

D-50: Preliminary study of the peritrophic membrane and midgut epithelium in field-caught mosquitoes

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The peritrophic membrane (PM) of insects served as a barrier between the midgut epithelium and the ingested food. In mosquitoes, the PM was believed to be secreted after the blood meal had entered the gut. The appearance, exact location and quality of the secretion for many mosquito species was unknown. In this study the formation and appearance of the PM in field-caught mosquitoes was examined using a histological technique.

Serial 8 μ paraffin sections of blood-fed and unfed mosquitoes representing 5 *Culex* and 5 *Anopheles* species, in different fixatives and stained with a modified Azan stain, were examined by light microscopy. Best results were obtained with the Carnoy's fixative - Azan stain combination, where the peritrophic membrane stained blue against the red-orange blood meal.

The PM appeared as a non-cellular secretion between the blood meal and the midgut in all blood-fed mosquitoes. Histologically, the texture of the PM was different in the 2 genera, appearing as a thin, lamellated, continuous layer surrounding the blood meal in anophelines, and as unlamellated patches concentrated in specific areas in the culicines. The PM was not observed in unfed mosquitoes. Pre-meal midgut epithelial cells were columnar at the anterior and posterior ends, and cuboidal in the mid region. The post-meal appearance was flattened, with cells of varying thickness. After partial digestion of the meal, the cells regained their original appearance, probably because of the elimination of fluid from the midgut.

Thus, while the PM appeared to be secreted only in response to a meal in *Culex* and *Anopheles*, its formation and appearance were different in the 2 genera.