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Biyolojik not (Biological note)

Hypolixus pica (Faust) (Coleoptera: Curculionidae) feeding on almonds in Antalya

Antalya'da badem bitkisinde beslenen *Hypolixus pica* (Faust) (Coleoptera: Curculionidae)

Hikmet ÖZBEK[1]

Summary

The presence of the weevil, *Hypolixus pica* (Faust) (Coleoptera: Curculionidae) was detected in a newly established almond orchard (in 2010) in Antalya. This is the first report of this species feeding on the foliage of almond plants. Its feeding and damage to plant were observed in the 2011-2013 period. The adults of the weevil appeared at the end of August, and their feeding activities continued through September-November. Due to feeding at the edges of the leaves, the damaged leaves became irregularly shaped and in some instances the whole leaf lamina was eaten or left as midribs.

Key words: *Hypolixus pica,* Curculionidae, almond, harmful, *Amaranthus,* Turkey.

Özet

Hypolixus pica (Faust) (Coleoptera: Curculionidae)'nın varlığı, Antalya'da yeni tesis edilmiş (2010'da) bir badem bahçesinde tespit edilmiştir. Bu çalışma, bu türün bademlerde beslendiğinin ilk kaydıdır. Türün beslenme ve bitkiye olan zararı 2011-2013 periyodunda izlenmiştir. Erginler, Ağustos sonunda görülmeye başlanmış, Eylül-Kasım boyunca faaliyetleri devam etmiştir. Yaprak kenarlarından itibaren beslenmelerini sürdüren erginler, yaprak kenarlarında düzgün olmayan yenikler oluşturdukları gibi, yaprak ayasını tamamen yedikleri veya sadece ortadamarı bıraktıkları da olmaktadır.

Anahtar sözcükler: *Hypolixus pica*, Curculionidae, badem, zararlı, *Amaranthus,* Türkiye

[1] Atatürk University, Faculty of Agriculture, Department of Plant Protection, Erzurum, Turkey
Sorumlu yazar (Corresponding author) e-mail: hozbek@atauni.edu.tr
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An insect damage was recognized on young newly established almond orchard (50-150 cm tall), at the end of August, 2010, in Antalya (Varsak, N: 40°96'521" E: 29°87'522"). After determination of this damage was caused by the weevil, *Hypolixus pica* L. (Coleoptera: Curculionidae), observations were carried out to detect the feeding habits and damage rate of the weevil during the summer and fall of 2011-2013.

Hypolixus pica has a large distribution range; such as Afro-tropical, Oriental and Palaearctic regions (Gültekin, 2012). In the Palaearctic region, occurrence of the species has been reported in Southwest Asian countries; Cyprus, Egypt, Iran, Iraq, Jordan, Pakistan, Syria, Turkey and the United Arab Emirates, and in European countries; only in France. In Turkey, there is only one record indicating the occurrence of the species in the southern part of the country (Gültekin & Korotyaev, 2012).

The genus *Amaranthus* L. (Amaranthaceae) comprises approximately 70 plant species, of which 60 are native to the America and the rest occur in Australia, Asia, Africa and Europe (Costea & De Mason, 2001). Some *Amaranthus* species are important noxious weeds in various cultivated plant species (Bürki et al., 2001). Among them, *Amaranthus spinosus* L. is native to tropical America and has been known in 44 countries as a noxious weed affecting 28 different crops (Waterhouse, 1994). Occurance of *A. spinosus* has been reported in the eastern Mediterranean Region In Turkey (Gönen & Uygur, 2000). Certain *Amaranthus* species have already been determined as the host plants of *H. pica* in different countries (Tawfik et al., 1976; Pourtaherzarei et al., 2010). Tawfik et al. (1976) studied the biology of this weevil on *A. caudatus* L. in Egypt. Pourtaherzarei et al. (2010) conducted their studies in Iran and noted that the larvae of *H. pica* fed in the stem of *A. retroflexus* L., but its adults on the leaves and seeds of the same plant species, and had three generations per year. In Turkey, more recently, Gültekin & Korotyaev (2012) found that the larvae of *H. pica* fed on (actually in the roots) the root of the *A. spinosus,* and immature stages of the insect were developed in the root system of this plant and the adult *H. pica* appeared in the first week of September in the Hatay province.

In this present study, the weevil, *H. pica*, was first time detected feeding on the leaves of young almond plants in Antalya at the end of August, 2010. It fed on the edges of the leaves, and damaged leaves become irregularly shaped and in some instances the whole leaf or leaf lamina is eaten, leaving only the midribs (Figure 1). Upon being disturbed, the weevil falls to the ground and lie back for a short time before climbing back on the host plant. In general, distribution of the weevil in the orchard was sporadic. In August the density was lower; 1 or 2 weevils on per plant were recorded in certain parts of the orchard, however, in September insect population increased and higher numbers (up to 5 weevils per plant) were recorded. Feeding continued during September and November, even in October copulating weevils were observed on the shoots and leaves. Damage caused to the almond plant by the weevil was significant in some parts of the orchard; a reduction in the foliage occurred, in some cases, foliage loss exceeded almost 30% of annual foliage production of the plant. Therefore, the garden owner made an insecticide application against the weevil in September, 2012 to prevent a further increase in foliage loss.

Figure. 1. *Hypolixus pica* L. and its feeding damage on the leaves of a young almond plant.

Pourtaherzarei et al. (2010) noted that the adults of *H. pica* fed on the leaves and seeds of *A. retroflexus* in Iran. In Turkey, although Gültekin & Korotyaev (2012) did not give any information about the feeding habits of the weevil, they found that larvae definitely fed on the roots of *A. spinosus* and completely destroyed the root system (Figure 2). However, in Antalya the larval host of the weevil could not be detected. There has been no any record of occurrence of *A. spinosus* in Antalya. Concerning the larval host plant of *H. pica,* there are two possibilities: firstly, the distribution range of *A. spinosus* has reached Antalya, secondly, the larvae of *H. pica* feed on another *Amaranthus* species in Antalya.

Figure 2. *Amaranthus spinosus* (left), feeding damage of the larva of *Hypolixus pica* in the root of *A. spinosus* (right) (Gültekin & Korotyaev, 2012).

Both choice and no-choice tests involving the adults of the weevil and leaves from four stone fruits; almond, peach, apricot and plum trees were carried out in the laboratory to determine the food preference and damage rate of the weevil. In choice test, one leaf from each plant was introduced into a glass jar with wet paper tissue at the bottom, then four weevils were transferred into each jar, and the jars were kept in natural light at 22-24°C. Over a period of 10 days, the weevils consumed a significantly higher proportion of both almond and peach leaves. No-choice test was conducted to determine damage rate of the weevil in each of the four plant species when no alternatively host was available. For this purpose, the leaf from each plant was offered in separate jars, and all other procedures were the same as in the choice test. Over a period of 10 days, a little feeding was observed on the leaves of both plum and apricot whereas higher feeding damages occurred on the leaves of almond and peach. The results from both choice and no-choice tests indicate that in addition to almonds, *H. pica* also feeds on the foliage of

peaches. Additionally, the current observations reveal that *H. pica* overwinters as an adult in leaf litters on the ground and has one generation per year in Antalya.

Gültekin & Korotyaev (2012) claimed that *H. pica* may be useful as a biological control agent for *A. spinosus,* which is a widespread weed species in various countries including Turkey (Waterhouse, 1994; Gönen & Uygur, 2000). However, the present study revealed that the weevil fed on the foliage of young almond and peach trees, so it must be regarded as a pest insect species. Under these circumstances, *H. pica* could not be a biological control agent for *A. spinosus*. Moreover, Pourtaherzarei et al. (2010) indicated that *H. pica* had three generations per year in Iran, whereas one generation occurs in Antalya.

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