

COULD THE NEOGREGARINE *APICYSTIS BOMBI* BECOME A THREAT TO HONEY BEES?

Santiago Plischuk¹, Marina Haramboure¹, Carlos Lange^{1,2}

¹Centro de Estudios Parasitológicos y de Vectores -CEPAVE- (CONICET - UNLP). La Plata, Argentina.

²Comisión de Investigaciones Científicas de la provincia de Buenos Aires (CICPBA). La Plata, Argentina.

About 20 species of bumble bees (*Bombus* spp.) worldwide are known to be natural or typical hosts (*i.e.*, the pathogen is commonly found and can complete development) of the neogregarine (Apicomplexa: Neogregarinorida) *Apicystis bombi*. The pathogen has also been reported in association with other hosts from the same family, the Apidae (stingless bees, honey bees) and others, such as the Megachilidae and Andrenidae. In bumble bees, infections primarily proliferate in adipose tissue leading to reductions of energy reserves for host growth and reproduction, and possibly to alterations of intermediate metabolism. Effects on the European honey bee (*Apis mellifera*), however, are still unknown. Although a few reports about this association exist, possible deleterious effects on honey bees have not yet been examined. Detection techniques for *A. bombi* are mainly two: host dissection and observation of tissues and organs with compound microscopy, and molecular analyses using specific primers (*e.g.*: NeoF and NeoR). Using one or both techniques, the association between *A. mellifera* and *A. bombi* was examined in Finland, Argentina, Japan, Belgium, Spain, and Algeria, with the parasite always at relatively low prevalence. In Argentina, monitoring across eight years at a northwestern Patagonian site within the only region of the country where this pathogen has been found, not just in *A. mellifera* but also in bumble bee species, determined a mean prevalence of 11.3% of infected honey bees *per* season. In parallel, *A. bombi* was never found in other localities of the country, despite screening more than 400.000 honey bees. A salient feature of *A. bombi* infections in honey bees of Patagonia as opposed to those in bumble bees is that virtually all oocysts in honey bees were not refractive suggesting the possibility that they do not reach maturity and viability in that host. Leaving aside the unknown (but potential) pathogenicity on infected individuals, this fact could suggest that the lifecycle of *A. bombi* in *A. mellifera* would not be completed properly, and conceivably pathogen transmission would be interrupted. If that is true, and honey bees are indeed suboptimal or atypical hosts, their colonies would be threatened only in areas where infected bumble bees (or other suitable host) are present.

Keywords: Apoidea; Suboptimal or atypical host; *Bombus*; Entomopathogen.