head. Male head bluntly transverse, widest across eyes (Fig. 4). Antennomere 1 approximately 1.5 times longer than wide, 2 longer than wide, 3–5 subquadrate, 6 transverse, 7 enlarged and subquadrate with round depression, 8–10 transverse (Fig. 1). Frontal rostrum prominent and frontal sulcus linear reaching apex of rostrum (Fig. 4). Thorax. Prosternum as long as wide, widest at midpoint of prosternum (Fig. 6). Elytra longer than wide (Fig. 1). Hind wings fully developed. Meso- metaventrite trapezoidal, longer than wide (Fig. 8). Abdomen. Abdominal tergite IV with pair of transverse patches of microtrichia reaching middle (Fig. 1). Abdominal segment VI enlarged, at least twice longer than VII (Fig. 10). Abdominal sternite IV with distinct basolateral foveae, lacking on V–VI (Fig. 10). Aedeagus. Median lobe oval and dorsal process transverse (Fig. 12). Phallobase symmetrical and rounded (Fig. 12). Parameres asymmetrical and slender with many apical setae (Fig. 12).

**TYPE MATERIAL**


**DISTRIBUTION**

Marlborough (MB), Nelson (NN) (Fig. 16: black circles).

**HABITAT**

The holotype was collected by sifting leaf and log litter in broadleaf and podocarp forests.

**ETYMOLOGY**

This species is named for a world-renowned beetle specialist and one of the most influential specialists of Pselaphinae during modern time, Donald S. Chandler.

*NUNNEA* PARK & CARLTON GEN. NOV.

http://zoobank.org/6B361E5E-CF2D-4EDB-89EF-229411AB56E9

Type species: *Nunnea johni* sp. nov., here designated

**DIAGNOSIS**

The members of *Nunnea* may be separated from other faronite genera by the following combination of characters: body length 1.8–2.5 mm (Figs. 2 and 3); frontal rostrum prominent and frontal sulcus linear, reaching eyes (Fig. 5); anterior frontal fovea absent and posterior frontal fovea oval (Fig. 5); prosternum longer than wide with lateral procopial foveae (Fig. 7); mesocoxae divided by distinctly prominent ventral process (Fig. 9: arrow); mesoventrite with promesocoxal foveae and large lateral mesosternal fovea (Fig. 9); abdominal segment VI at least twice larger than VII (Fig. 11); abdominal sternites IV–VI with distinctly large basolateral foveae (Fig. 11); only known from northern South Island (Fig. 16: black triangles and circles).

Figs. 1–3. Habitus. Scale bars = 1 mm. (1) Chandlerea donaldi sp. nov.; (2) Nunnea johni sp. nov.; (3) N. kuscheli sp. nov.
DISTRIBUTION

New Zealand.

ETYMOLOGY

This genus is named for the collector of the holotype, John T. Nunn, who also provided many valuable specimens for this study.

REMARKS

The members of this genus do not possess distinct external secondary sexual characters. Male abdominal sternite IX is fragile and partially concealed by sternite VIII, rendering it simple and reduced in appearance. Females possess a more robust, rectangular abdominal sternite IX bearing a pair of long setae that are usually visible in ventral view. Female genitalia, including spermathecae, apparently are mem-

Figs. 4–15. Head, dorsal view. (4) Chandlerea donaldi sp. nov.; (5) Nunnea johni sp. nov. Prosternum, ventral view. (6) C. donaldi. sp. nov.; (7) N. johni sp. nov. Meso- and metaventrite, ventral view. (8) C. donaldi. sp. nov.; (9) N. johni sp. nov. Abdomen, ventral view. (10) C. donaldi. sp. nov.; (11) N. johni sp. nov. Male genitalia, dorsal view. (12) C. donaldi. sp. nov.; (13) N. johni sp. nov.; (14) N. kuscheli sp. nov. (15) female sternite IX of N. johni sp. nov., dorsal view. Scale bars = 0.1 mm.
branous and were not observable after clearing specimens using 10% potassium hydroxide.

*Nunnea johni* Park and Carlton sp. nov. (Figs. 2, 5, 7, 9, 11, 13, 15 and 16)

http://zoobank.org/2F02E262-A913-4F40-B52D-46164FF6989D

**DIAGNOSIS**

This species is separated from other species of *Nunnea* by the dimensions of antennomere 4, which is longer than wide (Fig. 2) and slender median lobe of genitalia (Fig. 13).

**DESCRIPTION**

Length 1.8–2.5 mm. Body reddish brown; antenna, elytra, legs, maxillary palpi paler (Fig. 7).  

*Head.* Male head round, widest across eyes (Fig. 5). Ventral head convex. Antennomere 2 longer than wide, 3 subquadrate, 4 longer than wide, 5–10 subquadrate (Fig. 5). Eyes prominent, approximately one-half length of temples (eye : temple = 1 : 2) (Fig. 5).  

*Thorax.* Prosternum longer than wide, widest at midpoint of prosternum (Fig. 7). Elytra as long as wide (Fig. 2). Hind wings rudimentary as small pads. Meso- metaventrite trapezoidal, longer than wide (Fig. 9).  

*Abdomen.* Abdominal tergite IV without patches of microtrichia (Fig. 2).  

*Aedeagus.* Median lobe slender and S-shaped with round dorsal process (Fig. 13). Phallobase symmetrical and rounded (Fig. 13). Parameres symmetrical with apical setae (Fig. 13). Female abdominal sternite IX rectangular, longer than wide and bearing pair of long and short setae from posterior margin (Fig. 15).

**TYPE MATERIAL**


**PARATYPEs (n = 19; 8 males, 11 females).** New Zealand: Buller (BR): 3 ♂ 2 ♀ (1 ♂, slide-mounted), Nelson Lakes NP, Mt. Robert, Speargrass Tr, 875 m, 41° 49’ 46” S, 172° 48’ 31” E, 30-XI–17-XII-2005, *Nothofagus* forest, FMHD#2005-061, pitfall trap, A. Newton, M. Thayer, ANMT site 1161 (FMNH); 1 ♂, Nelson Lakes NP, n slope Mt. Robert, Pinchgut Tr, 950 m, 14-XII-1984–6-I-1985, *Nothofagus* forest, A. Newton, M. Thayer 707, window trap (FMNH); Nelson (NN): 1 ♂, same data as holotype (FMNH); 1 ♂, Kahurangi NP, Cobb Dam Rd, Asbestos Tr, 450 m, 41° 06’ 33” S, 172° 43’ 17” E, 29-XI–18-XII-2005, *Nothofagus* forest, FMHD#2005-111, litter, A. Solodovnikov, D. Clarke et. al, ANMT site 1160 (FMNH); 3 ♂ 2 ♀, Dun Mt., 31-VI-1996, A. K. Walker, litter 66/274 (NZAC); 1 ♂, Upper Maitai, 13-II-1957, E. S. Gourlay (NZAC); 1 ♂, Cobb Reservoir, 1037 m, 18-IX-1964, T. G. Wood, moss 64/100 (NZAC); Marlborough Sounds (SD): 3 ♂ ♀, Tennyson Inlet, west side Te Mako Bay, 125 m, 15-XII-1984–5-I-1985, *Nothofagus*-podo-hwdw, A. Newton, M. Thayer 710, FIT & window trap (FMNH); 1 ♂, 70 km ne Nelson, Tennyson Inlet, 480 m, 27-V-1982, FMHD#2005-604, Beech forest litter, S. Peck (FMNH).

**DISTRIBUTION**

Buller (BR), Nelson (NN), Marlborough Sounds (SD) (Fig. 16: black squares).

**HABITAT**

Specimens of this species were collected using pitfall, flight intercept, window traps, or by sifting beech and leaf litter in broadleaf, hardwood, podocarp or *Nothofagus* forests.

**ETYMOLOGY**

This species is named for the collector of the holotype, John T. Nunn, who also provided many valuable specimens for this study.

*Nunnea kuscheli* Park & Carlton sp. nov. (Figs. 3, 14 and 16)

http://zoobank.org/5C1DCB25-1702-462C-BE00-0CFF8C211D74

**DIAGNOSIS**

This species is separated from other species of this genus by the dimensions of antennomere 4, which are subquadrate (Fig. 3) and broader median lobe of genitalia (Fig. 14).

**DESCRIPTION**

Length 1.8–2.5 mm. Body reddish brown; antennae, elytra, legs, and maxillary palpi paler (Fig. 3).  

*Head.* Male head round, widest across eyes (Fig. 16). Known collection localities of *Chandlerea* gen. nov. and *Nunnea* gen. nov. *C. donaldi* sp. nov.: black squares; *N. johni* sp. nov.: black circles; *N. kuscheli* sp. nov.: triangles.
eyes. Ventral head convex. Antennomere 2 longer than wide, 3–10 subquadrate (Fig. 3). Eyes prominent, approximately one-half length of temples (eye : temple = 1 : 2). Thorax. Prosternum longer than wide, widest at midpoint of prosternum. Elytra as long as wide (Fig. 3). Hind wings rudimentary as small pads. Meso- metaventrite trapezoidal, longer than wide. Abdomen. Abdominal tergite IV without patches of microtrichia (Fig. 3). Aedeagus. Median lobe broad and semicircular with round dorsal process (Fig. 14). Phallobase symmetrical and rounded (Fig. 14). Parameres symmetrical apical setae (Fig. 14). Female abdominal sternite IX rectangular, longer than wide and bearing pair of setae from posterior margin.

TYPE MATERIAL

HOLOTYPE. NEW ZEALAND: Nelson (NN): 1 ♂ (NZAC), aedeagus dissected and mounted in balsam on a clear plastic card, "New Zealand: NN: Devil River Rd, Tawhai SF 3km S of Reefton 17 IV 1972, 197m J. McBurney, litter, PB15", "HOLOTYPE Nunnea kuscheli Park and Carlton des. 2013". PARATYPES (n = 8; 4 males, 4 females). New Zealand: Buller (BR): 2 ♂ ♂, Fletchers Ck, Stoney Ck, 28-I-1972, J. S. Dugdale, PN15, litter 72/101 (NZAC); 1 ♂, Fletchers Ck, 7-III-1972, J. S. Dugdale, litter 72/106 (NZAC); 2 ♂ ♂, Reefton, 12-IV-1977, J. A. Wightman, pit trap cutover pine (NZAC); 1 ♂, W Inangahua SF, 126 m, Fletchers Ck, 18-IV-1972, J. S. Dugdale, moss & litter on Beech forest floor, XBZ (NZAC); 1 ♂, 1.8 km n Punakaiki, 80 m, 19-XII-1984–20-I-1985, hardwood forest with nikau, A. Newton, M. Thayer 718, FIT & window trap (FMNH).

DISTRIBUTION

Buller (BR), Nelson (NN) (Fig. 16: black triangles).

HABITAT

Specimens of this species were collected using pitfall, flight intercept, window traps, or by sifting moss and leaf litter.

ETYMOLOGY

This species is named for one of the most influential New Zealand beetle specialists, Guillermo Kuschel.

Key to species of Chandlerea gen. nov. and Nunnea gen. nov.

The key is based on male specimens because female specimens are indistinguishable based on external morphology, and a female specimen of Chandlerea gen. nov. is unknown.

1.— Male antennomere 7 enlarged (Fig. 1); elytra longer than wide (Fig. 1) ................. Chandlerea donaldi Park & Carlton sp. nov.

1’.— Antennomere 7 of both sexes slightly larger than 6 (Figs. 2–3); elytra as long as wide (Figs. 2 and 3) ..................... 2

2. (1) Antennomere 4 longer than wide; median lobe of genitalia slender and S-shaped (Fig. 13) ............ Nunnea johni Park & Carlton sp. nov.

2’.— Antennomere 4 subquadrate; median lobe of genitalia broad and semicircular (Fig. 14) .................. N. kuscheli Park & Carlton sp. nov.

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