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Vorivore: Redirecting Energy up to Food Chain

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Viruses are the top predators in any food chain. As viruses behave both like living and non-living organism hence assume a greater significance. Viruses mainly causes disease in plants and animals. Apart from this virus has been known to affect the ecosystem. Viruses affects the ecosystem by two ways viz 1) Viral shunt (where virus lyse the microbes and the release the nutrients (Wilhelm et al, 1999) and 2) killing the host (host mortality: Weitz et al, 2012). Because of these abilities of viruses that is to kill and lyse microbes, it has been placed at the top of the food chain as supreme predator.

But despite of the fact that it is top most predator, viruses can be food to other organisms. Recently a study conducted by DeLong et al (2022) found out that a protist can eat the viruses and derive energy from them. This protist has been named as vorivore which means virus eating organism. And this process is named as Vorivory.

In an aquatic ecosystem, foragers which swallow soil particles, water, leaves also ingest some viral particles but as viral particles are small in number their ingestion is calorically insignificant and hence is not sufficient to affect the ecosystem processes. Nevertheless, viruses do contain nucleic acid, amino acids and lipids. So, if any organism consumes viral particle in large quantities, then it may influence the population dynamics of the virus consuming species (vorivores).

DeLong et al conducted study on two protists viz *Halteria* sp. and *Paramecium bursaria*. They provided chlorovirus as food to these protists. Chlorovirus was found in food vacuole of these protists. And because of the feeding of the protist the plate forming unit (pfu) of cholorovirus was reduced by two times. This reduction in PFU density confirms a huge energy and matter flow from virus to consumer (protist). It has also seen that *Halteria* can even grow and increase in size while eating on chlorovirus but *Paramecium bursaria* can only eat chlorovirus but cannot grow.

Hence by eating the virus these protists are playing a crucial role in aquatic food web because these small protists has large population. And zooplankton feeds on these protists. So, there is an upward movement of energy and matter (obtained from virus) in aquatic food web i.e, from virus to protist to zooplankton. And thereby representing a significant and globally relevant trophic transfer. This also counters the fact that due to viral shunt the energy is not returned in food chain. Because now energy and matter are redirected upward to the food web.

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