First experience with *Eurytoma schreineri* in the Czech Republic

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Abstract

Eurytoma schreineri *(Schreiner, 1908) is a new invasive species in the Czech Republic. The first individual of this pest was recorded in 2012. Its origin is European part of Russia (region Astrachan). Larvae feed inside of plum seeds. Fruits prematurely decline. Locally, damage can reach up to 90%. Since 2013 we have done monitoring of this pest all over the country. In 2019, we studied its biology, flight activity, attractiveness of colour sticky traps. We also tested several insecticides against adults of* Eurytoma schreineri *under laboratory condition. We did tarsal and contact tests of the effectiveness of selected insecticides. Yellow sticky traps were the most attractive. SpinTor was the most effective in both types of tests. Observed efficacy reached 100 %.*

Keywords: *Eurytoma schreineri,* plums, invasive species, SpinTor, yellow sticky traps

Introduction

Plum seed wasp *Eurytoma schreineri* (Schreiner, 1908) is a new invasive species in the Czech Republic. The first record of this pest was in Moravia in 2012 and in Bohemia in 2013. Its origin is European part of Russia. *E. schreineri* was firstly described as a pest fruits of plum (*Prunus domestica* L.) (Georgescu 2006). In the second half of the last century this species spread to Moldova, Romania and Turkey. The occurrence of *E. schreineri* is reported from Greece (Koveos et al. 2002) and also in western Siberia (Růžička 2014). This species was first recorded in Bulgaria in 2013 (Arnaudov et al. 2017). It harms primarily *Prunus domestica* and *P. domestica insititia* (ssp.). Preferred species include *P. domestica syriaca* and *P. cerasifera* and *P. armeniaca*. *P. spinosa* is less preferred. Occurrence on cherries (*P. avium*) and sour cherries (*P. cerasus*) was not confirmed in the Czech Republic (Růžička 2014).

Larvae feed inside of plum seeds. Attacked fruits visibly did not differ from healthy. Infested fruits caused massive fruit falls and drying (Arnaudov 2017). Fallen stones on the ground have a circular hole with a diameter 1.3-1.8 mm (Kocourek et al. 2015).

Insecticidal treatment is necessary to do against adult females, before they start lay eggs. Treatment must be repeated two or three times, after 6-8 days. Removal of fallen fruits and stones is recommended for effective protection as well as cultivating soil under trees (Kocourek et al. 2015). Calypso 480 SC (thiacloprid) is the only one pesticide registered for targeted treatment against *E. schreineri* in the Czech Republic in 2019.

Material and Methods

Monitoring

Since 2013, it was done monitoring of this pest all over the country. Monitoring was carried out by collecting mummified fruits and stones under stone fruits in selected localities. Subsequently, the collected stones were cracked in the laboratory. The results of the monitoring were entered into the network of faunistic maps with the map network KFME (Kartierung der Flora Mitteleuropas) (Zelený 1972).

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Attractiveness of colour sticky traps
Optical traps (colour plastic plates) - green, red, blue, yellow and white were tested. It was used nine traps from each colour. Controls were performed regularly twice a week during May and June.

Residual efficacy of insecticides
Experiments were conducted under laboratory conditions during 2019 with adults of *E. schreineri*. Efficacy of four agrochemicals were investigated: SpinTor (spinosad), Calypso 480 SC (thiacloprid), Movento 100 SC (spirotetramat) and Siltac EC (*3D-IPNS polymery + silicons)*. Distilled water was used as a control. For each experiment, 33 adult individuals were used. Each treatment was sprayed using a Potter precision laboratory spray tower (Burkard Scientific) into the Petri dish bottom (5.5 cm in diameter) and also into the inner part of the lid. One wasp was placed into each treated Petri dish. Mortality of each individual was recorded 24, 48, 76, 96 and 120 hours after treatment. Abbott's method (1925) was used for testing agrochemicals efficacy. Differences in mortality of *E. schreineri* among the tested insecticides were analysed using a repeated-measures analysis of variance (ANOVA). All analyses were performed with STATISTICA 10 (TIBCO Software, Palo Alto, USA).

Contact efficacy of insecticides
For the contact efficacy test, each wasp was sprayed using the Potter tower. The amount of material applied was the same as for the residual efficacy methodology. Immediately after spraying, wasps were placed into clean Petri dishes as in the residual efficacy test.

Results and Discussion
Monitoring
Two significant spread areas of *E. schreineri* have been found so far. These are eastern Bohemia and southeast Moravia.

Attractiveness of colour sticky traps
The most effective were yellow sticky traps (169 pcs. caught wasps) compared with white (41), green (40), red (11) and blue (2).

Residual Effect of the Tested Agrochemicals
SpinTor and Calypso 480 SC had the highest effect on *E. schreineri* (100 and 65%). On the other hand, insecticides Siltac EC (14%) and Movento 100 SC (1.2%) had a low impact on the *E. schreineri* mortality. In the control variant, 0.7% mortality was recorded.

Contact Effect of the Tested Agrochemicals
As in the previous experiment, the highest mortality was seen after treatment with SpinTor (100%) and Calypso 480 SC (54%). The effect of Movento 100 SC (1.4%) and Siltac EC (6.4%) on mortality of *E. schreineri* was very low.

Based on the obtained results, the yellow trap is most suitable for monitoring and setting the date of pesticide application. SpinTor appears to be the most effective insecticide and could be recommended for using in IPM and for Organic farming only SpinTor is allowed.

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