

## NATURAL HISTORY AND OBSERVATIONS

**Notes on insects recently introduced to Metro Vancouver and other newly recorded species from British Columbia****C. G. RATZLAFF<sup>1</sup>, K.M. NEEDHAM, and G. G. E. SCUDDER****ABSTRACT**

Sixteen insect species are recorded for the first time from British Columbia, including seven new to Canada. These records are comprised of nine introduced species, including the first record of *Rhopalum gracile* Wesmäl (Hymenoptera: Crabronidae) from North America, and range extensions for seven species native to the Nearctic region. Colour images of selected specimens are included.

**Key words:** Introduced, Coleoptera, Diptera, Hemiptera, Hymenoptera, Trichoptera, British Columbia, Canada

**INTRODUCTION**

During the course of our fieldwork over the past few years, and by determining older unidentified material in the Spencer Entomological Collection, we have discovered 16 species never before recorded from British Columbia, including seven species new to Canada. Nine of the species have been introduced from their native ranges, and seven are range extensions for Nearctic species. We report these new records here.

Our field work during this time consisted mainly of monthly forays to local areas, participation in bioblitzes and species surveys outside the Lower Mainland (which concentrate efforts on a select locale for a short period of time), and an ongoing survey of the "green roof" atop the Vancouver Convention Centre.

All specimens recorded here are deposited in either the Spencer Entomological Collection [SEM] or the first author's personal collection [CGR]. All photos were taken by the first author using a Leica DFC490 digital camera mounted on a Leica M205C stereomicroscope. Post-processing of the images was done using Adobe Photoshop CS4.

**INTRODUCED INSECTS**

The following nine species are native to the Palearctic region and have been recently introduced to British Columbia. Three of these are new to Canada.

**Coleoptera: Chrysomelidae*****Cassida rubiginosa* Müller**

The leaf beetle, *Cassida rubiginosa* Müller, has been recorded from British Columbia for the first time. Native to Europe and Asia, this species was first introduced to North America in Quebec around 1902 and is now found throughout most of Canada east of the Rockies and in the northeastern United States. Members of the Family Asteraceae, specifically thistles, are the preferred host plant for *C. rubiginosa*, although they are polyphagous (Majka and Lesage 2008). The specimens collected in Richmond at both Terra Nova Rural Park and Iona Beach Regional Park were found feeding on thistle.

**New Records:** 3 adults, Richmond, Terra Nova Rural Pk., 49.1660, -123.1956, 15.viii.2013 (C. G. Ratzlaff) [CGR, SEM]; 1 adult, Richmond, Iona Beach Reg. Pk., 49.21940, -123.20839, 12.ix.2014 (C. G. Ratzlaff) [CGR]; 1 adult, Richmond, Iona

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Beach Reg. Pk., 49.2196, -123.2083, 13.v.2015 (C. G. Ratzlaff) [CGR] (Fig. 1a); 1 adult, Richmond, Iona Beach Reg. Pk., 49.220, -123.211, 1.vii.2015 (C. G. Ratzlaff) [SEM]



**Figure 1.** (a) *Cassida rubiginosa* Müller from Iona Beach Regional Park, in Richmond, B.C.; (b) *Brumus quadripustulatus* Linnaeus from the University of British Columbia (UBC) Botanical Garden, in Vancouver, B.C.; and, (c) *Chilocoris bipustulatus* (Linnaeus) from the Beaty Biodiversity Museum at UBC, in Vancouver.

#### **Coleoptera: Coccinellidae**

##### ***Brumus quadripustulatus* Linnaeus**

The pine ladybird, *Brumus quadripustulatus* Linnaeus, used widely in the Palearctic region as a biocontrol agent, was first introduced and established in California between 1915 and 1928 as a control for woolly hemlock adelgid (Gordon 1985). There are no known further releases of *B. quadripustulatus*, and the species has apparently dispersed north along the Pacific Coast. Year-round specimen records show that this species can overwinter as an adult. These represent the first records of this species in Canada.

**New Records:** 1 adult, Richmond, 49.1888, -123.0959, 16.vi.2013 (C. G. Ratzlaff) [CGR]; 1 adult, Vancouver, 49.2281, -123.0870, 13.iv.2014 (C. G. Ratzlaff) [CGR]; 2 adults, Vancouver, UBC Botanical Garden, 49.254, -123.247, 16.v.2014 (C. G. Ratzlaff) [CGR, SEM] (Fig. 1b); 1 adult, Vancouver, UBC Botanical Garden, 49.254, -123.247, 4.xi.2014 (C. G. Ratzlaff) [CGR]; 1 adult, Vancouver, 49.2281, -123.0870, xi.2014 (C. G. Ratzlaff) [CGR]; 1 adult, Vancouver, Pacific Spirit Reg. Pk., 49.2445, -123.2002, 8.ii.2016 (C. G. Ratzlaff) [SEM]; 1 adult, Vancouver, UBC, Beaty Biodiversity Museum, 49.2632, -123.2502, 22.iii.2016 (C. G. Ratzlaff) [SEM]; 2 adults, Vancouver, UBC, Beaty Biodiversity Museum, 49.2632, -123.2502, 1.iv.2016 (C. G. Ratzlaff) [SEM]; 2 adults, New Westminster, Sapperton Landing Pk., 49.2166, -12.8929, 11.iv.2016 (C. G. Ratzlaff) [SEM]; 1 adult, Burnaby, Deer Lake Pk., 18.viii.2016 (K. Needham) [SEM]

#### **Coleoptera: Coccinellidae**

##### ***Chilocoris bipustulatus* (Linnaeus)**

*Chilocoris bipustulatus* (Linnaeus), a species widespread in the Palearctic region, first became established in North America when it was introduced in California in 1951 as a biocontrol agent for scale insects (Gordon 1985). Although it likely has been released in a number of locations throughout North America, *C. bipustulatus* is poorly adapted to low temperatures and will not survive cold winters (Kehat *et al.* 1970). Our records from Vancouver, the first for Canada, may be the direct result of biocontrol releases where recent mild winters may have enabled this species to persist. Our first specimens were

collected at Burns Bog during a B.C. Ministry of Environment, Lands, and Parks Ecosystem Review (Kenner and Needham 1999), but were misidentified as *Chilocoris tricyclus* Smith, a similar-looking native species.

**New Records:** 3 adults, Delta, Delta Nature Reserve, 11.x.1999 (R. Kenner and K. Needham) [SEM]; 1 adult, Vancouver, Queen Elizabeth Pk., 49.2442, -123.1121, 15.v.2013 (C. G. Ratzlaff) [SEM]; 1 adult, Vancouver, 49.2281, -123.0870, 17.x.2013 (C. G. Ratzlaff) [CGR]; 1 adult, Vancouver, UBC Botanical Garden, 49.254, -123.247, 17.iv.2015 (C. G. Ratzlaff) [SEM]; 2 adults, Vancouver, UBC, Beaty Biodiversity Museum, 49.2632, -123.2502, 19.iv.2016 (C. G. Ratzlaff) [SEM] (Fig. 1c)

## Diptera: Opomyzidae

### *Geomyza tripunctata* (Fallén)

The Palearctic opomyzid, *Geomyza tripunctata* (Fallén), commonly known as the cereal fly, is recorded for the first time in British Columbia. In Canada, it has previously been recorded from Ontario, Quebec, Prince Edward Island, and Nova Scotia (Wheeler *et al.* 1999). The larvae feed on the shoots of various grasses and have the potential to be a crop pest.

**New Records:** 1 adult, Vancouver, 49.2281, -123.0870, ix.2010 (C. G. Ratzlaff) [CGR]; 1 adult, Vancouver, 49.2281, -123.0870, 27.vi.2013 (C. G. Ratzlaff) [SEM]; 1 adult, Abbotsford, 49.0782, -122.3130, 18.viii.2013 (C. G. Ratzlaff) [SEM]; 1 adult, Vancouver, Memorial South Pk., pond, 49.2321, -123.0869, 5.ix.2013 (C. G. Ratzlaff) [CGR]; 1 adult, Richmond, Iona Beach Reg. Pk., 49.2276, -123.2299, 11.iv.2014 (C. G. Ratzlaff) [CGR]; 1 adult, Mayne I., Miner's Bay, 48.8504, -123.3013, 15.xi.2014 (C. G. Ratzlaff) [SEM]; 2 adults, Vancouver, Vancouver Convention Centre, Green Roof, 49.2887, -123.1162, 8.iv.2016 (C. G. Ratzlaff and K. Needham) [SEM] (Fig. 2a); 1 adult, Sidney I., Dragonfly Pond, 48.6033, -123.3046, 14.viii.2016 (SEM Team) [SEM]

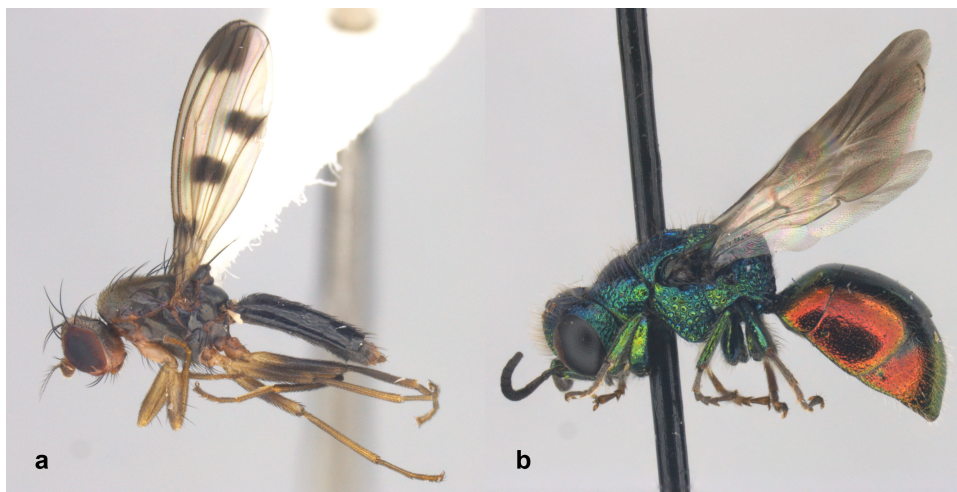


Figure 2. (a) *Geomyza tripunctata* (Fallén) from the green roof at the Vancouver Convention Centre, Vancouver, B.C.; (b) *Pseudomalus auratus* (Linnaeus) from Woods Island Park, in Richmond, B.C.

## Hemiptera: Miridae

### *Atractotomus magnicornis* (Fallén)

The plant bug, *Atractotomus magnicornis* (Fallén), is recorded for the first time in British Columbia. Native and widespread in Europe, *A. magnicornis* is currently found in Ontario, Quebec, Nova Scotia, and Newfoundland, as well as in several states in the

eastern United States (Stonedahl 1990; Maw *et al.* 2000). This species is associated with conifers, primarily members of *Abies* and *Picea*, often in gardens or other ornamental environments (Stonedahl 1990).

**New Records:** 1♀, Coquitlam, Westwood Plateau Ridge Pk., 6.vii.2013 (T. Loh) [SEM]; 3♀, Vancouver, UBC, Beaty Biodiversity Museum, 49.2632, -123.2502, 15.vii.2016 (C. G. Ratzlaff) [SEM]

### Hymenoptera: Chrysididae

#### *Chrysis angolensis* Radoszkowski

The large cuckoo wasp, *Chrysis angolensis* Radoszkowski, a cleptoparasite of mud-daubers in the genus *Sceliphron*, is recorded for the first time in British Columbia. A common host, *Sceliphron caementarium* (Drury), often builds mud nests on human-made structures that are then transported and has been spread throughout many parts of the world, facilitating the cosmopolitan distribution of *C. angolensis* (Kimsey 2006). In North America, *C. angolensis* is thought to have been originally introduced to the eastern US during World War II and has since spread to the western states, eastern Canada, and parts of Mexico (Bohart and Kimsey 1982).

**New Records:** 1♀, Vancouver, UBC Campus, 49.2593, -123.2477, 12.ix.2013 (C. G. Ratzlaff) [SEM]; 1♀, Richmond, Terra Nova Rural Pk., 49.173, -123.199, 4.x.2015 (J. Chan) [SEM] (Fig. 3)



**Figure 3.** Female *Chrysis angolensis* Radoszkowski collected from Terra Nova Rural Park, in Richmond, B.C.

### Hymenoptera: Chrysididae

#### *Pseudomalus auratus* (Linnaeus)

The small cuckoo wasp, *Pseudomalus auratus* (Linnaeus), has recently been introduced to the Vancouver area. Native to Europe, Asia, and North Africa, this species was introduced to the eastern United States sometime before 1828. It was recorded from Utah in the late 1960s and then in California in 1980 (Bohart and Kimsey 1982). It has since spread to a number of other states, as well as to eastern Canada. The hosts for *P. auratus*, a cleptoparasite, are stem-nesting pemphredonine (Crabronidae) wasps, and it has been suggested that its spread is a result of the transportation of garden plants (Danks 1971; Bohart and Kimsey 1982).



**New Records:** 1♂ 2♀, Vancouver, 49.2281, -123.0870, 17.vi.2013 (C. G. Ratzlaff) [CGR, SEM]; 1♂, Vancouver, 49.2281, -123.0870, 10.vi.2014 (C. G. Ratzlaff) [SEM]; 1 adult, Richmond, Iona Beach Reg. Pk., 49.22177, -123.21223, 25.vi.2014 (C. G. Ratzlaff) [CGR]; 1 adult, Vancouver, 49.2281, -123.0870, 29.vi.2014 (C. G. Ratzlaff) [CGR]; 1 adult, North Saanich, Schwartz Bay Terminal, 49.6883, -123.4099, 17.vii.2015 (C. G. Ratzlaff) [CGR]; 1 adult, Vancouver, 49.2281, -123.0870, 6.v.2016 (C. G. Ratzlaff) [SEM]; 1 adult, Richmond, Woods I. Pk., 49.2119, -123.1646, 14.vii.2016 (C. G. Ratzlaff) [SEM] (Fig. 2b)

### Hymenoptera: Crabronidae

#### *Rhopalum gracile* Wesmael

The crabronid wasp, *Rhopalum gracile* Wesmael, is recorded here for the first time in North America from Iona Beach Regional Park in Richmond, British Columbia. This small wasp lives throughout the Palearctic region from England to Japan, although it is typically uncommon (Bitsch and Leclercq 2009). It nests in the stems of plants such as *Euthamia occidentalis* Nuttall and species of *Phragmites* (Bitsch & Leclercq 2009); the latter genus grows near the specimen collection location. *Rhopalum gracile* was probably introduced by means of aircraft, because Iona Beach is close to Vancouver International Airport. It is unknown whether a population will become established; further monitoring is needed.

**New Record:** 1♂ 1♀, Richmond, Iona Beach Reg. Pk., 49.2196, -123.2083, 22.vii.2015 (C. G. Ratzlaff) [SEM] (Fig. 4)



**Figure 4.** *Rhopalum gracile* Wesmael (a) male and (b) female from Iona Beach Regional Park, in Richmond, B.C.

### Hymenoptera: Torymidae

#### *Megastigmus aculeatus* (Swederus)

The parasitic wasp, *Megastigmus aculeatus* (Swederus), is recorded for the first time in western North America. This species develops in the seed buds of *Rosa* species and reproduces primarily through thelytokous parthenogenesis. Although native to western Europe, *M. aculeatus* has spread over much of the globe and now occurs throughout eastern Europe, parts of Africa, Iran, Iraq, China, Japan, Australia, and eastern North America, including Ontario and Quebec. More than 23 host species of *Rosa* have been recorded in the West Palearctic region, including several that have been introduced to North America (Roques and Skrzypczyńska 2003). The wide commercial transport of *Rosa* species, along with their parthenogenic reproduction, allow for easy colonization of areas by *M. aculeatus*.

**New Record:** 1♀, Whistler, Creekside Field, 50.0942, -122.9874, 9.vii.2016, 650m, light trap (SEM Team) [SEM] (Fig. 5)



**Figure 5.** Female *Megastigmus aculeatus* (Swederus) from Creekside, in Whistler, B.C.

## SIGNIFICANT RANGE EXTENSIONS OF NEARCTIC INSECTS

The following seven species are native to North America; these records represent range extensions into British Columbia. Four of these species are also new to Canada.

### Diptera: Blephariceridae

#### *Philorus californicus* (Hogue)

The net-winged midge, *Philorus californicus* (Hogue), is recorded for the first time in Canada. This also represents the first record of the genus in Canada. Members of this family of flies are associated with fast-flowing streams, where the larvae live on the surfaces of rocks, often in cracks and crevices (Hogue 1973).

**New Record:** 1 larva, Lindell Beach, nr. Stillwood Camp, Watt Cr., 49.024, -121.999, 17.vi.2014, under rock in fast-flowing stream (C. G. and N. A. Ratzlaff) [SEM] (Fig. 6)

### Diptera: Ulidiidae

#### *Chaetopsis massyla* (Walker)

The picture-wing fly, *Chaetopsis massyla* (Walker), is recorded for the first time from British Columbia, collected during the 2015 Gulf Islands National Park Reserve BioBlitz on Saturna Island. This species is widespread throughout most of North America and feeds on damaged stems of wetland monocots, such as cattails and sedges (Steyskal 1965; Allen and Foote 1992). *Chaetopsis massyla* is also a pest of corn in several south-eastern states (Goyal *et al.* 2010).

**New Record:** 1 adult, Saturna I., Gulf Islands Nat. Pk. Res., Winter Cove, 48.8123, -123.1879, 17.vii.2015 (C. G. Ratzlaff) [SEM] (Fig. 7)

### Hemiptera: Miridae

#### *Orectoderus montanus* Knight

The plant bug, *Orectoderus montanus* Knight, is recorded for the first time in British Columbia. The genus *Orectoderus* Uhler was recently revised and now contains five

species, with three of those species reported from Canada (Nyniger 2010). To date, *O. montanus* has been recorded in Canada only from Alberta and Saskatchewan (Kelton 1980; Maw *et al.* 2000; Nyniger 2010). In the United States, it has been recorded from Colorado, Idaho, Montana, Nevada, North Dakota, Utah, and Wyoming. Hosts for *O. montanus* include *Ericameria nauseosa* (Pall. ex Pursh) (Asteraceae), *Symphoricarpos* spp. (Caprifoliaceae), and *Potentilla fruticosa* Linnaeus (Roseaceae) (Nyniger 2010).

**New Record:** 1♂, Pink Mt., 57.0487, -122.8687, 2.vii.2016, 1715m (C. G. and N. A. Ratzlaff) [SEM]



**Figure 6.** (a) Dorsal and (b) ventral view of a *Phylorus californicus* (Hogue) larva from Watt Creek, south of Cultus Lake, B.C., showing the suction cups on each segment used to hold onto the surface of rocks in fast-flowing streams.

#### Hymenoptera: Crabronidae

##### *Spilomena barberi* Krombein

The small cryptic wasp, *Spilomena barberi* Krombein, is identified for the first time from British Columbia. It has been recorded in Canada, from Ontario and Quebec, and in the United States, from coast to coast (Buck 2004). Little is known about the biology of *S. barberi*, and it is rarely collected.

**New Record:** 1♀, Osoyoos, Haynes Ecological Reserve, 13.vii. - 17.viii.1988, pitfall trap, *Purshia/Aristida* shrub-steppe (S.G. Cannings) [SEM]; 1♀, Hornby Island, Norman Pt., 9.vii.1989 (S. G. Cannings) [SEM]

#### Hymenoptera: Platygasteridae

##### *Synopeas anomaliventre* (Ashmead)

The parasitic wasp, *Synopeas anomaliventre* (Ashmead), is identified for the first time from Canada. It has previously been recorded from Maryland, Pennsylvania, Florida, Louisiana, and New Hampshire, in the eastern United States (Muesebeck 1979).



Many small parasitic wasps have widespread distributions, and whether this disjunct record is natural or the result of an accidental introduction is unknown. Nothing is known of the biology of this species, but others in the genus are parasitic on flies in the Family Cecidomyiidae (Fouts 1924).

**New Record:** 1♀, Galiano I., north end, 19.iv.1981 (S. G. Cannings) [SEM]



**Figure 7.** *Chaetopsis massyla* (Walker) from Winter Cove in Gulf Islands National Park Reserve, on Saturna Island, B.C.

### Hymenoptera: Pompilidae

#### *Ceropales pacifica* Townes

The spider wasp, *Ceropales pacifica* Townes, is recorded from Canada for the first time, previously being recorded only from Oregon and California. No specific information about the biology of *C. pacifica* is known, but members of the genus are kleptoparasites of other wasps in the Family Pompilidae. Females lay an egg in the book lungs of a host wasp's unattended spider prey before it is deposited in the host's nest. When hatched, the *Ceropales* larva will consume both the spider and the egg laid by the host wasp (Townes 1957).

**New Records:** 1♂1♀, Oliver, UBC Geology Camp, 20.vii.1989, malaise trap, pine/thicket edge (S. G. Cannings) [SEM]; 2♂, Oliver, UBC Geology Camp, 22.vii.1989, malaise trap, pine/thicket edge (S. G. Cannings) [SEM]; 1♂, Oliver, UBC Geology Camp, 22.vii.1990, malaise trap, ponderosa pine forest (S. G. Cannings) [SEM]; 1♀, Oliver, UBC Geology Camp, 27.vii.1990, malaise trap, hawthorn thicket edge (S. G. Cannings) [SEM] (Fig. 8); 1♂, Oliver, UBC Geology Camp, 28.vii.1990, malaise trap, hawthorn thicket edge (S. G. Cannings) [SEM]

### Trichoptera: Limnephilidae

#### *Desmona mono* (Denning)

*Desmona* is an unusual genus of caddisfly in the Family Limnephilidae. Its members inhabit the shallow edges of high-alpine lakes and springs or seeps of alpine meadows (Wiggins 1996). Although most limnephilids are detritivores, feeding on dead and decaying plant material at the bottom of these lakes, *Desmona* crawl out of the water at night to feed on living plants near the water's edge (Wiggins and Wisseman 1990).

In North America, three species are recognized in the genus (Nimmo 2012). *Desmona bethula* Denning and *Desmona denningi* Nimmo are found in California, while *Desmona*



*mono* (Denning) (= *Monophylax mono*) inhabits the Pacific Northwest of the United States.

During surveys of some high-alpine lakes, streams, and seeps atop Whistler Mountain as part of the 2014 Whistler Bioblitz, we collected several larvae and cases of *Desmona*, which were later identified as *D. mono*. These represent the first record of this genus and species for British Columbia and Canada.

**New Records:** 9 larvae, Whistler, Blackcomb Mt., Overlord Trail wetland, 50.080, -122.888, 23.viii.2014 (C. M. Stinson) [SEM] (Fig. 9); 3 larvae, Whistler, Whistler Mt., Harmony L., 50.0640, -122.9379, 3.ix.2014, 1760m (C. G. Ratzlaff) [SEM]; 8 larvae, Whistler, Whistler Mt., Harmony L., 50.0640, -122.9379, 28.ix.2014, 1780m (C. G. Ratzlaff) [SEM]; 1 larva, Whistler, Whistler Mt., alpine stream, 50.0522, -122.9350, 28.ix.2014, 1810m (C. G. Ratzlaff) [SEM]; 1 larva, Whistler, Blackcomb Mt., Blackcomb L., 50.0813, -122.8812, 27.vi.2015, 1800m (C. G. Ratzlaff) [SEM]

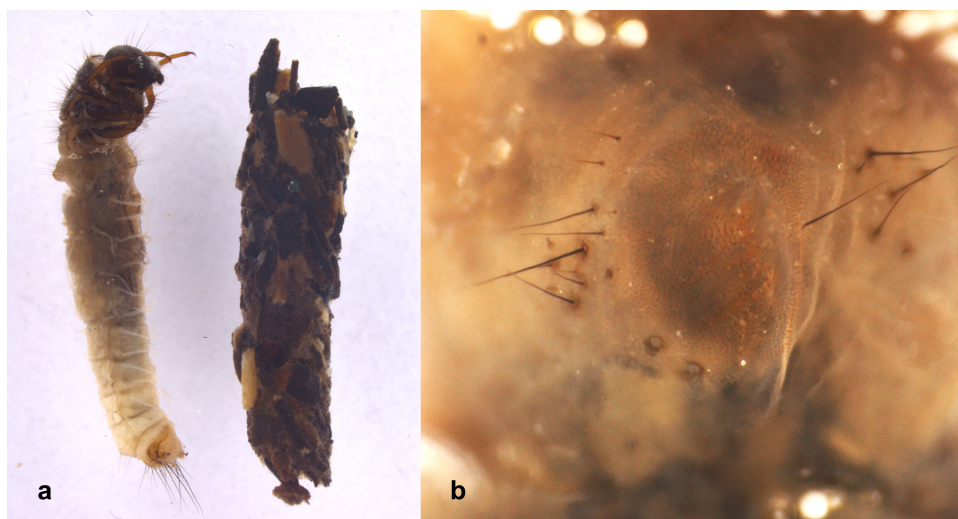


**Figure 8.** *Ceropales pacifica* (Townes) from the UBC Geology Camp, in Oliver, B.C.

## CONCLUSION

Examination of these new records highlights the importance of concentrated surveys targeting specific locales, as well as the usefulness of repeated forays to the same area. Seasonal and yearly variation in species presence makes it imperative to revisit a site periodically in order to produce a comprehensive species list for an area.

The value of the taxonomic expertise of previous researchers and detailed reference material, such as exists in provincial and national research collections, cannot be underestimated in projects such as these. Cataloguing the biodiversity of an area would not be possible without these resources. Adding to the historical record of species distributions and seasonal occurrences is valuable both in and of itself and as a foundation for further research.



**Figure 9.** (a) Larva and case of *Desmona mono* (Denning) from Overlord Trail on Blackcomb Mountain, in Whistler, B.C.; (b) The lateral hump showing the two ring-like sclerites found in the larvae of *Desmona* species.

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