3.1 **THE RECENT GLOBAL TUBERCULOSIS EPIDEMIC**

It Estimates that eight million people get TB every year, of which 95% live in developing countries. An estimated 3 million people die from TB every year making it one of the world's leading infectious causes of death among young people and adults. One-third of the world's population is infected with TB, due to a combination of economic decline, the breakdown of health systems, insufficient application of TB control measures. HIV fuels the TB epidemic by ---

1) Reactivation of latent TB infection.
2) Rapid progression of recently acquired TB infection.
3) Exogenous tubercle infection.

These factors led to an increase in the number of TB cases in the community thereby increase risk of TB transmission to others in the general community\(^{(1)}\).

Between 2000 and 2020, it is estimated that:

- Nearly one billion people will be newly infected with TB.
- 200 million people will become sick from TB.
- 70 million will die from TB if control not strengthened and active TB if left untreated.

These alarming statistics indicating the devastating nature of tuberculosis\(^{(2,3)}\).

3.2 **Challenges and difficulty in the treatment of tuberculosis**

(1) Tubercle bacilli grow slowly, dividing only once in 1-2 days in an open cavity, pulmonary lesions even in favorable conditions.

(2) The caseations tend to block blood vessels, supplying necrotic area, making penetration difficult by anti-tubercular drugs.

(3) Tubercle bacilli remain viable & multiply even when ingested by macrophages & drugs poorly penetrate into the macrophages.

(4) Caseations necrosis allows bacilli to remain as persisters in dormant conditions by sealing of the communication of necrotic area with communicating channels like bronchus. Ability to bounce back within weeks or months of apparent completion of treatment-relapses.

(5) Organism develops resistance to anti-tubercular drugs & multiplies. Resistant bacilli are now rising\(^{(4)}\).

(6) Ability to team up with *Diabetes Mellitus*, silicosis and most recently with human immunodeficiency virus (HIV) infection and disease;
There are several reasons that justify the need to search new drugs for TB, e.g. improvement of current treatment by shortening its duration, to get efficient treatment for MDR-TB and to eradicate the latent infection. So, the development of new drugs for shortening the duration of the treatment and to fight against multidrug resistant tuberculosis strains is urgent\(^{(5)}\). In this instance, the plant kingdom with enormous chemical diversity may be looked as undoubtedly a valuable source for new antitubercular agents. There is a great demand for herbal medicines in the developed as well as developing countries because of their wide biological activities, higher safety margin than the synthetic drugs and lesser costs. A golden triangle consisting of Ayurveda, modern medicine and science will converge to form a real discovery engine that can result in newer, safer, cheaper and effective therapies\(^{(6)}\).

### 3.3 Benefits of herbal therapy compared to allopathic in TB

- **Side effects:** The side effects are more directly related with amount of drug taken into the body like enzyme induction, hepatotoxic. It can be reduced by using herbal drugs.

- **Patient compliance:** It is possible because reduced dosing frequency of drug dose, less side effects & toxic effects thus reducing the toxicological profile by use of herbal drug.

In this search, information obtained from folk knowledge and traditional medicine of different cultures can be valuable. On this background, the potential of Indian medicinal plants useful as anti-tb appears to be encouraging.

*Ricinus communis* Linn. whole plant juice used in scrofula/tuberculosis was reported traditionally\(^{(5)}\) *Vitex negundo* Linn. also reported traditionally used in tuberculosis. Hence these two plants were selected for evaluation of anti-tubercular activity. However, it is important bioassay-directed fractionation is an important process in the identification of active principles in natural product extracts.
3.4 OBJECTIVES:

- To obtain different solvent extracts from plants by extraction methods.
- Phytochemical investigation of extracts of plants.
- Pharmacological screening for anti-tubercular activity of all extracts of plants.
- To isolate the naturally occurring phytoconstituents from the anti-tubercular extract of plant.
- Pharmacological screening for anti-tubercular activity of its fractions and isolated purified compounds for anti-tubercular activity.
- To evaluate the rate of drug resistance.
- Development of new analytical method of extract/active chemical constituent.
REFERENCES


