

Faithful males do not bring flowers

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Purple-crowned fairy-wren (*Malurus coronatus*). Image: Doug Adams/Australian Wildlife Conservancy

(PhysOrg.com) -- Fairy-wrens are notorious for their infidelity: despite living in seemingly harmonious monogamous pairs, females produce mostly illegitimate young, and males spend more time courting other females than their own partner. Among these promiscuous birds, researchers from the Max Planck Institute of Ornithology in Germany and the University of Freiburg, Germany have now found a uniquely faithful species, the purple-crowned fairy-wren. What's more, males of this species have lost all striking adaptations for extra-pair mating that characterise the other fairy-wrens, including presentation of flower petals during courtship displays.

This is surprising as the social mating system and potential costs and benefits of extra-pair mating appear similar to other fairy-wrens. This

implicates that extra-pair paternity as an evolutionary strategy is rather labile and can change much faster than previously assumed (*BMC Ecology*, Online publication 19.05.2009).

Fairy-wrens are colourful and charismatic Australian [songbirds](#). Although they are small, they are long-lived, and partners vigorously defend exclusive, year-round territories and cooperate to raise their young. Like most [bird species](#), fairy-wrens are therefore socially monogamous, but genetic parentage testing showed that the vast majority of nests contain illegitimate young, sired by males other than their social father.

Fairy-wrens are notorious in terms of extra-pair paternity, not only for near-universal infidelity of females, but also for an associated set of morphological and behavioural adaptations to extra-pair mating in males. Reproductive organs have evolved to extreme sizes and males can be observed to leave their own territory many times per day to court other females nearby, often presenting them with a flower as part of their pursuit.

Sjouke Anne Kingma and colleagues at the Max-Planck Institute for Ornithology in Radolfzell, Germany and University of Freiburg, Germany, now found one fairy-wren species that is virtually monogamous, the purple-crowned fairy-wren (*Malurus coronatus*). The researchers tested the genetic parentage of 227 offspring from 104 nests in a population of these birds in Mornington Wildlife Sanctuary in Western Australia. All but ten offspring were fathered by the social partner of their mother.

The study by Kingma and colleagues showed that morphological adaptations associated with extra-pair mating were also reduced. For example, while other fairy-wren males moult a large part of their body into colourful breeding plumage before breeding, the male purple-

crowned fairy-wren adorns itself with more modest plumes. Additionally, reproductive organs in purple-crowned fairy-wrens are much smaller than in other fairy-wrens, in agreement with relaxed reproductive competition between males. In addition, the researchers demonstrated absence of the suite of distinctive behavioural adaptations associated with extra-pair mating that characterize other fairy-wrens. While male suitors of all other fairy-wrens present flower petals to females during extra-pair courtship, the field researchers never observed this behaviour in purple-crowned fairy wrens in over 300 observation hours.

"We were surprised by these drastic reductions in female infidelity and male competitiveness", says Kingma. This is because in most aspects of their breeding biology and ecology purple-crowned fairy-wrens are very similar to their promiscuous sister species. The researchers propose that mating systems may evolve faster than had been previously assumed. "The extreme mating habits and associated adaptations of fairy-wrens may have disappeared in one single evolutionary step", explains the researcher. If even such a highly specialized mating system can be lost within a relatively short evolutionary period, without clear associated changes in other aspects of biology, this has implications for the understanding of the different kinds of mating systems. "If the differences between the species can not generally be explained by ancestry, or by the social system or ecological factors, then we are far from a profound understanding of the evolutionary basis of extra-pair paternity", conclude the ornithologists.

More information: Sjouke A. Kingma, Michelle L. Hall, Gernot Segelbacher and Anne Peters, Radical loss of an extreme extra-pair [mating](#) system. *BMC Ecology*, Online Publication 19.05.2009

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