

Title:

"Retinal characterization in the eyes of two bats endemic in the Egyptian fauna; the Egyptian fruit bat (*Rousettus aegyptiacus*) and insectivorous bat (*Pipistrellus Kuhlii*) using the light microscope and transmission electron microscope".

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Journal Name	Microscopy Research and Technique (IF: 1.327).
Publication Date	Accepted and under publication
Volume	
Issue	
Page	
Publisher	Wiley & Sons, Inc

Abstract:

Bats are the only mammalian, which can fly in the dark without eye usage. This study was conducted to describe the structural and functional adaptations of the retina of two bats very common in the Egyptian fauna; the Egyptian fruit bat (*Rousettus aegyptiacus*) and insectivorous bat (*Pipistrellus Kuhlii*) having a different lifestyle. Seven eyes were collected from adult individuals of each species. Examination of the retina by light microscope and transmission electron microscope were carried out. The retina of *Pipistrellus Kuhlii* was thicker than *Rousettus aegyptiacus* which had many projections extended from the choroid layer into retina forming papillae. Despite rods dominant in retinae of both species, cone photoreceptors were encountered in both retinae. The outer plexiform layer of *Rousettus aegyptiacus* was arranged into islets between the outer nuclear layers produced differences in its thickness. However, the retina of *Pipistrellus Kuhlii* showing the normal arrangement of retinal structure. The retinal pigment epithelium of both bat species consists of a single layer of the cuboidal cells with a round to oval vesicular nuclei which are lack of pigmentation in *Rousettus aegyptiacus* and poorly pigmented in the *Pipistrellus Kuhlii*. In conclusion, our investigation detected many structural and ultrastructural differences between the two bat species. The presence of many projections protruded from the choroid layer of *Rousettus aegyptiacus* retina is considered the most characteristic difference between the retinae of *Rousettus aegyptiacus* and *Pipistrellus Kuhlii*.