Strain of living with competitive males: Males age faster than females due to brawling in early adulthood

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Male badgers that spend their youth fighting tend to age more quickly than their passive counterparts according to new research from the University of Exeter.

The 35-year study revealed that male badgers living alongside a high density of other males grow old more quickly than those living with lower densities of males.

The results, which are published in the *Proceedings of the Royal Society B*, indicate that competition between males in early life accelerates ageing in later life, providing a potential explanation for why males age faster than females.

Author Christopher Beirne from the Centre for Ecology and Conservation at the University of Exeter's Penryn Campus in Cornwall said: "The study shows that when male badgers don't have to fight for a mate, they can prioritise their health and wellbeing and as a result they age more slowly. However, when badgers fight a lot in their youth, they really pay for it by ageing rapidly in later life."

Unlike the males, female badgers appeared to be unaffected by the density of other females in the area, indicating that they don't suffer from the effects of competition in the same way as males.

Co-author Dr Andrew Young from the University of Exeter said: "The findings are particularly interesting because males age faster than females in many species, including our own, but we don't really understand why. Our findings suggest that male badgers age faster than females because of the male-male competition that they experience during their lifetimes; males that experience strong competition age more quickly than females, while males that experience little competition do not."

The exact causes of the observed ageing are not fully understood and so the findings provide rare support for the view that sex differences in ageing rates arise in part from reproductive competition and the costs associated with living alongside rivals.

Previous studies have shown that male badgers are more likely to have bite wounds, contest matings and have a higher mortality rate than females.

The researchers quantified ageing as the rate of body mass loss in late-life because badgers, like humans, become frail and lose weight as they grow old. Body mass in badgers, which can live for up to 13 years in the wild, is positively associated with reproductive success and survival, and so rapid declines in body mass are likely to indicate reduced reproductive success and survival prospects.

The research is the result of a collaboration between the University of Exeter and the Animal and Plant Health Agency's long-term field study in Gloucestershire, UK, where the resident European badger population has been continuously monitored since the 1970s.

Sex differences in senescence: the role of intra-sexual competition in early adulthood by Christopher Beirne, Richard Delahay, Andrew Young is published in *Proceedings of the Royal Society B*.

More information: Sex differences in senescence: the role of intra-sexual competition in early adulthood, rspb.royalsocietypublishing.or … .1098/rspb.2015.1086

Provided by University of Exeter