

THE PRESENCE OF THE DOG ROSE FRUIT FLY *CARPOMYA SCHINERI* (DIPTERA, TEPHRITIDAE) IN BĂNEASA - BUCHAREST AREA (SOUTHERN ROMANIA)

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Abstract: The present work reports the first record of the dog-rose hips fly *Carpomya schineri* Loew 1856 in Romania. The presence of *C. schineri* on dog-rose shrubs grown spontaneously in Băneasa area (the northern part of Bucharest city, southern Romania) was observed in 2014-2016 period. The flies were captured in Tephrit-type traps used for detection of Medfly, *Ceratitidis capitata* Wied, within the framework of the IAEA Vienna Regional European projects. The hips were heavily infested, resulting in a degree of 67% attack, the reason for which we consider the fruit fly *C. schineri* a very important pest for dog-rose hips in Romania.

Key words: *Carpomya schineri*, dog-rose fruit fly, Romania.

INTRODUCTION

The fly *Carpomya schineri* Loew 1856 is one of the two fruit flies in the family Tephritidae which attack the rose hips, the other one being the *Rhagoletis alternata*. *C. schineri* is specific to the Palearctic Region, being spread in many regions of the European and Asian continents. According to the Fauna Europaea website and relevant literature reports (Merz, 2001; Kohnen et al., 2009; Pollini & Cravedi, 2014; Stalažs, 2014; Voigt et al., 2015, Tomov & Ivanova, 2015; Von der Dunk & Weltner, 2016), the presence of *C. schineri* is confirmed in many European countries such as Lithuania, Netherlands, Belgium, France, Spain, Italy, Germany, Hungary, Austria, Slovakia, Switzerland, Bulgaria, Ukraine, Georgia. The fly is also found in regions from European and Asian Russia and countries from Middle East (Israel, Turkey) (Freidberg & Morgulis, 2011; Galinskaya & Ovtshinnikova, 2014). On the Fauna Europaea portal, *C. schineri* is not confirmed for Romanian territory, while the fly *R. alternata* it is.

Studies of Kohnen et al. (2009) show that in southern Europe, the populations of *C. schineri* cohabit with those of *R. alternata* and have a similar genetic profile design. Both flies species are specialized pests to fruits of dog-roses in the genus *Rosa*, section *Caninae*, and their spreading is closely related to the natural areas where their hosts are present. Dog-roses (*Rosa canina* group) are the most common rose species in Europe and western Asia and they grow spontaneously on forest edges, pastures and hayfields, along roadsides and near cultivated fruit tree orchards (Kohnen et al., 2009).

C. schineri has one generation per year. Its adults emerge from June to September. The females lay their eggs into the ripe rosehips and the larvae develop in the pulp of the fruits until September - October (Kohnen et al., 2009). The mature larvae of third instar leave the fruit to pupate in the soil where they overwinter (Voigt et al., 2015).

In this study we present data on the presence of the fruit fly *Carpomya schineri* and the damage caused by its larvae to dog-rose hips in Băneasa area, the Northern part of Bucharest city (Southern Romania). This represents the first record of *C. schineri* in Romania.

MATERIALS AND METHODS

The presence of the fly *C. schineri* and its damage caused to the rose hips were evaluated in an urban abandoned area situated in the northern part of Bucharest (southern Romania) in the 2014-2016 period. The adult flies were captured in Tephri Traps®, (the Sorygar Company, Spain), baited with three attractants (trimethylamine, ammonium acetate, putrescine), granted by AIEA Vienna to survey the invasive fruit fly *Ceratitis capitata*. Dog-rose bushes were present in the area of research as well as other spontaneous species of herbaceous and woody plants.

The identification of the adult flies to belong to *C. schineri* species was performed following the morphological characters of thorax (scutum and scutellum), anepisternum and mediotergite coloured in black and the patterns of wing ornamentation described by Carroll et al. (2006) and Korneyev et al. (2017). To confirm the identity of *C. schineri*, we obtained adults from infested fruits. Samples of infested ripped hips were collected from different dog-rose bushes in the survey field and stored on corrugated card in 3 l glass jars covered with cloths in laboratory conditions at 20°C. The emergence of larvae was periodically observed. The resulting pupae were placed in the plastic boxes containing sterile wet sand and kept at 4°C according to the protocol described by Vallo et al., (1976), later they were transferred to laboratory at 22°C temperature and 65% relative humidity until the adults emerged. The adults which appeared were also investigated from morphological viewpoint. We concluded that they were identical to those in the traps and were established to belong to *C. schineri*. The percentage of attacked fruits was estimate for a number of 200 hips collected arbitrarily from dog-rose bushes in the survey area.

RESULTS AND DISCUSSIONS

The presence of the fly of dog-rose *C. schineri* has not been recorded in Romania so far. In 2014, we detected the presence of two tephritid flies, subsequently identified to belong to the fruit fly *C. schineri*, during an examination of the insects captured in the Tephri traps tested for Medfly *C. capitata* in Băneasa area. We considered this finding as a good opportunity to analyse the presence of *C. schineri* in this area during the next two years, 2015 and 2016.

The fly *C. schineri* feed on the fruits of wild roses from the genus *Rosa*, in particular the species of dog-rose in the complex *Canina*. Other plants from the same genus, host of the fly, are *R. gallica* (Hendel, 1927), *R. pimpinellifolia* (*R. spinosissima*), *R. glutinosa*, *R. rugosa*, *R. elliptica* and *R. glauca* (Sengalevich, 1970; Freidberg, 1974; Pollini & Cravedi, 2014). According to the studies of Eppelsheim in Germany in 1871, *R. pimpinellifolia* species offered first evidence that the plants in the *Rosa* genus are hosts for the fly *C. schineri*. The author obtained adults from larvae found into the hips of *R. pimpinellifolia*. Later, Perris in 1876 discovered large dipterous larvae inside hips of *R. canina* in south-western France, from which the emerged flies were also identified to belong to *C. schineri* (Balduf, 1959).

Considering the shape and size of the fruits, we distinguished two varieties of dog-roses, members of the genus *Rosa* which offered plenty of hips available to fruit flies in the field in which we have investigated: one variety with round and smaller fruits and the other with elongated and larger fruits. *Rosa canina* L. is one of the most widespread species of the

genus *Rosa* in Romania, its bushes being a characteristic presence for natural areas (Popescu, 1984, cited by Ropciuc, 2011).

A total of 13 adults of *C. schineri* were captured in two Tephri traps placed on rose bushes in the survey field, as follows 2 flies in 2014, 8 flies in 2015 (7 flies on 14 September and 1 fly on 17 September) and 3 flies in 2016 (1 fly on 27 July and 2 flies on 29 August).

In 2015, from 45 pupae of *C. schineri* obtained and reared in sandy soil medium at optimum temperature (Vallo et al., 1976) until the flies emerged, only a proportion of 46.6% generated adults in 2016. The appearance of flies was a long process which lasted several months under laboratory conditions. The flies freshly emerged are illustrated in Figure 1. The adults have a body of 4-5 mm long and greenish eyes. The thorax has shiny black spots with yellow stripe patterns; the wings have the transversal bands yellow-brownish with irregular edges.

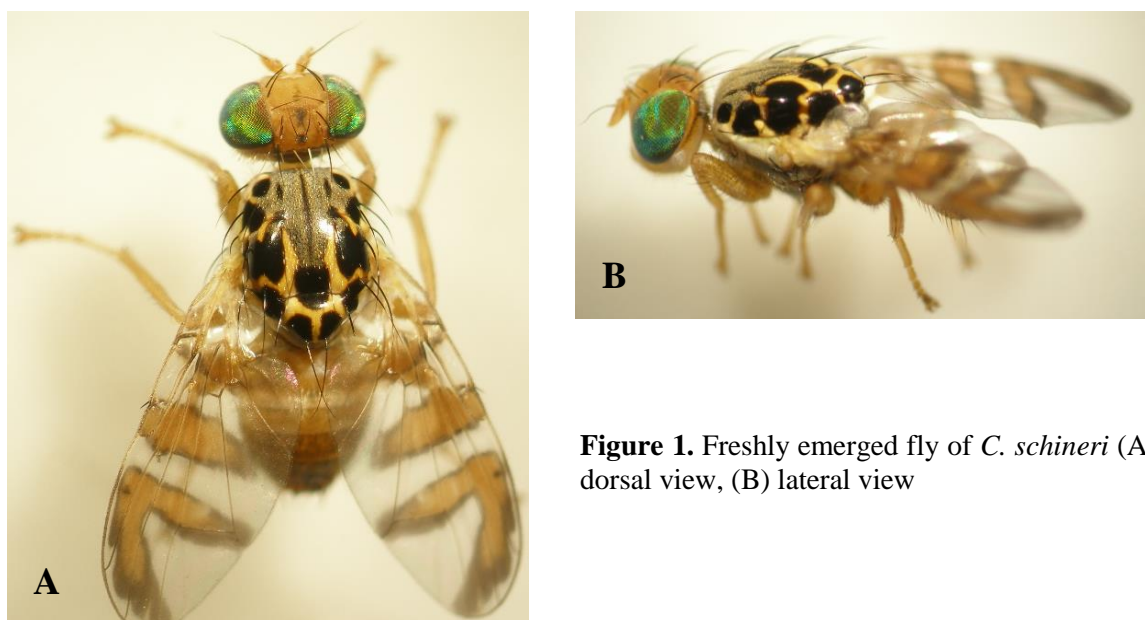


Figure 1. Freshly emerged fly of *C. schineri* (A) dorsal view, (B) lateral view

The larvae are the most important development stage of *C. schineri* for the fruits of dog-rose, because the emerging larvae feed with their pulp. Damages to the ripped hips in the survey area were visible from August onwards. The infestation level of the hips was 66.6% in the middle of September 2015. Our data demonstrated that *C. schineri* has a great potential to attack the fruits of *Rosa*, confirming the results in literature. In Hungary, the percentages of damaged hips were between 0.88 and 65.08% (Voigt et al., 2015). In earlier studies in Bulgaria it has been shown that the level of damage ranged from 71.8 to 91.2% of the hips (Sengalevich, 1970).

To estimate the presence of larvae and pupae inside fruits, a number of 75 infested hips were sectioned one by one under a stereomicroscope in August 2016. The checked hips showed on their surface 1 to 3 round exit holes left by the mature larvae when they moved to the soil (Figure 2 A). The damaged rose hips presented specific larval galleries filled with dejections (Figure 2 B). Both larvae and pupae of the fly *C. schineri* were found in the damaged hips (Figure 2 C and D). In a single rose hip we found 2 larvae and 1 pupa. The larva (Figure 3 A) has a white or yellow colour, is apodous and acephalous, characters typical of the Diptera genus. The pupa (Figure 3 B) is coarctate and has a white-yellowish colour.

On 13 November 2016, in 93 rose hips collected in the field and checked in the laboratory conditions just one larva and one pupa were found inside. On 5 December 2016, we collected 47 rose hips but none of them hosted any larvae or pupae.



Figure 2. Orifices made by larvae exiting the rose hips (A); galleries with dejections (B); larvae inside a rose hip (C); pupa inside a rose hip (D)



Figure 3. Larvae (A) and pupae (B) resulted from damaged rose hips

CONCLUSIONS

By the results of this study we are recording for the first time the presence of the dog-rose hips fly, *Carpomya schineri*, in Romania.

The adult flies were trapped in 2014 - 2016 period in an urban abandoned area in the zone Băneasa, placed in the Northern part of Bucharest city (Southern Romania) in Tephrit-type traps commonly used for capturing of the Medfly *Ceratitidis capitata*. The flies were trapped from late July until the middle of September.

The hips were heavily infested; the degree of attack reached 66.6%.

The fly *C. schineri* could become a serious pest to the fruits of the dog-rose in Romania cultivated for multiple medical uses.

Further monitoring is needed with specific traps to study the dynamics and abundance of the fruit fly population.

ACKNOWLEDGEMENTS

The study was performed with financial support by the Ministry of Research and Innovation, the Nucleu program, the project PN 16-29-01-01. The authors would like to thank Mr. Alecu Diaconu from Institute of Biological Research Iasi, Mr. Corneliu Pârvu and Mr. Costică Adam from National Museum of Natural History “Grigore Antipa” Bucharest for their help in searching the literature on *Carpomya schineri* presence in Romania.

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