Ilham Ben Yelles et al., Oral Health Dent Manag 2019, Volume 18
DOI: 10.4172/2247-2452-C1-094

Antimicrobial and antioxidant activity of essential oil of cumin dental caries on *Streptococcus sanguinis* involved on dental caries diabetes mellitus

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Introduction: Diabetes mellitus is one of the most common chronic diseases in children. However, several studies have shown that unbalanced diabetes is often associated with changes in the oral environment namely altered buffering capacity, xerostomia, high numbers of Streptococci and Lactobacilli which increases the risk of dental caries.

Aim: To reduce the appearance of *Streptococcus sanguinis* involved in dental caries.

Materials & Methods: After recruiting diabetic children, two young patients responding to informed consent, underwent salivary sampling for isolation and identification of the bacterium, microbial activity of the extracted oil was evaluated by the disc diffusion method, then a minimal inhibitory concentration was sought, then antioxidant activity was achieved by the free radical trapping method DPPH.

Results: Carious disease is present in 80% of diabetic children, 72% had unbalanced diabetes with an average HbA1C level of 8.1+/-1.6%. The disc diffusion method has shown that essential oil of cumin has intermediate activity on Streptococci sanguinis. The inhibition diameter is 14mm. This oil also has a more interesting antioxidant activity (CI50=0.02) than ascorbic acid (CI50=0.048). All experiments were performed in triplicate. Data were analyzed using SPSS software 21.0 (Chicago, IL, USA). The data are expressed as the mean±standard deviation values. The statistical analysis was done using Student's t-test. Values of $p<0.05$ were considered statistically significant.

Conclusion: Given the high prevalence of carious disease in diabetic children. The essential oil of cumin revealed an interesting intermediate activity on *S. sanguinis,* to prevent the installation of the lesion.

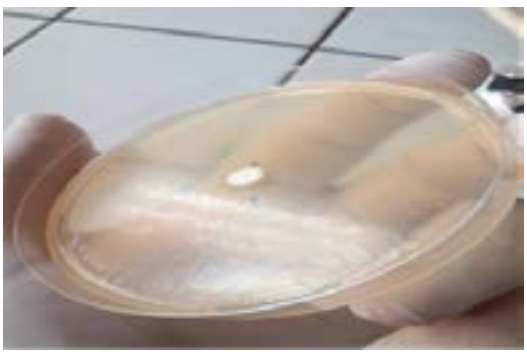

Figure 1: Activity of cumin oil on Streptococci sanguinis

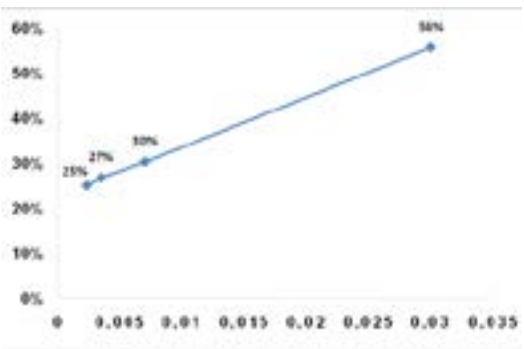

Figure 2: Percentage of inhibition of cumin essential oil (Cuminum cyminum)

Recent Publications

1. Bag A and Chattopadhyay R R (2015) Evaluation of synergistic antibacterial and antioxidant efficacy of essential oils of spices and herbs in combination. 10(7):e0131321.
2. Freires I A, Bueno-Silva B, Galvão L C de C, Duarte M C T, Sartoratto A, Figueira G M, et al. (2014) The effect of essential oils and bioactive fractions on *Streptococcus mutans* and *Candida albicans* biofilms: A confocal analysis. 2015(2015):871316.
3. Lee Y (2016) Physiological Production of Essential Oil in Plants-ontogeny, secretory structures and seasonal variations: Review. Pertanika J Sch Res Rev. 2:1.
4. Zheljazkov V D, Gawde A, Cantrell C L, Astatkie T and Schlegel V (2015) Distillation time as tool for improved antimalarial activity and differential oil composition of cumin seed oil. PLoS One 10(12):e0144120.

Biography

Ilham Ben Yelles is passionate about Dentistry and Biological Sciences. She has obtained her first Graduate Diploma in Dentistry at Tlemcen University of Algeria in 2004. In 2012 she has joined the National Laboratory for Research in Applied Molecular Biology and Immunology at the University of Tlemcen, under the direction of Professor Mourad ARIBI In 2015. She enrolled in the Doctoral program in medical sciences where, she learned about the therapeutic effects of metallo proteinases responsible for carious disease in children. After completing additional training, she obtained a Diploma of Sub-specialization in Clinical Health Research at the University of Oran, and in June 2018, a certificate in E-learning in specialized endodontics.

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