

Phytotherapy for *Streptococcus viridans*

Leila Masoori¹, Shaghayegh Yazdani², Faranak Rezaei^{3,4*} and Mansour Amraei⁵

¹Department of Parasitology and Mycology, School of Medicine, Iran University of Medical Sciences, Tehran, Iran

²Department of Virology, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

³Department of Microbiology, School of Medicine, Lorestan University of Medical Sciences, Khorramabad, Iran

⁴Razi Herbal Medicines Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran

⁵Department of Microbiology, Biotechnology and Medicinal Plants Research Center,
Ilam University of Medical Sciences, Ilam, Iran

Corresponding author: Dr. Faranak Rezaei; Department of Microbiology, School of Medicine,
Lorestan University of Medical Sciences, Khorramabad, Iran

Abstract

The oral cavity has one of the most complex microbial properties in the body. Streptococci are the most important organisms in the mouth. Today, due to the resistance of the bacteria and the ability of bacteria to cause acute infections, the use of medicinal herbs and effective natural products has become widespread. Therefore, in this study, we tried to report medicinal herbs that have anti-*Streptococcus viridans* properties. In the current review, the articles were searched with keywords of Streptococcus viridians, dental diseases, herbs and phytotherapy. Searching was carried out for databases including Scopus, ISCs, SIDs, Magnets, and a number of other databases. Based on the results of the review, it was revealed that the herbs including Schinus terebinthifolius, Rosmarinus officinalis, Hyptis pectinata, Wilbrandia sp, Amaryllis belladonna, Lajoensia pacari, Hematanthus phagedaenicus, Achyrocline satureioides, Dorstenia sp, Boerhaavia coccinea and Copaifera sp are the most important medicinal plants with anti-*Streptococcus viridans* effect. The medicinal plants have the anti-*Streptococcus viridans* effects due to the bioactive substances, antioxidants, flavonoids, flavones, anthocyanins, etc.

Keywords: Oral Infections, *Streptococcus viridans*, Medicinal Plants

INTRODUCTION

Oral infections are one of the most common causes of human health threats, which are the main causes of the generation and distribution of various microorganisms that naturally live in the mouth. The oral cavity has one of the most complex microbial properties in the body. Streptococci are the most important organisms in the mouth (1). *Streptococci viridians* are have a nonlinear classification comprising a large group of alphasic hemolytic Streptococci in oral cavity. *Streptococci viridians* do not have Lancefield Group antigens. They have little pathogenicity (2). Oral and dental infections and the prevention of systemic diseases such as infective endocarditis require the use of a variety of antibiotics (3,4). Selection of an appropriate antibiotic in hospitals in addition to the optimal treatment of the disease, can also reduce the complications of the disease, reduce the duration of the disease, reduce the cost of treatment, and reduce the types of resistant bacteria that can be treated, and can also complicate antibiotics (5- 7). Controlling the amount of decay microorganisms reduces tooth decay (8). Despite the fact that many antimicrobial agents are effective in controlling and removing dental plaque, but due to the problems with the procedure and the various factors within the mouth, few of them demonstrate the clinical effects, or some of them cause many side effects in long-term usage (9). Today, due to the drug resistance and the ability of the

bacteria to cause acute infections, the use of medicinal herbs and effective natural products has become widespread (13-13). Medicinal plants are used due to the richness in medicinal and antioxidant substances with special effects (22-42) and in the treatment of various diseases (23-26). In this study, we tried to report medicinal herbs that have anti-*Streptococcus viridans* effects.

METHODS

In the current review, the articles were searched with words of *Streptococcus viridians*, dental diseases, herbs and phytotherapy. Searching was carried out from databases including Scopus, ISCs, SIDs, Magnets, and a number of other databases.

RESULTS

Accordingly, 11 effective herbal medicines on *Streptococci viridians* are used. Based on the results of the review, it was revealed that the herbs of Schinus terebinthifolius, Rosmarinus officinalis, Hyptis pectinata, Wilbrandia sp, Amaryllis belladonna, Lajoensia pacari, Hematanthus phagedaenicus, Achyrocline satureioides, Dorstenia sp, Boerhaavia coccinea and Copaifera sp are the most important medicinal plants with anti-*Streptococcus viridans* effect. Further details are given in Table 1 .

Table 1. Medicinal herbs effective on *Streptococcus viridans*

No.	Scientific Name	Part of plant	Family Name	Common Name	Origin of plant	Country Of study	year	Bacteria	Result	ref
1	Schinus terebinthifolius	Wood bark	Anacardiaceae	Brazilian peppertree	Brazil	Brazil	In vitro 2002	<i>Streptococcus viridans</i>	Antibacterial effect of ethanolic extract of this herb was 18.33 mm in diameter without growth.	(27)
2	Rosmarinus officinalis	Leaves	Labiatae	Rosemary	Brazil	Brazil	In vitro 2002	<i>Streptococcus viridans</i>	Antibacterial effect of ethanolic extract of this plant was 13.33 mm in diameter.	(27)
3	Hyptis pectinata	Leaves	Labiatae		Brazil	Brazil	In vitro 2002	<i>Streptococcus viridans</i>	Antibacterial effect of ethanolic extract of this plant was 13.6 mm in diameter.	(27)
4	Wilbrandia sp	Roots	Cucurbitaceae		Brazil	Brazil	In vitro 2002	<i>Streptococcus viridans</i>	Antibacterial effect of ethanolic extract of this plant was 12 mm in diameter.	(27)
5	Amaryllis belladonna	Rhizome	Amarillidaceae	Jersey lily	Brazil	Brazil	In vitro 2002	<i>Streptococcus viridans</i>	Antibacterial effect of ethanolic extract of this plant was 10.3 mm in diamete.	(27)
6	Lafoensia pacari	Roots	Lythraceae		Brazil	Brazil	In vitro 2002	<i>Streptococcus viridans</i>	Antibacterial effect of ethanolic extract of this plant was 15 mm in diameter without growth.	(27)
7	Hematanthus phagedaenicus	Leaves and aerial part	Apocynaceae		Brazil	Brazil	In vitro 2002	<i>Streptococcus viridans</i>	Antibacterial effect of ethanolic extract of this plant was 10.7 mm in diameter.	(27)
8	Achyrocline satureioides	Flowers	Compositae	Macela	Brazil	Brazil	In vitro 2002	<i>Streptococcus viridans</i>	Antibacterial effect of ethanolic extract of this plant was 14.3 mm in diameter without growth.	(27)
9	Dorstenia sp	Roots	Moraceae		Brazil	Brazil	In vitro 2002	<i>Streptococcus viridans</i>	Antibacterial effect of ethanolic extract of this plant with a diameter of 1.5 mm inhibition zone.	(27)
10	Boerhaavia coccinea	Roots	Nictaginaceae	scarlet spiderling	Brazil	Brazil	In vitro 2002	<i>Streptococcus viridans</i>	Antibacterial effect of ethanolic extract of this plant was 11.3 mm in diameter.	(27)
11	Copaifera sp	Leaves and Flowers	Leguminoseae		Brazil	Brazil	In vitro 2002	<i>Streptococcus viridans</i>	The antibacterial property of the essential oil of this plant was 11.5 mm in diameter without growth.	(27)

DISCUSSION

Oral hygiene is one of the most important aspects of everyday life, which, if not done properly, causes gingivitis and severe tooth pain. Dental infections are sometimes so dangerous that they will be at the expense of human lives if they do not pay attention. (28) Several factors such as inappropriate health and misuse of oral and dental wasting, inappropriate food selection, inheritance and lack of medical and specialized oral and dental care can contribute to the development of tooth plaque (29). Maintaining proper oral and dental health is the only way to prevent tooth decay and damage caused by it. One of the easy ways to maintain oral hygiene is the use of medicinal herbs. Traditionally, vegetables, fruits include apple, hawthorn, celery, strawberries, walnut shells, etc., to remove dental plaque and tooth decay infectious agents (30,31). Medicinal plants are rich in active and bioactive and antioxidant substances that have therapeutic properties. Medicinal plants have antimicrobial effects on dental agents and dental plaque due to their active compounds (32-38). Medicinal plants have the of anti-*Streptococcus viridans* effects due to the bioactive substances, antioxidants, flavonoids, flavones, anthocyanins, etc.

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