NEWS FROM THE UNIVERSITY OF TASMANIA, AUSTRALIA

Media Release

Chiefs of Staff, News Directors

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New devils research finds facial tumours are evolving to benefit themselves

New Tasmanian Devil research that will be published tomorrow has found that the tumours of the Devil Facial Tumour Disease (DFTD) at a population in north western Tasmania have been changing and competing over the years to increase infection rates.

The findings that will be published in the journal *Proceedings B* indicate that future research efforts to fight the DFTD decimating the Tasmanian Devil population will need to focus on the tumour and its ability to change, as well as on the devils and their genetics.

The work was carried out by scientists from the University of Tasmania, the Tasmanian Department of Primary Industries, Parks, Water and Environment and the University of Cambridge, UK.

The research was carried out on a population of devils in north western Tasmania that have been monitored for a decade, with the research team regularly taking tumour and blood samples every three months. It is the only site where the researchers have a long-term genetic and immunological data set of devils and tumours from the beginning of the DFTD epidemic outbreak.

Lead author Dr Rodrigo Hamede, University of Tasmania School of Biological Sciences, said this research is the first solid evidence that tumour lineages are competing and having an effect on transmission and population effects.

“The tumour is subject to changes- for its own benefit rather than the devil’s benefit. The tumour is a living organism and wants to do whatever is best for it.”

Dr Hamede said previous research (three years ago) found that the devil population the team was regularly sampling had not declined, the disease prevalence was very low, and animals were surviving for quite a long time and dying from old age, not from DFTD. So the team was very keen on finding out what was happening.

“We were looking at the devils from different angles but we couldn’t associate the reduced effects of DFTD with devils’ genotypes or immune responses in this population.

“Then we started looking at the tumour and we realised that the tumour in this population was tetraploid. That means it has four copies of chromosomes rather than two. (Two is normal.) So it was an unusual tumour strain.”

In the years following this, the team found that the tumour strain had changed again, becoming diploid; a more normal and stable tumour carrier type. That coincided sharply with a large and rapid population decline, higher infection rates and devils dying younger.

“We began seeing basically the same patterns in that population that happened everywhere else; our unique population was not unique anymore, because the tumour had changed.

“The tumour used to allow devils to survive longer and the population to sustain itself. Then the diploid strain arrived and out-competed the more benign tumour strain, and has caused a severe population decline. The diploid tumour at this site is the older and most common tumour type which is spread over most of Tasmania.

“This is the first evidence since we've been studying this disease that the tumour strain can have an effect in the epidemic outcome and population impacts in devils.

“Through our collaborations we have managed to understand the epidemic patterns and find out that it is actually related to the tumour genetics.

“The main message from this research is that we need to take into account tumour genetic variability into our population viability analysis; into how we manage DFTD; and especially into how we see the evolution of DFTD and how it compromises co-existence between devils.

“We need to be very thorough, not just looking at devils, but putting the same amount of funding and research rigour into looking closely at the tumours.”

Information released by:
University of Tasmania, Communications and Media Office
Phone: 61 3 6226 2691 or 0447 537 375
Email: Media.Office@utas.edu.au