

Original Article Published: 27 August 2023

## Exploring the Therapeutic Potential of Wild Edible Mushrooms: Safety Evaluation and Isolation of Antimycobacterial Sterols from *Afrocantharellus platyphyllus* (Heinem.) Tibuhwa

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Received 17 April 2023 Accepted 15 August 2023 Published 27 August 2023

DOI <https://doi.org/10.1007/s42250-023-00765-6>

### Abstract

#### Purpose

*Afrocantharellus platyphyllus* (Heinem.) Tibuhwa (family Cantharellaceae) is a wild mushroom that is used for food and in the management of diseases by communities in Southern Tanzania. The current study investigated the safety and potential of the mushroom *A. platyphyllus* to yield active antimycobacterial compounds.

#### Methods

Preliminary safety evaluation was done using the brine shrimp lethality test (BST) and white albino mice. An 80% ethanolic extract of *A. platyphyllus* fruiting bodies was separated by using a liquid–liquid partitioning and the anti-mycobacteria compounds were isolated by column chromatography. The structures for isolated compounds were determined using Nuclear Magnetic Resonance (NMR) Spectroscopy.

#### Results

In the acute oral toxicity test none of the mice used showed any sign of toxicity during the 14 days' observation. Similarly, the mushroom extract was mildly toxic to brine shrimps with LC<sub>50</sub> of 61.94 µg/mL. The bioassay guided fractionation yielded two known compounds Cerevisetrol (**1**) and (22E, 24R)-Ergosta-5α, 6α-epoxy-8,22-diene-3β,7α-diol (**2**). These compounds were isolated for the first time from the genus *Afrocantharellus* and *A. platyphyllus* species were active against Mycobacteria with MICs ranging from 9.50 to 39.00 µg/mL against *Mycobacterium indicus pranii* (MIP), 19.00 to 78.00 µg/mL against *Mycobacterium madagascariense* (MM), 19.00 µg/mL to 78.00 µg/mL against a standard *Mycobacterium tuberculosis* strain (Mtb1) and 78.00 µg/mL to 312.00 µg/mL against a resistant clinical *Mycobacterium* isolate (Mtb2) against compounds 1 and 2 respectively.

#### Conclusion

*A. platyphyllus*, an edible mushroom yielded two known compounds with antimycobacterial properties which are potential scaffold for antimycobacterial drug design. These findings support further initiatives to evaluate other traditionally used mushrooms for antimycobacterial and other biological activities.