Title: Chronic bee paralysis virus: dissemination in honey bee colonies and diagnosis**.**

Author: Ribière, M.; Blanchard, P.; Schurr, F.; Celle, O.; Faucon, J. P.

Abstract :

The Chronic bee paralysis virus (CBPV) is the aetiological agent of an infectious and contagious disease of adult honey bees known as chronic paralysis. Over the past few years, the outbreak in France of trembling symptoms caused by CBPV has led our laboratory to conduct studies in order to improve the knowledge on this agent and on the disease. Full-length nucleotide sequences for the two major RNAs of CBPV have been characterized, leading to the development of, firstly, molecular diagnostic tools that can be used to detect genetically variable viral isolates and, secondly, a Real-Time PCR viral quantification technique. This two step real-time RT-PCR assay allowed us to quantify CBPV genome and to determine the distribution of CBPV infection within hives and their environment. Samples of various ages of brood and adult bees were collected from several hives at different time of the year (spring, summer, and autumn). The virus was detected in all the live stages and along the year. Moreover, significant high mortality rates were observed in France during the 2007 and 2008 beekeeping season. Bee samples from apiaries located in various parts of France were analysed to evaluate the CBPV load by Real-Time PCR. Some surveyed apiaries presented high viral loads confirming the diagnosis of the chronic paralysis and highlighting the role of CBPV in bee mortalities. Knowledge on CBPV genome, sequence and variability, has allowed us to develop tools to better follow virus dissemination, including bee faeces and *Varroa destructor,* and ways of spread. We have detected CBPV, for the first time, in two species of ants (*Camponotus vagus and Formica rufa*). These results suggest ways by which the infection may be spread and other sites of viral persistence in the apiary environment.