

Title: Conservation and ecology of the hazel dormouse, *Muscardinus avellanarius*: Multiple paternity in the hazel dormouse: not so promiscuous after all? *PhD Thesis, University of Exeter, 2012*

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Background to study

It is important that the natural mating systems of species is understood to inform on conservation management and captive breeding systems. Evidence obtained from Wales suggests that hazel dormice are polyandrous in that females mate with multiple males. This behaviour can increase the genetic diversity of offspring and the effective population size and can reduce inbreeding. Further evidence of mating systems of dormice is required.

Method

- Hair pluck samples from Dormice were obtained from 5 woodland sites in Cornwall and Devon between 2009 and 2011. Samples were collected during routine nest box monitoring and information on date, site, sex, weight, age, reproductive condition, torpor state and distinguishing features were obtained as accompanying data.
- DNA was extracted from samples using standard protocols and each sample was genotyped using 22 microsatellite markers, identified as suitable for parentage analysis.
- 216 genotypes were separated into male, female and juvenile and were analysed to investigate multiple paternity in sampled litters (n=12). Multiple paternities in Devon and Cornwall were compared to those recorded in Wales.

Key results

- The mother of all offspring in 11 of the 12 litters was present in the nest box when samples were obtained and in one instance the father of all juveniles was also present. One litter had no parent assigned to it and all juveniles were half siblings suggesting polyandry.
- Six of the 12 litters had more than one sire and in one litter, four different males were inferred as having sired the four juveniles sampled from the nestbox.
- The rate of multiple paternities was significantly lower in Devon and Cornwall than what had previously been recorded in Wales where 95% of 20 litters were sired by more than one male.
- There was no significant difference in the maternal weight between females who mated with multiple or single males nor was there a correlation between female weight and litter size.

Key messages to landowners and managers derived from these results

- Captive breeding programmes should consider multiple mating by rotating resident females with a group of males to encourage natural mating behaviour. In the absence of multiple mating in captive bred stocks, dormice may still adopt this mating strategy once released into the wild.
- Further research into the influence of habitat and nestbox provision on mating systems is advised to further our understanding of what influences the observed variations in multiple mating by female dormice.

Key words/phrases

Dormice; *Muscardinus avellanarius*; microsatellites; paternity; polyandry; multiple mating; litters