

# Are We Missing Half of the Viruses in the Ocean?

- Viruses are abundant in the ocean and a major driving force in plankton ecology and evolution.
- It has been assumed that most of the viruses in seawater contain DNA and infect bacteria, but RNA containing viruses in the ocean, which almost exclusively infect eukaryotes, have never been quantified.
- Data suggests that the abundance of RNA viruses rivaled or exceeded that of DNA viruses in samples of coastal seawater, with marine picorna-like viruses predominating, possessing small genomes and are at or below the detection limit of common fluorescence-based counting methods.
- As these RNA viruses infect eukaryotes, the data imply that protists contribute more to marine viral dynamics than one might expect based on their relatively low abundance.



## SHORT COMMUNICATION

### Are we missing half of the viruses in the ocean?

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The percentage of reads in each of two libraries (August 2009 and June 2010) that matched known viruses, that had no significant match in the sequence databases, or were most similar to sequences derived from cells

Viral classification			% Of all sequences		% Of viral sequences		Genome length (nt)	RNA mass per virion (ag)	Weighted RNA mass per virion (ag)	
<i>N A type</i>	<i>Order</i>	<i>Family</i>	2009	2010	2009	2010			2009	2010
dsRNA (+) ssRNA	Unassigned Picornavirales	<i>Reoviridae</i>	1.2	0.02	2.4	0.0	25.6	28.9		
		<i>Dicistroviridae</i>	6.5	8.8	12.9	15.3	9.3	5.24		
		<i>Marnaviridae</i>	1.5	0.1	3.0	0.2	8.6	4.85	5.38	5.25
		Unassigned <sup>a</sup>	6.9	6.3	13.7	11.0	9.3	5.23		
		Unclassified <sup>b</sup>	23.7	22.8	47.2	39.7	9.6	5.42		
		Uncultured <sup>c</sup>	10.4	19.4	20.7	33.8	9.0	5.08		
All other viruses <sup>d</sup>			0.3	0.6						
		Virus total	50.5	58.0						
		No hits	42.8	41.1						
		Cells	6.7	0.8						

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