

Preliminary assessment of the role of mosquitoes diversity in West Nile Virus transmission dynamics

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The effects of biodiversity on infectious diseases dynamics are known, especially for vector borne diseases (VBD). Biodiversity may influence VBD transmission in several ways including reduction of the fraction competent vectors in the community (competition) and reduction of the fraction of the susceptible host population (dilution). We studied the mosquito population at a single location where WNV was detected in 2017 only hypothesising the potential role of vector species diversity on West Nile Virus (WNV) circulation. Mosquitoes were collected in 2010-2017 at a WWF Reserve in Veneto Lagoon, as part of the entomological surveillance for WNV. Mosquitoes were bi-weekly captured from May to October using CDC-CO₂ traps, identified and tested for WNV using RT Real-Time PCR. Biodiversity variations were assessed by comparing the total Species Richness (S), the Shannon-Wiener's Entropy Index (H), and the Equal Number of Species (ENS). An average of 11.25 captures were performed per year (range: 8-13); the overall S ranged between 6 and 13. The trend of H indicated non-significant fluctuations during the eight years, accounting for observation at the capture-level, with an overall low level of biodiversity (average value: 0.78; S.E. 0.04). The ENS resulted markedly lower than the number of species observed, indicating the presence of few predominant species. The most abundant species was *Culex pipiens* (60.1%). Preliminary assessments of variation in environmental variables (temperature, precipitation, and relative humidity) did not revealed significant differences between 2017 and the previous years. Although an overall reduced biodiversity in the last year was observed, our results did not allowed the formulation of hypotheses on the effect of mosquitoes biodiversity on WNV circulation in the study area. Further studies on underlying factors are needed to unravel the disease dynamics, also including the effect of diversities of host species in the area.

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