

# Feather color is more than skin deep

April 15 2009

---

Where do birds get their red feathers from? According to Esther del Val, from the National History Museum in Barcelona, Spain, and her team, the red carotenoids that give the common crossbill (*Loxia curvirostra*) its red coloration are produced in the liver, not the skin, as previously thought. Their findings, published online in Springer's journal *Naturwissenschaften*, have implications for understanding the evolution of color signaling in bird species.

Carotenoids have important physiological functions, including antioxidant, immunomodulating, and photoprotectant properties. Carotenoid pigments are also used by many bird species as colorants, and are responsible for most of their red, orange and yellow coloration. In particular, carotenoid-red coloration in [birds](#) has been shown to act as an ornament, signaling the nutritional and health status of the individual and its ability to locate high quality resources. Recent studies have suggested that the transformation of carotenoid pigments takes place directly in the follicles during feather growth.

Del Val and her team show for the first time that, contrary to previous assumptions, the liver acts as the main site for the synthesis of carotenoids responsible for the birds' coloration, not the skin.

The researchers examined the carotenoid content of the liver, blood, skin and feathers of seven common crossbills (finches) in which adult males display carotenoid-based coloration on the throat, breast and rump. They were particularly interested in the anatomical origin of the birds' red plumage. They found the primary red feather [pigment](#) of male crossbills

in the birds' liver and blood, implying that the carotenoids are synthesized in the liver and then travel to the peripheral tissues via the [bloodstream](#).

Del Val concludes: "This surprising divergence with previous studies raises the question whether there are inter-specific differences in anatomical sites for conversion of carotenoids. Understanding inter-specific variation in mechanisms of color production may be the key to comprehend the different evolutionary pathways involved in color signaling."

More information: Del Val E et al (2009). The liver but not the skin is the site for conversion of a red carotenoid in a passerine bird. Naturwissenschaften. DOI 10.1007/s00114-009-0534-9

Source: Springer

Citation: Feather color is more than skin deep (2009, April 15) retrieved 20 April 2024 from <https://phys.org/news/2009-04-feather-skin-deep.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.