

## The effects of female choice, genetic similarity between mates and male size on siring success in a field population of agile antechinus (*Antechinus agilis*)



The agile antechinus is a small, nocturnal, carnivorous marsupial that exhibits obligate semelparity. It has a short, highly-synchronised, annual breeding season after which all males die. Females mate with multiple males during a single oestrus and multiple paternity in litters is common. Recently, using a variety of captive mate choice experiments, we showed that females choose males based on scent. Also, female mate choice and male siring success is profoundly influenced by genetic relatedness between mates, rather than male size. However, the effect of female mate choice, and genetic similarity between mates, on male siring success in wild populations was unknown.

This study examined the effects of genetic similarity between mates on siring success in wild agile antechinus. Animals were trapped monthly between 2002 and 2004 on two grids in the Mt. Disappointment State Forest, Victoria. A genetic sample was taken from all animals caught, including 177 adult agile antechinus and 204 pouch young. Paternity of young and genetic similarity between mates was determined using highly polymorphic, microsatellite markers. Microsatellite results were analysed using the Genepop, Cervus and Kinship programs.

In 2002, males which were genetically dissimilar to females sired significantly more young ( $p < 0.05$ ). Larger males also sired a higher proportion of young ( $p < 0.01$ ), especially in 2003 ( $p < 0.001$ ), a year in which animal weight, survival and litter size were significantly affected by drought. The operational sex ratio was female biased in 2003 (female 66%;  $p < 0.05$ ), but in 2002 the population did not deviate from parity. However, there were more sires per litter in 2003 ( $3.2 \pm 0.2$ ) than 2002 ( $2.6 \pm 0.2$ ). We suggest that, in severe drought conditions, females accept more and larger males to ensure pregnancy and maximize litter size. Also, food resources may limit the capacity of smaller males to compete with larger males for females. The results show that genetic relatedness between mates and male size significantly influences siring and breeding success in wild populations of agile antechinus.

