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Scientific Note/Comunicação Científica

First report of the *Aphis craccivora* Koch on *Catasetum* sp. in Brazil

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Abstract. The genus *Catasetum* (Orchidaceae) currently has 194 orchid species distributed throughout Central America, northern Argentina, and southern Brazil, with Brazil as the largest producer with 103 species that may be epiphytic, terrestrial, or rupicolous. Aphids are insect pests that can damage ornamental plants such as orchids, either directly by sucking their sap or indirectly via secretions. Their secretions are attractive to pathogens and other insects, which then feed on the plant and cause a loss of flowers and leaves, spots to appear, reduced flower production, and flowering deformation. These defects can then reduce the value of the plant. When an aphid attack occurs, their ability to rapidly multiply and spread can cause major disruptions to disruptions to parts of the plant's life cycle. In this report, we examine how the aphid *Aphis craccivora* Koch infests *Catasetum* sp. and causes tissue death, decay of the buttons and base of the stem, and stains in the flowers. Thus, owing to the damage that insects of the family Aphididae can cause ornamental plants, this study aims to report the first recorded *A. craccivora* attack on *Catasetum* sp. in Brazil.

Keywords: Aphids; Entomology; Orchidaceae; Ornamental plants; Pest.

Primeiro relato de *Aphis craccivora* Koch in *Catasetum* sp. no Brasil

Resumo. O gênero *Catasetum* (Orchidaceae) tem atualmente 194 espécies de orquídeas distribuídas por toda a América Central, norte da Argentina e sul do Brasil, sendo o Brasil o maior produtor com 103 espécies que podem ser epífitas, terrestres ou rupícolas. Afídeos são insetos-praga que podem danificar plantas ornamentais, como orquídeas, diretamente sugando sua seiva ou indiretamente via secreções. Suas secreções são atrativas para patógenos e outros insetos, que então se alimentam da planta e causam danos em flores e folhas, com surgimento de manchas e deformações nas flores. Estes danos podem então reduzir o valor comercial da planta. Quando ocorre um ataque de pulgão, sua capacidade de se multiplicar e disseminar rapidamente pode causar grandes danos no ciclo de vida da planta. Neste trabalho, relata-se o ataque do pulgão *Aphis craccivora* Koch em *Catasetum* sp. O dano observado foi morte de tecidos, e deterioração dos botões e da base da haste, e manchas nas flores. Assim, devido ao dano que os insetos da família Aphididae podem causar plantas ornamentais, este estudo tem como objetivo relatar o primeiro ataque de *A. craccivora* em *Catasetum* sp. no Brasil.

Palavras-chave: Afídeos; Entomologia; Orchidaceae; Plantas Ornamentais; Praga.

The Brazilian market for flowers and ornamental plants is growing in demand. The total value traded in 2016 was US$ 6,65 billion and the cooperative headquarters in São Paulo accounted for 35.5% of the market total. The main trading center in South America is Veiling Holambra, which distributes products throughout Brazil and is the largest producer of ornamental plants in the country (Sebrae 2015).

The average annual per capita consumption of flowers in Brazil is R$ 26.27, which is below average with respect to the international market. Orchids represent 19 to 22% of the purchasing preference, especially smaller orchids such as the thumbnail *Phalaenopsis* and *Dendrobium* and those with large inflorescences such as *Phalaenopsis* and *Cymbidium* (Sebrae 2015).

Orchidaceae is one of the largest families of angiosperms. There are over 700 genera, approximately 300 of which occur naturally in Brazil. Of these, 28 are only found in Brazil (Reflora 2016) and these 28 genera contain 35,000 species that are mostly epiphytic. However, habitat destruction due to deforestation and exploitation has increased the extinction rate of these species. Several species of Brazilian orchids are now extinct from their natural habitat (Colombo *et al*. 2004).

In addition to habitat destruction, the use of toxic products directly influences pollinators, which play a fundamental role in the dissemination of pollen, and in species conservation (Koch & Silva 2012).

The genus *Catasetum* was proposed in 1822 by Karl S. Kunth and it has the greatest diversity of shapes and colors, which can confuse even experienced researchers. According to the World Checklist of Selected Plant Families, it currently has 194 species that are found in Central America, northern Argentina, and southern Brazil, which is the where the largest number of

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species are found. These 103 species in Brazil may be rupicolous, terrestrial, or epiphytic (Holst 1999; Faria *et al.* 2016).

The female flowers of the genus *Catasetum* are less attractive with membranous petals and sepals, fleshy, short columns, and either absent or atrophied anthers. The flowers of this genus are either uni or bisexual and can be found on the same or on separate inflorescences of the same plant (Koch & Silva 2012; Faria *et al.* 2016).

The flowers are more susceptible to pests and diseases during the period of growth and flowering, which may lead to a loss of flowers or to plant death. The main pests include mites, caterpillars, beetles, cochineals, and aphids. Aphids (Aphididae) are sap-sucking insects that attack the leaves, roots, and flowers of a plant. Peronti & Silva (2002) emphasized that aphids damage most ornamental plants causing either directly by sap sucking or indirectly via secretions. The secretions of aphids are attractive to other pathogens and insects, which can lead to falling flowers and cosmetic patches that reduce the plant's commercial value. An aphid attack can lead to plant death if not controlled in time (Faria *et al.* 2016).

Aphids are easily transported with plants to other sites, which makes controlling these insects challenging. Most aphids can live in association with tree species, as observed by Leal & Oliveira (1983) who recorded this association in public squares in Recife, Brazil. In addition, Bergmann *et al.* (1988) identified 16 aphids–plant associations in the state of São Paulo, and Peronti & Silva (2002) recorded 59 associations by observing 25 common aphid species interact with different species of trees, shrubs, and herbaceous plants. However, Peronti & Silva (2002) excluded certain plant species that are susceptive to this kind of pest, including those kept in nurseries, in orchards, or under protection.

This study aims to report the first recorded *Aphis craccivora* Koch attack on *Catasetum* sp. in the state of Mato Grosso, and in Brazil because of the damage that insects of the family Aphididae can cause to ornamental plants.

The occurrence of *A. craccivora* damage in *Catasetum* sp. was observed in Orquidário Altaflorestense, an area in Mato Grosso State University, located in Campus II in Alta Floresta, Mato Grosso. The nursery has approximately 500 specimens belonging to 45 species, and the attack was verified in the species: *Catasetum osculatum* Lacerda & Castro, *Catasetum macrocarpum* Rich. ex Kunth, *Catasetum juruenense* Hoehne and *Catasetum tigrinum* Rich. ex Kunth. *A. craccivora* attack was found in 60 plants of *Catasetum* sp. whose flowering periods were during the months of July, August, and September of 2015. This flowering period also coincided with the dry season.

The damage by *A. craccivora* in *Catasetum* sp. was observed in plants that were emitting flower. The following observations were made: tissue death, rotting of the buttons and base rod, and prevention of flowering. The leaves were also attacked in the central region where there is a greater flow of sap and where honeydew was excreted. Honeydew is a sticky, sugar-rich liquid that is secreted by aphids and some scale insects as they feed on plant sap. It is observed as a darkened portion of the leaf or limb and may possibly act as a substrate to promote fungi growth. Affected flowers have dark spots ranging from brown to black, which reduce the plant's commercial value.

The black aphid (*A. craccivora*) belongs to the genus Aphis, which contains about 500 species. The black aphid was first reported in Mexico (Peña & Sifurtes 1972), but it is distributed mainly throughout South America, New Zealand, and Australia. In Brazil, aphid attacks were recorded in weeds (*Solanum americanum* Mill. and *Amaranthus hybridus* L.) in the Santa Maria-RS (Sturza *et al.* 2011) and also in the Valley of San Francisco Northeast, where they caused damage to mango trees (Ferreira & Barbosa 2002). There are also reports of damage caused by *A. craccivora* in alfafa (*Medicago sativa* L.) (Cunha *et al.* 2016) and in feijão-caupi [*Vigna unguiculata* (L.) Walp.] (Rodrigues *et al.* 2012; Melville *et al.* 2016). Their secretions were also observed in the leaves and inflorescences of cashew trees in the northeast region, that favor the development of fungi and other pathogens causing wilting and death of plant parts reducing production (Mesquita & Sobrinho 2013). Similar symptoms were observed in *Catasetum* sp. where secreted substances covered every flower stem and inflorescences, killing the plants before the formation of flower buds.

The significant damage that aphids cause ornamental plants such as orchids can reduce their commercial value and even prevent or lower their production. Therefore, it is important both to monitor these pests and to study possible methods of control.

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