In vivo toxicity study of Erythroxylum cuneatum leaves extract and its effects on working memory of rats

ABSTRACT

Erythroxylum cuneatum has been traditionally proven to possess beneficial properties in treating drug addiction and other illness. Due to less information on this plant, this elusive plant was investigated further to evaluate the in vivo toxicity profile of the plant and to investigate the effect of E. cuneatum on cognitive performance in rats. Two different extracts were produced from the leaves of E. cuneatum which were aqueous and alkaloid extracts. Acute in vivo toxicity test was evaluated in ICR mice to determine their medium lethal dose 50 value. In the in-vivo toxicity study, aqueous extract showed the almost similar toxic effect as alkaloid extract which was 416.86 mg/kg for alkaloid extract and 316.23 mg/kg for aqueous extract. These findings suggesting that aqueous and alkaloid extracts showed toxic effects at the high dose, thus safe at a low dose. Working memory task using novel object discrimination test (NOD) was performed for the determination of neurobehavioral profiles. In the NOD test, alkaloid-treated rats did not show any significant discrimination between the familiar and novel object ($P > 0.05$); thus it can be interpreted as not induce a memory defi cit. It can also be postulated that the extract has no effect on memory and learning neither improvises nor impairs the cognitive function. In conclusion, since E. cuneatum does not show any impairment on cognitive, its pharmacological properties could be further investigated without significant changes in cognitive performance.

Keyword: Erythroxylum cuneatum; Medium lethal dose; Acute toxicity study; Novel object discrimination test; Working memory