

# Phytotherapy for *Streptococcus mitis*

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## Abstract

The most common cause of gum disease is lack of observance of oral hygiene and the accumulation of bacterial plaque, followed by dental mass, food intake and dental restorations. Bacterial agents which cause dental plaque formation and ultimately cause tooth decay. *Streptococcus mitis* is the greatest bacterial agent isolated from dental plaque. Medicinal plants are rich in substances whose pharmacological properties are applied through potent antioxidant and bioactive substances. We tried to report medicinal plants with anti-*Streptococcus mitis* properties in this reviewing study. Searching in this reviewing study was done with words such as *Streptococcus mitis*, dental diseases, medical plants and phytotherapy. Searching was done from databases such as Scopus, ISC, SID, Magiran and several other databases. Accordingly, 9 medical plants effective on *Streptococcus mitis* are used. According to obtained results, it was determined that *Cinnamomum cassia*, *Spilanthes calva*, *Azardirachta indica*, *Acacia nilotica*, *Ocimum basilicum*, *Emblca officinalis*, *Terminalia bellirica*, *Syzygium cuminii* and *Syzygium aromaticum* medicinal plants are the most important medicinal plants with anti-*Streptococcus mytises* effects. Medicinal plants of this study have anti-*Streptococcus mitis* effects due to bioactive substances, antioxidants, flavonoids, flavones, anthocyanins, etc.

**Keywords:** Medicinal plants, dental plaque, *Streptococcus mitis*

## INTRODUCTION

Microbial plaque is one of the most common causes of dental diseases including gum disease, dental caries and periodontal diseases (1). The most common cause of gum disease is lack of observance of oral hygiene and the accumulation of bacterial plaque, followed by dental mass, food intake and dental restorations (2). Bacterial agents which cause dental plaque formation and ultimately cause tooth decay. *Streptococcus mitis* is the greatest bacterial agent isolated from dental plaque (3). Bacterial dental plaques require antibiotic treatment (4). The use of antibiotics leads to the development of antibiotic-resistant strains, hence the efforts are on replacing natural and herbal antibiotics (5). Medicinal plants have always been a source of medication for the treatment of oral and dental illness (6-9). Medicinal plants are rich in substances whose pharmacological properties are applied through potent antioxidant and bioactive substances (11-16). We tried to report medicinal plants with anti-*Streptococcus mitis* properties in this reviewing study. Medicinal plants of this study have anti-*Streptococcus mitis* effects due to bioactive substances, antioxidants, flavonoids, flavones, anthocyanins, etc.

## METHOD OF WORK

Searching in this reviewing study was done with words such as *Streptococcus mitis*, dental diseases, medical plants and phytotherapy. Searching was done from databases such as Scopus, ISC, SID, Megiran and several other databases.

## RESULTS

According to obtained results, it was determined that *Cinnamomum cassia*, *Spilanthes calva*, *Azardirachta*

*indica*, *Acacia nilotica*, *Ocimum basilicum*, *Emblca officinalis*, *Terminalia bellirica*, *Syzygium cuminii* and *Syzygium aromaticum* medicinal plants are the most important medicinal plants with anti-*Streptococcus mitis* effects. Further details in this regard have been provided in table 1.

## DISCUSSION

Infectious diseases represent one of the most important causes of mortality especially in the developing countries. The plants presented in this study and a lot of other plants have phenolic and bioactive compounds (21-27). These plants, therefore, which possess phenolic compounds, might also be effective against pathogenic microorganism.

An antibiotic is a substance that is derived from or derived from a microorganism and destroys other microorganisms or prevents them from growing. There are hundreds of natural antibiotics with varying powers of power, which requires review of medicinal plants that affect each bacterium so that we can produce effective drugs by identifying them. Antibiotics not only harm harmful microbes, but also even beneficial microbes for the body. Antibiotics can be both bactericidal and bacteriostatic. It is likely that the herbs of this study have both bacteriostatic bacteriostatic effects. Medicinal plants of this study have anti-*Streptococcus mitis* effects due to bioactive substances, antioxidants, flavonoids, flavones, anthocyanins, etc.

Table 1: Medicinal plants effective on *Streptococcus mitis*

No.	Scientific Name	Part of plant	Family Name	Common Name	Origin of plant	Country Of study	year	Bacteria	Result	ref
1	Cinnamomum cassia	bark	Lauraceae	Chinese cinnamon	Pakistan	Pakistan	In vitro 2006	human isolates of <i>Streptococcus mitis</i>	The diameter of the oil deficiency shaft of this plant for bacteria was reported to be 15 mm	(17)
2	Spilanthes calva	Floral parts	Asteraceae		India	India	In vitro 2012	Clinical isolates of <i>Streptococcus mitis</i>	The antibacterial properties of the aqueous extract of this plant have been demonstrated with a diameter of 10.3 mm inhibition zone. However, the diameter for inhibition zone in antibiotic controls of nalidixic acid was 10.3 mm and it was 10.3 mm in tetracycline	(18)
3	Azadirachta indica	Foliage	meliaceae	Neem	India	India	In vitro 2012	Clinical isolates of <i>Streptococcus mitis</i>	The antibacterial properties of the aqueous extract of this plant have been demonstrated with a diameter of 11.6 mm inhibition zone. However, the diameter for inhibition zone in antibiotic controls of ampicillin was 11.3 mm and it was 11.3 mm in gentamicin, 11.6 mm in carbenicillin, 10.3 mm in nalidixic acid, 11 mm in nitrofurantoin and 10.3 mm in Tetracycline	(18)
4	Acacia nilotica	Foliage	Fabaceae		India	India	In vitro 2012	Clinical isolates of <i>Streptococcus mitis</i>	The antibacterial properties of the aqueous extract of this plant have been demonstrated with a diameter of 11 mm inhibition zone. However, the diameter for inhibition zone in antibiotic controls of nalidixic acid was 10.3 mm and it was 11 mm in Nitrofurantoin and 10.3 mm in Tetracycline	(18)
5	Ocimum basilicum	Foliage	Lamiaceae	Basil	India	India	In vitro 2012	Clinical isolates of <i>Streptococcus mitis</i>	The antibacterial properties of the aqueous extract of this plant have been demonstrated with a diameter of 10.6 mm inhibition zone. However, the diameter for inhibition zone in antibiotic controls of nalidixic acid was 10.3 mm and it was 10.3 mm in tetracycline	(18)

Table 1(Contd): Medicinal plants effective on *Streptococcus mitis*

No.	Scientific Name	Part of plant	Family Name	Common Name	Origin of plant	Country Of study	year	Bacteria	Result	ref
6	<i>Emblica officinalis</i>	Foliage	Euphorbiaceae		India	India	In vitro 2012	Clinical isolates of <i>Streptococcus mitis</i>	The antibacterial properties of the aqueous extract of this plant have been demonstrated with a diameter of 24.6 mm inhibition zone. However, the diameter for inhibition zone in antibiotic controls of ampicillin was 11.3 mm and it was 11.3 mm in gentamicin, 11.6 mm in carbenicillin, 10.3 mm in nalidixic acid, 11 mm in nitrofurantoin and 10.3 in Tetracycline	(18)
7	<i>Terminalia bellirica</i>	Foliage	Combretaceae	Beleric	India	India	In vitro 2012	Clinical isolates of <i>Streptococcus mitis</i>	The antibacterial properties of the aqueous extract of this plant have been demonstrated with a diameter of 23 mm inhibition zone. However, the diameter for inhibition zone in antibiotic controls of ampicillin was 11.3 mm and it was 11.3 mm in gentamicin, 11.6 mm in carbenicillin, 10.3 mm in nalidixic acid, 11 mm in nitrofurantoin and 10.3 in Tetracycline	(18)
8	<i>Syzygium curminii</i>	Foliage	Myrtaceae	jambul	India	India	In vitro 2012	Clinical isolates of <i>Streptococcus mitis</i>	The antibacterial properties of the aqueous extract of this plant have been demonstrated with a diameter of 19.3 mm inhibition zone. However, the diameter for inhibition zone in antibiotic controls of ampicillin was 11.3 mm and it was 11.3 mm in gentamicin, 11.6 mm in carbenicillin, 10.3 mm in nalidixic acid, 11 mm in nitrofurantoin and 10.3 in Tetracycline	(18)
9	<i>Syzygium aromaticum</i>	Floral parts	Myrtaceae		India	India	In vitro 2012	Clinical isolates of <i>Streptococcus mitis</i>	The antibacterial properties of the aqueous extract of this plant have been demonstrated with a diameter of 19.3 mm inhibition zone. However, the diameter for inhibition zone in antibiotic controls of ampicillin was 11.3 mm and it was 11.3 mm in gentamicin, 11.6 mm in carbenicillin, 10.3 mm in nalidixic acid, 11 mm in nitrofurantoin and 10.3 in Tetracycline	(18)



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