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Outbreaks of *Spodoptera eridania* (Lepidoptera: Noctuidae) in tomato plantations in Espírito Santo state, Brazil

Surtos de *Spodoptera eridania* (Lepidoptera: Noctuidae) em plantios de tomate no Estado do Espírito Santo, Brasil

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Abstract. *Spodoptera eridania* Cramer (Lepidoptera: Noctuidae) has been reported in various crops in recent years in Brazil. The outbreaks of *S. eridania* were observed in regions of tomato production in the state of Espírito Santo, Brazil. The chemical control used as the main method of control pests, without the agronomic observations of integrated pest management, is a probable cause of such outbreaks in tomato in these regions.

Keywords. *Lycopersicon esculentum,* lepidopterous pest, tomato insect pest.

Resumo. *Spodoptera eridania* Cramer (Lepidoptera: Noctuidae) tem sido relatada em diversas culturas, nos últimos anos no Brasil. O dano de *S. eridania* foi observado nas regiões de produção de tomate no Estado do Espírito Santo, Brasil. O controle químico usado como o principal método de controle de pragas, sem as observações agronômicas do manejo integrado de pragas, é uma provável causa de tais surtos desta praga em tomate nessas regiões.

Palavras-chave. *Lycopersicon esculentum*, lepidópteros pragas, pragas do tomateiro

The tomato is a major agricultural crop in the "Região Serrana" and southern regions of the state of Espírito Santo, Brazil. *Tuta absoluta* (Meyrick) (Lepidoptera: Gelechiidae), *Neoleucinodes elegantalis* (Guenée) (Lepidoptera: Crambidae), *Helicoverpa zea* (Boddie) (Lepidoptera: Noctuidae), *Phthorimaea operculella* (Zeller) (Lepdoptera: Gelechiidae) are key insect pests of the tomato. Chemical insecticides are most commonly used for their control of insect pest; however, reliance on chemical insecticides as the only form of pest control triggers subsequent outbreaks of other pest species (Gross & Rosenheim, 2011).

Spodoptera eridania (Cramer) (Lepidoptera: Noctuidae) is a polyphagous insect found in crops of other countries (Liburd et al., 2000). Furthermore, this insect has no status of key pest in Brazil. Nevertheless, this insect has caused economic loss in soybean, cotton and bean harvests in the Cerrado Region of Brazil (Santos et al., 2005). Outbreaks of *S. eridania* caterpillars were recorded in the municipalities of Domingos Martins, Conceição do Castelo, Vargem Alta and Venda Nova do Imigrante on tomato crops. Damage caused by this insect is considered sporadic but its evidence have been increase in this places.

Eggs masses of this lepidopteron always deposited in the lower surface of leaves were collected from the mid portion of tomato plants. The first instars were also collected, which showed gregarious behavior. Injury occurs when the caterpillars feed on the new leaf parenchyma and then destroy the leaf by complete consuming it. The last instars were found hiding under the leaves during the day, although its injury is visible due to its feeding on the pericarp of the fruit. These caterpillars had a subspiracular stripe which extends to the thorax where it is interrupted by a black spot.

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The specimies were collected in the municipalities of Domingos Martins, Conceição do Castelo, Vargem Alta and Venda Nova do Imigrante on tomato crops and maintained in Laboratory of the Center for Scientific and Technological Development for Pest Management "NUDEMAFI." The occurrence of this insect on tomato began in June 2005 to 2011 with injuries occurring at regular times at mild temperatures (20-25°C).The eggs were removed from the leaves and isolated in a plastic gerbox for daily observation of caterpillar hatching to determine if the insects in field were similar to those damaging the plants.

The caterpillars in their early stages were maintained in transparent plastic boxes (30 x 20 x 10 cm), and closed with a tissue-type "voil" which allowed for the exchange of air. Tomato leaves were daily provided as for the caterpillars in the early and final stages of pupation. Larvae were killed in boiling water and transferred to 80% ethanol to be identified.

Pupae were separated in a gerbox and daily monitored for the emergence of adults. A portion of the newly emerged adults were killed in a chamber containing sulfuric ether and then the specimens were then closely analyzed. These adults had a grey-brown color and grey forewings with a central dark spot and white hindwings, which begin near the medium to end region of the medium portion of the wing. The rest of the adults were raised in PVC tubes (25,0 x 20,0 cm), with the inside coated with white paper sheets. The top of the tube was sealed with a tissue type cloth and food composed of a 10% honey solution, offered in 20 mL bottles containing a cotton wad in constant contact with the solution, was renewed every 48 hours. The tubes were maintained in a climatized chamber at 25 ± 1 º C, relative humidity of 70 ± 10% and photophase of 12 hours. The appearance of egg masses was monitored daily and compared with that encountered in the field.

Populations from different localities showed characteristics of posture and injury similar to specimens in the field. The injury caused by the species in the laboratory and field is quite similar with the leaf skeletonization (Figure 1a and 1d).

The taxonomic identification of the material also was similar, indicating the occurrence of *S. eridania* in all tomato crops. The moths have a greyish brown color, gray forewings with a central dark spot or bar and hindwings are white (Figure 1b).The egg mass, with one layer and a light green color initially, subspheric and may be covered by scales of the abdomen of the female (Figure 1c).

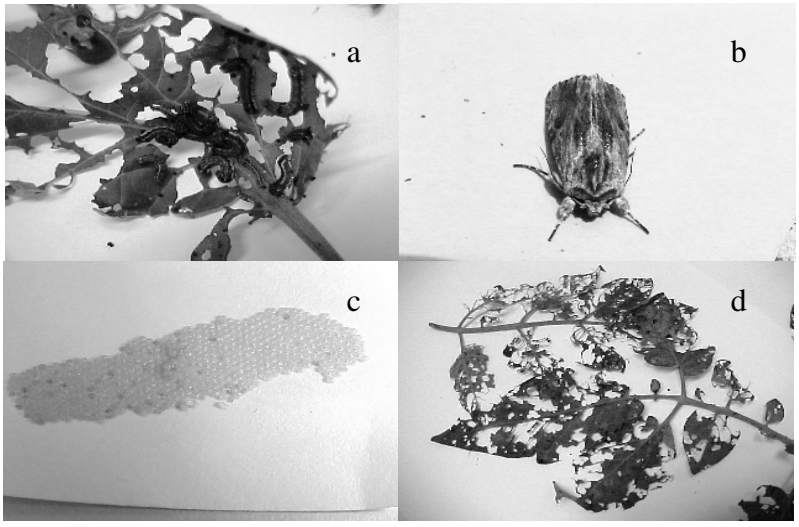


Figure 1. (a) *Spodoptera eridania* Cramer (Lepidoptera: Noctuidae) caterpillar feeding on leaf of tomato; (b) Adult of *Spodoptera eridania*; (c) *S. eridania* eggs rearing in laboratory; (d) Injure in leaves of tomato.

The cause of these outbreaks of *S. eridania* is likely due to the lack of natural enemy populations and the application of insecticides without agronomic observations of integrated pest management, as the main method of pest control in tomato plantations, used in the control of key pests of this crop. These observations are similar to those that occur with outbreaks of the mite *Oligonychus*

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ilicis, which is beneficed due to treatment of other plant pests in coffee plantations (Nakano, 2011). Thus, integrated forms of control should be evaluated to minimize the damage induced by *S. eridania* in tomato and the risk of changing the status of this insect pest of secondary to primary.

Research should be conducted to evaluate new control methods to maximize the activity of natural enemies. Our work highlights a critical need to predict the level of damage caused by *S. eridania* in tomato in future research, due to non-observance of the precepts of integrated pest management and alert to the needs of ecological risk assessment of agricultural practices on pest control.

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