

'Heat-proof' eggs help turtles cope with hot beaches

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Green turtle hatchling. Photo by Sam Weber, University of Exeter

(PhysOrg.com) -- Sea turtles face an uncertain future as a warming climate threatens to reduce their reproductive viability. However, new research led by the University of Exeter and published this week in *Proceedings of the Royal Society B* shows that some turtles are naturally heat-tolerant.

The study focused on [green turtles](#) nesting on Ascension Island, a UK overseas territory in the South Atlantic Ocean. Scientists from the Universities of Exeter and Groningen found that eggs laid by turtles nesting on a naturally hot beach withstand [high temperatures](#) better than eggs from turtles nesting on a cooler beach just a few kilometres away.

The warmer beach has dark sand, whereas the neighbouring beach is two

to three degrees Celsius cooler because it has white sand. Green turtles travel from the coast of South America to the tiny island to nest. Most female turtles nest on the beaches where they themselves hatched, so populations can become adapted to specific nesting locations.

The researchers placed some of the eggs laid on each beach into incubators of either 32.5 degrees Celsius or 29 degrees Celsius and monitored their progress. They found that the eggs from the warmer beach were better able to thrive in the hot [incubator](#) than those from the cooler beach.

Dr Jonathan Blount of the University of Exeter, who led the research, said: "We believe this is the first time that adaptation to local environmental conditions has been demonstrated in [sea turtles](#), which is all the more remarkable because the beaches in question are just six kilometres apart".

Heat-tolerant populations may be crucial in allowing species to adapt to a warming world, highlighting the need for conservation strategies which protect diversity in animal populations.

University of Exeter PhD student Dr Sam Weber, lead author of the study, said: "Such adaptations probably evolve over many generations, so whether turtle evolution can keep pace with the rapid climate change that scientists have predicted remains to be seen. However, occasional movements of heat-adapted [turtles](#) to other nesting sites could help to spread their favourable genes."

Provided by University of Exeter

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