Determination of certain biological characteristics of the pistachio seed wasp, Eurytoma plotnikovi Nik. (Hymenoptera, Eurytomidae), for its natural enemies in South East Anatolia, Turkey

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in

Kodad O. (ed.), López-Francos A. (ed.), Rovira M. (ed.), Socias i Company R. (ed.).
XVI GREMPA Meeting on Almonds and Pistachios

Zaragoza : CIHEAM
Options Méditerranéennes : Série A. Séminaires Méditerranéens; n. 119

2016
pages 217-219

Determination of certain biological characteristics of the pistachio seed wasp, *Eurytoma plotnikovi* Nik. (Hymenoptera, Eurytomidae), for its natural enemies in South East Anatolia, Turkey

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Abstract. The project was conducted in pistachio orchards in Gaziantep in 2011-2013. The purpose of the study was to determine biological characteristics of pistachio seed wasp, *Eurytoma plotnikovi* Nik. (Hymenoptera, Eurytomidae). Fruits infested with the pest were placed in cages in January in orchard. The cages were checked weekly starting in the first week of April. After the first adult emergence in the orchard in Gaziantep, daily monitoring was initiated. First and maximum adult emergence times and adult emergence period were determined in orchard. According to examination of the fruits in the orchard in Gaziantep in July in 2011 and 2013, it was determined that the pest pupates within fruits and later leaves the fruit as an adult. During the study, pupa period, adult lifespan, male/female ratio and host range of the pest in Southeastern Anatolia were determined.

Keywords. Pistachio – Pistachio seed wasp – *Eurytoma plotnikovi* Nik. (Hymenoptera, E urytomidae) – Naturel enemies.

Détermination de certaines caractéristiques biologiques de la guêpe des semences du pistachier,* Eurytoma plotnikovi *Nik. (Hymenoptera, Eurytomidae), pour ses ennemis naturels dans le sud-est de l'Anatolie, Turquie

Résumé. *Le projet a été mené dans des vergers de pistachiers à Gaziantep en 2011-2013. Le propos de l'étude était de déterminer les caractéristiques biologiques de la guêpe des semences du pistachier,* Eurytoma plotnikovi *Nik. (Hymenoptera, Eurytomidae). Les fruits infestés par le ravageur furent placés en janvier dans des cages dans le verger. Les cages étaient inspectées toutes les semaines à partir de la première semaine d'avril. Après la première émergence d'adultes dans le verger à Gaziantep, une surveillance journalière fut mise en place. Le moment de la première émergence d'adultes, de l'émergence maximale d'adultes, ainsi que la période d'émergence d'adultes, furent déterminés au verger. Selon l'examen des fruits du verger à Gaziantep en juillet 2011 et 2013, on a établi que le ravageur se nymphose à l'intérieur des fruits et quitte ensuite le fruit ayant atteint l'âge adulte. Durant l'étude, on a déterminé la période de nymphose, espérance de vie à l'âge adulte, le rapport mâle/femelle et spectre d'hôtes du ravageur dans le sud-est de l'Anatolie.*

Mots-clés. *Pistachier – Guêpe des semences du pistachier –* Eurytoma plotnikovi *Nik. (Hymenoptera, Eurytomidae) – Ennemis naturels.*

I – Introduction

Pistacia species exist and can grow within 30-45º latitude both in North and South hemisphere and in microclimates resembling them (Bilgen, 1973). According to Ülkümen and Özbek (1950), the origin of pistachio is Turkey, Iran and Afghanistan. Turkey is in the North hemisphere and within the area of its genetic origin. Southeastern Anatolia has an important role in pistachio production. Besides being the place of its first cultivation, due to its own ecological characteristics, the region provides opportunities for its cultivation and dispersal. Pistachio is an undemanding plant in all re-

spects. Therefore, it can grow in places which are stony, insufficient in nutrients and rich with lime. Furthermore, because pistachio cultivation is possible on areas where irrigation water is restricted, amount of rainfall is low (300-500 mm/m^2) and on areas where cultivation of any other crop is not economically feasible, pistachio production has considerable economic value for both growers and the country (Tekin *et al.,* 2001).

Three pest insect species were determined on pistachio fruits in Turkey. These are *Megastigmus pistaciae* Wal., *Shneidereria (= Recurvaria) pistaciicola* Danil. and *Eurytoma plotnikovi* Nik. (Hymenoptera: Eurytomidae) (Doğanlar & Karadağ, 2008). Difficulties on the control of, *Eurytoma plotnikovi* entailed this study to elucidate the biology of the pest in the region.

II – Materials and methods

Materials: The main materials of the study were infested pistachio orchards by the pest, fruits in these orchards, insect culturing cages, branch cages, and meteorological data.

Some morphological features of *Eurytoma plotnikovi* Nik: Morphological measurements were taken from 30 males, females, larvae and pupa.

Adult lifespan: To find the adult lifespan, 47 individuals were taken into culture in natural conditions. As nutrition, cotton wetted with sugar solution was placed in each cage and renewed daily. Dead individuals were recorded daily and removed from the cages.

Overwintering status: Wintering pistachio orchards in order to detect the status of the pest from the fruit samples were collected. A portion of the collected samples individually opened and wintering pest status is determined.

Adult emergence: In order to determine the time of adult emergence, cages containing damaged fruits were placed in orchards in Gaziantep and şanlıurfa in the first week of January. Adult emergence was monitored weekly starting from the first week of April. The data was evaluated to determine first and maximum adult emergence times and adult emergence period. During adult emergence period, maximum and minimum temperatures and average relative humidity were recorded daily.

Pupa period: Larvae removed from injured fruits were placed in culture cages and left in natural conditions. Time between pupation and adult emergence was determined by periodical.

Host plants: Samples were collected from *Pistacia* species in order to find whether or not the pest has other hosts.

III – Results and discussion

Certain morphological features of *Eurytoma plotnikovi* Nik: Female body length (excluding ovipositor) is 2.1-2.5 mm while male body is mm long. The body is generally rust-red in color, head, black base with metal hose and show pronotum the middle of the segment; antenna and legs rust color. Male body black; legs rust-colored; black antennae; wing veins brown; abdomen short ball-shaped. The male antenna is tall. The larvae mature in the period 5-6 mm long, white-colored, legless. The eggs are oval. Pupa first color is white and the dark color is close to adult emergence. Pupa is free stern type.

Adult lifespan: 20 individuals have been released into the cage from individuals living 5 days with the shortest adult individuals who lived the longest 20 days. Adult life continued an average 13.5 days. Male individuals live up to 10 days with 2 adults and the average male individual life lasts 6 days. Female individuals are living up to the 2 to 13 days. The average adult female individual's life lasts 8 days.

Overwintering status: It was determined that the pest larvae during winter.

Adult emergence: Adult emergence was found that first week of May. However, depending on the phenology can be output in mid May. The average duration of 32.5 days for the emergence Gaziantep, Sanliurfa province has been identified as 27 days.

Pupa period: First pupa was observed on the second week of April. The time between the first adult emergence and the date of first pupae in nature is 15-16 days.

Host plant: Besides *Pistacia vera*, the pest was also found in the fruits of *P. khinjuk* and *P. terebinthus.*

IV – Conclusions

As a result E.plotnikovi is an important species to be considered in the areas of pistachios. it is especially important in determining the time of adult emergence to monitor for that struggle has concluded that there is need to.

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