

The Effects of *Clitoria ternatea* Extract on Zebrafish Model of Alzheimer's Disease: A Neurobehavioural Study

(Kesan Ekstrak *Clitoria ternatea* pada Model Ikan Zebra bagi Penyakit Alzheimer: Suatu Kajian Tingkah Laku Neuron)

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ABSTRACT

Alzheimer's disease (AD) is a progressive neurodegenerative disease that is currently affecting 40-50 million people worldwide. It is generally recognized from its main symptom dementia, in which the patient undergoes a progressive decline in their cognitive memory. Recent studies have shown that medicinal plants such as *Clitoria ternatea* equipped with antioxidant properties has high potential in treating AD. The study was conducted using zebrafish model of AD induced with aluminium chloride for 28 days. The treatment dose of *C. ternatea* extract (4.34 mg/L) was then given for 14 days. The behaviour of the zebrafish were evaluated through memory testing by using a T-maze test and novel tank diving test. Histological studies were also performed. 50% of the zebrafish tested showed improvement in memory through the T-maze test after treatment with *C. ternatea* extract. Zebrafish model of AD treated with *C. ternatea* extract also shows a decrease in anxiety in the novel tank diving test. A significant increase of purkinje cells were also observed from the histological study after treatment with *C. ternatea* extract. Nucleus elongation of oligodendrocytes from zebrafish model of AD induced with aluminium chloride were improved when treated with the *C. ternatea* extract. In conclusion, it was found that *C. ternatea* extract exhibits strong potential for treating zebrafish model of AD induced with aluminium chloride.

Keyword: Alternative treatment; Alzheimer's disease; *Clitoria ternatea*; neurodegenerative; Zebrafish model

ABSTRAK

Penyakit Alzheimer adalah penyakit kemerosotan neuron yang kini menjejaskan 40-50 juta orang di seluruh dunia. Ia secara amnya dikenali melalui gejala utamanya iaitu demensia, apabila pesakit mengalami kemerosotan dalam ingatan kognitif mereka. Kajian baru-baru ini telah menunjukkan bahawa tumbuhan perubatan seperti *Clitoria ternatea* yang dilengkapi dengan sifat antioksidan mempunyai potensi yang tinggi dalam merawat penyakit Alzheimer. Penyelidikan ini dijalankan dengan menggunakan model ikan Zebra yang telah diberikan penyakit Alzheimer menggunakan aluminium klorida selama 28 hari. Dos rawatan menggunakan tumbuhan *C. ternatea* sebanyak 4.34 mg/L kemudiannya diberikan selama 14 hari. Tingkah laku ikan Zebra telah dinilai melalui ujian ingatan dengan menggunakan ujian pagar sesat dan ujian penyelaman tangki. Kajian histologi juga telah dilakukan. 50% daripada ikan Zebra yang dituji menunjukkan peningkatan dalam ingatan melalui ujian pagar sesat selepas rawatan dengan ekstrak *C. ternatea*. Ikan Zebra yang dirawat dengan ekstrak *C. ternatea* juga menunjukkan penurunan tahap kegelisahan dalam