

Peacock's train is not such a drag

September 17 2014



A Peafowl flaring his feathers. Credit: Wikipedia.

The magnificent plumage of the peacock may not be quite the sacrifice to love that it appears to be, University of Leeds researchers have discovered.

Dr Graham Askew, from the University's School of Biomedical Sciences, filmed five Indian peacocks taking off using two high-speed

video cameras to try to work out what price male birds pay for carrying the spectacular iridescent feathers they use in displays to attract females.

"These feathers weigh about 300g and can exceed 1.5m, so it's expected that the male birds would be making a significant sacrifice in their flight performance for being attractive—possibly giving up their lives if the train restricts escape from predators such as tigers and leopards in their natural environment," Dr Askew said.

He filmed the take-offs of birds carrying full plumage in 3D, and then filmed the same birds taking off without their trains. The display feathers, which naturally moult at the end of the breeding season, were cropped to judge the change in take-off performance between the two states.

To his surprise, Dr Askew found there was no significant difference.

Dr Askew observed the position of each bird's centre of mass, their wing motions and the movement of the train in take-off and then calculated the amount of power used by the birds to accelerate and gain height over the first two wing beats. He found it was essentially the same, regardless of the presence or absence of the train.

"Intuitively you expect that the train would detrimentally affect [flight performance](#) and so not finding a detectable effect was a bit surprising," Dr Askew said. "These birds do not seem to be making quite the sacrifices to look attractive we thought they were."

He added: "The train of the peacock is one of the most iconic examples of [sexual selection](#) in the animal kingdom. It has been thought that such elaborate ornamentation carries a functional cost for the bearer. These results therefore have broader ramifications for evolutionary biology's understanding of sexual selection."

Dr Askew also looked at how much drag the train created during take-off by mounting a detached train in a wind tunnel. Although the drag doubled, overcoming that drag is only a tiny part of the power used by the birds during take-off. Therefore, the impact of the train on the overall take-off performance is negligible, allowing birds with and without trains to invest the same amount of power in the ascent.

The results do not mean that having an ornate train carries no costs for peacocks. Dr Askew pointed out that the feathers might adversely affect flight stability and the [birds'](#) ability to run. Just creating the ornate plumage is a costly exercise; [male birds](#) invest about 3% of their daily metabolic energy budget in train growth.

More information: Graham N. Askew, 'The elaborate plumage in peacocks is not such a drag,' will be published in *The Journal of Experimental Biology* on September 18 2014 [DOI: 10.1242/jeb.107474](https://doi.org/10.1242/jeb.107474)

Provided by University of Leeds

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