First report of leafminer *Lyriomyza* spp. in *Daucus carota* in Brazil

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Diptera, Lepidoptera, and Coleoptera are the taxonomic groups of leaf miners more common of the world (Foba et al., 2015; Jahnke et al., 2008; Queiroz, 2002; Marchiori et al., 2004). The dipterous agromyzid leaf miner, *Lyriomiza* spp., are a more important polyphagous pest of the vegetables species of plants (Foba et al., 2015) in the Americas. The *Liriomyza huidobrensis* (Blanchard), *L. trifolii* (Burgess), and *L. sativae* (Blanchard) have been recorded as the most important leafminer pests in vegetable production systems in word (Guantai et al., 2015). More than 87% of the *Liriomyza* species attacking *Pisum sativum* L., *Phaseolus vulgaris* L., *Solanum lycopersicum* L., and *Solanum tuberosum* (Foba et al., 2015). Adults, males and females, feeding of the leaves and its immature stage (larvae) feeding of palisade parenchyma tissue (Bueno et al., 2007). In addition, the females of *L.* spp. are vector of diseases by transference during feeding or egg laying (Durairaj et al., 2010). *Liriomyza* have a hability of rapid dispersal and colonization of different landscapes, often in association with global trade and transportation (Weintraub, 2001). It has been reported that all plants, but nothing is known about *L.* spp. and how is it that they may damage in *Daucus carota* (Apiaceae), nor about the percentage of pest attack, nor why this is happening in this type of crop. *D. carota* is a vegetable of great importance worldwide. This manuscript reports the first record of *L.* spp. in leaves of *D. carota* (Apiaceae) in Brazil.

The study was conducted in commercial carrot plantations (cv 'Juliana') in the municipality of Rio Paranaíba and São Gotardo, Minas Gerais, Brazil (19° 12' 57.91" S, 46° 13' 41.08" W), with an average temperature of 26.32 °C, 45-98% RH, and 1,321 mm annual rainfall and an average altitude of 1,250 m. Sixty carrot plants were selected in three plantations. Sampling was conducted during the drier months (July to September) and raining months (January to March). The evaluated characteristics were the numbers of mined leaflets per plant and mines per plant. The number of mined leaflets and mines per plant were evaluated by performing a direct counting of these features throughout the plant.

During the sampling period, *Liriomyza* spp. was observed in carrot plantations in Rio Paranaíba and São Gotardo. The higher number of mines per plant, number of mined leaflets, and infested plants (%) were of 22.10, 12.33 and 21.02, respectively. (Table 1). The mines of *L.* ssp. occur in all leaves. They are meandering and located at the end of the leaves (Figure 1a, b). The leaves when are high infestations become yellow and die within 10 days. This species has been reported causing direct and indirect damage on flowers, and vegetables (Chabi-Olaye et al., 2008). But in the Apiaceae family is the first time we have reported this pest. The occurrence of *L.* spp. on *D. carota*, contributes to the knowledge of the *Liriomyza* genus and shows the importance of monitoring and incorporating different control strategies to manage the population of this insect.

Table 1. Plantations, area and attack of leafminer *Liriomyza* spp. in *Daucus carota*.

Plantations (n=Plants evaluated)	Area (ha)	Number of mines/leaf	Number of mined leaflets/plant	Plants infested (%/ha)
1 (n=2,400)	120	8.25±0.12	3.05±0.02	5.25
2 (n=3,750)	250	13.26±1.05	8.07±0.11	10.23
3 (n=2,000)	80	22.10±0.29	12.33±0.03	21.02

Figure 1. Carrot leaves with one (a), and two mines (b) of *Liriomyza* spp. Arrows indicate the location of the mine on the sheet.

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