AADOCR
American Association for Dental, Oral, and Craniofacial Research

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Global and Temporal Oral Microbial Catalog Expands Known Microbiome Biodiversity

Alexandria, VA – A study presenting a globally and temporally comprehensive catalog of oral microbial taxa to improve our understanding of how interactions between microbial communities and host lifestyle contribute to oral health was presented at the 54th Annual Meeting of the AADOCR, which was held in conjunction with the 49th Annual Meeting of the Canadian Association for Dental Research, on March 12-15, 2025 in New York, NY.

The abstract, "Global and Temporal Oral Microbial Catalog Expands Known Microbiome Biodiversity" was presented by Irina Marie Velsko of the Max Planck Institute for Evolutionary Anthropology during the "Biology of Oral Microbiome Members" Oral Session that took place on Thursday, March 13, 2025 at 1:30 p.m. EDT (UTC-4).

The healthy human oral microbiome is comprehensively described in a subset of the global population, living primarily in urban and industrialized contexts. Whether these microbes represent the diversity of taxa present across the world and throughout human history is not defined. This study presented a globally and temporally comprehensive catalog of oral microbial taxa, providing a broad foundation for understanding how interactions between microbial communities and host lifestyle contribute to oral health. Researchers assembled oral metagenomes from non-industrial populations in Africa, Oceania, and South America (n=152), and ancient dental calculus metagenomes representing 6 continents and 100,000 years of human history (n=465), producing 6,119 and 3,100 metagenome assembled genomes (MAGs), respectively. They downloaded 10,510 publicly available oral MAGs from industrial populations in Europe, Asia, Oceania, and North America.

The study found the classes Spirochaetia, Saccharimoniadia, and Campylobacteria represented substantial numbers of new clusters. Subsequent taxonomic profiling of oral metagenomes indicated these species clusters represent a significant proportion of the taxa found globally and temporally. Over 2600 clusters are unique to individual continents, yet additional sampling may reveal more shared diversity in underrepresented regions.

This large globally- and temporally-inclusive collection of oral MAGs represents substantial unrecognized diversity that opens new avenues for studying the role of the oral microbiome in maintaining health and the transition to disease. The authors of this study are working to include this diversity in the Human Oral Microbiome Database.

About AADOCR

The American Association for Dental, Oral, and Craniofacial Research is a nonprofit organization with a mission to drive dental, oral, and craniofacial research to advance health and well-being. AADOCR represents the individual scientists, clinician-scientists, dental professionals, and students based in academic, government, non-profit and private-sector institutions who share our mission. AADOCR is the largest division of the International Association for Dental, Oral, and Craniofacial Research. Learn more at www.aadocr.org.