

Swan study shows reproductive success in early life leads to faster ageing

April 21 2006



Birds from mute swan colony at Abbotsbury, Dorset. Credit: Dr Anne Charmantier

Why do we stop reproducing after a certain age, and how is this age determined? A study by Oxford University researchers has shed light on this question by studying data from Dorset swans.

A theory which says that reproductive success in early life will lead to faster ageing later has been supported by the study of mute swans (*Cygnus olor*) which shows that those swans which reproduce early in life also stopped breeding early, and vice versa. Which pattern a swan adopts appears to be genetically inherited.

The team, from the Edward Grey Institute in Oxford's Department of Zoology, investigated data on swans that bred as youngsters and those that started to reproduce at a much later age. They discovered the age at which swans started to reproduce varied considerably – from two to twelve years old – and the age at which swans stopped breeding also showed huge variation – from two to twenty years old. The main finding, however, was that the birds that started breeding at an early age stopped reproducing earlier than the late-starters.

The study, to be published in the science journal PNAS this week, supports the 'antagonistic pleiotropy' theory for the evolution of ageing, that says that you 'pay' in later life for your success in reproducing when young. It is thought the study is the first to show this pattern in a wild animal population.

The researchers studied data dating back to the late 1960s of individually identifiable birds from the mute swan colony at Abbotsbury, in Dorset. As soon as swans started pairing up, the researchers visited the nesting area to identify all breeding parents, and they collected data on their breeding site, breeding dates and clutch sizes. They were able to monitor up to six generations of the same family and discovered the age at which the birds reproduced was found to have a heritable component – if the mother reproduced later in life, it was more likely that her cygnets would too when they were adults.

Lead author, Dr Anne Charmantier, said: 'Ageing is about losing your capacity for reproduction, or having a higher probability of dying. At first sight, it is difficult to explain in the natural selection framework, because it shouldn't be selected for. One theory that tries to elucidate whether ageing can be explained by selection is the "antagonistic pleiotropy" theory – that is, you cannot win on all levels: the more you invest early in life, the earlier you are going to senesce (age) in reproductive terms. We show this in the swan study.'

‘The important thing about this study is it shows that this link between the age at which you start reproducing and the age at which you stop is actually genetic. If you carry genes which will make you start reproducing early, you also carry genes which will make you stop early. It’s what we call an “evolutionary trade-off”. It explains why birds and other animals, like humans, age – because we invest in early life.’

Source: University of Oxford

Citation: Swan study shows reproductive success in early life leads to faster ageing (2006, April 21) retrieved 23 March 2023 from <https://phys.org/news/2006-04-swan-reproductive-success-early-life.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.