

**Honeydew Moth *Cryptoblabes gnidiella* (MILLIÈRE, 1867)
(Lepidoptera: Pyralidae): an adventive species frequently
imported with fruit to Poland**

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ABSTRACT. *Cryptoblabes gnidiella* is an opportunistic species native to the Mediterranean region. This species has been reported from several dozen host plants, including many cultivated plants, especially fruit (e.g. grapes, lemons or pomegranates). It is considered a serious pest together with accompanying insects such as mealybugs. It is also suspected of being a vector of certain pathogens. The Honeydew Moth constitutes a threat not only to crops in the Mediterranean basin but is also becoming a problem in other parts of the world with a suitable climate, where this species has been accidentally imported. The records given here are from the time of year when pomegranates are commonly available on supermarket shelves. These data show that the import of this species is quite common and that the lack of such information hitherto may be due to its having been overlooked. This paper presents the first records of *Cryptoblabes gnidiella* in Poland.

KEY WORDS: alien species, introduction, pest, pomegranate, first record, Poland.

INTRODUCTION

The genus *Cryptoblabes* ZELLER, 1848 has only two members in the European fauna – *Cryptoblabes gnidiella* (MILLIÈRE, 1867) and *C. bistriga* (HAWORTH 1811). Only the latter has been recorded in Poland so far (BUSZKO & NOWACKI 2000, KARSHOLT & RAZOWSKI 1996). This genus is more widespread in Australia and in SE Asia, where numerous species have been described; many of them, however, are of unclear taxonomic status (NEUNZIG

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1986). The Honeydew Moth is native to and common in the Mediterranean region. This polyphagous and opportunistic species is associated with several dozen species of plants, especially crop plants. For this reason it is often considered a pest. Although *C. gnidiella* is of Mediterranean origin, it has been introduced to many regions with a similar climate, particularly in cultivable areas. It has also turned up accidentally in imported fruit in other parts of the world, e.g. in Great Britain (BAGNOLI & LUCCHI 2001, BEN YEHUDA et al. 1991, CARTER 1984).

Description

Imago: Wingspan 11-20 mm. Head and thorax greyish-brown. The pattern of the forewings is highly variable: they can be brownish with just a faint pattern, or the pattern can be quite distinct with whitish cross-lines and reddish or purple scales. The hindwings are greyish without any discernible pattern (Fig. 1).

Pupa: Ca 6-7 mm long with a typical lepidopteran shape. Reddish-brown with 2 prongs/hooks on the cremaster.

Larva: The final instar measures approximately 12 mm. It is slender with longitudinal stripes. The basic body colour is reddish-brown but can vary from yellowish, olive to deep brown (Fig. 2). Sometimes without distinct stripes (CABI 2012, NEUNZIG 1986).

The preimaginal stages of the Honeydew Moth can be confused with those of the Locust Bean Moth *Apomyelois ceratoniae* (ZELLER, 1839). The latter species has pinkish caterpillars, without longitudinal stripes, which mostly feed and pupate within fruits, unlike *C. gnidiella*. These features may be helpful in discriminating between the two species as they feed on the same set of host plants (AVIDOV & GOTHILF 1960).

Distribution

The Honeydew Moth is native to the Mediterranean Basin. In Europe it is mainly found in Portugal, Spain, Italy, Greece, Ukraine and Austria (in the last country probably as an alien species) (Fig. 3). This moth has also been reported from Great Britain as an accidentally adventive species with imported fruit, especially pomegranates. The first record from the British Isles comes from 1936; since then it has been reported just a few times. Outside Europe *C. gnidiella* is native to northern Africa and south-western Asia (CARTER 1984, NEUNZIG 1986, KARSHOLT & NIEUKERKEN 2013). Owing to its biology and links with many cultivable plants, it has been introduced to many regions with a Mediterranean climate, e.g. Bermuda, Hawaii, New Zealand, Brazil, Uruguay, Malaysia, South Africa and Zimbabwe (CARTER 1984, KRÜGER 1998, NEUNZIG 1986, TREMBLAY 1990, VIDART et al. 2013).

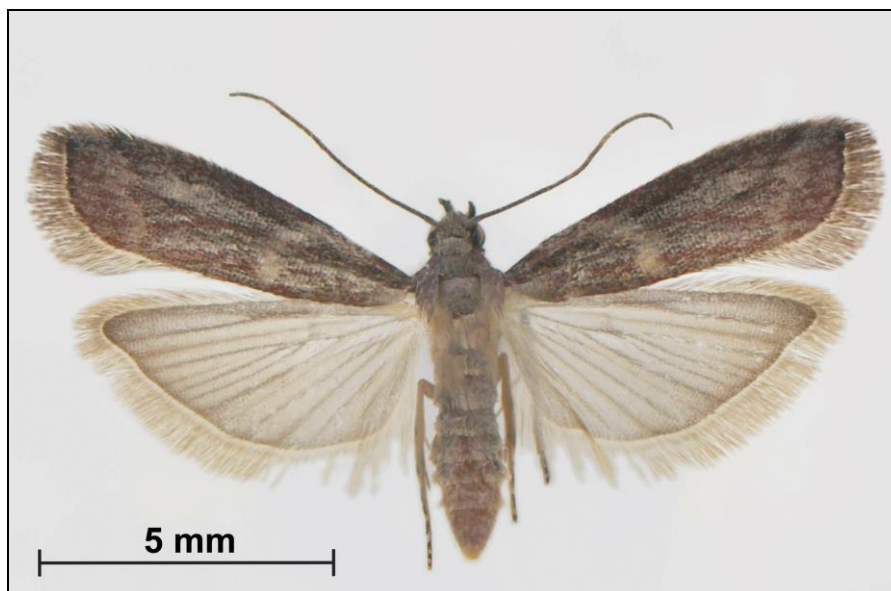


Fig. 1. Honeydew Moth *Cryptoblabes gnidiella* – imago.



Fig. 2. Honeydew Moth *Cryptoblabes gnidiella* – larva inside the remains of a pomegranate corolla (with visible frass and cocoon strands).



Fig. 3. Distribution of the Honeydew Moth *Cryptoblabes gnidiella* in Europe and the Mediterranean Basin (dots show the new records; the crosshatched areas represent countries where the species occurs in the wild; the areas coloured dark grey show countries where the species has been accidentally introduced; the blank areas represent countries without any records of this species).

MATERIAL AND METHODS

All the materials examined were fruit obtained from large shopping centres or discount stores. Pomegranates (and one kaki (persimmon)) with visible traces of feeding were selected and taken to the laboratory. The feeding areas were examined under a stereoscopic microscope (Olympus SZ11). The parts of the fruits with established larval feeding areas (the remnants of corollas in the case of pomegranates) were removed and placed in small vessels, which then were kept in conditions similar to the natural ones for this species. The rearing period ranged from 2 to 4 weeks. The photographs of the imago and larva were taken with a Nikon D5100 camera + Nikon Nikkor Micro 105 mm lens.

RESULTS

All but one of the fruits were imported pomegranates *Punica granatum* LINNAEUS, 1753 (the exception was a kaki *Diospyros kaki* THUNBERG, 1780 stored and sold in large chain stores in Poland (the countries of origin of the fruits are given in brackets). The following data constitute the first records of this adventive species in Poland (Fig. 3):

- Lublin [51°13'55" N, 22°36'42" E]; a large shopping centre at 32a Witosa St.:
 - in pomegranates – 22.10.2014: 2 pupae and 1 larva (Turkey); 24.10.2014: 1 pupa (Turkey); 31.10.2014: 1 pupa and 2 larvae (Turkey); 05.11.2014: 1 larva (Greece); 12.11.2014: 3 larvae (including 2 dead) and 1 exuvium (Greece); 19.11.2014: 3 larvae (Greece); 22.11.2014: 1 larva and 1 pupa (Greece); 26.11.2014: 1 larva and 1 exuvium (Greece); 26.11.2014: 1 exuvium (Turkey); 27.11.2014: 1 pupa (Turkey); 03.12.2014: 1 dead larva (Turkey); 10.12.2014: 1 exuvium (Turkey); 18.09.2015: 1 larva and 1 exuvium (Turkey); 25.09.2015: 1 pupa and 3 larvae (Turkey);
 - in the kaki – 22.11.2014: 1 larva (Greece).
- Lublin [51°13'47" N, 22°35'52" E], discount store at 1 Grabskiego St.:
 - in pomegranates – 03.11.2014: 1 dead larva (Spain/Turkey); 10.11.2014: 1 larva (Spain/Turkey); 12.11.2014: 2 larvae (Spain/Turkey); 15.11.2014: 1 pupa (unknown); 26.11.2014: 2 exuviae (Spain); 03.12.2014: 1 exuvium (Spain); 30.09.2015: 1 exuvium, 1 pupa and 1 larva (Turkey); 02.10.2015: 1 pupa (Spain); 03.10.2015: 1 larva (Spain); 10.10.2015: 8 larvae (including 1 dead) (Spain); 21.10.2015: 3 exuviae, 2 pupae and 1 dead larva (Spain); 24.10.2015: 1 larva (Spain); 15.11.2015: 2 larvae (Chile).
- Lublin [51°14'12" N, 22°36'16" E], large shopping centre at 6 Witosa St.:
 - in pomegranates – 15.11.2014: 1 larva (unknown).
- Lublin [51°13'57" N, 22°35'55" E], discount store at 48 Pogodna St.:
 - in pomegranates – 27.10.2014: 1 larva (unknown).
- Warsaw [52°10'47" N, 21°00'15" E], large shopping centre at 12 Wołoska St.:
 - in pomegranates – 15.11.2014: 2 pupae and 2 exuviae (Egypt); 13.11.2015: 6 larvae (Turkey).

- Warsaw [52°10'42" N, 21°00'48" E], large discount centre at 27 Zygmunt Modzelewskiego St.:
 - in pomegranates – 16.11.2014: 2 pupae (Turkey/Spain/Israel).
- Zamość [50°42'31" N, 23°17'06" E], discount store at 4 Jana Pawła II Ave.:
 - in pomegranates – 27.10.2015: 1 exuvium, 1 pupa and 1 larva (Spain/Turkey).

In total, the material consisted of 39 live larvae and 17 pupae, from which 29 adults were reared. The caterpillars, most of them being reddish-brown with characteristic conspicuous longitudinal stripes, fed both singly and collectively (up to seven in one fruit) (Fig. 2).

In addition to the above records, frass, signs of feeding and remnants of exuviae were visible in many of the fruits on display in the shops. These data are not included here for lack of sufficient features enabling unequivocal identification. The reference material is deposited in the first author's collection.

DISCUSSION

The Honeydew Moth (*Cryptoblabes gnidiella*) is a ubiquitous pest in both the Mediterranean Basin and agricultural regions with a similar climate in other parts of the world. Its biology is thus well known. Under optimal conditions it can have up to six generations per year. It can develop without a winter diapause. The number of generations also depends on the species of host plant and ambient temperatures. The temperature threshold for this species is 13°C. Its activity peaks several times during the year: once in April-June, twice or three times in July-September and once or twice in October-November. The adults are attracted to "sugars" in the shape of fruit juice or honeydew (hence the name of the moth) (AVIDOV & GOTHILF 1960, BEN YEHUDA et al. 1991, ÖZTURK & ULUSOY 2012, VIDART et al. 2013). Caterpillars of this polyphagous species may feed on leaves, twigs, flowers, seeds, fruits, fruit juice and mealybug secretions. Curiously enough, it was also recorded as a predator of some stink bugs (ZHANG 1994). Larvae pursue a secretive lifestyle and can be found in rather sheltered places among foliage or fruits (AVIDOV & GOTHILF 1960, BAGNOLI & LUCCHI 2001). The problem of this pest concerns mainly vineyards, citrus fruit plantations (another English name of this moth is the Citrus Pylalid), as well as pomegranate orchards, avocados, mangos and other fruit crops (AVIDOV & HARPAZ 1969, BAGNOLI & LUCCHI 2001, BEN YEHUDA et al. 1991, EPPO 2004, ÖZTURK & ULUSOY 2011, 2012). It is defined as a secondary pest

associated with the occurrence of scale insects, mealybugs or the European Vine Moth *Lobesia botrana* (DENIS & SCHIFFERMÜLLER, 1775) (Tortricidae). The moths predominantly attack plants previously infected or injured by the above-mentioned pests (BAGNOLI & LUCCHI 2001, BEN YEHUDA et al. 1991, SILVIA & MEXIA 1999), although it has also been reported without accompanying species (AVIDOV & HARPAZ 1969). *C. gnidiella* can be a vector and may contribute to the spread of some species of moulds that are potentially dangerous to many crops (BEN YEHUDA et al. 1991, SILVIA & MEXIA 1999). In our materials, the frass of this species always became overgrown by some species of moulds over time (authors' observations). Hence, this species sometimes figures on quarantine lists, e.g. in Costa Rica (VALERIN 2003). In certain countries it is considered a serious pest with a serious impact on the home market, for example in Brazil, Uruguay or Egypt (BISOTTO-DE-OLIVEIRA et al. 2007, EL-ZEMAITY et al. 2009, SELLANES et al. 2010). For instance, the percentage of crop infestation or losses in production caused by the Honeydew Moth have reached 2.48% of infected pomegranates in orchards in the coastal area of Tunisia, 2.44% dropped grapefruits in groves in Israel and a 4.6% loss in citrus production in Sardinia (AVIDOV & GOTHILF 1960, KSENTINI et al. 2011, ORTU 1982).

Given the number of records obtained and taking into account the fact that this species was found in at least 1-2 fruits in almost every displayed boxful of pomegranates from October till mid-December, the Honeydew Moth can be regarded as a quite common adventive species in imported fruit. The lack of any previous records or observations about this moth in Poland and other European countries to which pomegranates are commonly imported, is probably due to its being overlooked, as it is quite small in size and has a rather secretive lifestyle. Another reason may be that warehoused fruits and vegetables are not very common research objectives for entomologists. A third reason for its being overlooked may be that the caterpillars do not eat the consumable parts of pomegranates, so consumers do not complain if they find something suspicious on the fruits. The presence of this moth requires constant monitoring because of the potential threats to its host plants, especially in countries with an appropriate climate.

There are no threats to fruit crops in Central Europe owing to this region's cool climate and the species' quite high temperature requirements (the threshold is ca 13°C) (AVIDOV & GOTHILF 1960). But this is an excellent example of how easily and in large numbers certain species can spread imperceptibly and potentially constitute a threat to native crops.

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