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Diterpenoids from Alepidea amatymbica Eckl. & Zeyh : Cytotoxicity, antibiotic, and lipoxygenase inhibitory activities

Alepidea amatymbica is a herbaceous plant with a broad ethnomedicinal application among the native of Eastern and Southern Africa. The isolation of diterpenoids from A. amatymbica and evaluating their biological activities based on the ethnomedicinal information was the primary focus of this investigation. Five bioassay guided isolated compounds: ent-13-hydroxy-16-kauren-19-oic acid (1), 16-hydroxy-kaur-6-en-19-oic acid (2), 14- acetoxy ent- kaur-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 activities. The compounds were purify using open column chromatography, PTLC, and characterised with FTIR, NMR, and HRMS EI. The diterpenoids did not show 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 µg/ml compared to standard indomethacin with EC50 of 17.22±5.48 µg/ml. Among the diterpenes tested, only 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 µg/ml). 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. *In vitro*, biological activities results illustrated that the compounds can be a source of treatment and management for inflammation-related diseases with no cytotoxic effect; therefore, justifying its traditional applications.

Biography

Okoli Bamidele Joseph completed BSc in Chemistry in 2001 at Federal University of Agriculture Abeokuta, Oyo State, MSc in Organic Chemistry in 2005 at the University of Ibadan, and PhD in Organic Chemistry in 2015 at the great Ahmadu Bello University, Zaria, Kaduna State. Following his Master's at the University of Ibadan, he joined the Chemistry Department of Bingham University in 2006. Presently, he is a Postdoctoral Research Fellow at the Institute of Chemical and Biotechnology, Vaal University of Technology, South Africa. He has published over 16 research papers on isolation and characterization of organic compounds from native plants. He is the author of Organic Spectroscopy, a one-volume treatment designed for graduate students and advanced undergraduates. He is a member of America Chemical Society and recently joined Chemical Society of Nigeria. He was the Coordinator of the Students Industrial Work Experience Scheme, and Deputy Coordinator, School of Basic Studies, Bingham University and an authorized representative of an African-Asian educational exchange program. His main interest shifted from teaching undergraduate students to research in the early 2000s and enthusiastically embraces isolation, characterization and biological activities of novel compounds.

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