



Female shark reproduces without sex

*From correspondents in Belfast
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A FEMALE hammerhead shark which gave birth without sex has put the bite into conventional wisdom about reproduction among large vertebrates, according to research published today.

The shark's offspring has no paternal DNA, bemused experts from Northern Ireland and the United States report.

The discovery is the first known case of asexual reproduction in sharks but it also raises concerns about the genetic health of dwindling shark populations, they say.

The investigation was launched after an unexpected birth in an aquarium at the Henry Doorly Zoo in Nebraska in December 2001.

The baby's arrival baffled staff, as none of the three possible mother hammerheads in the tank had been exposed to any male hammerhead for the past three years, after they had been caught as babies off Florida.

The research was carried out by scientists from Queen's University Belfast, the Guy Harvey Research Institute at Nova Southeastern University in Florida and the Henry Doorly Zoo.

The head of the Queen's research team and the study's co-author, Paulo Prodohl, from the School of Biological Sciences, 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."

Co-author Mahmood Shivji, who led the Guy Harvey Research Institute team, said the research 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," said Mr Shivji.

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," Mr Shivji said.

Females of only very few vertebrate species can give birth to fully formed young without requiring their eggs to be first fertilised by a male's sperm.

This reproductive ability is known as parthenogenesis - but it is a rare event and until now only seen in some species of birds, reptiles and amphibians, never in major vertebrates such as sharks.

Mammals are now the only major vertebrate group where this form of reproduction has not been seen, said Mr Prodohl.

The study appears in *Biology Letters*, a journal published by Britain's Royal Society.
