

Survey of rove beetles (Coleoptera, Staphylinidae) from Stanley Park, Vancouver, British Columbia, Canada, with new records and description of a new species. Part 2

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Abstract

The second survey in 2008 of rove beetle species from Stanley Park, Vancouver, British Columbia, Canada is presented. Fifty-one species were found from the following subfamilies: Aleocharinae (18), Micropeplinae (1), Omaliinae (11), Osoriinae (1), Oxytelinae (2), Paederinae (1), Proteininae (2), Pselaphinae (3), Steninae (1), Staphylininae (8), and Tachyporinae (3). All species are listed in Tables 1 and 2. Thirty-five species were previously recorded from the storm-undamaged sites in 2007, including 16 species that were site-specific. Fifty-one species are reported from the storm-damaged sites, including 31 species that are site-specific. There are 19 species in common between storm-damaged and undamaged sites. Sixty-seven species of rove beetles are now known from all the sites studied in Stanley Park. One new species, *Sonoma squamishorum* Chandler & Klimaszewski, **sp. n.**, is described and illustrated. *Proteinus collaris* Hatch is recorded from Canada and British Columbia for the first time. Four adventive aleocharine species are recorded.

Keywords

British Columbia, Canada, Coleoptera, new species, Staphylinidae, Stanley Park, survey, Vancouver

Introduction

This is the second paper devoted to rove beetles from Stanley Park. It includes species from samples collected in the storm-damaged forest in December 2006 (Figs. 1, 2 A-D). The first paper described species collected in 2007 from portions of the forest undamaged by the storm (McLean et al. 2009). The purpose of this paper is to compare the rove beetle fauna in the storm-damaged areas surveyed in 2008 with the 2007 collection from the undamaged forest, and to describe and document a new species of Pselaphinae.

Study locations

The 2008 study sites included a stand west of the South Creek Trail (49°18'03", 123°08'25"W) (Fig. 1, Site C) which had been burnt over in a fire in 1860. The high stumps (Fig. 2C) are a remnant from that period. The site was cleared of all fallen trees

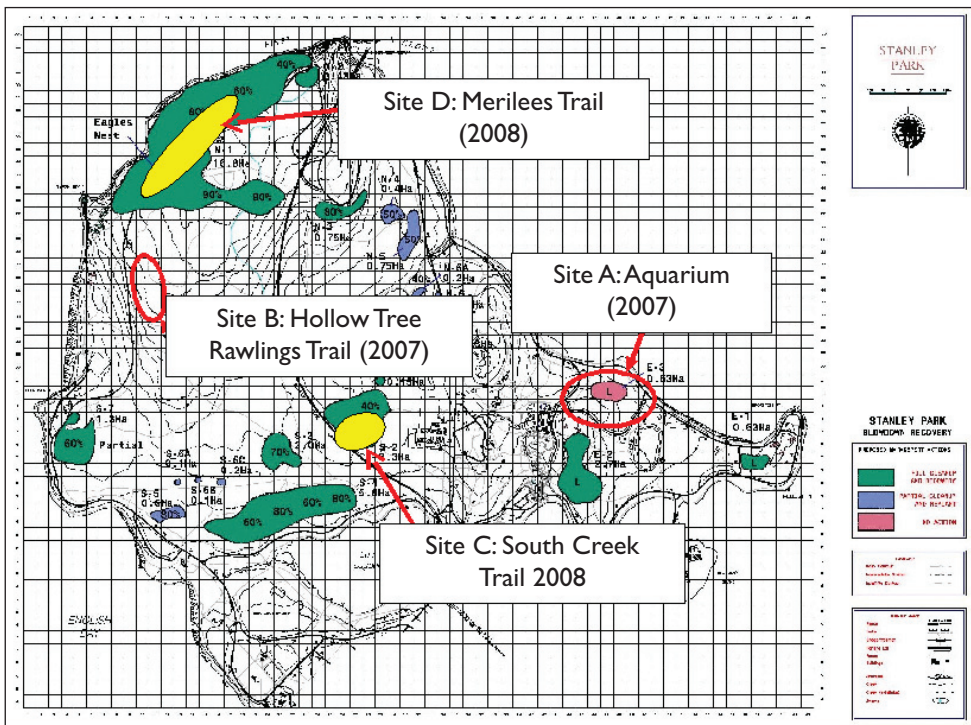


Figure 1. Map of Stanley Park, Vancouver, British Columbia, showing collecting locations for the 2007 and 2008 insect surveys.

and replanted in the fall of 2007 with clumps of Douglas-fir (*Pseudotsuga menziesii* (Mirbel) Franco) and western red cedar (*Thuja plicata* Donn ex. D. Don). The second 2008 study site was along Merilees Trail (Fig. 1, Site D) (49°18'40"N, 123°09'02"W) which has also been cleared and replanted with the same plant regime as Site C (Fig. 2D). The 2008 sites were much more open than the "intact" 2007 sites.

Material examined

More than 466 adult rove beetles were examined, and most aleocharines and pselaphines were dissected. The genital structures were dehydrated in absolute alcohol and mounted in Canada balsam on celluloid microslides and pinned with the specimens from which they originated.

Traps were set out on April 23, 2008 and collected monthly through October. At each site, five Lindgren multiple-funnel traps and a flight-intercept trap were set and a pitfall trap was placed near each of the hanging traps. Polypropylene glycol was used in all traps for preserving captured insects. The Lindgren traps were baited with specific pheromones and/or ethanol or alpha-pinene lures. The pitfall traps were unbaited. The collecting periods for each species are shown in Table 1.

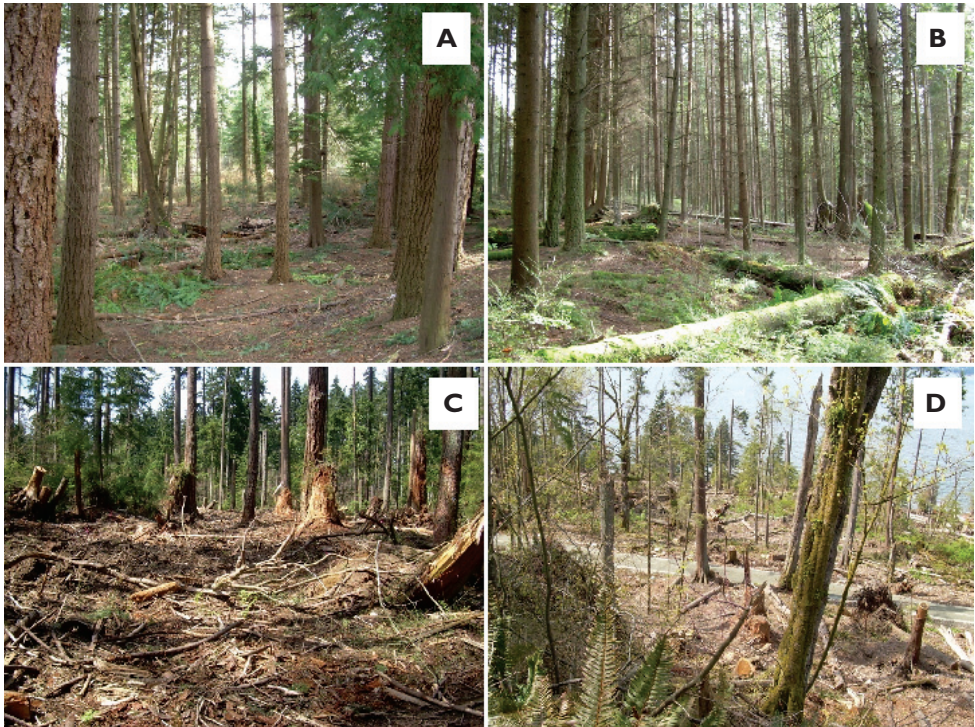


Figure 2. Collection sites A-D. Site A: Aquarium (2007). Site B: Hollow Tree/Rawlings Trail (2007). Site C: South Creek Trail (2008). Site D: Merilees Trail (2008).

The larger catches found in the hanging traps did not indicate any preferences of the staphylinid beetles for any of the semiochemical baits for bark beetles or wood borers. Trap catches were quite even among traps suggesting that the trap form and shape was consistent for all species.

The following references were used for identification in this study: Campbell (1973), Benick and Lohse (1974), Hatch (1957), Klimaszewski (2000), Klimaszewski et al. (2001), Klimaszewski and Winchester (2002), Klimaszewski et al. (2004), Klimaszewski et al. (2006), Klimaszewski et al. (2007), Newton et al. (2001), Seevers (1978), and Smetana (1971).

Conventions

Repository abbreviations:

- CNC** Canadian National Collection of Insects, Arachnids and Nematodes, Agriculture and Agri-Food Canada, Ottawa, Ontario, Canada
- LFC** Natural Resources Canada, Canadian Forest Service, Laurentian Forestry Centre, Quebec City, Quebec, Canada
- UBC** University of British Columbia, Spencer Entomological Collection, Beaty Biodiversity Museum, Vancouver, British Columbia, Canada
- UNHC** University of New Hampshire, Department of Zoology, Durham, New Hampshire, U.S.A.

Systematics

Supertribe Faraonitae, Tribe Faronini

Sonoma Casey, 1886

For diagnosis and literature review, see Marsh and Schuster (1962), with addenda by Park and Wagner (1962), and Chandler (1986 and 2003).

Sonoma squamishorum Chandler & Klimaszewski, sp. n.

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Figs 3–6

Specimens examined. Holotype. Male. CANADA: British Columbia: Vancouver, Stanley Park, Merilees Trail, CWH (49 18'40"N, 123 09'02"W), V-22/VI-27-2008, J.A. McLean & A. Li, funnel trap 1 (CNC). Paratype female: same park, South Creek Trail, CWH (49 18'03"N, 123 08'25"W), VI-27/VII-31-2008, J.A. McLean & A. Li, funnel trap 5 (UNHC).

Etymology. This species is named in recognition of the Squamish aboriginal people who are known to have lived in this area of Vancouver. It took until 2008 for the Musqueam, Squamish and Tsleil-Waututh, who traditionally used the land that is now Stanley Park, to be physically represented at the site. That has now been addressed with People Amongst the People, three gateways covered with designs in threes and multiples of three to represent the three aboriginal groups, a work created by Susan Point and her team of Musqueam carvers.

Diagnosis. Body small for *Sonoma*; frontal sulcus of head Y-shaped; discal foveae deeply impressed and impressions continued posteriorly to antebasal sulcus. Males with gula prominent and setose; aedeagus with phallobase separated, parameres nearly symmetrical, penis simple.

Description. Length 1.68–1.76 mm. Body light orange-brown (Fig. 6). Head about as long as wide; tempora broadly rounded and distinct; frontal sulcus deep, abruptly widened in apical half to nearly twice basal width, forming a thick “Y”, sulcus about as long as wide, base of sulcus even with midpoint of eyes; vertexal foveae distinct, posterior to point even with hind margin of eyes; eyes with about 60 facets in both sexes. Pronotum with each discal fovea at anterior margin of slightly converging impressions that extend to antebasal sulcus, median antebasal foveae distinct, nude; antebasal sulcus broad between lateral constrictions, narrow beyond constrictions to nude lateral antebasal foveae. Elytra half again as long as pronotum; foveal pattern 4–2–4 (four foveae in sutural stria, four in discal sulcus, and two faint foveae in longitudinal line between them, foveae difficult to see on dried specimens). Abdomen as long as elytra in dorsal view.

Males with posterior portion of gular area transversely projecting and densely setose. Legs lacking modifications. Abdomen with complete microsetigerous line near apex of visible tergite 1 (morphological segment 4). Visible sternites 4–5 progressively more strongly medially impressed, fifth visible sternite with prominent oblique and posteriorly directed acute projections at lateral third of sternite, projections strongly setose and extending posteriorly for short distance over anterior portion of sternite 6; sternite 6 with loose cluster of elongate spines to each side of middle (Fig. 4). Aedeagus of general form of *Sonoma grandiceps* Casey (Fig. 3); parameres with apical portions symmetrical, bases appearing slightly dissimilar, with coarse punctation on lateral portion of bases; penis elongate and of nearly even width in apical two-thirds, slightly asymmetrical.

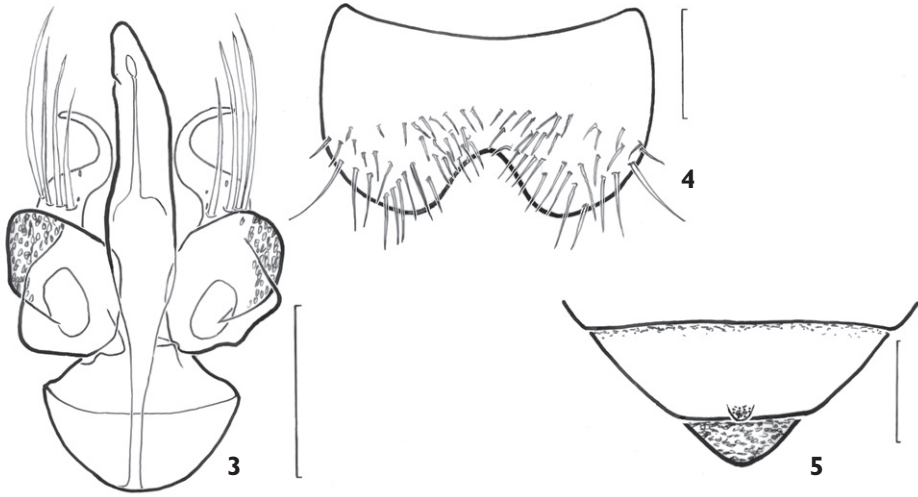
Females with gula slightly convexly curved, lacking dense setae. Abdomen with sternite 6 symmetrical, apex broadly and shallowly curved, with small granulate raised area at middle slightly projecting posteriorly (Fig. 5); sternite 7 flat and granulate (Fig. 5).

Distribution. Only known from Stanley Park in Vancouver, British Columbia.

Collection and habitat data. Both specimens were collected with funnel traps, and so the preferred habitat of this species is unknown. However, this collecting technique is particularly effective in trapping species that are associated with downed, dead, or dying trees, and the suspected habitat is in rotting wood. Several species of this



Figure 6. *Sonoma squamishorum*, dorsal view (holotype). Apical part of abdomen removed.



Figures 3–5. *Sonoma squamishorum*. Scale line equals 0.1 mm: **3** ventral view male genitalia **4** ventral view male sternite 6 **5** ventral view female sternites 6–7.

genus have a strong association with downed rotting logs and are found beneath loose bark or in logs that may be torn apart by hand (Chandler 2003).

Comments. *Sonoma squamishorum* appears to be closest to *S. grandiceps* Casey, 1893, known only from the type series taken in Santa Cruz, California in the late 1800's, and *S. tehamae* Chandler, 2003, known only from a single site in northern California. The males of these species share a strongly basally-constricted phallobase, nearly symmetrical parameres with a row of long setae, and a densely setose and prominent gula. *Sonoma grandiceps* is the most similar species based on aedeagal form and the prominent setose projections of the fifth abdominal sternite, and is separated from *S. squamishorum* by the slightly asymmetrical apices of the large curved spine of each paramere, and the lack of the coarse lateral punctation of the parameres found in *S. squamishorum*. The apical portion of the penis is slightly more asymmetrical in *S. grandiceps*, and *S. tehamae* has a much more asymmetrical penis, and lacks the apical curved spines of the parameres and the setose projections of abdominal sternite 5.

Faunistic account - results and discussion

This paper treats rove beetles captured from storm-damaged sites in Stanley Park, Vancouver, British Columbia, Canada. Collecting yielded 51 rove beetle species in the following subfamilies: Aleocharinae (18), Micropeplinae (1), Omaliinae (11), Osoriinae (1), Oxytelinae (2), Paederinae (1), Proteininae (2), Pselaphinae (3), Staeninae (1), Staphylininae (8), and Tachyporinae (3). All species are listed in Tables 1 and 2. Sixty-seven species of rove beetles in total are reported from all stud-

ied sites (A-D) (Table 1). Thirty-five species (52.2% of the total from sites A-D) were previously recorded from the storm-undamaged sites (Fig. 2A, B, Table 2), including 16 species (23.8% of the total from sites A-D) which were site specific (not found in the second survey) (McLean et al. 2009). Fifty-one species (76.1% of the total from sites A-D) are herein reported from the storm-damaged sites (Fig. 2 C, D), including 32 species (47.7% of the total from sites A-D) site specific (Tables 1, 2). There are 19 species (28.3% of the total from sites A-D) shared between storm-damaged and undamaged sites (Table 2). The substantial increase in number of species at sites C and D was to be expected because the storm damaged areas of the forest provide a more diversified habitat. There is more forest edge, some fragments of an old forest, more dead snags and logs, and many disturbed soil habitats providing opportunities for a greater species diversity of rove beetles. The species composition is different in the AB and CD sites, except for the 19 species (28.3%) which are in common (Table 2). There are differences between the dominant species in the studied sites (Table 2). *Atheta cheersae* Klimaszewski, a common species in disturbed forest, was not found in the undisturbed forest, *Atheta ventricosa* Bernhauer occurred in smaller numbers in disturbed forest; *Leptusa gatineauensis* Klimaszewski and Pelletier was better represented in disturbed areas of the park; and *Oxypoda stanleyi* Klimaszewski and McLean was more numerous in undisturbed forest. *Stictalia brevicornis* Casey was numerous in disturbed sites but was not found in the undisturbed sites where *Stictalia californica* Casey was present. *Deinopteroloma subcostatum* (Mäklin), *Eusphalerum pothos* Mannerheim, and *Oropus striatus* (LeConte) were more numerous in the disturbed sites. *Actium retracatum* Casey, *Sonoma squamishorum* sp. n., *Gabrieus forcipatus* (Hatch), *Pelecomanium testaceum* (Mannerheim), and *Tachinus maculicollis* Mäklin occurred only in the disturbed sites and *Deinothenarus pleuralis* (LeConte) only in undisturbed sites. Clearly different rove beetle species appear to prefer different habitats. There are many singletons present only at either site. Additional adventive species, *Xantholinus linearis* (Olivier), 1 female, and *Atrecus macrocephalus* (Nordmann), 1 female, were reared from logs collected in the park but are not included in the tables and are excluded from our calculations.

Proteinus collaris Hatch is recorded from Canada and British Columbia [Stanley Park] for the first time. Three adventive aleocharine species are recorded from the storm-damaged sites (B and/or C) are: *Aleochara curtula* (Goeze), *Mocyta fungi* (Gravenhorst), and *Oxypoda opaca* (Gravenhorst). The adventive species *Aleochara fumata* (Gravenhorst) and *Dalotia coriaria* (Kraatz), previously recorded from storm-undamaged sites, are not recorded from storm-damaged sites, and *A. curtula* was not recorded from the undamaged sites.

Klimaszewski and Winchester (2002) published the first comprehensive survey of aleocharine beetles from the ancient Sitka spruce forest in Carmanah Valley on Vancouver Island, British Columbia. They recorded 40 species, including 10 species new to science, in nine different tribes: Aleocharini (3 sp.), Athetini (20 sp.), Autaliini (1 sp.), Homalotini (5 sp.), Hypocyphitini (1 sp.), Lomechusini (1 sp.),

Myllaenini (1 sp.), Oxypodini (5 sp.), and Placusini (3 sp.). In the Stanley Park survey, only 25 species of aleocharines were recorded in five tribes: Aleocharini (2 sp.), Athetini (15 sp.), Homalotini (3 sp.), Oxypodini (2 sp.), and Placusini (3 sp.). Species from the tribes Autaliini, Hypocyphtini, Lomechusini, and Myllaenini were absent from Stanley Park. The dominant group at both study sites was Athetini with 20 species captured in Carmanah Valley and 15 in Stanley Park. There were 8 species in common between the two sites but no adventive species were recorded from the Carmanah native forest.

Table 1. List of rove beetles captured in Stanley Park, Vancouver, British Columbia, Canada. Subfamilies and species are listed alphabetically. New distribution records are in bold case. Adventive species are indicated with an asterisk (*). Canadian provinces and territories and American states are abbreviated. Site A is located in the area adjacent to the Vancouver Aquarium and site B along the Rawlings Trail near the Hollow Tree; site C along South Creek Trail, and site D along Merilees Trail. Two species represented by singletons, *Atrecus macrocephalus* (LFC, 1 female) and *Xantholinus linearis* (Olivier)* (LFC, 1 female, tentative identification pending on capturing a male) were reared from logs and are excluded from the tables below.

Subfamilies and species	Distribution in Canada and Alaska	Collecting sites in Stanley Park				Collecting period	Depository
		Sites A, B	Specimens captured	Sites C, D	Specimens captured		
ALEOCHARINAE							
<i>Acrotona</i> sp.	BC	--	-	D	1	VII-VIII	LFC
<i>Amischa</i> sp. 1	BC	A	1	--	-	VIII-X	LFC
<i>Amischa</i> sp. 2	BC	A, B	3+1?	D	1	V, VI, VIII, X	LFC, UBC
<i>Aleochara curtula</i> (Goeze)*	BC, ON, QC, NB, NS, NF&LB	--	-	C	3	V, VII, VIII	UBC
<i>Aleochara fumata</i> (Gravenhorst)*	AB, BC, MB, NB, NS, ON, PE, QC, YT	A	1	--	-	VII-VIII	UBC
<i>Atheta</i> (<i>Metadimetrotia</i>) <i>cheersae</i> Klimaszewski	BC	--	-	C	21+1?	IX-X	LFC, UBC
<i>Atheta</i> (<i>Dimetrotia</i>) <i>hampshirensis</i> Bernhauer	AK, BC, NB, NS, QC	A, B	2	--	-	VII, VIII	UBC
<i>Atheta</i> (<i>Pseudotia</i>) <i>nescia</i> (Casey)	BC	--	-	C	1	VI-VII	UBC
<i>Atheta</i> (<i>Atheta</i>) <i>ringi</i> Klimaszewski	BC	A	1	C	2	IV-VII	LFC, UBC
<i>Atheta</i> (<i>Alaobia</i>) <i>ventricosa</i> Bernhauer	AK, BC, ON, NB, YT	A, B	20	C	6	V-X	LFC, UBC
<i>Atheta</i> sp. 1	BC	--	-	C, D	6	IV-VI, IX-X	LFC, UBC

Subfamilies and species	Distribution in Canada and Alaska	Collecting sites in Stanley Park				Collecting period	Depository
		Sites A, B	Specimens captured	Sites C, D	Specimens captured		
<i>Atheta</i> sp. 2	BC	--	-	C	1	IV-V	LFC
<i>Atheta</i> sp. 3	BC	--	-	D	1	IV-V	LFC
<i>Dalotia coriaria</i> (Kraatz)*	AB, ON, BC	B	1	--	-	VII	UBC
<i>Leptusa gatineauensis</i> Klimaszewski	ON, QC, NS, BC	A, B	2	C, D	7	IV, V, VIII, IX	LFC, UBC
<i>Liogluta</i> sp.	BC	--	-	CD	2	V-VI, IX-X	LFC
<i>Mocyta fungi</i> (Gravenhorst)*	ON, QC, NB, NF & LB, NS, BC	A	2	D	1	IV-V, VII-VIII	UBC
<i>Oxypoda opaca</i> (Gravenhorst)*	ON, NS, BC	A	1	D	3	IV-V	UBC
<i>Oxypoda stanleyi</i> Klimaszewski & McLean	BC	A, B	26	C, D	17	IV-VII	LFC, UBC
<i>Placusa incompleta</i> Sjöberg * or Holarctic	BC, QC, NS	--	-	C	1	VI-VII	UBC
<i>Placusa tacomae</i> Casey	YT, NT, BC, AB, ON, QC, NS	A, B	5	--	-	V, VI, VII	UBC
<i>Placusa vaga</i> Casey	BC, QC	A	1	C	1	VII-VIII	UBC
<i>Stictalia brevicornis</i> Casey	BC	--	-	C, D	17	IV-VII, IX-X	LFC, UBC
<i>Stictalia californica</i> (Casey)	BC	A, B	4	--	-	V, VII, VIII-X	UBC
MICROPEPLINAE							
<i>Micropeplus punctatus</i> LeConte	AK, BC	A, B	4	C, D	5	IV-V, VII, IX-X	LFC, UBC
OMALIINAE							
<i>Acidota crenata</i> (Fabricius)	AK, BC, AB, SK, MB, ON, QC, NB, NS, PE, NF&LB	--	-	C	1	VII-IX	UBC
<i>Acrulia</i> sp.	AK, BC	--	-	D	2	IX-X	LFC, UBC
<i>Acrulia tumidula</i> (Mäklin)	AK, BC	A	1	--	-	IV	UBC
<i>Amphichroum maculatum</i> (Horn)	BC	--	-	D	2	IV-V	UBC
<i>Anthobium fimetarium</i> (Mannerheim)	AK, BC	B	3	C	3	VIII-X	LFC, UBC
<i>Amphichroum floribundum</i> LeConte	BC	--	-	C	2	IV-V	LFC, UBC

Subfamilies and species	Distribution in Canada and Alaska	Collecting sites in Stanley Park				Collecting period	Depository
		Sites A, B	Specimens captured	Sites C, D	Specimens captured		
<i>Amphichroum maculatum</i> Horn	BC	B	1	C	59	IV-VI	UBC
<i>Deinopteroloma subcostatum</i> (Mäklin)	AK, BC	A, B	12	D	33	V- X	UBC
<i>Eusphalerum pothos</i> Mannerheim	AK, BC, AB, ON, QC, NB, NS, NF	B	18	D	107	IV-VIII	UBC
<i>Hapalaraea megarthroides</i> (Fauvel)	BC, AB	B	1	--	-	VIII-X	UBC
<i>Pelecomanium testaceum</i> (Mannerheim)	AB, BC	--	-	D	5 + 3?	IV-VII	LFC, UBC
<i>Phloeonomus laesicollis</i> (Mäklin)	AK, BC, AB, ON, QC, NS, NF	B	1	C, D	3	VI-IX	UBC
<i>Phlaeopterus</i> sp.	BC	--	-	D	2	IX-X	LFC, UBC
OSORIINAE							
<i>Renardia nigrella</i> (LeConte)	AB, BC	--	-	C, D	4	VI-X	LFC, UBC
OXYTELINAE							
<i>Ochtheophilus</i> sp.	BC	--	-	C	2	IX-X	UBC
<i>Oxytelus laqueatus</i> (Marshall)*	AK, BC, YT, AB, SK, MB, ON, QC, NB, NS	A, B	8	--	-	VII, VIII	LFC, UBC
<i>Syntomium grahami</i> Hatch	AK, BC, QC, NB, NF	A	1	C	1	V-VII	UBC
PROTEININAE							
<i>Megarthrus pictus</i> Motschulsky	AK, BC	A	1	--	-	VIII-X	UBC
<i>Proteinus collaris</i> Hatch	BC [first Canadian record]	--	-	C	1	IV-V	UBC
<i>Proteinus limbatus</i> Mäklin	AK, BC, ON	B	2	C	4	VIII-X, IX-X	LFC, UBC
PSELAPHINAE							
<i>Oropus striatus</i> (LeConte)	BC	A, B	13	D	62	IV, V, VI, VII, VIII-X	UBC, UNH
<i>Sonoma squamishorum</i> sp. n. Chandler & Klimaszewski	BC	--	-	D	2	IV-VI	CNC UNH

Subfamilies and species	Distribution in Canada and Alaska	Collecting sites in Stanley Park				Collecting period	Depository
		Sites A, B	Specimens captured	Sites C, D	Specimens captured		
<i>Actium retractum</i> Casey	BC	--	-	D	1	IV-V	UBC
PAEDERINAE							
<i>Lathrobium</i> sp.	BC	B	1	--	-	VI-VII	UBC
<i>Medon</i> sp.	BC	--	-	D	1	IV-V	LFC
STAPHYLININAE							
<i>Atrecus macrocephalus</i> (Nordmann)	BC, AB, NT, ON, QC, NB, NS, NF&LB	--	-	C, D	4	V-IX	LFC, UBC
<i>Dinothenarus pleuralis</i> (LeConte)	BC, AB	A	12	--	-	IV, V, VI, VIII	LFC, UBC
<i>Gabrius forcipatus</i> (Hatch)	BC	--	-	CD	12	IV-VI	LFC, UBC
<i>Gabrius virilis</i> (Horn)	BC	A	1	--	-	IV-V	UBC
<i>Philonthus</i> sp.	BC	--	-	D	1	VIII-IX	UBC
<i>Quedius aenescens</i> Mäklin	AB, BC	--	-	D	1	V-VI	UBC
<i>Quedius crescenti</i> Hatch	BC	A, B	6	D	8	VI-VIII	CNC, LFC, UBC
<i>Quedius griffinae</i> Hatch	BC	--	-	C, D	2	VI-VII	LFC, UBC
<i>Quedius oculus</i> (Casey)	BC	--	-	D	1	VI-VII	LFC
<i>Quedius</i> sp 1.	BC	--	-	D	1	IV-V	LFC
STENINAE							
<i>Stenus sculptilis</i> Casey	BC	--	-	D	1	IV-V	UBC
TACHYPORINAE							
<i>Ischnosoma pictum</i> (Horn)	AB, BC, MB, ON, QC, NB, NF&LB, NS, PE	--	-	D	1	VII-VII	LFC
<i>Mycetoporus</i> sp.	BC	B	1			V	
<i>Tachinus crotchi</i> Horn	BC	A, B	7	--	-	VII, VIII	LFC, UBC
<i>Tachinus maculicollis</i> Mäklin	BC	--	-	C, D	34	VII-X	LFC, UBC
<i>Tachinus nigricornis</i> Mannerheim	AK, BC, AB	B	1	--	-	VII	UBC
<i>Tachinus semirufus</i> Horn	AK, BC	A, B	20	C, D	6	V-VII	LFC, UBC

Table 2. List of species site specific to A and/or B, and C and/or D, and common in all sites (A, B, C, D). Adventive species are marked with an asterisk (*).

Species which are site specific to A and/or B	Species which are site specific to C and/or D	Species common to all sites (A, B, C, D) or at least one in A, B or C, D category
ALEOCHARINAE	ALEOCHARINAE	ALEOCHARINAE
<i>Amischa</i> sp. 1	<i>Acrotona</i> sp.	<i>Amischa</i> sp. 2
<i>Aleochara fumata</i> (Gravenhorst)*	<i>Aleochara curtula</i> (Goeze)*	<i>Atheta</i> (<i>Atheta</i>) <i>ringi</i> Klimaszewski
<i>Atheta</i> (<i>Dimetrota</i>) <i>hampshirensis</i> Bernhauer	<i>Atheta</i> (<i>Metadimetrota</i>) <i>cheersae</i> Klimaszewski	<i>Atheta</i> (<i>Alaobia</i>) <i>ventricosa</i> Bernhauer
<i>Dalotia coriaria</i> (Kraatz)*	<i>Atheta</i> (<i>Pseudota</i>) <i>nescia</i> (Casey)	<i>Leptusa gatineauensis</i> Klimaszewski & Pelletier
<i>Placusa tacomae</i> Casey	<i>Atheta</i> sp. 1–3	<i>Mocyta fungi</i> (Gravenhorst)*
<i>Stictalia californica</i> (Casey)	<i>Liogluta</i> sp.	<i>Oxypoda opaca</i> (Gravenhorst)*
OMALIINAE	<i>Placusa incompleta</i> Sjöberg*	<i>Oxypoda stanleyi</i> Klimaszewski & McLean
<i>Acrulia tumidula</i> (Mäklin)	<i>Stictalia brevicornis</i> Casey	<i>Placusa vaga</i> Casey
<i>Hapalaraea megarthroides</i> (Fauvel)	OMALIINAE	MICROPEPLINAE
OXYTELINAE	<i>Acidota crenata</i> (Fabricius)	<i>Micropeplus punctatus</i> LeConte
<i>Oxytelus laqueatus</i> (Masham)*	<i>Acrulia</i> sp.	OMALIINAE
PAEDERINAE	<i>Amphichroum maculatum</i> (Horn)	<i>Anthobium fimetarium</i> (Mannerheim)
<i>Lathrobium</i> sp.	<i>Amphichroum floribundum</i> LeConte	<i>Amphichroum maculatum</i> Horn
PROTEININAE	<i>Pelecomalium testaceum</i> (Mannerheim)	<i>Deinopteroloma subcostatum</i> (Mäklin)
<i>Megarthrus pictus</i> Motschulsky	<i>Phlaeopterus</i> sp.	<i>Eusphalerum pothos</i> Mannerheim
STAPHYLININAE	OSORIINAE	<i>Phloeonomus laesicollis</i> (Mäklin)
<i>Dinothenarus pleuralis</i> (LeConte)	<i>Renardia nigrella</i> (LeConte)	OXYTELINAE
<i>Gabrius virilis</i> (Horn)	OXYTELINAE	<i>Syntomium grahami</i> Hatch
TACHYPORINAE	<i>Ochtheophilus</i> sp.	PROTEININAE
<i>Mycetoporus</i> sp.	PAEDERINAE	<i>Proteinus limbatus</i> Mäklin
<i>Tachinus crotchii</i> Horn	<i>Medon</i> sp.	PSELAPHINAE
<i>Tachinus nigricornis</i> Mannerheim	PROTEININAE	<i>Oropus striatus</i> (LeConte)
	<i>Proteinus collaris</i> Hatch	STAPHYLININAE
	PSELAPHINAE	<i>Quedius crescenti</i> Hatch
	<i>Sonoma squamishorum</i> sp. n.	TACHYPORINAE

Species which are site specific to A and/or B	Species which are site specific to C and/or D	Species common to all sites (A, B, C, D) or at least one in A, B or C, D category
	<i>Actium retractum</i> Casey	
	STENINAE	<i>Tachinus semirufus</i> Horn
	<i>Stenus sculptilis</i> Casey	
	STAPHYLININAE	
	<i>Atrecus macrocephalus</i> (Nordmann)	
	<i>Gabrius forcipatus</i> (Hatch)	
	<i>Philonthus</i> sp.	
	<i>Quedius aenescens</i> Mäklin	
	<i>Quedius griffinae</i> Hatch	
	<i>Quedius oculus</i> (Casey)	
	<i>Quedius</i> sp. 1	
	TACHYPORINAE	
	<i>Ischnosoma pictum</i> Horn	
	<i>Tachinus maculicollis</i> Mäklin	
16 species	32 species	19 species

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References

- Benick G, Lohse GA (1974) Tribus: Callicerini (Atheta). In: Freude H, Harde KW, Lohse GA (Eds) Die Käfer Mitteleuropas. Band 5: Staphylinidae II (Hypocyphitinae und Aleocharinae) Pselaphidae. Goecke & Evers Verlag, Krefeld, 72–221.
- Campbell JM (1973) A revision of the genus *Tachinus* (Coleoptera: Staphylinidae) of America north of Mexico. *Memoirs of the Entomological Society of Canada* 90: 1–106.
- Chandler DS (1986) New Pselaphidae from Oregon (Coleoptera). *The Pan-Pacific Entomologist* 62: 333–339.
- Chandler DS (2003) The ant-like litter beetles of Tehama County, California, and their ecological associations (Coleoptera, Staphylinidae, Pselaphinae). In: Cuccodoro G, Leschen RAB

- (Eds), Systematics of Coleoptera: papers celebrating the retirement of Ivan Löbl. *Memoirs on Entomology International*, Vol. 17, 565–616
- Hatch MH (1957) The beetles of the Pacific Northwest. Part II: Staphyliniformia. University of Washington Press, Seattle, 384 pp.
- Klimaszewski J (2000) Diversity of the rove beetles in Canada and Alaska (Coleoptera Staphylinidae). *Mémoires de la Société royale belge d'Entomologie* 39: 3–126.
- Klimaszewski J, Pelletier G, Germain C, Hébert C, Humble LM, Winchester NN (2001) Diversity of *Placusa* (Coleoptera: Staphylinidae, Aleocharinae) in Canada, with descriptions of two new species. *The Canadian Entomologist* 133: 1–47.
- Klimaszewski J, Winchester NN (2002) Aleocharine rove beetles (Coleoptera Staphylinidae) of the ancient Sitka spruce forest on Vancouver Island, British Columbia, Canada. *Mémoires de la Société royale belge d'Entomologie* 40: 3–126.
- Klimaszewski J, Pelletier G, Majka C (2004) A revision of Canadian *Leptusa* Kraatz (Col., Staphylinidae, Aleocharinae): new species, new distribution records, key and taxonomic considerations. *Belgian Journal of Entomology* 6: 3–42.
- Klimaszewski J, Pelletier G, Germain C, Work T, Hébert C (2006) Review of *Oxypoda* species in Canada and Alaska (Coleoptera, Staphylinidae, Aleocharinae): systematics, bionomics and distribution. *The Canadian Entomologist* 138: 737–852.
- Klimaszewski J, Assing V, Majka CG, Pelletier G, Webster RP, Langor D (2007) Records of adventive aleocharine beetles (Coleoptera: Staphylinidae: Aleocharinae) found in Canada. *The Canadian Entomologist* 139: 54–79.
- Marsh GA, Schuster RO (1962) A revision of the genus *Sonoma* Casey (Coleoptera: Pselaphidae). *The Coleopterists Bulletin* 16: 33–56.
- McLean JA, Klimaszewski J, Li A, Savard K (2009) First survey of rove beetles (Coleoptera, Staphylinidae) from Stanley Park, Vancouver, British Columbia, with new records and description of a new species. Part 1. *ZooKeys*. doi: 10.3897/zookeys.22.86
- Newton AF, Thayer MK, Ashe JS, Chandler DS (2001). Staphylinidae Latreille, 1802. In: Arnett RH, Thomas MC (Eds) *American Beetles*. 1. Archostemata, Myxophaga, Adephaga, Polyphaga: Staphyliniformia. CRC Press, Boca Raton, Florida, 272–418.
- Park O, Wagner JA (1962 [1961]) Family Pselaphidae. In: Hatch MH, *The beetles of the Pacific Northwest*. Part III. Pselaphidae and Diversicornia I. University of Washington Publications in Biology, pp. 4–31, pls. 1–10.
- SeEVERS CH (1978) A generic and tribal revision of the North American Aleocharinae (Coleoptera: Staphylinidae). *Fieldiana Zoology* 71: i–vi, 1–289.
- Smetana A (1971) Revision of the tribe Quediini of America north of Mexico (Coleoptera: Staphylinidae). *Memoirs of the Entomological Society of Canada* 79: I–VI, 1–303.

