Ancient genes may explain modern threat to Tasmanian devils

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PhD researcher Katrina Morris: "It is well known that low genetic diversity is a major extinction risk factor, but when and how devils lost their immune diversity has remained a mystery until now."

(Phys.org)—Tasmanian devils had low immune gene diversity for hundreds, and possibly thousands, of years before the emergence of Devil Facial Tumour Disease, researchers at the University of Sydney and University of Adelaide have discovered.

"Low immune gene diversity in modern devils has been linked to the spread and devastating impacts of Devil Facial Tumour disease (DFTD)," said senior author Katrina Morris, a PhD candidate at the University's Faculty of Veterinary Science and senior author of the study published in the journal *Biology Letters* today.

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"Devils once lived across much of mainland Australia, but became extinct sometime in the last few thousand years," said Dr Jeremy Austin, from the Australian Centre for Ancient DNA at the University of Adelaide.

"We looked at subfossil bones of these extinct mainland devils, as well as museum specimens of Tasmanian devils collected over the last 200 years. They capture the genetic diversity of the past allowing us to see how the immune gene diversity has changed over thousands of years."

The genes the researchers studied included the oldest marsupial genes to have ever had their genetic code sequenced, taken from mainland devil specimens at least 3000 years old.

Surprisingly, the immune diversity in devils was low in all Tasmanian samples dating from the 1980s back to before European arrival in 1800. Mainland devils, isolated from the Tasmanian population by sea level rises at the end of the last ice age, also had low and very similar diversity

to Tasmanian devils.

"Low immune diversity would have made devils susceptible to disease outbreaks," said Katrina Morris. "This may explain their history of population extinctions, population crashes and disease outbreaks in the 1800s and early 1900s."

Provided by University of Sydney