



Molecular and immunological studies on honeybee queens *Apis mellifera* (L.) and their antibacterial activity against *Paenibacillus larvae larvae*

A Thesis submitted as a partial fulfillment of the requirements
for The award of the Ph.D. degree in Entomology Faculty of
Science, Ain Shams University

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ABBREVIATIONS

ABS	:	Absorbency
AFB	:	American foul brood
Ab	:	Abacin
<i>A. mellifera</i>	:	<i>Apis mellifera</i>
AMPs	:	Antimicrobial peptides
bp	:	Base pair
BSA	:	Bovine serum albumin.
CBB	:	Coomassie brilliant blue
CFU	:	Colony formed unit
cm	:	Centimeter(s)
+ve control	:	Queens fed water
-ve control	:	Healthy queens
ct	:	Cycle threshold
Df	:	Defensin
<i>E coli</i>	:	<i>Escherichia coli</i>
DNA	:	Deoxy ribonuclease acid
EFB	:	European foul brood
H	:	Healthy queens
HP30	:	Hypothetical protein 30
hr	:	Hour(s).
kDa	:	Kilo dalton(s).
LD	:	Lethal dose.
LDP line	:	Lethal dose probability line
LPS	:	Lipopolysaccharidase
mg	:	milligram
M	:	Molar
μl	:	Microliter
μM	:	micromole
ml	:	Milliliter
Min.	:	Minute(s)
Mol. wt.	:	Molecular weight
N	:	Number of test replicates
PBS	:	Phosphate buffered saline
PCR	:	Polymerase chain reaction
<i>P. l. larvae</i>	:	<i>Paenibacillus larvae larvae</i>
pPo	:	Prophenoloxidase
RNA	:	Ribonucleic acid
SE	:	Standard error
SDS-PAGE	:	Sodium dodecyl sulphate-polyacrylamide gel electrophoresis

ssp.	:	Sub species
T	:	Treated queens (queens fed bacteria)
TAE	:	Tris-Acetate EDTA buffer
EDTA	:	Ethylene diamine tetra acetic Acid
UV	:	Ultraviolet