



Hammerhead Shark in Nebraska Gives Virgin Birth'

Wednesday, May 23, 2007

Associated Press

DUBLIN, Ireland — Female sharks can fertilize their own eggs and give birth without sperm from males, according to a new study of the asexual reproduction of a hammerhead in a U.S. zoo.

The joint Northern Ireland-U.S. research, being published Wednesday in the Royal Society's peer-reviewed *Biology Letters* journal, analyzed the DNA of a shark born in 2001 in the Henry Doorly Zoo in Omaha, Neb.

The shark was born 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 chromosomal contribution from a male partner. Shark experts said this was the first confirmed case in a shark of parthenogenesis, which is derived from Greek and 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 along 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, a 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 baby 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, Fla., who wasn't involved in the project.

He noted that sharks have been on Earth longer than other species higher up the evolutionary chain that have also demonstrated this ability, such as lizards and birds.

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