Abstract

Mycobacterium tuberculosis is arguably the world's most successful infectious agent in causing tuberculosis because of its ability to control it's own cell growth within the host. *M. tb.* is a globally successful pathogen due to its ability to persist for long periods of time, unrecognized by the human immune system. A protective covering of genes allows the organism to enter latency and then re-emerge later during endogenous reinfection. It is estimated that at least 30% of the world's population is infected with latent *Mycobacterium tuberculosis* and 1.3 million deaths per year. During infection, mycobacteria and other intracellular bacterial pathogens withstand an arsenal of host-derived mutagens that are responsible for DNA damage. The emergence of multidrug resistant strains of this pathogen has made the search for efficacious, safer, cheaper and more accessible drugs, a priority.

The objective of our study was to screen antimycobacterial activity of spices used in India on *Mycobacterium smegmatis* and determination of total polyphenolic and flavonoid contents and free radical damage to goat erythrocytes. Scanning electron microscopy of the bacteria was performed to investigate the impact of the extracts on the morphology of the bacterial cell, cytotoxicity assay was done in PBMC and murine macrophage cell line.The extracts exhibiting antimycobacterial property was further purified in column chromatography. Those fractions of extract which exhibited antimycobacterial activity were analysed in Fourier Transform Infrared Spectroscopy (FTIR).

Three extracts showed activity against *Mycobacterium smegmatis* Ethanol extract of *Syzigium aromaticum* showed the maximum activity with an inhibition zone of 13 mm against *Mycobacterium smegmatis.* The methanol fraction showed highest antimycobacterial activity with an MIC value of .78 µg/µl against *Mycobacterium smegmatis (ATCC 14468)*.. The phenolic content in *S. aromaticum* extract 602.73mg/gm GAE and maximum total flavonoid content was (mg of QE/100 g) is 35 mg. None of the extracts of exhibited hemolytic activity up to the maximum concentration of 50xMIC. SEM micrograph depicts morphological changes induced by the extracts at MIC. The extract did not exhibit any cytotoxicity at 50x MIC. This showed that plant extracts evaluated have great potential as antimycobacterial