

*Arsenophonus* is vertically and horizontally transmitted parasitic bacteria and strengthens its transfer through phenomenon called *son killing*. *Arsenophonus* has been detected in the arthropod hosts, insects, ticks and the garden spider *Araneus diadematus*.

The aim of this study is detection parasitic bacteria *Arsenophonus* in honeybees and its parasite *Varroa destructor*.

We find out that bacteria *Arsenophonus* is present in both hosts and it is identified as *Arsenophonus nasoniae*. Detection of bacteria *Arsenophonus* is discovered for the first time in *Varroa destructor* mites. We proved that the frequency of bacteria *Arsenophonus* in mites *Varroa destructor* is significantly higher than in honeybees.

This study shows that the mite *Varroa destructor* could act as a vector for transmission parasitic bacteria *Arsenophonus* among honeybees. Results of this study could lead to the future application of *Arsenophonus* as a biological control for the mite *Varroa destructor*.