



Tuta absoluta

Identity and taxonomy

Name: *Tuta absoluta* (Povolny, 1987)

Other scientific names: *Gnorimoschema absoluta* (Meyrick, 1917) Clarke, 1962, *Phthorimaea absoluta* (Meyrick, 1917), *Scrobipalpula absoluta* (Meyrick, 1917) Povolny, 1964, *Scrobipalpuloides absoluta* (Meyrick, 1917) Povolny, 1987.

Common names: Tomato borer, South American tomato moth, Tomato leaf miner or South American tomato pinworm.



Tuta absoluta

Hosts/species affected

Tuta absoluta attacks mostly plants of the solanaceae family.

Main hosts: Tomatoes and Potatoes

Minor Hosts: Eggplant and pepper

Weeds: *Datura spp*

Growth stages affected

- Seedling stage
- Vegetative growing stage
- Flowering stage
- Fruiting stage
- Post-harvest

Biology and Ecology

Egg: Small (0.36 mm long and 0.22 mm large), cylindrical, creamy white to yellow. Eggs are mainly deposited on the underside of leaves. Hatching takes place after 4 – 5 days. Females lay eggs on aerial parts of their host plants and a single female can lay a total of about 260 eggs during its lifetime.

Larva: Larvae are cream in colour with dark head, becoming greenish to light pink in the second to fourth instars. First instar is 0.9 mm long and fourth is 7.5 mm long. Duration: 13 –15 days.

Pupa: Pupa is Brown. Duration: 9 –11 days.

Adult: Adults are grey brown, about 6 mm long with a wing span of about 10mm and long filiform antenna. Pupation takes place in the soil, on the leaf surface or within mines, depending on environmental conditions.



Figure 1. Adult *T. absoluta* Photo by Koppert Biological systems(K)Ltd.

Life cycle

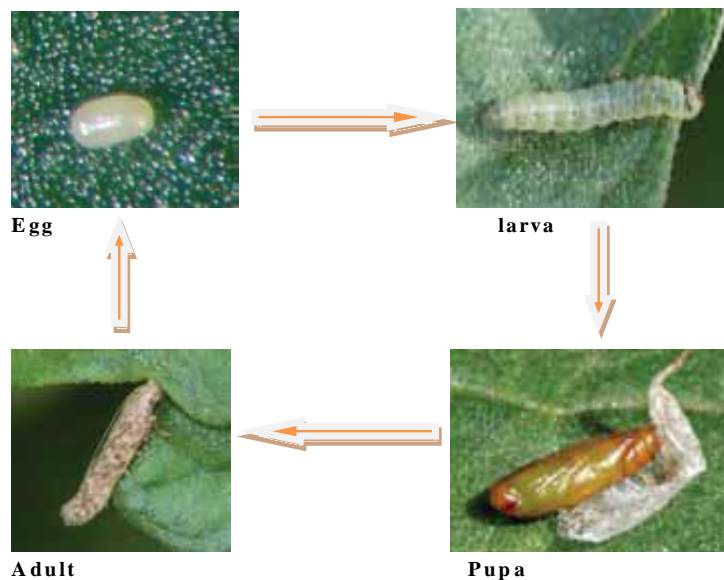


Figure 2. Life cycle is completed in 29 – 38 days depending on environmental temperatures. Photos by Koppert Biological systems(K) Ltd.

The biological cycle is completed in 29 – 38 days depending on environmental conditions. Studies in Chile have shown that development takes 76.3 days at 14 ° C, 39.8 at 19.7 ° C and 23.8 at 27.1 ° C (Barrientos et al., 1998).

Symptoms

After hatching, young larvae penetrate into fruits, leaves or stems on which they feed and develop creating conspicuous mines and galleries. Fruits are attacked as soon as they are formed and galleries formed inside them can be invaded by secondary pathogens leading to fruit rot. On leaves, larvae feed only on mesophyll tissues, leaving the epidermis intact. Leaf mines are irregular and may later become necrotic. Galleries in stems alter the general development of the plants (Caffarini et al., 1999).



Figure 3. Feeding mines on the leaves. Photo by Koppert Biological systems (K) Ltd

Means of movement and dispersal

Adult moths can spread several kilometers by flying or drifting with the wind.

Movement in trade

T. absoluta can be carried by consignments of plants for planting and fruits of tomato, eggplant and pepper. Other pathways include rooting media, farm equipment and transportation vehicles.



Figure 5. Tomato fruits attacked. Photos by Koppert Biological systems (K) Ltd

Impact

T. absoluta can cause losses of up to 80-100% in tomato plantations in both cultivated and open fields in native and introduced ranges if left uncontrolled (Desneux et al.2010)

Phytosanitary significance

T. absoluta was added in 2004 to the EPPO A1 action list of pests recommended for regulation as quarantine pests. Plants for planting and fruits of tomato originating from countries where *T. absoluta* occurs should be free from the pest (EPPO, 2016).

Detection and inspection

T. absoluta larvae on host plants prefer the apical buds, flowers or new fruits. Frass is also visible deposited on the feeding surfaces. During severe attack, it also colonizes the leaves where mines are evident on attacked leaves (Imenes et al., 1990).

Management

Preventive measures

- Use of clean planting materials
- Control of weeds

Scouting and monitoring

- Use of pheromone traps

Mass trapping

- Use of water traps
- Use of sticky traps

Biological Control

- Use of *Macrolophus pygmaeus*

Chemical control

Various products are registered in Kenya against *T. absoluta* available in various trade names.

Name of product (Active Ingredient)	Purpose of registration
E3, Z8, Z11-tetradecatrienyl acetate 0.76mg + E3, Z8-tetradecadienyl acetate 0.04mg	Attractant for the monitoring and control of male South America Tomato leaf miner (<i>Tuta absoluta</i>) in Tomato field.
Flubendiamide 480g/L	Control of <i>Tuta absoluta</i> in tomatoes.
Thiocyclam 50% w/w of thiocyclam-hydrogenoxalate	Control of <i>Tuta absoluta</i> in tomatoes.
Spirotetramat 75g/L + Flubendiamide 100 g/L	Control of <i>Tuta absoluta</i> in tomatoes.

For more information refer to the list of registered pest control products provided by the Pest Control Products Board (PCPB) Website: www.pcpb.or.ke

Note: Repeated use of a given chemical creates resistance.

References

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- Caffarini PM, Folcia AM, Panzardi SR & Pérez A (1999) [Incidence of low levels of foliar damage caused by *Tuta absoluta* (Meyrick) on tomato.] Boletín de Sanidad Vegetal, Plagas 25, 75 – 78 (in Spanish).
- Desneux, N., E. Wajnberg, K.A.G Wyckhuys, G. Burgio, S. Arpaia, C.A. Narvaez-Vasquez, J. Gonzalez-Cabrera, D. Catalan Ruescas, E. Tabone, J. Frandon, J. Pizzol, C. Poncet, T. Cabello and A. Urbaneja. 2010. Biological Invasion of European tomato crops by *Tuta absoluta*: ecology, geographical expansion and prospects for Biological control. J. Pest Sci. 83:197-215.
- Imenes SDL, Uchôa-Fernandes MA, Campos TB, Takematsu AP, 1990. Aspectos biológicos e comportamentais da traça do tomateiro *Scrobipalpula absoluta* (Meyrick, 1917), (Lepidoptera-Gelechiidae). Arquivos do Instituto Biológico, Sao Paulo, 57(1/2):63-68.
- EPPO (2016). EPPO Global database. Retrieved from <https://gd.EPPO.int/>.

