

Biodiversity and disease risk: complex effects of non-hosts on parasite transmission

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Recent years have seen a heated debate about claims that biodiversity decreases disease risk. Most of this debate focusses on vector-borne diseases like Lyme disease where hosts of low competence for pathogens can reduce infection levels in target hosts (dilution effect). However, dilution effects can also occur in hosts infected by parasites that are transmitted via free-living stages, mainly by the interference of non-hosts with parasite transmission. In this presentation, I will first highlight the variety and magnitude of non-host interference with parasite transmission. I will then exemplify some underlying mechanisms using studies on aquatic virus and trematode transmission. Finally, I will present experiments investigating whether increasing diversity of non-hosts leads to stronger dilution effects on free-living infective stages. These experiments indicate that the effects of non-host diversity on parasite transmission are very complex. They do not only depend on the identity of the interfering species but also on complex intra- and inter-specific interactions of dilutors that can actually both reduce or enhance parasite transmission. This implies that non-host diversity can significantly affect the transmission of free-living infective stages but that a general claim that biodiversity reduces disease risk is far too simplistic in this case due to complex biotic interactions of the players involved.