Species of Yeast Identified in the Plaque of Healthy Patients versus Periodontal Patients

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Introduction

Although many study the human oral cavity for bacteria, different species of yeast that are also present are often overlooked. Therefore, the different strains of yeasts found in the mouth have not yet been identified. This study focuses on developing a PCR-based technique to identify species of yeast in the mouth. The relationship between the species of yeast found in patients with periodontal disease versus healthy patients was also analyzed.

Objectives

To test the method of isolating and identifying yeast species.
To determine the pattern of yeast species in healthy versus periodontal patients.

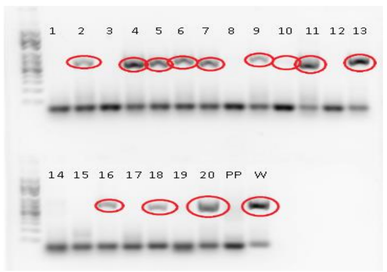
Methods

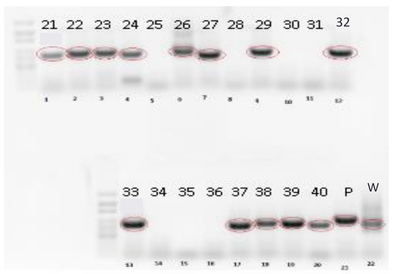
Samples of plaque from four different sites in the mouth were collected from ten patients with periodontal disease and ten patients with healthy periodontium. Plaques samples were resuspended in water and boiled to release genomic DNA. A two-step PCR method was used to amplify the internal transcribed spacer

Primer name	Forward	Reverse	Amplicon size	PCR
NESTED PCR				
NSA3f/NLC2r	AAACTCTGTCGTGCTGGGGATA	GAGCTGCATTCCCAAACAACTC	~1100 bp	1ST
NS1f/NLB4r	GATTGAATGGCTTAGTGAGG	GGATTCTCACCCTCTATGAC	~910 bp	2ND

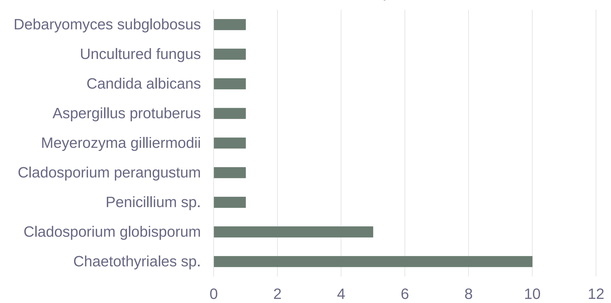
The PCR product was then separated via agarose gel electrophoresis. Amplicons with correct base pair lengths were gel-purified and sequenced. Specific species of yeasts were identified using the Basic Local Alignment Search Tool from The National Center for Biotechnology Information by comparing the sequenced DNA with a national database. The relationships between the yeast species found in healthy patients and periodontal patients were determined.

Results: Healthy Patients

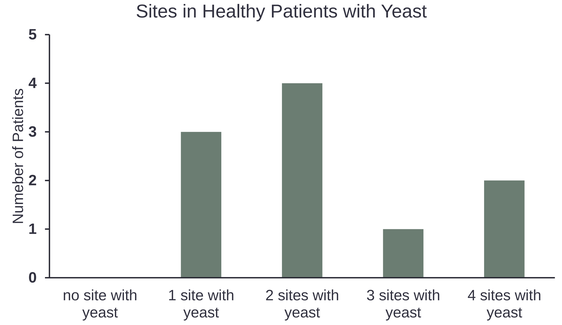




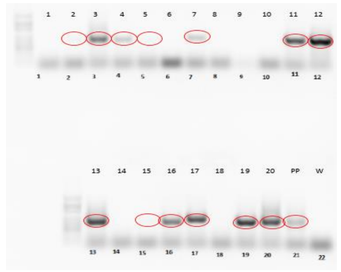
Number of Sites Found with Specific Yeast

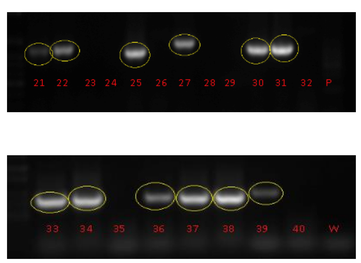


Sites in Healthy Patients with Yeast

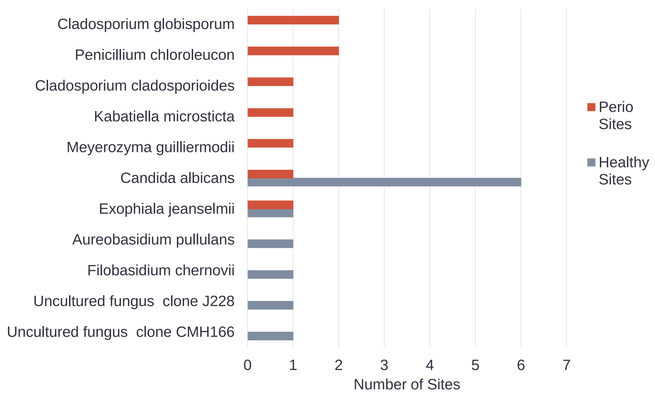


Results: Periodontal Patients

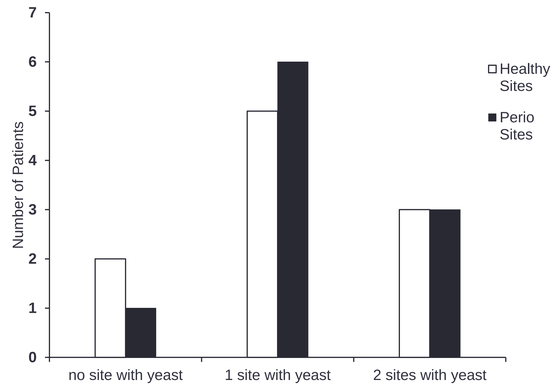




Species of Yeasts Found at Healthy and Perio Sites



Sites in Perio Patients with Yeast



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Results

Many species of yeast were identified in the plaque of healthy patients and patients with periodontal disease. The major yeast species found in the plaque of individuals with a healthy periodontium was *Chaetothyriales sp.* and *Cladosporium globisporum.* The major yeast found in the plaque from healthy sites of individuals with periodontal disease was *Candida albicans*, while *Penicillium chloroleucon* and *Cladosporium globisporum* were identified in plaque from diseased sites. In perio sites, *Chaetothyriales sp.* and *Cladosporium globisporum* do not occur together, unlike in healthy patients.

Conclusions

The developed method was able to identify yeast species found in the plaque. From the results, there appears to be a difference in the species of yeasts found in healthy patients versus periodontal patients. Further studies with a larger patient pool will give more insight on the relationship between different yeast species in healthy and periodontal patients and any possible association with oral health.

References

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2. Lauer A, Baal JD, Baal JC, Verma M, Chen JM. Detection of *Coccidioides immitis* in Kern County, California, by multiplex. PCR. Mycologia. 2012;104:62-69. 10.3852/11-127.