

Nano Particles of Babool –*Acacia Nilotica* Bark Powder Against Oral Microbiome

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Abstract

The oral microbiome is an ecosystem in itself, where some harmful bacteria that are known to cause cavities and disease. Together, both form a community called Biofilm, better known as a dental plaque. Microscopic evaluation of these biofilms indicated that *Streptococcus mutans* accounts for approximately 80% of the colonization. Chew sticks - twigs of babool (*Accacia nilotica*) nanoparticles are more promising against *Streptococcus* at 20 µg.

Keywords: Babool, biofilm, chew sticks, oral microbiome, *Streptococcus*.

Introduction

The microorganisms found in the human oral cavity have been referred to as the oral microflora, oral microbiota, or more recently as the oral microbiome. The term microbiome was coined by Joshua Lederberg “to signify the ecological community of commensal, symbiotic, and pathogenic microorganisms that literally share our body space and have been all but ignored as determinants of health and disease [1].

Microorganisms from the oral cavity cause a number of oral infectious periodontitis (gum disease), endodontic (root canal) infections, alveolar osteitis (dry socket), and tonsillitis. Aggravates to cardiovascular disease, preterm birth and pneumonia.

Many plant-derived medicines used in traditional medicinal systems have been recorded in pharmacopeias as agents used to treat infections and a number of these have been recently investigated for their efficacy against oral microbial pathogens. The general antimicrobial activities of medicinal plants and plant products, such as essential oils, have been reviewed earlier [2and3].

The experimental plant *Acacia nilotica* or *Vachelia nilotica* bark powder was extracted with distilled water

and later silver nanoparticles were made and tested against *Streptococcus* isolated from oral mouth swabs.

Materials And Method

The antimicrobial properties of Babool to treat or prevent oral diseases involved assessing the inhibiting property of the oral pathogens, *Streptococcus mutans* using disc diffusion method. The minimum inhibitory concentration MIC was detected and compared with the positive control.

A positive control Naringin, a polymethoxylated flavonoid an FDA-approved health supplement, was shown to inhibit the growth of periodontal pathogens *Streptococcus mutans* (9.8–125 mg mL⁻¹) [4]

Results

The efficacy of the babool nanoparticles was more effective than the positive control Naringin. (Table1).

Discussion

Babool bark powder fights against dental caries and gum diseases and strengthen teeth. If gargled with Babool bark, it will give relief from toothache mouth ulcer and bleeding gums.

Further, because of its anti-microbial and anti-fungal

nature, but the nanoparticles of the stem bark was more promising .

Table1: Efficacy of Babool on Oral Microbiome

S.No	Concentration of the extract μL	Zone of inhibition for bark powder of Acacia (mm)	Zone of inhibition for nanoparticles of Acacia (mm)	Positive Control Naringin
1	1	24	35	30
2	5	38	45	40
3	10	48	55	50
4	15	72	80	80
5	20	75	85	80

Conflict of interest

The authors declare no conflict of interest.

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