ISOLATION OF ANTICANCER COMPOUNDS FROM EXTRACTS OF SELECTED BASIDIOMYCETES FROM KENYA

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A Research Thesis Submitted to the Graduate School in Partial Fulfilment of the Requirements for the Award of the Degree of Doctor of Philosophy in Chemistry of Egerton University

EGERTON UNIVERSITY

OCTOBER 2017

ABSTRACT

Tropical basidiomycetes comprise a vast and yet largely untapped source of useful new pharmaceutical products. Compounds isolated from basidiomycetes' fruiting bodies, exhibit promising activity against tumours *in vitro* and *in vivo*. Some have been employed clinically as antitumor drugs. As different types of cancers emerge, there is need of more novel and target specific drugs. These drugs can be anticancer compounds isolated from basidiomycetes which can either be a possible alternative or increase the number of drugs controlling cancer. In this work, the basidiomycetes investigated were collected from fields of Egerton University, Mau Forest, Kerio Valley in Kenya. Herbarium specimens are retained in the Integrated Biotechnology Research Laboratory at Egerton University. A total of twenty-one compounds were isolated, of which four compounds had novel structures. They are namely ergosta-7,22-dien-3-acetate, 5α,8α–epidioxy-6α,7α-epoxyergosta-9(11),22-dien-3β-ol, ergosta-7(8),22,24(28)-trien-3-one and ergosta-7,24(28)-dien-3-one. Fresh fruiting bodies of *Termitomyces microcarpus* collected from fields of Egerton University yielded five ergostanes and betulinic acid. Flesh *Suillus granulatus*, collected from the Mau Forest yielded two compounds. *Trametes versicolor*, a polypore collected from the Kerio valley yielded five ergostanes and one cycloartane, *Xylaria longipes* also collected from the Kerio Valley yielded four ergostanes and one cytochalasan. *Clavulina cinerea* collected from Kerio Valley yielded three ergostanes, a cyclopeptide and two pentacyclic triterpenes. The compounds isolated were fully characterised using NMR, IR and mass spectrometry. The ergostane-type sterols are common and widely distributed among the fungal metabolites however, this is the first report on the extractions of the sterols from the basidiomycetes. The compounds isolated were screened for activities against a panel of 60 human cancer cell lines derived from nine cancer types at single dose concentration of 0.001 mM. The compound 5α,8α–epidioxyergosta-6,22-dien-3β-ol isolated from *T. microcarpus* displayed considerable antiproliferative activity and was selected for an advanced assay against the full 60 cell panel at five concentrations at 10-fold dilution. Although the molecular mechanism by which cell death is induced remains to be confirmed, the compounds isolated from the basidiomycetes have shown to be a source of potential therapeutic agents for cancer treatment.

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