Tassie tiger no match for dingo

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The wily dingo out-competed the much larger marsupial thylacine by being better built anatomically to resist the “mechanical stresses” associated with killing large prey, say Australian scientists.

Despite being armed with a more powerful and efficient bite and having larger energy needs than the dingo, the thylacine was restricted to eating relatively small prey while the dingo's stronger head and neck anatomy allowed it to subdue large prey as well.

Earlier studies had given ambiguous results regarding the size of prey favoured by the thylacine, and had suggested that changes in mainland Aboriginal culture may have driven its extinction 3,000 years ago in mainland Australia.

This new conclusion, published today in *Proceedings B of the Royal Society*, is based on sophisticated computer simulations revealing bite forces and stress patterns applying to dingo and thylacine skull specimens.

A team led by UNSW palaeontologist Stephen Wroe, along with Karen Moreno (UNSW) and University of Newcastle colleagues, Colin McHenry and Philip Clausen, conducted the research.

The simulations illustrate mechanical stresses and strains applying to the skull, jaw, teeth and cranial muscles of both animals across a range of biting, tearing and shaking motions that simulate the impact of controlling and killing a struggling prey.

Engineers use the same methodology – known as finite element analysis – to predict distortion and “failure” in load-bearing materials, such as metal in the body and wings of an airplane.

The researchers applied this technique to test the hypothesis that the dingo would have substantially overlapped with the thylacine regarding its choice of favourite prey.

Their results demonstrated considerable similarity between the two species, but also informative differences.

“The thylacine has a greater bite force than the dingo but its skull becomes more stressed than the dingo under conditions that simulate the influence of struggling prey,” says Dr Wroe, who believes the bigger marsupial took downsized, relatively small prey despite its big energy requirements.

“If the thylacine had been better able to hunt large prey, such as adult kangaroos and emus, as well as smaller species, then it would have faced less competition from the smaller dingo,” says Dr Wroe.

As well, the dingo may have enjoyed a competitive edge by having a social structure that enabled it to hunt in packs, whereas the thylacine was a lone hunter.

The findings add to a complex picture of how and why the thylacine became extinct after millions of years of successful survival in Australia. Its extinction on the continent's mainland has also been linked to climate change and a shift in Aboriginal land-use patterns about the same time as the introduction of the dingo.

The unique carnivore then persisted only on the island of Tasmania – which was free of dingoes – until the arrival of European settlers, who

persecuted it believing it to be a wolf-like creature that killed sheep.

Kept as pets, exported to zoos, killed by farmers and hunters, the pre-European thylacine population of around 5,000 was also pressured by government bounties: records reveal that 2,000 bounties were paid in the period the period 1888-1912.

Like the dingo, the settlers competed with the thylacine's food base by hunting small animals and reducing their numbers through ecological and environmental impacts.
The last known individual died in a Tasmanian zoo in 1936.

"As a large dedicated flesh eater reliant on relatively small prey, the thylacine may have been particularly vulnerable, not only to food competition with the dingo – but also to the destructive influence of the first Europeans in Australia", Dr Wroe says.

Source: University of New South Wales