

Study: Sharks can have 'virgin births'

By Shawn Pogatchnik, Associated Press

DUBLIN — Female sharks can fertilize their own eggs and give birth without any sperm from a male shark, according to a new study into the asexual reproduction of a hammerhead in a Nebraska zoo. The joint Northern Ireland-U.S. research, being published Wednesday in the Royal Society journal *Biology Letters*, analyzed the DNA of a shark born in 2001 in the Henry Doorly Zoo — in a tank with three potential mothers, none of whom had contact with a male hammerhead for at least three years.

Analysis of the baby shark's DNA found no trace of any contribution from a male partner. Shark experts said this was the first confirmed case in a shark of parthenogenesis, which derived from the Greek means "virgin birth."

Asexual reproduction is common in some insect species, rarer in reptiles and fish, and has never been documented in mammals. The list of animals documented as capable of the feat has grown in line with the numbers being raised in captivity — but until now, sharks were not considered a likely candidate.

"The findings were really surprising because as far as anyone knew, all sharks reproduced only sexually by a male and female mating, requiring the embryo to get DNA from both parents for full development, just like in mammals," said marine biologist Paulo Prodahl, of Queen's University of Belfast, Northern Ireland, co-author of the report.

Before the study, many shark experts had presumed that the Nebraska birth involved a female shark's well-documented ability to store sperm for a lengthy period of time. Doing this for six months is common, while three years would be exceptional, they agreed.

The lack of any paternal DNA in the shark ruled out this possibility.

"We were all very skeptical about these reports, about the possibility of a so-called virgin birth in a shark, because sharks have this unusual ability to store sperm for months if not years. So this finding is new and definitely unexpected," said Bob Hueter, director of the Center for Shark Research at the Mote Marine Laboratory in Sarasota, Florida, who was not involved in the project.

The report's other co-author, Mahmood Shivji of the Guy Harvey Research Institute in Dania Beach, Florida, said the finding explained growing numbers of reports of mystery, male-free shark births in conditions of captivity.

Shivji said the research "may have solved a general mystery about shark reproduction," because it suggests that sharks can "switch from a sexual to a non-sexual mode of reproduction." But he said this was not necessarily a positive ability because baby sharks produced only by the mother suffer from "reduced genetic diversity."

Genetic diversity makes living creatures better able to adapt to threats, such as disease.



The Shark Reef at Mandalay Bay in Las Vegas featured a new great hammerhead shark in 2003. A new study of a hammerhead at a Nebraska zoo found it was capable of 'virgin births.'