

## NATURAL HISTORY AND OBSERVATIONS

# An updated list of the mosquitoes of British Columbia with distribution notes

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Since “The Mosquitoes of British Columbia”, originally published by Dr. Peter Belton 35 years ago, there have been only sporadic and incomplete updates on the mosquito fauna of British Columbia (BC). Darsie and Ward’s (2005) “Identification and Geographical Distribution of the Mosquitoes of North America, North of Mexico” reported the presence and distribution of many species within BC but was continent-wide in scope and did not provide BC-specific information. It also disregarded the presence or distribution of several species.

Belton (1983) recognized 46 mosquito species as occurring within British Columbia, discounting previous records of *Culex restuans* but including *Aedes nevadensis* due to specimens he had collected from the BC Interior. Darsie and Ward (2005) recognized 45 species, discounting records of *Ae. nevadensis* from Belton (1983) as well as previous records of *Cx. restuans*. Since 2005, several additional species records have been made for BC, and a new record of *Cx. restuans* from southern Vancouver Island supports its inclusion as part of BC’s mosquito fauna, bringing the total number of species known from the province to 50. In several instances, the distribution of various species within BC has also been extended, due to new collection records in previous unsurveyed or undersurveyed areas.

### **List of the mosquito species known from British Columbia**

- Aedes (Ochlerotatus) aboriginis* Dyar
- Aedes (Ochlerotatus) aloponotum* Dyar (Updated distribution)
- Aedes (Ochlerotatus) campestris* Dyar & Knab
- Aedes (Ochlerotatus) canadensis* (Theobald)
- Aedes (Ochlerotatus) cataphylla* Dyar
- Aedes (Aedes) cinereus* Meigen (Updated distribution)
- Aedes (Ochlerotatus) communis* (De Geer)
- Aedes (Ochlerotatus) diantaeus* Howard, Dyar & Knab
- Aedes (Ochlerotatus) dorsalis* (Meigen)
- Aedes (Ochlerotatus) euedes* Howard, Dyar & Knab
- Aedes (Ochlerotatus) excrucians* (Walker)
- Aedes (Ochlerotatus) fitchii* (Felt & Young)
- Aedes (Ochlerotatus) flavesrens* (Mueller)
- Aedes (Ochlerotatus) hendersoni* Cockerell
- Aedes (Ochlerotatus) hexodontus* Dyar
- Aedes (Ochlerotatus) impiger* (Walker)
- Aedes (Ochlerotatus) implicatus* Vockeroth
- Aedes (Ochlerotatus) increpitus* Dyar
- Aedes (Ochlerotatus) intrudens* Dyar
- Aedes (Finlaya) japonicus japonicus* (Theobald) (Jackson *et al.* 2016) (Updated distribution)
- Aedes (Ochlerotatus) mercurator* Dyar

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*Aedes (Ochlerotatus) melanimon* Dyar

*Aedes (Ochlerotatus) nevadensis* Chapman & Barr (Updated distribution, first formal record)

*Aedes (Ochlerotatus) nigripes* (Zetterstedt)

*Aedes (Ochlerotatus) pionips* Dyar

*Aedes (Ochlerotatus) provocans* (Walker)

*Aedes (Ochlerotatus) pullatus* (Coquillett)

*Aedes (Ochlerotatus) punctor* (Kirby)

*Aedes (Ochlerotatus) riparius* Dyar & Knab

*Aedes (Ochlerotatus) schizophanax* Dyar (Jackson *et al.* 2013)

*Aedes (Ochlerotatus) sierrensis* (Ludlow)

*Aedes (Ochlerotatus) spencerii spencerii* (Theobald) (Updated distribution)

*Aedes (Ochlerotatus) spencerii idahoensis* (Theobald) (Updated distribution)

*Aedes (Ochlerotatus) sticticus* (Meigen)

*Aedes (Ochlerotatus) togoi* (Theobald)

*Aedes (Aedes) vexans vexans* (Meigen)

*Aedes (Aedes) vexans nipponei* (Theobald) (Belton 2015) (First formal record)

*Anopheles earlei* Vargas

*Anopheles freeborni* Aitken

*Anopheles punctipennis* (Say) (Updated distribution)

*Culex pipiens* L.

*Culex restuans* Theobald (McCann and Belton 2015)

*Culex tarsalis* Coquillett (Updated distribution)

*Culex territans* Walker (Updated distribution)

*Culiseta alaskaensis* (Ludlow)

*Culiseta impatiens* (Walker)

*Culiseta incidens* (Thomson)

*Culiseta inornata* (Williston)

*Culiseta minnesotae* Barr

*Culiseta morsitans* (Theobald)

*Culiseta particeps* (Adams) (Jackson *et al.* 2013) (Updated distribution)

*Coquillettidia perturbans* (Walker) (Updated distribution)

### Notes on new species records and distribution updates

*Anopheles punctipennis* (Say) is previously known from both Vancouver Island and the southern mainland of BC, but Darsie and Ward (2005) seem not to have recognized records of this species from Vancouver Island. Surveys by Stephen *et al.* (2006) found this species to be widely distributed on Vancouver Island, re-confirming its presence there.

*Aedes aloponotum* Dyar is known from the Fraser Valley and southern Vancouver Island. The distribution shown in Darsie and Ward (2005) seems to erroneously display the range of this species as extending up the Fraser Canyon and east to the interior of BC, possibly due to a mis-citation of Gjullin and Eddy (1972), who reported this species as occurring in the Fraser Valley. This may possibly be due to confusing the Fraser Valley with the Fraser Canyon. Additionally, the author has found this species from the outskirts of Whistler, extending the northern limits of its known range.

*Aedes cinereus* Meigen was reported from every part of BC by Belton (1983), but the distribution displayed by Darsie and Ward (2005) does not include Vancouver Island. Stephen *et al.* (2006) found *Ae. cinereus* in light traps on Vancouver Island, demonstrating that this species does occur there.

*Aedes japonicus japonicus* (Theobald) was first reported in BC from samples collected in Maple Ridge and Mission in 2014 (Jackson *et al.* 2016), and additional specimens have been collected by Sean McCann in Langley and by the author in Burnaby and Saanichton, with samples deposited in the Spencer Entomology Collection at the UBC Beaty Biodiversity Museum. This species seems to have become established in the Lower Mainland and southern Vancouver Island and may be spreading; if it is not present throughout these regions yet, it may soon become so. Whether or not it can become established in other parts of BC remains to be seen.

*Aedes nevadensis* Chapman and Barr was reported by Belton (1983) from larval collections made in Castlegar. However, this record does not seem to have been recognized by Darsie and Ward (2005), and its presence is recorded here to remove ambiguity. Belton made further collections of this species just outside Manning Park, and the author has collected them from Pemberton and from north of Princeton. The author's specimens have been deposited in the Spencer Entomology Collection at the UBC Beaty Biodiversity Museum. This species is likely found in dry areas of much of the Southern Interior of BC, although how far north its range extends is currently unknown.

*Aedes schizophinax* Dyar was first reported in BC from a collection made in the municipality of Sparwood, near the Alberta border (Jackson *et al.* 2013). An additional specimen, collected in Williams Lake by C. Phippen, along with records from Washington, suggest this species may exist in low numbers throughout the Interior of BC.

*Aedes spencerii spencerii* (Theobald) was previously believed to be present in BC only in the Peace River region (Belton 1983), with records from Kaslo of two specimens – one collected by HG Dyar and one by RP Currie (Dyar 1904) – considered dubious (Belton 1983). Examination of specimens in the Spencer Entomology Collection at the UBC Beaty Biodiversity Museum have revealed additional specimens of *Ae. spencerii spencerii* collected in the Southern Interior of BC, where it was previously believed only the *idahoensis* subspecies was found (Belton 1983). These two subspecies probably overlap in distribution throughout much of this region. I have also seen specimens in the Royal BC Museum collected from the Chilcotin.

*Aedes togoi* (Theobald) is thought to be an invasive species from Asia; however, there is evidence that this mosquito might be indigenous to rock pools along the coast of BC and adjacent Washington State (Sota *et al.* 2015).

*Aedes vexans nipponii* (Theobald) is a subspecies of *Ae. vexans* from east Asia that has recently been found in Ontario (Thielman and Hunter 2007). It is characterized by the presence of a median longitudinal stripe of pale scales on the abdominal tergites, which *Ae. vexans vexans* (Meigen) lacks (Tanaka *et al.* 1979). A specimen collected in Cawston by P. Belton distinctly possesses this attribute and has been deposited in the Spencer Entomology Collection at the UBC Beaty Biodiversity Museum.

*Culex tarsalis* Coquillett was previously thought to be found only in the southern half of mainland BC (Belton 1983; Wood *et al.* 1979). However, this vector of West Nile virus, Western equine encephalitis virus, and other viruses, has also recently been found in man-made sites throughout Vancouver Island (Stephen *et al.* 2006) and as far north as the Yukon (Peach 2018). It is likely to exist in suitable habitats throughout BC.

*Culex territans* Walker was reported as occurring across the south of BC by Belton (1983) but has also been found as far north as the Yukon (Belton and Belton 1990; Wood *et al.* 1979). Recent records extend its range to Vancouver Island (Stephen *et al.* 2006). These records imply that *Cx. territans* may be present throughout BC where suitable habitat exists.

*Culiseta particeps* (Adams) was first reported by (Jackson *et al.* 2013) from locations in Pitt Meadows and the Township of Langley. Additional specimens have also been found in Vancouver, including an adult female collected in 1918 that was found in a museum collection, and larvae that were found by the author in Prince Rupert. This species is likely to be found all along the coast of BC.

*Coquillettidia perturbans* (Walker) was previously known from suitable habitat throughout mainland southern BC (Belton 1983). Recent work by Poirier and Berry (2011) has revealed that this species is present as far north as Fort Nelson, and Stephen *et al.* (2006) found it throughout much of Vancouver Island, as well. These new records suggest it may be present in suitable habitat throughout most of BC, probably mirroring the distribution of host plants such as cattails (*Typha latifolia*) (Poirier and Berry 2011).

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