

RECOGNITION OF THE TYPES OF *OKANAGANA OCCIDENTALIS* (HEMIPTERA: CICADOIDEA: TIBICINIDAE): LECTOTYPE DESIGNATION, TYPE LOCALITY AND SPECIES IDENTITY

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Cicadas of the genus *Okanagana* Distant are restricted to North America. Three species, *O. rimosa* (Say), *O. bella* Davis and *O. occidentalis* (Walker) have overlapping geographic ranges and are similar in external appearance. The type of *O. rimosa* has been lost; for *O. occidentalis*, the subject of the present paper, the type series is uncertain. The original description of *O. occidentalis* appears in the appendix of an account by Lord (1866a) of the animals he collected in British Columbia and Vancouver Island. Walker's description (Walker 1886) does not list numbers of specimens examined, localities or depository. Although it is unclear which specimens were available to Walker for the species description, we have located specimens in The Natural History Museum (BMNH) collection which we consider to be the types. Information on these specimens is detailed below.

Among a list of specimens from British Columbia, donated by Lord to the BMNH (reg. no. 1864.18), there is reference to a single specimen of *Cicada occidentalis*, Walker's new species (although unpublished at the time). A later entry in the register (1864.33) duplicates this information and additionally states "The new species were described by Mr. Walker". These records call into question whether the Lord Collection contained all the Walker types for the new species that Lord collected or whether Walker had access to other specimens. If the Lord Collection contained all the Walker types, then *O. occidentalis* was described from a single specimen having the BMNH reg. no., 1864.18. However, there is currently no specimen of *O. occidentalis* in the Museum with this registration number. This specimen appears to have been lost or destroyed many years ago. Davis (1923) makes reference to correspondence with a Mr. Blair (in 1921) and a Mr. Bequart (in 1922) in which they state the type could not be found or was lost.

Other evidence suggests that there was more than one specimen available to Walker for his description. In Lord's (1866b) re-description, two general locations (several hundred kilometers apart) are given for where the species was originally collected (see type locality discussion). In addition, the BMNH collection now contains the

following four British Columbian specimens (female) of *O. occidentalis* that are contemporary to its original description, and which we believe to have been collected by Lord. The following data labels are associated with these specimens; the numbers refer to entries in the BMNH register.

Specimen (a). Labelled: 'Vancouv / er's. Isl.'; '60 13' on reverse of blue disc.

Specimen (b). Labelled 'Brit/Columb' and '60 / 112' on reverse of blue disc; Brit Columb / Chulukweyuk / Prairie June 59'.

Specimen (c). Labelled '74 / 86' and 'Brit/Columb' on reverse of white disc; 'Brit. Columbia / Chulukweyuk / Trail. Aug. 1859'.

Specimen (d). Labelled '74 / 86' and 'Brit/Columb' on reverse of white disc; 'occidentalis' handwritten label (by Walker?); yellow "cotype" disc put on by Distant (see Davis, 1923).

From the BMNH register the following additional information is given:

1860.13 [specimen (a)]: "Presented by Lieut Col. Hawkins" and added in another handwriting in pencil: "J K Lord for the North Am B...[thereafter unclear]."

1860.112 [specimen (b)]: "Collected by Mr. Lord Assistant Naturalist to H.M. Boundary Commission on the North West Coast of America sent by Col. Hawkins to the Foreign Office. Presented by Lord John Russell". An accompanying entry adds that Hawkins was "Her majestys commissioner for defining the Boundary Line between the British & American Territory in Oregon".

1874.86 [specimens (c) and (d)]: "Presented by Mr. F. Walker". It is unclear how Walker acquired these specimens, as it would be expected that specimens collected by Lord would have gone through the Foreign Office before being donated to the BMNH, as in the case of specimen (b).

As noted above, Lord's collection contained various insects, from British Columbia, with Walker's new species names (reg number 1864.18). A few of these, together with a few registered as 1860.112, located in the BMNH during

the course of this study, are labelled as types and also have the "Chulukweyuk" label found on specimens (b) and (c). The above museum register entries can be considered bibliographic evidence that Walker had access to the four specimens of *occidentalis* when describing the species (as per Article 72.4.1. of the Code; ICZN 1999). These entries, together with the specimen labels provide a link between all specimens, further supporting their status as types. They are automatically considered syntypes, since a holotype was not designated and there is currently no lectotype (as per Article 73.2 of the Code; ICZN 1999).

We here select specimen (b) as the lectotype and the remaining, slightly smaller, three specimens are considered paralectotypes.

Measurements of the lectotype (per Recommendation 74C of the Code; ICZN 1999) are:

body length = 21.5 mm

length to wing tip = 30.5 mm

wing length = 26 mm

maximum width of forewing = 9.2 mm

wingspan ($2 \times$ wing length + width of mesothorax) = 62.3 mm

width of mesothorax = 6.9 mm

width of head across eyes = 6.9 mm

These measurements are slightly less than the values of 12 lines (= 25.4 mm) for body length and 32 lines (= 67.7 mm) for "wings" (we assume wing span) given in Walker's (1866a) original description. The lectotype is located in the Natural History Museum collection with the accession number '60 112'. The collection label has the following information: 'Brit Columb Chulukweyuk Prairie June 59'.

Davis (1919) suggested that the type locality of *O. occidentalis* was in the north-eastern portion of the state of Washington in the Colville Valley, where the Boundary Line Commission had its headquarters. However, in determining the type specimens of *O. occidentalis* it became clear that at least some of Lord's specimens (including the lectotype of *O. occidentalis*, here designated) were collected in "Chulukweyuk", British Columbia.

As noted above, there are examples of other Walker types in the BMNH from the Lord Collection, or reference to them in the BMNH register. There are referred to as either "Chulukweyuk", "Chulukweyuk Prairie", "Chulukweyuk Trail", "Chulukweyuk Lake", or "Chulukweyuk River". Lord (1866a) makes reference to a "Chelukweyuk River" (note the different spelling) in the lizard section of his book. Lord (1866a: 289) also mentions that he received curatorial assistance from a Mr. Smith at the BMNH. The hand writing in the register entries appears to be similar to the "Chulukweyuk" data labels which suggests the labels were added to the specimens by a curator (possi-

bly Mr. Smith). "Chulukweyuk", therefore, may be a transcription error of Chelukweyuk.

The settlements of British Columbia have been spelled many different ways in attempts to anglicize Native American place names. We have been able to trace Chelukweyuk to the modern city of Chilliwack. Chilliwack is a Halkomelem word that was originally pronounced 'ch.ihl-Kway-uhk' (Akrigg & Akrigg 1986) and is located in the Fraser River valley of the southwestern British Columbia mainland along the eastern side of the Cascade Mountains at approximate coordinates 49° 10' N 121° 57' W. This locality may be consistent with Lord's (1866b) re-description which mentions the Cascade Mountains. Chilliwack is consistent with the museum registers and data labels in that there is a lake, river, and other geographical features that share the name. Therefore, the type locality of *O. occidentalis* is considered to be Chilliwack, British Columbia.

Based on the type series of four females in the BMNH collection, *O. occidentalis* can be distinguished from females of similar species by the sinuate hind margin of the pregenital sternite. Other similar sympatric species, i.e. *O. bella* Davis and *O. rimosa* (Say), have a straighter margin.

SUMMARY

Okanagana occidentalis (Walker) was described from specimens collected in British Columbia. As no holotype was designated we identify a syntypic series in the Natural History Museum, London and designate a lectotype to clarify the identity and type locality of the species. Present day Chilliwack, British Columbia is identified as the type location.

We would like to thank Daniele Perez-Venero of Barry University (USA), Dennis Duffy at the Archives of British Columbia (Canada), and Janet Mason, Provincial Toponymist, Geographic Data BC, Ministry of Environment, Lands & Parks, British Columbia (Canada) who helped us to locate Chulukweyuk and Gillian Watson, CABI (BMNH) for her helpful comments on an earlier draft of the manuscript.

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