

Abstract

Alepidea amatymbica, an herbaceous plant with a broad ethnomedicinal application among the native of Eastern and Southern Africa. The isolation of diterpenoids from *A. amatymbica* and evaluation of their biological activities, based on the ethnomedicinal information, was the primary focus of this investigation. Five bioassay guided isolated diterpenoids: ent-13-hydroxy-16-kauren-19-oic acid (1), 16-hydroxy-kaur-6-en-19-oic acid (2), 14-acetoxy entkaur-16-en-19-oic acid (3), 14-oxokaur-16-en-19-oic acid (4), and 14-acetoxo-12-oxokaur-16-en-19-oic acid (5) were screened in vitro for their anti-inflammatory, cytotoxicity, and antimicrobial. The diterpenoids were isolated and purified using open column chromatography, PTLC, and characterised with FTIR, NMR, and HRMS EI. The diterpenoids were not cytotoxicity on the normal cell but showed a significant effect of cancer cell lines. 14-acetoxo-12-oxokaur-16-en-19-oic acid showed a high inhibitory effect on lipoxygenase with an EC₅₀ of 19.10 ± 3.15 $\mu\text{g/ml}$ compared to standard indomethacin with EC₅₀ of 17.22 ± 5.48 $\mu\text{g/ml}$. Among the diterpenes isolated and tested, 14-oxokaur-16-en-19-oic acid and 14-acetoxo-12-oxokaur-16-en-19-oic acid showed significant antibiotic activities against bacteria (MIC 125 $\mu\text{g/ml}$) compared to gentamycin. Consequently, the antibiotic activity is structurally linked to the positions of acetate and oxo groups at C-14 and C-12 which enhances the activity of the diterpenoids. The in-vitro biological activities confirmed that the diterpenoids are sources of treatment and management of inflammation-related diseases, justifying its traditional application