

ALDO POLLINI (\*) - PIERO CRAVEDI (\*\*)

**CARPOMYA VESUVIANA A. COSTA (DIPTERA TEPHTRITIDAE  
TRYPETINAE CARPOMYINI) FROM JUJUBE TREE  
IN EMILIA-ROMAGNA (NORTHERN ITALY)**

(\*) Via R. Luxemburg 11, 40026 Imola (Bologna), Italy; e-mail: aldo.pollini@imolanet.com

(\*\*) Istituto di Entomologia e Patologia vegetale, Università Cattolica del Sacro Cuore, Via Emilia Parmense 84, 29122 Piacenza, Italy.

Pollini A., Cravedi P. - *Carpomya vesuviana* A. Costa (Diptera Tephritidae Trypetinae Carpomyini) from jujube tree in Emilia-Romagna (Northern Italy).

The presence of *Carpomya vesuviana* (Diptera Tephritidae) on fruit of jujube tree (*Ziziphus jujuba*) in Emilia-Romagna (Northern Italy) is reported. Some aspects of the biology of the species are described. Differently from southern regions, where *C. vesuviana* is polivoltine, in Emilia-Romagna only one generation per year occurs.

KEY WORDS: jujube tree, pest, biology.

## INTRODUCTION

Several species of the family Tephritidae (Diptera) have already been reported in Romagna, feeding on fruit crops. Such species are: *Bactrocera oleae* (Gmelin, 1790) (on *Olea europaea*), *Ceratitis capitata* Wiedemann, 1824 (on pome fruits, stone fruits, figs, persimmon), *Rhagoletis cerasi* (Linnaeus, 1758) (on cherry), *Rhagoletis completa* (Linnaeus, 1758) (on walnut). Surveys in the Romagna area looking for other species feeding on "small fruit" plants led to the discovery of *Anomoia permunda* (Harris, 1780) on *Sorbus domestica* and *Crataegus azarolus*; *Carpomya schineri* (Loew, 1856) (POLLINI *et al.*, 2007) on *Rosa canina* fruits, used in herbal medicine and to produce alimentary sauce, as well as on fruits of *Rosa rugosa*.

There have been other surveys on other small fruit species, such as the medlar tree, the pomegranate, strawberry tree and jujube tree (*Ziziphus jujuba* Miller) (PIGNATTI, 1982). The latter, a species of the family Rhamnaceae, is mostly found in southern regions but is also quite common in Emilia-Romagna where it was once planted in farmhouses near east or south-facing walls. This species is now very frequent in small domestic orchards and is also grown in small commercial orchards to produce fruits for fresh consumption. The most common cultivars are "Olivacea" or "Datteriforme"; with less organoleptic value, but more attractive for the biggest fruits are "Gigante meliforme", "Gigante periforme" and "Gigante tardivo periforme".

Our attention was drawn to a few tens of decaying fruits containing a Tephritidae larva. Only one larva/fruit was found different from the more common and wide spread *C. capitata* that lays groups of eggs and many larvae develop inside of each fruit. For this reason the presence of the Mediterranean fruit fly was rejected and the presence of a different species hypothesized. As jujube fruits can host *Carpomya vesuviana* as well as *C. incompleta* Becker, 1903

(SILVESTRI, 1916; CARROLL *et al.*, 2006; MONASTERO, 1968), it was decided to check which of the two was responsible for the damage observed. Puparia were collected and allowed to develop until the adult stage. The emerged adults were identified as *C. vesuviana*.

MORPHOLOGICAL CHARACTERS  
OF THE SPECIES

The adult is about 5 mm long, basically yellow with wings with two faint brown bands. The thorax has small black spots on its border and a larger one in the central part of the distal half.

The larva, whitish-yellowish, is 7-9 mm long at maturity. The microcephalic portion is typical of the family, with slightly developed cephalic lobes, antennae with two segments, cephalic-pharyngeal frame with mandibles without the apical tooth. The fore spiracles are protruding, with a convex margin, while the posterior ones are not clearly distinguishable from the anal segment.

Puparium is whitish, 4-5 mm long, with clear transversal furrows, provided with fore and hind spiracles.

KEY TO DISTINGUISH *CARPOMYA* SPP. ADULTS  
LIVING ON *ZIZIPHUS JUJUBA*

- Wings
  - a - presence of two parallel brown bands, quite enlarged but faint, normal at the costal margin ..... *Carpomya vesuviana*
  - b - parallel brown bands, quite narrow and well defined, normal at the costal margin, their apex near the anal margin  
..... *Carpomya incompleta*
- Protorax
  - a - without spots ..... *Carpomya incompleta*
  - b - small black spots in the hind part ..... *Carpomya vesuviana*

## GEOGRAPHICAL DISTRIBUTION

This species is present in the Palearctic region (Italy, Bosnia, North Africa, Caucasus, Middle East, Central Asia, China, Pakistan, India and Thailand) as well as in the Afrotropical region (Mauritius) (SOOKAR *et al.*, 2006).

## HOSTS DAMAGES AND CULTIVAR SENSITIVITY

*Carpomya vesuviana* lives on *Ziziphus jujuba*. According to our surveys, the species was collected only on fruits of cv "Olivaceo", while no damage was observed on different jujube cultivars ("Gigante meliforme", "Gigante periforme" and "Gigante tardivo periforme").

## BIONOMICS

Adults fly from the second half of September and after mating females lay 1-2 eggs/fruit. Nevertheless only one larva was always observed in infested fruits. Larval developments take three instars and mature larvae pupate after emerging from the fruit with half of the body or they fall on the soil and pupate at a depth of a few centimeters. According to our data in Emilia-Romagna *C. vesuviana* is a univoltine species. In the southern region the species has 1-2 generations per year (SILVESTRI, 1916; MONASTERO, 1968). In the north-west of China, in the Turpan district of the Xinjiang Uygur region, the species can have 2-3 generations per year. From the rearing of many puparia, a few adults emerged from June but they could not generate offspring as jujube tree fruits are not suitable for hosting eggs or enabling larval development.

## NATURAL ENEMIES

No specific parasitoids are known, but a few species usually developing on olive fruit fly have been collected. *Opius concolor* Szépliget, 1910 and *Biosteres* (= *Chilotricha*) *persulcatus* Silvestri, 1916 (Hymenoptera, Braconidae, Opiinae) have been reported as larval endoparasites emerging from pupae of *C. vesuviana* and *C. incompleta* (VIGGIANI, 2000).

## CONTROL MEASURES

For pest management of "minor crops" and particularly for "small fruits" there are no or only a few registered active

ingredients. So it is necessary to use alternative control strategies. In this case, to limit the damage produced by *C. vesuviana* several approaches can be adopted: mass trapping with yellow sticky traps, McPhail bottle-traps can be used; or hand-made bottle-traps using ordinary PET bottles with suitable lateral windows or with a special cap (Trap-tap) to allow the entrance of flies and partly filled with an attractive hydrolysed protein solution.

## RIASSUNTO

CARPOMYA VESUVIANA A. COSTA  
(DIPTERA TEPHRITIDAE TRYPETINAE  
CARPOMYINI) SU GIUGGIOLO IN  
EMILIA-ROMAGNA (ITALIA SETTENTRIONALE)

Viene segnalata la presenza di *Carpomya vesuviana* (Diptera Tephritidae) su frutti di giuggiolo (*Ziziphus jujuba*) in Emilia-Romagna (Italia settentrionale). Viene descritta la biologia della specie che in Emilia-Romagna è monovoltina mentre nelle regioni meridionali italiane può compiere 1-2 generazioni.

## REFERENCES

- CARROLL L.E., NORRBOOM A.L., DALLWITZ M.J., THOMPSON F.C., 2006 – *Pest fruit flies of the world - larvae*. Version: 8<sup>th</sup> December 2006. <http://delta-intkey.com>
- MONASTERO S., 1968 – *Nuove osservazioni sulla biologia della Carpomyia incompleta Becker*. - Boll. Ist. Entomol. Agr. Oss. Fitopatol. Palermo, 7: 147-157.
- PIGNATTI S., 1982 – *Flora d'Italia* (3 voll.). Edagricole, Bologna, 2324 pp.
- POLLINI A., RINALDI CERONI M., TURA E., 2007 – *Danni da mosca su rosa canina*. - Inf.tore Agr., 63 (43): 62.
- SILVESTRI F., 1916 – *Sulle specie di Trypaneidae del genere Carpomyia dannose ai frutti di Zizyphus*. - Boll. Lab. Zool. Gen. Agr. Portici, 11: 170-182.
- SOOKAR P., PERMALLOO S., GUNGAH B., ALLECK M., SEEWORUTHUN SI., SOONNOO A.R., 2006 – *An area wide control of fruit flies in Mauritius*. - Proceedings of the 7th International Symposium on Fruit Flies of Economic Importance, 10-15 September, 2006, Salvador, Brazil, pp. 261-268.
- VIGGIANI G., 2000 – *Lotta biologica e integrata nella difesa fitosanitaria*. Liguori Editore, Napoli, IX edizione, 917 pp.