

Distribution and topography of the ganglion cells and displaced amacrine cells in the howler monkey retina (*Alouatta caraya*)

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Differently from all other Platyrrhini, males and females howler monkeys are regular trichromats. Previous studies have shown that the howler monkey has a well developed fovea and a very high cone density in the foveola (Franco *et al.*, 2000; Finlay *et al.*, 2008). In the present work, the density distributions of ganglion cells (GC) and displaced amacrine cells (DAC) were determined in three retinas from different *Alouatta caraya*. The animals were deeply anesthetized and perfused transcardially. The eyes were removed and the retinas were prepared as whole, flat-mounts, and stained with cresyl violet using the method of Nissl. The criteria to distinguish GC from DAC were refined by inspecting a collection of capuchin monkey retinas retrogradely labeled after horseradish peroxidase or biocytin deposits in the optic nerve and counterstained with cresyl violet (Silveira *et al.*, 1989; Yamada *et al.*, 1996). GC density peaks at 0.5 mm from the fovea, reaching 50,000 / mm². In comparison with the capuchin monkey retina, the howler monkey retina has a lower peripheral GC density which compensates for an increased foveal packing. The increased central GC number means that the increased cone density in this primate could be available for increased acuity measured behaviorally. The GC density decreases towards the retinal periphery at approximately the same rate along all meridians, but is 1.2-1.8 times higher in the nasal periphery when compared to the temporal region at the same eccentricities. The DAC have a shallow density gradient, their peak density in the central region was about 1,500-2,000 / mm². The means and standard deviations for the retinal area and total numbers of cells (n = 3) were: 679 ± 37 mm²; 1,120,299 ± 76,581 GC and 553,447 ± 81,000 DAC. The GC density distribution in the howler monkey retina is consistent with that of diurnal Anthropoidea.

Supported by grants from CNPq-PRONEX / FAPESPA #2268, NSF #0130789, and FINEP IBN-Net #01.06.0842-00. LMA received a CNPq-PIBIC fellowship for undergraduate students. BDG received a CAPES-PROF fellowship for graduate students. LCLS is a CNPq research fellow.