



التسجيل الأولي لمتطفل جديد من فصيلة ذباب التاكينا (Diptera) Tachinidae
على حشرة دودة ثمار التفاح *Cydia pomonella* L. في سورية
First Recorder of a New Parasitoid on Codling Moth, *Cydia pomonella* L.
Belongs to Tachinidae Family in Syria

Eng. Shadi Alhaj⁽¹⁾ Prof. Abed Alnabi Basheer⁽¹⁻²⁾ Prof. Louai Aslan⁽¹⁾

(1) Department of plant protection, Faculty of Agriculture, Damascus University, Damascus, Syria.

(2) The Arab Center for the Studies of Arid Zones and Dry Lands (ACSAD).

shadialhaj@live.com

الملخص

أجريت الدراسة في منطقة بشرافي في محافظة اللاذقية (سورية) خلال الفترة 2011-2013 في بستان تفاح وآخر جوز، تم جمع عينات مصابة بدودة ثمار التفاح وثمار الجوز، بهدف تحديد المتطفلات الحشرية على الحشرة. تم تسجيل المتطفل *Neoplectops pomonellae* الحشرات في شتوتغارت في ألمانيا من قبل Hans-Peter Tschorsing. وهذا المتطفل يسجل لأول مرة في سورية على يرقات دودة ثمار التفاح على العائلين التفاح والجوز.
الكلمات المفتاحية: متطفل، *Cydia pomonellae*، متحف، *Neoplectops*، اللاذقية، سورية.

Abstract

This study were conducted over a period 2011- 2013 in Bushraghi (Lattakia/Syria) in west of Syria on two plant hosts (apple and walnut). A number of parasitoids emerged in the laboratory from the field-collected larvae, including tachinids that were kindly determined by Hans-Peter Tschorsnig of the Staatliches Museum für Naturkunde, Stuttgart, Germany. A new tachinid species (Diptera: Tachinidae) collected from apple and walnut orchards parasite on *Cydia pomonella* in Lattakia Governorate (Syria). The new species distinguish and identified as *Neoplectops pomonellae*. The parasitoid has been reported for the first time in Syria on larva of Codling moth in two plant host apple and walnut.

Key words: parasitoids, *Cydia pomonella*, Museum, *Neoplectops*, Lattakia, Syria.

©2019 The Arab Center for the Studies of Arid Zones and Dry Lands, All rights reserved. ISSN:2305 - 5243 ; AIF-177 (p: 28 - 34)

Introduction

The Codling moth, *Cydia pomonella* L. (Lepidoptera: Tortricidae) is the most serious pest of apple and pear worldwide. When apple orchards are not protected, up to 95 percent fruit damage can occur only due to infestation by the Codling moth. The Codling moth occurs on all continents where apple and pear are grown, with a distribution from Europe, Asia, North and South Africa to Australia. Also, *C. pomonella* is found as key pest in other fruit crops such as peach, plum, quince and walnut (Hoyt *et al.*, 1983; Barnes, 1991; Quarles, 2000; Van Frankenhuyzen and Stigter, 2002). Usually this pest controlled by using insecticides from pyrethroids or organophosphate chemical groups such as cypermethrin, alphacypermethrin, esfenvalerate or chlorpyrifos. However, codling moth populations are resistant to these insecticides (Alhaj *et al.*, 2009), on other hand there are many studies in Syria focused on biological control of codling moth by studying its parasitoids.

Many parasitoids belong to Ichneumonidae and Braconidae and also Chalcididae are recorded on *C. pomonella* in Syria (Almatni 2003; Alhaj *et al.*, 2009; Basheer *et al.*, 2010).

The Tachinidae is the largest family of Diptera with 10,000 described species in the world (Irwin *et al.*, 2003). Overall, the Tachinidae are considered beneficial, as most species are primary parasitoids of plant pests. Many tachinids have been used successfully in biological control programs (Grenier, 1988; Stireman *et al.*, 2006). There are parasitoids on various species of Lepidoptera, Hymenoptera, Coleoptera, Heteroptera, Orthoptera, and a few others (Tschorsnig and Herting, 1994).

The history of studies on Tachinidae fauna is not very long in Syria, and still we need very considerable researches to be done to describe the complete diversity and distribution of Tachinidae species.

Elodia morio is reported as one of the most important parasitoids of the codling moth in Europe (Rosenberg, 1934; Coutin 1974; Athanassov *et al.*, 1997). However, it was not found in recent study in west of Syria.

The primary object of this paper is to describe a new species of Tachinidae parasitoid on *C. pomonella* is *Neoplectops pomonellae*.

Material and Methods

This study was conducted over a period 2011- 2013 in Bushraghi in west of Syria (35° 17' N, 36° 6' W, altitude 760m) on two plant hosts (apple and walnut).

In the present study, *C. pomonella* larvae were collected using cardboard strips that were placed around the trunks of plant hosts at two times in June and removed in 1015- July and beginning of August and removed in full winter.

In the laboratory, the live larvae were placed in corrugated cardboard cylinders inside PVC jars with a mesh cloth on the lid. Glass jars were put over the mesh to collect the newly emerged moths and parasitoids.

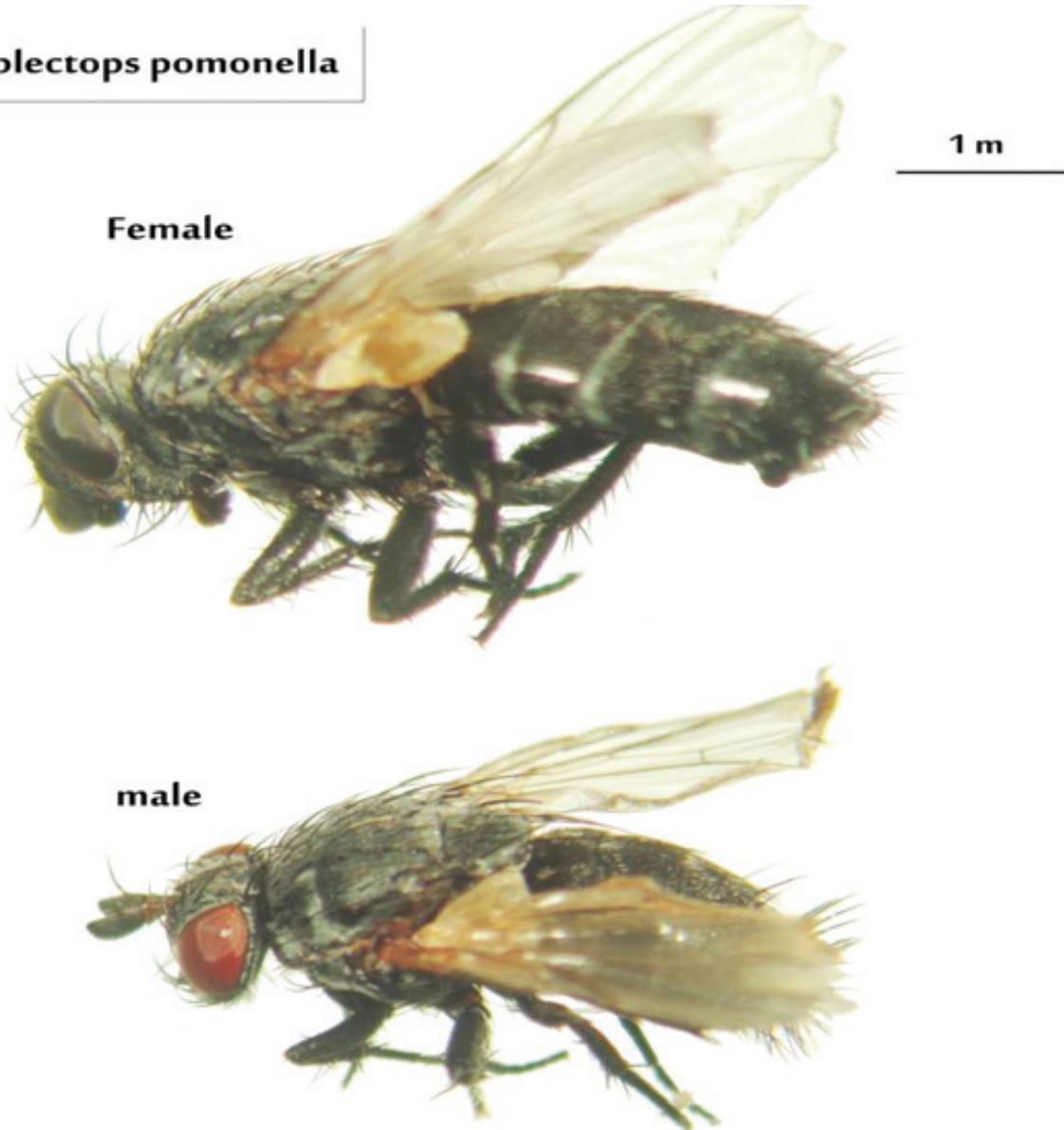
A number of parasitoids emerged in the laboratory from the field-collected larvae, including tachinids that were kindly determined by Hans-Peter Tschorsnig of the Staatliches Museum für Naturkunde, Stuttgart, Germany.

Results and Discussion

All of the tachinids that emerged from *C. pomonella* L. were belonged to the species *Neoplectops pomonellae*.

Adult:

Neoplectops pomonella



Female

male

a photo by Shadi alhaj

Fig1. Adult of parasitoid *N .pomonellae*

The Parasitoid is a fly, average of length of the female is 5.18 ± 0.02 mm, and its more longer than the male (average of length is 4.03 ± 0.025 mm).

Parasitoid distinguishes by black-gray color, and narrow black longitudinal stripes on whole body. Thorax in black color, wide at front and narrow at the end coating by black bristles, also abdomen is in black, wide at front and narrow at the end with more density of bristles are at the end (Fig.1).

Venation of the wing:

N. pomonellae have a complete wing venation, Tegula is very clear at the base of wing, also the base of vein R it's very clear, measuring vein CS1 is about twice of vein CS2. Vein M is very clear, and it deflects at the end of the wing to the edge (Fig. 2).

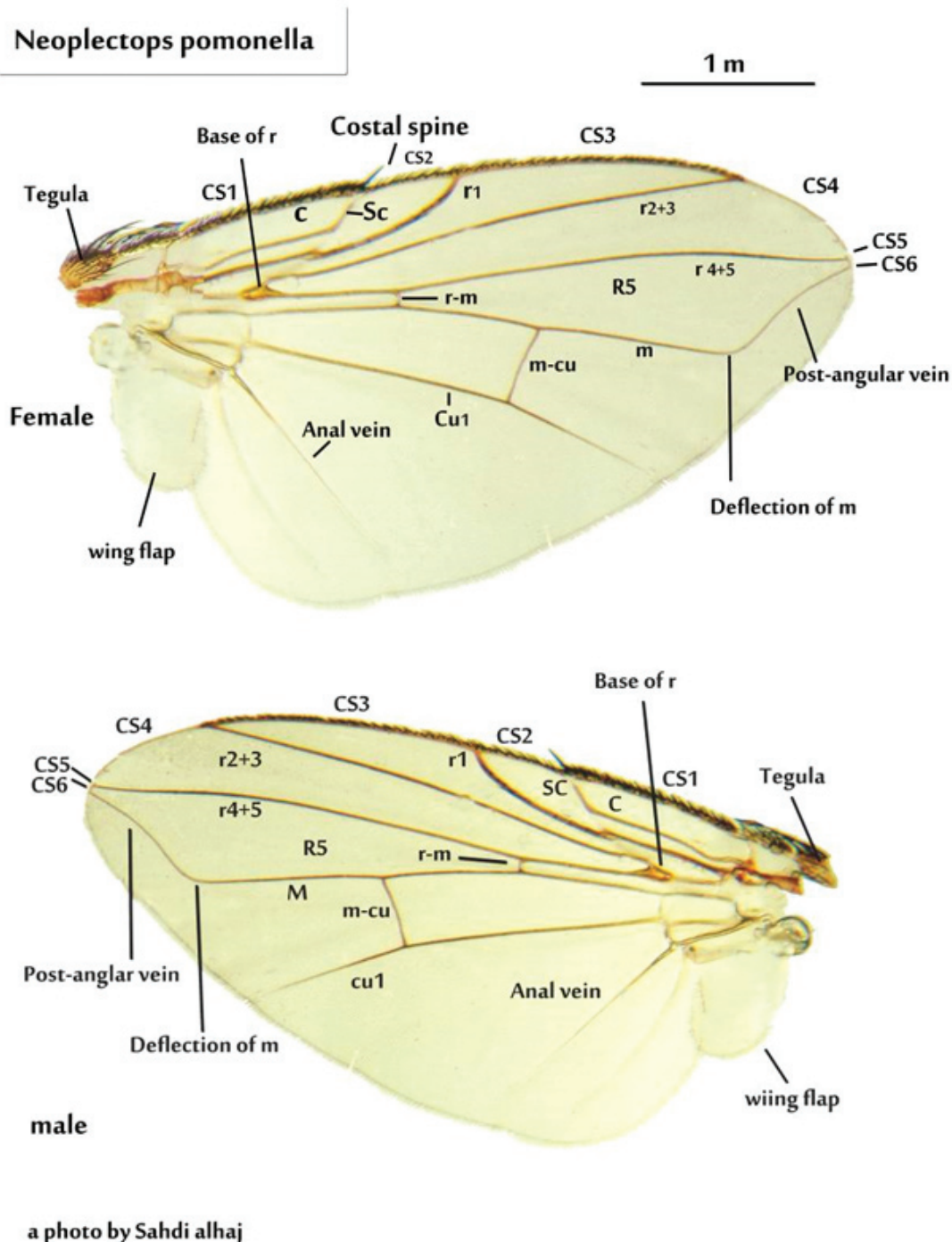


Fig2. Wing venation of parasitoid *N. pomonellae*.

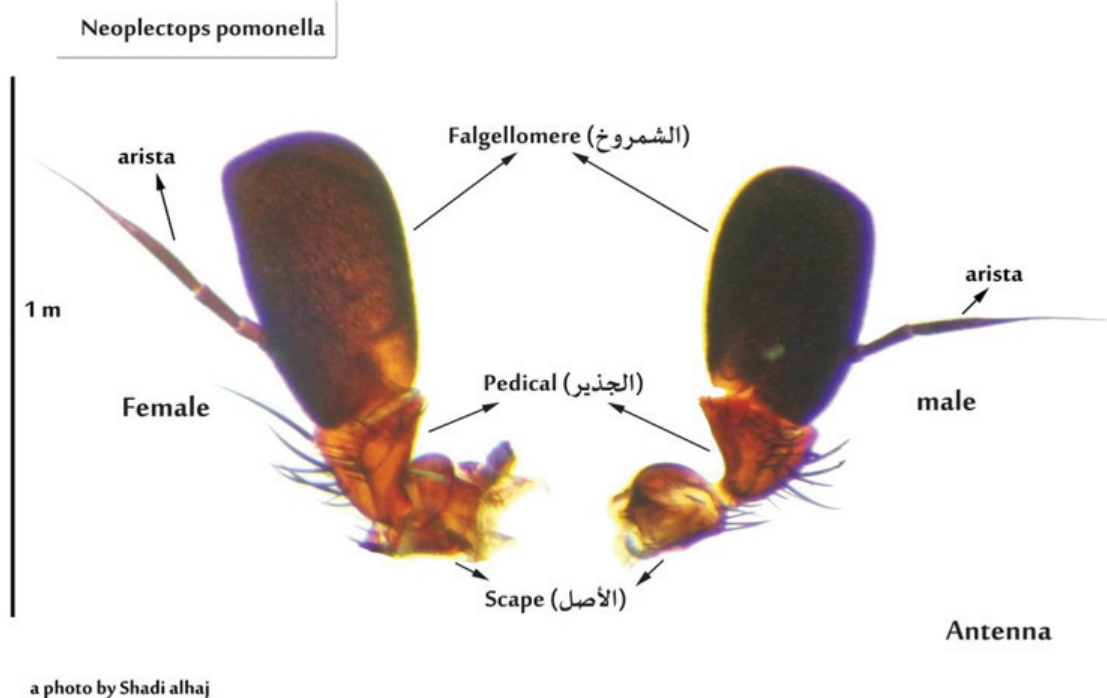


Fig 4. Antenna of parasitoid *N. pomonellae*

Legs:

Legs are similar in both female and male, with dark black color for most of the leg with light brown for coxa and trochanter in front legs.

All legs coated with dense bristles differ in length.

Usually the legs of the female are greater than that of the males (Fig.5).

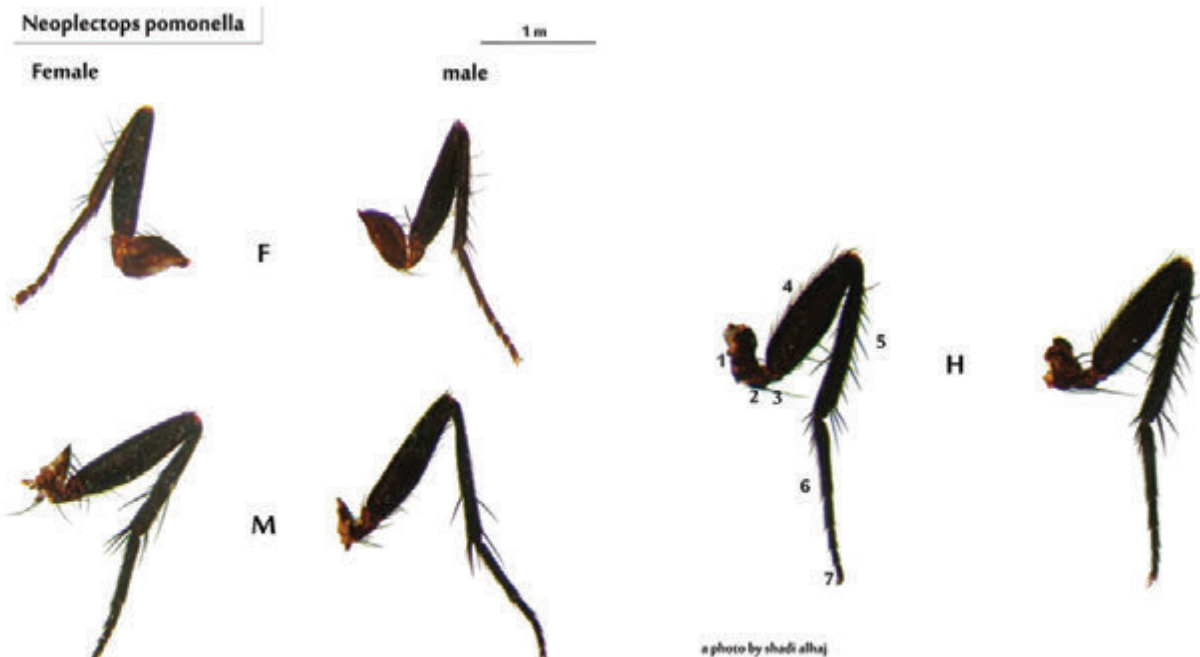


Fig 5. Legs of parasitoid *N. pomonellae*, F: front leg, M: Medium leg, H: Hind leg, 1: coxa, 2: Trochanter, 3: Trochantellus, 4: Femur, 5: Tibia, 6: Tarsus, 7: pretarsus

References

- Athanasov, A.Z., P. J. Charmillot, Ph. Jeanneret and D. Renard. 1997. Les parasitoïdes des larves et des chrysalides du carpocapse *Cydia pomonella* L. Revue Suisse de Viticulture, Arboriculture, Horticulture 29(2): 99- 106.
- Alhaj, S., A. Bacheer and L. Aslan. 2009. Studies on codling moth *Cydia pomonella* L. parasitoids in Lattakia governorate, Syria. Master thesis in agricultural engineering, department of plant protection, agricultural faculty, Damascus University.
- Almatni, W. 2003. Survey and study of Natural enemies of Codling moth, *Cydia pomonella* L., In As-Sweida and evaluation of some of Bio-Agent Measutres. Ph.D thesis in agricultural engineering, Department of plant protection, agricultural faculty, Damascus University.
- Basheer, A., L. Aslan., and S. Alhaj. 2010. Survey of parasitoids of codling moth *Cydia pomonella* L. in Eramo region in Lattakia governorate (Syria). Arab journal of plant protection, 28(1): 91- 95.
- Barnes MM .1991. Codling moth occurrence, host race formation, and damage. In: World Crop Pests, Vol. 5. Tortricid Pests: Their Biology, Natural Enemies and Control (Eds Van der Geest LPS and Evenhuis HH) : 313–328. Elsevier Press, Amsterdam (NL).
- Coutin, R. 1974. Les principaux ravageurs et leurs ennemis. Parasites du Carpacse : 23–28. In Les organisms auxilieres en verger de pommiers. OILB/SROP, Brochure n/3.
- Hoyt, S.C., J.R. Leeper, G.C. Brown and B.A. Croft. 1983. Basic biology and management components for insect IPM. In: Croft, B.A. Hoyt, S.C. (Eds.), integrated management of insect pests of pome and stone fruits. Wiley, New York: 93- 151.
- Grenier S .1988. Applied biological control with tachinid flies (Diptera, Tachinidae): a review. Anz Schdling Pfl Umw 51: 49- 56.
- Irwin, M.E., E.I. Schlinger and F.C.Thompson. 2003. Diptera, true flies : 692- 702. In: Goodman, S.M. and Benstead, J.P., The Natural History of Madagascar. University of Chicago Press, Chicago and London. 1728 pp.
- Quarles, W. 2000. Mating disruption success in Codling moth IPM. IPM Practitioner 22: 1- 12 .
- Rosenberg, H.T. 1934. The biology and distribution in France of the larval parasites of *Cydia pomonella* L. Bulletin of Entomological Research 25: 201- 256.
- Tschorsnig H. P and B. Herting. 1994. Die Raupenfliegen (Diptera: Tachinidae) Mitteleuropas: Bestimmungstabellen und Angaben zur Verbreitung und kologie der einzelnen Arten. Stuttgarter Beitrge zur Naturkunde (A) 506: 1- 170. Online authorized version of English translation by Rayner R. and Raper C.: Tschorsnig H.-P. & Herting B. 2001: The Tachinids (Diptera: Tachinidae) of Central Europe: Identification Keys for the Species and Data on Distribution and Ecology, <http://tachinidae.org.uk/site/downloads.php>.
- Stireman JO, J.E. O'Hara and D.M. Wood. 2006. Tachinidae: Evolution, behavior and ecology. Annu Rev Entomol 51: 525- 555.
- Van Frankenhuyzen, A and H. Stigter. 2002. Schädliche und nützliche Insekten und Milben an Kern- und Steinobst in mitteleuropa. Ulmer Verlag, Stuttgart, pp. 288.

N° Ref: 700