

Interactions of the invasive *Drosophila suzukii* with native parasitoids in Switzerland



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Introduction

Drosophila suzukii has been introduced into Europe in 2008, it established widely and has become a serious pest of fruit crops. The fly provides a potential resource to natural enemies that have coevolved with native *Drosophila* species. To unravel the interactions of *D. suzukii* with native parasitoids in Switzerland we conducted a field survey to collect native parasitoids. Parasitoids were then exposed to *D. suzukii* in the lab. Results of this study provide baseline information on the influence of *D. suzukii* on the native parasitoid community as well as on the biocontrol potential of the investigated native parasitoids.

Field collections

Hymenopteran parasitoids collected

- Braconidae:** *Asobara* sp. (BS, ZH, TG)
Diapriidae: *Trichopria* sp. (TG, TI, VD)
Eucoilidae: *Leptopilina bouldardi* (ZH, TG, TI)
Leptopilina heterotoma (BS, ZH, TG, VD, VS)
Pteromalidae: *Spalangia erythromera* (BS)
Trichmalepsis microptera (BS, TG)
Pachcrepoideus vindemmiai (BS, ZH, TG, TI, VD, VS)

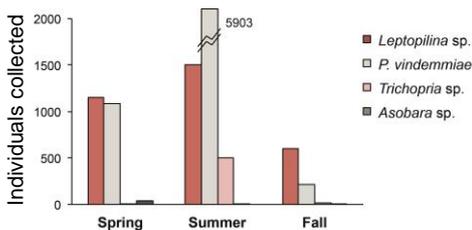


Fig. 2: Collected parasitoid individuals during early, mid and late season

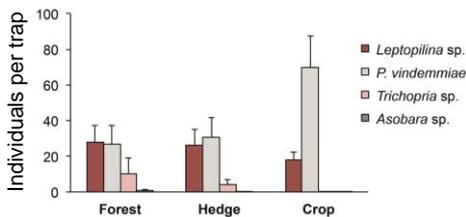


Fig. 3: Mean number of emerged individuals per trap (+SE) in different habitats.

Results

- 7 parasitoid species were collected
- *P. vindemmiai* most abundant species
- Almost no *Trichopria* sp. found in crops

Method



Field collection

- 6 regions in Switzerland
- Each 12 locations (natural habitats and fruit crops)
- 4-day sampling during early, mid, and late growing season
- Delta traps baited with fruits infested by *Drosophila melanogaster*
- Collection of naturally infested fruits

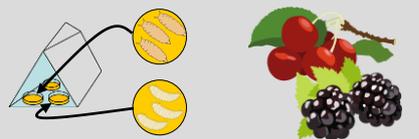


Fig. 1: A: Field samples were kept at 22°C/70% RH for 6 weeks, emerged parasitoids were collected 3x/week

B: Lab cultures were established separately for each species and region

Parasitization assays

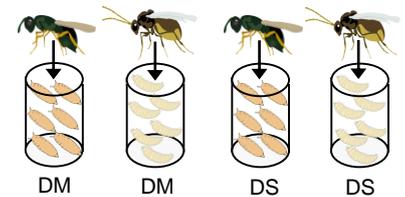


Fig. 4: No-choice parasitization assays were conducted (DM: *D. melanogaster*, DS: *D. suzukii*; 30-45 hosts; n=10-20)

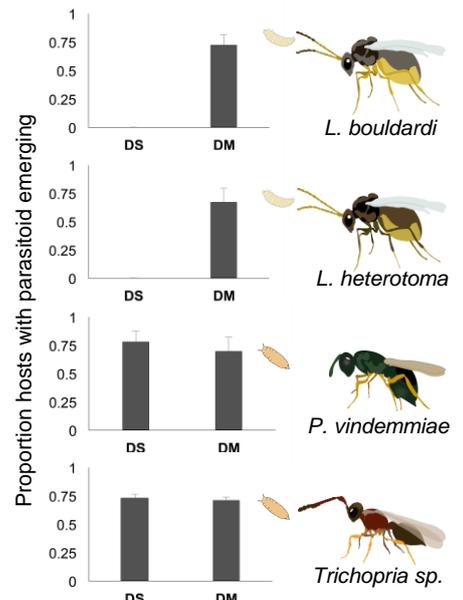


Fig. 5: Proportion of host pupae/larvae from which parasitoids emerged (all TI-strains)

Results

- The pupal parasitoids developed on DS
- The larval parasitoids parasitized DS but no offspring developed

Conclusion

Numerous native *Drosophila* parasitoid species are present in Switzerland. Some of them are able to include *D. suzukii* into their host range, while others parasitize this fly but cannot use it for reproduction. The native parasitoid community has a potential to reduce *D. suzukii* numbers in agricultural and natural habitats and has to be regarded when considering different pest control options.

Acknowledgements

Federal Office for the Environment for funding

Numerous farmers for allowing access to their fruit crops