

Frankliniella occidentalis

Distinguishing features

Both sexes fully winged. Body and legs variable in colour; a particularly common pest form is mainly yellow with a brown patch medially on each tergite, but among various populations body colour varies from almost uniformly dark brown to yellow; antennal segments III–V yellow but apices variably brown, more extensively brown in cooler climates; fore wing pale with dark setae. Antennae 8-segmented; segments III–IV with forked sense cone, VIII longer than VII. Head wider than long; three pairs of ocellar setae present, pair III longer than distance between external margins of hind ocelli, arising on anterior margins of triangle; postocular setae pair I present, pair IV longer than distance between hind ocelli. Pronotum with 5 pairs of major setae; anteromarginal setae slightly shorter than anteroangulars, 2 pairs of minor setae present between abteromarginal setae; one pair of minor setae present medially between posteromarginal submedian setae; upper surface of fore coxae without microtrichia on sculpture lines. Metanotum with 2 pairs of setae at anterior margin, campaniform sensilla usually present. Fore wing with 2 complete rows of veinal setae. Abdominal tergites V–VIII with paired ctenidia, these sometimes weakly developed on IV, on VIII anterolateral to spiracle; posteromarginal comb on VIII complete, with short slender microtrichia arising from triangular bases. Sternites III–VII without discal setae.

Male smaller and paler than female; tergite VIII with no posteromarginal comb; tergite IX posterolateral setae stout in larger males; sternites III–VII with transverse pore plate.

Related species

Similar to the Eurasian *F. intonsa*, this species from western North America has the postocular setae pair IV longer, and almost always has metanotal campaniform sensilla. Also remarkably similar in structure is *F. panamensis*, a species widely recorded by quarantine services around the world in shipments of live plants associated with the horticultural trade out of Colombia. It is usually darker than *occidentalis*, and both sexes have a series of microtrichia on the upper surface of the hind coxae (Gunawardana *et al.*, 2017). Currently 230 species are listed in *Frankliniella*, with up to 130 further names placed into synonymy (Nakahara, 1997). These synonymies result from unrecognized variability in size and colour exhibited by many species. This variation is reflected in the large number of subspecies names listed under *occidentalis*. However, there are further problems with this species, in that Rugman-Jones *et al.* (2010) indicated that two species exist within some populations, but these can be distinguished only by the use of molecular data.

Biological data

Adults have been taken from a very wide range of plants, feeding and breeding in flowers, on leaves, and often in buds. However, the species has also been reported as a predator on leaf mites under



Common pest form



Dark form



Female - SEM image



Head & pronotum

some conditions. Molecular data (Rugman-Jones *et al.*, 2010) indicate that more than one genetic species exists under the name *occidentalis*, but nothing is known about any possible differences in biology or host-plant associations. Dark body colour is possibly related to low temperatures during development rather than to a genetic difference.

Distribution data

Western flower thrips is an invasive pest species that was first recorded in Britain in 1986 (Baker *et al.*, 1993; Kirk & Terry, 2003), and is also recorded from the Republic of Ireland (O'Connor, 2008). It has subsequently established itself as the predominant thrips pest of horticulture and ornamental plant production under glass, and is also a pest of semi-protected strawberry production (outdoors in polythene tunnels) where it has been shown to overwinter at production sites (Sampson, Bennison & Kirk, 2019). However, only a single adult female has ever been collected in open countryside, in Hampshire, apparently truly independent of a crop protection context (Collins, 2021a). Originally from western North America, it is now widespread around the world, and is abundant in southern Europe.

Family name

THRIPIDAE - THRIPINAE

Species name

Frankliniella occidentalis (Pergande)

Original name and synonyms

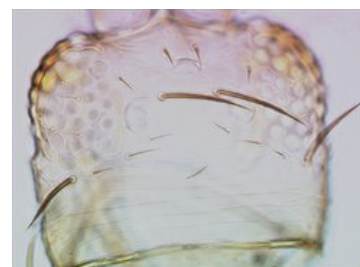
- Euthrips occidentalis* Pergande, 1895: 392
- Euthrips tritici* var. *californicus* Moulton, 1911: 16
- Euthrips helianthi* Moulton, 1911: 40
- Frankliniella tritici* var. *moultoni* Hood, 1914: 38
- Frankliniella nubila* Treherne, 1924: 84
- Frankliniella tritici maculata* Priesner, 1925: 15
- Frankliniella claripennis* Morgan, 1925: 142
- Frankliniella canadensis* Morgan, 1925: 143
- Frankliniella trehernei* Morgan, 1925: 144
- Frankliniella occidentalis* f. *brunnescens* Priesner, 1932: 182
- Frankliniella occidentalis* f. *dubia* Priesner, 1932: 182
- Frankliniella venusta* Moulton, 1936: 172
- Frankliniella conspicua* Moulton, 1936: 173
- Frankliniella chrysanthemi* Kurosawa, 1941: 173
- Frankliniella dahliae* Moulton, 1948: 97
- Frankliniella dianthi* Moulton, 1948: 98
- Frankliniella syringae* Moulton, 1948: 98
- Frankliniella umbrosa* Moulton, 1948: 105

References

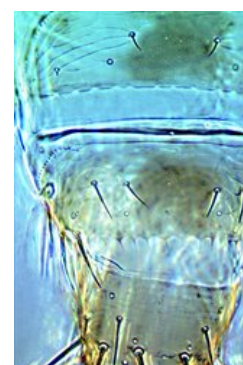
Baker CRB, Barker I, Bartlett PW & Wright DM (1993) Western flower thrips, its introduction and spread in Europe and role as a vector of tomato spotted wilt virus. *BCPC Monograph No 54: Plant Health and the Single Market*, pp. 355–360.



Antenna



Head



Tergites VII-IX



Tergites VII-VIII



Collins DW (2021a) Noteworthy recent records of species of Thripidae (Thysanoptera) in Great Britain. *British Journal of Entomology and Natural History* **34**: 169–191.

Gunawardana DN, Li DM, Masumoto M, Mound LA, O'Donnell CA & Skarlinsky TL (2017) Resolving the confused identity of *Frankliniella panamensis* (Thysanoptera: Thripidae). *Zootaxa* **4323** (1): 125–131.

Kirk WDJ & Terry I (2004) The spread of the western flower thrips *Frankliniella occidentalis* (Pergande). *Agricultural and Forest Entomology* **5**: 301–310.

Nakahara S (1997) Annotated list of the *Frankliniella* species of the world (Thysanoptera: Thripidae). *Contributions on Entomology, International* **2** (4): 355–389.

O'Connor JP (2008) A review of the Irish thrips (Thysanoptera). *Irish Naturalists' Journal* **29**: 20–24.

Rugman-Jones PF, Hoddle MS & Stouthamer R (2010) Nuclear-mitochondrial bar coding exposes the global pest western flower thrips (Thysanoptera: Thripidae) as two sympatric cryptic species in its native California. *Journal of Economic Entomology* **102**: 877–886.

Sampson C, Bennison J & Kirk WDJ (2019). Overwintering of the western flower thrips in outdoor strawberry crops. *Journal of Pest Science*. <https://link.springer.com/article/10.1007/s10340-019-01163-z>

Female sternite VII



Male sternite pore plates



Fore wing