

**ABSTRACTS PRESENTED AT  
INTERNATIONAL ASSOCIATION FOR DENTAL RESEARCH  
SYMPOSIUM ON ORAL MALODOR  
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*Sources, Measurements and Implications of Oral Malodor. J. TONZETICH (Department of Oral Biology, Faculty of Dentistry, The University of British Columbia, Vancouver, B.C. Canada)*

Malodor emitted through the mouth is a composite of physiological and pathological odors derived from the systemic, nasopharyngeal and oral sources. Approximately 80% of physiological odor, which is attributed to  $H_2S$  and methyl mercaptan ( $CH_3SH$ ), originates from sites and causes within the oral cavity. The principal source of this odor emanates from dorsoposterior surface of the tongue. This transient condition, which afflicts about 50% of the adults, can usually be controlled and measured by organoleptic or instrumental analysis employing mass spectrometric, and gas chromatography units equipped with flame ionization and flame photometric detectors. Aside from the undesirable sociopsychological implications of halitosis, high levels of  $H_2S$  and  $CH_3SH$  appear to be of pathological importance. Their levels progressively increase with severity of periodontal involvement and deepening of periodontal pockets. The production of large amounts of thiol compounds at periodontal diseased sites has ominous implications. They have the potential to exert very destructive effects on oral mucosal tissues, especially the connective tissue. Of particular significance is their suppression of collagen synthesis and an increase in collagen degradation in gingival fibroblast cultures resulting in over 70% lower collagen content of  $CH_3SH$  exposed cultures. In addition they stimulate select cytokine production in culture systems indicating that they can activate the immune response system, thereby causing an increase in production and activation of collagenolytic enzymes. Supported by the Medical Research Council of Canada, grant MT 35849.

*Biochemical and Clinical Factors Influencing Oral Malodor in Periodontal Patients. D. YAEGAKI and K. SANADA (The Nippon Dental University at Niigata, Niigata, Japan)*

Periodontal disease frequently causes oral malodor. The amount of Volatile Sulfur Compounds (VSC) in mouth air from periodontal involvements was 8 times of control, and  $CH_3SH/H_2S$  ratio was 8 times. The periodontal pathogenic microorganisms have been described to enhance VSC production, especially  $CH_3SH$ . But our studies also indicated that the concentration of disulphide, which produces VSC, increases in proportion to the total pocket depth. And, we found that 60% of VSC in periodontal patients is produced from the tongue surface which involves 4 times the amount of tongue coating in control.

Although 2-ketobutyrate is a by-product in the methionine metabolism to  $CH_3SH$ , 2-ketobutyrate was shown to increase in the saliva of periodontal patients. It was implied that methionine metabolism to  $CH_3SH$  really increased in the oral cavity. Thereby, we estimated the methionine supply from gingival fluid of periodontal involvements. The result showed that methionine concentration was almost 3 times of cysteine (n=20).

Our studies suggest that in addition to bacteria, these factors enhance VSC production, and the elevated  $CH_3SH$  production in turn might accelerate the periodontal disease.