



**Ain Shams University
Faculty of Science
Department of Entomology**

**Cellular and histological changes in the gut of
Phlebotomus papatasi during the digestion process**

A Thesis Submitted by

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Abstract

Phlebotomus papatasi is hematophagous insect, need a blood meal to produce eggs. The adult females of *P. papatasi* in response to the blood meal: the formation of an extracellular membrane separating ingested food from the gut epithelial cells. This layer is called peritrophic membrane (PM). The present study showed different feeding time according to the blood source (hamster, human, BALB/c mice and pigeon). Females of *P. papatasi* gave shortest feeding time when they fed on hamster and highest feeding time when it fed on BALB/c mice. Also using different types of blood affected the oviposition time, hatching time, fecundity and fertility of adult females of *P. papatasi*.

Females fed on hamster blood had the shortest time of oviposition and hatching and highest number of eggs and hatchability when compared with other sources of blood meals. Cellular and histological changes were recorded during digestion of blood meal by electron microscope. Peritrophic membrane appeared few hours after blood meal and it is stabilized and strengthened on the second and the third day after blood meal then begins to break down until it disappears completely on the fifth day after the blood meal.

By light microscopy the membrane appeared as a light-brown structure when the blood digestion is increased. By electron microscope, the peritrophic membrane was seen after taking blood meal and performing its function of protecting the epithelial cells of the gut.

Key words: *Phlebotomus papatasi*, midgut, peritrophic matrix, feeding period, biological parameters.

LIST OF ABBREVIATIONS

°C	Degree Celsius
°N	Degree North
°S	Degree South
µm	Micrometer or Micron
ANOVA	Analysis of variance
BM	Blood Meal
<i>C. grisescens</i>	<i>Culicoides grisescens</i>
CDC- Light traps	Central of disease control light traps
CIEP	Counter Immune Electrophoresis
CL	Cutaneous Leishmaniasis
cm	Centimeter
d	Day
Fig.	Figure
h	Hour
HIV	Human Immunodeficiency Virus
<i>L.</i>	<i>Leishmania</i>
<i>Lu.</i>	<i>Lutzomyia</i>
L.S.	Longitudinal section
M	Mean

MG	midgut
min.	Minutes
mm	Millimeter
MRT	Multiple Range Test
<i>P.</i>	<i>Phlebotomus</i>
PBM	Post Blood Meal
PM	Peritrophic menbrane
RH	Relative Humidity
<i>S.</i>	<i>Sergentomyia</i>
SD	Standard Deviation
SPSS	Statistical Package for the Social Science
SSAM	Solid state Army miniature
T.S.	Transverse section
VL	Visceral Leishmaniasis
WHO	World Health Organization

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