

The Development of Biological Methods for the Protection of Trees and Shrubs Against Invasive Pests in Hungary

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Keywords: *invading pests, classical biological control, parasitoid *Torymus sinensis*.*

*New invading pests in Europe and particularly in Hungary, starting to be very common event, especially forest pests and those attacking parks and artificial plantations. Usually pesticide treatments are not enough effective against the invading species. Also many effective insecticides are strictly prohibited for use in parks and forests. Thus, research on their native parasitoid complexes and their regulative role is very important. In some cases, they can essentially regulate the population dynamics of those pests. During the last decades, research on parasitoid complexes of some important invaders and their effectiveness were evaluated in Hungary, especially what concern the parasitoid communities of some leaf-miners, the horse-chestnut miner *Cameraria ohridella*, and *Parectopa robinella* and *Macrosaccus robinella* on black locust (*Robinia pseudoacacia*). Another invading pest, the sweet chestnut gall wasp (*Dryocosmus kuriphilus*), a serious pest of chestnuts worldwide appeared in Hungary in 2013. During 2002-2015 parasitoid complexes were under investigation in many European countries and native Hymenoptera parasitoids were established on the new invading pest: in Italy – 39 species, in Slovenia – 28 species, in Croatia – 20 species. In Hungary in 2013, 11 native parasitoid species were found on *D. kuriphilus*, in 2015 the number of parasitoid species increased to 17. However, the parasitization rate of native parasitoids in Hungary prolong years was very low, 2.0–4.7%. Thus, the classical biological control of the sweet chestnut gall wasp, *Dryocosmus kuriphilus*, by the introduced parasitoid *Torymus sinensis* was evaluated in Hungary and its introduction and multiple release to the chestnut stands appeared to be very successful. For the first time *Torymus sinensis* was introduced to Hungary in 2014 and later multiple releases in different parts of the country were made in 2015 and 2016. Effectiveness of the introduced parasitoid evaluated in 2017 showed very high percentage of parasitization. In many places the parasitization rate of *Dryocosmus kuriphilus* by *Torymus sinensis* was very high, from 70 up to 84.3–92.9 %.*