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## Antimycobacterial activity assessment of three ethnobotanical plants against *Mycobacterium Tuberculosis*: An In Vitro study

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### ABSTRACT

**Objective/Background:** Resistances to herbal medicines are still not defined and finding natural remedies against drug resistant *Mycobacterium tuberculosis* (MTB) has research priority. The antimycobacterial susceptibility method for herbal extracts is unclearly defined and there is no standard method for assessment of the materials against bacteria. In the present study, time kill of three medicinal plants was determined against MTB.

**Methods:** The clinical isolate of MTB from a patient who harbored confirmed tuberculosis was used in the study. Aqueous extracts of *Aloe vera* leaves, mint, and *Hypericum perforatum* were prepared using reflux distillation. Disk diffusion methods were conducted in Petri dishes and McCartney bottles containing Löwenstein–Jensen medium to measure the sensitivity of plant extracts in serial concentrations of 0.25–8 mg/mL. A pour plate method was performed by mixing 0.7 mL of each concentration of extract in 5 mL Löwenstein–Jensen medium followed by surface culturing of MTB fresh cells. The time kill method was conducted by bacterial suspension in equal amounts of the extract and viable evaluation in fresh culture at the beginning, and at 24-h, 48-h, 72-h, and 1-week intervals. All cultures were incubated at 37 °C for 4 weeks. Inoculum concentrations were considered as a variable.

**Results:** The zones of inhibition of *A. vera*, *H. perforatum*, and mint extracts in the disk diffusion method in McCartney bottles were 60 mm, 41 mm, and zero, respectively, but Petri dishes did not have repeatable results. In the pour plate method, an extract concentration up to 1 mg/mL could inhibit cell growth. In mint extract, colony forming was four times more than the others at 0.5 mg/mL. Time kill of 95% of cells occurred when exposed to extracts of *A. vera* and *H. perforatum* separately, but was 50% in 24 h and 20% in 10 min. The time kill for mint was 95% in 1 week.

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*Conclusion:* The results give some scientific basis to the use of plant extracts for growth control of MTB cells. Clinical trials are recommended for assessment of the extract as complementary medicine, as well as for antiseptis.

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### **Conflicts of interest**

The authors declare no conflicts of interest.