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THE VISUAL ECOLOGY OF NOCTURNAL PRIMATES

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While the evolution of trichromatic vision among diurnal primates is thought to be adaptively correlated with foraging efficiency, the adaptive significance of color vision among nocturnal primates is relatively unstudied. Some primates possess monochromatic vision resulting from the functional loss of the short (S) wavelength sensitive opsin gene, yet others have maintained functional S- and M/L-opsin genes and thus the capacity for dichromatic color vision. Tarsiers (genus *Tarsius*) are small-bodied, nocturnal, faunivorous primates found in Sumatra, Borneo, Sulawesi, and the Philippines. They have dichromatic color vision, but the spectral sensitivities of the M/L-opsin pigments can vary between species by as much as 15nm. Such variation could be due to genetic drift or natural selection. To test the relative adaptive advantages of the two dichromatic phenotypes, we measured the reflectance spectra of typical prey items in the tarsier diet. Next, we used irradiance spectra under twilight, full moon, and new moon conditions to calculate the radiance spectrum of each insect and to estimate the relative quantum catches for *Tarsius bancanus* and *T. syrichta*. Lastly, we determined the chromatic and achromatic contrast of each insect against a background of mature leaves or leaf litter under varying scotopic light environments. The findings from this model are expected to inform hypotheses on the functional adaptive significance of divergent dichromatic vision phenotypes among tarsiers.

Keywords: color vision, dichromacy, nocturnal, tarsiers