

APHIDS AT BEDGEBURY PINETUM, KENT:

2017 SURVEY

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Introduction & Methods

Whether for biodiversity studies or to facilitate pest control it is useful to be able to identify the over 600 species of aphids found on plants in Britain. Our surveys started in late 2014 with the aim of identifying and photographing aphids and associated predators, parasitoids and mutualists at Bedgebury Pinetum. Efforts were concentrated upon conifer trees given the rich variety available at Bedgebury. To obtain aphids in optimal condition we used convenience / opportunistic sampling by hand to examine the maximum number of suitable hosts as described in previous reports.

We have identified the aphid species we have found by examination of high resolution photographs and by microscopic examination of specimens preserved in alcohol, using the identification keys of Blackman & Eastop (1994) and supplementary information from Carter & Maslen (1982).

Work proceeds on providing colour photos of live aphids for the upcoming new book on aphids : Royal Entomological Society series "Handbooks for the Identification of British Insects" Volume 2 Part 8, covering the subfamilies **Anoeciinae, Lachninae, Eriosomatinae, Phloeomyzinae, Thelaxinae, Hormaphidinae & Mindarinae**. Most of the species have now been covered, with only a few remaining. We are hoping the book will be published later this year.

For identifying aphids we are still in the position that bird identification was in a hundred years ago when the only way to identify a bird was to shoot it and measure the length of its feathers. The methods for preparing aphids prior to identification are time-consuming and complicated - and impossible for most people. On our website we are constructing an atlas for the identification of aphids in Britain. We have now photographed more than half the British species and continue to find more of the remaining species each year. We have also found a number of very rare species, and several entirely new to Britain.

Results

Aphid Species List 2017

Aphid species	Host plant species
<i>Acyrtosiphon pisum</i>	<i>Cytisus scoparius</i> (broom)
<i>Adelges piceae/nordmanniana</i>	<i>Abies nordmanniana</i> (Nordman fir), <i>Abies fraseri</i> (Fraser fir)
<i>Adelges cooleyi</i>	<i>Pseudotsuga menziesii</i>
<i>Adelges laricis</i>	<i>Larix decidua</i> (European Larch)
<i>Aphis fabae</i>	<i>Juglans hindsii</i> (Walnut)
<i>Aphis fabae?</i>	<i>Cornus sp.</i> (Dogwood)
<i>Aphis ilicis</i>	<i>Ilex aquifolium</i> (Holly)
<i>Aphis epipactis</i>	<i>Epipactis helleborine</i> (Broad-leaved helleborine)
<i>Aphis salicariae</i>	<i>Chamaenerion angustifolium</i> (Rosebay willowherb)
<i>Appendiseta robiniae</i>	<i>Robinia pseudoacacia</i> (black locust tree)
<i>Betulaphis quadrituberculata</i>	<i>Betula pubescens</i> (downy birch)
<i>Chaitophorus salicti</i>	<i>Salix caprea/cinerea</i> (sallow)
<i>Cinara curvipes</i>	<i>Abies amabilis</i> (Pacific silver fir)
<i>Cinara juniperi</i>	<i>Juniperus communis</i> (Common juniper), <i>Juniperus squamata</i> (Flaky juniper)
<i>Cinara pruinos</i>	<i>Picea wilsoni</i> (Wilson spruce)
<i>Cinara pectinatae</i>	<i>Abies nordmanniana</i> (Nordman fir) <i>Abies fargesii</i> (Farges' fir)
<i>Cinara pini</i>	<i>Pinus sylvestris</i> (Scots pine)
<i>Cinara pinea</i>	<i>Pinus sylvestris</i> (Scots pine)
<i>Cinara pilicornis</i>	<i>Picea smithiana</i> (Morinda spruce)
<i>Cinara piceae</i>	<i>Picea wilsonii</i> (Wilson spruce)

<i>Ctenocallis setosa</i>	<i>Cytisus scoparius</i> (Broom)
<i>Dysaphis aucupariae</i>	<i>Sorbus torminalis</i> (Wild Service Tree)
<i>Essigella californica</i>	<i>Pinus montezuma</i> (Montezuma pine)
<i>Eulachnus rileyi</i>	<i>Pinus montezuma</i> (Montezuma Pine)
<i>Eulachnus sp x</i>	<i>Pinus canariensis</i> (Canary Islands pine)
<i>Hyadaphis</i>	<i>Lonicera</i> (Honeysuckle)
<i>Illinoia lambersi</i>	<i>Erica</i> (Heath) <i>Rhododendron</i> (Rhododendron)
<i>Pineus pini</i>	<i>Pinus sylvestris</i> (Scots pine)
<i>Symydobius oblongus</i>	<i>Betula pendula</i> (Silver birch)
<i>Uroleucon sonchi</i>	<i>Sonchus oleraceus</i> (Common sowthistle)

Species Diversity

As in previous years, there is a predominance of *Cinara* species on the trees, reflecting the dominance of conifers at Bedgebury. In 2017 we found the juniper aphid *Cinara juniperi* on two species of juniper, *Juniperus communis* and *Juniperus squamata*. This is a relatively rare species that we have only found previously in highland Scotland. It was surprising to find *Cinara juniperi* on a host other than *Juniperus communis* since it is normally restricted to that host.

The most interesting find on other plants was the extraordinary broom hedgehog aphid (*Ctenocallis setosa*) which was flourishing on broom plants in the meteorological enclosure. It has numerous long finger-like papillae protruding from the dorsum presumably to aid crypsis. Stroyan (1977) describes this species as rare and only records it for Surrey; we know of no other recent records of it. The helleborine aphid (*Aphis epipactis*) is another rarity, previously only recorded in Glamorgan and Surrey (Stroyan, 1984) .

Below we have listed species by plant host starting with the Pinaceae and Cupressaceae. We have concentrated on those species we have not previously found at Bedgebury, but have included a pictures of all the aphid species we found to assist those who may be interested in identifying some of the fascinating aphids found at Bedgebury. For reference purposes we have included the computer file name of each image.

CONIFERS

***Abies amabilis* (Pacific silver fir)**

***Cinara curvipes* (Bow-legged fir aphid)**



Cinara_curvipes_attended_by_Formica_rufa_c2017-07-10_15-32-01ew.jpg

Previously in 2014 we found this species on Tsuga heterophylla (Western hemlock).

***Abies fargesii* var *faxoniana* (Farge's fir)**

***Cinara pectinatae* (green-striped fir aphid):** The other *Cinara* species prevalent on *Abies* species at Bedgebury is the green striped fir aphid.



Cinara_pectinatae_feeding_at_needle_base_c2017-03-28_14-22-01ew.jpg

Abies fraseri (Fraser fir)

A common symptom of *Adelges piceae* attack on North American firs is ‘gouting’ (shown below) where the terminal growth is stunted with swelling around the buds and branch nodes.



Gouting_caused_by_Adelges_piceae_c2017-05-23_18-33-06ew.jpg

Abies nordmanniana (Nordman Fir) - previously misidentified as Abies procera

***Adelges piceae* (balsam woolly adelgid)/ *Adelges nordmannianae*:**

We found this adelgid at Bedgebury on 23/3/18 and 28/3/18.



Adelges_piceae_nordmannianae_c2017-03-28_18-12-01ew.jpg

Cinara pectinatae (green-striped fir aphid) was also found on *Abies nordmanniana* (see picture above on *Abies fargesii*)

***Juniperus communis* (Common juniper) & *Juniperus squamata* (Flaky juniper)**

***Cinara juniperi* (Juniper aphid):** We have only previously found the juniper aphid in the north of Scotland, and this was the first time (July 2017) we had found it at Bedgebury.



Cinara_juniperi_aptera_c2017-07-10_17-25-01ew.jpg

It is normally restricted to *Juniperus communis*, so we were surprised to also find it on *Juniperus squamata*. It was attended by southern wood ants (*Formica rufa*).



Cinara_juniperi_attended_by_Formica_ant_c2015-07-13_13-59-46ew.jpg

Larix (larch)

***Adelges laricis* (larch adelgid):** The larch adelgid alternates between its primary host *Picea* (spruce) and its secondary host *Larix* (larch). Wax coated *Adelges laricis* exules were found on *Larix europaeus* on 16/5/17 and 8/6/17 & 10/7/17.



Adelges_laricis_c2017-05-16_11-56-01ew.jpg

Picea smithiana (Morinda spruce)

***Cinara pilicornis* (Spruce shoot aphid):** On 8/6/17 we found *Cinara pilicornis* alates and immatures on *Picea smithiana*.



Cinara_pilicornis_alate_c2017-06-08_18-42-02ew.jpg

The spruce shoot aphid may be found on the young growth of many different spruce species including Norwegian spruce (*Picea abies*) and Sitka spruce (*Picea sitchensis*).

Picea wilsoni (Wilson's fir)

Cinara pruinosa: On 16/5/17 we found *Cinara pruinosa* alates & immatures on *Picea wilsoni*.



***Cinara pruinosa*_alate_c2017-05-16_16-47-01.jpg**

In addition, on 8/6/17 a dead alate and live immatures of *Cinara piceae* were found on *Picea wilsoni*.

Pinus canariensis (Canary Island Pine)

Eulachnus sp.: On 26/6/17 we found a *Eulachnus* sp. feeding on Canary Island pine (*Pinus canariensis*). Unfortunately all members of the colony were immature, and hence could not be identified



***Eulachnus*_sp._on_*Pinus canariensis*_c2017-06-26_17-57-03ew.jpg**

Pinus montezuma (Montezuma pine)

***Essigella californica* (Monterey pine needle aphid):** The authors contributed one of the first records of *Essigella californica* in Britain when we found it on *Pinus montezumae* at Bedgebury in 2012 (Reid, S., Dransfield, R.D. & Brightwell, R., 2015). We found it again in 2013 and on 23/6/17 – its continued presence at Bedgebury and elsewhere suggests the species is now firmly established in Britain.



Essigella_californica_on_Pinus_montezumae_c2017-06-23_17-35-01ew.jpg

Pinus sylvestris (Scots pine)

***Cinara pinea* (Large pine aphid)** is a common aphid at Bedgebury on Scots Pine..



Cinara_pinea_immature_showing_rostrum_c2017-03-28_18-35-03ew.jpg

We found this immature feeding at the needle base very early in the year on 28th March.

Pinus sp (Pine)

Cinara ? schimitscheki



Cinara_under_bark_possible_schimitscheki_c2017-03-30_17-26-03ew.jpg

We are uncertain of the identity of this species, which we found feeding under loose bark on 30th March, but *Cinara schimitscheki* is the most likely.

Pseudotsuga menziesii (Douglas fir)

Adelges cooleyi (Cooley spruce gall adelgid)



Adelges_cooleyi_on_douglas_fir_c2017-05-16_11-18-01ew.jpg

Adelges cooleyi is always very common on the needles Douglas fir.

NON-CONIFERS

***Betula pendula* (Silver birch)**

***Symydobius oblongus* (Shiny birch aphid):** A common resident on birch, the picture above shows a young nymph that has recently hatched from the egg (unhatched eggs shown left).



Symydobius_oblongus_linstar_larva_egg_c2017-03-13_18-26-02ew.jpg

***Betula pubescens* (Downy birch)**

***Betulaphis quadrituberculata* (Small downy birch aphid):** This was found commonly on downy birch on 25/8/17.



Betulaphis_quadrituberculata_on_Betula_c2017-08-25_17-25-02ew.jpg

Cytisus scoparius (Common broom)

***Ctenocallis setosa* (Broom hedgehog aphid):** *Ctenocallis setosa* apterae (wingless female adults) are unmistakable given their numerous long finger-like papillae (small rounded protuberances) protruding from the dorsum (the upper, spinal, surface).



Ctenocallis setosa feeds flattened against the midribs on the upper sides of leaves of broom.

Ctenocallis_setosa adult_aptera_nymphs_c2017-07-25_17-30-01ew.jpg



Ctenocallis_setosa adult_immature_on_Broom_c2017-07-25_15-24-02ew.jpg



Ctenocallis_setosa_adult_aptera_lateral_c2017-07-25_17-47-02ew.jpg

Its colour, small size and irregular profile make it very difficult to see - especially on the older, often blotchy leaves. It is rare but widely distributed in Europe.



Ctenocallis_setosa_alate_dorsal_c2017-07-27_10-21-01.jpg

The alate (winged female adult, see picture above) has the papillae much reduced in size, and has the wing veins bordered in black.

Ctenocallis setosa has only been recorded before in Surrey.

Acyrtosiphon pisum (Pea aphid): The common pea aphid was also present on broom.



Acyrtosiphon_pisum_head-on_c2017-06-09_14-23-02ew.jpg

Acyrtosiphon pisum is considered one of the 14 aphid species of most agricultural importance

***Ilex aquifolium* (Holly)**

Aphis ilicis (Holly aphid): Wood ants always attend holly aphids in the bizarrely twisted holly leaves (see below).



Aphis_ilicis_Formica_rufa_c2017-06-23_11-50-02ew.jpg

Robinia pseudoacacia (Black locust)

***Appendiseta robiniae* (Black locust aphid):** At some time in the last 400 years the aphid specific to black locust, *Appendiseta robiniae* was also introduced to Europe, most likely via Britain.



Appendiseta_robiniae_alate_mature_cc2017-05-27_16-03-04ew1.jpg

Salix caprea (Sallow)

***Chaitophorus salicti* (Sallow leaf vein aphid):** This is another species that is nearly always attended by ants – in this case a *Myrmica* species.



Chaitophorus_salicti_attended_by_Myrmica_ant_c2017-08-25_15-21-03ew.jpg

Sorbus torminalis (Wild service tree)

***Dysaphis aucupariae* (Wild service aphid):** The galls of this species occur regularly on the wild service trees near the Forestry Commission office at Bedgebury.



Dysaphis_aucupariae_gall_on_Sorbus_torminalis_c2017-05-16_11-08-01ew.jpg

HERBACEOUS PLANTS

Chamaenerion angustifolium (Rosebay willowherb)

***Aphis salicariae* (Dogwood-Rosebay willowherb aphid):** This species host alternates, overwintering on dogwood before moving to willowherb leaves in summer.



Aphis_salicariae_alate_nymphs_c2017-07-11_14-39-01ew.jpg

***Epipactis helleborine* (broad-leaved helleborine)**

Aphis epipactis (*Helleborine aphid*): *Aphis epipactis* are actually very dark green, but appear almost sooty black, as in the first picture below.



The immatures have the white wax markings typical of the long-haired black aphid group.

Aphis_epipactis_adult_aptera_c2017-07-10_18-46-02ew.jpg



Aphis_epipactis_IVal_c2017-07-10_18-41-02ew.jpg

There are very few records of this species, and it is still unclear whether it is distinct from a number of other black aphid species.

Rhododendron spp., *Erica* sp.

Illinoia lambersi (Rhododendron aphid): This species was present in large numbers on rhododendron near the Bedgebury nursery - **below** a young nymph on the back of an alate.



*Illinoia lambersi*_alate_young_nymph_on_back_c2017-06-26_17-21-01ew.jpg

Lonicera (Honeysuckle)

Hyadaphis passerinii (Honeysuckle aphid): In spring colonies of this species curl the leaves of honeysuckles upwards.



*Hyadaphis passerinii*_adult_aptera_c2017-06-23_18-21-01ew.jpg

***Sonchus oleraceus* (Common sowthistle)**

***Uroleucon sonchi* (Large sowthistle aphid)**



Uroleucon_sonchi_on_Sonchus_c2017-07-31_18-01-01ew.jpg

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References:

Blackman, R. L. & Eastop, V. F. (1994). *Aphids on the world's trees: an identification and information guide*. CAB International. <http://www.aphidsonworldsplants.info/>

Carter, C. R. & Maslen, N. R. (1982). *Conifer Lachnids*. Forestry Commission Bulletin No. 58, 75pp.

Stroyan, H.L.G. (1977). *Homoptera: Aphidoidea (Part) - Chaitophoridae and Callaphidae*. Handbooks for the identification of British insects **2** (4a). Royal Entomological Society, London.

Stroyan, H.L.G. (1984). *Aphids - Pterocommatinae and Aphidinae (Aphidini)*. Handbooks for the identification of British insects. **2** (6) Royal Entomological Society of London.