UNIVERSITI TEKNOLOGI MARA

ANXIOLYTIC EFFECTS OF ETHANOLIC EXTRACT OF *MORINGA OLEIFERA* LEAVES IN CHRONICALLY STRESSED *DANIO RERIO*

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ABSTRACT

Medicinal properties of *Moringa oleifera* are vast which include anti-microbial, anti-inflammatory, anti-convulsant, anti-oxidant and anti-anxiety. As the number of mental disorders cases have been increasing over the years, and the drugs available in market face significant challenges due to their side effects, it is of a dire need to identify natural plants that are potential stress relievers. This study was designed to determine the potential of ethanolic extract of *M. oleifera* leaves (MOLE) as an anxiolytic agent using zebrafish. The changes in the behaviour and metabolite profiles and the related metabolic pathways in response to MOLE treatment were studied. A chronic unpredictable stress model was used to induce anxiety in zebrafish for 14 days. Anxiety was measured using an open field tank and a light/dark tank. Three doses of MOLE (500, 1000 and 2000 mg/L) were administered to the zebrafish. Fluoxetine was used as the positive control. Upon sacrifice, the brains were extracted for LC-MS/QTOF based metabolomics analysis. The changes in the metabolite profiles and the related anxiety pathway in response to MOLE were studied. MOLE improved the anxiety behaviour such as swimming zone preference, and increased duration in the upper zone and light zone by the zebrafish. Distinctive metabolite profiles were observed in zebrafish with different treatments. Pathways analysis using Metaboanalyst software had identified several pathways which shed light on the mechanisms of actions of the anxiolytic effect of MOLE. MOLE reduce anxiety effects by regulating the metabolism of purine, glutathione, arginine and proline, D-glutamine and D-glutamate. These findings can be used for further research to identify compounds of interest that are potentially good therapeutics and serve as an alternative therapy for anxiety disorder.

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