



Asian - African society
Of Mycobacteriology

Available at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/IJMYCO



Antimycobacterial ingredients from plants used in traditional medicine to treat Buruli ulcer

Patrick Valere Tsouh Fokou ^{a,*}, Abena Adomah Kissi-Twum ^a, Dorothy Yeboah-Manu ^b, Regina Appiah-Opong ^a, Phyllis Addo ^c, Lauve Rachel Tchokouaha Yamthe ^{d,e}, Alvine Ngoutane Mfopa ^e, Fabrice Fekam Boyom ^e, Alexander Kwadwo Nyarko ^{a,f}

^a Department of Clinical Pathology, Noguchi Memorial Institute for Medical Research, Accra, Ghana

^b Department of Bacteriology, Noguchi Memorial Institute for Medical Research, Accra, Ghana

^c Department of Animal Experimentation, Noguchi Memorial Institute for Medical Research, Accra, Ghana

^d Department of Biochemistry, University of Yaoundé 1, Yaoundé, Cameroon

^e Institute of Medical Research and Medicinal Plants Studies (IMPM), Yaoundé, Cameroon

^f Department of Pharmacology and Toxicology, School of Pharmacy, University of Ghana, Accra, Ghana

ARTICLE INFO

Article history:

Received 13 September 2016

Received in revised form

19 November 2016

Accepted 21 November 2016

Available online xxxx

Keywords:

Phytotherapy

Buruli ulcer

Cytotoxicity

Mycobacterium ulcerans

Phytochemistry

ABSTRACT

Aim and objectives: Buruli ulcer (BU) is a neglected tropical disease caused by a mycobacteria, *Mycobacterium ulcerans*. The WHO recommended Rifampicin-Streptomycin combination side effects and poor compliance, leaves rural populations with no choice than to patronise indigenous remedies. This study is aimed at validating medicinal plants used in traditional medicine to treat BU by investigating the *in vitro* efficacy and safety as well as their composition in active molecules.

Methods: A short report-based survey was used to identify medicinal plants used traditionally for BU treatment. Maceration of collected plant samples in methanol, hydroethanolic, ethanol, dichloromethane, and hexane, resulted in a total of 67 extracts assessed for antimycobacteria activity against *Mycobacterium smegmatis* and *Mycobacterium ulcerans* using the Resazurin Microtiter Assay. The cytotoxicity effect of promising extracts was assessed on normal human liver cells using the MTT assay. The bio-guided fractionation of the promising extracts led to the isolation of active compounds.

Results: Majority of plants prepared as infusion, decoction, poultice, and macerate were administered topically. Significant antimycobacterial activity with MIC values ranging from 16 to 250 µg/mL was recorded against *M. smegmatis* (25 extracts) and *M. ulcerans* (17 extracts).¹ Most of antimycobacterial extracts showed no significant cytotoxicity against normal human hepatocytes.¹ The isolation guided by the biological activity revealed nine compounds with significant *in vitro* anti-*M. ulcerans* activity (MIC = 16–128 µg/mL).

Conclusions: The results completed support the use these plants in the indigenous knowledge against BU. Further analyses of active principles might lead to new drug toe fight against BU.

* Corresponding author.

E-mail address: ptsouh@gmail.com (P.V. Tsouh Fokou).

Peer review under responsibility of Asian African Society for Mycobacteriology.

¹ This section is based on section of results of Tsouh Fokou, P.V.; Kissi-Twum, A.A.; Yeboah-Manu, D.; Appiah-Opong, R.; Addo, P.; Tchokouaha Yamthe, L.R.; Ngoutane Mfopa, A.; Fekam Boyom, F.; Nyarko, A.K. In Vitro Activity of Selected West African Medicinal Plants against *Mycobacterium ulcerans* Disease. *Molecules* 2016, 21, 445.

<http://dx.doi.org/10.1016/j.ijmyco.2016.11.025>

Conflict of interest

We have no conflict of interest to declare.

Funding statement

The funder had no role in the design of the study, the collection and analysis of data, the preparation of the manuscript, or decision to publish.

Acknowledgement

This work received financial supported from the Bill and Melinda Gates Foundation fund to the Noguchi Memorial Institute for Medical Research Postdoctoral and Postgraduate Training in Infectious Diseases Research (Global Health Grant No. OPP52155).