Article presented at 3rd Int Sci Conf of Med and Biol Tech of Al-Furat Al-Awsat Tech Univ and Duhok Polytech Univ., Duhok, Iraq (3rd ISCMBT 2023)

Original Article

Antiviral Effectiveness of *Nigella sativa* Oil on LaSota Strain of Newcastle Disease Virus *In Vitro*

Firas Taha Mansour Al-Mubarak, Manar Mohammed Hizam[1], Amal Faleh Hashem Al-Gorani[1], Wasfi Abood Al-Masoudi[2]

Department of Microbiology, College of Medicine, University of Basrah, Basrah, Iraq, [1]College of Pharmacy, National University of Science and Technology, Dhi Qar, Iraq, [2]Department of Physiology, College of Veterinary Medicine, University of Basrah, Basrah, Iraq

Abstract

Objectives: Newcastle disease (ND) is a highly prevalent disease among poultry all over the world and causes great economic losses in the poultry industry. Despite the high effectiveness of vaccines for controlling such diseases, there is no operative antiviral drug utilized to treat infections. This study aims to test *Nigella sativa* oil as an antiviral for the ND virus. **Materials and Methods:**Oil of *N. sativa* was incubated along with (the LaSota strain) virus for 1 and 24 h in the laboratory and its antiviral effect was detected by performing a hemagglutinating test for the detection of surface protein activity, reverse transcriptase-polymerase chain reaction for the detection of the virus. In addition, the toxicity of the oil to the organism was determined by injecting it into the allantoic fluid of embryos of chicken with a virus or without it. **Results:** The results revealed that such a product plays an important function in reducing the virus's effectiveness, perhaps by destroying the receptors on the surface of the virus by comparing with the control group, which included treating the virus with phosphate saline only, which offered the opposite. Besides, there was a clear effect on the viral genome. Moreover, no organism toxicity was there because the embryos were oil-injected only or with a mixture of oil and virus were healthy and similar to the uninoculated embryos. In addition, the embryos injected with the virus showed signs of disease compared to the other oil-containing groups. **Conclusions:** This study concludes that the current findings indicate that the oil of *N. sativa* will be a worthy antiviral and may have a function in disease control.

Keywords: Hemagglutination, Newcastle disease virus, *Nigella sativa*, RT-PCR

Introduction

Newcastle disease (ND) is an extremely contagious and deadly viral disease that affects birds of wide-ranging, especially domesticated poultry.[1] It is caused by an RNA virus, the ND virus, which belongs to the family of *Paramyxoviridae*.[2] The disease usually causes huge losses in the poultry industry. Although vaccination can protect against the outbreak of the ND virus, it is not always sufficient because infection with the virus has remained frequent throughout the world.[3]

For a long time, ND has been one of the most vital diseases, for which there is no effective treatment, and antibiotics can be utilized to treat bacterial complications only. Therefore, there is an urgent need to find an effective treatment for this disease.[4] Several studies showed that some herbal extracts, such as licorice root, garlic, *Thymus vulgaris*, and *Achillea millefolium* have played a function in reducing the effectiveness of viral potency.[5-7] *Nigella sativa* has traditionally been utilized to treat a variety of ailments, disorders, and conditions related to the digestive system, respiratory system, liver, and kidney function, the system as vascular, heart, and immune system support, besides well-being in general.[8,9]

The current study aimed to evaluate the efficacy of the oil of *N. sativa* on the ND virus. This was achieved by evaluating the effect of the oil on viral protein receptors by performing a hemagglutination assay, as well as

Access this article online

Quick Response Code:

Website: https://journals.lww.com/mjby

DOI: 10.4103/MJBL.MJBL_249_23

Address for correspondence: Prof. Firas Taha Mansour Al-Mubarak, Department of Microbiology, College of Medicine, University of Basrah, Basrah, Iraq.
E-mail: firasiraqi76@yahoo.com

Submission: 03-Mar-2023 **Accepted:** 24-May-2024 **Published:** 24-Jul-2024

How to cite this article: Al-Mubarak FTM, Mohammed Hizam M, Faleh Hashem Al-Gorani A, Abood Al-Masoudi W. Antiviral effectiveness of *Nigella sativa* oil on LaSota strain of Newcastle disease virus *in vitro*. Med J Babylon 2024;21:S101-6.