

## Involvement of gamma aminobutyric acid in the anticonvulsant effect of the leaf methanol extract of *Ruta graveolens* L. (Rutaceae) in mice

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**Abstract:** The possible involvement of gamma aminobutyric acid (GABA), in the anticonvulsant effect of *Ruta graveolens* L. was investigated by studying the effect of the leaf methanol extract against seizures elicited by either pentylentetrazole (PTZ), bicuculline, picrotoxin or N-Methyl-DL-Aspartic acid (NlvIDLA) in mice. Leaf methanol extract of *Ruta graveolens*, phenobarbitone, diazepam and muscimol significantly antagonized seizures induced by PTZ, bicuculline or picrotoxin. Combined treatment of sub-effective doses of *R. graveolens* and muscimol significantly antagonized seizures induced by PTZ, bicuculline or picrotoxin. Dimethylsulfoxide (DMSO) or phenytoin did not significantly affect the seizures produced by PTZ, bicuculline or picrotoxin. *Ruta graveolens*, phenobarbitone, diazepam, phenytoin or DMSO did not significantly affect seizures produced by NlvIDLA. LY233053 significantly antagonized seizures produced by NlvIDLA. Combined treatment of sub-effective doses of LY233053 and *Ruta graveolens* did not significantly alter NlvIDLA-induced seizures. The phytochemical qualitative analysis of the plant species showed the presence of tannins, cardiac glycosides, saponins, flavonoids, triterpene steroids and alkaloids. The LD50 value obtained following oral administration of the leaf methanol extract of *R. graveolens* was above 4000 mg kg<sup>-1</sup>. The HPLC fingerprint of the plant species revealed certain characteristic peaks at 350 run. The data obtained in this study, indicate that the leaf methanol extract of *R. graveolens* has anticonvulsant activity. The data obtained also indicate that GABA mechanism may probably be involved in the anticonvulsant effect of the plant extract. The relatively high LD50 obtained for the plant species, given orally, indicates that it is safe in mice.

### Introduction

Epilepsy is a worldwide neurological disorder which is also prevalent in South Africa. Besides the use of standard medicines to manage and treat the condition effectively, medicinal plants have been used especially in rural communities by traditional medicine practitioners to manage and treat epilepsy (Van Wyk *et al.*, 1997; Wat 1967). One of such medicinal plants is *Ruta graveolens* L.





























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