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Poster #24: Temperate versus virulent phage lifestyle impacts microdiversity in soil environments

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Bacteriophages are not only the most ubiquitous biological entity on earth, they also display remarkable genetic diversity across and within populations. While macrodiversity has been extensively studied, the drivers of microdiversity (intra-species genetic diversity) remain poorly understood, particularly in relation to phage lifestyle. The distinguishing ability of temperate phages to integrate themselves into the host genome has an unknown influence on the microdiversity present. This difference in microdiversity could impact the adaptability of phages to (a)biotic factors. To identify a possible association between microdiversity and lifestyle, we analysed 12 existing viromics datasets focusing on soil bacteriophages, including 43,171 viral genomes in total. We found that phages predicted to be temperate consistently exhibit higher microdiversity than their virulent counterparts in eight of 12 datasets. Of the remaining four datasets, one showed the opposite trend and three datasets did not show a significant trend at all. The detected pattern holds across multiple quality thresholds and lifestyle prediction methods. These findings suggest that lifestyle has a significant impact on genetic variation within phage populations, with potential implications for phage-host coevolution and environmental adaptability.

Reference #1

Reference #2

Reference #3

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