

Antitubercular and HIV-1 enzyme inhibitory activities of South African macrofungi

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The medicinal properties of African and South African macrofungal species, including mushrooms/toadstools, brackets and puff balls, are poorly documented or had not been investigated. Globally, ±36.7 million people live with the human immunodeficiency virus (HIV), and ±10.4 million people became infected with tuberculosis (TB) in 2016. HIV and TB are two diseases with high prevalence in Sub-Saharan Africa. TB is an opportunistic infection in HIV/AIDS infected individuals with impaired immune systems. Increased antimicrobial resistance is a global problem and growing concern. Ethanol (80%) extracts of 21 macrofungal species were screened for antitubercular activity against the *Mycobacterium tuberculosis* H37 strain, and the endpoint determined using the CellTiter-Blue[®] cell viability assay. The ethanol extracts were also screened for HIV-1 reverse transcriptase (RT) and protease inhibition using colourimetric and fluorometric assay kits, respectively. *Fomitopsis lilacinogilva* (MIC: 31.25 µg/mL) and *Gymnopilus junonius* (MIC: 62.5 µg/mL) inhibited *M. tuberculosis*. *Pisolithus tinctorius* (IC₅₀: 1.35 µg/mL) inhibited HIV-1 RT activity, which was comparable to the non-nucleoside RT inhibitor, nevirapine (1 and 10 µg/mL), used in antiretroviral therapy. *P. tinctorius* (IC₅₀: < 2.5 µg/mL), *Pycnoporus sanguineus* (IC₅₀: 26.30 µg/mL) and *Chlorophyllum molybdites* (IC₅₀: 49.7 µg/mL) inhibited HIV-1 protease activity. South African macrofungal species contain biological active compounds with antitubercular and HIV-1 enzyme inhibitory activities, which might play an important role in the future development of novel antibiotics and antiretroviral drugs against TB and HIV/AIDS, respectively.