Bemisia tabaci (Gennadius, 1889) - Cotton whitefly (Hemiptera, Aleyrodidae)

Alain Roques

14.31 – *Bemisia tabaci* (Gennadius, 1889) - Cotton whitefly (Hemiptera, Aleyrodidae)

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Description and biological cycle: Small, about 1 mm long, sap-sucking whitefly with two pairs of white wings and a white to light yellow body, covered with waxy powdery material (*Photo left*). Larvae also sap-sucking, feeding on > 900 plant species. This taxon corresponds to a species complex that comprises a large number of genetically variable populations, some of which are discernible owing to distinct phenotypes. Well-studied *B.tabaci* populations that have been differentiated are referred to as races or biotypes. The B biotype is a particularly aggressive variant. One female produces 80–300 eggs per lifetime. Unmated females produce parthenogenetically only male progeny. Development needs 15–70 d from egg to adult depending on temperature (10–32 °C, 27 °C is optimal), while 11–15 generations per year are possible (*Photo right- empty exuviae*).

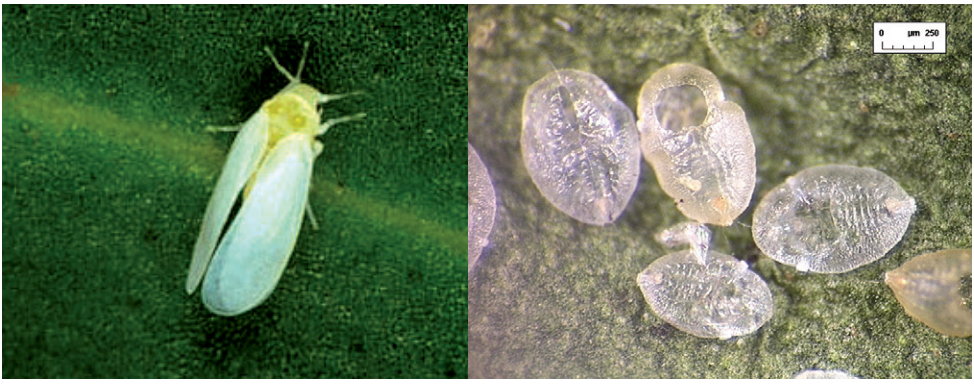
Native habitat (EUNIS code): Unknown.

Habitat occupied in invaded range (EUNIS code): I- Regularly or recently cultivated agricultural, horticultural and domestic habitats; I1- Arable land and market gardens; glasshouses.

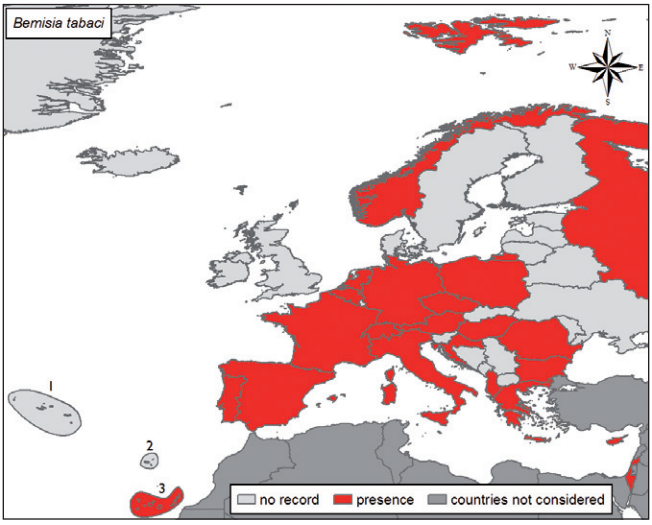
Native range: Asia -Pacific region. Cotton whitefly appears to be a species complex. Recent genetic data indicate as many as ten morphologically indistinguishable species indigenous to the Asia-Pacific region.

Introduced range: Widely spread in the last 15 years. Reported at present from all continents; present in the field in most of Southern Europe but restricted to glasshouses in Western, Central and Northern Europe (*Map*). Apparently eradicated in Finland, Ireland and the United Kingdom.

Pathways : Intercontinental dispersal of eggs, nymphs and adults occurs with plant trade. Directional adult flight is limited but winds may carry flying adults over long distances due to their small size.



Credit: Jean-Yves Rasplus (left), Jean-Claude Streito (right)



Impact and management: Heavy infestations cause important yield losses, ranging from 20–100% depending on the crop and season, to both field and glasshouse agricultural crops and ornamental plants. Three types of damage are observed. Direct feeding damage by adults and larvae may reduce host vigour and growth, cause chlorosis and uneven ripening, and induce physiological disorders. Indirect damage results from accumulation of honeydew produced by nymphs, which serves as a substrate for the growth of black sooty mould on leaves and fruit. The mould reduces photosynthesis and lessens market value of the plant or yields it unmarketable. Finally, it is the most important vector of plant viruses worldwide. As vector of over 100 plant viruses, a small population of whiteflies is sufficient to cause considerable damage. Avoid importations from infested areas. Sequential plantings, avoiding the establishment of affected crops near infested fields, can be used. Adult activity and abundance can be monitored using yellow sticky traps. Chemical control: a number of insecticides provided effective control in the past, but resistance has developed rapidly. Biological control: the use of natural enemies such as chalcids (e.g., *Encarsia formosa, Eretmocerus* spp.) and the entomopathogenic fungus *Verticillium lecanii* is moderately efficient, but cannot sufficiently decrease infestations to stop virus transmission.

Selected references

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