



Scientific Note

Epicauta vittata (Fabricius): occurrence in tomato plant and weeds in the State of Rondônia

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Abstract. The tomato (*Solanum lycopersicum* L.) plant stands out for being a species cultivated throughout the national territory, being the most important vegetable in Brazil, from the socioeconomic point of view. However, it has been one of the crops most affected by phytosanitary problems. For example, there are the pest insects of the genus *Epicauta* (Coleoptera: Meloidae). Thus, the objective of this study was to record the occurrence of a pest insect (beetle) harming vegetative growth and productive performance in the fresh-market tomato crop and feeding on weeds. The tomato plants were found on "jurubeba" (*Solanum paniculatum* L.) rootstock, spaced 1.0 m x 0.5 m, grown in the municipality of Rolim de Moura, Rondônia state. The insect-pest (beetle) was identified as *Epicauta vittata* (Fabricius). It was observed that the damages caused by the larvae occurred in the main stem of the tomato, only above the grafting site, causing boring, however no damage was observed in the rootstock ("jurubeba"). Adult insects caused defoliation in both tomato plant and joyweed (*Alternanthera tenella* Colla), slender amaranth (*Amaranthus viridis* L.), "trapoeraba" (*Commelina benghalensis* L.) and morning glory (*Ipomoea purpurea* [L.]). High population of *E. vittata* causes severe damages to tomato, damaging the vegetative growth and productive performance of the crop, however does not affect the root system when grafted with "jurubeba" (*S. paniculatum*). *Epicauta vittata* in the adult phase is fed alternately of weeds.

Keywords: *Alternanthera tenella*; *Amaranthus viridis*; *Commelina benghalensis*; *Ipomoea purpurea*; striped blister beetle.

Tomatoes are among the most cultivated vegetables in Brazil, being cultivated throughout the national territory, thus, they deserve to be highlighted both from an economic and social point of view. It is cultivated in 57,717 ha, with a production of 4,004,991 kg, presenting an average yield of 69,471 kg ha⁻¹ (IBGE 2019).

Of the total production, 70% is destined for the market for *in natura* consumption (table tomatoes) and the rest for industry. For *in natura* market, it is usually cultivated in a tutored manner, with emphasis on semi-staked staking. When the fruit is destined for the industry, it is commonly used an undergrowth cultivation, without any type of conduction (MAKISHIMA & MELO 2009).

Despite the success of tomato farming in Brazil, it is one of the vegetables that has been most affected by phytosanitary problems, among which the presence of pest insects that cause damage to the crop throughout the cycle stands out. In this sense, *Epicauta* spp. (Coleoptera: Meloidae), popularly known as striped blister beetle, it is an insect extremely harmful to the species of the family of the solanaceae, being able to feed itself in fruits and leaves, in a destructive way (SALAS *et al.* 1999; CAPINERA 2003).

The Meloidae family includes more than 2,500 species in the world (KINNEY *et al.* 1998), some of which constitute agricultural pests, especially plants of the families Leguminosae, Solanaceae, Amaranthaceae and Compositae. Adults have

long legs, a fully exposed head, a pronotum narrower at the extremity, a navicular body and strongly sclerotized. Most adults eat only floral parts, however, some, in particular *Epicauta* spp., also feed on leaves (SELANDER & FASULO 2000).

Species of the genus *Epicauta* are often described as pests of different cultures in Brazil, causing considerable damage (LOURENÇÃO *et al.* 1985; BOIÇA JUNIOR *et al.* 2007; MOURA *et al.* 2014; CARMO *et al.* 2019). *Epicauta atomaria* (Germar), known as striped blister beetle, is a very common species, which feeds on leaves, causing numerous holes (GALLO *et al.* 2002). Additionally, *Epicauta vittata* (Fabricius) is native to the United States of America and has been reported to damage several solanaceae, such as peppers, tomatoes, eggplants and potatoes (CAPINERA 2003; CARMO *et al.* 2019). Thus, the objective was to record the occurrence of this insect pest (striped blister beetle) impairing vegetative growth and productive performance in the cultivation of table tomatoes and feeding on weeds.

Larvae, pupae and adults of insect-pest (striped blister beetle) were collected, causing damage to the main stem and promoting defoliation in the tomato [*Solanum lycopersicum* L. (Solanaceae)], Cv. Fascínio, and concomitantly feeding on weeds joyweed [*Alternanthera tenella* Colla (Amaranthaceae)], slender amaranth [*Amaranthus viridis* L. (Amaranthaceae)], "trapoeraba" [*Commelina benghalensis* L. (Commelinaceae)] and morning glory [*Ipomoea purpurea* (L.) (Convolvulaceae)].

The tomato plants were on rootstock of "jurubeba" [*Solanum paniculatum* L. (Solanaceae)], conducted in a semi-stacked system, with spacing of 1.0 m x 0.5 m, making a population of 20,000 plants ha⁻¹, being grown on the experimental campus from the Federal University of Rondônia (Universidade Federal de Rondônia), in the municipality of Rolim de Moura, State of Rondônia (11° 34'57"S, 61° 46'21"W), from November 11, 2018 to December 06, 2018.

The larvae, pupa and adult phases of the insect pest and the damage were recorded in the tomato crop. In addition, the presence of the adult was recorded, causing defoliation in the aerial part of the weeds joyweed, slender amaranth, "trapoeraba" and morning glory. The photographic record was performed with a Samsung Galaxy J7 Prime cell phone with a 13 megapixel digital camera.

To control the insect pest, the contact and ingestion insecticide Deltamethrin, from the chemical group of the Pyrethroids (Decis 25 EC®), was used in the concentration of 30 mL 100 L⁻¹ of water.

The insect pest observed in the area was identified as *E. vittata*. The egg phase of this species lasts between 10 and 16 days and the pupal period from 9 to 13 days (CAPINERA 2003). The specimens of *E. vittata* collected on the tomato measure between 9 and 17 mm in length, have brown heads and pronotum and dark elytra, with white edges and a white longitudinal line (Figure 1), as described by (CAPINERA 2003).

Epicauta vittata is native to the United States, occurring in many states, and is also reported in Canada (CAPINERA 2003). The only occurrence of this species in Brazil was in Rondônia, in 2017 (CARMO *et al.* 2019). There are records of *E. vittata* in several cultures, such as: solanaceous, brassicas, cucurbits, carrot, bean, soybean, beet, corn and sweet potato (CAPINERA 2003; CARMO *et al.* 2019).

The initial damage caused by *E. vittata* was observed at 30 days after transplanting, persisting until the end of the culture cycle. In the tomato, the larvae pierced the main stem, causing blackening followed by necrosis of the conducting vessels (Figure 1: A-C). This damage caused in the xylem, probably limited the transport of water and nutrients in the plant and the redistribution of carbohydrates by phloem, which initially promoted symptoms of wilt and nutritional

imbalance in damaged plants.

Additionally, it was noted that damage to the conductive vessels has always occurred above the grafting site, leading to reduced growth and development of the tomato (graft). It is noteworthy that the rootstock of "jurubeba" was not damaged below the grafting site (Figure 1: A-D).

In the hottest hours, adults took shelter in the soil and in the axillae of tomato plants. The larvae were already lodged inside the main stem. The adult insect caused the defoliation of the tomato (Figure 1: E and F), reducing the leaf area, as observed by CARMO *et al.* (2019) in the pepper and eggplant culture.

Defoliation caused by adults of *E. vittata* was also found in the weed species *A. tenella*, *A. viridis*, *C. benghalensis* e *I. purpurea* (Figure 2). According to CAPINERA (2003), *Amaranthus* spp. it is highly preferred by adults. Thus, *E. vittata* is a polyphagous species. Therefore, strict cultural management of alternative hosts is required, since the presence of *E. vittata* in areas with tomato cultivation can exponentially increase the pressure of this insect, becoming a pest, since the tomato seems to properly feed *E. vittata*, favoring its rapid multiplication, which can make commercial activity unfeasible.

The chemical control of *E. vittata* adults was done with the insecticide Deltametrina. On the other hand, there was no death of pupae and larvae, since in the young stage, insects were found inside the main stem of the tomato, preventing the action of the insecticide, since its mode of action is contact and ingestion. Thus, a systemic insecticide would possibly control the larvae. Thus, for effective control of *E. vittata*, in addition to chemical control, it was necessary to manually pluck the damaged plants, removing them from the field. However, it is necessary to evaluate seasonality in weeds and natural enemies of this insect pest, in order to contribute to integrated management.

High infestation of *E. vittata* impairs the vegetative growth and productive performance of the tomato. Because it is a polyphagous insect, *E. vittata* can feed on the adult stage of *A. tenella*, *A. viridis*, *C. benghalensis* e *I. purpurea*. The young phases of *E. vittata* do not feed on *S. paniculatum* when used as rootstock for tomato.

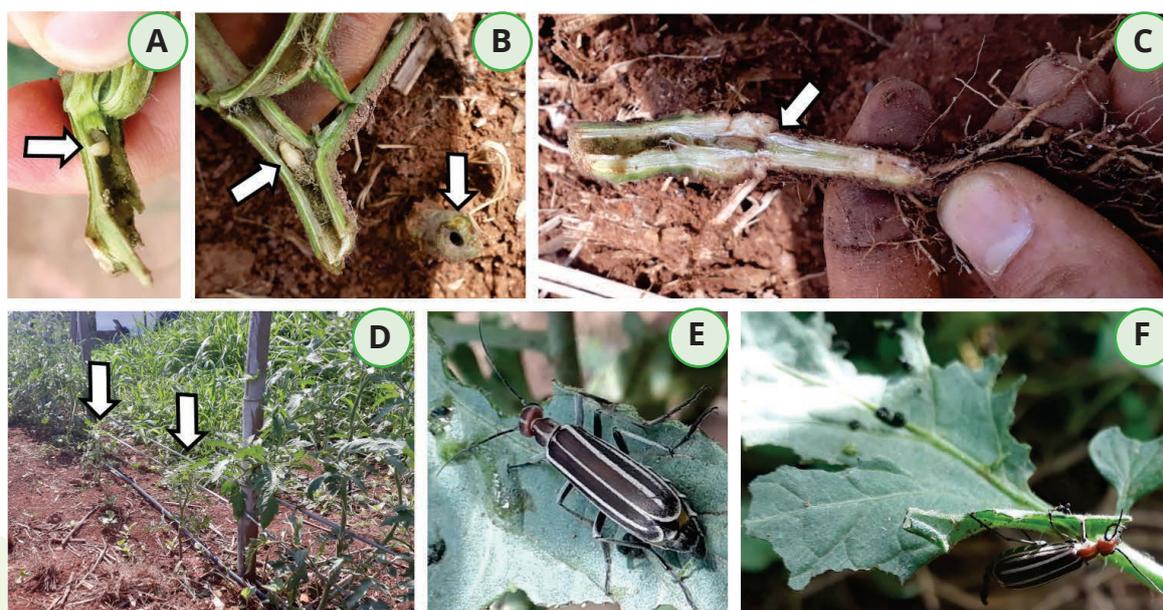


Figure 1. Damage caused by *Epicauta vittata* in tomato in the State of Rondônia. (A) Larva feeding on the main stem. (B) Pupa in the main stem pierced and cross-sectional view of the main stem. (C) Gallery formation, just above the rootstock of "jurubeba". (D) Plants with reduced development due to damage to the main stem. (E and F) Adult of *E. vittata* causing defoliation in tomato (Photos: Turcato, CS).

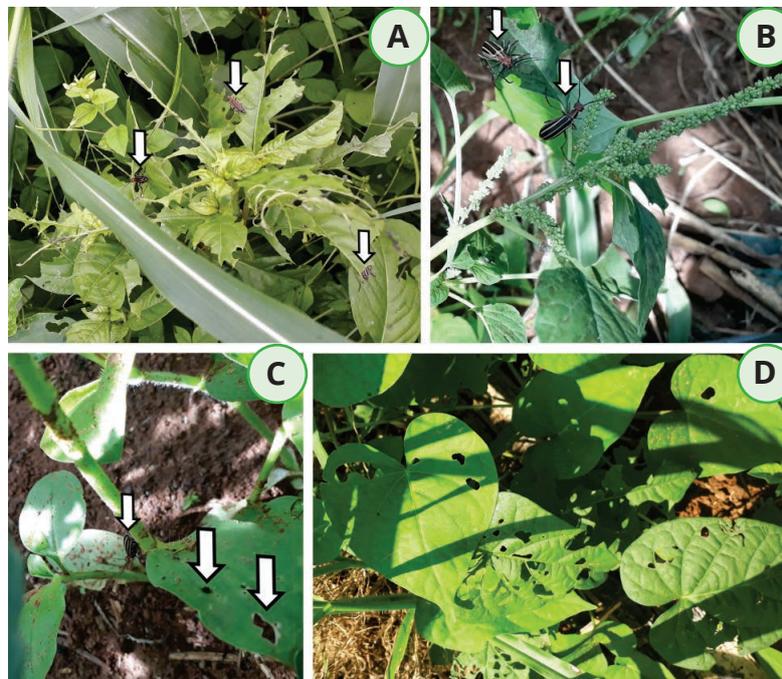


Figure 2. Weed defoliation caused by *Epicauta vittata* in the State of Rondônia. Adults and damage (defoliation) in joyweed, *Alternanthera tenella* (A) and slender amaranth, *Amaranthus viridis* (B). The smaller arrow shows the adult and the larger the damage (defoliation) in "trapoeraba", *Commelina benghalensis* (C). Damage (defoliation) in morning glory, *Ipomoea purpurea* (D) (Photos: Turcato, CS).

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