

# Molecular identification of *Fusobacterium spp.* in dogs with or without gingivitis/ periodontitis in Ahvaz and Tehran districts

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## Abstract

Periodontal disease is one of the most common disorders seen in small animal practices. Oral bacteria play an important role in periodontitis. *Fusobacterium spp.* is one of the important bacterial agents in the progression of periodontitis. The aim of the present study was to investigate the association between the presence of *fadA* and *leukotoxin* genes in *Fusobacterium spp.* isolated in dogs with or without gingivitis/ periodontitis in districts of Tehran and Ahvaz. One hundred and fifty samples (75 dogs from Tehran and 75 from Ahvaz district), between 2 to 11 years old, 78 males and 72 females, were studied during ten months. The studied major breeds included White Terrier, Poodle, Pomeranian, Shih Tzu, Yorkshire terrier, Pug, Spitz, Maltese and the rest were other breeds. They were fed with dry, homemade or mixed food. Twenty samples had healthy gums (13.33 %), 32 cases periodontitis grade 1 (21.33%), 47 other cases periodontitis grade 2 (31.33%) and 51 samples periodontitis grade 3 (34%). Twenty-seven out of 150 samples were infected with *Fusobacterium* (18.0%; 95% CI: 11.8%-24.1%). The percentages of the relative frequency of these bacteria were 21.3% (95% CI: 12.0%-30.6%) and 14.6% (95% CI: 6.6%-22.6%) in Tehran and Ahvaz, respectively. Survey of *leukotoxin* gene in 18 samples of *Fusobacterium necrophorum* showed that 11 samples (61.11%) (9 cases from Tehran and 2 other cases from Ahvaz) had this gene; the observed difference in the presence of this gene, was not statistically significant (p-value=0.43; df=1;  $X^2=0.62$ ). Nine out of 26 samples (34.61%) had *fadA* virulence gene and the relationship between the presence of *fadA* gene and periodontitis grades was not statistically significant (p-value=0.41; df=1;  $X^2=0.68$ ). Multivariable logistic regression showed that age, gender, breed, periodontitis, district, and type of food explained 97.6% of the infection and only gender and periodontitis had a significant effect on infection. The presence of *fadA* gene in *Fusobacterium nucleatum* isolated from dental plaques of dogs suffering from periodontitis and *leukotoxin* gene in *Fusobacterium necrophorum* subspecies *necrophorum* were not significant in periodontitis in related to two different districts of Tehran and Ahvaz. In conclusion, the prevalence of *Fusobacterium* was 16% and 2% in periodontitis grade 3 and healthy gums, respectively.

**Key words:** Periodontal diseases, *Fusobacterium*, *Leukotoxin*, *FadA*, Gingivitis, Dog

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