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First record of the occurrence of the diamondback moth on sour passion fruit

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Abstract – Known as the diamondback moth, *Plutella xylostella* L. is registered as one of the most important pests of Brassicaceae in the world. It is characterized as a specialized insect in this family, due to specifics for feeding. However, based on reports from producers, the shoots of sour passion fruit in the extreme south of Santa Catarina, were damaged by a phytophagous insect attack. The damage plants were collected and from this, it was possible to identify the specie *P. xylostella* as the insect causing the damage. Therefore, the purpose is to communicate a new record of phytophagous insect associated with passion fruit, as well as a new host outside the list of Brassicaceae for *P. xylostella*. The collected shoots had amber exudation and sawdust appearance in the axils of leaf growth, the plants had wilted leaves and emission of lateral shoots. It is believed that the individuals have managed to complete the life cycle in the plant because of the similarity in the nitrogen compounds present in the species of Brassicaceae and Passifloraceae.

Index terms: *Plutella xylostella*; *Passiflora edulis;* Brassicaceae; insect pest.

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Primeiro registro de ocorrência da traça-das-crucíferas no maracujazeiro-azedo

Resumo – Conhecida como traça-das-crucíferas, a *Plutella xylostella* L. é registrada como uma das mais importantes pragas de Brassicaceae no mundo. É caracterizada como um inseto especializado nesta família, devido a especificidades para a alimentação. No entanto, após relatos de produtores de maracujazeiro-azedo, no extremo sul de Santa Catarina, de ponteiras da planta danificadas por ataque de inseto fitófago, foram realizadas coletas deste material e, a partir deste, foi possível identificar a espécie *P. xylostella* como o inseto causador do dano. Dessa forma, objetiva-se comunicar um novo registro de inseto fitófago associado ao maracujazeiro, assim como um novo hospedeiro fora do rol de brassicáceas para *P. xylostella.* As ponteiras coletadas apresentavam exsudação cor âmbar, e aspecto de serragem nas axilas de crescimento foliar, folhas murchas e a emissão de brotações laterais. Acredita-se que os indivíduos tenham conseguido completar o ciclo de vida na planta devido à semelhança nos compostos nitrogenados presentes nas espécies de Brassicaceae e de Passifloraceae.

Termos para indexação: *Plutella xylostella*; *Passiflora edulis*; Brassicaceae; inseto-praga.

Plutella xylostella (Lepidoptera: Plutellidae) is popularly known as diamondback moth, a microlepidoptera originating in Europe, but with registered occurrence in almost all continents (CASTELO-BRANCO et al., 1996, TRINDADE et al., 2014; HOLTZ et al., 2015), being considered one of the most important pests of Brassicaceae in the world (CASTELO-BRANCO et al., 1996, TRINDADE et al., 2014; HOLTZ et al., 2015). It is estimated that for 2014, it has generated a deficit of US$ 105 million for Brazilian producers (HOLTZ et al., 2015).

According to the consulted literature, the species *P. xylostella* was exclusively associated with species of the Brassicaceae family (TALEKAR & SHELTON, 1993; SARFRAZ et al., 2006). This is because *P. xylostella* is a specialist insect whose stimuli for feeding require greater specificity (RENWICK & LOPEZ, 1999).

Considering that the cruciferous moth is reported as an oligophagous species, specialized in the Brassicaceae family, it can be said that worldwide it is capable of having up to 3500 host species as this is the number of species recorded for such family (FAHEY et al., 2001). However, the following species stand out as *P. xylostella* hosts: cabbage (*Brassica oleraceae* L.), kale (*Brassica oleraceae* L var. acephala), canola (*Brassica napus* L.) and mustard (*Brassica juncea* (L.) Coss) (TRINDADE et al., 2014; HOLTZ et al., 2015).

The objective of this work was to make a first report of *P. xylostella* causing damage in a crop other than Brassicaceae.

At the beginning of the 2021/2022 harvest, extensionists from the EPAGRI municipal office in Sombrio, state of Santa Catarina, were informed of the existence of shots of sour passion fruit damaged by larvae in some orchards in the region. Therefore, some collections were carried out in order to identify the the organism that was making the damaged, since there are no reports of insect pests with this habit for the crop.

In November 2021, a field inspection was carried out in a passion fruit orchard located between coordinates 29°03’23.57”S e 49°35’40.87”W, which displayed these symptoms in the shots of seedlings in an advanced stage of development . The orchard was characterized by conventional management, in a trellis system, with interrow vegetated with a mixture of forage species, such as: *Avena sativa* L. (white oat), *Avena strigosa* Schreb (black oat), *Secale cereale* L. (rye) and *Raphanus sativus* L. (forage turnip).

Damaged sour passion fruit shots were collected, with the presence of yellow or amber exudation and the appearance of sawdust in the axillary region of the leaves, in addition to wilting and the presence of lateral shoots. A sweep was carried out using a net over the green cover between the rows of the orchard, in order to collect insects that could be associated with damage to the passion fruit plant (Figure 1).

From the collected shots, two adults of *P. xylostella* emerged (Figure 2). Eleven adults were also collected through the net between the rows of the orchard, on the cover crops. It is believed that the use of green manure may have contributed to this infestation, as turnip, belonging to the Brassicaceae family were found among the species in the seed mixture.

The adults were sent to the curator of the entomology museum at the Experimental Station of EPAGRI, in Caçador, SC, where they were compared with those in her collection of Brassicaceae pests, and thus the species was confirmed.

It should be observed that the cruciferous moth is considered a cosmopolitan species, with great dispersion and reproduction capacity (CHENG et al., 2008; IRAC-BR, 2016). Although this species has specificity with the cruciferous family due to the presence of glucosinolates, the fact that it completed the development in the shoots of the sour passion fruit to a possibility of *P. xylostella* becoming a problem for the crop, taking into account its biology and the increasing use of mixtures of cover crops between the rows of orchards. Glucosinolates are nitrogenous compounds from the same group of cyanogenic glycosides, which are found in passion fruit as a form of biochemical defense of the

Figure 1 –Damage to the apical part of passion fruit caused by *P. xylostella* in Sombrio-SC.

Figure 2 – Adult of diamondback moth emerged from damaged apical shoots of passion fruis in Sombrio-SC.

plant against herbivores. Both compounds have similar ways of being metabolized by the insect organism, however, when broken down, they release different products from each other, in addition to causing different reactions in the pest organism (LOUDA; MOLE, 1991; SEIGLER, 1991).

Among the crops present in the extreme south of Santa Catarina, sour passion fruit is considered one of the most important for family farming in the region, which is one of the main suppliers of sour passion fruit for the domestic market in the first half, with an average productivity greater than 25 t/ha in 2021, higher than the national average (IBGE, 2022; PETRY & MARCHESI, 2019). However, this average productivity value is still considered low, and according to Faleiro & Junqueira (2016), this fact may be associated with inadequate management, non-adapted varieties and the occurrence of pests limiting the development of the crop.

Therefore, reporting the occurrence of new insects associated with the crop is paramount, especially for controling and monitoring purposes of possible population outbreaks. Reporting the occurrence of *P. xylostella* in sour passion fruit becomes necessary so that it is possible to come up with the most appropriate and efficient control methods for this species, if necessary.

Despite the low incidence of attacked shoots and the small number of adults collected, the fact that this species completed its life cycle in the passion fruit shoot indicates that it has the potential to adapt to such a crop. However, it should be observed that further works are needed in relation to the fitness of *P. xylostella* adults reared in passion fruit, in order to verify whether the generated individuals have fertile and viable reproductive systems for the maintenance of the species.

Therefore, it is necessary to monitor the producing regions that use green manures, especially those that contain brassicaceae seeds, such as *Raphanus sativus* L. Considering that this is one of the natural hosts of the species in question and, due to its biological characteristics, it can occasionally become a problem for the cultivation of passion fruit.

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