

Some recent observations on two rare aphid species in The Netherlands: *Rhopalosiphum rufulum* and *Aphis citricola* (Homoptera: Aphididae)

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Abstract: In 1991 *Rhopalosiphum rufulum* was found on its winter host *Sorbus commixta*. Although the species had been caught 20 years ago in a Moericke yellow water trap, its life cycle in The Netherlands was not clear. The discovery of *Aphis citricola* in 1996 in an orchard on plum trees (*Prunus domestica*) was quite a surprise. Normally *A. citricola* occurs in warmer regions but it is suggested that due to the relatively warm summers of the past years it could settle outdoors in The Netherlands.

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Introduction

Not all aphid species can be observed every year or for a more extended period in a certain region because of too small populations due to weather conditions or the abundance of natural enemies, etc. For several species the complete life cycle is not yet known, especially with respect to the trees or shrubs on which they hibernate. The abundance of aphids also depends on the species, some are frequent flyers (migrants) and others are not. Suddenly they appear, but from where? We encountered this phenomenon in *Rhopalosiphum rufulum* Richards and *Aphis citricola* Van der Goot.

Rhopalosiphum rufulum Richards

Rhopalosiphum rufulum originates from the United States of America and Canada and, according to Stroyan (1984), the species was observed for the first time in 1970 in the United Kingdom and Germany and further caught in 1971 in The Netherlands in Moericke yellow water trays. In the United States of America and Canada *Crataegus* sp. and *Sorbus* sp. have shown to be the winter host plants of *R. ru-*

fulum. However, in Europe the aphid was only found on its summer host, *Acorus calamus* L., in some years even very numerous, but it was unknown where they overwintered. D. Hille Ris Lambers has searched unsuccessfully for many years for the winter host plant of *R. rufulum* in West-Europe, especially in The Netherlands. However, at the same time in the UK researchers succeeded to force *R. rufulum* to oviposit on *Crataegus monogyna* Jacq. (Stroyan, 1984).

In May 1991, *Rhopalosiphum rufulum* was discovered by chance on a winter host in the nursery of the town Utrecht. Many colonies were found on *Crataegus* sp. evoking striking leaf-curling. The same year this species was also observed in Wageningen but only on locally planted *Sorbus commixta* Hedl. Like *Crataegus*, this host reacted with strong curling of the leaves (figs 1-2) as a consequence of feeding activities of the aphids. However, on other *Sorbus* species in the botanical garden in Wageningen no *R. rufulum* was found.

During 1992, the same trees were observed regularly but in contrast to 1991 no aphids were observed. Unexpectedly, in 1993 many colonies were found on *A. calamus* resulting the



Fig. 1. Symptoms on *Sorbus commixta* evoked by *Rhopalosiphum rufulum*.



Fig. 2. Detail of symptoms.

next year in a severe attack of every *S. commixta* growing in Wageningen. As a consequence the trees looked disconsolate with all leaves curled. On the contrary, in 1995 and 1996 the monitored trees harboured just a few small scattered colonies and during the last mentioned summer only some *A. calamus* plants were colonized by *Rhopalosiphum rufulum*.

Aphis citricola Van der Goot

The second author yearly monitored orchards for the presence of all kinds of pests. In the beginning of July 1996, at Slijk-Ewijk (province of Gelderland), observations were conducted in an orchard with plum trees (*Prunus domestica* L.). Not only the well-known *Hyalopterus pruni* (Geoffroy), *Phorodon humuli* (Schrank) and *Brachycaudus helichrysi* (Kaltenbach) were found but also a few shoots colonized by an aphid resembling *Aphis pomi* De Geer. The leaves at the end of the infested shoots curled

strongly. After identification of the alate individuals it appeared to be *Aphis citricola* (= *Aphis spiraecola* Patch). This species, the green citrus aphid or spiraea aphid, originates from the tropics and is established well in Mediterranean regions. In the USA *A. citricola* also can be found on apple (*Malus domestica* Borkh.) (Börner & Heinze, 1957). Moreover, it is an efficient vector of viruses of *Citrus*. Probably due to the warm summers during the last three years it also occurs in temperate regions. However, the northernmost record of *A. citricola* thusfar was from Locarno (Anonymous, 1969).

The life cycle of *Aphis citricola* is holocyclic with *Spiraea* sp. as primary host (Blackman & Eastop, 1984). In spring the fundatrices reproduce on *Spiraea* and due to feeding, the host plants become severely damaged. From this winter host *A. citricola* migrates to weeds but occasionally also to apple, plum, black-berry, etc. Stroyan (1984) reports the different host plants on which *A. citricola* has

been found: Rosaceae, Caprifoliaceae, Boraginaceae, Asteraceae, Apiaceae, Rutaceae, Rubiaceae, Cucurbitaceae, etc. Thus, *A. citricola* also colonizes plants which are hosts of *A. pomi*, making distinction from the latter in the field impossible. According to Heie (1986), the life-cycle of this species in tropical and subtropical regions is anholocyclic and in North-America, South-Europe and East-Asia it is holocyclic. *Citrus* is also a primary host (Blackman & Eastop, 1994).

Discussion

Rhopalosiphum rufulum seems to be a holocyclic aphid. Therefore it is strange that, nevertheless some people extensively searched for this species, until now the winter host plants were unknown in The Netherlands. After the first record on *Crataegus* in 1991 observations on this host were not continued. The first observations on winter hosts suggest that most of the *Sorbus* spp. are not or less susceptible. According to the striking symptoms on *S. commixta* one would expect that *R. rufulum* should have been detected earlier on this host plant. *Sorbus commixta*, however, is planted rarely. It is not possible to predict the settling of this aphid species either on the winter host or on the summer host. It is remarkable that in certain years only *A. calamus* is heavily colonized and this might be the reason that *R. rufulum* has been known since long from this plant species.

It was the first time the second author found a few shoots of plum trees beset with alate and apterous *Aphis citricola*. Stroyan (1984) assumes that the species is not able to overwinter outside in temperate regions and he may be

right. The aphid population concerned may have been able to survive because adjacent to the orchard a greenhouse is situated in which blackberry is grown, that is supposed to harbour overwintering *A. citricola*. The aphids may have been introduced into The Netherlands on imported *Citrus*-bonsai trees. Because of the phytosanitary interest with respect to virus transmission, we have send the specimens to the Commonwealth Institute of Entomology, London, where *A. citricola* caught all over the world, is registered centrally (Anonymous, 1969).

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