

Molecular and immunological investigation of neuroinflammation induced by mycotoxines

Nadia F. Ismail¹, Mohamad El-Saied², Maha El-Demellawy³, Doaa Ghareeb⁴ and Sobhy El-Sohaimy⁵

¹Medical Laboratory Technology Department, Faculty of Allied Medical Sciences, Pharos University, Alexandria. Egypt

²Department of Biochemistry, Faculty of Science, Alexandria University, Alexandria Egypt

³Medical Biotechnology Department, Genetic Engineering and Biotechnology Research Institute, City for Scientific Research and Technology Applications, New Borg El Arab, Alexandria, Egypt

⁴Biochemistry Department, Faculty of Science, Alexandria University, City for Scientific Research and Technology Applications, New Borg El Arab, Alexandria, Egypt

⁵Department of Food Technology, City for Scientific Research and Technology Applications, New Borg El Arab, Alexandria, Egypt

Background: Neuroinflammation represents the coordinated cellular response to tissue damage. Mycotoxins are low-molecular-weight natural products produced as secondary metabolites by filamentous fungi. The toxic effect of mycotoxins on animal and human health is referred to as mycotoxicosis, *Fusarium* species are the main pathogenic fungi causing maize ear and kernel rot worldwide, mainly produce fumonisin B (FB) that contaminate grains and grain products. **Aim:** To test the antifungal effects of corn seed extracts. **Materials and Methods:** In this study, fungi were isolated from corn seeds and ethanolic natural product crude extracts were used as antifungal compounds. Antifungal effects of three extracts were assessed in vitro on toxin production and different toxin concentrations (in vitro study). A newly identified sequence was registered to our study group and was given a new accession number by GenBank. The inhibitory effect for the production of fumonisin B1 was for *Cinnamomum zeilanicum* followed by *Berberis vulgaris* and finally *Calluna vulgaris*. Gene expression by Real time PCR the fold change calculated values for the assessment of IL-1 β , COX II, iNOS and TNF- α gene expressions showed decreased values. **Conclusion:** Corn seed extracts showed immunological anti-inflammatory effects on neuroinflammation induced by mycotoxines.

Keywords: Cinnamon zeilanicum; *Fusarium sporotrichioides*; mycotoxins; natural product; neuro-inflammatory

Editor-in-Chief: Prof. M.L. Salem, PhD - Article DOI: 10.21608/IJCBR.2021.61334.1161