The Harvestmen (Arachnida, Opiliones) of British Columbia

PHILIP D. BRAGG[1,3] and ROBERT G. HOLMBERG[2]

ABSTRACT

Twenty species of harvestmen (six families within three suborders) are known from British Columbia. They are 1) Triaenonychidae: *Paranonychus brunneus*, *Sclerobunus nondimorphicus*; 2) Ceratolasmatidae: *Hesperonemastoma modestum*; 3) Sabaconidae: *Sabacon occidentalis*, *Sabacon* species, *Taracus* species; 4) Nemastomatidae: *Dendrolasma mirabile*, *Ortholasma pictipes*; 5) Sclerosomatidae: *Leiobunum exilipes*, *Leuronychus pacificus*, *Nelima paessleri*, *Togwoteeus biceps*; 6) Phalangiidae: *Leptobunus parvulus*, *Liopilio glaber*, *Odiellus pictus*, *Oligolophus tridens*, *Opilio parietinus*, *Paraoligolophus agrestis*, *Phalangium opilio* and *Rilaena triangularis*. Four are new records for BC: *O. parietinus*, *O. pictus*, the second *Sabacon* species, and the undetermined *Taracus* species. There are reports of two other species (Sclerosomatidae: *Hadrobunus grandis* and *Leiobunum aldrichi*) but these are probably incorrect. A further nine species have been collected from the Yukon or adjacent American states and may occur in the province. Each of these 31 species is listed along with information on its taxonomy and distribution. Updates on locations and earliest collection dates are also given for three species introduced into North America from Europe: *O. tridens*, *P. agrestis* and *R. triangularis*.

Key Words: Arachnida; Opiliones; Harvestmen; BC species

INTRODUCTION

Harvestmen (Opiliones) constitute an order in the class Arachnida. Harvestmen are characterized by having the prosoma and opisthosoma broadly fused (i.e. one rather than two body parts), chelate chelicerae, pedipalps that can be leg-like or very spiny, two medial eyes, a pair of scent glands on the anterior of the prosoma, and a penis or ovipositor. Unlike spiders (Araneae), harvestmen do not have silk glands or venom glands. Harvestmen are primarily predacious on small invertebrates, especially other arthropods, but are also scavengers of dead animals and occasionally feed on fleshy fruits. Opiliones is currently divided into four suborders: Cyphophthalmi, Laniatores, Dyspnoi and Eupnoi (Pinta-da-Rocha *et al.* 2007).

Knowledge of the species of Opiliones and of their distribution in British Columbia (BC) is very limited. Banks (1916) identified the first two species for the province. Over the years, various people added to the knowledge of this region (Roewer 1910 and 1923, Bishop 1949, Briggs 1971, Bragg and Leech 1972, Bragg and Holmberg 1975, Cokendolpher 1980). As the published records for harvestman of BC are scattered, taxonomic studies have resulted in changes in classification and nomenclature, and we have accumulated more specimens, we herein summarize the present knowledge of harvestmen in BC.

We believe that at least twenty species of harvestmen occur in BC. These are placed in three suborders (Laniatores, Dyspnoi and Eupnoi) and six families (Triaenonychidae, Ceratolasmatidae, Saba-

[1] Dr. Philip D. Bragg, 4378 West 14th Avenue, Vancouver, BC V6R 2Y1. Telephone: 604-224-3897; E-mail: pbragg@interchange.ubc.ca
[2] Faculty of Science and Technology, Athabasca University, Athabasca, Alberta T9S 3A3, robert@athabascau.ca
[3] Corresponding author

conidae, Nemastomatidae, Sclerosomatidae and Phalangiidae). At least three, and up to five, of these species are introduced from Europe. There are reports of two other native species (*Hadrobunus grandis* and *Leiobunum aldrichi*) occurring in BC but these records are probably incorrect. Up to nine additional species may occur in the province. These nine species have been collected from adjacent states of the USA or the Yukon.

Most species listed here can be identified with the use of Edgar's key (1990). Bishop (1949) gives detailed descriptions of many species. Spoek (1963) and Hillyard and Sankey (1989) give good descriptions of the introduced European and Holarctic species. For general information on harvestmen, see Pinta-da-Rocha *et al.* (2007).

Species are listed alphabetically under the family or subfamily. Very limited synonymies are given in regular font following the current name in italics. The first reference listed is the original description. The last reference usually gives the best description of the species. Unless otherwise indicated, BC locality records are from specimens in our personal collections or in the three museums listed in the acknowledgements. The BC collection sites are usually given as simply the nearest geographical name. However a few localities originally given in miles were converted into kilometres (km). Unless otherwise stated, named parks are Provincial Parks. Distribution records from outside BC are from the literature as well as our records and are only designated by province, territory or state.

SPECIES RECORDS

Suborder LANIATORES Thorell 1876

Superfamily Triaenonychoidea Sørensen 1886

Family TRIAENONYCHIDAE Sørensen 1886

Subfamily Paranonychinae Briggs 1971

Paranonychus brunneus (Banks 1893)

Sclerobunus brunneus (Banks 1893)

Sclerobunus parvus (Roewer 1931 cited by Shear and Derkarabetian (2008))

Paranonychus brunneus (Briggs 1971)

Britannia Beach (Briggs 1971); Burnaby; Garibaldi Park (Briggs 1971); Grouse Mountain, Lake Cowichan (Vancouver Island; hereafter abbreviated VI); North Vancouver; Manning Park (Briggs 1971); Mount Seymour Park (Briggs 1971); Moresby Camp, Graham Island (Queen Charlotte Islands); Skedans, Louise Island (Queen Charlotte Islands); Sooke (VI); Upper Carmanah Valley (VI); Vancouver.

This species is also known from Alaska, Washington, and Oregon (Briggs 1971).

It is found under logs and in leaf litter of forests. Adults were collected in all months except January.

Subfamily Triaenonychinae Sørensen 1886

Sclerobunus nondimorphicus Briggs 1971

Sclerobunus nondimorphicus (Briggs 1971)

The only two BC records are from Hope (17 and 28 km east of), near Manning Park (Briggs 1971).

It is also known from Washington and Oregon (Briggs 1971).

This species has been collected from forests between June and September (Briggs 1971).

Suborder DYSPNOI Hansen and Sørensen 1904

Superfamily Ischyropsalidoidae Simon 1879

Family CERATOLASMATIDAE Shear 1986

Hesperonemastoma modestum (Banks 1894)

Nemastoma modesta (Banks 1894b)

Hesperonemastoma modestum (Gruber 1970)

Burnaby; Gordon River (VI); Honeymoon Bay (VI); Mesachie Lake (VI); Moresby Camp, Moresby Island (Queen Charlotte Islands); Nimkish Lake (VI); Vancouver.

This species is also known from Washington, Oregon and California

(Cokendolpher and Lee 1993).

This species is found under logs and in leaf litter. Adults were pitfall trapped from May through December.

Family SABACONIDAE Dresco 1970

Sabacon occidentalis (Banks 1894)

Phlegmacera occidentalis (Banks 1894b)

Sabacon occidentalis (Shear 1975)

Alert Bay (VI) (Bishop 1949); Brooks Peninsula (VI); Burnaby; Cassiope Lake (VI); Goldstream Park (VI); Honeymoon Bay (VI); Kyuquot (VI) (Shear 1975); Mesachie Lake (VI); Manning Park (Shear 1975); Parksville (VI); Prince Rupert (Bishop 1949); Skidgate, Graham island (Queen Charlotte Islands); Sooke (VI); Queen Charlotte City, Graham Island (Queen Charlotte Islands); Tahsis (VI); Upper Carmanah Valley (VI); Vancouver; Yakown River, Graham island (Queen Charlotte Islands).

This species is also known from Alaska, Washington, Oregon and California (Cokendolpher and Lee 1993). In Bragg and Leech (1972), this species was listed as *Sabacon crassipalpe*, which is now considered as only Eurasian (Shear 1975).

Sabacon occidentalis is found under logs and in leaf litter. Adults were collected in pitfall traps June through October.

Sabacon species

There is a second species of *Sabacon,* which occurs in northeastern BC, that will be described separately by RGH *et al*.

Pine Pass (129 km West of Dawson Creek).

Adults are present between April/May and October in Alberta.

Taracus species.

More specimens from BC and the United States need to be studied for a definitive identification.

Creston; Hourglass Cave, Gordon River (VI); Upper Carmanah Valley (VI).

This genus is characterized by very elongate chelicerae. Seven species have been described from the western United States (Cokendolpher and Lee 1993).

Adults were collected between September and October in BC.

Superfamily Nemastomatoidea Simon 1872

Family NEMASTOMATIDAE Simon 1872

Subfamily Ortholasmatinae Shear and Gruber 1983

Dendrolasma mirabile Banks 1894

Dendrolasma mirabilis (Banks 1894a)

Dendrolasma mirabile (Shear and Gruber 1983)

Burnaby; Mesachie Lake (VI); Metlakatla (Shear and Gruber 1983); Queen Charlotte City, Graham Island (Queen Charlotte Islands); Upper Carmanah Valley (VI); Vancouver.

This species is also known from Washington and Oregon and perhaps California (Shear and Gruber 1983). Edgar (1990) noted that this species ranges "from southern Oregon to southern Alaska". However the most northern record (i.e. Metlakatla; Shear and Gruber 1983) is south of the BC-Alaska border. It may be premature to state that this species occurs in Alaska.

Dendrolasma mirabile is found in moist coniferous forests under logs and in leaf litter. Adults were collected June through August.

Ortholasma pictipes Banks 1911

Ortholasma pictipes (Banks 1911, Shear and Gruber 1983)

Alert Bay (VI) (Shear and Gruber 1983); Bamfield (VI); Goldstream Park (VI); Kyuquot (VI) (Shear and Gruber 1983); Skedans, Louise Island (Queen Charlotte Islands); Sooke (VI); Vancouver.

Ortholasma pictipes is also known from Washington, Oregon and California (Shear and Gruber 1983).

This species is found in coniferous forests under logs and in leaf litter. Adults collected from February through October.

Suborder EUPNOI Hansen and Sørensen 1904

Superfamily Phalangioidea Latreille 1802

Family SCLEROSOMATIDAE Simon 1879

Subfamily Leiobuninae Banks 1893

Hadrobunus grandis (Say 1821)

Phalangium grandis (Say 1821)

Hadrobunus grandis (Roewer 1923)

Roewer (1923, page 919) recorded this species from BC ("Brit Kolumbien: Vancouver-Stadt – 1 ♂ – (Mus. Wien …)". However, as noted by Cokendolpher and Lee (1993), this record is probably incorrect.

Hadrobunus grandis has been collected from Ohio, Illinois, Georgia, Maryland, North Carolina, Oklahoma and Virginia (Cokendolpher and Lee 1993).

Leiobunum aldrichi (Weed 1893)

Liobunum (*sic*) longipes (Weed 1890)

Leiobunum longipes (Davis 1934)

Leiobunum aldrichi (Cokendolpher 1984)

Bishop (1949) recorded "*Leiobunum longipes"* (now *Leiobunum aldrichi*; see Cokendolpher 1984) from "British Columbia, Selkirk Mts. (J.C.B)".

Although Roewer (1910, 1923) recorded this species from Washington and Weed (1893) recorded it from South Dakota, we think that this species does not occur in BC. Other than these old records, this species occurs in eastern North America (Ontario and 23 states) (Cokendolpher and Lee 1993).

Leiobunum exilipes (Wood 1868)

Phalangium exilipes (Wood 1868)

Leiobunum exilipes (Davis 1934)

Banks (1916) reported "Several specimens from Kaslo and Frye Creek [BC], from June 13 to July 23. These specimens have shorter legs than those from California." Davis (1934) recorded "*British Columbia*: Inverness, July 1 ♀ (Keen). Vancouver: 2 ♂, 1 ♀ (Banks)". RGH examined the Inverness specimen from the Canadian National Collection in Ottawa (single female labeled "Inverness", "July", "Rev. J.H. Keen" and identified by Davis). It is a dark *Nelima paessleri.* Older *N. paessleri* tend to darken and may resemble *L. exilipes*. Note that we have not seen any specimens of this species from BC.

Leiobunum exilipes is recorded from Alaska, Washington, Oregon, California, Nevada, and Montana (Cokendolpher and Lee 1993).

Adults have been collected between July and November (Davis 1934).

Leuronychus pacificus (Banks 1894)

Leiobunum pacificum (Banks 1894c)

Leuronychus pacificum (Banks 1900)

Leuronychus pacificus (Banks 1901, Roewer 1910, 1923)

Mudge Island; Nanaimo (VI) (Roewer 1910).

This species is also recorded from Alaska, Washington, Oregon, California and Baja California (Cokendolpher and Lee 1993).

Adults were collected from Mudge Island in August.

Nelima paessleri (Roewer 1910)

Leiobunum paessleri (Roewer 1910, Davis 1934, Holmberg *et al.* 1984)

Nelima paessleri (Crawford 1992)

Alouette Lake; Brooks Peninsula (VI); Burnaby; Candlestick Cave, Kelsey Bay (VI); Cascade Cave, Port Alberni (VI); Cheakamus Lake; Cody Caves Park (north of Nelson); Field; Glacier; Gordon River (VI); Hope; Inverness; Horne Lake Caves Park (VI); Kimberly; Kuskonook; Meager Lake Hot Springs; Metlakatla (Davis 1934); Mount Kobau: Port Alberni (VI); Rogers Pass (Davis 1934); Salmon Arm; Slesse Creek and Chipmunk Caves (near Chilliwack); Sooke (VI); Stein Lake; Upper Carmanah Valley (VI); Victoria (VI); Vancouver; Wolfe Creek Cave (Cowichan Lake, VI).

Nelima paessleri is known also from Alberta, Alaska, Washington, Oregon, California, Montana and, possibly, Wyoming (Holmberg *et al.* 1984). We also have seen collections from Idaho.

This species has been collected from a wide range of forested habitats associated with coastal and interior mountains. Adults overwinter in aggregations in caves and mines (Holmberg *et al.* 1984). Adults are present all months of the year; juveniles between May and October. Sexes can only be distinguished by dissection of the genitalia.

Togwoteeus biceps (Thorell 1877)

Mitopus biceps (Thorell 1877)

Homolophus biceps (Rower 1923)

Togwoteeus biceps (Holmberg and Cokendolpher 1997)

Anarchist Mountain; Apex Mountain (near Keremeos); Inkaneep Park; Kamloops; Kleena Kleene; Manning Park; Mount Kobau; Oliver; Osoyoos; Salmon Arm; Summerland; Vernon; White Lake; Vaseaux Lake.

Togwoteeus biceps is known also from Alberta, Saskatchewan, Arizona, California, Colorado, Idaho, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming (Holmberg and Cokendolpher 1997).

This species is found in many habitats, from densely wooded areas to windswept mountain tops above the tree line. It occurs in dry areas but also near bodies of water. This species is restricted to higher elevations in the southern part of its range. It has been found under rocks and logs, and in deserted buildings. Adults occur between May and November with a peak in August. Immatures overwinter and can be present in any month (Holmberg and Cokendolpher 1997).

Family PHALANGIIDAE Latreille 1802

Subfamily Oligolophinae Banks 1893

Odiellus pictus (Wood 1868)

Phalangium pictum (Wood 1868)

Odiellus pictus (Bishop 1949)

The only record is Sitkum Creek, Nelson.

This species is widespread in all other Canadian provinces. It is also present throughout the northeastern USA (Cokendolpher and Lee 1993).

Odiellus pictus prefers wet locations in hardwood and coniferous forests, in meadows and marshes, in leaf litter and under rocks, and on the foliage of trees. Adults occur between July and October.

Oligolophus tridens (C.L. Koch 1836)

Opilio tridens (C.L. Koch 1836)

Oligolophus tridens (Spoek 1963, Hillyard and Sankey 1989)

Campbell River (VI) (our earliest records are from 1978); Comox (VI) (1979); Richmond (1971); Summerland (1980).

This species was introduced from Europe (Bell 1975). It is also in New Brunswick (1974), Newfoundland (1958), Nova Scotia (1956), Ontario (1961), Prince Edward Island (1972), Quebec (1970), as well as Maine (1982) and Vermont (prior 1974, Bell 1975).

This small species occurs mainly in the ground layer of many different disturbed habitats including grasslands, alfalfa fields, sand beaches as well as forests. Adults have been collected in Canada between July and November.

Paraoligolophus agrestis (Meade 1855)

Opilio agrestis (Meade 1855)

Paraoligolophus agrestis (Spoek 1963, Hillyard and Sankey 1989)

Ainsworth Hot Springs (1985); Burnaby (1971); Balfour (1980); Brentwood Bay (VI) (1975); Boswell (1980); Campbell River (VI) (1984); Comox (VI) (1984); Coombs (VI) (1984); Haney (1979); Hope (1984); Mesachie Lake (VI) (1979); Parksville (VI) (1978); Port Alberni (VI) (1979); Richmond (1971); Rogers Creek (1980); Vancouver (1963).

This is a European species introduced into BC by 1963 and Washington by 1972 (Bragg and Holmberg 1975). We now have single records from Alberta (1978) and Nova Scotia (1950).

The species is found in gardens and in forests under logs and in leaf litter, or on low bushes and herbs. Mature specimens occur between August and January.

Subfamily Phalangiinae Simon 1879

Leptobunus parvulus (Banks 1894)

Liobunum (sic) parvulum (Banks 1894c)

Leuronychus parvulus (Banks 1901)

Leptobunus parvulus (Cokendolpher 1985)

Alliford Bay, Moresby Island (Queen Charlotte Islands); Alouette Lake; Brooks Peninsula (VI); Burnaby; Cassiope Lake (VI); Coombs (VI); Cowichan Lake Experimental Station (VI); Golden Ears Park; Haney; Manning Park; Masset, Graham

Island (Queen Charlotte Islands); Port Alberni (VI); Squamish; Upper Carmanah Valley (VI); Vancouver.

Leptobunus parvulus is found also in Alaska, Washington, Oregon, and California (Cokendolpher 1985).

This species is active at night and can be found on low branches and shrubs and on the trunks of alders. Juveniles have been collected from the tops of 29 m tall red cedar, Douglas fir and Western hemlock trees (Holmberg *et al.* 1981). Juveniles were mostly collected May through August; adults, July through November.

Liopilio glaber Schenkel 1951

Liopilio glaber (Schenkel 1951, Cokendolpher 1981)

The only record from BC is "Mt. St. Paul, mile 392 [km 631] Alaska Highway" (Cokendolpher 1981).

Liopilio glaber is found also in the Rocky Mountains of Alberta, Washington and Oregon (Crawford and Edwards 1989, Cokendolpher and Lee 1993).

Adults were collected between July and September at higher elevations.

Opilio parietinus (DeGeer 1778)

Phalangium parietinum (DeGeer 1778)

Opilio parietinus (Spoek 1963, Hillyard and Sankey 1989)

Ainsworth Hot Springs; Kamloops; Kleena Kleene; Port Alberni (VI); Prince George; Summerland.

This species is widely distributed in the Western Palearctic and may have been introduced into North America from Europe. In Canada, it is known from Alberta, Manitoba, Saskatchewan, Ontario, and Quebec. It has also been collected from more than 20 states (Cokendolpher and Lee 1993).

Opilio parietinus was collected in disturbed areas similar to those for *Phalangium opilio*. *O. parietinus* was often collected with *P. opilio* but, with time, the latter seems to outcompete it. Adults from western Canada occur between July and November.

Phalangium opilio Linnaeus 1758

Phalangium opilio (Linnaeus 1758, Spoek 1963, Hillyard and Sankey 1989)

Ainsworth Hot Springs; Aspen Grove; Balfour; Barrière; Bella Coola; Blind Bay; Blue River; Burnaby; Cache Creek; Campbell River (VI); Chetwynd; Chilkoot Pass; Chilliwack; Comox (VI); Coombs (VI); Cranbrook; Creston; Dawson Creek; Edgewood; Elgin; Errington (VI); Fairmont; Fort Nelson; Fort St. John; Glacier National Park; Goldstream Park (VI); Grand Falls; Haney; Hazelton; Hernando Island; Hope; Hudson's Hope; Kamloops; Kootenay National Park; Ladner; Liard River; Manning Park; Masset, Graham Island (Queen Charolotte Islands); Mesachie Lake (VI); Mica Creek; Mission; Mount Robson Park; Nakusp; Nanaimo (VI); Nelson; Nicola Lake; Oliver; Osoyoos; Parksville (VI); Paul lake (near Kamloops); Penticton; Port Alberni (VI); Pouce Coupe; Prince George; Queen Charlotte City, Graham Island (Queen Charlotte Islands); Quesnel; Skookumchuk; South Pender Island (VI); Summerland; Telkwa; Terrace; Tlell, Graham Island (Queen CharlotteIslands); Trutch; Vancouver; Vernon; Victoria (VI); Weir Beach (24km west of Victoria, VI); West Vancouver; Williams Lake; Yoho National Park.

Phalangium opilio occurs in all provinces of Canada, Yukon and Northwest Territories. It is also present in at least 17 US states as well as Europe, Asia, North Africa and New Zealand (Cokendolpher and Lee 1993). Although this harvestman is commonly collected in Canada, it is most likely introduced from Europe.

Phalangium opilio is found in disturbed areas, such as gardens and roadside ditches, as well as grasslands and forest edges. *Phalangium opilio* and *Togwoteeus biceps* are the two species most likely found in drier areas. Eggs are laid in the fall. The first juveniles are seen in early April. The first adults appear in June. The adults do not overwinter.

Rilaena triangularis (Herbst 1799)

Opilio triangularis (Herbst 1799)

Platybunus triangularis (Spoek 1963)

Rilaena triangularis (Hillyard and Sankey 1989)

Burnaby (1971); Coquitlam (1972); Haney; Pitt Meadows (1973); Sumas (1963); Terrace (1975); Vancouver (1967).

This species was introduced from Europe into BC and Washington (Bragg and Holmberg 1975). The earliest record that we have for Washington is 1951. It has also been collected from Maine (1986), Massachusetts (1999) and New York (1999).

R. triangularis matures in April to July in BC and England. In England, it lays its eggs during the summer and overwinters in a juvenile stage (usually third or fourth instar) (Hillyard and Sankey 1989). This species is found in disturbed areas, such as gardens, and at the edges of woods.

OTHER POSSIBLE SPECIES

Other species that have been collected from adjacent states and the Yukon and may be found in BC include:

Acuclavella cosmetoides Shear 1986 (Family Ceratolasmatidae) occurs in northern Idaho and Washington. Also *A. merickeli* Shear 1986 occurs in Idaho and Washington.

Liopilio yukon Cokendolpher 1981 (Family Phalangiidae) has been collected in Yukon and Alaska.

Metanonychus idahoensis Briggs 1971 (Family Triaenonychidae) is found in northern Idaho.

Mitopus morio (Fabricius 1779) (Family Phalangiidae) seems to be Holarctic in distribution. It is common in eastern North America but occurs also in Alaska (Cokendolpher and Lee 1993).

Protolophus niger Goodnight and Goodnight 1942 (Family Protolophidae) has been recorded from Washington and Oregon (Cokendolpher and Lee 1993).

Sclerobunus robustus idahoensis Briggs 1971 (Family Triaenonychidae) is found in northern Idaho.

Siro acaroides (Ewing 1923), of the fourth Opiliones suborder Cyphophthalmi, extends from California to Washington (Cokendolpher and Lee 1993). *Siro kamiakensis* (Newell 1943) occurs in northern Idaho and Washington (Cokendolpher and Lee 1993).

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