

**COLOR VISION IN FEMALE MONKEYS CARRYING PROTANOPIC GENE**

K.A. Widayati<sup>1,2</sup>, B. Suryobroto<sup>1</sup>, A. Saito<sup>2</sup>, A. Mikami<sup>3</sup>

<sup>1</sup>*Department of Biology, Bogor Agricultural University, Bogor, Indonesia,* <sup>2</sup>*Tokyo University, Tokyo, Japan,*  
<sup>3</sup>*Chubu Gakuin University, Seki, Japan*

*Presenter's Email:* kanthiarum@yahoo.com

A mutant gene composed by intragenic recombination of genes encoding long and short wavelength opsins had recently been discovered in X-chromosome of a few *Macaca fascicularis*. Males carrying solely this gene instead of the two originals had protanopic vision. In order to know the color perception of female monkeys carrying protanopic gene, we tested two individuals in two paradigms. First, using modified Ishihara color blind test, we tried to ascertain if they could perceive colors which could be perceived by trichromats. Second, we assed if they have same advantage in breaking color camouflage as shown by protanope monkeys. We found that the female carrier monkeys passed both tests. The existence of protanopic cone reduced the number of long wavelength cones in retina so it might made the color difference between red and green less vivid but sufficient to pass colorblind test. Blue-yellow neural channel may work reasonably well but red-green channel is imperfect. Therefore the sensitivity of red-green channel may be reduced compared with normal trichromatic monkeys. This made the color camouflage ineffective for the carrier. In conclusion we found that female carriers have the advantages conferred by both trichromatic and protanopic phenotypes.

Keywords: color vision, protanope, female carrier, *Macaca fascicularis*