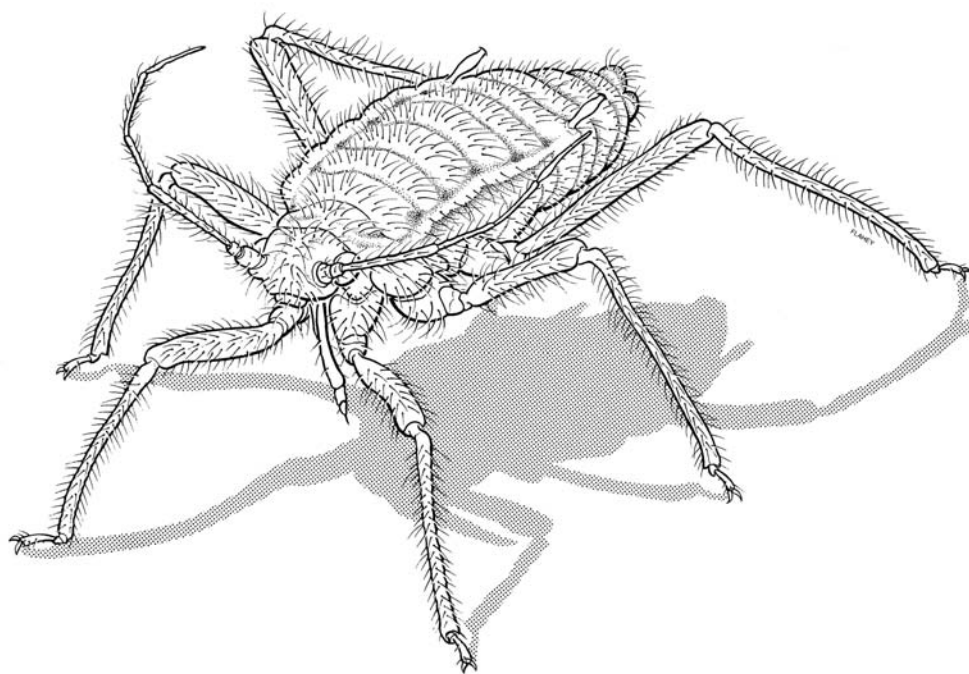


Aphids of the Yukon



FRONTISPIECE. *Pterocomma bicolor* (Oestlund), widespread on *Salix* and *Populus*, is a common component of the Yukon aphid fauna. Length about 3.5 mm.

Aphids (Homoptera: Aphidoidea) of the Yukon

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Abstract. Fifty-three species of Aphidoidea (Hemiptera) are recorded in the Yukon Territory. An additional 55 species are listed as almost certainly belonging to the Yukon aphid fauna. General distributions, individual Yukon locality records and biological data are provided for each species. Most of the known Yukon fauna consists of widespread species reaching their northern distributional limits, suggesting postglacial colonization by a boreal and montane fauna. Forty percent of the species feed on just 5 abundant and widespread tree and shrub genera. Three-quarters of the species do not show host alternation, a pattern consistent with boreal faunas elsewhere.

Résumé. *Les pucerons (Hemiptera: Aphidoidea) du Yukon.* Cinquante-trois espèces d'Aphidoidea (Hemiptera) sont signalées dans le territoire du Yukon et 55 autres espèces sont présumées appartenir aussi à la faune des pucerons du Yukon. Pour chaque espèce, on trouvera ici la répartition générale, la liste des localités où elle a été rencontrée au Yukon, ainsi que des données biologiques qui la concernent. La plus grande partie de la faune du Yukon se compose d'espèces plutôt répandues, à la limite nord de leur répartition, ce qui semble indiquer que la colonisation du Yukon s'est faite par migration d'espèces boréales alpines. Quarante pourcent des espèces dépendent pour leur nourriture de seulement 5 genres abondants et répandus d'arbres et d'arbrisseaux. Trois quarts des espèces ne changent pas d'hôte au cours de leur cycle, ce qui est caractéristique des faunes boréales.

Introduction

The Aphidoidea are a predominately north-temperate group of Hemiptera, with more than 1000 species in Canada. They feed on a wide range of hostplants and are generally abundant in most parts of the temperate region. They are characterized by varying degrees of host specificity, but most species are more or less monophagous. Many species have complex life cycles involving host alternation, and alternation of parthenogenetic and sexual generations. General aspects of aphid biology are discussed in Blackman (1974), Dixon (1985), and Foottit and Richards (1993).

There have been few studies of northern aphids. Richards (1961, 1963, 1964) identified 19 species of eastern arctic aphids. Robinson (1979*a, b*) listed species from the Churchill, Manitoba, region and from northwestern Canada and Alaska. Collecting efforts in the Yukon and adjacent areas have been limited. See Robinson (1979*b*) for a history of collecting in the region. Recently, R.A. Ring and A.F.G. Dixon have made collections in the Mackenzie Delta and on Herschel Island. Other samples were incidental to the work of other investigators interested principally in other insect groups or involved in ecological studies. As a result, there is a considerable bias towards the southern parts of the Territory (specifically, the Whitehorse region). Most species records are based on a single sample.

The objectives of this study are to update the knowledge of the Yukon fauna since Robinson's (1979*b*) contribution, and to analyse collection records for information on distributional affinities to other aphid faunas. Due to the sparse nature of the data available,

inferences about the characteristics of the aphid fauna of the Territory should be considered speculative.

Materials and Methods

All records (except species no. 108, taken from Sorensen 1988) are based on specimens that have been examined by the authors. Most of the material was collected by A.G. Robinson (in part with B. Batula), with additional collections by R.E. Leech, J.E.H. Martin, P.J. Skit-sko, R.A. Ring and A.F.G. Dixon, and H.G. Walker. Most material examined is housed in the Canadian National Collection (CNCI), Eastern Cereal and Oilseed Research Centre, Ottawa, Ontario. This material includes the A.G. Robinson collection, which was re-examined. Additional portions of Robinson's series, as well as collections by F.C. Hottes from Alaska, are located at the Systematic Entomology Laboratory, USDA, Beltsville, Maryland (USNM).

The terminology for the distribution patterns reflects a combination of geographic and ecological zones. For most aphids treated here, the true distribution and habitat associations are inadequately known, so assignment to a particular zone is tentative, and the zone definitions should be treated loosely. The ecological zones are not mutually exclusive. However, a system of intersecting terms allows assignment of species to a single category in preference to multiple listing of the species. *Boreal* here signifies a transcontinental distribution which includes both the boreal zone proper, and southern transitions to deciduous forest and grasslands. *Western montane* indicates a north-south distribution in the Cordillera; usually such a pattern corresponds to boreal-equivalent habitat types, but for a few species this is not necessarily so. *Boreomontane* is used for species with a broad boreal distribution with southern extensions in the Cordilleran ranges and the Appalachians. *Western boreal* and *Western boreomontane* are subsets of 'Boreal' and 'Boreomontane' respectively, indicating distributions limited to the region west of Hudson Bay and the Great Lakes. *Widespread* indicates broad trancontinental distributions extending southward to at least latitude 37°N.

Use of aphid taxonomic names follows Eastop and Hille Ris Lambers (1976), Smith and Parron (1978), or Footitt and Richards (1993), as appropriate. The higher level groupings of the annotated list are based on the classification of Heie (1980). Heie's scheme allows for the representation of biologically distinct families. Taxonomic groups represented in the Yukon fauna are briefly described. Descriptions of the genera and more complete descriptions of the higher taxa can be found in Footitt and Richards (1993). Species numbers correspond to numbers in the annotated lists of species.

The true aphids (superfamily Aphidoidea), characterized by presence of viviparous parthenogenetic generations, tergum 9 developed into a caudal lobe, and usual possession of siphunculi, are treated here. Phylloxerans and woolly adelgids (superfamily Phylloxeroidea), with parthenogenetic females oviparous, are not treated. However, representatives of the family Adelgidae occur in the Yukon.

Fifty-three species of Aphidoidea are known to occur in the Yukon, as well as 55 additional species that are very likely to occur there. For each species, information is provided on overall distribution, followed, in the case of species known from the Yukon, by locality records for the Territory. General biological data on the species, primarily host range and feeding site, are given, although this information is not based on Yukon collections, for which biological data are usually lacking.

Annotated List of Species Known to Occur in the Yukon

[Family Mindaridae, see species 54]

Family Pemphigidae

Usually alternate between primary and secondary hosts. Primary hosts are various deciduous trees and shrubs, on which a gall is produced. Secondary hosts include a wide range of plant taxa, where the root is usually the preferred feeding site. Abundant wax produced from platelike gland fields. Eyes reduced in wingless forms. Siphunculi pore-like or absent. Sexual forms reduced in size, without mouthparts, female producing a single egg.

Subfamily Pemphiginae

Primary host is often *Populus* (this is so for all Yukon species). [See also species 55–58]

1. *Pemphigus* sp.

Distribution: Unknown.

Yukon records: Gravel L.; Caribou Bar Cr.; Lac LaBerge; Rampart House.

Biological information: Virtually all *Pemphigus* species form galls on leaves or twigs of various species of *Populus* L. Most alternate to roots of herbaceous plants.

Taxonomic notes: *Pemphigus* species have few distinctive external morphological features, and often require knowledge of gall form and position or multiple individuals to confirm identification. The specimens recorded here are isolated sexuparae (migrants from secondary to primary host) without host associations, but differ from the sexuparae of the following species.

2. *Pemphigus betae* Doane

Nearctic, Widespread

Distribution: Yukon, British Columbia to New Brunswick, California to Louisiana, Illinois to New York.

Yukon records: Whitehorse.

Biological information: Heteroecious between a leaf gall on *Populus balsamifera* L. (and other species farther south) and roots of herbaceous plants, principally Chenopodiaceae.

3. *Thecabius* (*Parathecabius*) *populimonilis* (Riley)

Nearctic, Widespread

Distribution: Yukon to New Brunswick, south to California, Texas and New York.

Yukon records: Whitehorse.

Biological information: Forms beadlike galls along the leaf margin of *Populus balsamifera* (and related poplars farther south). Possibly monoecious on this host.

Family Drepanosiphidae

Life cycle without host alternation. Normally, distortion of the host tissue does not occur, and only *Tamalia* species form organized galls. Many species have only winged viviparous adult females. Cauda usually knob shaped and anal plate bilobed. Wax glands dispersed or aggregated into small clusters or plates around bases of setae. A number of species are saltatorial.

Subfamily Phyllaphidinae

Tribe Phyllaphidini

Mostly (including all Yukon species) on deciduous trees and shrubs. [See also species 59–62]

4. *Betulaphis arctosetis* Richards

Nearctic, Subarctic-northern boreal

Distribution: Alaska to Baffin Island.

Yukon records: Whitehorse.

Biological information: On leaves of *Betula glandulosa* Michx. and *B. papyrifera* Marsh.

5. *Euceraphis betulae* (Koch)

Holarctic, Boreal

Distribution: Throughout boreal and boreal transition zones of the entire Holarctic region.

Yukon records: North Fork Pass, Ogilvie Mts.; Dawson City; Klondike City; Bighorn Cr., Missing L., Slipping Cr., Snipe L., Kluane National Park; Kraus Hot Springs; Sheaf Cr.; South Nahanni R.

Biological information: On foliage of *Betula* spp.

Taxonomic notes: Specimens from northwestern North America differ in mensural characteristics from *E. betulae* as defined by Blackman (1977).

6. ***Oestlundiella flava* (Davidson)**

Nearctic, Boreomontane

Distribution: Alaska to Newfoundland, New England, south in west to California and Colorado.

Yukon records: Whitehorse.

Biological information: On leaves of *Alnus* Ehrh.

7. ***Tamalia coweni* (Cockerell)**

Nearctic, Boreomontane

Distribution: Yukon, Mackenzie Valley, British Columbia to Ontario, western United States, north-eastern United States.

Yukon records: Rampart House; Whitehorse.

Biological information: Forms a closed gall from the leaf of *Arctostaphylos uva-ursi* (L.) Spreng.

Tribe Saltusaphidini

On sedges. Body elongate and dorso-ventrally flattened. [See also species 63–64]

8. ***Thripsaphis (Trichocallis) cyperi* (Walker)**

Holarctic, Boreal

Distribution: Alaska to Newfoundland, northern United States; Eurasia.

Yukon records: mi 43 Aklavik Rd., Ogilvie Mts.; Kluane National Park.

Biological information: On Cyperaceae.

Subfamily Chaitophorinae

Tribe Chaitophorini

Clustered colonies on *Populus* and *Acer*. Small, relatively flat-bodied aphids, with numerous large setae. [See also species 65–67]

9. ***Chaitophorus neglectus* Hottes and Frison**

Nearctic, Widespread

Distribution: Widespread in North America.

Yukon records: Whitehorse.

Biological information: On leaves of *Populus tremuloides* Michx. (and cottonwoods farther south).

Taxonomic notes: This species is generally considered a subspecies of *C. populifolii* (Essig), but the slight differences in morphology and pigmentation and different host preferences are maintained throughout the largely coincident range of these 2 entities.

10. ***Chaitophorus populicola* Thomas**

Nearctic, Widespread

Distribution: Common throughout North America.

Yukon records: Carcross; Dawson City; Mayo; McRae; Whitehorse.

Biological information: Feeds on growing tips (especially young plants and sucker shoots) of *Populus* L.

11. ***Chaitophorus populifolii* Essig**

Nearctic, Widespread

Distribution: Widespread in North America.

Yukon records: Dawson City; Whitehorse.

Biological information: Feeds on leaves of *Populus balsamifera* L.

Family Aphididae

Wax glands dispersed. Siphunculi usually cylindrical or clavate; long or short, rarely absent.

Subfamily Pterocommatinae

Life cycle without host alternation. Relatively large, very setose aphids on Salicaceae. [See also species 68, 69]

12. ***Pterocomma bicolor* (Oestlund)** (Frontispiece)

Nearctic, Widespread

Distribution: Alaska to Newfoundland, California to North Carolina (with subspecies *groenlandicum* on Arctic Islands and Greenland).

Yukon records: mi 42 Aklavik Rd., Ogilvie Mts.; Dawson City; Whitehorse; South Nahanni R.

Biological information: On branches of species of *Salix* L. and *Populus* L.

13. ***Pterocomma salicis* (Linnaeus)** Holarctic, Widespread
Distribution: Yukon, Mackenzie Valley, British Columbia, Manitoba, widespread in northern United States south to California, Kansas and New Jersey; introduced from Palearctic region.
Yukon records: Dawson City; Rampart House; Whitehorse.
Biological information: On *Salix* L.

14. ***Pterocomma smithiae* (Monell)** Nearctic, Widespread
Distribution: Yukon to New Brunswick, California to Florida.
Yukon records: Whitehorse.
Biological information: On *Salix* L.

Subfamily Aphidinae

Life cycle with or without host alternation. Some species, particularly host-alternating species on the primary host, cause distortion of the hostplant, but the production of organized galls is rare. Hosts are usually Dicotyledonae, but include all vascular plant groups as well as mosses. Most species of Aphidoidea belong to this subfamily.

Tribe Aphidini

Appendages short, body rounded. Biologically diverse. [See also species 70–75]

15. ***Aphis farinosa* Gmelin** Holarctic, Widespread
Distribution: Throughout North America and Eurasia.
Yukon records: Dawson City.
Biological information: On *Salix* L.

16. ***Aphis helianthi* Monell** Nearctic, Widespread
Distribution: Widespread in North America.
Yukon records: Mayo; Rampart House.
Biological information: Heteroecious between *Cornus* L. and various herbaceous plants including composites, umbellifers and *Epilobium* L.

17. ***Aphis* cf. *maculatae* Oestlund**
Distribution: Unknown.
Yukon records: Ogilvie Mts.
Biological information: A large series of wingless forms collected on *Betula* sp.
Taxonomic notes: Very similar to *A. maculatae*, but outside the morphological range exhibited by collections in other parts of the continent. Listed here as a separate entity because *A. maculatae* is not known to feed on birch.

18. ***Aphis masoni* Richards** Nearctic, Arctic-subarctic
Distribution: Yukon, Baffin Island, and Churchill, Manitoba.
Yukon records: Carcross; Whitehorse.
Biological information: On *Oxytropis* DC.
Taxonomic notes: Yukon specimens differ from the type specimens from the eastern Arctic in a number of morphological details.

19. ***Aphis ribiensis* Gillette and Palmer** Nearctic, Western boreomontane
Distribution: Yukon, south in eastern Cordilleran ranges to Colorado, Manitoba.
Yukon records: Whitehorse.
Biological information: On *Ribes* L.

20. ***Aphis rubicola* Oestlund** Nearctic, Widespread
Distribution: Alaska to Nova Scotia, south to California and Pennsylvania.
Yukon records: Whitehorse.
Biological information: On *Rubus idaeus* L. var. *strigosus* (Michx.) Maxim.

21. ***Aphis varians* Patch** Nearctic, Boreomontane
Distribution: Alaska to New Brunswick, south to Colorado and Pennsylvania.
Yukon records: Herschel Is.; Dawson City; Whitehorse.
Biological information: Alternates between *Ribes* L. and *Epilobium angustifolium* L.

22. *Rhopalosiphum* cf. *nigrum* Richards*Distribution:* Unknown.*Yukon records:* Whitehorse.*Biological information:* *Rhopalosiphum* species alternate between *Prunus*, *Malus* or *Crataegus* species and Monocotyledonae. *Rh. nigrum* uses *Crataegus* and semiaquatic monocots. The Whitehorse specimen was collected from “garden plants”, and may not be a natural element of the fauna.

Tribe Macrosiphini

Typically, appendages more elongate than other tribes. Biologically diverse. [See also species 76–98]

23. *Acyrtosiphon* sp. A*Distribution:* Unknown.*Yukon records:* Herschel Is.*Biological information:* On *Salix arctica* Pallas.*Taxonomic notes:* The single collection appears to belong in *Acyrtosiphon*, but does not fit within any described species. No other *Acyrtosiphon* is known from this hostplant.**24. *Acyrtosiphon assiniboensis* Robinson** Nearctic, Western? boreal*Distribution:* Alaska to southeastern Manitoba, possibly eastward.*Yukon records:* Kluane National Park; Whitehorse.*Biological information:* Feeds on *Potentilla fruticosa* L.**25. *Acyrtosiphon caraganae* (Cholodkovsky)** Holarctic, South boreal*Distribution:* Originally Central Asian, now widely distributed across Canada.*Yukon records:* Whitehorse.*Biological information:* Feeds on new shoots and pods of *Caragana arborescens* Lam.**26. *Acyrtosiphon churchillensis* Robinson** Nearctic, Western? boreal*Distribution:* Yukon to northern Manitoba, possibly eastward.*Yukon records:* Whitehorse.*Biological information:* On herbaceous legumes (*Oxytropis* DC., *Melilotus* Mill., *Trifolium* L.).*Taxonomic notes:* This is a northern counterpart of the widespread pea aphid, *A. pisum* Harris.**27. *Amphorophora agathonica* Hottes** Nearctic, Widespread*Distribution:* Widespread in Canada and northern half of United States, south to Virginia and California.*Yukon records:* Whitehorse.*Biological information:* On *Rubus idaeus* L. var. *strigosus* (Michx.) Maxim.**28. *Capitophorus* sp.***Distribution:* Unknown.*Yukon records:* Dawson.*Taxonomic notes:* The few specimens do not match well with any described species.**29. *Cavariella* (*Cavariella*) *kono*i Takahashi** Holarctic, Widespread*Distribution:* Alaska, Mackenzie Valley, British Columbia to New Brunswick, Minnesota to New York; East Asia.*Yukon records:* Dempster Hwy. km 155.*Biological information:* Alternates between *Salix* species and Umbelliferae.**30. *Chaetosiphon* (*Pentatrachopus*) *fragaefolii* (Cockerell)** Nearctic
(originally Western montane)*Distribution:* Alaska, Yukon, Mackenzie Valley to New Brunswick, Arizona to North Carolina (originally western).*Yukon records:* Whitehorse.*Biological information:* On leaves of species of *Rosa* L. and *Fragaria* L.**31. *Fimbriaphis fimbriata* Richards** Nearctic, Western boreomontane*Distribution:* Yukon, Mackenzie Valley, British Columbia to Ontario, Oregon.*Yukon records:* Whitehorse.*Biological information:* On *Rosa* L. and *Fragaria* L.

32. ***Illinoia (Illinoia) goldamaryae* (Knowlton)** Nearctic, Boreal
Distribution: Alaska, Yukon, Mackenzie Valley, British Columbia to Newfoundland, south to Utah and Pennsylvania.
Yukon records: Whitehorse.
Biological information: Feeds on plants in tribe Astereae (Compositae) (*Aster* L., *Erigeron* L., *Solidago* L.)
33. ***Illinoia (Oestlundiella) rubicola* (Oestlund)** Nearctic, Widespread
Distribution: Alaska, Yukon, British Columbia to Newfoundland, south to California, Kansas and Pennsylvania.
Yukon records: Whitehorse.
Biological information: On terminal shoots and underside of young leaves of *Rubus idaeus* L. var. *strigosus* (Michx.) Maxim.
34. ***Macrosiphoniella frigidicola* Gillette and Palmer** Nearctic, Widespread
Distribution: Yukon to New Brunswick, Colorado to Pennsylvania.
Yukon records: Whitehorse.
Biological information: On *Artemisia* L.
35. ***Macrosiphoniella tapuskae* (Hottes and Frison)** Nearctic, Widespread
Distribution: Alaska, Yukon, Quebec, northern United States; Europe (introduced?).
Yukon records: Whitehorse.
Biological information: On *Achillea* L.
36. ***Macrosiphum californicum* Essig** Nearctic, Widespread
Distribution: Alaska, Mackenzie Delta, British Columbia to Newfoundland, Oregon to Pennsylvania, and south to Arizona and Colorado in western United States.
Yukon records: mi 42 Aklavik Rd., Ogilvie Mts.
Biological information: On *Salix* L.
37. ***Macrosiphum euphorbiae* (Thomas)** Cosmopolitan
Distribution: Very widely distributed.
Yukon records: Whitehorse.
Biological information: Alternates between *Rosa* and various herbaceous plants in area of origin in east-central North America; non-alternating in areas of introduction. This species is a common agricultural pest.
38. ***Macrosiphum pseudorosae* Patch** Nearctic, Widespread
Distribution: Yukon, Mackenzie Delta, Manitoba to Nova Scotia, Colorado to North Carolina.
Yukon records: Whitehorse.
Biological information: Alternates between *Rosa* L. and herbaceous plants (primarily Compositae).
Taxonomic notes: This species is also referred to in the literature as *Macrosiphum pallidum* (Oestlund) due to differing interpretations of the rules of nomenclature.
39. ***Macrosiphum subarcticum* Robinson** Nearctic, Western? boreal
Distribution: Alaska, Yukon, Yellowknife in Northwest Territories, central Saskatchewan, north-eastern Manitoba; may occur eastward.
Yukon records: Whitehorse.
Biological information: On *Epilobium angustifolium* L.
40. ***Myzaphis rosarum* (Kaltenbach)** Holarctic, Widespread
Distribution: Alaska, Yukon, Yellowknife in Northwest Territories, Ontario, New Brunswick, Newfoundland; across Eurasia.
Yukon records: Whitehorse.
Biological information: On *Rosa* L. and *Potentilla* L.
 Note: The lack of records west of Ontario in southern Canada suggests that this species may in fact have a Palaearctic-East Beringian distribution, with introduction into eastern Canada from Europe.
41. ***Nasonovia (Kakimia) sp. A***
Distribution: Unknown.

Family Lachnidae

Life cycle without host alternation. Host tissue not distorted by feeding. Siphunculi short, usually with a broad setose conical base. Wax glands dispersed.

Subfamily Cinarinae

On conifers. [See also species 99–108]

52. *Cinara coloradensis* (Gillette) Nearctic, Boreomontane

Distribution: Alaska to Nova Scotia, south in eastern ranges of Cordillera to Colorado.

Yukon records: Lac LaBerge; Whitehorse.

Biological information: On trunk of young specimens of *Picea* species.

53. *Cinara fornacula* Hottes Nearctic, Boreal

Distribution: Alaska to Newfoundland, Colorado to Pennsylvania.

Yukon records: Whitehorse.

Biological information: Feed on current-year twig growth of *Picea glauca* (Moench) Voss and *P. mariana* (Mill.) BSP. at the base of the needles.

Annotated List of Species Expected to Occur in the Yukon

The following 55 species may be expected to occur in the Yukon Territory based on their occurrence in one or more adjacent regions, specifically, central and eastern Alaska, northern British Columbia, or the Mackenzie Valley. Most of these are broadly distributed boreal species which may be expected in the Liard River Valley, Yukon River Valley and Tintina Trench. There are also a few species apparently distributed broadly in arctic or subarctic zones which are to be expected in the northern Yukon. The likelihood that these species occur in the Yukon is very high, so we have included distributional and biological information about them. A number of other species not yet known from adjacent regions, but which may in fact occur in the area, are not considered here.

Family Mindaridae

Contains only the genus *Mindarus*, confined to conifers of the genera *Picea* and *Abies*. Characterized by abundant white wax secretion from platelike gland fields.

54. *Mindarus obliquus* (Cholodkovsky) Holarctic, Boreal

Distribution: Alaska, British Columbia to Newfoundland; northern Europe.

Biological information: On new shoots and immature cones of species of *Picea* Dietr.

Family Pemphigidae

Subfamily Pemphiginae [See also species 1–3]

55. *Pemphigus populiglobuli* Fitch Nearctic, Widespread

Distribution: Alaska, Alberta, Quebec, California to North Carolina.

Biological information: Heteroecious between a gall at the blade-petiole junction on *Populus balsamifera* L. and roots of herbaceous plants.

56. *Thecabius affinis* (Kaltenbach) Holarctic, Widespread

Distribution: Widespread Holarctic species. Occurs in Alaska and the Mackenzie Valley.

Biological information: Forms a leaf gall on *Populus* species (including *P. balsamifera*, but not *P. tremuloides*), alternating to roots of *Ranunculus* species.

57. *Pachypappa rosettei* (Maxson) Nearctic, Boreomontane

Distribution: British Columbia to Nova Scotia, south in west to Colorado.

Biological information: Forms a 'leaf nest' on the terminal shoots of *Populus tremuloides* Michx.; presumed alternate host is roots of *Picea glauca* (Moench) Voss.

Taxonomic notes: This is the North American segregate of the Palaearctic *P. tremulae* (L.), and often is considered conspecific with that species.

58. *Pachypappa sacculi* (Gillette)

Nearctic, Boreomontane

Distribution: Alaska, British Columbia to Nova Scotia, south in western United States to Arizona.*Biological information*: Forms a sacculate gall on the leaf of *Populus tremuloides* Michx.**Family Drepanosiphidae**

Subfamily Phyllaphidinae

Tribe Phyllaphidini [See also species 4–7]

59. *Boernerina variabilis alaskensis* Hille Ris Lambers
and Hottes

Nearctic, Boreal

Distribution: Alaska, Mackenzie Valley south to northern British Columbia, east to Newfoundland and Nova Scotia.*Biological information*: On underside of leaves of *Alnus* Ehrh.*Taxonomic notes*: *B. variabilis* Richards sensu stricto occurs only in southern British Columbia and foothills of Alberta. All other collections recorded as “*variabilis*”, including paratypes of that species from northern British Columbia and Alaska, are referable to *alaskensis*. With the exception of a single intermediate collection from Yellowknife the 2 taxa are morphologically distinct.60. *Boernerina (Boernerinella) occidentalis* Hille Ris Lambers
and Hottes

East Beringian?

Distribution: A few widely separated localities in Alaska.*Biological information*: On leaves of *Alnus* species.61. *Cepigillettea betulaeifoliae* Granovsky

Nearctic, Boreomontane

Distribution: Alaska, British Columbia to Ontario, Colorado to Illinois.*Biological information*: Feeds on leaves of *Betula* L.62. *Euceraphis gillettei* Davidson

Nearctic, Boreomontane

Distribution: Alaska, British Columbia to Newfoundland, California to New Jersey.*Biological information*: On leaves of *Alnus* Ehrh.

Tribe Saltusaphidini [See also species 8]

63. *Iziphya umbella* Richards

Nearctic, Boreomontane

Distribution: Mackenzie Valley, British Columbia to Quebec, Colorado to Pennsylvania.*Biological information*: On *Carex* L.64. *Thripsaphis (Trichocallis) verrucosa* Gillette

Nearctic, Boreomontane

Distribution: Alaska to Newfoundland, south in western United States to Colorado.*Biological information*: On Cyperaceae.

Subfamily Chaitophorinae [See also species 9–11]

65. *Chaitophorus horii* Takahashi

Palaeartic-East Beringian

Distribution: Mackenzie Delta; northeast Asia, possibly across northern Asia. (Subspecies *bethuani* Börner lives in northern and alpine Europe.)*Biological information*: On *Salix glauca* L. and related species of willow.*Taxonomic notes*: Previously unrecorded in North America.66. *Chaitophorus nigrae* Oestlund

Nearctic, Widespread

Distribution: Alaska, Mackenzie Valley to New Brunswick, California to North Carolina.*Biological information*: On leaves of *Salix* L.67. *Chaitophorus pusillus* Hottes and Frison

Holarctic, Widespread?

Distribution: Mackenzie Delta to California east to New Brunswick and New York.*Biological information*: On *Salix* L. Collections are few.**Family Aphididae**

Subfamily Pterocommatinae [See also species 12–14]

68. *Fullawaya martini* (Richards)

Nearctic, Arctic-subarctic

Distribution: Alaska, to Baffin Island, northern Quebec (Ungava).*Biological information*: On *Salix* L.

69. ***Pterocomma populifoliae* (Fitch)** Nearctic, Widespread
Distribution: Alaska, British Columbia to Nova Scotia, California to New Jersey.
Biological information: On *Populus* L.

Subfamily Aphidinae

Tribe Aphidini [See also species 15–22]

70. ***Aphis astragalina* Hille Ris Lambers** Nearctic, Western boreomontane?
Distribution: Known only from a few sites in Alaska, Alberta, Montana and Manitoba.
Biological information: On *Hedysarum* L.

71. ***Aphis lugentis* Williams** Nearctic, Widespread
Distribution: Widespread in North America from Alaska, Mackenzie Valley and Manitoba southward.
Biological information: On *Senecio* L.

72. ***Aphis maculatae* Oestlund** Nearctic, Boreomontane
Distribution: Transcontinental in Canada and northern United States, north to Yellowknife, south in mountains to Colorado and Pennsylvania.
Biological information: Alternates between leaves of *Cornus* L. and new shoots of *Populus* L., or persisting (asexually?) on the latter. See also species 17.

73. ***Aphis nivalis* Hille Ris Lambers** Nearctic, Subarctic
Distribution: Greenland to Yellowknife, south in Hudson Bay to Churchill.
Biological information: On *Epilobium* species.

74. ***Aphis neogillettei* Palmer** Nearctic, Widespread
Distribution: Alaska to Newfoundland, south to California and New York.
Biological information: On *Cornus* L.

75. ***Aphis salicariae* Koch** Holarctic, Boreal
Distribution: Alaska to Newfoundland; northern Europe to Central Asia.
Biological information: Alternates between *Cornus* L. and *Epilobium* L.

Tribe Macrosiphini [See also species 23–51]

76. ***Aulacorthum solani* (Kaltenbach)** Cosmopolitan
Distribution: Originally Palaearctic, now in temperate areas throughout world, including southern Alaska and Yellowknife region. Possibly occurs in Whitehorse area.
Biological information: This is a polyphagous aphid, common in agricultural areas, and is a pest of potato.

77. ***Capitophorus elaeagni* (Del Guercio)** Cosmopolitan
Distribution: Widespread throughout temperate and subtropical regions of world, including southern Alaska and Yellowknife.
Biological information: Host-alternating; primary hosts are species of *Elaeagnus* L., and alternate hosts are species of *Cirsium* L.

78. ***Capitophorus hudsonicus* Robinson** Nearctic, Subarctic
Distribution: Alaska, Mackenzie Delta, northern Manitoba.
Biological information: Feeds on *Shepherdia canadensis* (L.) Nutt.

79. ***Cavariella (Cavariella) aegopodii* (Scopoli)** Holarctic, Widespread
Distribution: Widespread in the Holarctic region, including Alaska and the Mackenzie Valley.
Biological information: Alternates between species of *Salix* L. and various Umbelliferae.

80. ***Cavariella (Cavariella) pastinacae* Linnaeus** Cosmopolitan
Distribution: Widespread in Holarctic Region, including southern Alaska.
Biological information: Alternates between *Salix* species and Umbelliferae.

81. ***Cavariella (Cavariella) aquatica* (Gillette and Bragg)** Holarctic, Boreomontane
Distribution: Alaska, Mackenzie Valley, Colorado; Europe, Siberia.

Biological information: Alternates between *Salix* species and emergent aquatic plants; sometimes found underwater.

82. ***Chaetosiphon minor* (Forbes)** Nearctic
(originally Western montane?)

Distribution: Alaska; widespread in North America (originally western?).

Biological information: On leaves of *Fragaria* L.

83. ***Hayhurstia atriplicis* (Linnaeus)** Cosmopolitan

Distribution: Alaska, Mackenzie Valley, throughout North America; originally Palaearctic.

Biological information: Forms galls from the folded leaves of *Chenopodium* (primarily *C. album* L.) and *Atriplex*.

84. ***Illinoia alni* (Mason)** Nearctic, Boreal

Distribution: Mackenzie Valley to Newfoundland, south to New England.

Biological information: On leaves of species of *Alnus* Ehrh.

85. ***Illinoia canadensis* (MacGillivray)** Nearctic, Boreal

Distribution: Mackenzie Valley, Quebec, New Brunswick, Pennsylvania.

Biological information: On *Myrica gale* L.

86. ***Illinoia (Masonaphis) paqueti* (MacGillivray)** Nearctic, Boreal

Distribution: Alaska, Mackenzie Valley to Quebec north shore.

Biological information: On *Ledum groenlandicum* Oeder.

87. ***Macrosiphum albifrons* Essig** Nearctic
(originally Western montane)

Distribution: Alaska, Mackenzie Delta, British Columbia, western United States; introduced to eastern North America and Europe.

Biological information: On *Lupinus* L.

88. ***Macrosiphum constrictum* Patch** East Beringian?

Distribution: Known only from type specimens, Pribilof Islands, Alaska.

Biological information: On *Pedicularis* sp.

Taxonomic notes: The taxonomic status of this species is uncertain.

89. ***Nasonovia (Neonasonovia) nabali* (Oestlund)** Nearctic, Widespread

Distribution: Alaska, Mackenzie Valley to Newfoundland, south to Kansas and North Carolina.

Biological information: Alternating between *Ribes* L. and liguliflorous composites.

90. ***Nasonovia (Kakimia) essigi* (Gillette and Palmer)** Nearctic

Distribution: Alaska, British Columbia to Manitoba, California to New Jersey.

Biological information: On *Aquilegia* L.

91. ***Nearctaphis bakeri* (Cowen)** Nearctic

Distribution: Alaska, British Columbia to Nova Scotia, south to California and North Carolina; local introductions to western Europe. Possibly occurs in Whitehorse area.

Biological information: Alternates between *Malus* L. (sometimes also other related genera such as *Crataegus*) and roots of legumes. May persist asexually on legumes in the absence of primary hosts.

92. ***Placoaphis siphunculata* Richards** Nearctic, Boreal

Distribution: Alaska, British Columbia, Quebec, New York.

Biological information: On *Rosa* L. Rarely collected.

93. ***Pleotrichophorus knowltoni* Corpuz-Raros and Cook** East Beringian

Distribution: Alaska.

Biological information: On *Artemisia* L.

94. ***Pseudocercidus rosae* Richards** Nearctic, Western boreal

Distribution: Yellowknife, British Columbia to Manitoba.

Biological information: On roses.

95. ***Sitobion insulare* (Pergande)** Western Nearctic, Western montane
Distribution: Alaska. Subspecies *yagasogae* Hottes is known from British Columbia to Colorado.
Biological information: Subspecies *yagasogae* Hottes feeds on *Polygonatum* Mill.
96. ***Uroleucon (Uroleucon) alaskense* Robinson** East Beringian?
Distribution: Alaska. Known from type series only.
Biological information: On *Achillea* L.
97. ***Uroleucon (Uroleucon) epilobii* (Pergande)** East Beringian?
Distribution: Alaska.
Biological information: On *Epilobium* sp.
Taxonomic notes: According to Robinson (1985), known only from type specimens, but recorded from Colorado and Kansas by Smith and Parron (1978).
98. ***Uroleucon (Uroleucon) gigantiphagum* Moran** Nearctic, Boreal
Distribution: Alaska, Michigan, Ontario to New Brunswick. Probably throughout southern Boreal zone.
Biological information: On *Solidago* L.
- Family Lachnidae**
Subfamily Cinarinae [See also species 52–53]
99. ***Cinara alaskana* Hottes** Nearctic (East Beringian?)
Distribution: Alaska.
Biological information: On *Picea glauca* (Moench) Voss.
Taxonomic notes: Known only from the type locality. Status uncertain.
100. ***Cinara bonita* Hottes** Nearctic, Western montane
Distribution: Alaska, California, Colorado.
Biological information: On *Picea* Dietr.
101. ***Cinara braggii* (Gillette)** Nearctic, Boreomontane
Distribution: Alaska to Newfoundland, Colorado to Pennsylvania.
Biological information: On *Picea* Dietr.
102. ***Cinara laricifex* (Fitch)** Nearctic, Boreal
Distribution: Alaska, Mackenzie Valley to Newfoundland, Iowa to New York.
Biological information: On twigs of *Larix laricina* (Du Roi) Koch.
103. ***Cinara nigripes* Bradley** Nearctic, Boreal
Distribution: Alaska to Ontario.
Biological information: On species of *Picea* Dietr.
104. ***Cinara nimbata* Hottes** Nearctic, Western montane
Distribution: Alaska, Colorado.
Biological information: On *Picea* Dietr.
105. ***Cinara rara* Bradley** Nearctic, Boreal
Distribution: Alaska, Saskatchewan, Manitoba.
Biological information: On *Picea mariana* (Mill.) BSP.
106. ***Cinara vandykei* (Wilson)** Nearctic, Western montane
Distribution: Alaska, British Columbia to Washington and Colorado.
Biological information: On *Picea* Dietr.
107. ***Cinara yukona* Hottes** Nearctic (East Beringian?)
Distribution: Alaska.
Biological information: On *Picea* sp.
Taxonomic notes: Known only from the type locality. Status uncertain.
108. ***Essigella aleyeska* Sorensen** Nearctic, Boreal
Distribution: Alaska, Ontario, Quebec.
Biological information: Collections in Alaska are from *Picea glauca* (Moench) Voss and those in eastern Canada from *Pinus banksiana* Lamb.

Discussion

One-hundred-and-eight species in 38 genera are recorded or are expected to occur in the Yukon Territory. Because of a general lack of collecting in the north, only 53 of these species (in 24 genera) have actually been found in the Yukon. Only A.G. Robinson has made an extensive effort at collecting aphids in the Territory, but his sampling was limited to the vicinity of Whitehorse. In addition, the majority of the collections were made in late summer. This additional bias affects the sampling of host-alternating species on their primary host before they have moved to their secondary host.

The expected species are based on records in adjacent regions (central and eastern Alaska, Mackenzie Valley of the Northwest Territories and northern British Columbia). An analysis of the distributions of plants known to harbour aphids would suggest additional potential species, but this is not pursued here. Table 1 summarizes the distributional relationships of the known and expected Yukon aphid fauna.

Very few aphid species are unique to the Alaska-Yukon region (East Beringian). We strongly suspect that most of these instances are artefacts of imprecise taxonomy and a lack of sampling. Three species which currently are known to have only a western boreal distribution (species 24, 26, 39) probably are more widely distributed in the boreal zone. Only 4 described species with a broad subarctic or arctic distribution have been collected in the Yukon. However, the number of Arctic-subarctic species may be expected to be increased by more extensive collecting in the northern part of the Territory. The aphid fauna of the entire western Arctic is virtually unknown. Two of the 4 species collected on Herschel Island (23, 41) appear to be undescribed, but are represented by only one or a very few specimens. Two species (49, 65) which apparently are widespread in the northern parts of the Palaearctic region have been found in the Yukon or neighbouring areas (Palaearctic-Beringian distribution) (species 40 possibly also has a similar natural distribution).

A high percentage of the Yukon fauna (60% of known and 78% of expected) consists of relatively broadly distributed Nearctic species (Boreal, Western montane, Boreomontane, and Widespread Nearctic, in about equal proportions) reaching their northern range limits in the Yukon-Alaska area. The predominance of such species indicates that the primary source of the fauna has been postglacial colonization from the south. This conclusion, however, may be biased by the concentration of sampling in the vicinity of Whitehorse. A further 7 percent of the species are Holarctic species adapted to northern habitats (widespread Holarctic and circumboreal elements). Also represented is a substantial number of species associated with human activity (anthropochorous element; 9% of expected fauna), feeding on either cultivated or introduced weedy plants. Although the powers of dispersal of the common pest species of aphids are well known, dispersal of most species is chiefly a more local phenomenon (Loxdale et al. 1993).

Because most aphids are more or less monophagous, the nature of the Yukon flora necessarily limits the potential aphid fauna. The bulk of the aphid species (25% of the known, 52% of the expected species) feed on only 5 genera of abundant trees and shrubs: willow, poplar, birch, alder and spruce (Table 2). The relatively large representation of Pemphigidae, Drepanosiphidae and Pterocommatinae (of family Aphididae), which contain large components specializing on these plant groups, reflects this host bias. Most of the remaining species are found on Rosaceae and Compositae. Once again, there is a sampling bias favouring the dominant elements of the vegetation, but we believe that the pattern will hold under further investigation. A large proportion of the host-alternating species (3 of 9 known, 7 of 13 expected species) in the area use willow or poplar as the primary host. The remainder use

TABLE 1. Range types of known species of aphids from the Yukon. Species numbers correspond to numbers in the annotated list. Both recorded and expected species are included; numbers for species actually collected in the Yukon are shown in bold.

East Beringian	(7 expected)
<i>Boernerina occidentalis</i> (60), <i>Macrosiphum constrictum</i> (88), <i>Pleotrichophorus knowltoni</i> (93), <i>Uroleucon alaskense</i> (96), <i>Uroleucon epilobii</i> (97), <i>Cinara alaskana</i> (99), <i>Cinara yukona</i> (107)	
Other Nearctic	(36 known, 38 expected)
Widespread (15 known, 8 expected)	
<i>Pemphigus betae</i> (2), <i>Thecabius populimonilis</i> (3), <i>Pemphigus populiglobuli</i> (55), <i>Chaitophorus neglectus</i> (9), <i>Chaitophorus nigrae</i> (66), <i>Chaitophorus populicola</i> (10), <i>Chaitophorus populifolii</i> (11), <i>Chaitophorus pusillus</i> (67), <i>Pterocomma bicolor</i> (12), <i>Pterocomma populifoliae</i> (69), <i>Pterocomma smithiae</i> (14), <i>Aphis helianthi</i> (16), <i>Aphis lugentis</i> (71), <i>Aphis neogillettei</i> (74), <i>Aphis rubicola</i> (20), <i>Amphorophora agathonica</i> (27), <i>Illinoia rubicola</i> (33), <i>Macrosiphoniella frigidicola</i> (34), <i>Macrosiphoniella tapuskae</i> (35), <i>Macrosiphum californicum</i> (36), <i>Nasonovia nabali</i> (89), <i>Nasonovia essigi</i> (90), <i>Nasonovia cynosbati</i> (43)	
Arctic and Subarctic (2 known, 3 expected)	
<i>Betulaphis arctosetis</i> (4), <i>Fullawaya martini</i> (68), <i>Aphis masoni</i> (18), <i>Aphis nivalis</i> (73), <i>Capitophorus hudsonicus</i> (78)	
Boreal (2 known, 11 expected)	
<i>Betulaphis variabilis alaskensis</i> (59), <i>Illinoia alni</i> (84), <i>Illinoia canadensis</i> (85), <i>Illinoia goldamaryae</i> (32), <i>Illinoia paqueti</i> (86), <i>Macrosiphum pseudorosae</i> (38), <i>Placoaphis siphunculata</i> (92), <i>Pseudocercidus rosae</i> (94), <i>Uroleucon gigantiphagum</i> (98), <i>Cinara laricifex</i> (102), <i>Cinara nigripes</i> (103), <i>Cinara rara</i> (105), <i>Essigella aleyeska</i> (108)	
Western boreal (7 known)	
<i>Aphis ribiensis</i> (19), ? <i>Acyrtosiphon assiniboinensis</i> (24), ? <i>Acyrtosiphon churchillensis</i> (26), <i>Macrosiphum subarcticum</i> (39), <i>Nasonovia wahinkae</i> (44), <i>Pleotrichophorus intermedius</i> (45), <i>Uroleucon boreale</i> (48)	
Western montane (4 known, 6 expected)	
<i>Chaetosiphon fragaefolii</i> (30), <i>Chaetosiphon minor</i> (82), <i>Macrosiphum albifrons</i> (87), <i>Nasonovia castelleiae</i> (42), <i>Pleotrichophorus patonkussella</i> (45), <i>Sitobion insulare</i> (95), <i>Wahlgreniella nervata</i> (51), <i>Cinara bonita</i> (100), <i>Cinara nimbata</i> (104), <i>Cinara vandykei</i> (106)	
Boreomontane (5 known, 9 expected)	
<i>Pachypappa rosettei</i> (57), <i>Pachypappa sacculi</i> (58), <i>Cepigillettea betulaeifoliae</i> (61), <i>Euceraphis gillettei</i> (62), <i>Oestlundia flava</i> (6), <i>Tamalia coweni</i> (7), <i>Iziphya umbella</i> (63), <i>Thripsaphis verrucosa</i> (64), <i>Aphis maculatae</i> (72), <i>Aphis neogillettei</i> (74), <i>Aphis varians</i> (21), <i>Cinara braggii</i> (101), <i>Cinara coloradensis</i> (52), <i>Cinara fornacula</i> (53)	
Western boreomontane (1 known, 1 expected)	
<i>Aphis astragalina</i> (70), <i>Fimbriaphis fimbriata</i> (31)	
Palaeartic-Beringian	(1 known, 1 expected)
<i>Chaitophorus horii</i> (65), <i>Uroleucon simile</i> (49)	
Holarctic	(7 known, 4 expected)
Widespread (5 known, 1 expected)	
<i>Thecabius affinis</i> (56), <i>Pterocomma salicis</i> (13), <i>Aphis farinosa</i> (15), <i>Cavariella konoi</i> (29), <i>Myzaphis rosarum</i> (40), <i>Uroleucon taraxaci</i> (50)	
Circumboreal (2 known, 3 expected)	
<i>Mindarus obliquus</i> (54), <i>Euceraphis betulae</i> (5), <i>Thripsaphis cyperi</i> (8), <i>Aphis salicariae</i> (75), <i>Cavariella aquatica</i> (81)	
Anthropochorous elements	(3 known, 6 expected)
Nearctic (1 expected)	
<i>Nearctaphis bakeri</i> (91)	
Holarctic (Palaeartic origin) (1 known, 1 expected)	
<i>Acyrtosiphon caraganae</i> (25), <i>Cavariella aegopodii</i> (79)	
Cosmopolitan (Nearctic origin) (1 known)	
<i>Macrosiphum euphorbiae</i> (37)	
Cosmopolitan (Palaeartic and Oriental origin) (1 known, 4 expected)	
<i>Aulacorthum solani</i> (76), <i>Capitophorus elaeagni</i> (77), <i>Cavariella pastinacae</i> (80), <i>Hayhurstia atriplicis</i> (83), <i>Sitobion avenae</i> (47)	

TABLE 2. Hostplant groups of Yukon aphids. Species numbers correspond to numbers in the annotated list. Species actually collected in the Yukon have numbers less than 54. Species 37 (listed in parentheses) may or may not be host-alternating in the Yukon.

Host group	Sole host (non-alternating spp.)	Primary (winter) host (alternating spp.)	Secondary (summer) host (alternating spp.)
Pinaceae (<i>Pinus</i> , <i>Picea</i> , <i>Larix</i>)	52, 53, 54, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108		57
Ranunculaceae	44, 90		56
Salicaceae (<i>Salix</i> , <i>Populus</i>)	3, 9, 10, 11, 12, 13, 14, 15, 23, 36, 65, 66, 67, 68, 69	1, 2, 29, 55, 56, 57, 58, 79, 80, 81	72
Betulaceae (<i>Betula</i> , <i>Alnus</i>)	4, 5, 6, 17, 59, 60, 61, 62, 84		
Saxifragaceae (<i>Ribes</i>)	19, 43	21, 89	
Rosaceae (<i>Potentilla</i> , <i>Rosa</i> , <i>Rubus</i>)	20, 24, 27, 30, 31, 33, 40, 82, 92, 94	(37), 38, 51, 91	
Leguminosae	18, 25, 26, 70, 87		91
Ericaceae	7, 86		51
Myricaceae	85		
Umbelliferae			29, 79, 80
Cornaceae (<i>Cornus</i>)	39, 74	16, 72, 75	
Scrophulariaceae	41, 42, 88		
Onagraceae (<i>Epilobium</i>)	39, 45, 73, 97		21, 75
Elaeagnaceae	78	77	
Chenopodiaceae	83		2
Compositae	32, 34, 35, 45, 46, 48, 49, 50, 71, 93, 96, 98		38, 77, 89
Polyphagous on Dicotyledonae	(37), 76		1, 16, (37), 55, 56, 81
Monocotyledonae	8, 47, 63, 64, 95		22

Cornus, *Ribes*, *Rosa* or *Elaeagnus*. Three-quarters of the Yukon species (77% of 48 known and 73% of 55 expected species for which data are available) do not show host alternation (Table 2), a pattern similar to that for boreal faunas elsewhere.

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