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## Marine viruses discovered through metagenomics shed light on viral strategies throughout the ocean

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Marine viruses are key drivers of host diversity, population dynamics and biogeochemical cycling, contributing to the daily flux of billions of tons of organic matter. Yet much of their biodiversity remains uncharacterized, impairing the study of viral communities through metagenomics and consequently our understanding of their interactions with microbes and their environment. By combining data from 78 previously published marine viral metagenomes we obtained a dataset of 27346 marine virome contigs which include 44 complete (circular) genomes. Genome clustering revealed that these are the first members of previously uncharacterized lineages. Furthermore, they outnumber all currently known phage genomes in marine habitats. Computational host prediction was performed including a newly developed and highly accurate method based on co-occurrence associations, revealing that many of the novel viruses infect numerically dominant members of the marine microbiome such as Cyanobacteria and Proteobacteria. A negative association was observed between host abundance and virus-to-host ratio, supporting the recently proposed Piggyback-the-Winner model of reduced phage lysis at higher host densities. Analyzing abundance patterns of both the new and previously known viruses throughout the oceans revealed strategies taken by marine viral communities to adapt between photic/aphotic, warm/cold and winter/summer regimes according to targeted hosts and diversity of auxiliary metabolic genes. Our results chart an important part of the marine viral sequence space and provide new handles to understand the interactions of these viruses with their hosts and the abiotic conditions of their environment.

## **Biography**

Felipe Hernandes Coutinho is currently a PhD candidate at Universidade Federal do Rio de Janeiro, Brazil. He researches on microbial and viral communities from diverse marine habitats with a focus on discovering new taxa, characterizing the factors that shape the composition of the marine microbiome and describing ecological interactions between biological entities and their environment.

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