

Virus-eating virus identified in Antarctic lake

March 29 2011, by Deborah Braconnier

(PhysOrg.com) -- Deep within the waters of Antarctica's Organic Lake an Australian research team, led by microbiologist Ricardo Cavicchioli from the University of New South Wales, have discovered a new virophage, or virus eater. Their findings were recently published in the *Proceedings of the National Academies of Sciences*.

The new virophage was discovered by graduate student Sheree Yau and given the name Organic Lake Virophage, or OLV. The new virophage was identified when she noticed that sequences in the protein shell from the lake were similar to a previously discovered virophage named [Sputnik](#).

Sputnik, which was first discovered in the water-cooling tower in Paris in 2008, was the first virophage ever identified. Earlier this month, Matthias Fischer and Curtis Suttle announced the discovery of a second virophage known as Mavirus.

The discovery of OLV makes this only the third virophage, though there is evidence of sequence matches to OLV in numerous other locations including the nearby Ace Lake. However, the other matches span the globe, including a lagoon in the [Galapagos Islands](#), a bay in New Jersey, and a [freshwater lake](#) in Panama.

Virophages, which are known as virus eaters, attack other viruses, as is the case with the first virophage, Sputnik. Unable to multiply within a host, virophages rely on hosts infected with other viruses. In the case of

Sputnik, it was an amoeba infected with a mamavirus. Sputnik would essentially take over the replication process of the mamavirus. Because of this takeover, the mamavirus is unable to produce properly, thus reducing its ability to infect the [amoeba](#).

The new OLV genome was discovered within the sequences of phycodnaviruses. Phycodnaviruses are a group of large viruses that attack [algae](#). The OLV targets these phycodnaviruses, allowing the algae in the [lake](#) to survive and bloom during the summer months.

The team's discovery, and the discovery of connected sequences in other locations around the globe, opens the door for the possible discovery of many more virophages. The study of these virus eaters is just beginning and holds promise of a better understanding of the complexity of biological function within these viruses.

More information: Sheree Yau et al., Virophage control of antarctic algal host–virus dynamics, Published online before print March 28, 2011, *Proceedings of the National Academies of Sciences*
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