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**Antibacterial Effect of Eucalyptus as Root Canal
Filling Material for Primary Teeth in Comparison
with Other Materials (A Microbiological Study)**

A Thesis

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ABSTRACT

Background: Microbial invasion is the most common cause of pulpal necrosis. Therefore, irrigation and obturation of primary teeth with antimicrobial materials is quite necessary to increase the success of endodontic treatment.

Aims: To evaluate the antimicrobial effect of zinc oxide eucalyptus in comparison with zinc oxide eugenol, and metapex against *Streptococcus species*, *Staphylococcus aureus*, *Escherichia coli* and *Candida albicans*.

Methodology: Antimicrobial effect of eucalyptus oil against *Streptococcus species*, *Staphylococcus aureus*, *Escherichia coli*, and *Candida albicans* was estimated by using agar diffusion method. The microorganisms were isolated and identified from necrotic pulp of primary root, then they were spread on Muller Hinton agar. Holes of 6 mm were punched into the agar plates and filled with the selected materials. The diameter of inhibition zones was measured after overnight incubation at 37°C. The statistical analysis was done using One Way ANOVA test with Tukey or Dunnett's T3 as post hoc tests, and Kruskal-Wallis test with Dunn-Bonferroni post hoc test, at 0.05 level of significant.

Results: The inhibition zones diameter of zinc oxide eucalyptus mixture and zinc oxide eugenol against *Staphylococcus aureus*, *Candida albicans* and *Streptococci species* were almost similar to each other with statistically non-significant differences. However, there were highly significant differences in the diameter of inhibition zones among tested materials against *Escherichia coli*.

While Metapex showed the lowest diameter of inhibition zones with highly significant difference when compared to zinc oxide eucalyptus mixture and zinc oxide eugenol against all the microorganisms.

Conclusion: Zinc oxide eucalyptus revealed almost similar antimicrobial effect of zinc oxide eugenol against *Staphylococcus aureus*, *Candida albicans* and *Streptococcus species*, while for *Escherichia coli* it had lower antimicrobial effect. Furthermore, Metapex revealed the lowest antimicrobial effect against all

of the microorganisms when it was compared to zinc oxide eugenol and zinc oxide eucalyptus. Zinc oxide powder and the eucalyptus oil showed physical reaction on mixing.