Structural color of butterflies: The case of Papilio butterflies

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The term “structural color” is often used to describe color produced by a material possessing periodic variations in refractive index, which is commonly observed in many species of butterflies. Papilio butterflies commonly have multilayered bowl structures on their wing scales but the resulting colorations are different each other. Papilio ulysses has blue colored wing and Papilio palinurus shows green coloration on its wing, while Papilio blumei has green coloration on the wing scales but display a blue colored tail. We investigated the structures of the scale on the wings of Papilio butterflies using focused ion beam milling and analyzed the structural origin of the structural color from each Papilio butterfly. The coloration mechanism was attributed to the combination of the multilayer reflection from different feature size coupled with additive color mixing.

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