ERYTHMELUS KLOPOMOR—PROMISING CANDIDATE FOR CLASSICAL BIOLOGICAL CONTROL AGAINST THE INVASIVE OAK LACE BUG

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PURPOSE AND SCOPE

The North American oak lace bug (OLB, *Corythucha arcuata*) is a potentially very dangerous invasive pest of European oaks. It was first detected in Europe in 2000 and in Hungary in 2013, and currently occurs in 26 countries. Most Eurasian deciduous oaks are suitable host plants, therefore about 30 million ha of oak-dominated forests in Europe can facilitate its rapid spread. Its negative effects can be very diverse: decreasing photosynthetic activity, deteriorating health, decreasing acorn yield, negative effect on other oak herbivorous insects, and more (Kern et al. 2021, Paulin et al. 2020). One of the main reasons for its rapid expansion and mass proliferation is that native European predators and insect pathogens are unable to control it (Csóka et al. 2009). The only control option is a classical biological control program, the essence of which is to find and introduce a specialist regulatory species that is effective in the pest's native range.

METHODS AND APPROACH

In the first half of July 2023, we collected oak leaves with OLB egg bunches from 13 different locations in five States of the United States. Leaves collected were first observed, and only further processed if a large percentage of unhatched eggs was found. The leaf parts with the egg bunches were cut, producing approximately 2-cm by 2-cm pieces. These were then put into transparent 25-ml containers, with a piece of paper tissue, held at room temperature and checked every day for emergence. Parasitoids emerged on the same day were collected and put into 2-ml Eppendorf tubes with 90 percent ethanol, for identification later. Checking continued until late August; data collected were the location and time of sampling, and number of parasitoids and their time of emergence. Individual eggs of bunches with parasitoids were also counted, to produce a parasitism rate for these samples.

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FINDINGS AND IMPLICATIONS

In the field our initial observation was that collecting OLB eggs proved more challenging than we first assumed. In 13 locations we were only able to collect a total of 400 egg masses as samples. They were close to natural habitats, in which we found only a handful of OLB-infested leaves. Our largest samples were collected in or near urban areas. Results showed that almost a quarter of the samples were parasitized.

Based on the information so far, the egg parasitoid, *Erythmelus klopomor* (Hymenoptera: Mymaridae), is the most suitable candidate for a biological control program against OLB. This is based on the following aspects: it is a specialist parasitoid of lace bugs, reproduces parthenogenetically, and is multivoltine with a short life cycle. It can also be found in different climatic conditions and can be collected en masse in its native area of distribution.

Our results also indicate that the presence of a resident parasitoid is the most likely factor of low OLB numbers in its native range. Further studies of this parasitoid are planned, to understand its ecology better. For example, experiments on overwintering habits, parasitism rates throughout the vegetative season, and host specificity are all studies that will form the cornerstones of this species' suitability as a biological control agent.

LITERATURE CITED

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