KEEP IT *preened*

Fine feathers may indeed make fine birds, but maintaining feathers in good condition is important for more than just a bird's outward appearance.

Bateleur
CHRIS VAN ROOYEN

Besides providing thermal insulation, feathers impart the aerodynamic properties to wings and tails that allow for controlled flight. Feather condition directly affects aerodynamic efficiency and lift-generating properties and it is for this reason that some long-distance migrants moult their flight feathers shortly before setting off on migration.

Feathers are constantly under attack from micro-organisms such as fungi and feather-degrading bacteria. The latter adhere to the feather barbules and produce enzymes that digest keratin molecules, the building blocks of feathers. A bird's primary defence against this relentless microscopic onslaught is the white, odourless secretion produced by its uropygial (or preen) gland located at the base of the tail. This gland, which is found in most birds, produces a cocktail of waxes and oils that slows the rate at which micro-organisms break down feather keratin.

These secretions are also an important component of feather waterproofing in aquatic birds, which tend to have larger glands than their terrestrial counterparts. In some species, such as the Green Wood-Hoopoe and African Hoopoe, uropygial glands have taken on a more specialised, defensive role and produce foul-smelling secretions that apparently deter predators.

Although ornithologists have long recognised the importance of the uropygial gland in maintaining feather condition, new research suggests an unexpected connection between this gland and a bird's chances of surviving to a ripe old age. For species that are preyed on by aerial predators such as falcons and accipiters, feather condition can literally mean the difference between life and death. The condition and aerodynamic properties of flight feathers affect a bird's manoeuvrability and thus its chances of successfully evading an aerial attack.

A team of Scandinavian researchers recently examined the correlation between the size of a species' uropygial gland and the bird's vulnerability to aerial predation. They hypothesised that species with relatively large uropygial glands, and thus greater production of chemical defences against microbial feather degradation, are less likely to feature in the diet of an aerial predator, the Eurasian Goshawk.

To test this hypothesis, the scientists examined the diet of a goshawk population in Denmark. Their analysis revealed that species with relatively large uropygial glands occurred less often than expected in the goshawks' diet, based on the prey species' relative abundances in the study area. In other words, fewer individuals of these species were eaten by goshawks than would be expected solely on the basis of the prey species' relative commonness in the goshawks' territories. Conversely, prey species with relatively small uropygial glands occurred disproportionately frequently in the goshawks' diet.

These findings make logical sense. All else being equal, birds with larger uropygial glands maintain their flight feathers in better condition and are therefore better equipped to outmanoeuvre a pursuing predator. Although this study tells a rather neat ornithological story, there are several aspects that still need to be verified. For instance, the link between a relatively large uropygial gland and better manoeuvrability when attacked by a predator is conjecture rather than established fact. If the results of this study withstand rigorous scientific scrutiny, however, they may well represent a fundamental advance in our understanding of avian predator–prey interactions.

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REFERENCE
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