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Antimicrobial effects of *Hericium erinaceus* extracts – *In vitro* and *in vivo* studies

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We examined the antimicrobial activity of an extract of *Hericium erinaceus* toward cariogenic bacteria and periodontal disease-related bacteria *in vitro* and in the human oral cavity and we evaluated the possibility of the specimen as a new oral care agent. We prepared ethanol extracts of several mushrooms, *Pleurotus eryngii*, *Grifola frondosa*, *Hypsizygus marmoreus*, *Hypsizygus marmoreus* (white), *H. erinaceus* and *Lentinula edodes*. Then ethyl acetate-soluble extracts (Fr. L-9) of *H. erinaceus*. *Porphyromonas gingivalis* ATCC 33277, *Streptococcus mutans* MT 8148 and *S. sobrinus* 6715 were incubated with those mushroom extracts in broth and OD 595 nm in the cultures was measured. Healthy subjects (n=10) rinsed their mouths with a suspension of *H. erinaceus* extracts, cetylpyridinium chloride (CPC) and sterilized distilled water, respectively, and discharged liquids were collected at 0-5 hours after rinsing. Then bacteria in the liquids were measured by counting colony-forming units (CFU) and by quantitative polymerase chain reaction (qPCR). Extracts of *H. erinaceus* exhibited strong antimicrobial activity toward *P. gingivalis*. Fr.L-9 from *H. erinaceus* extracts also showed antimicrobial activities toward *P. gingivalis*, *S. mutans*, and *S. sobrinus*. CFU experiments showed that *S. mutans* and *P. gingivalis* were decreased by rinsing with *H. erinaceus* extracts. Results of qPCR analysis showed that rinsing with *H. erinaceus* extracts did not affect the total number of bacteria but decreased the percentage of *P. gingivalis* to total bacteria in the discharged liquids. Extracts of *H. erinaceus* have antimicrobial activities toward *P. gingivalis* and *S. mutans* and may improve the human oral microbiome from dysbiosis to symbiosis.

Biography

Matsushita Kenji has completed his PhD from Kagoshima University in Japan and Post-doctoral studies from Johns Hopkins University School of Medicine in USA. He is the Head of Department of Oral Disease Research at National Center for Geriatrics and Gerontology in Japan.

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