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## Antibacterial and antifungal effects of Fumitory oil on gram positive and gram negative bacteria and fungi *in vitro*

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Essential oils are great sources of nature. Today they are used a lot in food industry. One of these essential oils is Fumitory oil. The effects of growth inhibition of Fumitory oil on gram positive bacteria (*Staphylococcus aureus* and *Bacillus cereus*), gram negative bacteria (*E. coli* and *Salmonella typhimorium*) and fungi (*Candida albicans* and *Aspergillus flavus*) were studied *in vitro*. The disc diffusion method was used to evaluate the zone of bacterial and fungal growth inhibition of the oil. Minimal Inhibitory Concentration (MIC) of the oil was used as broth dilution method for bacteria and fungi. Minimal bacteriocidal Concentration (MBC) and Minimal Fungicidal Concentration (MFC) of the oil were determined by agar surface culture method. Tetracyclin and nistatin were used as positive control and normal saline was used as negative control. Zone of inhibition in bacteria and fungi were not significant. In *E. coli* and *Salmonella typhimorium*, Minimal Inhibitory Concentration (MIC) was 62.5 µl/ml and Minimal Fungicidal Concentration (MFC) of the oil was 125 µl/ml. On *Staphylococcus aureus*, Minimal Inhibitory Concentration (MIC) was 15.9 µl/ml and Minimal Fungicidal Concentration (MFC) of the oil was 62.9 µl/ml. The oil didn't inhibited of fungi growth. The Fumitory oil was found to be bacteriostate and bacteriocide about some bacteria but it didn't had any significant antifungal effect.

**Keywords:** Essential oils, Antifungal, Antibacterial, Fumitory, MIC, MFC, MBC

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## Effects of *Echinacea purpurea* on liver and kidney of rat and mouse

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*Echinacea purpurea*, commonly known as the purple coneflower, red sunflower and rudbeckia has been used for a number of years to treat the common cold, coughs, bronchitis, upper respiratory infections, and some inflammatory conditions. However, there is little information about its effects on liver and kidney. Therefore, the present study was carried out to investigate the effects of this agent on hepatic enzymes activities and BUN in Rat and mouse. Moreover, its histopathologic effects on liver and kidney of these species were evaluated. For this purpose, 60 Rats and 60 mice were used. The animals of each species were divided randomly into three groups. Group 1 and 2 of each species were given 1% and 5% dried powdered *Echinacea purpurea* for 15 days, respectively. Groups 3 of rats and mice were used as controls groups. All animals were sacrificed on day 16 and blood samples were collected in test tubes. Moreover, samples of liver and kidney were collected in 10% formaline. All samples were analysed and the results were assessed statistically using ANOVA. The results of present study showed that *Echinacea purpurea* have no effect on hepatic enzymes activity and cause no histopathologic changes in liver and kidney. In conclusion, these results suggest that *Echinacea purpurea* has no toxic effects on liver and kidney of rats and mice.

**Keywords:** *Echinacea purpurea*, Rat, Mice, Liver, Kidney