

Brine Shrimp Cytotoxic Activity of *Morinda elliptica* Leaves and Root Crude Extracts

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ABSTRACT

This survey was conducted to test for in vivo Brine Shrimp Lethality Assay (BSLA) of *Morinda elliptica* leaves and root extract after successive maceration in four solvents (n-hexane, dichloromethane (DCM) ethyl acetate and methanol) and cytotoxicity was evaluated in terms of LC₅₀ (lethality concentration). 10 nauplii were placed in different concentrations (in three replicates each) of the plant extracts, after 24 hours the surviving brine shrimp larvae were counted and LC₅₀ was assessed. The result of the survey showed a concentration dependent increment in mortality rate of the brine shrimp nauplii and n-hexane and methanol fractions of the leaves and root extracts were more potent against the brine shrimp with LC₅₀ values of 35.483 ppm and 39.259 ppm (µg/ml) respectively, whereas ethyl acetate of both the extracts exhibited lower potent activity with LC₅₀ values 62.250 ppm and 102.250 ppm (µg/ml) in roots and leaves respectively. These findings indicated that bioactive ingredients are present in the plants that could account for its pharmacological effects.

Keywords: Brine shrimp, cytotoxicity, extract, LC₅₀, *Morinda elliptica*

INTRODUCTION

Brine shrimp lethality bioassay (BSLA) is a rapid and comprehensive bioassay for the bioactive compounds of natural and synthetic origin, the method was presented by Meyer *et al.* (1982) as a general assay capable of detecting spectrum of bioactivity present in crude extracts of medicinal plants (Kaniz *et al.*, 2013). The technique is cost effective and can be mastered easily, it requires a small amount of sample and appears predictive of cytotoxicity and pesticidal activity (Ghisalberti, 1993), and since its introduction the method has been used for bioassay of guided isolation of active antitumor and cytotoxic agent *trilobacin* from the bark of *Asimina triloba* (Zhao *et al.*, 1992), cisannonacin from *Annona muricata* (Rieser *et al.*, 1996), evaluation of acute toxicity of medicinal plants from Kenya biodiversity (Nguta *et al.*, 2012), comparative bioassay of plants different parts (Kaniz *et al.*, 2013) and lethality of Thai medicinal plants in the family Meliaceae. Thus, the aim of this method is to provide a front-line screening that can be backed up by more specific and more expensive bioassay once the active compound is isolated (Siriton *et al.*, 2004).

M. elliptica is a medicinal plant used in Malaysia (locally known as Mengkudu kecil in Malay), it is a shrub or small tree which could

reach 5 m high growing in newly developed areas or in bushes throughout the Malay Peninsula. The leaves are narrowly elliptic or oblanceolate shortly acuminate, with a long, narrow base measuring approximately 15 cm long and 3 cm wide with 7 pairs of nerves and 1 cm long petiole (Zakaria & Mohd, 2010). Traditionally, parts of the plant are being utilised in various ways for many health troubles and ailments, the shoot is eaten with rice to help increase appetite, it is also eaten to help treat headache, cholera, diarrhoea especially when combined with fever.

The paste of the pounded leaves is applied to the anus for treating piles and is also smeared over with oil heated and then applied over the body for fever, enlarged spleen, wounds and postpartum period, and a lotion of leaves is also rubbed on the body after childbirth (Burkil, 1966; Zakaria & Mohd, 2010). *M. elliptica* has been reported to have antioxidant activities (Subramaniam *et al.*, 2003), antibacterial and cytotoxic activities (Ali *et al.*, 2000), and contains anthraquinones (Ismail *et al.*, 1997; Ali *et al.*, 2000). Survey has shown that the leaf is applied to open wounds and the anus indicating a contact with exposed body cells, which might be a medium for fungal or bacterial infections, or being harmful to the cells, thus this work (an extract