

ABSTRACT

Convulsion is a chronic neurological disorder that develops in up to 5% of the world's population with prevalence of nearly 88% occurring in Sub-Saharan Africa, prompting serious medical, social, health related stigma and discrimination. Although a number of antiepileptic drugs (AED) are available for patients, most of the drugs have been associated with adverse side effects, dose-related neurotoxicity and teratogenic effects besides the AED therapy failures reported in approximately 20% of the patients. Since AED therapies have drawbacks restricting their clinical utility, herbal medicines may offer therapeutic options due to their accessibility, and less or no side effects. *Maytenus heterophylla* is one such plant that has been in use by the Teso communities in western Kenya to manage convulsions. However, there is no scientific evidence to validate the application. Therefore, the current study was intended to screen the extracts for anticonvulsant activity, isolate the pure compounds and test them for anticonvulsant activity. A bioassay-guided isolation and characterization was designed to evaluate the antiepileptic potential of the various parts of *M. heterophylla*. Solvent extraction followed by chromatographic separation and spectroscopic techniques were used to isolate and characterize the compounds from the active fractions. Picrotoxin-induced convulsion assays in white albino Swiss mice was used to evaluate the *in-vivo* anticonvulsion potential of the extracts and compounds. Stem bark methanol extract (200 mg/kg b.w) significantly ($P < 0.05$) decreased convulsions compared to control animals against Picrotoxin-induced seizure and relatively better than the leaf and root extract. The stem bark extract also offered up to 62.5% protection against seizure at 200 mg/kg which was significant ($P < 0.05$) compared to diazepam (87.5%). Two new triterpenes; 3-methoxy-4-decarboxydihydrozeylasterone (55) and 3,4-*seco*-1-hydroxy-21-oxoolean-3,11-olide (56) together with three known compounds; 3-acetoxy-28-hydroxy-lupe-20(29)-ene (54), Oleanolic acid (58) and a monoterpene, 3,5-dihydroxycamphanoate (57) were isolated from the stem bark of *M. heterophylla*. The isolates showed weak to moderate activities with compounds 55 and 56 showing the highest activities at 62.5% ($P < 0.05$) and 75% ($P < 0.05$) protection respectively, against convulsion compared to the distilled water (Negative control) at concentrations of 50 mg/Kg b.w. The results suggest that *Maytenus heterophylla* contains bioactive compounds against Picrotoxin-induced convulsion and the plant's stem bark may be beneficial in management of epilepsy. Compounds 55 and 56 should therefore be explored further for potential to manage convulsions. These results lend credence to the ethno-medical claim for the use of the plant in traditional medicine.