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Altitude affects the distribution and abundance of two non-native insect pests of the common walnut

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Abstract

The leaf miner *Coptodisca lucifluella* and the carpophagous *Rhagoletis completa*, of American origin, are two non-native walnut (*Juglans* spp.) pests in Italy. For the Friuli Venezia Giulia region (FVG) (N-E Italy), *C. lucifluella* is not yet listed, while *R. completa* has been present for over 25 years. During 2015, samples of leaves and fruits were collected from 219 single old common walnut trees (*Juglans regia*) placed at different altitudes (0–1,073 m a.s.l.) in FVG to detect the distribution and abundance of both pests. Samples of leaf miner larvae and their parasitoids were subjected to mitochondrial DNA analysis for identification. *C. lucifluella* has been found in 55 out of 219 sites. The species has been identified by typical leaf symptoms and by its DNA barcode. This is the first report of the species for FVG. The leaf miner distribution was negatively correlated with altitude. The species has not been observed at sites over 600 m a.s.l. Larvae were parasitized by native parasitoids identified as belonging to the genus *Chrysocharis* by morphological features and by DNA barcode. *R. completa* has been found in 89 out of 165 sites on walnut trees with fruits. The infestation level was very high in lowland localities. At sites over 700 m a.s.l., no infestation was found. Both species are widespread in the region, and their occurrence is significantly affected by altitude. Data suggest that walnut trees could be cultivated in some mountain areas without the need to control *R. completa* with insecticides.