Tittle: From nature's bounty to drug discovery: Leveraging phytochemicals and molecular approaches to combat multi-drug-resistant (MDR) tuberculosis

Abstract: A large number of people annually lose their lives to tuberculosis (TB), which is an age-old disease caused by the *Mycobacterium tuberculosis*. The global spread of TB is a concern for all regions. The south-east Asian region recorded 46% of all new TB cases in 2021, followed by the African and western Pacific regions with 23% and 18%, respectively. Researchers are always searching at natural substances for potential alternative therapeutics to tackle the worrisome growth in multi-drug-resistant (MDR) tuberculosis due to the high costs associated with developing new treatments and unfavourable side effects of currently used synthetic pharmaceuticals. Phytochemicals show promising results as a future health aid due to their multi-targeting ability on pathogen cells. In the search for new drug leads, the Ayurvedic and Siddha medical systems have made an extensive use of ethnomedicinal tools, including the use of plants like Amalaki (*Emblica officinalis* Gaertn.), Guduchi (*Tinospora cordifolia* willd.), Sariva (*Hemidesmus indicus* R.Br.), Kustha (*Saussurea lappa* Falc.), turmeric (*Curcuma longa* Mal.) and Green tea (*Camellia sinensis* Linn.). These sources are high in flavonoids, polyphenols, tannins and catechins, has been shown to reduce the risk of TB. In this overview, we look at how natural sources like plants, algae and mushrooms have helped researchers to find new drug leads, and how to back these natural sources through mapping the molecular approaches and other approaches has helped them to defeat MDR.