

Hammerhead shark gives virgin birth

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BELFAST: A female hammerhead shark that gave birth without sex has put the bite into conventional wisdom about reproduction among large vertebrates.

Bemused experts from Northern Ireland and the United States report that the shark – housed in an aquarium at the Henry Doorly Zoo in Nebraska, USA – gave birth to offspring with no paternal DNA.

The discovery, reported in the British journal *Biology Letters*, is the first known case of asexual reproduction in sharks, and according to the researchers, raises concerns about the genetic health of dwindling shark populations.

The virgin birth

An investigation was launched after the unexpected birth occurred in December 2001. The baby's arrival baffled staff, since none of the three female hammerheads in the tank had been exposed to a male hammerhead in the three years since they'd been caught as babies off Florida, USA.

The research was carried out by scientists from Queen's University in Belfast, Ireland, the Guy Harvey Research Institute at Nova Southeastern University in Florida, and the Henry Doorly Zoo. Co-author Paulo Prodohl, who led the Queen's University team, described the findings as "really surprising".

"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," he said.

Co-author Mahmood Shivji, who led the Guy Harvey Research Institute team, said the study may have solved a mystery about other species of shark having babies in captivity despite not having contact with males.

"It now appears that at least some female sharks can switch from a sexual to a non-sexual mode of reproduction in the absence of males," he said.

Genetic diversity damaged

But what appears to be a boon for the world's threatened sharks also has a downside. "Unfortunately, this occurrence is not benign, because it results in reduced genetic diversity in the offspring since there is no new genetic variation introduced from the paternal side," Shivji said.

Only a few vertebrate species can give birth to fully formed young without the female's eggs being fertilised by a male's sperm. This reproductive ability is known as parthenogenesis - a rare event that until now has only been seen in some species of birds, reptiles and amphibians; never in major vertebrates such as sharks.

But according to Prodohl, mammals are now the only major vertebrate group where this form of reproduction has not been observed.



A captive hammerhead has given birth to offspring with no paternal DNA, in the first known virgin birth among sharks.