

Cytoplasmic incompatibility in the parasitoid species

Lariophagus distinguendus

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The parasitoid wasp *Lariophagus distinguendus* parasitizes beetle larvae which develop endophytically in seeds and grains. Therefore it is used for the biological control of stored product pests. Molecular studies revealed that *L. distinguendus* consists of at least two groups (König et al. 2015). One group parasitizes larvae of drugstore beetles (DB) and the other larvae of granary weevils (GW). The two groups are reproductively isolated.

In this project we studied the hypothesis that endosymbionts are involved in reproductive isolation and speciation of representative strains of these two groups, and that endosymbiont infection in specific strains is due to horizontal transmission from beetle host. We showed that reproductive isolation of the strain RAV parasitizing DB and the two strains PFO and SLO parasitizing GW, is partially due to the occurrence of endosymbionts that inhibit successful development of female offspring via cytoplasmic incompatibility (CI) mechanism. Antibiotic treatment partially neutralises this isolation and allows hybrids to occur. While the RAV strain is infected with *Spiroplasma*, the PFO and SLO strains as well as the DB host are infected with *Wolbachia*, in contrast to their GW host, which is infected with *Rickettsia*.

These data indicate that reproductive isolation in *L. distinguendus* is partially due to *Spiroplasma*. The well known reproductive manipulating endosymbiont *Wolbachia* probably do not play a role in CI. Remarkably, induction of CI by *Spiroplasma* has not been demonstrated before. In addition, there is no supportive evidence for horizontal transmission of endosymbionts from beetle hosts to *L. distinguendus*. To substantiate these assumptions, it is necessary to study the presence of endosymbionts in further strains from both wasp group and beetle hosts.

König, K., Krimmer, E., Brose, S., Gantert, C., Buschlüter, I., König, C., Klopstein, S., Wendt, I., Baur, H., Krogmann, L., Steidle, J.L.M. 2015. Does early learning drive ecological divergence during speciation processes in parasitoid wasps? *Proceedings of the Royal Society B* 282, 20141850; doi:10.1098/rspb.2014.1850