

# *Aleurocanthus spiniferus* (Quaintance, 1903) an alien invasive Aleyrodidae threatening the Mediterranean

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**ABSTRACT:** The recent accidental introduction in Italy, Croatia and Montenegro of the invasive Orange Spiny Whitefly (OSW), *Aleurocanthus spiniferus* (Quaintance, 1903), is a new challenge for plant protection all over the Mediterranean and represents a menace to Citrus and many other host plants trade in this region. Today OSW is reported in the EPPO A2 list, as introduced, acclimatized and spreading in the EPPO region. In fact, starting from its primary detection sites in Italy (near Gallipoli, the province of Lecce, in Apulia), where it recorded in 2008, the whitefly is still progressively invading new territories and widening its diffusion. The pest infests citrus plants in fruit orchards, private and urban gardens, avenues, natural reserves and protected areas. Recent findings in Apulia reveal the establishment of OSW up to the provinces of Taranto and Bari, considerably northwester than previously reported. Pest foci in or near main cities and towns are probably due to trade-dependent, passive dispersion of leaves-marketed fruits and plants for plantings. *A. spiniferus* is mainly a pest of evergreen plants; in Italy, it overwinters as juvenile fixed under host plant leaves. In the warm season, OSW also infests many deciduous host plants, generating abundant populations that increase the dispersal ability of the species, consistently. We discuss the pest invading ability basing on the new territories gained by the insect and the possible advantages deriving to *A. spiniferus* by the above-mentioned alternate use of evergreen/deciduous host plants.

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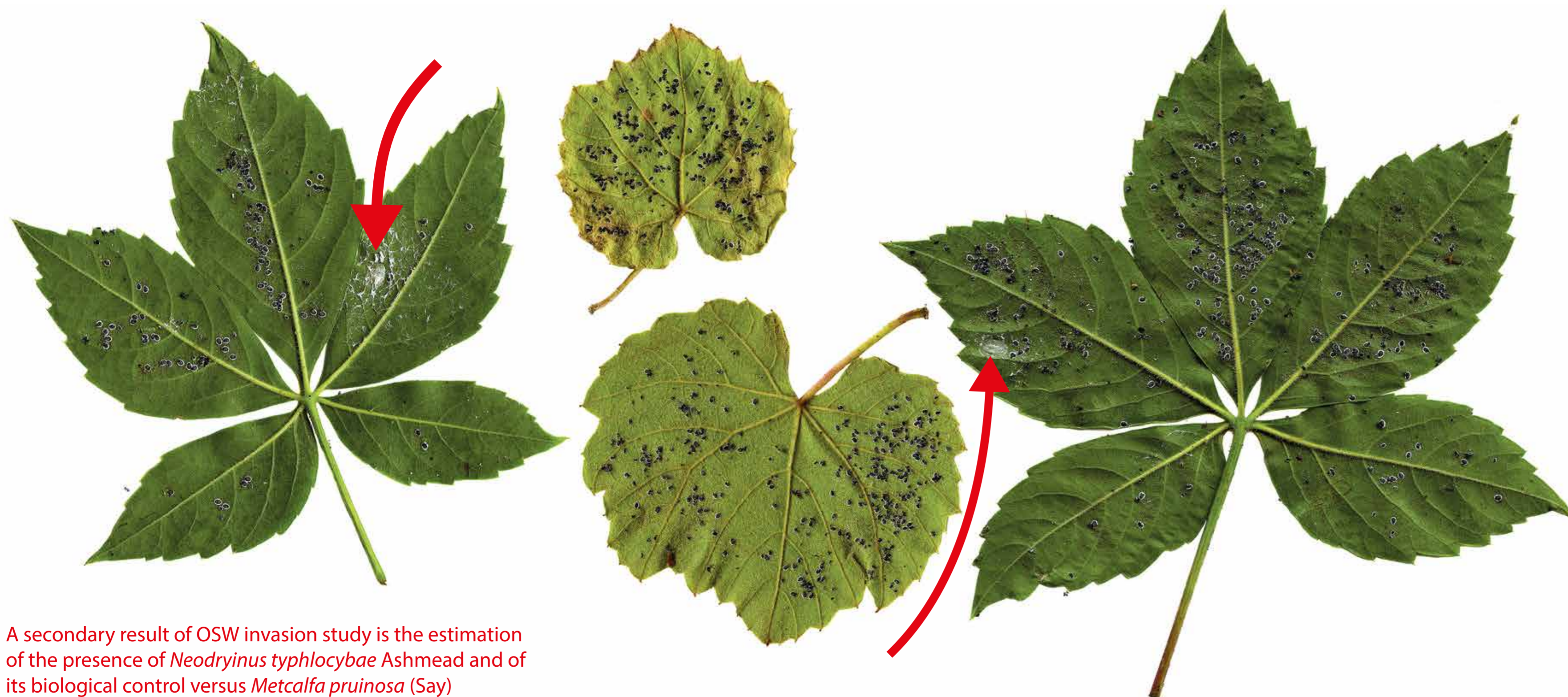
*Aleurocanthus spiniferus* originated in tropical Asia, but it invaded different geographic regions (Africa, Japan, India, Central America, South America and Australia). We estimated the first Orange Spiny Whitefly (OSW) entry in Italy in 2005 reporting the first invasion in 2008. OSW spreads from plant to plant by active dispersion and from place to place by hitchhiking, mainly. As other whitefly species, OSW has six developmental stages: egg; 3 nymph instars; pupa into the puparium and adult. All instars are on the leaves. The life cycle of *A. spiniferus* lapses 2-4 months, but there can be three to six overlapping generations per year.

Management of heavy whitefly infestations is quit difficult. Whiteflies are not well controlled because any effective insecticide is on the market. In many situations, natural enemies will provide adequate control of this whitefly abroad. In Italy, the spread of the pest remains unchallenged by indigenous natural enemies because of the lack of any active predators or parasitoids, until now. Only larvae of *Clitostethus arcuatus* (Rossi) (Coleoptera Coccinellidae) prey OSW eggs and 1st and 2nd instar nymphs of *A. spiniferus* on infested plants, but the beetle is unable to check the pest population.

OSW is a polyphagous insect, *Citrus* spp. are the main hosts plant of economic importance, but here we report the pest to infest more than 90 plant species belonging to 38 plant families. Underside the leaves dense demes of immature stages develop excreting a shower of sticky, clear and fluid honeydew all over the plants. Soon, black sooty mould spots and layer the plants that downgrade respiration and photosynthesis making trees and fruit unsightly and unsalable, respectively. A massive infestation makes trees almost black and dirty. OSW causes a general weakening of seriously infested plants directly by sap loss and indirectly by the growth of sooty moulds.

From 2008 onward *A. spiniferus* spread around, thus eliciting the alarm of the local growers. Countrywide collection activities showed that the pest invaded 13 municipalities in the Lecce District, namely: Alezio, Casarano, Collepasso, Gallipoli, Martino, Melissano, Parabita, Racale, Ruffano, Sannicola, Scorrano, SuPersano and Taviano. At the end of 2009, the pest spread further infesting 68 of the 97 municipalities of Lecce District with a various degree of infestation intensity. One year later, *A. spiniferus* plagued 88 districts but was still absent in Diso, Guagnano, Melendugno, Novoli, Salice Salentino, Squinzano, Trepuzzi, Uggiano la Chiesa and Veglie. These nine uninfested municipalities are located along Brindisi-Taranto Districts border, on the Adriatic coast, at the north edge of the infested area. During 2011 the pest spread into the villages alongside the Adriatic, apparently. Inspections in April 2011 showed the first pest outbreaks in San Pancrazio Salentino, a village in Brindisi District where *A. spiniferus* infested a *Citrus limon* in a private garden. Despite the fact that *Aleurocanthus spiniferus* mainly infests evergreen host plants thus overwintering as juvenile underside the leaves, OSW is also capable to host-shift on deciduous hosts during their vegetative season.

This attitude lets the pest increase its dispersal ability over the territory thanks to a considerable peak of the population. Left picture shows heavy infested underside leaves of *Vitis vinifera* CV and *Parthenocissus quinquefolia* (L.) Planch., 1887 but *Parthenocissus tricuspidata* (Siebold & Zucc.) Planch. is infested too.



A secondary result of OSW invasion study is the estimation of the presence of *Neodryinus typhlocybae* Ashmead and of its biological control versus *Metcalfa pruinosa* (Say)

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