

Susceptibility of bacterial pathogens to *Mentha citrata* Ehrh

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SUMMARY

The antibacterial activity of methanol, ethanol, Petroleum ether and aqueous extracts from *Mentha citrata* (Lamiaceae) root, stem and leaves were tested by disc diffusion method against *Klebsiella pneumoniae*, *Bacillus cereus*, *Proteus vulgaris*, *Pseudomonas aeruginosa*, *Escherichia coli* and *Staphylococcus aureus*. Methanolic and ethanolic leaf extracts showed greater activity against pathogenic organisms, than those of aqueous and petroleum ether extract. It exhibited significant antibacterial activity against *E. coli*, *Staphylococcus aureus* and *Proteus vulgaris*. Moderate activity was associated with *Bacillus cereus* and *Klebsiella pneumoniae*.

Key words : Antibacterial activity, *Mentha citrata*, Leaf extract

Plants provide the principal ingredients used in most of the traditional medicines. Man relied on natural products in general and plants in particular to promote and maintain good health and to fight sickness, pain and disease since time immemorial. With the advances in experimental methods in phytochemical and pharmacology, several medicinal plants were screened for active principles and biological activities (Riley *et al.*, 1983). It has been estimated that over half of the world's 25 best selling pharmaceuticals for 1991 owed their origin to a natural source material (O'Neill and Lewis, 1993). Another statistics reveals that approximately 120 plant-derived chemical compounds are currently used as drugs. Many of these are extracted and purified directly from plants (Farnsworth *et al.*, 1985). Due to indiscriminate use of antibiotics, the microorganisms have developed resistance to many antibiotics. This leads to serious clinical problems in the treatment of infectious diseases (Davis, 1994). In addition, antibiotics are sometimes associated with side effects and toxicity (Idose *et al.*, 1968; Ahmad *et al.*, 1998). Because of the side effects, drug toxicity and the resistance that pathogenic bacteria built against the antibiotics much recent attention has been paid to extracts and biologically active compounds from medicinal plants. They represent a rich source from which new antibacterial and antifungal chemotherapeutic agents may be obtained. Antimicrobial of plant origin have enormous therapeutic potential. They are effective in the treatment

of infectious diseases while simultaneously mitigating many of the side effects that are often associated with synthetic antimicrobials (Iwu *et al.*, 1999; Kokoska *et al.*, 2002).

Mentha citrata Ehrh. Commonly known as bergamot mint, is one of the important aromatic plants of mint family. This taxon cultivation is taken up in Punjab and Uttar Pradesh at large scale. According to year 2006, bergamot cultivation in India is done in about 1,200 hectares of land with estimated production of 150 tonnes of bergamot oil. *Mentha citrata*, as it is a hybrid between *Mentha piperata* and *M. viridis* flowering is very rare. Only a few plants in an acre of plot show flowering during the season. The active principle present in this plant is linalool and linalool acetate. They are triterpenoid compounds mainly used in aromatherapy and has many medicinal value. However, there is no report regarding the antibacterial potential of the crude extracts of *Mentha citrata* root, stem and leaf on several bacteria that can cause severe infections and diseases in human and animals.

MATERIALS AND METHODS

Mentha citrata plants were collected from garden of Presidency college, Hebbal, Bangalore, Karnataka, India, which were in turn brought from GKVK, Bangalore. Leaves, stem and roots of these plants were collected, shade dried and crushly powdered

Preparation of crude extracts:

The powdered plant material (10g) were then extracted separately by soaking in, methanol, ethanol petroleum ether and aqueous for 5 days. Each mixture was stirred every 12 hrs using sterile glass rod. At the end of fraction, each extract was passed through Whatmann No.1 filterpaper. The filtrate obtained was

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