

How to distinguish the greenhouse whitefly from the tobacco whitefly?

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Date: 16.03.2014 *Issue:* 3/2014



In Europe, vegetable and ornamental crops outdoors and in greenhouses are mainly damaged by the greenhouse whitefly (*Trialeurodes vaporariorum*) and the tobacco whitefly (*Bemisia tabaci*).

Greenhouse Whitefly. The adult has a yellow body covered with a white waxy coating, two pairs of waxy-white wings, red eyes, and four-segmented antennae. It possesses a very well-developed piercing-sucking mouthpart. The body length is 1 – 1.5 mm. The egg is elongated-oval, rounded at one end and pointed at the other. At the rounded end, there is a short spine with which it attaches itself to the parenchyma of the leaves. Immediately after laying, it is light yellow, and later - gray-brown to black-brown, and is 0.6 – 0.7 mm long. The first instar

larva is pale yellow, almost transparent, with three pairs of legs, antennae, and violet-red eyes. The second and third instar larvae are similarly colored but lack antennae and legs and are immobile. These larvae are up to 0.8 – 1.0 mm long. The fourth (last) instar larva is elliptical and covered with long, upright waxy hairs, colored pale yellow. After a certain feeding period, this larva transforms into the so-called “pupa” = puparium. The adult insect emerges through a T-shaped slit from the upper side of the puparium.

Tobacco Whitefly. The adult insect resembles the greenhouse whitefly but is smaller and more yellowish. The outer edges of the wings are parallel and appear closer to the body, whereas in the greenhouse whitefly, they are more spread out and form a triangle. Immediately after eclosion, the body is yellow, and the wings are transparent. Later, it becomes covered with a white waxy coating but remains more yellow than that of the greenhouse whitefly. The wings also become covered with a white waxy coating and acquire a whitish color. After laying, the egg is yellowish-green, and later light brown. Its length is about 0.2 – 0.25 mm – smaller than the egg of the greenhouse whitefly. The first instar larva is transparent, with antennae, legs, and well-developed piercing-sucking mouthparts, and a length of about 0.25 – 0.3 mm. The second and third instar larvae are flat, without legs and antennae, and the fourth instar larva – at the beginning of its development – is wide and flat, but later acquires an elongated-oval shape and is 0.8 – 0.9 mm long. With this shape and size, it transforms into the so-called “pupa” = puparium.

| Stage | <i>Tr. vaporarium</i> | <i>Bemisia tabaci</i> |
|---|---|--|
| Eggs | First 1 – 2 days white, later brown to black  | Light yellow-green, later light brown  |
| Larva | Difficult to distinguish from the larva of <i>B. tabaci</i>  | Difficult to distinguish from the larva of <i>T. vaporarium</i>  |
| Pupa: | Oval, white, covered with upright waxy hairs.  | Often flat and transparent or yellow.  |
| Parasitized by: <i>Encarsia formosa</i> | Black opaque  | Brown, with visible coloration of the parasitoid  |
| Adult insect | Larger than <i>B. tabaci</i> , whitened by waxy flakes, appears triangular  | Smaller than <i>T. vaporariorum</i> , appears yellow due to fewer waxy flakes, more elongated  |
| Optimal development temperature | 20 - 25°C | 25 - 30°C |
| Lifespan | Relatively short at high temperature | Longer even at high temperature |

| Stage | <i>Tr. vaporarium</i> | <i>Bemisia tabaci</i> |
|-------------------------------|--|---|
| Distribution on plants | On the upper part | Throughout the entire plant |
| Damage | Aesthetic damage with reduction in yields from honeydew and sooty mold and from sap sucking. | Aesthetic damage with reduction in yields from honeydew, sooty mold, and sap sucking. Small populations cause strong physiological changes with symptoms similar to viral diseases. |
| Insecticide resistance | Weak (low) | Strong (high) |

Morphological and biological differences between greenhouse and tobacco whitefly (according to Koppert)