Corrections for the Hemiptera: Heteroptera of Canada and Alaska

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ABSTRACT

A total of 175 changes to the current checklist of Hemiptera: Heteroptera of Canada and Alaska are reported. Eighty deletions, eighty-eight nomenclature changes, and seven spelling corrections are detailed. In addition, comments are given on *Anthocoris tomentosus* Péricart, *Orius diespeter* Herring, *O. tristicolor* (White), and *Tupiocoris agilis* (Uhler).

Key words: Changes, checklist, Heteroptera, Canada, Alaska

INTRODUCTION

Maw *et al.* (2000) published a checklist of the Hemiptera of Canada and Alaska, giving details of the occurrence of the species of Heteroptera. Since then, there have been a large number of taxonomic changes that have resulted in deletions and nomenclature modifications for many of the taxa. In addition, a few spelling errors have been noted. Details of the 175 changes are outlined here, and comments on four taxa are given.

The order of taxa follows Maw *et al.* (2000), but species are listed in alphabetical order in each family.

Museum abbreviations are as follows:

CNC	Canadian National Collection of Insects, Agriculture and Agri-Food Canada, Ottawa, Ontario
RBCM	Royal British Columbia Museum, Victoria, B.C.
UAM	University of Alaska Museum, Fairbanks, Alaska.
UBCZ	Spencer Entomological Collection, Beaty Biodiversity Museum (formerly Spencer Entomological Museum, Department of Zoology) University of British Columbia, Vancouver, B.C.
USNM	National Museum of Natural History (formerly United States National Museum), Washington, D.C.

SYSTEMATIC TREATMENT

I. Deletions

Family CORIXIDAE

Glaenocorisa quadrata Walley

This corixid was originally described by Walley (1930) from Quebec. Jaczewski and Lansbury (1961) followed Ossianilsson (1960) and considered *G. quadrata* a synonym of *G. cavifrons* (Thomson), and stated that *G. cavifrons* was at most a subspecies of *G. propinqua* (Fieber). Although doubted by Brown (1946), this was accepted by Jansson (1986), who concluded that there were two subspecies of *G. propinqua*, with *G. propinqua cavifrons* occurring in North America. However, as noted by Jansson (2002), *G. cavifrons* was raised to specific status by Jansson (2000), because the two subspecies are sympatric in Scotland and northern Finland. Hence, *G. quadrata* Walley should be

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deleted, and all occurrence records in North America placed under *G. cavifrons* (Thomson).

Sigara modesta (Abbott)

This species was recorded from British Columbia by Downes (1934) as *Arctocorisa modesta*, with a listing of material from Vernon, 26.ix.1919 (W. Downes), determined by G.S. Walley. This record was accepted by Polhemus *et al.* (1988) and repeated in Maw *et al.* (2000).

Sigara modesta was not listed from British Columbia by Hungerford (1948), Lansbury (1960), or Scudder (1977). Scudder (1977) excluded *S. modesta* (Abbott) from the British Columbia list of Corixidae, noting that there were no other records of this species in the province. He also noted that other specimens in the Downes collection that were labelled "*modesta*" were in fact *S. grossolineata* Hungerford and that the Vernon determination was probably incorrect. Unfortunately, he overlooked the Vernon record of *S. washingtonensis* listed in Hungerford (1948), even though there were specimens with the appropriate date in the Downes collection that had been donated to the UBCZ collection in 1958. However, Scudder (1977) did quote a Vernon record in Lansbury (1955), although the date in the latter was printed as 26.ix.1929 (W. Downes).

Hungerford (1948) lists a male specimen with data Vernon, 26.ix.1919 (W. Downes), under his new species *S. washingtonensis*. In the UBCZ collection, with collection numbers COR3139-COR3141, I have located one male and three females with data 'Vernon, 26.ix.1919 (W. Downes)'. These are from the Downes collection donated to UBCZ in 1958; it is assumed that these are the specimens mentioned by Downes (1934). Hence, the record of *S. modesta* (Abbott) from British Columbia should be deleted.

Trichocorixa verticalis fenestrata (Walley)

This is treated the same as *T. verticalis verticalis* (Fieber) by Jansson (2002). Hence, *T. verticalis fenestrata* should be deleted and records should be placed under *T. verticalis verticalis*.

Family SALDIDAE

Salda anthracina Uhler

This saldid was recorded from Alaska and British Columbia by Polhemus (1988) and from Alaska, British Columbia, Northwest Territories, and the Yukon Territory in Maw *et al.* (2000). Specimens in the UBCZ collection from Alaska, Northwest Territories, and the Yukon were initially determined by me as *S. anthracina* using the key in Schuh (1967), with particular attention paid to the fact that this key noted that the second antennal segment in *S. anthracina* was pale. At that time, I had not seen specimens of *S. anthracina* from elsewhere. This led me to record *S. anthracina* in Maw *et al.* (2000). These specimens were as follows:

AK: Donnelly Cr., Richardson Hwy., 15.vii.1985 (S.G. Cannings) [UBCZ].
NT: 15 km N of BC border, Liard Hwy., 26.vi.1985 (E. Bijdemast) [UBCZ].
YK: Dawson, 31 km E, 26.vi.1980 (Bruce Gill) [UBCZ].
Kluane N.P., Slims River flats, 21.vii.1979 (G.G.E. Scudder) [UBCZ].
Kluane, Slims R. delta, 7.viii.1986, (S.G. Cannings) [UBCZ].
Mi 1059 Alaska Hwy., Kluane L., 5.vii.168 (Campbell-Smetana) [CNC].
Moose Cr., 68°31'N 137°01'W, 26.vii.1982 (G.G.E. Scudder) [UBCZ].
Von Wilczek L., 2.vii.1980 (Bruce Gill) [UBCZ].

After receiving one male and one female determined by the late J.T. Polhemus as *S. provancheri* Kelton & Lattin, and noting that these specimens from Colorado, Weld County, Pawne National Grasslands, July 1970 (R.T. Bell), had the second antennal segment mostly pale and the first segment dorsally flavescent and ventrally fuscous, I redetermined my western specimens as *S. provancheri* and not *S. anthracina.* As a result, in Scudder (1997), I recorded *S. provancheri* from Dawson (31 km E), Moose Cr., Slims R. delta and von Wilczek Lks. The specimens from Alaska and the Northwest Territories were also determined as *S. provancheri*, and not *S. anthracina*.

I note that Schuh (1967) stated that *S. anthracina* is quite variable morphologically and lives in situations similar to those preferred by S. *provancheri*, which was recorded by Schuh (1967) as *S. bouchervillei*. I have been unable to trace the original record of *S. anthracina* from Alaska, although this record is reported by Drake and Hoberlandt (1950), Drake and Hottes (1950), and Drake (1952). D. Sikes (in litt., 15 March 2018) informs me that there are no specimens under *S. anthracina* in the University of Alaska Museum.

All the specimens I have seen from Alaska that might be S. *anthracina* are, in fact, *S. provancheri*.

Drake and Hottes (1950) cite a record of *S. provancheri* as *S. bouchervillei*, from Alaska (Rampart), noting that his species is quite variable in size and degree of wing development. *Salda provancheri* was also recorded from Cook Inlet, Valdez Bay, in Alaska by Bahr and Schulte (1976). Polhemus (1988) recorded *S. provancheri* from Alaska, British Columbia, and the Northwest Territories.

Salda anthracina was recorded from British Columbia by Downes (1927) as *Lampracanthia anthracina*, with the observation that the British Columbia material was in the CNC. I have been unable to locate specimens of *S. anthracina* from British Columbia in the CNC, and this absence has been confirmed by H.E.L. Maw (in litt., 22 Feb. 2018). However, there are specimens of *S. provancheri* from British Columbia in the CNC, RBCM, and UBCZ collections, with some of the latter being recorded by Downes (1927) as *S. coriacea*, a synonym of *S. provancheri*.

Hence, it is evident that the records of *S. anthracina* from British Columbia, the Northwest Territories, and the Yukon in Maw *et al.* (2000) should be deleted. The occurrence of *S. anthracina* in Alaska needs to be confirmed.

Family ANTHOCORIDAE

Tetraphleps uniformis Parshley

Lattin (2006) has shown that *T. uniformis* Parshley is a synonym of *T. canadensis* Provancher, and restored *T. furvus* Van Duzee as a valid species in its place. Hence, *T. uniformis* should be deleted and replaced by *T. furvus* Van Duzee.

Xylocoris umbrinus Van Duzee

Lattin (2005) has shown that *X. umbrinus* Van Duzee is a synonym of *X. californicus* (Reuter). Thus, *X. umbrinus* Van Duzee should be deleted and replaced by *X. californicus* (Reuter).

Family NABIDAE

Pagasa fusca (Stein)

After Kerzhner (1993a) raised *P. nigripes* Harris to specific status and recorded this species from Alberta, Saskatchewan, Quebec and Alaska, Scudder (2008) showed that all the specimens of *P. fusca* (Stein) reported from the Yukon and the Northwest Territories, and some specimens from British Columbia, were *P. nigripes*. Thus, *P. fusca* should be deleted from the Yukon and Northwest Territories.

Family MIRIDAE

Adelphocoris superbus (Uhler)

Schwartz and Scudder (2003) concluded that *A. superbus* (Uhler) is a synonym of *A. rapidus* (Say). Hence, *A. superbus* and all three provincial records should be deleted.

Agnocoris pulverulentus (Uhler)

This species was first reported from Alaska (Fort Yukon) by Moore (1955). Moore (1956) did not list the Alaska (Fort Yukon) material when he recorded *A. rubicundus* (Fallén) in the New World, but considered this latter species as Holarctic. Wheeler and Henry (1992) also did not record *A. rubicundus* from Alaska, although they stated that this species may have survived in an Alaska refugium. Maw *et al.* (2000), while recording A. *pulverulentus* in Alaska following Moore (1955), also noted *A. rubicundus*

from Alaska. This was based on specimens from Alaska in the CNC determined by M.D. Schwartz as *A. rubicundus*. Included was material labelled 'Alaska, Fort Yukon, 900', 4.viii.1951 (H.C. Severin)'. T.J. Henry informs me (in litt., 15 February 2018), that he could not locate Alaska specimens of *Agnocoris* in the USNM, although Moore (1955) recorded one male and three females as *A. pulverulentus* from Alaska, Fort Yukon, July 18, 1951 (R.I. Sailer) [USNM].

As a result, I hereby delete the record of A. *pulverulentus* from Alaska, assuming it is in fact *A. rubicundus*.

Aoplonema uhleri (Van Duzee)

Forero (2008) has shown that *Hadronema uhleri* Van Duzee is a synonym of *A. princeps* (Uhler). *Aoplonema uhleri* should be deleted and replaced by *A. rubrum* Forero.

Capsus ater (Linnaeus)

This species was reported from Alberta (Edmonton) by Blatchley (1926), quoted from Alberta by Henry and Wheeler (1988), and reported by Maw *et al.* (2000). The record was doubted by Wheeler and Henry (1992), and it was not included from Alberta in Kelton (1980). All the specimens of *Capsus* that I have examined from Alberta are *C. cinctus* (Kolenati). This latter species, recorded as *C. simulans* (Stål), was first reported from Banff and Lethbridge in Alberta by Knight (1926) and subsequently were recorded under this name from Alberta by Strickland (1953), MacNay (1953), and Kelton (1980).

Hence, it is assumed that the record of *C. ater* from Alberta should be deleted. Vinokurov (1977) synonymized *C. simulans* (Stål) with C. *cinctus* (Kolenati) and noted that this species occurred in North America from Alaska to Iowa in the United States.

Chlamydatus pullus (Reuter)

Many of the records formerly placed under *C. pullus* (Reuter) by Kelton (1965), Scudder (1997), and Maw *et al.* (2000) are now placed under the species *C. keltoni* Schuh & Schwartz (Schuh and Schwartz 2005). *Chlamydatus pullus* (Reuter) as noted by Schuh and Schwartz (2005) is found only in Quebec, Saskatchewan, and the Yukon. The latter were recorded as "*Chlamydatus* sp. near *auratus* Kelton" by Scudder (1997).

The result is that all records of *C. pullus* in Canada, except those from Quebec, Saskatchewan, and the Yukon, should be deleted.

Coquillettia insignis (Uhler)

Wyniger (2011) revised the genus *Coquillettia* Uhler and found that *C. insignis* Uhler is confined to California. The species in Alberta and Saskatchewan was described as a new species *C. schwartzi* Wyniger and the specimens from British Columbia as being either of two new species, described as *C. pergrandis* Wyniger or *C. thomasi* Wyniger.

Hence, *C. insignis* Uhler, in Maw *et al.* (2000), should be deleted and replaced by the species listed above.

Dacota hesperia Uhler

This species was recorded from British Columbia in Maw *et al.* (2000), based on a single female specimen from B.C., Fraser, 29.vii.1982 (G.G.E. Scudder). This specimen was subsequently determined in 2010 by M.D. Schwartz as *Pinophylus rolfsi* (Knight) and recorded as AMNH_PBI00394201. *Pinophylus rolfsi* is now *P. alpinus* (Van Duzee), according to Schwartz (2013).

Thus, the record of *D. hesperia* Uhler from British Columbia should be deleted.

Dicyphus vestitus Uhler

Dicyphus vestitus was recorded from British Columbia by Parshley (1919) and Downes (1927). Parshley (1919) cited specimens from B.C., Saanich Dist., V.I., Apr. 30, Sept. 14, 1918 (W. Downes), and Downes (1927) cited specimens from Goldstream, Sept. 9th, 1923 (K.F. Auden), Vernon, May 6th, 1920 (H.R. Ruhmann), and Victoria, Sept. 7th, 1920 (W. Downes).

Based on these records, *D. vestitus* was recorded from British Columbia by Henry and Wheeler (1988), and this record was repeated by Maw *et al.* (2000).

In the UBCZ collection, which now contains the late W. Downes collection, there are specimens of *D. discrepans* Knight that are labelled B.C., Saanich Dist., 14.ix.1918 (W.

Downes) and B.C., Goldstream, 9.ix.1923 (K.F. Auden): these are evidently specimens listed by Parshley (1919) and Downes (1927), respectively. Although Knight (1923) described *D. discrepans* and distinguished it from *D. vestitus*, *D. discrepans* was not listed by Downes (1927). It is evident that the early records of *D. vestitus* in Parshley (1919) and Downes (1927) should be assigned to *D. discrepans*.

Hence, the *D. vestitus* Uhler record from British Columbia in Maw *et al.* (2000) should be deleted. Henry (1999a) gives a recent key to *D. discrepans* and *D. vestitus*.

Lopidea confluenta (Say)

Maw *et al.* (2000) recorded *L. confluenta* (Say) from Alberta, Manitoba, Ontario, and Quebec.

Lopidea confluenta is not recorded from Alberta by Strickland (1953) nor from the prairie provinces by Kelton (1980). However, it is listed from Ontario and Quebec by Asquith (1991) and Wheeler and Henry (1988). It was recorded from Manitoba (Aweme) by Criddle (1921), and this was the basis for its inclusion in Scudder (2014).

It is evident that the Alberta record is an error and should be deleted. The Manitoba record needs to be confirmed.

Lopidea nigridea serica Knight

This was reported from Alaska in Maw *et al.* (2000), based on one female specimen from Tok, 22.vii.1982 (L.A. Kelton) [CNC]. However, M.D. Schwartz has since determined that this specimen is *L. dakota* (Knight).

Hence, *L. nigridea serica* Knight should be deleted for Alaska, as noted by Scudder and Sikes (2014).

Megalopsallus lycii (Knight)

Europiella lycii Knight 1968 was transferred to the genus *Megalopsallus* Knight by Schuh *et al.* (1995) and synonymized with *M. humeralis* (Van Duzee) by Schuh (2000). The latter species does not occur in Canada and should therefore be deleted. The Alberta and Saskatchewan records under *M. lycii* in Maw *et al.* (2000) should be assigned to *M. sparsus* (Van Duzee) (Schuh 2000).

Megalopsallus montanae (Knight)

Europiella montanae Knight 1968 was transferred to the genus *Megalopsallus* Knight by Schuh *et al.* (1995) and synonymized with *M. nigrofemeratus* (Knight) by Schuh (2000). Hence, *M. montanae* (Knight) can be deleted.

Melanotrichus concolor (Kirschbaum)

This European species was reported from Quebec as *Orthotylus concolor (*Kirschbaum) by Moore (1980), Larochelle (1984), and Roch (2008). This record as *M. concolor* (Kirschbaum) was reported from Quebec by Henry and Wheeler (1988) and repeated by Maw *et al.* (2000).

However, Henry (1991) could not confirm the identity of Quebec specimens and believed that they actually are *M. virescens* (Douglas & Scott). As a result, the record of *M. concolor* from Quebec should be deleted and replaced by *M. virescens*.

Microphylellus elongatus Knight

Microphylellus elongatus Knight was cited as a synonym of *Plagiognathus flavipes* (Provancher) by Schuh (2001) (see below). Hence, *M. elongatus* Knight should be deleted.

Orectoderus salicis Knight

This species has been synonymized with *O. montanus* Knight by Wyniger (2010). Hence, it can be deleted.

Orthotylus candidatus Van Duzee

Scudder (2008) reported that the earlier records of *O. candidatus* Van Duzee from Ontario and Saskatchewan were referable to *O. nyctalis* Knight. Hence, the records of *O. candidatus* Van Duzee from Ontario and Saskatchewan should be deleted.

Paradacerla downesi (Knight)

This species was recorded by Downes (1934) from B.C., Jordan Meadows on Vancouver Island, at 1700 feet (W. Downes) det Downes. However, specimens from

Jordan Meadows are not in the late W. Downes collection donated to UBCZ in 1958 and are not in the RBCM. Specimens from British Columbia were not listed in Kelton and Knight (1959), and currently *P. downesi* is unknown in British Columbia. Hence, *P. downesi* should be deleted from the Canadian list.

Pilophorus clavatus (Linnaeus)

This European species was listed from Alberta, British Columbia, Manitoba, Nova Scotia, Ontario, Quebec, and Saskatchewan by Henry and Wheeler (1988), and these records were repeated in Maw *et al.* (2000). *Pilophorus clavatus* was first reported from Newfoundland in 2005 by Wheeler *et al.* (2006).

Downes (1927) recorded *P. clavatus* determined by H.H. Knight, from British Columbia, Victoria, 17.ix.1924 (W. Downes) and Mission, 22.ix.1925 (W. Downes), while Kelton (1980) noted this species from British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, and Nova Scotia. *Pilophorus clavatus* was recorded from Quebec by Moore (1950) and Larochelle (1984), but not by Roch (2008), who queried the occurrence in Ontario and New Brunswick.

Schuh and Schwartz (1988) noted that they were unable to confirm all the earlier records of *P. clavatus* in Canada, except for the records from Manitoba and Nova Scotia. Schuh and Schwartz (1988) considered that other records of *P. clavatus* in Canada could either be *P. neoclavatus* Schuh & Schwartz or misidentified other species. These comments were repeated by Wheeler and Henry (1992).

In the late W. Downes collection in the UBCZ, I found one female with the data, B.C., Victoria, 17.ix.1924 (W. Downes), which is evidently the specimen recorded by Downes (1927) from British Columbia. This specimen was determined by M.D. Schwartz in 1998 as *P. vicarius* Poppius, so the British Columbia record of *P. clavatus* should be deleted.

It would thus appear that all records of *P. clavatus* from Canada, except those for Manitoba, Nova Scotia, and Newfoundland, should be deleted.

Pilophorus uhleri Knight

This species was recorded from Alberta, British Columbia, Manitoba, Ontario, and Saskatchewan by Henry and Wheeler (1988), while Schuh and Schwartz (1988) considered *P. uhleri* an eastern North American species, occurring west to Alberta. Schuh and Schwartz (1988) gave records for Alberta, Manitoba, New Brunswick, Nova Scotia, Prince Edward Island, and Saskatchewan, but not British Columbia.

Downes (1927) reported *P. uhleri* Knight, determined by H.H. Knight, from British Columbia, Victoria, 15 Sept. 1924 (W. Downes), on *Pinus contorta*. This record was accepted by Henry and Wheeler (1988) and Maw *et al.* (2000).

However, a female specimen in the late W. Downes collection at UBCZ, with the data, B.C., Victoria, *Pinus contorta*, 15.ix.1924 (W. Downes), is evidently the specimen listed by Downes (1927). It was determined by M.D. Schwartz in 1998 as *P. americanus* Poppius.

Hence, *P. uhleri* from British Columbia, should be deleted. It may be noted that Schuh and Schwartz (1988) reported that *P. uhleri* most closely resembles *P. americanus*.

Plagiognathus albatus vittiscutis Knight

Treated as *P. albatus* (Van Duzee) by Schuh (2001). Hence, *P. albatus vittiscutis* Knight can be deleted.

Plagiognathus albonotatus Knight

Synonymized with *P. fuscosus* (Provancher) by Schuh (2001). Hence, *P. albonotatus* Knight should be deleted.

Plagiognathus caryae Knight

Synonymized with *P. albatus* (Van Duzee) by Schuh (2001). Hence, *P. caryae* Knight should be deleted.

Plagiognathus cuneatus Knight

This variety of *P. annulatus* Uhler, established by Knight (1923), was synonymized with *P. obscurus* Uhler by Schuh (2001). Hence, *P. cuneatus* Knight should be deleted.

Plagiognathus fumidus Uhler

Considered a synonym of *Europiella decolor* (Uhler) by Schuh (2001). Hence, *P. fumidus* Uhler should be deleted.

Plagiognathus fusciflavus Knight

Synonymized with *P. verticalis* (Uhler) by Schuh (2001). Hence, *P. fusciflavus* Knight should be deleted and *Plagiognathus verticalis* (Uhler) added to the B.C. listing.

Plagiognathus moerens (Reuter)

According to Schuh (2001), this species is not known to occur in Alberta and British Columbia. Records for these two provinces should be transferred to *P. shoshonea* Knight. Thus, the records of *P. moerens* (Reuter) for Alberta and British Columbia should be deleted.

Plagiognathus nigritus Knight

Synonymized with *P. brevirostris* Knight by Schuh (2001). Hence, *P. nigritus* Knight should be deleted and the Alberta record transferred to *P. brevirostris* Knight.

Plagiognathus obscurus albocuneatus Knight

Treated as *P. obscurus* Uhler by Schuh (2001). Thus, *P. obscurus albocuneatus* Knight should be deleted.

Plagiognathus politus flaveolus Knight

Treated as *P. politus* Uhler by Schuh (2001). Thus, *P. politus flaveolus* Knight should be deleted.

Plagiognathus repletus Knight

Synonymized with *P. albatus* (Van Duzee) by Schuh (2001). Hence, *P. repletus* Knight should be deleted.

Plagiognathus similis Knight

Synonymized with *P. albatus* (Van Duzee) by Schuh (2001). Hence, *P. similis* Knight should be deleted.

Psallus variabilis (Fallén)

Psallus variabilis (Fallén) was reported from Ontario by Blatchley (1926) and Henry and Wheeler (1988), and this record was repeated in Maw *et al.* (2000). However, Wheeler and Henry (1992) reported that this Ontario record was incorrect, Knight (1927) having noted that early records of *P. variabilis* in North America were incorrect and that specimens were misidentified. Knight (1927) said that these early records refer to *Lepidopsallus rubidus* var *atricolor* Knight, which Wheeler and Henry (1992) call *Atractotomus atricolor* (Knight). However, Stonedahl (1990) does not record *A. atricolor* (Knight) from Ontario, although Stonedahl (1990) reported *A. rubidus* (Uhler) from Ontario. Nevertheless, valid records for *P. variabilis* (Fallén) in North America were given by Wheeler and Hoebeke (1982) and Wheeler and Henry (1992): these did not include Ontario. Larochelle (1984) synonymized *L. rubidus* var *atricolor* Knight with *L. rubidus* (Uhler).

It is evident that the record of *P. variabilis* (Fallén) from Ontario and Canada in Maw *et al.* (2000) should be deleted.

Sixeonotus insignis Reuter

This species was recorded from Quebec by Larochelle (1984). However, Quebec specimens from Knowlton, 4.vii.1929 (G.S. Walley), Knowlton, 8.viii.1929 (L.J. Milne), and Otter Lake, 24.vii.1958 (L.A. Kelton) in the CNC have been determined by M.D. Schwartz in 2000 as *S. deflatus* Knight. Hence, the Larochelle (1984) record from Quebec probably refers to *S. deflatus*. Thus, the *S. insignis* Reuter record from Quebec should be deleted.

Slaterocoris robustus (Uhler)

This species was recorded from Alberta in Maw *et al.* (2000), but it was not cited by Strickland (1953), Kelton (1968, 1980), Henry and Wheeler (1988), or Schwartz (2011). Evidently, this record for Alberta was a mistake and should be deleted. The record of *S. robustus* (Uhler) from British Columbia was confirmed by Schwartz (2011).

Trigonotylus americanus Carvalho

In the original description of *T. americanus*, in Carvalho and Wagner (1957), paratypes were listed from British Columbia, Vernon, vii-i-47 (H.B. Leech). Based on determinations by the late L.A. Kelton, *T. americanus* was recorded from Alaska (Hope) and the Yukon by Scudder (1997), and so recorded in Maw *et al.* (2000). As noted by Scudder and Sikes (2014), a male specimen with the data 'Alaska, Hope, Kenai Pen., 15.ii.1951 (W.J. Brown)' in the CNC has been determined by M.D. Schwartz as *T. viridis* (Provancher). Hence, Scudder and Sikes (2014) stated that *T. americanus* Carvalho should be removed from the list of Heteroptera from Alaska, because no other specimens of the species are known from the state.

Similarly, M.D. Schwartz has dissected males of the Yukon specimens listed as *T. americanus* by Scudder (1997) and found all of these to be *T. viridis* (Provancher). Golub (1989) resurrected *T. viridis* (Provancher), which Kelton (1971) considered a synonym of *T. ruficornis* (Geoffrey). All other specimens of *Trigonotylus* Fieber from the Yukon appear to be *T. viridis*. Hence, the record of *T. americanus* Carvalho from the Yukon should be deleted.

Trigonotylus tenuis Reuter

Henry and Wheeler (1988) reported *T. doddi* (Distant) from Alberta, Manitoba, and Saskatchewan. Since Golub (1989) showed that *T. doddi* was a junior synonym of *T. tenuis* Reuter, Maw *et al.* (2000) reported the Henry and Wheeler (1988) records as *T. tenuis* Reuter. However, Wheeler and Henry (1992) have noted that the original Henry and Wheeler (1988) records undoubtedly refer to other species of *Trigonotylus* Fieber. Perhaps they refer to *T. canadensis* Kelton, described from Alberta, Manitoba, and Saskatchewan by Kelton (1970).

Hence, it is reasonable to delete the record of *T. tenuis* Reuter from the prairie provinces and Canada. It is not included in Kelton (1980).

Family ARADIDAE

Aradus lugubris nigricornis Reuter

This taxon, treated as a subspecies by Froeschner (1988), was said by Parshley (1921) not to be of geographic significance, because it occurs throughout the range of the species *A. lugubris* Fallén in North America. Hence, it should be deleted.

Family ORSILLIDAE

Nysius groenlandicus (Zetterstedt)

This species in North America was recorded from Alaska, Manitoba, Newfoundland, Ontario, Prince Edward Island, and Quebec by Ashlock and Slater (1988). These records were repeated in Maw *et al.* (2000), with the addition of the Yukon and Labrador. All of these occurrence records were based on the published literature, although not all authors cited the diagnostic characters used in their identification.

The published records were: Alaska (many cited by Slater 1964); Yukon (Scudder 1997); Manitoba (Churchill) (Barber 1947a, 1947b); Newfoundland (presumably Brown 1934); Ontario (Muskoka Lake District) (Van Duzee 1889); Prince Edward Island (Barber 1947a, 1947b); Quebec (Bradore Bay) (Brown 1934; Barber 1947a; Moore 1950; Béique and Robert 1964; Larochelle 1984); Labrador (Nain) (Brown 1934).

Ashlock (1967) questioned whether *N. groenlandicus* (Zett.) occurred in North America, and this was noted by Böcher (1976). Böcher (1978) observed that *N. groenlandicus* seems to be absent in North America, and this was repeated by Danks (1981).

At present, the record of *N. groenlandicus* from Prince Edward Island should be deleted, although the identity of this material still must be determined.

Family RHYPAROCHROMIDAE

Perigenes constrictus (Say)

This species was reported from Alaska by Van Duzee (1919), and this record was repeated by Slater (1964), Ashlock and Slater (1988), Maw *et al.* (2000), and Lattin (2008). However, Scudder and Sikes (2014) noted that the female specimen in the CNC from Ketchikan, on which the Alaska record is based, is actually a specimen of *Ligyrocoris sylvestris* (Linnaeus). Hence, the record of *P. constrictus* (Say) from Alaska should be deleted, as noted by Scudder and Sikes (2014).

Scolopostethus atlanticus Horváth

This species was reported from British Columbia, Manitoba, Ontario, Quebec, and Newfoundland by Ashlock and Slater (1988), and these records were repeated in Maw *et al.* (2000). These provincial records were evidently based on earlier reports, namely those for Manitoba (Winnipeg) by Gibson (1912), for Ontario (Ottawa) by Gibson (1915), and for Quebec by Béique and Robert (1964); Roch (2008) also reported *S. atlanticus* from Ontario and Quebec. The records for Newfoundland were from Torre-Bueno (1917) and Slater (1964), and Torre-Bueno (1946). However, it may be noted that neither Parshley (1919) nor Downes (1927) gave records for *S. diffidens* Horváth.

Sweet (1964) gave a detailed description of the distinguishing characters of *S. atlanticus* and considered this species an eastern Nearctic taxon. He thought that most of the distribution records for *S. atlanticus* from the northern part of North America were incorrect, and he specifically noted that the records for British Columbia in Parshley (1919) referred to *S. thomsoni* Reuter. He also noted that the late H.G. Barber had frequently mistakenly named specimens of *S. thomsoni* and *S. diffidens* in the USNM as *S. atlanticus*.

I examined and photographed the male lectotype of *S. atlanticus* Horváth in Budapest in February 1965 and have not seen similar material in all the numerous specimens of *Scolopostethus* Fieber from Canada that I have examined over the past 60 years. In fact, in the late W. Downes collection donated to UBCZ in 1958, there is one short-winged female from B.C., Agassiz, 25.vii.1921 (W. Downes). This is obviously the specimen listed by Downes (1927), but it is *S. diffidens*. The same collection contains a macropterous female from B.C., Enderby, 14.x.1920 (W. Downes). This was listed by Downes (1927) as *S. atlanticus*, but is actually *S. thomsoni*. Furthermore, a short-winged female from B.C., Colquitz, 4.iv.1919 (W. Downes), and a macropterous female from B.C., Cowichan, 24.viii.1918 (W. Downes), both listed by Brown (1934) as *S. atlanticus* and now in the late W. Downes collection at UBCZ, are in fact *S. thomsoni*.

Hence, I conclude that *S. atlanticus* should be deleted from the list of species in Canada.

II. Nomenclature Changes

Family ANTHOCORIDAE

Orius minutus (Linnaeus)

Lewis and Lattin (2010) have noted that this introduced species in British Columbia is actually *O. vicinus* Ribaut. Hence, this name should be replaced with *O. vicinus*.

Family NABIDAE

Kerzhner and Henry (2008) have rearranged the checklist of the Nabidae in North America. This has resulted in a large number of nomenclatural changes. *Nabicula* Kirby and *Omanonabis* Asquith & Lattin are treated as subgenera of *Nabis* Latreille, and *Anaptus* Kerzhner is considered a subgenus of *Himacerus* Wolff. These changes result in nine nomenclatural changes in the Nabidae as follows:

- *Anaptus major* (Costa): change to *Himacerus* (*Anaptus*) *major* (Costa).
- *Nabicula* (*Dolichonabis*) *americolimbata* (Carayon): change to *Nabis* (*Dolichonabis*) *americolimbatus* (Carayon).
- *Nabicula* (*Dolichonabis*) *limbata* (Dahlbom): change to *Nabis* (*Dolichonabis*) *limbatus* Dahlbom.

- *Nabicula* (*Dolichonabis*) *nigrovittata nearctica* Kerzhner: change to *Nabis* (*Dolichonabis*) *nigrovittatus nearctica* (Kerzhner).
- *Nabicula* (*Limnonabis*) *propinqua* (Reuter): change to *Nabis* (*Limnonabis*) *propinquus* Reuter.
- *Nabicula* (*Nabicula*) *flavomarginata* (Scholtz): change to *Nabis* (*Nabicula*) *flavomarginatus* Scholtz.
- *Nabicula* (*Nabicula*) *subcoleoptrata* Kirby: change *Nabis* (*Nabicula*) *subcoleoptratus* (Kirby).
- *Nabicula* (*Nabicula*) *vanduzeei* (Kirkaldy): change to *Nabis* (*Nabicula*) *vanduzeei* (Kirkaldy).
- *Omanonabis lovetti* (Harris): change to *Nabis* (*Omanonabis*) *lovetti* Harris.

Family MIRIDAE

Coniferocoris pinicolus (Coniferocoris Schwartz & Schuh)

This genus *Coniferocoris* Schwartz & Schuh was synonymized with *Plesiodema* Reuter by Schwartz (2006). Thus, this species, listed in Maw *et al.* (2000) as *C. pinicolus*, should be changed to *Plesiodema pinicolus* (Schwartz & Schuh).

Icodema nigrolineatum (Knight)

Henry (1999b) has shown that *Plagiognathus nigrolineatum* Knight should be placed as the type species of a new genus that he named *Americodema*. Hence, the name *I. nigrolineatum* (Knight) should be changed to *Americodema nigrolineatum* (Knight).

Genus *Lygocoris*, subgenus *Neolygus* Knight

Neolygus Knight was raised to generic status by Yasunaga *et al.* (2002). This results in 29 name changes as listed below:

- *Lygocoris alni* (Knight): change to *Neolygus alni* (Knight).
- *Lygocoris atricallus* Kelton: change to *Neolygus atricallus* (Kelton).
- *Lygocoris atritylus* (Knight): change to *Neolygus atritylus* (Knight).
- *Lygocoris belfragii* (Reuter): change to *Neolygus belfragii* (Reuter).
- *Lygocoris caryae* (Knight): change to *Neolygus caryae* (Knight).
- *Lygocoris clavigenitalis* (Knight): change to *Neolygus clavigenitalis* (Knight).
- *Lygocoris communis* (Knight): change to *Neolygus communis* (Knight).
- *Lygocoris contaminatus* (Fallén): change to *Neolygus contaminatus* (Fallén).
- *Lygocoris fagi* (Knight): change to *Neolygus fagi* (Knight).
- *Lygocoris geneseensis* (Knight): change to *Neolygus geneseensis* (Knight).
- *Lygocoris hirticulus* (Van Duzee): change to *Neolygus hirticulus* (Van Duzee).
- *Lygocoris inconspicuus* (Knight): change to *Neolygus inconspicuus* (Knight).
- *Lygocoris invitus* (Say): change to *Neolygus invitus* (Say).
- *Lygocoris johnsoni* (Knight): change to *Neolygus johnsoni* (Knight).
- *Lygocoris knighti* Kelton: change to *Neolygus knighti* (Kelton).
- *Lygocoris laureae* (Knight): change to *Neolygus laureae* (Knight).
- *Lygocoris omnivagus* (Knight): change to *Neolygus omnivagus* (Knight).
- *Lygocoris ostryae* (Knight): change to *Neolygus ostryae* (Knight).
- *Lygocoris parrotti* (Knight): change to *Neolygus parrotti* (Knight).
- *Lygocoris parshleyi* (Knight): change to *Neolygus parshleyi* (Knight).
- *Lygocoris piceicola* (Kelton): change to *Neolygus piceicola* (Kelton).
- *Lygocoris quercalbae* (Knight): change to *Neolygus quercalbae* (Knight).
- *Lygocoris semivittatus* (Knight): change to *Neolygus semivittatus* (Knight).
- *Lygocoris univittatus* (Knight): change to *Neolygus univittatus* (Knight).
- *Lygocoris viburni* (Knight): change to *Neolygus viburni* (Knight).
- *Lygocoris vitticollis* (Reuter): change to *Neolygus vitticollis* (Reuter).
- *Lygocoris walleyi* (Kelton): change to *Neolygus walleyi* (Kelton).

Melanotrichus elongatus Kelton

Orthotylus leonardi was proposed by Kerzhner and Schuh (1995) for *O. elongatus* (Kelton 1980), *M. elongatus* Kelton, a junior secondary homonym of *O. elongatus* Wagner 1965.

It would seem that the name *M. leonardi* (Kerzhner & Schuh) should replace *M. elongatus* Kelton.

Microphylellus adustus binotatus Knight

This species was synonymized with *Reuteroscopus falcatus* Van Duzee by Schuh (2001). However, *R. falcatus* Van Duzee was made the type species of the new genus *Vanduzeephylus* by Schuh and Schwartz (2004). Hence, the name *M. adustus binotatus* Knight should be replaced by *Vanduzeephylus falcatus* (Van Duzee).

Microphylellus flavipes (Provancher)

This species has been transferred to the genus *Plagiognathus* Fieber by Schuh (2001). Hence, it should now be called *Plagiognathus flavipes* (Provancher).

Microphylellus longirostris (Knight)

This species has been transferred to the genus *Plagiognathus* Fieber by Schuh (2001). Hence, it should now be called *Plagiognathus longirostris* (Knight).

Microphylellus maculipennis Knight

This species has been transferred to the genus *Plagiognathus* Fieber by Schuh (2001). Hence, it is now called *Plagiognathus maculipennis* (Knight).

Microphylellus modestus Reuter

This species has been transferred to the genus *Plagiognathus* Fieber by Schuh (2001). Hence, it is now called *Plagiognathus modestus* (Reuter).

Microphylellus tsugae Knight

This species has been transferred to the genus *Plagiognathus* Fieber by Schuh (2001). Hence, this is now *Plagiognathus tsugae* (Knight).

Microphylellus tumidifrons Knight

This species has been transferred to the genus *Plagiognathus* Fieber by Schuh (2001). Hence, it is now *Plagiognathus tumidifrons* (Knight).

Parapsallus vitellinus (Scholtz)

This introduced species was transferred to the genus *Plagiognathus* Fieber by Schuh (2001). Hence, it should be called *Plagiognathus vitellinus* (Scholtz).

Pinophylus rolfsi (Knight)

This is now *P. alpinus* (Van Duzee) according to Schwartz (2013), as noted under *Dacota hesperia* Uhler above. Hence, a nomenclature change is necessary.

Platylygus Van Duzee

Pappus Distant has been shown to be the senior synonym of *Platylygus* Van Duzee by Henry (2006). Thus, all five species of *Platylygus* should be transferred to *Pappus*:

- *Platylygus luridus* (Reuter): change to *Pappus luridus* (Reuter).
- *Platylygus piceicola* Kelton: change to *Pappus piceicola* (Kelton).
- *Platylygus pseudotsugae* Kelton: change to *Pappus pseudotsugae* (Kelton).
- *Platylygus rolfsi* Knight: change to *Pappus rolfsi* (Knight).
- *Platylygus rubripes* Knight: change to *Pappus rubripes* (Knight).

Plesiodema sericeum (Heidemann)

Plesiodema sericeum Heidemann has been placed as the type species of the new genus *Izyaius* by Schwartz (2006). Hence, the name *P. sericeum* should be changed to *Izyaius sericeum* (Heidemann).

Psallus alnicenatus Knight

This species has been transferred to the genus *Plagiognathus* Fieber by Schuh (2001). Hence, it should now be called *Plagiognathus alnicenatus* (Knight).

Psallus morrisoni Knight

This species has been transferred to the genus *Plagiognathus* Fieber by Schuh (2001). Hence, it should now be called *Plagiognathus morrisoni* (Knight).

Psallus parshleyi Knight

This species has been transferred to the genus *Plagiognathus* Fieber by Schuh (2001). Hence, it should now be called *Plagiognathus parshleyi* (Knight).

Psallus physocarpi Henry

This species has been transferred to the genus *Plagiognathus* Fieber by Schuh (2001). Hence, it should now be called *Plagiognathus physocarpi* (Henry).

Sthenarus cuneotinctus Van Duzee

Schuh and Schwartz (2004) have made this species the type of the new genus *Aurantiocoris*. Hence, the species should now be cited as *Aurantiocoris cuneotinctus* (Van Duzee).

Teleorhinus brindleyi Knight

This species was synonymized with *T. cyaneus* Uhler by Wyniger (2010). Hence, the name should be changed to *T. cyaneus* Uhler.

Family TINGIDAE

Dictyonota tricornis (Schrank)

The genus *Kalama* Puton was recognized by Péricart (1982), with *Kalama tricornis* (Schrank) being one of the included species (Froeschner 2001). This latter species was recorded as introduced into Canada and the United States by Drake and Ruhoff (1965) under the name *D.* (*Alcletha*) *tricornis* (Schrank), a fact reiterated by Froeschner (2001). Hence, this tingid should now be recorded as an introduction under the name *K. tricornis* (Schrank).

Family OXYCARENIDAE

Crophius ramosus Barber

Henry *et al.* (2015) resurrected the genus *Mayana* Distant and cited *Mayana ramosa* (Barber) as one of the included species. Hence, *C. ramosus* Barber should be changed to *M. ramosa* (Barber).

Family PIESMATIDAE

Piesma cinereum (Say)

Péricart (1974) made *Tingis cinerea* Say the type species of a new subgenus that he named *Parapiesma*, and *Parapiesma* Péricart was raised to generic status by Heiss and Péricart (1997). Hence, *Parapiesma cinereum* (Say) is the current name for what was previously called *Piesma cinereum* (Say).

Piesma explanatum McAtee

This piesmatid was included in the subgenus *Parapiesma* by Péricart (1974). Since *Parapiesma* Péricart was raised to generic status by Heiss and Péricart (1997), the current name for this taxon, previously called *Piesma explanatum* McAtee, is *Parapiesma explanatum* (McAtee).

Family PENTATOMIDAE

Genus *Acrosternum*, subgenus *Chinavia* Orian

Chinavia Orian was treated as a distinct genus by Ahmad *et al.* (1996). This results in the following changes:

- *A. hilare* (Say): change to *C. hilaris* (Say).
- *A. pensylvanicum* (Gmelin): change to *C. pensylvanica* (Gmelin).

Apateticus bracteatus (Fitch)

Thomas (1992) recognized the genus *Apoecilus* Stål separate from *Apateticus* Dallas and keyed *Apoecilus bracteatus* Fitch. This is the name that should be recognized for this species.

Apateticus cynicus (Say)

This species should now be called *Apoecilus cynicus* (Say), as noted above.

Codophila remota (Horváth)

Kerzhner (1993b) and Rider (1998) have noted that the correct name for this taxon is *Anthemia eurynota remota* (Horváth).

Cosmopepla bimaculata (Thomas)

Rider and Rolston (1995) have noted that the correct name for the species is *C. lintneriana* Kirkaldy.

Holcostethus piceus (Dallas)

Rider and Rolston (1995) proposed the new name *H. macdonaldi* for this species.

III. Spelling Errors

Family CORIXIDAE

Hesperocorixa harrisi (Uhler)

Should be *Hesperocorixa harrisii* (Uhler), according to Jansson (2002).

Hesperocorixa kennicotti (Uhler)

Should be *Hesperocorixa kennicottii* (Uhler), according to Jansson (2002).

Family MIRIDAE

Actinocoris Reuter

This should be spelt *Actitocoris* Reuter.

Atractotomus cerocarpi Knight

This should be spelt *Atractotomus cercocarpi* Knight.

Closterotomus norvegicus (Gmelin)

This should be spelt *Closterotomus norwegicus* (Gmelin), according to Kerzhner and Josifor (1999).

Family TINGIDAE

Alveotingis grossocerata Osborne & Drake

Should be *Alveotingis grossocerata* Osborn & Drake.

Family LYGAEIDAE

Melanopleurus pyrropterus (Stål)

This should be spelt *Melanopleurus pyrrhopterus* (Stål).

IV. Other Comments

Family ANTHOCORIDAE

Anthocoris tomentosus Péricart

Lewis and Horton (2012) have shown that many of the occurrence records listed from *A. tomentosus* from the Yukon by Scudder (1997) are a new species that was described as *A. aquilivenis* Lewis. Lewis and Horton (2012) also gave records of *A. aquilivenis* for Alaska and British Columbia that had previously been determined as *A. tomentosus*. However, *A. tomentosus* still has valid occurrence records from Alaska, Yukon and British Columbia.

Orius diespeter Herring

The Yukon records for *O. diespeter* Herring given in Scudder (1997) are in fact the species *O. sibericus* Wagner (Lewis *et al.* 2015). Hence, the Yukon record for *O. diespeter* in Scudder (1997) should be deleted and replaced by *O. sibericus*. However, *O. diespeter* Herring does occur in the Yukon (Lewis and Horton 2010), although it is recorded as *O. tristicolor* (White) by Scudder (1997) (see below).

Orius tristicolor (White)

Lewis and Horton (2010) have shown that all records from the Yukon listed by Scudder (1997) as *O. tristicolor* are in fact a colour variation of *O. diespeter* Herring. Lewis and Horton (2010) also suggest that all records of *O. tristicolor* in eastern Canada

actually refer to *O. diespeter*. Hence, *O. tristicolor* is deleted for Saskatchewan to Newfoundland, and replaced by *O. diespeter*.

Lewis and Horton (2010) updated the known distribution of *O. diespeter* to include Alberta, British Columbia, Nova Scotia, Ontario, Quebec, the Yukon, and Alaska: *O. tristicolor* was recorded from Alberta and British Columbia but not Alaska.

Lewis informed me on January 30, 2018 (in litt.) that a male specimen in the UBCZ collection, number ANTH0784, with data "Firth R., 69°08'N 140°14'W, 23.vi.1984 (S.G. Cannings)" that she determined in 2010 is in fact *O. tristicolor*. This was originally reported in Lewis and Horton (2010) as *O. diespeter*. However, this has been clarified since by Lewis (in litt., 23 February 2018). Hence, *O. tristicolor* is still recorded from the Yukon but not Alaska.

Family MIRIDAE

Tupiocoris agilis (Uhler)

Tupiocoris agilis was first reported from British Columbia by Parshley (1919) as *Dicyphus agilis* Uhler with records for Saanich Dist., V.I., Apr. 30, Sept. 14, 1918 (W. Downes). It was also reported from British Columbia by Downes (1927) under the same name, with specimens recorded from Agassiz, Sept. 1921 (R. Glendenning), Duncan, Aug. 4th, 1921 (W. Downes) and Saanich, June 18th, 1918 (W. Downes). Kelton (1980) writing under *D. confusus* Kelton, concluded that the early records of what is now *T. agilis* (Uhler) probably refer to what is now *T. confusus* (Kelton), *T. similis* (Kelton), or some other species.

However, new records of *T. agilis* (Uhler) for British Columbia were published by Schwartz and Scudder (2001). Although I have been unable to trace the earlier specimen listed by Parshley (1919) and Downes (1927), these can be ignored, as the recent records by Schwartz and Scudder (2001) validate the species in British Columbia.

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