

VIRAL DRIVERS OF HONEY BEE LOSSES – THE DEFORMED WING VIRUS- CLADE AND THE AKI-COMPLEX

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The recent colony losses among honey bees (*Apis mellifera*) have worried not only beekeepers but also the general public. Even simple causal relationships remain elusive and the picture has emerged that such losses are of multifactorial origin, it became more and more clear that viral diseases with members of the AKI-complex and the Deformed wing virus-clade, both associated with *Varroa destructor*, play a key role. Acute bee paralysis virus (ABPV), Kashmir bee virus (KBV) and Israeli acute paralysis virus (IAPV) form the AKI-complex and Deformed wing virus (DWV) and *Varroa destructor* virus-1 (VDV-1) form the DWV-clade. Like most honey bee viruses, all these are RNA-based and consist of complex distributions of mutant genomes termed quasispecies. This quasispecies nature of RNA viruses must be considered when evaluating bee virus detection studies performed via PCR-based methods, as primers designed for a specific virus will always only detect those viruses of the mutant cloud whose genome sequences in the region of the primer binding sites are not (yet) mutated.

Keywords: Acute bee paralysis virus; Deformed wing virus; Israeli acute paralysis virus; Kashmir bee virus