

*Bemisia tabaci*  [简体中文](#) [正體中文](#)

**System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Insecta	Homoptera	Aleyrodidae

**Common name** Weisse Fliege (German), sweet potato whitefly (English), cotton whitefly (English), mosca blanca (English, Dominican Republic)

**Synonym** *Aleyrodes tabaci*, Gennadius  
*Aleyrodes inconspicua*, Quaintance  
*Bemisia inconspicua*, Quaintance  
*Bemisia emiliae*, Corbett  
*Bemisia signata*, Bodnar  
*Bemisia bahiana*, Bondar  
*Bemisia costa-limai*, Bondar  
*Bemisia gossypiperda*, Misra and Lamba  
*Bemisia achyranthes*, Singh  
*Bemisia hibisci*, Takahashi  
*Bemisia longispina*, Priesner and Hosny  
*Bemisia gossypiperda*, var. *mosaicivectura* Ghesquiere  
*Bemisia goldingi*, Corbett  
*Bemisia nigeriensis*, Corbett  
*Bemisia rhodesiaensis*, Corbett  
*Bemisia tabaci*, (Gennadius) Takahashi  
*Bemisia manihotis*, Frappa  
*Bemisia vayssierei*, Frappa  
*Bemisia (Neobemisia) hibisci*, Visnya  
*Bemisia (Neobemisia) rhodesiaensis*, Visnya  
*Bemisia lonicerae*, Takahashi  
*Bemisia minima*, Danzig  
*Bemisia miniscula*, Danzig

**Similar species** *Trialeurodes vaporariorum*

**Summary** *Bemisia tabaci* has been reported from all continents except Antarctica. Over 900 host plants have been recorded for *B. tabaci* and it reportedly transmits 111 virus species. It is believed that *B. tabaci* has been spread throughout the world through the transport of plant products that were infested with whiteflies. Once established, *B. tabaci* quickly spreads and through its feeding habits and the transmission of diseases, it causes destruction to crops around the world. *B. tabaci* is believed to be a species complex, with a number of recognised biotypes and two described extant cryptic species.



[view this species on IUCN Red List](#)

## Species Description

Eggs, deposited on the underside of leaves, (Note: circular egg deposition for *Bemisia* is rare) are tiny, oval-shaped, about 0.25mm in diameter and stand vertically on the leaf surface. Newly laid eggs are white then turn brownish. Upon hatching the first instar nymph (0.3mm in length), commonly called the "crawler", moves about the leaf in search of a place to insert its needle-like mouthparts into the plant to suck up plant phloem. When the crawler finds this site, it molts to the second instar; its legs are pulled up under its body and the rest of the immature stage is sessile. There are three additional nymphal instars (0.4-0.8mm) with the successive stage molting to a slightly larger form. The last nymphal instar develops red eye spots and is commonly called the "red-eyed nymph." This stage is often incorrectly called the pupal stage; incorrect because insects in this order Hemiptera have incomplete metamorphosis, thus there is no pupa. Throughout the nymphal stages, the body of the whitefly is opaque white in colour and is covered by a waxy exoskeleton. As nymphs feed, they excrete large quantities of liquid waste in the form of honeydew. Honeydew is rich in plant carbohydrates and as whiteflies feed and excrete, this waste is distributed onto plant leaves, flowers and fruit and supports the growth of sooty mould fungus, causing the plant to turn black. Adult whitefly are about 1mm long with two pairs of white wings and light yellow bodies. Their bodies are covered with a waxy powdery material. While whitefly adults can be seen on all plant surfaces, they spend most of their time feeding, mating and ovipositing on the under surfaces of leaves. Males and females are present, typically in even ratios, and mating takes place after an elaborate courtship period. Whiteflies have an interesting biology (called arrhenotoky) in which females can lay eggs that have not been fertilised and these eggs will result in male offspring. Fertilised eggs will result in female offspring. Each female can produce as many as 200 eggs in her lifetime.. It takes 30-40 days to develop from egg to adult, depending on the temperature (OISAT, 2004). The EPPO (2004) states that, "Infested plants may exhibit a range of symptoms due to direct feeding damage, contamination with honeydew and associated sooty moulds, whitefly-transmitted viruses and phytotoxic responses. There may be one, or a combination of the following symptoms: chlorotic spotting, vein yellowing, intervein yellowing, leaf yellowing, yellow blotching of leaves, yellow mosaic of leaves, leaf curling, leaf crumpling, leaf vein thickening, leaf enations, leaf cupping, stem twisting, plant stunting, wilting and leaf loss. Phytotoxic responses such as a severe silvering of courgette and melon leaves usually indicate the presence of a *Bemisia argentifolii* infestation."

Please see PaDIL (Pests and Diseases Image Library) Species Content Page [Bugs: Silverleaf whitefly](#) for high quality diagnostic and overview images.

## Notes

Considerable research has been done on the taxonomy of *Bemisia tabaci*, and Perring (2001) proposed 7 distinct groups within the complex. *Bemisia tabaci* is believed to be a species complex, with a number of recognised biotypes and two described extant cryptic species. Nineteen biotypes have been identified based on non-specific esterase banding patterns (biotypes A-T), and the two described species are *Bemisia tabaci* and *Bemisia argentifolii* Bellows and Perring (Bellows *et al.* 1994). *B. argentifolii* carries the common name of silverleaf whitefly.

## Lifecycle Stages

McAuslane (2000) outlines the life cycle of *Bemisia tabaci* stating that, "*Bemisia tabaci* eggs are oval in shape and somewhat tapered towards the distal end. The egg is pearly white when first laid but darkens over time. At 25 °C, the eggs will hatch in six to seven days. The first nymphal instar is capable of limited movement and is called the crawler. The dorsal surface of the crawler is convex while the ventral surface, appressed to the leaf surface, is flat. The crawlers usually move only a few centimeters in search of a feeding site but can move to another leaf on the same plant. After they have begun feeding, they will molt to the second nymphal instar, usually two to three days after eclosion from the egg. The second, third and fourth nymphal instars are immobile with atrophied legs and antennae, and small eyes. The nymphs secrete a waxy material at the margins of their body that helps adhere them to the leaf surface. The second and third nymphal instars each last about two to three days. The red-eyed nymphal stage is sometimes called the "pupal stage". There is no molt between the fourth nymphal instar and the red-eyed nymphal stage but there are morphological differences. The fourth and red-eyed nymphal stages combined lasts for five to six days. The stage gets its name from the prominent red eyes that are much larger than the eyes of earlier nymphal instars." Adult females insert their eggs into the foliage of host plants and the newly-hatched nymphs settle for larval life with little movement on the plant chosen by the parent. Winged adults fly about, however, and move between crops ( Byrne *et al.* 1996). Individual females often feed on a variety of different plants, including crops and weeds within crops ( Byrne *et al.* 1990). The species of plants fed upon differ in quality, and while some plant species are best for survival, others are better for egg production ( Costa *et al.* 1991). Adults live for a week or more ( Byrne & Bellows 1991) and much of the egg production depends on the food ingested during adulthood."

## Habitat Description

The EPPO (2004) states that, "*Bemisia tabaci* are usually detected by close examination of the undersides of leaves, which will reveal adults and/or nymphs. Shaking the plant may disturb the small white adults, which flutter out and quickly resettle. Adults may also be found on sticky traps placed above infested plants."

## General Impacts

600 host plants have been cited in, Oliveira *et al.* (2001). *Bemisia tabaci* possibly originated in India (Fishpool & Burban, 1994) and as a result of widespread dispersal, particularly during the last 15 years, is now distributed nearly worldwide. *B. tabaci* is also a vector of over 100 plant viruses in the genera *Begomovirus* (Geminiviridae), *Crinivirus* (Closteroviridae) and *Carlavirus* or *Ipomovirus* (Potyviridae) (Jones, 2003). Damage is caused not only by direct feeding, but also through transmission of viruses. *Begomoviruses* are the most numerous of the *B. tabaci* transmitted viruses and can cause crop yield losses of between 20% and 100% (Brown & Bird, 1992). The EPPO (2004) states that, "Since the early 1980s, *B. tabaci* has caused escalating problems to both field and protected agricultural crops and ornamental plants. Heavy infestations of *B. tabaci* and *B. argentifolii* may reduce host vigour and growth, cause chlorosis and uneven ripening, and induce physiological disorders. The larvae produce honeydew on which sooty moulds grow, reducing the photosynthetic capabilities of the plant, resulting in defoliation and stunting. *B. tabaci* is known to be a potentially damaging pest of crops such as cotton, brassicas, cucurbits, okra, solanums in the tropics and subtropics (Goolsby *et al.* 2004). Ellsworth and Martinez-Carrillo (2001) state that, "*B. tabaci*'s small size belies its ability to move relatively large distances locally, placing many hosts within communities at risk of infestation. This ability to disperse is made worse by its extensive movement through commerce of plant products around the globe. The small size and rapid reproductive potential are other characteristics that result in explosive population growth. The damage potential of this pest as a direct plant stressor, virus vector, and quality reducer (e.g., by contamination with excreta) is substantial. These attributes, among others, render this species a shared pest within agricultural communities." Cassava mosaic disease (CMD) and cassava mosaic *geminiviruses* (CMGs) are transmitted by the whitefly (Colvin *et al.* 2004) destroying cassava crops. Cassava (*Manihot esculenta*) is one of the most widely grown staple food crops in sub-Saharan Africa. It is particularly important to the poorest farmers because of its role in food security and as a source of income. Agriculture in tropical and subtropical regions are most threatened, with crops such as beans, cucurbits, peppers, cassavas and tomatoes particularly being affected (Brown, 1994). Tomato yellow leaf curl virus (TYLCV) limits tomato production in several geographic regions, including the Middle East and Far East (Zeidan *et al.* 1998).



# GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Bemisia tabaci*

## Management Info

**Integrated Pest Management:** The [Whitefly IPM Project](#) provides a paradigm for future work on cassava mosaic begemoviruses and whiteflies on cassava in both Africa and elsewhere. Ellsworth and Martinez-Carrillo (2001) offer an extensive integrated management approach. The report details the exact plans and steps that are necessary to adopt and follow through with the integrated pest management guidelines suggested. A summary of the guidelines sketches out the steps to be taken.

For details on preventative measures, chemical, physical, cultural and biological control options, please see [management information](#).

**Principal source:** [Diagnostic protocols for regulated pests: Bemisia tabaci \(EPPO, 2004\)](#)

[Ellsworth and Martinez-Carrillo, 2001](#) IPM for *Bemisia tabaci*: a case study from North America.

**Compiler:** National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

**Review:** Thomas M. Perring, Professor\ Department of Entomology\ University of California USA

**Publication date:** 2005-10-10

## ALIEN RANGE

[1] AFRICA	[1] ATLANTIC - WESTERN CENTRAL
[1] AUSTRALIA	[1] BANGLADESH
[1] BERMUDA	[1] BRAZIL
[1] BURKINA FASO	[1] BURUNDI
[1] CANADA	[1] COOK ISLANDS
[1] COSTA RICA	[1] CURACAO
[1] DOMINICAN REPUBLIC	[1] EAST AFRICA
[1] EGYPT	[1] EL SALVADOR
[1] EUROPE	[1] FIJI
[1] FRENCH POLYNESIA	[1] GABON
[1] GREECE	[1] GUINEA
[1] INDIA	[1] INDONESIA
[1] IRAN, ISLAMIC REPUBLIC OF	[1] ISRAEL
[1] JAMAICA	[1] JAPAN
[1] JORDAN	[1] KIRIBATI
[1] LATIN AMERICA	[1] MALTA
[1] MEDITERRANEAN AREA	[1] MEDITERRANEAN & BLACK SEA
[1] MEXICO	[1] MICRONESIA, FEDERATED STATES OF
[1] NEW CALEDONIA	[1] NIUE
[1] PAKISTAN	[1] PALAU
[1] PAPUA NEW GUINEA	[1] PORTUGAL
[1] PUERTO RICO	[1] REUNION
[1] SAINT KITTS AND NEVIS	[1] SAINT LUCIA
[1] SAMOA	[1] SENEGAL
[1] SOUTH AMERICA	[1] SUDAN
[1] TANZANIA, UNITED REPUBLIC OF	[1] THAILAND
[1] TURKEY	[1] UGANDA
[19] UNITED STATES	[1] VANUATU

## BIBLIOGRAPHY

77 references found for *Bemisia tabaci*

### Management information

Global Invasive Species Database (GISD) 2024. Species profile *Bemisia tabaci*. Available from: <https://www.iucngisd.org/gisd/species.php?sc=106> [Accessed 25 October 2024]

Albajes, R. 2003. Integrated control of *Bemisia tabaci* in the Mediterranean basin. In Abstracts: 3rd International *Bemisia* Workshop, March 17-20, 2003. Barcelona

**Summary:** Discussion about an IPM in the Mediterranean area.

Attard, D., 2002. Methods of controlling Tomato yellow leaf curl virus (TYLCV) and its vector *Bemisia tabaci* in the Maltese Islands. EPPO Bulletin 32 (1) , 39-40

Attique, M.R., Rafiq, M., Ghaffar, A., Ahmad, Z., and Mohyuddin, A.I. 2003. Hosts of *Bemisia tabaci* (Genn.) (Homoptera: Aleyrodidae) in cotton areas of Punjab, Pakistan. *Crop Protection*. 22 (5): 715-720.

Bedford, I.D. and Olivier, D.J. 2003. The European Whitefly Studies Network. In Abstracts: 3rd International *Bemisia* Workshop, March 17-20, 2003. Barcelona

**Summary:** A European Whitefly Studies Network has been formed to share information about whiteflies and their control.

Bellamy, D.E., Asplen, M.K., and Byrne, D.N. 2004. Impact of *Eretmocerus eremicus* (Hymenoptera: Aphelinidae) on open-field *Bemisia tabaci* (Homoptera: Aleyrodidae) populations. *Biological Control*. 29 (2): 227-234.

Bernays, E. A. 1999. *When host choice is a problem for a generalist herbivore: experiments with the whitefly, Bemisia tabaci*. *Ecological Entomology* 24:260-267

**Summary:** Studying investigating the biological control of species.

Brown, S., McLaughlin, W., Jerez, I.T., and Brown, J.K. 2002. Identification and distribution of *Bemisia tabaci* (Gennadius) (Homoptera: Aleyrodidae) haplotypes in Jamaica. *Tropical Agriculture*. 79 (3): 140-149.

Chu, C., Jackson, C.G., Alexander, P.J., Karut, K., and Henneberry, T.J. 2003. Plastic cup traps equipped with light-emitting diodes for monitoring adult *Bemisia tabaci* (Homoptera: Aleyrodidae). *Journal of Economic Entomology*. 96 (3): 543-546.

Colvin, J., C. A. Omongo, M. N. Maruthi, G. W. Otim-Nape, and J. M. Thresh. 2004. *Blackwell Publishing, Ltd. Dual begomovirus infections and high Bemisia tabaci populations: two factors driving the spread of a cassava mosaic disease pandemic*. *Plant Pathology*.

**Summary:** Informative research paper on the spread of species and the diseases it carries.

de Oliveira, M.R.V., Amancio, E., Laumann, R.A., and Gomes, L. de O. 2003. Natural enemies of *Bemisia tabaci* (Gennadius) B biotype and *Trialeurodes vaporariorum* (Westwood) (Homoptera: Aleyrodidae) in Brasilia, Brazil. *Neotropical Entomology*. 32 (1): 151-154.

[Department for Environment, Food and Rural Affairs\(DEFRA\), 2001. Bemisia tabaci The Tobacco Whitefly. Central Science Laboratory.](#)

**Summary:** Information on description, economic importance, distribution, habitat, history, growth, and impacts and management of species.

Available from: <http://www.defra.gov.uk/plant/pestnote/bt.htm> [Accessed 24 September 2004]

Ellsworth, P. and Naranjo, S. 2003. Whiteflies in Arizona: an IPM success story. In Abstracts: 3rd International *Bemisia* Workshop, March 17-20, 2003. Barcelona

**Summary:** Report into the success of the IPM used in Arizona for whiteflies.

European and Mediterranean Plant Protection Organization (EPPO), 2004. Diagnostic protocols for regulated pests: *Bemisia tabaci*. EPPO Bulletin 34: 281-288.

**Summary:** Studying investigating the biological control of species.

[FFTC \(Food and Fertilizer Technology Center\), 2002. Biological Characteristics and Forecasting outbreaks of the whitefly, Bemisia tabaci, A vector of diseases in In South Africa.](#)

**Summary:** Information on description, economic importance, distribution, habitat, history, growth, and impacts and management of species.

Available from: <http://www.agnet.org/library/article/tb135.html> [Accessed 24 September 2004]

Genscoyly, I., Horowitz, A.R., Sezgin, F., and Oncuer, C. 2003. Effect of drip and furrow irrigation methods on *Bemisia tabaci* populations in cotton fields. *Phytoparasitica*. 31 (2): 139-143.

Goolsby, J. A., P. J. Debarro, A. A. Kirck, R. W. Sutherst, .: Canas, M. A. Cioperlik, P. C. Ellsworth, J. R. Gould, D. M. Hartley, K. A. Hoelmer, S. E. Naranjo, M. Rose, W. J. Roltsch, Raul A. Ruiz, C. H. Pickett, and D. C. Vacek. 2004. *Post-release evaluation of biological control of Bemisia tabaci biotype B in the USA and the development of predictive tools to guide introductions for other countries*. *Biological Control*.

**Summary:** Studying investigating the biological control of species.

Hilje, L. 2003. Whitefly management in Latin America and the Caribbean. In Abstracts: 3rd International *Bemisia* Workshop, March 17-20, 2003. Barcelona

**Summary:** Report on management of whitefly in Latin America and the Caribbean.

Jazzar, C. and About-Fakhr Hammad, E. 2003. The efficacy of enhanced aqueous extracts of *Melia azedarach* leaves and fruits integrated with the *Camptotylus reuteri* releases against the sweet potato whitefly nymphs. *Bulletin of Insectology*. 56 (2): 269-275.

Jazzar, C., and E. A. F. Hammad. 2004. *Efficacy of multiple biocontrol agents against the sweet potato whitefly Bemisia tabaci (Gennadius) (Homoptera: Aleyrodidae) on tomato*. *Journal of Applied Entomology* 128:188-194.

**Summary:** Studying investigating the biological control of species.

Lakra, B.S. 2003. Effect of date of planting on whitefly population, leaf curl incidence and yield of potato cultivars. *Journal of the Indian Potato Association*. 30 (1-2): 115-116.

Legg, J.P., Otim, M., Owor, B., Ntawuruhunga, P., Ndyetabura, I., Obiero, H., Kyamanywa, S., Colvin, J. and Gerling, D. 2003. Managing cassava mosaic geminiviruses and their *Bemisia tabaci* vector in Africa: current practice and future opportunities. In Abstracts: 3rd International *Bemisia* Workshop, March 17-20, 2003. Barcelona

**Summary:** An IPM involving whitefly management is currently being developed in Africa.

Legg, J. P., R. French, D. Rogan, G. Okao-Okuja, and J. K. Browns. 2002. *A distinct Bemisia tabaci (Gennadius) (Homoptera: Sternorrhyncha: Aleyrodidae) genotype cluster is associated with the epidemic of severe cassava mosaic virus disease in Uganda*. *Molecular Ecology* 11:1219-1229.

**Summary:** Studying investigating the biological control of species.

Maleque, M.A., Kabir, K.H., Khanam, N.N., Alam, S.N., and Islam, N. 2002. Combined effects of planting date and variety of tomato on the incidence of whitefly, *Bemisia tabaci* gennadius and virus diseases. *Bangladesh Journal of Zoology*. 30 (2): 159-165.



# GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Bemisia tabaci*

Martinez-Carrillo, J.L. 2003. The silverleaf whitefly in Mexico. In Abstracts: 3rd International *Bemisia* Workshop, March 17-20, 2003. Barcelona

**Summary:** Whiteflies in Mexico maybe becoming resistant to the insecticides used.

[Mau, R. F. L., and J. L. M. Kessing. 1992. \*Bemisia tabaci\* \(Gennadius\). Department of Entomology: Crop Knowledge Master.](#)

**Summary:** Information on description, economic importance, distribution, habitat, history, growth, and impacts and management of species.

Available from: [http://www.extento.hawaii.edu/kbase/Crop/Type/b\\_tabaci.htm](http://www.extento.hawaii.edu/kbase/Crop/Type/b_tabaci.htm) [Accessed 24 September 2004]

[McAuslane, H. K. 2002. \*Bemisia tabaci\*. Featured Creatures: University of Florida Institute of Food and Agricultural Sciences: Department of Entomology and Nematology.](#)

**Summary:** Information on description, economic importance, distribution, habitat, history, growth, and impacts and management of species.

Available from: [http://creatures.ifas.ufl.edu/veg/leaf/silverleaf\\_whitefly.htm](http://creatures.ifas.ufl.edu/veg/leaf/silverleaf_whitefly.htm) [Accessed 24 September 2004]

Naranjo, S.E., Ellsworth, P.C., and Hagler, J.R. 2004. Conservation of natural enemies in cotton: role of insect growth regulators in management of *Bemisia tabaci*. *Biological Control*. 30 (1): 52-72.

Naranjo, S.E., Hagler, J.R., and Ellsworth, P.C. 2003. Improved conservation of natural enemies with selective management systems for *Bemisia tabaci* (Homoptera: Aleyrodidae) in cotton. *Biocontrol Science and Technology*. 13 (6): 571-587.

Nomikou, M., Janssen, A., and Sabelis, M.W. 2003. Herbivore host plant selection: Whitefly learns to avoid host plants that harbour predators of her offspring. *Oecologia*. 136 (3): 484-488.

Oji, F.L. 2003. Farmer field school: an IPM training and extension model for pest management. In Abstracts: 3rd International *Bemisia* Workshop, March 17-20, 2003. Barcelona

**Summary:** Study into effectiveness of control using different cultivars, cultural practices and chemicals in Sudan.

Oliveira, M.R.V., T.J. Henneberry, and P. Anderson. 2001. History, current status, and collaborative research projects for *Bemisia tabaci*. *Crop Protection*. 20: 709-723.

Otoidobiga, L.C., Vincent, C., and Stewart, R.K. 2004. Relative abundance of *Bemisia tabaci* Gennadius (Homoptera: Aleyrodidae) and its parasitoids, and the impact of augmentative release of *Eretmocerus* spp. (Hymenoptera: Aphelinidae) on the population dynamics of the pest in Burkina Faso (West Africa). *International Journal of Pest Management*. 50 (1): 11-16.

Sharma, P., Rishi, N., and Malathi, V.G. 2004. Nucleic acid probe based technique for detection of cotton leaf curl virus in India. *Indian Journal of Biotechnology*. 3 (1): 133-135.

Sseruwagi, P., Sserubombwe, W.S., Legg, J.P., Ndunguru, J., and Thresh, J.M. 2004. Methods of surveying the incidence and severity of cassava mosaic disease and whitefly vector populations on cassava in Africa: A review. *Virus Research*. 100 (1): 129-142.

Stansly, P.A., Calvo, J. and Urbaneja, A. 2003. Calibration of release rates for *Eretmocerus mundus* Mercet (Hymenoptera: Aphelinidae) for control of *Bemisia tabaci* in sweet pepper and tomato. In Abstracts: 3rd International *Bemisia* Workshop, March 17-20, 2003. Barcelona

**Summary:** Experiment into the best way of using *Eretmocerus mundus* to control the whitefly.

Stonor, J., P. Hart, M. Gunther, P. DeBarro, and M. A. Rezaian. 2003. *Tomato leaf curl geminivirus in Australia: occurrence, detection, sequence diversity and host range*. *Plant Pathology* 52: 379-388.

**Summary:** Studying investigating the biological control of species.

Sun C-G., Zhang, Q-W., Xu J., Wang, Y-X., and Liu, J-L. 2003. Effects of transgenic Bt cotton and transgenic Bt+CpTI cotton on population dynamics of main cotton pests and their natural enemies. *Acta Entomologica Sinica*. 46 (6): 705-712.

Thompson, W. M. O. 2002. *A new host plant species for the cassava biotype of Bemisia tabaci (Gennadius) (Hom., Aleyrodidae)*. *Journal of Applied Entomology* 127: 374-376

**Summary:** Studying investigating the biological control of species.

Urbaneja, A., Stansly, P.A., Beltran, D., Sanchez, E. and Gallego, A. 2003. Life history of *Eretmocerus mundus* Mercet (Hymenoptera: Aphelinidae) on *Bemisia tabaci* biotype Q (Homoptera: Aleyrodidae) using sweet pepper and tomato. In Abstracts: 3rd International *Bemisia* Workshop, March 17-20, 2003. Barcelona

**Summary:** Experiment into the effectiveness of *Eretmocerus mundus* in controlling the whitefly.

Urbaneja, A., Stansly, P.H., Calvo, J., Beltran, D. Lara, L. and van der Blom, J. 2003. Commercial-scale trials of *Eretmocerus* spp. Mercet (Hymenoptera:Aphelinidae) for control of *Bemisia tabaci* in tomato and sweet pepper in southeastern Spain. In Abstracts: 3rd International *Bemisia* Workshop, March 17-20, 2003. Barcelona

**Summary:** Experiments involving using parasites of whitefly native to the Mediterranean and those of an American origin.

[Varnham, K. 2006. Non-native species in UK Overseas Territories: a review. JNCC Report 372. Peterborough: United Kingdom.](#)

**Summary:** This database compiles information on alien species from British Overseas Territories.

Available from: <http://www.jncc.gov.uk/page-3660> [Accessed 10 November 2009]

[Walker, K. 2006. Silverleaf whitefly \(\*Bemisia tabaci\*\) Pest and Diseases Image Library. Updated on 17/05/2006 3:04:01 PM.](#)

**Summary:** PaDIL (Pests and Diseases Image Library) is a Commonwealth Government initiative, developed and built by Museum Victoria's Online Publishing Team, with support provided by DAFF (Department of Agriculture, Fisheries and Forestry) and PHA (Plant Health Australia), a non-profit public company. Project partners also include Museum Victoria, the Western Australian Department of Agriculture and the Queensland University of Technology. The aim of the project is: 1) Production of high quality images showing primarily exotic targeted organisms of plant health concern to Australia. 2) Assist with plant health diagnostics in all areas, from initial to high level. 3) Capacity building for diagnostics in plant health, including linkage developments between training and research organisations. 4) Create and use educational tools for training undergraduates/postgraduates. 5) Engender public awareness about plant health concerns in Australia. PaDIL is available from : <http://www.padil.gov.au/aboutOverview.aspx>, this page is available from:

<http://www.padil.gov.au/viewPestDiagnosticImages.aspx?id=290> [Accessed 6 October 2006]

## General information

Akhtar, K.P., Hussain, M., Khan, A.I., Haq, M.A., and Iqbal, M.M. 2004. Influence of plant age, whitefly population and cultivar resistance on infection of cotton plants by cotton leaf curl virus (CLCuV) in Pakistan. *Field Crops Research*. 86 (1): 15-21.

- Attique, M.R., Rafiq, M., and Ghaffar, A. 2003. Role of weed hosts in the population buildup of *Bemisia tabaci* (Gen.) (Aleyrodidae: Homoptera) and its carry over to cotton. *Pakistan Journal of Zoology*. 35 (2): 91-94.
- Bellows T. S Jr, Perring T M, Gill R. J, Headrick D. H. 1994. Description of a species of *Bemisia* (Homoptera: Aleyrodidae). *Annals of the Entomological Society of America* 87: 195-206
- Bigirimana, S; Barumbanze, P; Obonyo, R; and Legg, J. P. 2004. First evidence for the spread of East African cassava mosaic virus-Uganda (EACMV-UG) and the pandemic of severe cassava mosaic disease to Burundi. *Plant Pathology (Oxford)*. 53(2).
- Boissot, N., Lafortune, D., Pavis, C., and Sauvion, N. 2003. Field resistance to *Bemisia tabaci* in *Cucumis melo*. *Hortscience*. 38 (1): 77-80.
- Byamukama, E., Gibson, R.W., Aritua, V., and Adipala, E. 2004. Within-crop spread of sweet potato virus disease and the population dynamics of its whitefly and aphid vectors. *Crop Protection*. 23 (2): 109-116.
- de Albergaria, N.M.M.S., Cividanes, F.J., and Doria, H.O.S. 2003. Ecological life table of *Bemisia tabaci* (Genn.) B-biotype (Hemiptera: Aleyrodidae). *Neotropical Entomology*. 32 (4): 559-563.
- Delatte, H., Dalmon, A., Rist, D., Soustrade, I., Wuster, G., Lett, J.M., Goldbach, R.W., Peterschmitt, M., and Reynaud, B. 2003. Tomato yellow leaf curl virus can be acquired and transmitted by *Bemisia tabaci* (Gennadius) from tomato fruit. *Plant Disease*. 87 (11): 1297-1300.
- Ghahhari, H., Bayat-Asadi, H., and Shojai, M. 2001. Effects of leaf factors and insecticide residues on behavior and biology of sweet potato whitefly *Bemisia tabaci* (Hom: Aleyrodidae). *Journal of Entomological Society of Iran*. 21 (2): 1-23.
- Horowitz, A.R., Denholm, I., Gorman, K., Cenis, J.L., Kotsedalov, S., and Ishaaya, I. 2003. Biotype Q of *Bemisia tabaci* identified in Israel. *Phytoparasitica*. 31 (1): 94-98
- Hu, J.S., Gelman, D.B., and Blackburn, M.B. 2003. Age-specific interaction between the parasitoid, *Encarsia formosa* and its host, the silverleaf whitefly, *Bemisia tabaci* (Strain B). *Journal of Insect Science (Tucson)*. 3: 1-10.
- [ITIS \(Integrated Taxonomic Information System\), 2004. Online Database Bemisia tabaci](#)
- Summary:** An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.
- Available from: [http://www.itis.gov/servlet/SingleRpt?search\\_topic=TSN&search\\_value=200547](http://www.itis.gov/servlet/SingleRpt?search_topic=TSN&search_value=200547) [Accessed December 31 2004]
- Jones, D.R. 2003. Plant viruses transmitted by whiteflies. *European Journal of Plant Pathology*. 109 (3): 195-219.
- Kashina, B.D., Mabagala, R.B., and Mpunami, A.A. 2003. Biomolecular relationships among isolates of Tomato yellow leaf curl Tanzania virus. *Phytoparasitica*. 31 (2): 188-199.
- Ko, C.-C., Chen, C.-N., and Wang, C.-H. 2002. A review of taxonomic studies on the *Bemisia tabaci* species complex. *Formosan Entomologist*. 22 (4): 307-341.
- Legg, J. P; Ndjelassili, F; and Okao-Okuja, G. 2004. First report of cassava mosaic disease and cassava mosaic geminiviruses in Gabon. *Plant Pathology (Oxford)*. 53(2).
- Louro, D; Quintot, A; Neto, E; Fernandes, J. E; Marian, D; Vecchiati, M; Caciagli, P; and Vaira, A. M. 2004 Occurrence of Cucumber vein yellowing virus in cucurbitaceous species in southern Portugal. *Plant Pathology (Oxford)*. 53(2)
- Mandour, N.S., Ren, S.-X., Qiu, B.-L., and Fazal, S. 2003. Effects of extraction from nymphs, exuviae and adults of *Bemisia tabaci* B biotype on the behavior of *Encarsia bimaculata* Heraty et Polaszek (Hymenoptera: Aphelinidae). *Acta Entomologica Sinica*. 46 (6): 745-748.
- Manzano, M.R., van Lenteren, J.C., and Cardona, C. 2003. Influence of pesticide treatments on the dynamics of whiteflies and associated parasitoids in snap bean fields. *Biocontrol (Dordrecht)*. 48 (6): 685-693.
- Maruthi, M.N., Muniyappa, V., Green, S.K., Colvin, J., and Hanson, P. 2003. Resistance of tomato and sweet-pepper genotypes to Tomato leaf curl Bangalore virus and its vector *Bemisia tabaci*. *International Journal of Pest Management*. 49 (4): 297-303.
- Moghahed, M.I. 2003. Influence of intercropping on population dynamics of major insect-pests of potato (*Solanum tuberosum*) in North Sinai Governorate, Egypt. *Indian Journal of Agricultural Sciences*. 73 (10): 546-549
- Morales, F.J., and Jones, P.G. 2004. The ecology and epidemiology of whitefly-transmitted viruses in Latin America. *Virus Research*. 100 (1): 57-65.
- Nirgianaki, A., Banks, G.K., Frohlich, D.R., Veneti, Z., Braig, H.R., Miller, T.A., Bedford, I.D., Markham, P.G., Savakis, C., and Bourtzis, K. 2003. Wolbachia infections of the whitefly *Bemisia tabaci*. *Current Microbiology*. 47 (2): 93-101.
- Nomikou, M., Janssen, A., and Sabelis, M.W. 2003a. Phytoseiid predator of whitefly feeds on plant tissue. *Experimental and Applied Acarology*. 31 (1-2): 27-36. Nomikou, M., Janssen, A., and Sabelis, M.W. 2003a. Phytoseiid predator of whitefly feeds on plant tissue. *Experimental and Applied Acarology*. 31 (1-2): 27-36.
- Nomikou, M., Janssen, A., and Sabelis, M.W. 2003b. Phytoseiid predators of whiteflies feed and reproduce on non-prey food sources. *Experimental and Applied Acarology*. 31 (1-2): 15-26
- Okao-Okuja, G., Legg, J.P., Traore, L., and Jorge, M.A. 2004. Viruses associated with cassava mosaic disease in Senegal and Guinea Conakry. *Journal of Phytopathology*. 152 (2): 69-76.
- Perring, T.M. 2001. The *Bemisia tabaci* species complex. *Crop Protection*. 20: 725-737
- Polston, J.E. and Sherwood, T. 2003. Pymetrozine interferes with transmission of Tomato yellow leaf curl virus by the whitefly *Bemisia tabaci*. *Phytoparasitica*. 31 (5): 490-498.
- Sharaf, N. and Hasan, H. 2003. The identification of two biotypes of *Bemisia tabaci* in Jordan. *Dirasat Agricultural Sciences*. 30 (1): 101-108.
- Soroker, V., Nelson, D.R., Bahar, O., Reneh, S., Yablonski, S., and Palevsky, E. 2003. Whitefly wax as a cue for phoresy in the broad mite, *Polyphagotarsonemus latus* (Acari: Tarsonemidae). *Chemoecology*. 13 (4): 163-168.
- Stonor, J., Hart, P., Gunther, M., DeBarro, P., and Rezaian, M.A. 2003. Tomato leaf curl geminivirus in Australia: Occurrence, detection, sequence diversity and host range. *Plant Pathology (Oxford)*. 52 (3): 379-388.
- [The Pacific Islands Pest List Database \(PLD\)- Regional Pest Distribution Report- Bemisia tabaci tobacco whitefly.](#)
- Summary:** The Pacific Islands Pest List Database (PLD) stores records of pests that are currently known to affect agriculture, forestry and the environment in Pacific Island countries and territories (PICTs).
- PLD is available from: <http://www.spc.int:8088/pld/index.jsp>
- This distribution report is available from: <http://www.spc.int:8088/pld/report?action=8&searchString=bemisia&pest=1171> [Accessed 5 October 2005]



# GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Bemisia tabaci*

---

Ulusoy, M.R., and Bayhan, E. 2003. A new whitefly species on vegetable fields in the east Mediterranean region of Turkey: Silverleaf whitefly, *Bemisia argentifolii* Bellows and Perring (Homoptera: Aleyrodidae). *Turkiye Entomoloji Dergisi*. 27 (1): 51-60. Ulusoy, M.R., and Bayhan, E. 2003. A new whitefly species on vegetable fields in the east Mediterranean region of Turkey: Silverleaf whitefly, *Bemisia argentifolii* Bellows and Perring (Homoptera: Aleyrodidae). *Turkiye Entomoloji Dergisi*. 27 (1): 51-60.

Valverde, R.A., Sim, J., and Lotrakul, P. 2004. Whitefly transmission of sweet potato viruses. *Virus Research*. 100 (1): 123-128.

Varma, A. and Malathi, V.G. 2003. Emerging geminivirus problems: A serious threat to crop production. *Annals of Applied Biology*. 142 (2): 145-164.