Birds evolved ultraviolet vision several times, research finds

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Ultraviolet vision evolved at least eight times in birds from a common violet sensitive ancestor finds a study published in BioMed Central's open access journal *BMC Evolutionary Biology*. All of these are due to single nucleotide changes in the DNA.

Modern daytime birds either have violet sensitive or ultraviolet sensitive vision. Being ultraviolet sensitive alters visual cues used to select a mate, avoiding predators, and in finding food. Researchers from Uppsala University and the Swedish University of Agricultural Sciences sequenced the genes responsible for producing the light sensitive pigment (SWS1 opsin) from 40 species of birds, in 29 families.

Generating a phylogenetic tree from these sequences shows that there have been at least 14 shifts between violet and ultraviolet sensitive colour vision and back. An ancestor of Passeriformes (perching birds including larks, swallows, blackbirds, finches, birds of paradise, and crows) and Psittaciformes (parrots and allies) changed from the ancestral violet sensitive colour vision to ultraviolet and, in some cases passerines have reverted back to violet vision.

Anders Ödeen and Olle Håstad, who performed this research commented, "There are two different amino acid alterations that can each change bird colour vision from violet to ultraviolet. One particular single nucleotide change has occurred at least 11 separate times. In general during evolution once a colour shift has occurred all species from this ancestor keep it meaning that the rest of the eye and

physiology, must also evolved to 'cement' in the new colour sensitivity."

More information: The phylogenetic distribution of ultraviolet sensitivity in birds, Anders Odeen and Olle Håstad, *BMC Evolutionary Biology* (in press)

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