

- McMullen, L. H., and M. D. Atkins. 1961. Intraspecific competition as a factor in the natural control of the Douglas-fir beetle. *For. Sci.* 7:197-203.
- Reid, R. W. 1963. Biology of the mountain pine beetle, *Dendroctonus monticolae* Hopkins, in east Kootenay region of British Columbia. III. Interaction between the beetle and its host, with emphasis on brood mortality and survival. *Can. Ent.*, 95:225-38.
- Saarenmaa, H. 1983. Modeling the spatial pattern and intraspecific competition in *Tomicus piniperda* (Coleoptera: Scolytidae). *Commun. Inst. For. Fenn.* 118:1-40.
- Sahota, T. S. and A. J. Thomson. 1979. Temperature induced variation in the rates of reproductive processes in *Dendroctonus rufipennis* (Coleoptera: Scolytidae): A new approach to detecting changes in population quality. *Can. Ent.* 111:1069-1078.
- Schmitz, R. F., and J. A. Rudinsky. 1968. Effects of competition on survival in western Oregon of the Douglas-fir beetle, *Dendroctonus pseudotsugae* Hopkins (Coleoptera: Scolytidae). School of For., Oregon St. Univ., Corvallis. Res. Paper 8. 42pp.
- Thomson, A. J. and T. S. Sahota. 1981. Competition and population quality in *Dendroctonus rufipennis* (Coleoptera: Scolytidae). *Can. Ent.* 113:177-183.

THE APHIDS (HOMOPTERA:APHIDIDAE) OF BRITISH COLUMBIA

13. FURTHER ADDITIONS

A. R. FORBES AND C. K. CHAN
Research Station, Agriculture Canada
Vancouver, British Columbia, V6T 1X2

ABSTRACT

Eleven species of aphids and new host records are added to the taxonomic list of the aphids of British Columbia.

INTRODUCTION

Nine previous lists of the aphids of British Columbia (Forbes, Frazer and MacCarthy 1973; Forbes, Frazer and Chan 1974; Forbes and Chan 1976, 1978, 1980, 1981, 1983, 1984; Forbes, Chan and Footitt 1982) recorded 357 species of aphids collected from 787 hosts or in traps and comprises 1485 aphid-host plant associations. The present list adds 11 aphid species (indicated with an asterisk in the list) and 44 aphid-host plant associations to the previous lists. Twenty-three of the new aphid-host plant associations are plant species not in the previous lists. The additions bring the number of

known aphid species in British Columbia to 368. Aphids have now been collected from 810 different host plants and the total number of aphid-host plant associations is 1529.

The names of aphids are in conformity with Eastop and Hille Ris Lambers (1976) and are arranged alphabetically by species. Four new collection sites are tabulated in Table 1. The location of each collection site can be determined from Table 1 or from the tables of localities in the previous papers. The reference points are the same as those shown on the map which accompanies the basic list.

TABLE 1. Collection sites of aphids, with airline distances from reference points.

Locality	Reference Point	Dir	Distance km	mi
Mt. Cheam	Vancouver	E	167	104
Pender Island	Victoria	N	43	27
Rock Creek	Kelowna	SE	104	65
Sidney	Victoria	N	27	17

LIST OF SPECIES

ABIETINUM (Walker), ELATOBIUM

Picea sitchensis: Agassiz, May 4/45.

*ACHILLEAE (Koch), UROLEUCON

Achillea millefolium: Vancouver (UBC), Nov 16/84.

ADIANTI (Oestlund), SITOBION

Athyrium distentifolium var. *americanum*: Vancouver (UBC), Aug 26/83.

*Aphid species not in the previous lists.

Athyrium filix-femina ssp. *cyclosorum*: Vancouver (UBC), Aug 26/83.

AEGOPODII (Scopoli), CAVARIELLA

Angelica genusflexa: Harrison Lake, Aug 20/22.

Daucus carota: Chilliwack, Jun 26/45.

AGATHONICA Hottes, AMPHOROPHORA

Rubus idaeus: Agassiz, Jun 27/40.

ALBIFRONS Essig, MACROSIPHUM

Lupinus sp.: Victoria, May 20/21.

BETAEE Doane, PEMPHIGUS

- Lactuca sativa*: Abbotsford, Aug 28/84.
- CALIFORNICUM (Clarke), MACROSIPHUM**
Salix lasiandra: Agassiz, Jun 8/25.
- CANAE Williams, APHIS**
Artemisia tridentata: Keremeos, Sep 12/84.
- CARDUI (Linnaeus), BRACHYCAUDUS**
Senecio vulgaris: Vancouver (UBC), Jul 13/83.
- CARICIS (Glendenning), SITOBION**
Carex sp.: Mt. Cheam, Aug 17/22.
- CIRCUMFLEXUM (Buckton), AULACORTHUM**
Cyclamen persicum: Vancouver, Dec 2/83.
- COWENI (Cockerell), TAMALIA**
Arctostaphylos uva-ursi: Agassiz, Jul 15/39.
- *CREELII Davis, MACROSIPHUM**
Lathyrus japonicus: Pender Island, Aug 2/84.
Vicia faba: Burnaby (SFU), Oct 30/84, Nov 7/84;
Vancouver (CDA), Sep 14/84.
- CYTISORUM Hartig, APHIS**
Cytisus austriacus: Vancouver (UBC), Sep 11/84.
- DAVIDSONI (Mason), ILLINOIA**
Arnica amplexicaulis: Agassiz, Aug 17/22.
- *EOESSIGI (Knowlton), UROLEUCON**
Althaea sp.: Trail, Aug 23/49.
- FABAE Scopoli, APHIS**
Rudbeckia hirta: Vancouver (UBC), Sep 1/83.
Sanvitalia procumbens: Vancouver (UBC), Sep 1/83.
- FIMBRIATA Richards, FIMBRIAPHIS**
Rosa nutkana: Agassiz, Aug 28/28.
- FOENICULI (Passerini), HYADAPHIS**
Lonicera 'Dropmore Scarlet': Vancouver (UBC),
Sep 24/84, Sept 25/84.
Lonicera pyrenaica: Vancouver (UBC), Sep 24/84.
- *GIGANTIPHAGUM Moran, UROLEUCON**
Solidago sp.: Chilliwack, Jun 25/66.
- HIPPOPHAES (Walker), CAPITOPHORUS**
Hippophae rhamnoides: Sardis, Sep 28/28.
Polygonum persicaria: Agassiz, Sep 10/25.
- HOLODISCI Robinson, APHIS**
Holodiscus discolor: Pender Island, Aug 2/84;
Vancouver, Jun 19/84; Vancouver (UBC), Jun 19/84.
- HUMILIS (Walker), HYALOPTEROIDES**
Dactylis glomerata: Saanich, May 7/41; Sidney,
Apr 20/41.
- HUMULI (Schränk), PHORODON**
Humulus lupulus: Agassiz, Sep 14/25, Sep 25/22;
Vancouver, Oct 15/83.
- INSERTUM (Walker), RHOPALOSIPHUM**
Malus domestica: Agassiz, Oct 16/21.
- L A T Y S I P H O N (D a v i d s o n) ,
RHOPALOSIPHONINUS**
Viola sp.: Agassiz, Feb 17/26.
- LONICERAE (Siebold), RHOPALOMYZUS**
Lonicera 'Dropmore Scarlet': Vancouver (UBC),
Sep 24/84, Sep 25/84.
Lonicera pyrenaica: Vancouver (UBC), Sep 24/84.
- LUGENTIS Williams, APHIS**
Conyza canadensis var. *canadensis*: Agassiz, Jul 25/26.
Senecio sp.: Mt. Cheam, Jul 25/26.
- *LUPINI Gillette & Palmer, APHIS**
Lupinus sp.: Rock Creek, Jul/37.
- LYROPICTUS (Kessler), PERIPHYLLUS**
Acer circinatum: Agassiz, Apr 24/22.
Acer platanoides: Vancouver, Jun 2/32.
- *MACULATAE Oestlund, APHIS**
Populus tremuloides: Agassiz, Aug 27/51.
- *MARGINATA Koch, FORDA**
Gramineae: Chilcotin, May 20/29.
- MAXIMA (Mason), ILLINOIA**
Rubus parviflorus: Agassiz, May 6/26.
- *MENTZELIAE Wilson, MACROSIPHUM**
Mentzelia sp.: Agassiz, Jul 30/33.
- *MENZIESIAE (Robinson), ILLINOIA**
Menziesia glabella: Agassiz, Jun 28/27.
- MILLEFOLII (de Geer), MACROSIPHONIELLA**
Achillea millefolium: Agassiz, Jun 27/23.
- NASTURTII Kaltenbach, APHIS**
Nicotiana sp.: Abbotsford, Aug 17/37.
- N E R V A T A A R B U T I (D a v i d s o n) ,
WAHLGRENIELLA**
Arbutus menziesii: Vancouver, Jul/31.
- NYPHAEAE (Linnaeus), RHOPALOSIPHUM**
Callitriche stagnalis: Vancouver (UBC), Aug 20/84.
- OBLIQUUS (Cholodkovsky), MINDARUS**
Picea sitchensis: Sardis, Jun 9/41, Sumas, May 29/42.
- O R E G O N E N S I S (W i l s o n) ,
MICROSIPHONIELLA**
Artemisia tridentata: Keremeos, Sep 12/84.
- ORNATUS Laing, MYZUS**
Catalpa speciosa: Vancouver, Nov 4/83.
Rheum palmatum: Vancouver (UBC), Jun 3/83.
- PERSICAE (Sulzer), MYZUS**
Iris gatesii: Vancouver (UBC), Jun 3/83.
- PISUM (Harris), ACYRTHOSIPHON**
Cytisus austriacus: Vancouver (UBC), Jul 5/84.
Lathyrus japonicus: Pender Island, Aug 2/84.
- PLANTAGINEA (Passerini), DYSAPHIS**
Malus domestica: Agassiz, Sep 27/23.
- POPULIFOLII (Essig), CHAITOPHORUS**
Populus tremuloides: Agassiz, Aug 1/33.
- *PSEUDOCORYLI Patch, MACROSIPHUM**
Corylus cornuta var. *californica*: Agassiz, Aug 4/22.
- RIBISNIGRI (Mosley), NASONOVIA**
Cichorium intybus: Pender Island, Aug 3/84.
Hieracium murorum: Agassiz, Aug 10/26.
- SALICARIAE Koch, APHIS**
Cornus alba 'Argenteo-marginata': Vancouver (UBC), Sep 25/84.
- SIPHUNCULATA Richards, PLACOAPHIS**
Rosa nutkana: Agassiz, Aug 28/28.

SOLANI (Kaltenbach), AULACORTHUM

Corydalis aurea ssp. *aurea*: Vancouver (UBC),
Jul 15/83, Aug 26/83.

Digitalis purpurea: Langley, Oct 2/41.

Lilium auratum: Agassiz, Jun 26/39.

**TANACETARIA (Kaltenbach),
MACROSIPHONIELLA**

Tanacetum vulgare: Cloverdale, Aug 24/82.

TULIPAE (Boyer de Fonscolombe), DYSAPHIS

Iris sp.: Vancouver, Jan 15/32.

***VAGABUNDA (Walsh), MORDWILKOJA**

Populus sp.: Agassiz, Aug 27/23.

VARIANS Patch, APHIS

Epilobium angustifolium: Agassiz, Aug 2/32.

ACKNOWLEDGEMENTS

We wish to thank Dr. A. G. Robinson, University of Manitoba, Winnipeg, and Drs. V. F. Eastop and R. L. Blackman, British Museum (Natural History), London, England for valuable aid and advice in identifications.

REFERENCES

- Eastop, V. F., and D. Hille Ris Lambers. 1976. Survey of the world's aphids. Dr. W. Junk b.v., Publisher, The Hague.
- Forbes, A. R., and C. K. Chan. 1984. The aphids (Homoptera: Aphididae) of British Columbia. 12. Further additions. J. ent. Soc. Brit. Columbia 81:72-75.
- Forbes, A. R., and C. K. Chan. 1983. The aphids (Homoptera: Aphididae) of British Columbia. 11. Further additions. J. ent. Soc. Brit. Columbia 80:51-53.
- Forbes, A. R., and C. K. Chan. 1981. The aphids (Homoptera: Aphididae) of British Columbia. 9. Further additions. J. ent. Soc. Brit. Columbia 78:53-54.
- Forbes, A. R., and C. K. Chan. 1980. The aphids (Homoptera: Aphididae) of British Columbia. 8. Further additions. J. ent. Soc. Brit. Columbia 77:38-42.
- Forbes, A. R., and C. K. Chan. 1978. The aphids (Homoptera: Aphididae) of British Columbia. 6. Further additions. J. ent. Soc. Brit. Columbia 75:47-52.
- Forbes, A. R., and C. K. Chan. 1976. The aphids (Homoptera: Aphididae) of British Columbia. 4. Further additions and corrections. J. ent. Soc. Brit. Columbia 73:57-63.
- Forbes, A. R., C. K. Chan and R. Foottit. 1982. The aphids (Homoptera: Aphididae) of British Columbia. 10. Further additions. J. ent. Soc. Brit. Columbia 79:75-78.
- Forbes, A. R., B. D. Frazer and C. K. Chan. 1974. The aphids (Homoptera: Aphididae) of British Columbia. 3. Additions and corrections. J. ent. Soc. Brit. Columbia 71:43-49.
- Forbes, A. R., B. D. Frazer and H. R. MacCarthy. 1973. The aphids (Homoptera: Aphididae) of British Columbia. 1. A basic taxonomic list. J. ent. Soc. Brit. Columbia 70:43-57.