

Long-term monitoring of sapovirus infection in wild carnivores in the Serengeti

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Spotted hyenas in the Serengeti. Credit: Marian L East/IZW

Sapoviruses are an emerging group of caliciviruses, well-known agents of gastric enteritis, but very little is currently known about their role in wildlife ecology or the genetic strains that infect wildlife. Research findings by a group of scientists led by the Leibniz Institute for Zoo and Wildlife Research (IZW) describe for the first time sapovirus infection in African wild carnivores in the Serengeti ecosystem, including the spotted hyena, the African lion and the bat-eared fox. The results from two decades of monitoring reveal several sapovirus outbreaks of

infection in spotted hyenas and, counter-intuitively, that the risk of infection declined as group sizes increased. These findings were published in *PLOS ONE*.

Viruses within the Sapovirus genus are well known agents of gastric enteritis in people and domestic pigs. Sapoviruses are transmitted by the faecal-oral route and considered a major risk to human health. Sapovirus strains from people in the USA are known to have infected domestic dogs and Californian sea lions, suggesting these viruses have a considerable potential for cross-species transmission. Currently, little is known about sapovirus infection in wildlife and before this study, nothing was known about sapovirus infection in wild carnivores in Africa.

Results of the study, which was based in the Serengeti ecosystem in northern Tanzania, describe for the first time sapovirus infection in African wild carnivores, including the [spotted hyena](#), the African lion and the bat-eared fox. Genetic sequence data revealed that the strains identified from these African carnivores were new to science and that they showed some host-species specificity. Long-term monitoring of infection incidence among individually known animals in three spotted hyena groups revealed several outbreaks of sapovirus infection, and, counter-intuitively, that the risk of infection decreased as group sizes increased. "This type of effect has been termed either a dilution or an encounter-reduction effect, and in our study this effect is most likely explained by levels of herd immunity in a clan modulating infection risk" said Ximena Olarte-Castillo, Ph.D. student at the Leibniz IZW and lead author on the study.

Marion East, head of the research team at the Leibniz IZW, emphasised the importance of long-term monitoring of pathogens in wildlife, noting, "Our results not only track the genetic diversity of strains and changes of infection prevalence across two decades, they also provide a benchmark

against which future studies can gauge the potential impact of ecological and human induced changes on sapovirus infection in the spotted hyena population in the Serengeti."

More information: Ximena A. Olarte-Castillo et al. Divergent Sapovirus Strains and Infection Prevalence in Wild Carnivores in the Serengeti Ecosystem: A Long-Term Study, *PLOS ONE* (2016). [DOI: 10.1371/journal.pone.0163548](https://doi.org/10.1371/journal.pone.0163548)

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