

## Short communication

### *Prunus serotina* (American bird-cherry) as a host plant of Aphididae in the Netherlands

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*Prunus serotina*, American bird-cherry, or in America: black cherry, native in Central and Eastern North America, has in Europe sometimes been used as an ornamental, or as a lane tree. Its main use, however, was in forestry. Millions have been planted between rows of *Pseudotsuga douglasii* and *Larix leptolepis*, the idea being that the Conifer's litter would be better converted if mixed with that of this *Prunus*, and that later the Conifer would overgrow *Prunus serotina*. Policy has changed, however, and the tree is now considered a weed, and control has begun. In the meanwhile birds have further spread the tree, and it occurs everywhere on light, sandy soil in uncounted millions.

In its native country *Prunus serotina* has a few comparatively rare native aphids, and species of economic importance, like *Myzus cerasi* (F.), the black cherry aphid, and *Hyalopterus pruni* (Geoffr.), the mealy plum aphid, have occasionally been found on it. The latter 2 species are common pests in Europe, but are mostly only found as stray autumn migrants on the host in the Netherlands. Of the other aphid species infesting *Prunus serotina* in the Netherlands none has been reported from this host plant in North America.

1. *Myzus persicae* (Sulzer). In 1946 the green peach aphid, undoubtedly our most noxious aphid species, was found overwintering successfully as eggs on *Prunus serotina* near Kootwijk. Further investigations showed that only certain tree specimens are regularly infested, others never or rarely. Old trees with spurs and suckers growing from the trunk appeared more suitable as host plants than young trees. Healthy trees were found with an estimated 3000 primary colonies, more than we ever observed on *Prunus persica*. The over-all picture is, that of the overwintering eggs laid on *Prunus serotina* less than 0.01 % gives rise to a colony in spring.

Yet, from an agricultural point of view, *Prunus serotina* is very dangerous. *Myzus persicae* is already in its spring flight active as a virus vector in such crops as potatoes and beets. And though peach is nearly absent near the areas where seed potato growing is successful, there are now millions of *Prunus serotina* nearby.

The behaviour of *Myzus persicae* on *Prunus serotina* in spring is less pliable than it is on peach. The fundatrix develops on 1 or 2 of the leaves of a short spur on the trunk or a thick branch. The infested leaf is slightly curved, turns yellowish and drops early. Therefore early infestations are usually overlooked. The progeny, mostly as

larvae, walk along trunk and branches to the periphery of the canopy and cause conspicuous leaf curl. Peripheral leaf curls holding fundatrices were never found. Alatae are not very common in the second generation, but dominate in the third generation. Recolonization of *Prunus serotina* by alatae developed on the host or on peach has not been observed.

2. *Rhopalosiphum insertum* (Wlk.). This well known pest of apple and pear is, according to the literature restricted to Pomoideae (*Pyrus malus*, *Crataegus*, *Amelanchier*, *Mespilus*, *Sorbus*) as winter hosts. However, we found that this aphid in nature can successfully overwinter on some *Prunus* species, best of all on *Prunus serotina*. Fundatrices cause leaf curl in a curious way. Young leaves of *P. serotina*, in contrast to those of apple, are sharply folded along the mid vein. The young fundatrix, feeding on the morphological underside of the young leaf, first curves the mid vein sideways, then, when the leaves unfold, downwards. The result is a leaf curl very much resembling that caused by *Myzus persicae*, and often both species are found together on the same curled peripheral leaves.

On *Prunus serotina* only 2 generations develop, the second consisting of alatae which found colonies, usually attended by ants, on underground parts of Gramineae.

Because spring alatae of *Rhopalosiphum insertum* rather strongly resemble those of *R. padi* (L.) from *Prunus padus* and *P. tenella*, we repeatedly transferred alatae from curled leaves of *Prunus serotina* to caged, potted *Poa annua* and always obtained the easily recognizable root forms of *R. insertum*.

This aphid is known as a pest in horticulture, but not on its secondary hosts, Gramineae.

3. *Phorodon humuli* (Schrank). The summer form of this species, which overwinters as eggs on wild and cultivated *Prunus* species, is one of the most serious pests of hops (*Humulus lupulus*). It is, incidentally, also the aphid in which host alternation was first discovered, by Walker (1849), who in his overlooked publication of a few lines gave the advice to hop growers to prune sloe (*Prunus spinosa*)-hedges in order to destroy the overwintering eggs. Perhaps the earliest advice to biological, or integrated, insect control.

On *Prunus serotina* its infestation, lasting for at least 3 generations, can easily be recognized by the way the leaves are rolled. Both edges are rolled downwards and inwards but the mid vein is hardly curved, the result resembling a cigarette.

This species is on *Prunus serotina* less common than the 2 preceding ones, and mostly only 1 fundatrix per tree was found.

4. *Aphis pomi* de Geer. The species is generally recorded only from Pomoideae and *Spiraea* spp., with one record from *Sedum kamtschaticum*. However, healthy colonies, attended by *Lasius alienus*, were twice observed on the apices of twigs of a vigorously growing *Prunus serotina* in early summer. Colonizing alatae were frequently observed on sucker growth of trees that had been cut, but the larvae died. Oviposition on *Prunus serotina* has never been observed. The aphid is known as a serious pest in nurseries, on vigorously growing apple trees, and on some ornamental shrubs, notably *Cotoneaster* spp.

5. *Rhopalosiphum nymphaeae* (L.). The species overwinters on *Prunus* spp. as eggs but never becomes a pest on its winter hosts. A very heavy infestation was once observed on sucker growth sprouting from stumps of a row of *Prunus serotina* in Drenthe. Recognition is easy because the apterous and immature insects are deep bronzy brown. Alatae develop in the second and third generation. They fly to aquatic plants. It is probably the only aphid species which in summer is not host-specific, but primarily biotope-bound, the host plants belonging to any plant order as long as they grow in water. Besides the aphid has once been found infesting tulips grown for flowers in a greenhouse, where it can overwinter as viviparae.

Massive oviposition on *Prunus serotina* has frequently been observed, but this did not lead to colonies developing in spring.

6. *Appelia prunicola* (Kltb.). Of this species-complex 2 members overwinter as eggs on *Prunus spinosa* and *P. persica*, respectively. Infestation resulting in stunting of growth and heavy leaf curl was observed on suckers of *Prunus serotina* growing from the stump of a tree felled the winter before. Identification of the members of this complex by microscopical examination is far from easy. Therefore colonies were transferred to growing suckers of peach in the presence of *Lasius alienus*. This had no success, and the negative result may indicate that the colonies were the typical form normally living on *Prunus spinosa*, a form of no economic importance.

7. *Hyalopterus pruni* (Geoffr.). Only twice were small spring colonies of this species seen on *Prunus serotina*. Virtually all other deciduous species of *Prunus* are commonly infested. On *Prunus serotina* colonies were small, and the leaves were not distorted. As far as could be ascertained, the aphids died before alatae were produced in the observed colonies. Normally alatae develop in the 3rd–5th generation, and these fly to *Phragmites communis* and sometimes *Molinia coerulea*, on which grasses the species spends the summer.

8. *Autumn migrants*. Many aphid species with host alternation do not or hardly discriminate in autumn between host plants on which they are able to reproduce in spring, and related plant species on which they do not survive in spring. In this way many aphids associated with other *Prunus* spp. arrive, feed and reproduce in the autumn on *Prunus serotina*, often in very large numbers. Usually their offspring, oviparous females, develop without considerable mortality, and are fertilized by males committing the same wrong choice of host plants. Eggs are laid, and they hatch in spring, but the emerging larvae perish. In aphidologists' verbiage *Prunus serotina* is not a host plant to these aphids, though it is temporarily a food plant.

Aphid species commonly reproducing on *Prunus serotina* in the autumn, but never in spring are:

1. *Rhopalosiphum padi* (L.). Normal host plants: *Prunus padus*, *P. tenella*, temporarily *P. subhirtella*, in summer on Gramineae and related Monocotyledones.

2. *Myzus lythri* (Schrank). Normal host plant: *Prunus mahaleb*, in summer on *Lythrum*, rarely *Drosera* or *Epilobium*.

3. *Myzus cerasi* (F.). Normal host plants: *Prunus cerasus*, *P. avium*, some ornamental *Prunus* spp., in summer on Rubiaceae, *Gentiana* spp., more rarely Cruciferae

like *Cardamine* spp. and *Rorippa* spp. In America reported from *Prunus serotina*, but possibly only in the autumn.

4. *Brachycaudus cardui* (L.). Normal host plants: other *Prunus* spp. (*spinosa*, *insititia*, *domestica*), in summer on Compositae and Boraginaceae.

5. *Brachycaudus helichrysi* (Kltb.). Normal host plants: other *Prunus* spp. (*insititia*, *domestica*, more rarely *spinosa*), in summer on Compositae, Boraginaceae, Papilionaceae and sometimes other plants.

Since the eggs of aphids can hardly be identified, it appears impossible to forecast from oviposition in autumn the size of spring infestation, and spring migration on and from *Prunus serotina* to agricultural and horticultural crops. However, annual surveys in spring appeared to be comparatively simple, and they are very useful for obtaining information on the size of the spring flight of the multilateral pest, *Myzus persicae*.

## Samenvatting

### *Prunus serotina* (Amerikaanse vogelkers) als waardplant van bladluizen in Nederland

Sinds 1946 is bekend dat Amerikaanse vogelkers, een uiterst algemene struik of boom van lichte gronden in Nederland, fungeert als winterwaard van de perzikluis (*Myzus persicae*). In gebieden waar de perzik ontbreekt biedt Amerikaanse vogelkers, hoewel vele exemplaren minder geschikt zijn als waardplant, een goede mogelijkheid voor overwintering van de perzikluis. Vooral waar in de nabijheid pootaardappelen of bieten worden verbouwd, gewassen die ernstig lijden onder virusziekten door deze bladluis overgebracht, is de economische betekenis van Amerikaanse vogelkers buitengewoon groot. Ook andere bladluissoorten kunnen met succes op Amerikaanse vogelkers overwinteren en van deze soorten is de hopluis (*Phorodon humuli*) in het buitenland vaak bijzonder schadelijk op hop. Gevonden werd dat de appel-grasluis (*Rhopalosiphum insertum*) vaak ook op Amerikaanse vogelkers als ei overwintert, hoewel de literatuur uitsluitend winterwaardplanten uit de onderfamilie der appel-achtigen (Pomoideae) vermeldt. Bovendien koloniseert de appel-takluis (*Aphis pomi*) soms met succes jonge scheuten van deze importboom. Veel bladluissoorten, die met succes op andere soorten van het geslacht *Prunus* als ei overwinteren, leggen vaak zeer grote aantallen eieren op *Prunus serotina*, zonder dat zich daaruit in het voorjaar volwassen bladluizen ontwikkelen. De schrijver beschouwt Amerikaanse vogelkers als een zeer gevaarlijk gewas voor land- en tuinbouw, speciaal als bron voor virus-ovербrengende bladluissoorten.

## Reference

Walker, F., 1849, Notice of the hop fly. Zoologist 7: 2555.

## Address

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