

Prevalence and Transmission of *Culex pipiens* Densovirus

Altinli M.¹, Atyame C.N.², Gunay F.³, Alten B.³, Bonneau M.¹, Soms J.¹, Ogliastro M.⁴, Weill M.¹,
Gosselin-Grenet A.S.⁴, and Sicard M.¹

¹Institut des Sciences de l'Evolution de Montpellier (UMR CNRS-IRD-UM 5554), Equipe Evolution, Vecteurs, Adaptation, Symbioses. University of Montpellier, Montpellier, France ; ²Université de La Réunion, UMR « Processus Infectieux en Milieu Insulaire Tropical » (INSERM U 1187, CNRS 9192, IRD 249), Plateforme de Recherche CYROI, Ste Clotilde, Saint-Denis, La Réunion, France ; ³Faculty of Sciences, Department of Biology, Division of Ecology, VERG Laboratories, Hacettepe University, Ankara, Turkey ; ⁴UMR 1333 « Diversity, Genomes and Microorganismes-Insectes Interactions », University of Montpellier, INRA, Montpellier, France

Densoviruses infect many species of arthropods, especially insects, like mosquitoes. While most of the mosquito densoviruses are closely related, *Culex pipiens* densovirus (CpDV) totally differs from other mosquitoes densoviruses known so far. With their ambisense genome organisation and bigger genome size, they indeed represent a new type of mosquito densovirus. CpDV have been isolated from laboratory *Cx. pipiens* mosquitoes 18 years ago (Jousset et al., 2000). However, their prevalence in nature and the outcome of their interactions with (i) their host and (ii) the rest of their host's microbiome remained unexplored. A singularity of their hosts, *Cx. pipiens* mosquitoes, is that they are always found infected with five genetically distinct groups of endosymbiotic bacteria *Wolbachia* (wPip). Being vertically and maternally transmitted, *Wolbachia* manipulate their hosts' reproduction to ensure their spread within the host population. This fascinating endosymbiont has also been shown to protect several arthropod hosts against viral infection. In this context, we first explored the prevalence of CpDV in natural populations of *Cx. pipiens* mosquitoes. Our results showed a high prevalence of this virus all around the world suggesting their importance on the evolution and the ecology of this host-endosymbiont system. We are currently studying their transmission modes, to better understand both how they persist in nature and how they interact with their host (*Cx. pipiens*) - symbiont (*Wolbachia*) system. Using confocal and electron microscopies, we have highlighted that CpDV and *Wolbachia* are both present in the ovaries and in the eggs of *Cx. pipiens*. We have shown that CpDV is vertically transmitted (about 20%) and that the presence of *Wolbachia* could have an effect on the transmission. Understanding these tripartite cytological and immunological interactions could be useful to develop an effective vector control method without the risk of spreading the virus to other arthropods.