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The whiteflies (Hemiptera: Aleyrodidae) of Belgium

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Abstract

Seven species of whiteflies (Aleyrodidae) had already been reported for Belgium, which could all be confirmed. Here, six additional species are added to the Belgian fauna: *Aleurochiton pseudoplatani* Visnya, 1936, *Aleuroclava similis* (Takahashi, 1938), *Aleurotuba jelinekii* (Frauenfeld, 1867), *Siphoninus phillyreae* (Haliday, 1835), *Tetralicia ericae* Harrison, 1917 and *Trialeurodes ericae* Bink-Moenen, 1976.

Keywords: Aleyrodoidea, Belgian fauna, checklist, Sternorrhyncha

Samenvatting

Zeven soorten witte vliegen (Aleyrodidae) werden reeds gemeld in België, die allemaal konden worden bevestigd. Hier worden zes soorten toegevoegd aan de Belgische fauna: *Aleurochiton pseudoplatani* Visnya, 1936, *Aleuroclava similis* (Takahashi, 1938), *Aleurotuba jelinekii* (Frauenfeld, 1867), *Siphoninus phillyreae* (Haliday, 1835), *Tetralicia ericae* Harrison, 1917 en *Trialeurodes ericae* Bink-Moenen, 1976.

Résumé

Sept espèces de mouches blanches (Aleyrodidae) ont déjà été rapportées pour la Belgique, et toutes ont pu être confirmées. Ici, six espèces supplémentaires sont ajoutées à la faune belge: *Aleurochiton pseudoplatani* Visnya, 1936, *Aleuroclava similis* (Takahashi, 1938), *Aleurotuba jelinekii* (Frauenfeld, 1867), *Siphoninus phillyreae* (Haliday, 1835), *Tetralicia ericae* Harrison, 1917 et *Trialeurodes ericae* Bink-Moenen, 1976.

Introduction

Whiteflies (Aleyrodidae) are a small family of insects, which are related to scale insects (Coccoidea) and aphids (Aphidoidea). All these groups share host induced variability: the phenomenon that the morphology can depend on the host plant, which hampers taxonomy. Whiteflies are small sap-sucking insects of 1–3 mm in body length. Adults superficially resemble tiny moths (Fig. 1). The name 'whitefly' is derived from the presence of powdery wax on the body and the wings. Adults of both sexes possess a feeding rostrum and are four-winged and fully mobile. Usually, sexual reproduction takes place, but some species can be parthenogenetic. Eggs are usually laid on the lower surfaces of leaves. The eggs of many species are deposited in partial or complete circles, as the female turns around her rostrum while continuing both feeding and laying eggs (Fig. 1). First-instar larvae are mobile and can walk a short distance to locate suitable feeding sites. However, after the first moult, the remaining three larval stages are sessile and unable to relocate if feeding conditions deteriorate. The final larval stage is called 'puparium', which is especially appropriate because their emergence is delayed until the host plant is suitable for the development of the next generation. Whiteflies feed via stylet mouthparts that are used to pierce plant tissue and suck phloem sap. They often produce large amounts of sugar-rich honeydew, while extracting sufficient amino acids from the sap to support growth. This honeydew is often colonised by mould. Large

infestations may therefore affect the hosts, both by causing sap loss and by mould interfering with photosynthesis and in addition, some species can serve as vectors for viral plant diseases. Although they are economically important on crops and ornamental plants, they have hardly been studied. In Belgium, seven whitefly species had already been reported and here, six additional species are added to the Belgian fauna.

Fig. 1. Adult female *Aleyrodes proletella* (Linnaeus, 1758) depositing eggs. © Koen Lock.

Material and methods

Adults can rarely be identified and therefore, whitefly puparia were searched on the leaves of host plants on which indigenous species were expected based on the Dutch fauna (JANSEN, 2011). Species were identified using the key of MARTIN *et al*. (2000), which also contains an excellent introduction to the whiteflies, in combination with the pictures presented in JANSEN (2011). Material of all species new to Belgium was deposited to the entomological collection of the Royal Belgian Institute of Natural Sciences (I.G. 34.176).

Results

For each species, it is discussed on which host plants it can be found. Species new or previously uncertain for Belgium are depicted and for the examined material, dates and places are listed, including GPS coordinates in decimal degrees. The species are treated in alphabetical order and the observations per species in chronological order.

Aleurochiton aceris (Modeer, 1778)

LAMEERE (1900) reported *A. aceris* from *Acer pseudoplatanus* L., although this species is monophagous on *Acer platanoides* L. It is unclear whether the species or the hostplant was misidentified. However, the occurrence of *A. aceris* in Belgium could be confirmed during the present study. Puparia of *A. aceris* are covered with white wax, except for two black triangles near the front margin and two rows of dots near the midline (Fig. 2).

MATERIAL EXAMINED: Eeklo, Het Leen (51.168, 3.570), 3.X.2018; Lanaye, Montagne-Saint-Pierre (50.781, 5.684), 6.X.2018.

Fig. 2. Puparium *Aleurochiton aceris* (Modeer, 1778). © Koen Lock.

Aleurochiton pseudoplatani Visnya, 1936: new to Belgium

This species is monophagous on *Acer pseudoplatanus* L. Puparia are white with three black regions in the centre (Fig. 3).

MATERIAL EXAMINED: Sint-Amandsberg, Sint-Baafskouter-Rozenbroeken (51.057, 3.759), 28.IX.2018; Eeklo, Het Leen (51.168, 3.570), 3.X.2018; Lanaye, Montagne-Saint-Pierre (50.781, 5.684), 6.X.2018; Merelbeke, Gentbos (50.973, 3.754), 13.X.2018; Oudenaarde, Bos t'Ename (50.858, 3.647), 14.X.2018.

Fig. 3. Puparium *Aleurochiton pseudoplatani* Visnya, 1936. © Koen Lock.

***Aleuroclava similis* (Takahashi, 1938): new to Belgium**

Although it can be found on several plants in the rest of its distribution area, *Vaccinium vitis-idaea* L. is the only indigenous host plant in Belgium. Puparia are uniformly whitish and more or less translucent, except for the orange operculum (Fig. 4).

MATERIAL EXAMINED: Houthalen-Helchteren, Huttebeek (51.027, 5.448), 13.X.2018.

Fig. 4. Puparium *Aleuroclava similis* (Takahashi, 1938). © Koen Lock.

***Aleurotuba jelinekii* (Frauenfeld, 1867): new to Belgium**

This exotic species originates from the Mediterranean region, where it is common and widespread (MARTIN *et al*., 2000). It lives in urban areas, private gardens and public green where its main host plant *Viburnum tinus* L. is growing. The species can be recognized by the evenly shining black puparium with six dots of white flocculent waxy curls and a radiating white waxy edge (Fig. 5).

MATERIAL EXAMINED: Ghent, Botanical garden (51.036, 3.723), 27.IX.2018; Ghent, Botanical garden (51.036, 3.723), 18.XII.2019.

***Aleyrodes lonicerae* Walker, 1852**

Reported by LAMEERE (1900) from *Lonicera* L. and *Fragaria* L. It is a polyphagous species that has been found on at least 23 plant families (MOUND & HALSEY, 1978; EVANS, 2007), although the most likely hosts in Belgium include *Lonicera*, *Fragaria* and *Rubus caesius* L.

***Aleyrodes proletella* (Linnaeus, 1758)**

Reported by LAMEERE (1900) from *Chelidonium majus* L. and *Brassica* L. GHESQUIÈRE (1947) reported two parasites of *A. proletella* on cultured *Brassica*: *Encarsia tricolor* Forster, 1878 and an unidentified *Pteroptrix* Westwood, 1833, which both belong to the Hymenoptera. The species is recorded from representatives of 14 plant families (MOUND & HALSEY, 1978) and it is especially common on *C. majus* and *Brassica*, particularly the *Brassica oleracea* L. varieties

borecole (kale), Brussels sprout and green cabbage (JANSEN, 2011). This species was locally present on *C. majus* and *Brassica* species, but during the last decades, it has been spreading and it is now quite common and very abundant in private gardens, where it didn't occur before and it has become a pest on commercially grown cabbages (JANSEN, 2011).

Fig. 5. Puparium *Aleurotuba jelinekii* (Frauenfeld, 1867). © Koen Lock.

***Asterobemisia carpini* (Koch, 1857)**

A. carpini has been reported by LAMEERE (1900) from *Carpinus betulus* L. The species is known to be associated with representatives of 15 plant families (MOUND & HALSEY, 1978). Possible hosts in Belgium include for example *Corylus avellana* L., *Rubus* L. and *Vaccinium myrtillus* L.

***Massilieurodes chittendeni* (Laing, 1928)**

GHESQUIÈRE (1947a) found this species on *Rhododendron* L. in Brussels. *M. chittendeni* is monophagous on *Rhododendron*.

***Pealius quercus* (Signoret, 1868)**

This species was reported by LAMEERE (1900) from *Quercus* L. The species has been recorded on representatives of four families: Betulaceae, Fagaceae, Tiliaceae and Urticaceae (MOUND & HALSEY, 1978; EVANS, 2007). In the Netherlands, the species has been found on *Castanea sativa* Mill., *Fagus sylvatica* L., *Corylus avellana* L., *Quercus robur* L., *Quercus rubra* L. and *Quercus petraea* (Matt.) Liebl. (JANSEN, 2011).

***Siphoninus phillyreae* (Haliday, 1835): new to Belgium**

The species prefers woody hosts in the Oleaceae, Lythraceae and Rosaceae (MARTIN *et al.*, 2000). In Belgium, it is common on *Crataegus* L. and *Fraxinus* L. The puparia are white with two black regions in the middle and they are covered with spines (Fig. 6).

MATERIAL EXAMINED: Sint-Amandsberg, Sint-Baafskouter-Rozenbroeken (51.057, 3.759), 28.IX.2018; Eeklo, Het Leen (51.168, 3.570), 3.X.2018; Lanaye, Thier de Lanaye (50.778, 5.680), 6.X.2018; Merelbeke, Gentbos (50.973, 3.755), 13.X.2018; Oudenaarde, Bos t'Ename (50.859, 3.646), 14.X.2018; Kinrooi, Kessenich (51.148, 5.849), 20.X.2018.

Fig. 6. Puparium *Siphoninus phillyreae* (Haliday, 1835). © Koen Lock.

Tetralicia ericae Harrison, 1917: new to Belgium

This species is monophagous on *Erica tetralix* L. The puparia are completely black (Fig. 7).

MATERIAL EXAMINED: Kalmthout, Kalmthoutse Heide (51.401, 4.431), 4.X.2018.

Fig. 7. Puparium *Tetralicia ericae* Harrison, 1917. © Koen Lock.

Trialeurodes ericae Bink-Moenen, 1976: new to Belgium

This species is also monophagous on *Erica tetralix* L. The puparia are whitish and unevenly heightened by a band of wax (Fig. 8).

MATERIAL EXAMINED: Kalmthout, Kalmthoutse Heide (51.401, 4.431), 4.X.2018.

Fig. 8. Puparium *Trialeurodes ericae* Bink-Moenen, 1976. © Koen Lock.

Trialeurodes vaporariorum (Westwood, 1856)

This is a very common species in greenhouses. Also, in Belgium, it has been reported as a pest species and control measures have been studied (GHESQUIÈRE, 1933; DE JONGHE D'ARDOYE, 1937; VAN DE VEIRE *et al*., 1974; HEUNGENS & PELERENTS, 1977). GHESQUIÈRE (1947b) reported a parasite of *T. vaporiorum*: *Encarsia formosa* Gahan, 1933, which belongs to the Hymenoptera. It is an extremely polyphagous species that has been recorded on representatives of at least 82 plant families, including herbs, shrubs and trees (MOUND & HALSEY, 1978). Outdoor hosts in the Netherlands are *Bryonia dioica* Jacq., *Viburnum opulus* L., *Lapsana communis* L., *Mentha aquatica* L., *Chelidonium majus* L., *Solanum lycopersicum* L. and *Angelica archangelica* L. (BINK *et al*., 1980). During mild winters, the species might be able to overwinter outdoors.

Discussion

The seven whiteflies already reported as well as the six species new to Belgium had already been found in the Netherlands (JANSEN, 2011) and were thus expected. One additional species was found outdoors in the Netherlands: *Siphoninus immaculatus* (Heeger, 1856), which occurs on *Hedera helix* L. (JANSEN, 2011). However, this species is very difficult to detect in the field and it is suggested to look for puparia on the leaves under a stereo microscope (JANSEN, 2011). Another species to be expected is *Aleurochiton acerinus* Haupt, 1934, a Central European species which is monophagous on *Acer campestre* L., a very common tree in Belgium.

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