EPPO Datasheet: *Aculops fuchsiae*

Last updated: 2022-02-24

IDENTITY

Preferred name: *Aculops fuchsiae*
Authority: Keifer
Taxonomic position: Animalia: Arthropoda: Chelicerata: Arachnida: Acarida: Eriophyidae
Common names: fuchsia gall mite, fuchsia mite
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EPPO Categorization: A2 list
view more categorizations online...
EU Categorization: RNQP ((EU) 2019/2072 Annex IV)
EPPO Code: ACUPFU



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HOSTS

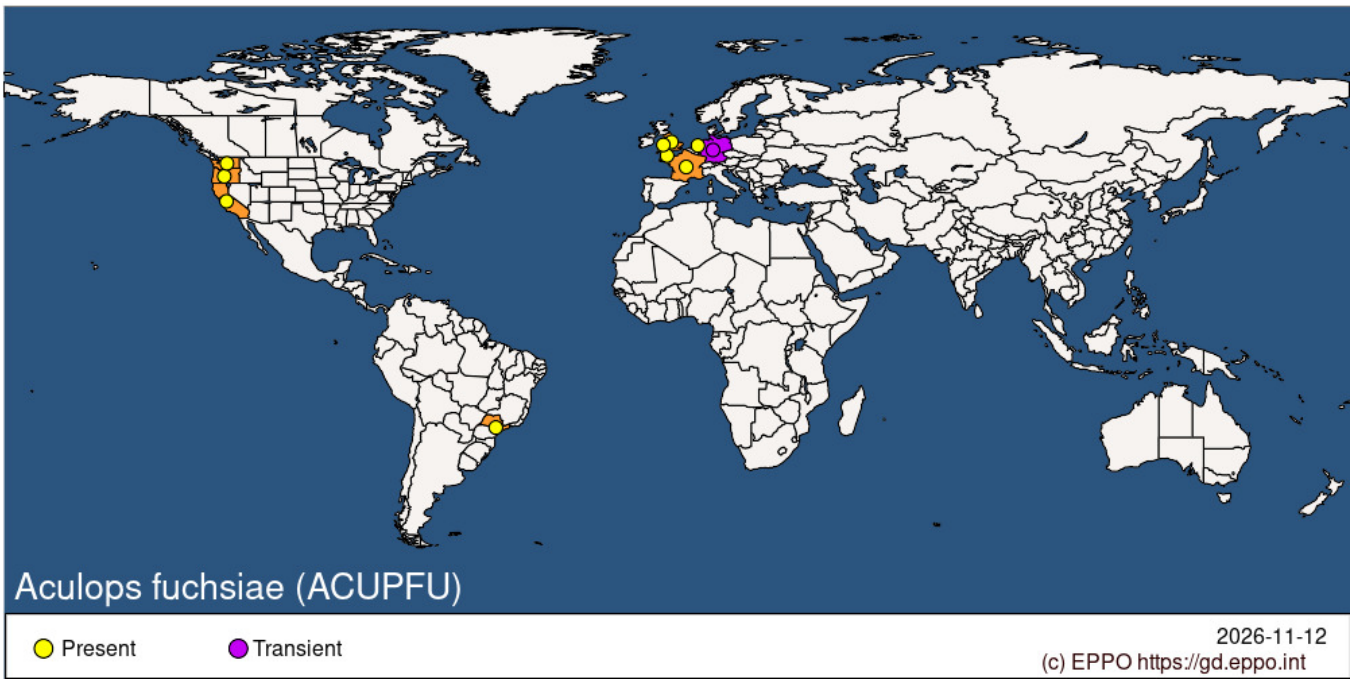
Hosts of *A. fuchsiae* are *Fuchsia* species and cultivars. This mite has been found to survive on all *Fuchsia* species investigated. The three species: *F. coccinea*, *F. magellanica*, *F. procumbens* and over 30 cultivars are recorded as being particularly susceptible. There is however, considerable variation in susceptibility and three species (*F. arborescens*, *F. microphylla* and *F. thymifolia*) and 11 cultivars have been noted as being resistant to *A. fuchsiae*, although these cultivars and species were able to host the mite they showed little sign of damage (Koehler *et al.*, 1985, Salisbury *et al.* 2014). Fuchsia cultivars bred from the Encliandra and Schufia taxonomic fuchsia groups and native to Central America may show more resistance than those from the Procumbentes and Quelusia taxonomic groups (Salisbury *et al.*, 2014).

Host list: *Fuchsia arborescens*, *Fuchsia coccinea*, *Fuchsia hybrids*, *Fuchsia magellanica*, *Fuchsia microphylla*, *Fuchsia procumbens*, *Fuchsia thymifolia*, *Fuchsia*

GEOGRAPHICAL DISTRIBUTION

Aculops fuchsiae is thought to originate from South America, where it was described from specimens collected in Southern Brazil (Sao Paulo) but is likely to occur more widely. It was discovered in the San Francisco area of California (USA) in 1981 (Koehler *et al.*, 1985), and has since spread rapidly in the southern part of this state. The mite has also occurred in Western Washington and Oregon, these intermittent populations are thought to periodically be wiped out by winter cold (Anon, 2012). In Europe the mite has probably been present since 2002 in Brittany, France and had become widespread in that region by 2012 (CABI, 2020). Elsewhere in Europe the mite has become widespread in the Channel Islands (Jersey and Guernsey) since being detected in 2006 (Ostojá-Starzewski & Eyre, 2012) and in Southern England since 2007, it has also been reported from Wales (Salisbury *et al*., 2014; RHS, 2022).

Outbreaks of *Aculops fuchsiae* have been reported in several other European countries in relation with movement of plants from infested areas (EPPO, 2012).



EPPO Region: France (mainland), Germany, Guernsey, Jersey, Netherlands, United Kingdom (England, Wales)
North America: United States of America (California, Oregon, Washington)
South America: Brazil (Sao Paulo)

BIOLOGY

Although the development of *A. fuchsiae* has not been described in detail, it is assumed that there are three life stages that precede the adult: egg, larva and nymph.. Only one female was described by Keifer (1972) and immature stages remain undescribed (Baker *et al.*, 2014).

The mites live and reproduce within the folds of galled tissue and among plant hairs, but not within the galls (Keesey, 1985). As the plants grow, mites leave the galled area and move upwards to new growth. The female lays about 50 eggs at a time, which hatch after 4 to 7 days at 18°C (Ostojá-Starzewski & Eyre, 2012). The life cycle is completed in 21 days at 18°C and there are several generations during the growing season (Keesey, 1985). All life stages of the mites can overwinter within the bud scales, (Natter 1982; Crawford (1983). The mite tolerates a winter temperature of 5°C (Koehler *et al.* 1985). Information on suitable temperature ranges is supported by its spread in England where the mite has been present on hardy outdoor fuchsias since 2007 and some winters have seen prolonged periods below 0°C (Salisbury *et al.*, 2014). In addition, following its initial discovery, it spread along approximately 900 km of coastal California in 4 years, in contrast to its spread inland was slower (Koehler *et al.* 1985). It was difficult to inoculate plants with the mite in glasshouses, but relatively easy to do so in the field, implying that the mite is not favoured by hot growing conditions (Koehler et al., 1985) and therefore may not survive well on plants grown under protection. More extreme cold, temperatures below -7°C for 3 to 4 nights are thought to kill the mite, limiting its establishment in the Pacific Northwest of the USA (Anon, 2012).

DETECTION AND IDENTIFICATION

Symptoms

In susceptible hosts *A. fuchsiae* causes deformation of the leaves, growths (galls) becoming grotesquely swollen and blistered, terminal shoots are often the most heavily affected. These galls often start as a yellowish green colour with a felt-like appearance, and as become reddened they age. Eventually further plant growth is often suppressed (Ostojá-Starzewski & Eyre, 2012). Affected flower buds often result in grossly abnormal blooms. *Aculops fuchsiae* is the only gall mite known to occur on *Fuchsia* and the galls are characteristic. Examination with a hand lens should reveal masses of yellowish fusiform mites especially within folds and leaf hairs of the deformed tissues.

Morphology

Type specimens of *A. fuchsiae* are held at Instituto Agronomico, Campinas, Estado São Paulo, Brazil and paratype specimens at the Entomological Research Division, USDA, Beltsville, Maryland, USA (CABI, 2020). The mite is about 200-250 µm long and 55-60 µm wide and pale yellowish-white in colour. *A. fuchsiae* is the only described species of eriophyoid mite that has fuchsia as a host however, confirmation of identity requires examination of cleared adult female specimens under a high-power microscope. Keifer (1972) gives an illustrated description of the female and mentions the short acuminate anterior shield lobe over the rostrum which is truncate underneath, and the presence of granules on the shield surface that obscure the pattern on the rear part of the shield as diagnostic of the species.

Detection and inspection methods

The galling symptoms induced on affected fuchsias are generally accepted as diagnostic of the presence of *A. fuchsiae*. However, due to their small size the mites require microscopic examination to confirm identify beyond all doubt. Examination of galls with a hand lens will usually reveal masses of the yellowish fusiform mites especially within folds of and leaf hairs of the deformed tissues will usually be enough to confirm the mites' presence. The mite can be difficult to detect on resistant cultivars or at early stages where galling may not be severe, examination with a hand lens should focus on the base of leaves, leaf buds and flower buds where mites are more likely to be present.

PATHWAYS FOR MOVEMENT

On plants in the field, dispersal can be expected to be principally by wind, insects, especially pollinators, and in its native range possibly hummingbirds (Koehler *et al.*, 1985). Movement of infested plants and cuttings is also important given the ease of vegetative propagation in fuchsias: this is considered to be the pathway of introduction into mainland Europe, the Channel Islands and the United Kingdom (Ostojá-Starzewski & Eyre, 2012; EFSA PHL, 2014). In the case of introductions to Jersey and Germany it is known that the mite was introduced with live plant material which avoided plant health checks by being brought in with personal luggage by *Fuchsia* enthusiasts from South America and the USA (Anderson and MacLeod, 2007; EPPO, 2012).

PEST SIGNIFICANCE

Economic impact

There has been no formal economic impact assessment of *A. fuchsiae*. The mite causes severe damage to fuchsias and must be ranked as a major pest of all but the most resistant species and cultivars. In California, where some growers had ceased to grow Fuchsia due to this mite (Koehler *et al.*, 1985) it has been rated as a class B pest, enabling county authorities to take exclusion measures. In the United Kingdom commercial *Fuchsia* production had a value of 4 million GBP in 2004 (EFSA PHL, 2014) and there are national and local societies dedicated to the plant. More than 55 million cuttings or rooted plants were imported into the EU in 2010 (EPPO, 2012). Anderson and MacLeod (2007) and EFSA PHL (2014) concluded that, due to this relatively high economic value of Fuchsia production, there was a risk not only to production nurseries but there may be a decline in the popularity of fuchsia. This effect may apply across the EPPO region if the mite spreads across Western Europe.

Control

Good sanitation is an essential aspect of control. Affected material should be removed and destroyed and the risks of mite spread associated movement of plants and cuttings from areas where *A. fuchsiae* is prevalent should be carefully considered (Koehler *et al.*, 1985, Salisbury *et al.*, 2014). Enclosing affected material in a polythene bag and exposing to the sun for a few hours will kill the mites, but selective heat treatment (e.g. 3 h at 45°C) damages the plants unacceptably (Koehler *et al.*, 1985). For the less susceptible cultivars, pruning alone was moderately successful in maintaining a good appearance (Koehler *et al.*, 1985), but may not control mite numbers. See notes under 'Hosts' for details of resistant species.

Control with pesticides is difficult and pre-symptom treatment is required to be effective (Ostojá-Starzewski & Eyre, 2012). Several pesticides (many now unavailable) were tested in California and some suppression of the mite population was achieved for some products, in some cases lasting several weeks (Koehler *et al.*, 1985). It has been suggested that at least three applications of acaricides at four-day intervals may break the mite life cycle, based on egg hatching time of 4 to 7 days (Ostojá-Starzewski & Eyre, 2012).

There are several mesostigmatid mites (Phytoseiidae) that feed on eriophyoid mites, although *A. fuchsiae* are relatively inaccessible to these predators once the galls have formed. *Neoseiulus californicus* has been found associated with *A. fuchsiae* in California and was thought to be one of the predators responsible for some reduction in fuchsia gall mite populations (Koehler *et al.*, 1985). *Amblyseius andersoni* is advertised as controlling *A. fuchsiae* by some suppliers of biological control agents to home gardeners in the United Kingdom (RHS, 2021), although detailed information on success with this predator is lacking.

Phytosanitary risk

Fuchsia plants can be found in open fields and under protected cultivation, as well as in gardens, in most of the EPPO region. In Europe, the climatic conditions do not seem to be the key limiting factor for the spread and establishment in open fields and under protected conditions (EFSA PHL 2014). With an apparent preference for mild oceanic conditions, it is considered to have the potential for becoming established in Atlantic areas of western Europe, and probably elsewhere, wherever suitable hosts are present, in the open ground or under protection (Baker *et al* 2014; CABI 2020). The mite is an extremely damaging pest of a moderately important ornamental plant, propagated commercially on a substantial scale. In addition it can be difficult to detect especially on more resistant cultivars, and it is difficult to control, and it is difficult to control. Therefore *A. fuchsiae* clearly presents a significant risk for *Fuchsia* production in the EPPO region.

PHYTOSANITARY MEASURES

As the main pathway is the movement of plants for planting, measures should be applied to guarantee that traded *Fuchsia* plants are pest-free. Possible measures are as follows (Picard *et al*., 2018): plants for planting of *Fuchsia* spp. should be produced in areas known to be free from *Aculops fuchsiae*, or in sites of production where inspections during the previous growing season did not detect symptoms on the plants, or on the mother plants from which they were derived. Alternatively, plants may be treated with an appropriate chemical treatment before dispatch, following which the plants have been inspected and no symptoms seen.

Where outbreaks do occur in new regions eradication measures should be attempted especially where there is a link to movement of plants rather than ‘natural’ spread.

Raising awareness among fuchsia enthusiasts is critical to avoid movement of infested plants to new areas and to allow rapid identification of new outbreaks.

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Datasheet history

This datasheet was first published in 1997 in the second edition of 'Quarantine Pests for Europe', and revised in 2022. It is now maintained in an electronic format in the EPPO Global Database. The sections on 'Identity', ‘Hosts’, and 'Geographical distribution' are automatically updated from the database. For other sections, the date of last revision is indicated on the right.

CABI/EPPO (1997) *Quarantine Pests for Europe (2nd edition)*. CABI, Wallingford (GB).

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