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TITLE: The Marine Viromes of Four Oceanic Regions

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ABSTRACT:

Viruses are the most common biological entities in the marine environment. There has not been a global survey of these viruses, and consequently, it is not known what types of viruses are in Earth's oceans or how they are distributed. Metagenomic analyses of 184 viral assemblages collected over a decade and representing 68 sites in four major oceanic regions showed that most of the viral sequences were not similar to those in the current databases. There was a distinct "marine-ness" quality to the viral assemblages. Global diversity was very high, presumably several hundred thousand of species, and regional richness varied on a North-South latitudinal gradient. The marine regions had different assemblages of viruses. Cyanophages and a newly discovered clade of single-stranded DNA phages dominated the Sargasso Sea sample, whereas prophage-like sequences were most common in the Arctic. However most viral species were found to be widespread. With a majority of shared species between oceanic regions, most of the differences between viral assemblages seemed to be explained by variation in the occurrence of the most common viral species and not by exclusion of different viral genomes. These results support the idea that viruses are widely dispersed and that local environmental conditions enrich for certain viral types through selective pressure.

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