Birds with a nose for a difference

June 30 2009

Avoidance of inbreeding is evident amongst humans, and has been demonstrated in some shorebirds, mice and sand lizards. Researchers writing in the open access journal *BMC Evolutionary Biology* now report that it also occurs in a strictly monogamous species of bird, suggesting that the black-legged kittiwake possesses the ability to choose partners with a very different genetic profile.

The study, led by Richard H. Wagner from the Konrad Lorenz Institute for Ethology of the Austrian Academy of Sciences, and Etienne Danchin from the University Paul Sabatier of Toulouse, and involving researchers from the Université Pierre et Marie Curie, the Alaska Science Center, and the University of Bern, tracked 10 genetic markers, microsatellite loci, to investigate whether kittiwakes avoid inbreeding by pairing with genetically distant mates, and whether inbreeding reduces the number of chicks they raised.

Most pairs avoid inbreeding more often than expected by chance, suggesting that kittiwakes can somehow tell who their relatives are in a large anonymous population. The minority of closely related pairs produced eggs that were less likely to hatch and chicks that were more likely to die. According to first author Hervé Mulard, "inbreeding is devastating in this population."

Second hatched chicks were particularly badly affected by this phenomenon. Whether because they were less able to fight off infections and parasites or because their parents neglected them, they grew more slowly and were even less likely to survive than their older siblings.

Other studies have shown that polygamous female birds seek out genetically distant partners for mating in order to give their offspring a better and healthier genetic profile. This study provides the first evidence of inbreeding avoidance in a strictly monogamous species, in which both parents contribute to rearing offspring, and divorce is rare.

The team is now studying whether similar to humans, birds might be able to detect a mate's genetic profile from their body odor. Mulard concludes, "this ability could serve strictly monogamous species well, as they may experience the highest selective pressure to choose genetically distant mates."

More information: Evidence that pairing with genetically similar mates is maladaptive in a monogamous bird;
Hervé Mulard, Etienne Danchin, Sandra L Talbot, Andrew M Ramey, Scott A Hatch, Joël F White, Fabrice Helfenstein and Richard H Wagner, BMC Evolutionary Biology (in press), www.biomedcentral.com/bmcevolbiol/

Source: BioMed Central (news : web)

Citation: Birds with a nose for a difference (2009, June 30) retrieved 18 September 2024 from https://phys.org/news/2009-06-birds-nose-difference.html

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