Trans-generational effects of parental age on offspring telomeres and fitness in a wild bird

Supervisory team:

Main supervisor: Dr Andrew Young (University of Exeter)
Second supervisor: Dr Alastair Wilson (University of Exeter)
Prof Duncan Baird (Cardiff University)

Collaborators: Prof Mark Haussmann (Bucknell University, USA)

Host institution: University of Exeter

Project description:

Humans and wild animals typically show late-life declines in fitness and health, a phenomenon known as senescence. The causes of these age-related declines are now a key focus of research in evolutionary biology and biomedicine. While most work to date has focussed on the plight of individuals as they age, it is fast becoming clear that a major component of senescence arises from trans-generational effects of the age of parents on the fitness of their offspring. However, the relative importance of maternal and paternal age effects and the mechanisms that generate them remain poorly understood. This is significant, given the key role that parental age effects may play in generating individual variation in health and ageing trajectories in both human and wild animal populations.

This project will provide the first test of the role that telomeres (nucleoprotein complexes that preserve chromosomal integrity) play in generating parental age effects in a wild vertebrate. While research on humans and wild vertebrates has highlighted the potential for parental age effects on offspring telomere lengths, comprehensive field studies of these effects have yet to be conducted. This project will combine longitudinal field research on an established study population of wild birds in the Kalahari desert (the white-browed sparrow weaver; *Plocepasser mahali*) with cutting edge laboratory analyses of telomere length and statistical modelling of existing life-history, behavioural and genetic data sets to investigate: (i) maternal and paternal age effects on offspring telomeres, (ii) the extent to which these can be attributed to age effects on parental investment or gamete telomere lengths, and (iii) the extent to which parental age effects on offspring telomeres can account for parental age effects on offspring fitness.

The project will be supervised by Dr Andy Young (University of Exeter, Cornwall campus) who specialises in integrative research on wild populations of social vertebrates (see www.animalsocieties.org), in collaboration with evolutionary biologist Dr Alastair Wilson (University of Exeter, Cornwall campus) and telomere biologist Prof Duncan Baird (University of Cardiff). The student will be based at the University of Exeter's large and dynamic Centre for Ecology and Conservation in Cornwall, with fieldwork conducted in the South African Kalahari desert, and laboratory work conducted in Cornwall and Cardiff. The project will therefore be well suited to a candidate seeking a cutting edge integrative project on wild vertebrates.