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In vitro Growth, Acidogenicity and Cariogenicity of Predominant Bacteria in Root Caries.

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Streptococcus mutans (Sm), *Lactobacillus acidophilus (La)* and *Actinomyces israelii (Ai)* are major agents of root surface caries, which is an increasing problem in elderly Chinese. The aim of this study therefore, was to evaluate *in vitro,* the growth, acidogenicity and cariogenicity of the latter organisms, both in mono- and co-cultures using the model of Gilmour *et al.* (*J Dent Res* 1997;76:1854). Forty-eight root specimens were prepared using intact extracted human molars. Fresh, wild-type bacteria obtained from root caries lesions (Shen *et al. J Dent Res* 2000;79:395) were assembled into seven experimental groups as either mono- or co-cultures and incubated with the root specimens. Appropriate controls were included. Growth curve of each experimental group was monitored for 24 hr, aerobically, at 37°C using a microplate reader (SpectraMAX 340, USA). The pH of the medium was recorded after 24hr-incubation using a pH meter. Mean depths of artificial root lesions so produced in each cultural group were measured using polarized light microscopy and microradiography (Gilmour *et al. Caries Res* 1993;27:169) in specimens cut into thin sections (100 ± 20 µm). Compared with mono-cultures, synergistic growth was observed in co-cultures of *La/Sm*, *Ai/La* and *Ai/La/Sm*. Mean lesion depth produced in *La* group was significantly shallower than other mono- or co-culture groups ($p < 0.01$). The pH values of all culture media were similar after 24hr incubation. The current data elucidate the complex interactions of three predominant bacterial species considered prime agents of human root surface caries. Supported by CRCG grant of HKU, Hong Kong SAR, China. gtang@hkucc.hku.hk

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