

# Investigation of the Anti-*Mycobacterium tuberculosis* Activity of *Cinnamomi Ramulus*

Xiaoke Zhang, Xia Wu, Wanmin Zhang, Wei Zhang, Ling Chen\*

Department of Tuberculosis, Affiliated Hospital of Zunyi Medical University, Zunyi, China

## Email address:

1757515670@qq.com (Xiaoke Zhang), lingjuncd@163.com (Ling Chen)

\*Corresponding author

## Abstract

**Background:** The global prevalence of drug-resistant tuberculosis (TB) poses a critical threat to public health. The limitations of conventional antibiotics, including drug resistance and adverse effects, necessitate the development of novel anti-TB agents. Traditional Chinese medicines (TCMs), with their diverse bioactive constituents and multi-target mechanisms, represent potential candidates. **Objective:** To screen TCMs for inhibitory activity against *Mycobacterium tuberculosis* (MTB) standard (H37Rv) and rifampicin-resistant strains, and evaluate cross-resistance with rifampicin. **Methods:** Nine TCMs including *Scutellariae Radix*, *Cinnamomi Ramulus*, *Houttuyniae Herba*, *Artemisiae Argyi Folium*, *Taraxaci Herba*, *Atractylodis Macrocephalae Rhizoma*, *Atractylodis Macrocephalae Rhizoma Praeparatum*, *Aconiti Lateralis Radix* and *Aconiti Lateralis Radix Praeparata* were selected. Components were isolated and extracted by Hangzhou Zungui Biomedical Technology Co., Ltd. The minimum inhibitory concentration (MIC) of each component against MTB H37Rv was determined using the microtiter plate method, with rifampicin as the positive control. Further testing showed that *Cinnamomi Ramulus* still maintains the same antibacterial efficacy against rifampicin resistant MTB and has no cross resistance with rifampicin. **Results:** Among the nine TCMs, *Cinnamomi Ramulus* components exhibited significant anti-MTB activity against H37Rv, with MIC values of 3.91–7.81 µg/mL. The remaining eight TCMs showed no notable activity (MIC  $\geq$ 62.5 µg/mL). *Cinnamomi Ramulus* retained equivalent efficacy against rifampicin-resistant MTB strains, with no cross-resistance observed. **Conclusion:** *Cinnamomi Ramulus* demonstrates potent anti-MTB activity against both drug-susceptible and rifampicin-resistant strains, independent of rifampicin cross-resistance. It may serve as a promising anti-TB drug candidate, providing a theoretical basis for the development of novel anti-TB agents.

## Keywords

*Cinnamomi Ramulus*, *Mycobacterium tuberculosis*, Antibacterial Activity, Drug resistance, Cross-resistance