IVES Technical Reviews
vine & wine

https://doi.org/10.20870/IVES-TR.2026.9943

Cryptoblabes gnidiella: a growing challenge for Mediterranean vineyards

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The honeydew moth *Cryptoblabes gnidiella* (Milliére, 1867) (Lepidoptera, Pyralidae, Phycitinae) is native to the Mediterranean region, but is now widespread in many countries worldwide[1]. It is a highly polyphagous pest, able to feed on more than 80 plant species, including herbaceous plants, shrubs, and trees, both wild and of agricultural interest. These include important crops in Mediterranean agriculture, such as the pomegranate (*Punica granatum* L. 1753), the persimmon (*Diospyros kaki* L.f. 1782), and the grapevine (*Vitis vinifera* L. 1753).

Geographical distribution

Although *Cryptoblabes gnidiella* is a Mediterranean species, it was considered a minor pest for decades. However, due to climate change and the consequent temperature rise, it has become a significant threat to viticulture in central and southern Italy[1]. Severe damage has been recorded on medium-late and late-ripening grapevine cultivars, including Sangiovese, Montepulciano, and Aglianico. More recently, the pest has expanded its range toward inland and northern areas of the peninsula and beyond the Alps, affecting vineyards in France, Spain, and Portugal[2 3 4]. In 2025, its presence and related damage were reported for the first time in Greece. In several South American countries, such as Brazil and Uruguay, *C. gnidiella* is already regarded as the primary grape moth, causing severe losses in production.

Life cycle

Cryptoblabes gnidiella (Figure 1) can complete 3-4 generations per year, depending on climatic conditions[5]. This species overwinters as larvae of different ages or pupae, primarily within the residual bunches of grapes left in the field, but also under the vine's bark.

In Italy, the first flight of the year starts with relatively low catches in late April to early May. Then, the catches increase progressively from mid-July, peaking in the second half of September, with a third and fourth flight partially overlapping and gradually decreasing and ending in late November-early December. Spring catches in vineyards are mostly represented by individuals overwintering in the larval or pupal stage inside bunches of grapes left in the field after harvest. Spring flights are not usually followed by the presence of larvae on vine flowers, as during this period, it prefers alternative hosts depending on the environmental context.

The first larvae can be found on bunches of grapes in the pre-closing phase, with greater frequency from veraison onwards and throughout the ripening phase. These will emerge from eggs laid mainly on the rachis and pedicels, making them difficult to detect during field inspections.

Harmfulness

During the early stages of infestation, larvae feed on the green tissues of the grape bunch (i.e., rachis and pedicels), thus reducing vascular integrity, which leads to slow and progressive bunch wilting. The marked gregarious behaviour of this pest promotes high larval aggregation (even 10-20 larvae per cluster depending on the severity of the infestation) within single bunches, resulting in partial to total bunch collapse[1] (Figure 2). Beyond direct injury, larval feeding predisposes damaged berries to secondary fungal infections, particularly *Botrytis cinerea* (Pers., 1794), favoured by dense canopies, elevated humidity, and limited aeration. Bunch damage also facilitates colonisation by secondary pests, such as nitidulid beetles and drosophilid flies, amplifying the overall phytosanitary and economic impact of this emerging viticultural pest[1]. During the last decade, we observed production losses ranging from 4 % to 70 % (personal observations), depending on the environmental conditions.

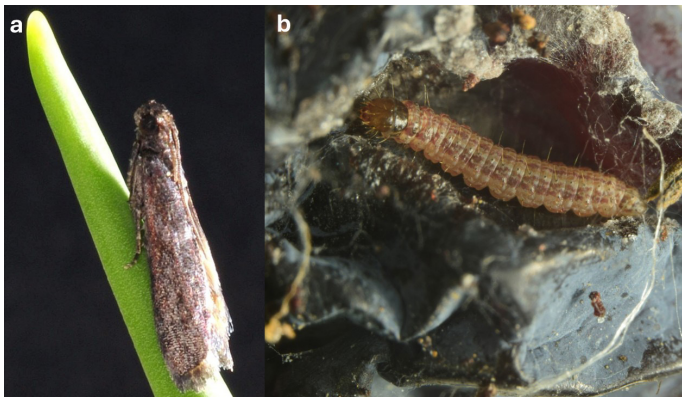


FIGURE 1. a) Adult of *C. gnidiella* with a wingspan of 12-16 mm. The front wings are dark gray, dotted with tiny black spots; scattered reddish-brown scales give them a purplish appearance, and b) V instar larva (10-12 mm), which has a light yellow-brown body with dark brown bands. The head is reddish-brown, with small black areas at the base of the blackish bristles, which are also present on the thorax and abdomen. The thoracic legs can vary from reddish-brown to black.

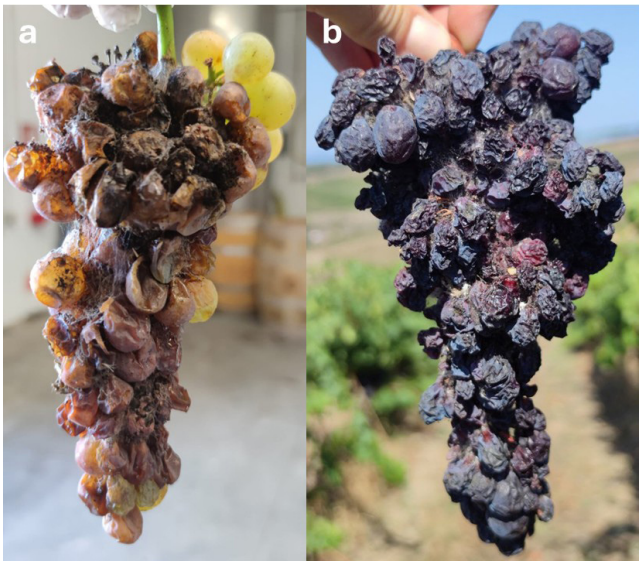


FIGURE 2. Bunches heavily damaged by *C. gnidiella*: a) Vermentino, early ripening variety, and b) Sangiovese, medium-late ripening variety. In both cases, the bunches contain many larvae and have withered berries covered in a dense web of silk covered in scattered excrement and exuviae. This leads to the development of different types of rot and the colonisation of other insects, such as nitidulid beetles.

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Monitoring and management methods

Monitoring using pheromone traps is a key step in tracking the flight activity of this *C. gnidiella* pest during the production season (Figure 3a). As in many other Lepidoptera, captures in the pheromone traps are not directly related to subsequent damage. For this reason, only a visual inspection of the infestation on the grapes can provide a realistic assessment of the pest impact on the crop. Tolerance thresholds for *C. gnidiella* have not been defined, given that eggs and young larvae are not easily detectable, because they are found in the innermost parts of the bunch. Since we cannot use a reliable threshold, recent years' experience suggests that prompt treatment is required following a sudden increase in captures and/or the appearance of the first symptoms on the bunch (Figure 3b). Of note, a physiologically based demographic model has been recently developed for *C. gnidiella*, which can correctly predict moth flights, albeit with a slight tendency to underestimate real observations[6]. It could be a useful tool for predicting the adult presence, pending further validation regarding the prediction of juvenile stages[6]. Currently, the most widespread control strategy remains the use of insecticides such as spinosyns, *Bacillus thuringiensis*, and chlorantraniliprole. The effectiveness of control strategies largely depends on accurate timing and appropriate application methods to protect grape bunches during the ripening to harvest period, which is the time frame of maximum pest pressure and damage potential, particularly considering the inherent difficulty in identifying the oviposition periods.

It is recommended that treatments be applied to the bunch area and not the entire canopy. The volume of water used will depend on the spraying equipment, as well as the compactness of the bunch (although 250 L/ha is normally used in treatments, up to 400 L/ha is recommended for *C. gnidiella* on compact bunches), in order to ensure adequate penetration of the active ingredient into the inner parts of the bunch where the eggs and larvae are hidden. Concerning mating disruption, significant effectiveness has been found in areas with medium to low insect pressure[7] [8].

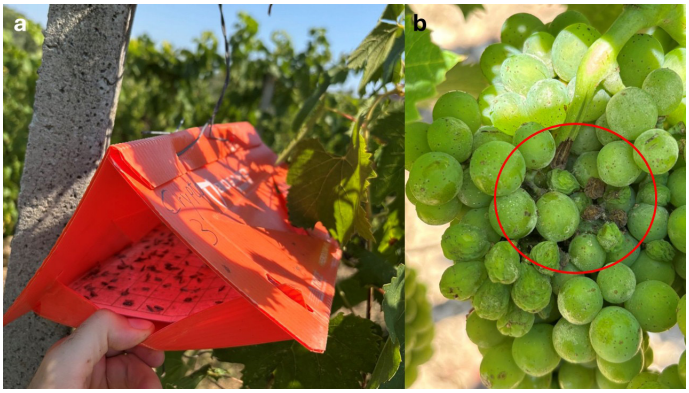


FIGURE 3. a) Flight monitoring of *C. gnidiella* using pheromone traps, and b) identification of the first symptoms of the attack.

Conclusions

Infestations by *C. gnidiella* moths are highly unpredictable, and some aspects of its life cycle are still unclear, including the impact of natural enemies. Ongoing field research needs to shed light on such aspects in order to help optimise sustainable management strategies and provide winegrowers with more accurate monitoring and control tools for managing this emerging pest. ■

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