

Parasitoid Communities of Two Invading Leafminers of Black Locust in Hungary: First Year Results

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Black locust (*Robinia pseudoacacia*) is a significant plantation tree in Hungary, which was introduced to Hungary in the mid 18th century and now occupies more than 21.6% of the forested area (nearly 370 thousand hectares). Two species of leaf miners, *Parectopa robiniella* Clemens 1859 and *Phyllonorycter robiniella* Clemens 1859 have invaded Hungary in the last two decades. Both species have become widespread and abundant on black locust throughout the country and serious infestations cause early leaf abscission on affected trees. No detailed study on parasitoids associated with these species have been conducted; this abstract reports results from the first year of the study on their parasitoid communities.

The work was carried out at two locations in 2001; Gödöllő is ca. 30 km NE-E of Budapest and Visonta is ca. 80 km in the same direction. Black locust is an abundant tree species at both sites and the stands that were sampled at both locations were relatively young (12-15 years). We deliberately chose younger stands because on younger trees (up to 6-8 m in height), the entire crown can be sampled using a long stalk brunch cutter. This way the sampling can be more representative than sampling only lower branches of larger trees. Beginning in early June, both sites were visited at 3-5 days intervals in order to determine the optimal time for sampling.

A significant difference was found in development of the two species. The 1st generation of *Parectopa* completed its development later than *Phyllonorycter*. In case of the 2nd generation, the difference was even larger, therefore the two species had to be sampled separately. At both sites for all sampled generations, 15 ca. 60 cm long branches were selected at random and were cut. Only the mines of the sampled generations were counted, whereas the old mines and the very young mines (under 10 mm) were neglected. We counted and recorded the following characteristics:

- number of leaves on sample branches
- number of leaflets by leaves
- intact leaflets
- leaflets with *Phyllonorycter* mines and leaflets with *Parectopa* mines
- leaflets with mines of both species
- number of larvae in each mine

About 500-600 mined leaflets were collected randomly during each sampling period. The first 300 mined leaflets containing either final instar larvae or pupae of the host were put into plastic tubes for individual rearing. The number of mines/leaflet and number of larvae in mines were counted in advance. If the leaflet contained mines of two species, the larva of the “secondary” species were removed from the mines (i.e. in case of *Phyllonorycter* sampling, larvae of *Parectopa* were removed from mines and vice versa). The rearing tubes were checked weekly and the emerged parasitoids were put into vials together with labels. The dead specimens were kept dry, while those that were still alive were placed into 70% alcohol. The braconids were identified by Dr. Jenő Papp (Natural History Museum, Budapest) and the chalcids were identified by Dr. George Melika (Systematic Parasitoid Laboratory, Kőszeg).

The first mines of *Parectopa* appeared ca. 2-3 days later than first mines of *Phyllonorycter*. While *Phyllonorycter* produced three generations *Parectopa* produced only two generations. *Parectopa* mines nearly always contain a single larva, whereas *Phyllonorycter* mines often contain more than one larva

(as many as five) In this case it is still not clear whether they originate from one female or from several females whose eggs are laid close to each other.

The most striking result of the rearing experiment is that hardly any parasitoids were reared from *Parcetopa*. The highest attack rate (*Visonta*, first generation) was only 1%. The attack rates by parasitoids were much higher for *Phyllonorycter*. The very low attack rate that we recorded for the third generation at both sites is due to the fact that the parasitoids that developed in the third generation of the host entered diapause along with their hosts. The most significant parasitoid of *Phyllonorycter* at both sites was the braconid *Pholetesor nanus*. It was responsible for 54-76% of the total parasitism. This species is known to attack a range of native *Phyllonorycter* leaf miners in Europe.