Acca sellowiana (Myrtaceae): A New Alternative Host for Drosophila suzukii (Diptera: Drosophilidae) in Brazil

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Acca sellowiana (Myrtaceae): a new alternative host for *Drosophila suzukii* (Diptera: Drosophilidae) in Brazil

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Feijoa (*Acca sellowiana* [Berg] Burret; Myrtaceae) is an evergreen shrub or short tree, 2 to 6 m in height (Weston 2010), and native to the highlands of southern Brazil and northeast Uruguay (Barni et al. 2004). Its fruit is similar in appearance, size, and texture to the common guava (*Psidium guajava* L.; Myrtaceae), but with the flesh having a distinctive sweet-tangy taste and a very aromatic flavor, and with a non-edible green skin (Amarante & Santos 2011). In addition, it is a good source of vitamins, minerals, and secondary metabolites with antibacterial, antioxidant, antiallergic, and immunological properties (Weston 2010).

Feijoa has been cultivated commercially in Colombia, the USA, the former Soviet Republics of the Caucasus region, and especially in New Zealand (Barni et al. 2004). In New Zealand, about 500 t of feijoa fruits are produced annually, and domestic sales generate around 1.7 million dollars (Plant and Food Research Institute of New Zealand Ltd. 2013). Despite the commercial potential of its fruit, feijoa is almost unknown in Brazil (Ducroquet et al. 2000), and its production faces several phytosanitary problems involving pests, especially the South American fruit fly, *Anastrepha fraterculus* (Wiedemann) (Diptera: Tephritidae), with infestations of up to 100% during the fruit ripening period (Ducroquet et al. 2000), and the guava weevil, *Conotrachelus psidii* Marshall (Coleoptera:. Curculionidae), whose damage can lead to loss of up to almost 100% of the fruits in monoculture (Luckmann et al. 2009).

Recently, in addition to specimens of *A. fraterculus* and *C. psidii* that emerged from *A. sellowiana* fruits collected in the 2015/2016 season, we also obtained adult specimens of *Drosophila suzukii* (Matsumura) (Diptera: Drosophilidae), commonly known as the spotted wing drosophila. This is the first record of *D. suzukii* in *A. sellowiana* fruits collected in an orchard located in Lages, Santa Catarina, Brazil.

Acca sellowiana fruits bearing feeding and oviposition damage caused by *C. psidii* (Fig. 1) were collected from different trees in a feijoa orchard in the Estação Experimental de Lages (EEL) of the Empresa de Pesquisa Agropecuária e Extensão Rural de Santa Catarina (Epagri) in Lages, Santa Catarina, Brazil (27.8086°S, 50.3306°W), in Mar 2016. The fruits were placed in plastic containers and taken to the Laboratório de Pesquisa em Entomologia of the Centro de Ciências Agroveterinárias da Universidade do Estado de Santa Catarina (CAV-UDESC) in Lages, where they were washed in a 1% solution of sodium hypochlorite, transferred to plastic pots (750 mL) covered with voile and containing sterile moist vermiculite, and kept at 25 ± 2 °C, 70 ± 10% RH, and a 12:12 h L:D photoperiod. Larvae, pupae, and adults that emerged from the fruits were collected every 2 d. Adult drosophilids were killed in a freezer, stored in 70% alcohol, and observed under a stereomicroscope for species identification according to EPPO (2013). Voucher specimens of *D. suzukii* were stored in 70% alcohol and deposited at the Museu de Entomologia of the CAV-UDESC.

Drosophila suzukii is native to Asia but has invaded Europe and North and South America (Hauser et al. 2009; Calabria et al. 2012; Deprá et al. 2014), where it has become a pest of soft and thin-skinned fruit crops as blackberries, blueberries, cherries, mulberries, raspberries, strawberries, some wine grape cultivars, and ornamental plants (Lee et al. 2011, 2015; Yu et al. 2013; Ioriatti et al. 2015). This is the first record of *D. suzukii* in feijoa. In addition, these results demonstrate the feasibility of feijoa as an alternative host for *D. suzukii*. Skin thickness of the feijoa fruit can reach 12 mm (Ducroquet et al. 2000), thus being considered a species of thick-skinned fruit and, therefore, unsuitable for *D. suzukii* oviposition, because the adult fly is unable to successfully lay eggs in the fruit flesh (Stewart et al. 2014). Although it is unlikely that *D. suzukii* may lay eggs in hard and thick-skinned fruit crops, this species is able to complete its development when thick-skinned fruits are damaged, rotten, or overripe (Steffan et al. 2013; Stewart et al. 2014). It has been reported before that feeding and oviposition damage caused by adults of *C. psidii* in feijoa fruit facilitate infections by pathogens such as *Colletotrichum* sp. (Phyllachoraceae) (Ducroquet et al. 2000) and, similarly, could have enabled females of *D. suzukii* to deposit eggs in the lesions present in the skin of the fruit (Fig. 1).

Our knowledge on preferred or alternative hosts of *D. suzukii* has been increasing from surveys done outside growing areas (Lee et al. 2015; Poyet et al. 2015). Reporting feijoa as an alternative host for *D. suzukii* is important because it has thick-skinned fruits, thus showing the possibility of this pest to adapt to different hosts available in the colonization areas. In addition, *A. sellowiana* is a fruit crop of economic importance in many countries, mainly in Asia, North and South America, and Oceania, and *D. suzukii* may become a pest of feijoa in these regions because it is native to Asia and is widely distributed in North America and Europe (Asplen et al. 2015).

In conclusion, we can affirm that *D. suzukii* is prevalent in Brazil. Furthermore, it can cause damage to *A. sellowiana* fruits and perhaps other native or cultivated fruit crops with thick-skinned fruits.

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Fig. 1. *Acca sellowiana* fruit showing characteristic symptoms of *Conotrachelus psidii* attack: damage caused by feeding (black circles) and oviposition (white circles). An adult male of *C. psidii* is indicated by a black arrow, and an egg-laying adult female of *Drosophila* sp. is indicated by a white arrow.

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Summary

We report, for the first time, the occurrence and development of *Drosophila suzukii* Matsumura (Diptera: Drosophilidae) in fruits of *Acca sellowiana* (Berg) Burret (Myrtaceae). Although fruits of *A. sellowiana* present hard and thick skin, damage caused by another insect pest, *Conotrachelus psidii* Marshall (Coleoptera: Curculionidae), may have enabled fruit infestation by *D. suzukii*.

Key Words: feijoa; spotted wing drosophila; invasive pest; first report

Sumário

Registra-se, pela primeira vez, a ocorrência e desenvolvimento natural de *Drosophila suzukii* Matsumura (Diptera: Drosophilidae) em frutos de *Acca sellowiana* (Berg) Burret (Myrtaceae). Apesar dos frutos de *A. sellowiana* apresentarem casca grossa e dura, danos causados por outro inseto-praga, *Conotrachelus psidii* Marshall (Coleoptera: Curculionidae), podem ter viabilizado a infestação destes por *D. suzukii*.

Palavras Chave: feijoa; drosófila-da-asa-manchada; praga exótica; primeiro registro

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