The study of Antibacterial effects of *Cuminum cyminum* L. essential oil on morphology of *Bacillus cereus* ATCC 11778 with use of Transmission of Electron Microscopy (TEM)

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Abstract
The objective of this survey is evaluation of antibacterial effects of *Cuminum cyminum* L. essential oil on *Bacillus cereus* morphology with use TEM. *Bacillus cereus* is a spore-forming food-borne pathogen often associated with food products such as meat, vegetables, soup, rice, and milk and other dairy products. 1-20% of total outbreaks of food intoxication in the world are caused by *Bacillus cereus*. There is an increasing interest in the use of plant-derived antimicrobial compounds as natural preservatives for foods. Such as *Cuminum cyminum* L. essential oils that mechanism of inhibition of the growth of several pathogen's morphology by them have been reported in various articles by electronic microscopy. The essential oil *Cuminum cyminum* plant were obtained by steam-distillation and analyzed by GC/MS. Then effect of concentration of these essential oils (450 μL/Lit) on morphology of *Bacillus cereus* were evaluated with TEM after processing and photographs explanation.

Electronic microscopy observations revealed that the cell membranes of *Bacillus cereus* treated by EO were significantly morphological damages, disrupted membranes, abnormality bacterial division, deformity and ...

The results showed, the potential inhibitory effects of the *Cuminum cyminum* essential oil on *Bacillus cereus* in Brain Heart Infusion broth. Vet. Res. Bull. 6, Sup. 1, 185-196

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