

# From pecan to walnut: American leafminer invades Italy on a new tree

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Live adult moth of *Coptodisca lucifluella*. Credit: Institute for Sustainable Plant Protection

A leafminer that has been invading Italian walnut orchards since 2010, has been shown to be identical to the North American species that feeds on hickories and pecan. The identity of these moths as *Coptodisca lucifluella* was proved by DNA barcoding and morphological study.

Probably the moth invaded the new host plant after it invaded Italy. The leafminer is already widespread in Italy but the level of damage does not seem to be worrisome.

In 2010 Umberto Bernardo and his colleagues of the CNR, Institute for Sustainable Plant Protection in Portici found an unknown leafmining moth in southern Italian walnut orchards. It soon appeared to belong to the North American genus *Coptodisca*, very small but beautiful moths of about 2.5 mm in rest. However, establishing the identity of the species was less easy, since the moth did appear not to be one of the species that are feeding on walnuts in North America.

## **From pecan to walnut**

Also in 2010, Erik J. van Nieukerken of Naturalis Biodiversity Center (Leiden, Netherlands) had collected North American larvae during his studies on another leafminer that was invading North Italian vineyards (*Antispila oinophylla*). Surprisingly, when the researchers compared their results, the DNA barcodes of North American *Coptodisca* larvae collected on hickories appeared to be very close to those of the Italian walnut feeding moths. Hickories are another group of trees that also include the pecan tree, but they also belong to the same family as the walnut tree. Because this group of moths had been poorly studied previously, the researchers studied moths from several North American collections and finally decided on the basis of both morphological and genetic studies that the species is *Coptodisca lucifluella*, described in the 19th century from hickory. They published this last week in the *Bulletin of Entomological Research*.

## **Widespread and abundant in Italy**

The moths have a beautiful colour pattern consisting of silver, black and

yellow spots, and measure only 4 mm in wingspan. The larvae make short galleries in the walnut leaves and at the end cut out a small shield, leaving a characteristic hole at the end of the leafmine. The larva attaches the shield to the leaves or other surfaces and pupates inside.



American leafminer moth *Coptodisca lucifluella* has been invading Italian walnut orchards since 2010. Interestingly, the moth lives on pecan trees in the United States, but invaded a new host plant in Europe: the walnut tree. Credit: Naturalis Biodiversity Center

*Coptodisca lucifluella* occurs in eastern North America from Texas north to New York. It feeds as larva on several species of wild hickory and commonly on pecan in orchards, e.g. in Georgia, where it is a minor pest. In North America the moth has never been found on walnut.

In Italy the species is widespread from the Veneto in the north to the Basilicata region in the south. The leafminer can develop 3-4 generations per year and is abundant in most of the investigated orchards, except those in higher altitudes. Almost all leaves appear to be infected, but overall the density is still low.

## **New hostplant**

It is likely that the ever increasing transport has brought the insect to Europe. The small shields with larvae or pupae, attach easily to leaves or trunks and could in that way easily be transported. It is interesting that the moth invaded a new hostplant in Europe, a phenomenon that has been seen in other invading insects. Further research is needed to establish the origin of import, to follow its invasion of Europe and to find the best sustainable measures to prevent this insect to become a pest.

Provided by Naturalis Biodiversity Center

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