

Metcalfa pruinosa (Say, 1830) introduced into the Czech Republic (Hemiptera, Flatidae)

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Abstract: A large population of the Nearctic planthopper *Metcalfa pruinosa* (Say, 1830) (Hemiptera, Flatidae), introduced and acclimatized in South Europe in the late 1970s, was found in 2001 in an outdoor ornamental gardening shop in the city of Brno in the Czech Republic, being the first record of the species and the family in the country and its northernmost record in Europe. *M. pruinosa*, probably introduced in the egg stage on ornamental shrubs from Italy, preferred young twigs of *Thuja occidentalis*, *Juniperus communis* and *Sorbus aucuparia* and was also found in numbers on *Lilium* spp. The damage on affected plants was rather of an aesthetic kind (spots of waxy filaments on shoots), even though a production of honeydew and a consequent development of sooty moulds was also observed. A brief review of published information on the distribution, biology and economic importance of *M. pruinosa* is given.

Zusammenfassung: *Metcalfa pruinosa* (Say, 1830) in die Tschechische Republik eingeführt (Hemiptera, Flatidae). – Im Jahr 2001 wurde eine große Population der nordamerikanischen Schmetterlingszikadenart *Metcalfa pruinosa* (Say, 1830) in einer offenen Ziergärtnerei in Brno gefunden. Diese Art wurde bereits Ende der 1970er Jahre in Südeuropa eingeschleppt und ist dort inzwischen fest eingebürgert. Der vorliegende Nachweis stellt den Erstfund (auch der Flatidae insgesamt) für die Tschechische Republik dar und ist zugleich der nördlichste der Art in ganz Europa. Die Population wurde vermutlich im Eistadium über Ziergehölze aus Italien eingeschleppt und bevorzugte junge Zweige von *Thuja occidentalis*, *Juniperus communis* und *Sorbus aucuparia*; mehrere Tiere wurden auch auf *Lilium* spp. gefunden. Der Schaden auf den Pflanzen war eher ästhetischer Natur (Flecken von Wachsfäden auf den Sprossen), wobei außerdem Honigtauproduktion und nachfolgender Befall von Grauschimmel zu beobachten waren. Abschließend wird ein kurzer Überblick über die veröffentlichten Informationen zur Verbreitung, Biologie und wirtschaftlicher Bedeutung der Art gegeben.

Key words: Fulgoromorpha, Flatidae, *Metcalfa pruinosa*, neozoa, introduction, ornamental horticulture, Czech Republic

In late August 2001, a population of an unknown insect on cultivated ornamental plants attracted the attention of phytopathologists in an outdoor gardening shop on the periphery of the city of Brno (Czech Republic, South Moravia, Brno, part Bystřice, 49°13'41"N 16°32'07"E). This insect was proved to be the "citrus flatid planthopper", *Metcalfa pruinosa* (Say, 1830) (Hemiptera, Fulgoromorpha, Flatidae). The species and the family Flatidae have not been reported from the Czech Republic so far.

Metcalfa pruinosa is a species of Nearctic origin, widely distributed in eastern North America, ranging from Canada (Ontario, Quebec) to the southern USA and Mexico, and the West Indies (Metcalf 1957). A subspecies *M. pruinosa cubana* (Metcalf & Bruner, 1948) is listed for Cuba. The introduction of this planthopper to Europe was for the first time documented in summer 1979 in northeastern Italy (Veneto, environs of Treviso) by Zangheri & Donadini (1980) and Dlabola (1981) who determined their material. In Italy it was rapidly diffusing (Arzone *et al.* 1987, Duso & Pavan 1987). The ways of its invasion

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were studied by Pantaloni (1989): the spread over long and middle distances was favoured by the road traffic; from some starting points along the highways in much frequented parking places with rich vegetation, *M. pruinosa* dispersed by self-spreading, supported by belts or rows of trees and shrubs. In 1985, the species was found in southeastern France (Provence) where it later became more and more frequent and reached even invasive proportions (della Giustina 1986; della Giustina & Navarro 1993). From Slovenia it was reported by Sivic (1991). An accidental finding of a single male in Austria (Graz) in 1996 was published by Holzinger *et al.* (1996). Brno, the place where *M. pruinosa* was found in the Czech Republic is situated approximatively 250 km northwards.

M. pruinosa is an extremely polyphagous species feeding on diverse plants, many of which are being cultivated as fruit trees or ornamentals. In America it was reported e. g. on citrus, grapevine, peach, cherry laurel, camellias, azaleas, magnolias, hollies, *Viburnum* spp. (Mead 1969) and many others (Dean & Bailey 1961). In Italy and France, numerous populations were found on *Rubus* spp. and *Ligustrum ovalifolium*; the planthopper colonized a large number of other trees and shrubs as well (grapevine, lemon, apple, pear, peach, *Prunus*, *Crataegus*, *Rosa* spp., *Ficus*, *Fraxinus*, *Corylus*, *Betula pendula*, *Laurus nobilis*, *Robinia pseudoacacia*, *Aesculus hippocastanum*, *Tilia cordata*, *Platanus hybrida*, and *Magnolia grandiflora*) and sometimes it occurred abundantly also on herbs, such as *Urtica dioica*, *Chenopodium album* and *Amaranthus retroflexus* (Zangheri & Donadini 1980; Barbolini *et al.* 1991; della Giustina & Navarro 1993). In Brno, *M. pruinosa* was concentrated especially on young twigs (1-3 years old) of ornamental cultivars of *Thuja occidentalis*, *Juniperus communis*, *Sorbus aucuparia*, but also *Lilium* spp., and was found in small numbers on some other woody or herbaceous species grown in their vicinity.

The species has one generation per year in the entire range of its distribution and overwinters in the egg stage. Eggs are laid in cracks in the bark of trees and shrubs (Dean & Bailey 1961; Mead 1969; Zangheri & Donadini 1980; della Giustina & Navarro 1993). This fact doubtlessly facilitated its introduction into Europe, including the Czech Republic, where it occurred in the gardening shop with ornamental shrubs imported from Italy. Auchenorrhyncha often make ovipositions that are difficult to detect and so they elude a normal phytosanitary check (Arzone *et al.* 1987). Ornamental horticulture seems to be particularly affected by a passive introduction of pests. On the same site, we recorded another species probably introduced from Italy: the psyllid *Lauritrioza alacris* (Flor, 1861) (Homoptera, Psylloidea, Triozidae). In France, nymphs of *M. pruinosa* start hatching in late May or early June, hatching goes on until mid July. First adults emerge around July 15th but young nymphs were observed as late as in August. The copulation takes place in September. The last adults disappear in early November (della Giustina & Navarro 1993). On September 1st 2001, the Brno population comprised several dozens of adults, some of them were weakly sclerotized (shortly after emergence) and ten fourth and fifth instar nymphs. The ovaries of females were still not fully developed, with no obvious traces of eggs. A copulation was not observed, not even in the box where some specimens were held so that we could take photographs of them. However, the population was considerably numerous and it is possible that the adults, that succeeded in surviving the insecticide treatment of September 14th, could lay overwintering eggs, even though the year 2001 was rainy and cold, and perhaps unfavourable for the thermophilous immigrants. The trophic activity of the adults of *M. pruinosa*, which is a phloem-sucker (Arzone *et al.* 1987), did not seriously affect the plants in Brno. Only some of the vegetative shoots were slightly deformed and curved due to the previous assembling of nymphs. The damage done to the ornamental plants was therefore rather of an aesthetic kind: where infested by

nymphs, the shoots were covered by irregular spots (5–10 cm long) of waxy filaments. This could impair the sales quality of affected plants, partly because buyers might mistake these deposits for those of Coccoidea and refuse the suspiciously looking shrubs, as pointed out by Mead (1969). A damage done by the secretion of honeydew was not detected in Brno first (the weather had been rainy for a long time before). Nevertheless, later in September, adults were discovered in numbers on cultivated *Lilium* spp. and spoiled these plants by honeydew, which was colonized by sooty moulds later. In the country of its origin, the planthopper seldom causes economic damage to most plants except to those weakened by some other factor such as freeze (Mead 1969). However, in Italy and France, where *M. pruinosa* pullulated, avenues, flower and nursery gardens, vineyards and orchards are frequently affected by massive numbers of nymphs and adults and undergo damage from sucking, honeydew and sooty mould (Duso 1984; Arzone *et al.* 1987; della Giustina & Navarro 1993). The honeydew and the hyphae of microfungi inhibit the transpiration and essentially deteriorate the aesthetic look of the affected plant and those plants growing below. On the other hand, the honeydew could be beneficial as a rich food for honeybees in late summer (Barbatini *et al.* 1991).

Two species of dryinid parasites, *Neodryinus typhlocybae* (Ashmead) and *Thaumato-dryinus danieli* Olmi (Hymenoptera, Dryinidae) are natural enemies of *Metcalfa pruinosa* and other Flatidae in the USA (Dean & Bailey 1961; Guglielmino & Olmi 1997). *Neodryinus typhlocybae* was introduced to Italy to control *M. pruinosa* (Girolami & Camporese 1994).

Considering the life strategy of *Metcalfa pruinosa* (polyphagy, flight ability), its natural distribution up to high latitudes in America and a relatively easy passive introduction in the egg stage e. g. together with ornamental plants from the Mediterranean region, it is possible that one day it would permanently acclimatize in central Europe and colonize natural habitats like it already happened in the case of the membracid *Stictoccephala bisonia* Kopp & Yonke, 1977. Anyway, the species of Auchenorrhyncha introduced into Europe from the Nearctic region are rather few in comparison with the ones introduced into North America from Europe (Arzone *et al.* 1987).

A detailed morphological description and illustrations of *Metcalfa pruinosa* in European literature, including the figures of species-specific male and female genitalia, can be found in Dlabola (1981) and della Giustina (1986). The only other representative of the family Flatidae reported from central Europe (Holzinger *et al.* 1997) is *Phantia subquadrata* (Herrich-Schäffer, 1838), indigenous to the eastern Mediterranean region and possibly accidentally found in one specimen in southern Slovakia (Dlabola & Štys 1976).

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