Abstract

Honeybees (*Apis mellifera*) are highly valued worldwide for their products, but also as pollinators of crops and wild plants. Due to the close proximity of bees in the beehive and their foraging habits, a large number of pathogens that weaken the bee colonies are spread both inside and between colonies. In recent decades, high annual losses of bees have been recorded, which still do not have a clear explanation. The sudden loss of bees (known as colony collapse disorder) is likely due to the interaction of multiple factors at once. A large part of the problem is attributed to viral diseases and some parasitic organisms; parasites of the Trypanosomatida group play an uncertain role. A member of this group, *Crithidia bombi*, is considered a problematic inhabitant of the digestive tract of bumblebees, which can cause serious complications. Close relatives, *C. mellificae* and *Lotmaria passim*, parasites of honeybees, are sometimes associated with their higher mortality. Pesticides, whose effects can be very toxic, have also come to the forefront in assessing bee losses, and most pesticides have therefore been banned in the EU. This thesis examines the prevalence, infection development, and host specificity of monoxenous trypanosomatids in bees and their pesticide interactions. A total of 26 species of Hymenoptera were tested for trypanosomatids. *C. bombi* infection was detected only in bumblebees (*Bombus terrestris*) with a prevalence of 32 %. *L. passim* was detected only in honeybees with a prevalence of 43 %, but a very high parasite load of up to 9.5 million cells per bee. Different morphological stages of this parasite were observed mainly in the rectum, with occasional occurrence in the ileum. Host specificity of *L. passim* and *C. bombi* was examined through experimental infections of bees and bumblebees, and parasite interactions in mixed infections were also monitored. Cross infections were successfully carried out in both pollinator species. A synergistic relationship between parasites was observed in mixed infections of both bees and bumblebees, where infection with one parasite increased the success rate of infection with the other parasite. The study of the effects of pesticides (imidacloprid) on honeybees experimentally infected with *L. passim* yielded surprising results. Exposure to pesticides increased parasite abundance, possibly due to a change in the expression of the transferrin 1 protein.

Keywords: honeybee, trypanosomatids, *Lotmaria*, *Crithidia*, bumblebees, pesticides, imidacloprid, prevalence, parasite interactions