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**Faculty of Veterinary Medicine**

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## **Molecular epidemiological investigation of animal hepaciviruses in Egypt**

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**For the degree of M. V. Sc.**

**(Virology)**

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**Abstract**

Equine hepacivirus (EqHV) is one of the non-primate hepaciviruses recently discovered in the Americas, Europe and Asia. It is a hepatotropic member of the genus *hepacivirus* of *Flaviviridae*. They are close relatives of hepatitis C virus (HCV). Information on EqHV epidemiology, pathogenesis and genetic diversity is limited. Information regarding prevalence and distribution of NPHV in Egyptian equids does not exist. NS3-specific RT-PCR was used to investigate whether EqHV RNA was present in 436 archival equid serum samples collected from five Egyptian governorates. Of the tested samples, 323 were from Arabian horses (*Equus caballus*), 28 were from draft horses and, 85 were from donkeys (*Equus asinus*).

EqHV sequences were detected in 10 horses and 2 donkey samples (2.75%). Detection rates were 7.01% (4/57) and 2.11% (8/379) in samples collected during 2015 and 2017, respectively. Phylogenetic analysis based on partial NS3 sequences placed the detected EqHV sequences into two different lineages. Taken together, the data suggests that the circulating viruses may have been introduced during two separate events. During the investigation, a novel pan-hepacivirus-specific RT-PCR assay was developed. The detection sensitivity of the assay resembled that of the reference NS3-specific assay. However, sequencing was not possible using the developed primer set. The novel RT-PCR assay can be used to investigate the presence of previously unidentified hapticiviruses using hepatitis C virus as a positive control.

**Key words:** Equine hepacivirus; non-primate hepaciviruses; Flaviviridae; Hepatitis C virus; genetic diversity; RT-PCR; & Phylogenetic analysis.



*Dedication*

*To*

*My parents*

*My grandmother*

*My Husband*  
*Dr. Mohamed Ramadan*

*My son: Yazeed*

*My brothers*  
*Ahmed and Mady*

*MY sisters*  
*Manna, Hagar and Esraa*

*All My friends especially Fatma, Amany,*  
*Asmaa, Eman, and Nahla.*



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