New virus discovered in whales, dolphins across Pacific

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Credit: NOAA

A novel virus, potentially fatal to whales and dolphins, has been discovered by researchers at the University of Hawai‘i Health and Stranding Lab. Prior to its discovery in 10 whale and dolphin host species across the Pacific, the virus was found in only a single marine mammal worldwide, a Longman's beaked whale stranded on Maui in 2010. The findings are published in *Frontiers in Marine Science*.

The discovery of beaked whale circovirus (BWCV) in whales and dolphins expands the knowledge of marine mammal species that can become infected with the disease. Circoviruses are DNA viruses that cause disease in birds, pigs and dogs, and in severe cases can become fatal.

"Our study found Cuvier's beaked whales tested positive for BWCV in Saipan and American Samoa, nearly 4,000 miles away from the first discovered case," said Kristi West, director of the UH Health and Stranding Lab. "The positive cases found outside of Hawai‘i were surprising, and indicates that this virus is spread across the Central and Western Pacific and may have a global presence in marine mammals."

The whales and dolphins that researchers tested came from multiple regions in the Pacific, with the majority of animals that tested positive for the disease being from the Hawaiian Islands.

"We were surprised to find just how many different species and how many animals overall were infected with BWCV, with 50% of the animals testing positive for this virus," said Cody Clifton, a Ph.D. student in the College of Tropical Agriculture and Human Resources who works at the UH Health and Stranding Lab. "Our research approach targeted animals for testing that we knew exhibited signs of sickness, but such a high rate of detection was unexpected."

Unknown disease for 22 years

The study found that circovirus has been present in the Pacific for at least the last 22 years. Researchers tested animals from the UH Health and Stranding Lab sample archive, which includes samples from animals that date back to 1997. Among those cases, researchers found BWCV present in a dwarf sperm whale that had stranded on O‘ahu in 2000, showing that this virus has been present among Hawaiian whales and

dolphins since then.

Currently, it is unknown what kind of impact BWCV may have on infected hosts. The initial case of BWCV was in a fatally ill whale but this animal was co-infected with other pathogens. More work is needed to understand if this virus has measurable effects on the health of dolphins and whales.

"We need to understand the causes of mortality and the threats that Hawai‘i's dolphins and whales face to better protect these species," said West. "Many of Hawai‘i's dolphins and whales are residents of small island-associated populations where a disease outbreak that causes severe illness and mortality can have devastating effects."

Sentinels of ocean health

Marine mammals are culturally significant to the people of Hawai‘i and are recognized sentinels of ocean health. An understanding of the threats faced by protected species such as dolphins and whales is critical for effective conservation and management.

Researchers rely entirely on public reporting of marine mammals that are distressed or deceased, which is vital to understanding causes of mortality and identifying and evaluating threats to protected species in Hawai‘i and the Pacific. The public is encouraged to report distressed, injured and dead marine mammals to the NOAA hotline 1-888-256-9840.

More information: Cody W. Clifton et al, Targeted surveillance detected novel beaked whale circovirus in ten new host cetacean species across the Pacific basin, *Frontiers in Marine Science* (2023). DOI: 10.3389/fmars.2022.945289

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