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Abstract for a: poster
Please indicate a preferred subject group:
- virus discovery
- ecologomics
- fitness and niches
- entangled genomes
N.b.: I was thinking to choose ‘fitness and niches”

Effect of host context, identity and resources on composition of plant viral pathogen communities

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While micro-organisms can infect every free-living organism and can control host vital rates such as fitness and lifespan, the importance of ecological factors as drivers of pathogen community assembly in natural ecosystems remain unclear. The prevalence and diversity of microbes may be controlled by neutral stochastic colonization and extinction events, or by niche differentiation that constrains pathogen distributions to particular environmental conditions, host species and vectors. To date, there have been few experiments replicated at large-enough spatial scales in natural systems to inform our understanding of pathogen community dynamics and assembly. To address this gap, we conducted a regionally-replicated experiment to investigate the community structure of five barley and cereal yellow dwarf viruses (B/CYDV’s) in over 5000 experimentally planted individuals of six grass species along a 700 km latitudinal gradient along the Pacific coast of North America (USA) and in response to experimentally manipulated nitrogen and phosphorus supplies. The viral community composition was correlated with host community context. For example, the prevalence of four out of the five viral species tested increased with perennial grass cover, leading to a 60% increase in the richness (i.e., coinfection) of the viral community within individual hosts in perennial dominated plant communities. The relative abundances of the five viruses tested differed at spatial scales larger than individual plots as well as according to host identity. Hosts infection rates in the field were correlated with vector preferences assessed in laboratory trials. Furthermore, the viral community composition differed among the different fertilization treatments, with differences among viral species in response to the addition of phosphorus. In summary, virus species distributions reflected a combination of local host context, host-specific vector preferences and host species identity, revealing the importance of niche differentiation in structuring virus assemblages. Altogether, these data will help predicting the dynamics of plant viral diseases in the context of human driven environmental changes such as modifications of plant communities richness and composition and alterations of biochemical cycling.

Keywords: community ecology, disease ecology, niche, nutrients, transmission, virulence, viral pathogen, grasslands
N.b.: Word count: 445 words, limit: 450 words