Warmer is better: Invasive cane toads set to thrive under global warming

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As global warming threatens many animal species with extinction, the cane toad is set to flourish with increasing temperature. This is a major cause for concern as the cane toad, once introduced to Australia as agricultural pest-control of the cane beetle, is an already highly invasive species and considered a pest in Australia. The researchers present their new findings at the Society for Experimental Biology Annual Conference in Prague on Friday, July 2, 2010.

"The negative effect of high temperature does not operate in Cane Toads, meaning that toads will do very well with human induced global warming", explains Professor Frank Seebacher from the University of Sydney.

Unlike fish and other cold-blooded creatures, whose oxygen transport system suffers at high temperatures, the cardiovascular system (heart and lungs) of Cane Toads performs more efficiently.

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When tested over an ambient temperature range of 20 - 30 ˚C, Cane Toads acclimatised perfectly to increased temperatures and resting oxygen demands remained constant.

Furthermore, the efficiency of the oxygen transport system in the Cane

Toad increased with increasing temperature, showing not only an ability to function over a broad thermal range but remarkably, a preference for higher temperatures.

This is in contrast to previous studies suggesting an increase in temperature results in a higher basic oxygen demand, coupled with decreased efficiency of the circulation system, leading to oxygen starvation.

"Warmer temperatures are advantageous and there is no indication that high temperatures limit oxygen delivery", explained Professor Seebacher.

The scientists say this positive effect may also apply to other anurans (the class of amphibians that includes frogs and toads), but more research needs to be done to find out.

"The impact of global warming doesn't have to be negative. Global average temperatures at present may in fact be cooler than many animals would like", explained Professor Seebacher.

"There will be winners and there will be losers but that needs to be judged on a species by species basis", added Dr Craig Franklin, co-author of the research.

The Cane Toad can adapt its physiology in response to a changing environment repeatedly and completely reversibly many times during its lifetime.

Originally introduced as agricultural pest-control due to its voracious appetite for the Cane Beetle, populations have now escalated out of control. The skin of the Cane Toad is toxic and deadly when ingested by other animals, many of them native predators.

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