Faithful females key to evolution of bird societies

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The promiscuous vermillion flycatcher won't receive help from other adult birds in raising its chicks. Credit: Joe Tobias.

(PhysOrg.com) -- Females with fewer sexual partners can explain where bird species have evolved to cooperate in the rearing of their young, according to Oxford University research.

In a study of 267 bird species, the researchers found that promiscuity rates overall were three times higher among species that show no social cooperation than in species where adult birds other than the parents help in raising chicks, for example by assisting in providing food, incubation

or defence. The findings are reported in the journal *Nature*.

‘We found that across bird species, whether or not a species is cooperative depends upon the sex lives of females,’ says Dr Ashleigh Griffin of the Department of Zoology at Oxford University, who led the research. ‘The more promiscuous a female is - the more mates she has - the less help there is likely to be from the rest of the family in raising the young.'

She explains: ‘When females are faithful and mate with only a single male, her offspring will be full siblings and hence closely related to each other. This favours cooperation, because helping a close relative reproduce can be an efficient way of transmitting genes to the next generation.

‘In contrast, if a female is promiscuous and mates with multiple males, her offspring will be half siblings and so less related. In this case, young adult birds may be more likely to disperse to breed themselves, rather than stay on the nest to help mum.’

Birds show a wide range of different behaviours, with some species being highly promiscuous, such as the vermillion flycatcher, while others are almost entirely monogamous, such as white-fronted bee-eaters or pied babblers. Vermillion flycatchers don’t have any helpers at the nest while adult white-fronted bee-eaters and pied babblers that aren’t the parents will help out in raising chicks.

Even within cooperative bird species, a wide range of behaviour is seen. The white-winged chough has never been known to breed successfully without helpers while the Seychelles warbler may or may not have helpers. Here too, the research team from Oxford University and the Natural History Museum in London showed that the amount parents depend on helpers for successfully raising chicks is correlated with

female faithfulness.

The researchers also put together an evolutionary tree of the 267 bird species and examined where cooperative breeding behaviours evolved from non-cooperative ancestors.

They found that these social interactions were more likely to evolve where levels of promiscuity were lower in the ancestors.

The connection between low levels of promiscuity and the evolution of social behaviour has already been shown in ants, bees, wasps, termites and shrimps, but there had previously been a number of doubts whether it would hold true for vertebrates.

The research team chose to test whether different levels of promiscuity could account for the evolution of cooperative behaviours in birds, rather than other vertebrates, because of the amount of information available in these species. But the scientists expect the rule could be true generally.

'There is no reason why promiscuity rates couldn't account for the distribution of social systems in mammals, including primates,' states Dr Griffin. 'Sex, at least in evolutionary terms, is an antisocial force.'

More information: www.nature.com/nature/journal/ … ull/nature09335.html

Provided by Oxford University