

Isolation and antimycobacterial activity of the four triterpenoids from *Terminalia avicennioides* root bark

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Introduction: Tuberculosis (TB) has reemerged as global health challenge particularly in developing countries of Africa. Issues of drug resistance, toxicity, accessibility and affordability are the major factors that necessitated investigation of indigenous plants to provide novel chemotypes with antimycobacterial activity. Ethnobotanical information indicates that the root bark of *Terminalia avicennioides* has been used for centuries in the treatment of respiratory diseases such as tuberculosis and cough in Nupeland, North Central Nigeria. Earlier, we evaluated the *in vitro* antimycobacterial activities of its root bark extract of this plant.

Materials and Methods: The antimycobacterial plant for this research was selected based on the ethnobotanical information. 70% methanol extract was obtained from the identified plant and tested using standard *in vitro* antimycobacterial activity. The efficacious extract with promising bioactivity was subjected to bioassay-guided fractionation for isolation and separation of novel bioactive agents using antitubercular assay. The constituents of the extracts are structurally elucidated by spectroscopic methods.

Results: Chemical investigation by bioassay-guided fractionation led to the isolation of four triterpenoids namely: friedelin, arjunolic acid, α -amyrin and 2, 3, 23-trihydroxyolean-12-ene.

Friedelin and arjunolic acid exhibited potent antimycobacterial activity against strain of *Mycobacterium bovis* (BCG). Structural

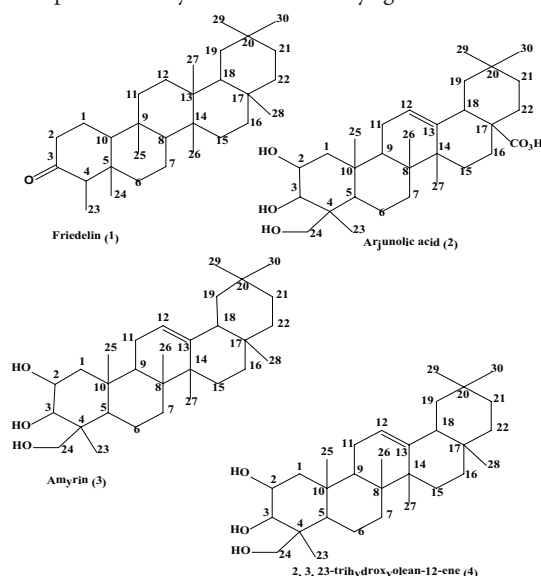


Fig. 1: Triterpenoidal compounds isolated from the root bark of *Terminalia avicennioides*

elucidation of the isolated compounds were based primarily on the analysis of 1-D and 2-D NMR spectral data including HMQC, HMBC, COSY and NOESY correlations, as well as comparison with reported authentic data of friedelin, arjunolic acid, α -amyrin and 2, 3, 23-trihydroxyolean-12-ene.

Conclusion: The present results further corroborate the traditional use of this plant in treatment of tuberculosis and cough and confirm the value of ethnopharmacological investigations into traditional herbs for potential drug development.