Evaluation of the inhibitory potential of the bee venom fraction(s) on highly pathogenic avian influenza (H5N1)

A master thesis submitted by

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Declaration

This thesis has not been submitted for a degree at this or any other university

Dina M. Osama El-Shaarawy

I would like to dedicate this work to every member of my faithful family especially my father for their endless love, support, and encouragement.

Finally to my supervisors and colleagues who share for the appearance of this work.

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Acknowledgment

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Abstract

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The highly pathogenic avian influenza H5N1 virus as a major for poultry industry and human health around the world needs a decisive control, melittin and secretory phospholipase A2 (sPLA2) of honeybee venom (***Apis mellifera***) are known by their antiviral effect against both enveloped and non-enveloped viruses.

In this study, melittin, sPLA2, and their mixture used against two Egyptian strains of H5N1 virus to estimate their virucidal effects

Bee venom fractions and their mixture were applied on MDCK cell line through three different treatments, pre-treatment, post-treatment, and co-incubation treatment by using different concentrations for each fraction. The concentrations of melittin used were (3µM & 1.5µM), for sPLA2 they were (1µM & 0.5µM), while the mixture only used at its maximum CC50 (0.4µM).

Melittin, sPLA2, and melittin-sPLA2 mixture showed up their virucidal effects in the three treatments and the results confirmed by (qRT-PCR), but their effects on cell health differ according to the dose applied from each fraction and the type of treatment. From results, 0.4µM of melittin-sPLA2 mixture gave superior results in cells protection compared to other fractions even compared to their low concentrations and the best treatment was co-incubation, pre-treatment, and post-treatment, respectively

This study recommend to apply those fractions in their two fold (CC50) concentration and using either co-incubation treatment or pre-treatment. A further in-vitro & in-vivo experiments are needed to know if they are applicable in vivo or not

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