Original Article

The Comparison Effect of Nanocopper Particles and Melissa Officinalis Essential Oil on Growth Inhibition of Escherichia Coli and Streptococcus Mutans

Naghsh, N. (PhD)
Assistant Professor of Animal Physiology, Department of Animal Physiology, Islamic Azad University, Falavarjan Branch, Esfahan, Iran

Nikbakht, Z. (MSc)
MSc of Microbiology, Department of Microbiology, Islamic Azad University, Falavarjan Branch, Esfahan, Iran

Doudi, M. (PhD)
Assistant Professor of Microbiology, Department of Microbiology, Islamic Azad University, Falavarjan Branch, Esfahan, Iran

Corresponding Author:
Nikbakht, Z.

Email:
nikbakhtzohre@yahoo.com

Received: 16 Dec 2012
Revised: 17 Jul 2013
Accepted: 20 Jul 2013

Abstract

Background and Objective: the plants with the less side effects and drug resistance have been used worldwide. In this study, we compared the inhibitory effects of nanocopper and essential oil of *Melissa officinalisL.a* on *E.coli* and *S.mutans in* In Vitro condition.

Material and Methods: for studying diameter of inhibitory zone, disk agar diffusion method was used. Then, antibacterial effects of these substances were evaluated by treating them for 24 hours in Nanocopper particles (concentration of 100 and 500 ppm) and essential oil (12.5% to 100%), and analyzed by ANOVA.

Results: twenty-four hours after treatment, nanocopper had no inhibitory effect on these bacteria. However, the diameter of inhibitory zone for E.coli and *S.mutans* was 31.30±0.13mm and 16.30±0.13mm, respectively. There was not any synergistic effect between different concentrations of this plant and 500ppm of nanocopper after 24 hours of treatment on E.coli. But for *S. Mutans*, the diameter of inhibitory zone for mixture of 50% & 25% essential oil and 500ppm concentration of nanocupper was increased significantly compared to only essential oil (p=0.001,p=0.01).

Conclusion: based on the findings, nanocopper particles and essential oil of *Melissa officinalis* L.a have not any synergic effects on *E.coli*, but with some concentrations of this plant the reverse is true on S.mutans.

Keywords: Essential Oil of *Melissa Officinalis*, Nanocopper Particles, *E.Coli*, *S.Mutans*

This paper should be cited as: Naghsh N, Nikbakht Z, Doudi M. [The Comparison Effect of Nanocopper Particles and Melissa Officinalis Essential Oil on Growth Inhibition of Escherichia Coli and Streptococcus Mutans]. MLJ. 2014; 7(Suppl.5):16-22[Article in Persian]