Characterization and sequence analysis of vitellogenin gene in the mosquito *Culex pipiens* L.

A Thesis
Submitted to the Department of Entomology,
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(Entomology)

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Abstract

Mona Gaber Abdel Aziz. Characterization and Sequence Analysis of Vitellogenin gene in the Mosquito *Culex pipiens* L. Faculty of Science, Ain Shams University, 2016.

Culex pipiens is one of the mosquito vectors that play an important role in transmission of lymphatic filariasis disease in Egypt. Few studies have explored the molecular reproductive biology of this species. The proposed study aims to characterize a fragment of the vitellogenin gene from anauatogenous *Culex pipiens* from Egypt. Vitellogenin (Vg), the major yolk protein precursor, plays a vital role in the maturation of oocytes and the development of embryo in insects. Using cDNA and specific primers, a 188-bp fragment was amplified and then sequenced. At nucleotide level, alignment BLAST revealed a 95, and 89% degree of similarities to different Vg isoforms of both *Cx. quinquefasciatus* Vg-C1and Vg-A1 and both *Cx. tarsalis* Vg1a and Vg1b, respectively with that of *Cx. pipiens* Vg. Also, Vg gene has been expressed in all stages of both sexes including immature (larva & pupa), pre- and post- blood feeding in females and in males by using real time PCR. Very low expression levels has been observed in both immature and male stages of ~ 2 fold change to the control which suggested that Vg serves for functions other than its main nutrient function. However, the highest level of Vg gene was expressed in adult females at 24hrs post blood meal fed females with ~ 155 fold changes to the control. . Similarly, SDS-PAGE analysis of dissected ovaries in non-blood and blood fed females at 0, 24, 48, 72 and 96 hrs post blood meal under reduced conditions has demonstrated the existence of the 2 subunits of the mature Vg in blood fed stages but not detected in non-blood fed females. Finally, this study could contribute to initial efforts to establish the molecular bases involved in *Cx. pipiens* vitellogenesis, which can provide incipient insights to control this important vector.

Keyword: Vitellogenin, Vitellogenesis, Anautogenous mosquito, Real-time PCR, *Culex pipiens*

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