Female red squirrels opt for quantity over quality

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Female North American red squirrels will mate with up to 14 males.

A group of University of Alberta researchers has discovered that a long drawn out search for "Mr. Right" is a luxury not afforded to female North American red squirrels.

PhD student Jeffry Lane, who led a three-year study on the mating habits of red squirrels near Kluane National Park in southwest Yukon, has discovered that red squirrel females, who are only in estrus and able to conceive for a single day each year, mate with more males-six on average but as high as 14-than has been shown in any other squirrel species.

While males mating with multiple females is quite common in the animal kingdom, females that multi-mate is much harder to explain.

"In males, the benefits of multi-female mating are well established, but in females the benefits of having many offspring is limited, making the reasoning for multi-male mating more puzzling," said Lane.

In contrast to other species, which seem to experience both costs - the potential for infanticide by males - and benefits - genetic superiority and protection - of multiple-male mating, Lane says female red squirrels didn't exhibit either cost or benefit, and so appeared to passively copulate with males.

Lane, who is supervised by Stan Boutin, professor in the Department of Biological Sciences, tested a number of hypotheses to explain why the females may mate with a high numbers of males, including to ensure fertilization of their ova and to cause confusion surrounding paternity to guard against a male later committing infanticide.

However, his findings, which have been published in the June 2008 edition of *Animal Behaviour*, revolved more around the red squirrel's less defined, hit-or-miss mating season.

In ground squirrels, for instance, Lane says mating between females is relatively synchronized because most of the population comes out of hibernation within a week's period and mate within three to five days, meaning there are lots of receptive females on any given day.

Red squirrels, however, don't hibernate and thus they don't have such a restriction on the length of their mating season. This means mating happens over a period of a couple of months.

"A longer mating season leads to fewer females in estrus on any given day, which means more males concentrate their efforts on the one or fewer receptive females that day," said Lane. "With females mating passively, it then leads to high levels of multi-male mating."

This indiscrimination seems to have no boundaries as the team noted that when female red squirrels chose a mate to copulate with, genetic relatedness did not play a factor.

However, despite this potential for inbreeding, researchers found that the relatedness of parents had no effect on the birth weight or growth rate of their offspring. As well, whether or not an offspring survived to one year of age wasn't affected by having related parents either.

"Detailed investigations into the social and genetic context of multi-male mating in red squirrels and other mammalian species should help to provide insight into the evolution and maintenance of this behavior," said Lane.

This is not the first time the red squirrel had made scientific headlines at the U of A. In 2003, Boutin led a team that discovered that the genetic make-up of North American red squirrels was changing to cope with global warming.

Being faced with increasingly warm spring temperatures and a corresponding increase in the amount of food available, red squirrels had advanced the timing of breeding by 18 days over the last 10 years - six days for each generation.

The discovery marked the first time scientists had been able to demonstrate a genetic response in an animal species to warmer conditions.

Source: University of Alberta