Connections Between Wing Color and Color Vision Among the Monarch Butterfly and the Rare White Morph, Danaus plexippus nivosus

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Dark orange filtering pigments found in Monarch butterflies' eyes are critical in discriminating long wavelength colors such as oranges and yellows. It is suspected these filtering pigments are used to decipher between wing hues for reproduction as well as with foraging for nectar. However, it is unknown whether or not there is a connection between this dark orange filtering pigment and the orange pigment found in the wings of the monarch. A high pressure liquid chromatography (HPLC) was used to measure quantities of pigments found in both the wings and the eyes of individual monarchs, including some rare “white” individuals which lack the orange pigment usually found in the wings. White monarchs, also named nivosus, have more “magenta” colored eyes instead of the typical black eyes found in orange monarchs. This study theorizes that the same mutation that removes the orange pigment in the wings may also affect pigment levels found in the eyes. By comparing results of pigment concentration of white monarchs to orange monarchs, I hope to identify a similar decrease or complete lack of pigment in the eyes as there are in the wings of the nivosus type. In addition, comparisons of pigment concentrations in the eyes were made between males and females, as well as between breeding and migratory generations. This study hopes to provide contributions towards understanding the connection between pigment concentrations found in the eyes and the butterfly behaviors of reproduction and migration.

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