

Genome study indicates peacock eyespots likely developed to impress females

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A Peafowl flaring his feathers. Credit: Wikipedia.

(Phys.org) —A team of researchers with members from several universities in the U.S. and one in China has found evidence that suggests that ocelli (areas on feathers that look like eyes) on male peafowl are likely a result of a preference by female birds. In their paper published in *Proceedings of the Royal Society B: Biological Sciences*, the

team describes the genome study they undertook and what they found as a result.

Anyone who happens upon a grown male peacock notices right away the striking [eyespot](#)s on its feathers—most noticeable when spread wide in an impressive stance. Such plumage is an example of an extreme evolutionary trait—peacocks for example, have difficulty moving around because of their elaborate train. Scientists have speculated on the eyespots for many years, but proof of the root of their purpose has remained elusive. In this new effort, the researchers sought to learn more about the eyespots to see if they could come closer to an answer.

Over the years, some scientists have suggested that birds of different species that have eyespots are likely related, and most have assumed that development of such eyespots has been a onetime trait. To find out if either is true, the researchers collected DNA samples from 15 bird groups, including three that have eyespots—sequencing almost 2,000 segments in all. The team then used what they'd found to construct a likely partial genealogy for the birds. In so doing, they found that birds of different species that have eyespots are not necessarily related. They also found that many species had developed eyespots, lost them, and then redeveloped them again. Adding what they found with prior research regarding behavior of the birds, the team concludes that the most likely reason for eyespots in males, is to attract females.

If that is indeed, the case, it would explain the huge outlay of energy in maintaining such large, ornamental plumage—competition with other males. Those that don't measure up risk not having their DNA passed on. It would also prove Darwin right—he suggested as much when encountering the birds during his travels. So impressed was he with the [birds](#), that he commented on them specifically in his famous books.

More information: The evolution of peafowl and other taxa with

ocelli (eyespot): a phylogenomic approach, *Proceedings of the Royal Society B*, Published 16 July 2014 [DOI: 10.1098/rspb.2014.0823](https://doi.org/10.1098/rspb.2014.0823)

Abstract

The most striking feature of peafowl (*Pavo*) is the males' elaborate train, which exhibits ocelli (ornamental eyespots) that are under sexual selection. Two additional genera within the Phasianidae (*Polyplectron* and *Argusianus*) exhibit ocelli, but the appearance and location of these ornamental eyespots exhibit substantial variation among these genera, raising the question of whether ocelli are homologous. Within *Polyplectron*, ocelli are ancestral, suggesting ocelli may have evolved even earlier, prior to the divergence among genera. However, it remains unclear whether *Pavo*, *Polyplectron* and *Argusianus* form a monophyletic clade in which ocelli evolved once. We estimated the phylogeny of the ocellated species using sequences from 1966 ultraconserved elements (UCEs) and three mitochondrial regions. The three ocellated genera did form a strongly supported clade, but each ocellated genus was sister to at least one genus without ocelli. Indeed, *Polyplectron* and *Galloperdix*, a genus not previously suggested to be related to any ocellated taxon, were sister genera. The close relationship between taxa with and without ocelli suggests multiple gains or losses. Independent gains, possibly reflecting a pre-existing bias for eye-like structures among females and/or the existence of a simple mutational pathway for the origin of ocelli, appears to be the most likely explanation.

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