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Veterinarni Medicina

The survival of *Escherichia coli* upon exposure to irradiation with non-coherent polychromatic polarized light

Djurdjevic-Milosevic DM , Solaja MM, Topalic-Trivunovic LjN, Stijepic MJ, Glusac JR:

Veterinarni Medicina, 56 (2011): 520-527

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The purpose of this work was to examine the influence of non-coherent polarized light upon the growth of *Escherichia coli*. Experiments were designed to test the main hypothesis that this kind of polychromatic light can produce decimal reductions in numbers of *E. coli* bacteria. Two strains of *E. coli* - isolated from ground pork and commercial culture *E. coli* ATCC 25922, were both exposed to light for 20, 30, 40 and 60 minutes. The source of non-coherent polarized light was a Bioptron-1 lamp (Zepter, Swiss) with the following technical

characteristics: wavelength 100–2000 nm, polarization > 95%, and constant radiation dose 2.4 J/cm<sup>2</sup> per minute. The result for both strains showed a slight increase in bacterial count in response to an irradiation time of 20 min and decreases in bacterial counts for irradiation times of 30, 40 and 60 min without characteristics of a decimal reduction. Bacterial counts after treatments displayed a linear relationship with the total count of bacteria before treatments as well as the percentage surviving bacteria and irradiation time. Data analysis (ANOVA two factors with replication) showed that the survival of bacteria was influenced significantly by duration time ( $P < 0.01$ ), bacterial culture ( $p < 0.05$ ), and interaction between duration time and bacterial culture ( $P < 0.01$ ). Neither *E. coli* ATCC 25922 nor *E. coli* isolated from ground pork showed a decimal reduction after irradiation with non-coherent polychromatic polarized light.

### **Keywords:**

bacteria; growth; light; plate count

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