

Why are so many fairy-wrens blue?

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A male superb fairy wren with U-type vision.

(Phys.org)—Researchers have long tried to explain the enormous diversity in colour of birds, and a new study is giving insights into why the humble fairy-wren, a colourful Australian bird, is radiantly blue.

Birds have more sophisticated visual systems than humans, and they can see certain [wavelengths of light](#) - the ultraviolet (UV) - which are invisible to us. Such a developed visual system is often used as an explanation for the large diversity of bird colours, as colour signals of animals are often finely tuned to their [visual abilities](#). But there also is variation within birds in how they perceive colours and this may affect which colours evolve.

[Colour vision](#) in most birds tends to fall into two categories, either violet-sensitive (V-type) or ultraviolet-sensitive (U-type). Both types are sensitive to the UV, but U-type eyes have higher sensitivity to UV and blue light. Accordingly, many species with U-type vision often show UV/blue plumage, presumably due to better perception of such colours by U-type vision.

However, the idea that U-type birds do actually perceive UV/blue colours better has never been fully explored. Now in a study published in the Royal Society journal [Proceedings of the Royal Society B](#), researchers have provided evidence of this widespread idea using fairy-wrens to explain how the vibrant blue plumage found on the breeding male of several species could be linked to higher [visual sensitivity](#) to ultraviolet (UV). Visual sensitivities among different species of fairy-wren can be either V- or U-type, and previous work shows that the latter is only found in fairy-wren species with UV/blue plumage coloration.

Monash University's Dr Kaspar Delhey, an ARC Discovery Early Career Researcher Award research fellow at the School of Biological Sciences, also associated with the Max Planck Institute for Ornithology (Germany), together with colleagues from the University of East-Anglia (UK) and Melbourne University, believe a correlation between plumage coloration and U-type eyes in fairy-wrens is explained by the greater ability of this visual type to detect contrast between UV/blue plumage coloration and their natural environment.

An ornithologist, Dr Delhey said that preference by potential mating partners for plumage that contrasted greatly to the natural environment may have driven this correlation.

"The reproductive success of males can depend a great deal on plumage coloration and just how conspicuous or 'good-looking' the male doing the courting is, something that might be preferred by females" Dr Delhey said.

"We found that higher UV sensitivity increased the contrast of the blue plumage against the natural environment, possibly making these colours more attractive.

"In comparing the performance of both types of visual systems in different fairy-wren species, we were able to demonstrate that U-type generally outperform V-type visual sensitivities at detecting plumage colours against natural backgrounds and that this difference is particularly large for UV/blue colours."

This may explain why all fairy-wrens with U-type eyes show UV/blue plumage colours when in breeding plumage.

Dr Delhey said the study provided scope for further research to understand the role of differences in colour vision in shaping the diversity of animal colours.

More information: [rspb.royalsocietypublishing.org ...
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Provided by Monash University

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