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SCIENTIFIC NOTE

Record of *Diglyphus* Walker (Hymenoptera: Eulophidae) Species in Brazil

AR Carvalho[1], VHP Bueno[2], DB Silva[2], VA Costa[3]

[1]Embrapa Agrobiologia, Seropédica, RJ, Brasil
[2]Depto de Entomologia, Univ Federal de Lavras, Campus Universitário, Lavras, MG, Brasil
[3]Instituto Biológico, Centro Experimental Central, Campinas, SP, Brasil

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Correspondence
Alessandra R Carvalho, Embrapa Agrobiologia, Rodovia BR 465, km 7, Seropédica, RJ, Brasil; acarvalho@cnpab.embrapa.br

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Abstract

Leafminers (Diptera: Agromyzidae) are pests of various crops, mainly in greenhouses, and have *Diglyphus* spp. as important leafminer larval parasitoids. Until recently, only *Diglyphus insularis* (Gahan) had been reported in Brazil. In here we report the first records of *Diglyphus begini* (Ashmead), *D. intermedius* (Girault) and *D. isaea* (Walker) in Brazil. These parasitoids were found parasitizing leafminer larvae on cultivated and spontaneous plants in some areas of Minas Gerais state, Brazil.

There are many communities of indigenous parasitoids for leafminer control (Diptera: Agromyzidae), and there is also evidence that they can efficiently regulate leafminer populations in pesticide-free areas (Murphy & La Salle 1999).

Diglyphus are one of the most important parasitoids attacking the leafminers *Liriomyza* spp. A complete sampling of the fauna associated with these pests always showed one or more species of leafminers being parasitized by *Diglyphus* species (Parrella *et al* 1989). *Diglyphus* spp. have been shown to be a promising control component in the pest management strategy for *Liriomyza trifolii* (Burgess), a common pest on cultivated ornamentals and vegetables in greenhouses (Heinz & Parrella 1989). *Diglyphus insularis* (Gahan) is the only species documented in Brazil until now (Gordh & Hendrickson 1979).

Surveys were made weekly from March 2007 to September 2008 to assess the natural enemies associated to leafminers in several commercial or domestic cultivated plants and weeds by collecting infested leaves, in the municipalities of Lavras, Ijaci and Campos Gerais, Minas Gerais State. The collected leaves were brought to the laboratory and had their petioles wrapped in cotton wool, placed into Petri dishes (25 cm diameter) lined with moistened filter paper, and covered with a plastic film. The Petri dishes were kept in a room at 25 ± 2°C until adult leafminer or parasitoid emergence. The emerged insects were stored in 70% ethanol for further identification. The parasitoids were identified to genus by using the key of Schauff *et al* (1997); *Diglyphus* species were identified following the Gordh & Hendrickson (1979) key.

Three species of *Diglyphus* not yet reported in Brazil, *D. begini* (Ashmead), *D. intermedius* (Girault) and *D. isaea* (Walker) were identified among the collected specimens. *Diglyphus begini* was collected in Lavras, Ijaci and Campos Gerais, and *D. intermedius* and *D. isaea* were found in Lavras, southern of Minas Gerais State.

Diglyphus begini is reported in a few places outside the Americas, such as Czech Republic, Norway, China, Slovakia and Yemen. However, most of the records are from Canada to South America, including Peru and Colombia, countries that border Brazil (NHM 2009). *Diglyphus intermedius* is known to Canada, United States, Hawaii, Mexico, Puerto Rico, Costa Rica, Colombia and China, while *D. isaea* has a wide distribution, occurring in Europe, Africa, India, Asia and North America. However, it was never reported

in South America (NHM 2009).

These parasitoids were found mostly on leafminers infesting home gardens of broccoli, cabbage and tomato, where pesticides certainly were not used for insect pest and/or disease control. In commercial fields, these parasitoids were found in lettuce and chrysanthemum crops (Table 1). *Diglyphus begini* was sampled from leafminers collected both in cultivated crops and weeds (Table 1).

The correlation between these three parasitoids and their hosts was impossible to conduct in this study, as the species of leafminers are not identified yet. As most of the Agromyzidae found in weeds do not belong to the genus *Liriomyza*, it is possible to state that, in this study, *D. begini* was found parasitizing leafminers from different genera. Webster & Parks (1913) observed *D. begini* eggs on the larval surface of *Agromyza parvicornis* Loew and Doutt (1957) observed on *Phytomyza atricornis* Meigen.

The three *Dighyphus* species were found more frequently in spring (September to December) and summer (December to March) seasons (Fig 1), when the climate in the sampled area is characterized by high temperatures and relative humidity.

The first record of three species of *Diglyphus* in Brazil raises the possibility of implementing biological control in the regions where the leafminers are the most frequent pest, making cultivation impossible or increasing the production cost and decreasing the quality of the final product. However, studies on the biology of each one of the *Diglyphus* species reported in here in the local climate, and on techniques for their commercial production are required.

Table 1 Host plants and number of *Diglyphus* species found in Minas Gerais State, Brazil, during 2007 and 2008.

Host plants	*D. begini*	*D. intermedius*	*D. isaea*
Crops			
Brassica oleracea var. *Acephala* (cabbage)	30	39	8
Brassica oleracea var. *italica* (broccoli)	83	4	—
Chrysanthemum sp. (chrysanthemum)	3	—	—
Lactuca sativa (crisphead lettuce)	2	—	—
Lycopersicon esculentum (tomato)	4	—	1
Weeds			
Commelina benghalensis (Bengal dayflower)	1	—	—
Jaegeria hirta (*botão-de-ouro*)	1	—	—
Richardia brasiliensis (richardia)	1	—	—
Tropaeolum majus (orange nasturtium)	13	—	—

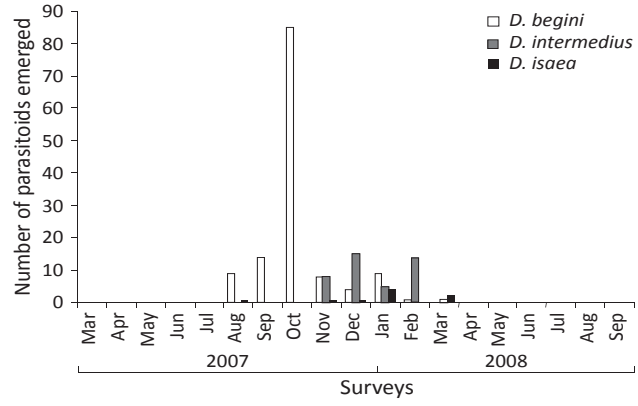

Fig 1 Number of *Diglyphus* species found in in Minas Gerais State, Brazil during 2007 and 2008.

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