

## *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 late 1970's, 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.

**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 Bystrc, 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 North-East 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 were studied by Pantaleoni (1989): the spreading at 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* went into the surrounding area by self-spreading, supported by belts of trees and shrubs in the landscape. In 1985, the species was found in South East 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, among which many cultivated and ornamental ones. In America it was reported e. g. on citrus,

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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 long list 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, Barbatini 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 wood species or herbs grown in their vicinity.

The species has one generation per year in the entire range of its distribution. It 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) (Hemiptera, 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 the 15th July 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 the 1st September 2001, the Brno population comprised several dozens of adults, some of them were weakly sclerosed (short time after the last skinning) 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 the 14th September, could lay overwintering eggs, even though the year 2001 was rainy and cold, and hypothetically 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, produced by them. 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 soiled these plants by honeydew, which was consequently colonized by sooty moulds. 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 moulds (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 the plants placed 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 *Thaumatomydryinus 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 *Stictocephala 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 eastern Mediterranean region and possibly accidentally found in one specimen in southern Slovakia (Dlabola & Štys 1976).

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