

A novel method for collecting dolphin DNA

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Scientists at Georgetown University, the National Aquarium and the University of Queensland are the first to extract DNA from dolphin blow (breath exhalations).

The researchers found that blow-sampling, which involves collecting exhalations from the blowholes of whales, dolphins and porpoises, could be developed as a less invasive method for DNA collection. Their findings are explained in the Aug. 25 edition of the online journal *PLoS ONE* in an article titled "Thar She Blows! A Novel Method for DNA Collection from Cetacean Blow."

Scientists currently biopsy animals by using a small piece of tissue taken from a dart gun to get DNA from wild dolphins and whales for use in research projects.

"Dart biopsying is considered inappropriate for very young animals and the technique requires considerable skill to avoid injuring the animals," says Janet Mann, a senior author on the paper and a professor of biology and psychology at Georgetown. "Thus identifying alternative genetic collection techniques for cetaceans remains a priority, especially for internationally protected species."

At the National Aquarium in Baltimore, Md., blow and blood samples were collected between March and May 2010 from six bottlenose dolphins. A test tube was held inverted over the dolphin's blowhole as they were trained to exhale on cue. A control sample of seawater was taken along with each blow sample set to ensure that any DNA results were from blow samples and not seawater contamination. The blood was

collected as part of routine medical examinations for the dolphins.

To estimate whether DNA profiles from the blow and blood samples matched, the scientists amplified 3 polymorphic dinucleotide microsatellite loci for each sample. To estimate whether mitochondrial DNA (mtDNA) also matched, the scientists amplified a 426 base-pair fragment of the maternally inherited mitochondrial DNA control region. For all samples, blow and blood showed a perfect match for each individual animal. The scientists were therefore able to show that DNA can be successfully extracted from dolphin blow.

The authors are currently applying their method to a wild population of bottlenose dolphins in Western Australia's Shark Bay that they have studied for more than two decades.

"Both biopsy and blow-sampling require close proximity of the boat, but blow-sampling can be achieved when [dolphins](#) voluntarily bow-ride, and it involves no harmful contact," says Mann. "While we recognize the important role played by dart-biopsying, we have provided evidence that blow-sampling is a viable and less invasive mode of DNA collection."

More information: Frere CH, Krzyszczyk E, Patterson EM, Hunter S, Ginsburg A, et al. (2010) Thar She Blows! A Novel Method for DNA Collection from Cetacean Blow. PLoS ONE 5(8): e12299.
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