
Document heading: Review Article

A Review: Herbal Remedies Used For The Treatment of Mouth Ulcer

Shubham Mittal¹, Ujjwal Nautiyal^{1*}

¹Himachal Institute of Pharmacy, Paonta Sahib, Sirmour, India

Received: 28-10-2018 / Revised: 30-12-2018 / Accepted: 20-01-2019

Abstract

The mouth ulcer often caused pain and discomfort and may alter the person choice of food while healing occurs. The two most common oral ulceration are Local trauma and Aphthous stomatitis. This review focuses on the causes of mouth ulcer, factors responsible for the mouth ulcer. As we know herbal medicine is the main stay of primary healthcare because of better culture acceptability, better compatibility with human body and lesser side effects. This review summarises about the drugs used for the treatment of mouth ulcer which are *Aloe vera*, *Guava*, *Capsicum annum*, *Papaya*, *Glycyrrhiza glabra*, *Turmeric*, Noni fruit along with their Biological source, Family, Morphology, Chemical constituents and Uses.

Keywords: Oral ulceration, Local trauma, Aphthous stomatitis.

Introduction

A mouth ulcer (also termed an oral ulcer, or a mucosal ulcer) is an ulcer that occurs on the mucous membrane of the oral cavity [1,2]. They are painful round or oval sores that form in the mouth, mainly on the inside of the cheeks or lips. Mouth ulcers are very common, and they occur in association with many diseases and by different mechanisms, but usually there is no serious underlying cause [3]. Common causes of mouth ulcers include nutritional deficiencies such as iron, vitamins especially B₁₂ and C, poor oral hygiene, infections, stress, indigestion, mechanical injury, food allergies, hormonal imbalance, skin disease etc. Mouth ulcers, also known as aphthous ulcers, can be painful while eating, drinking or brushing teeth [4,5].

Types of Mouth Ulcer

On the basis of ulcer size and number, mouth ulcer can be classified as minor, major and herpetiform [6,7]. The main types of mouth ulcer are:

Minor ulcers: These are around 2-8mm in diameter and they usually clear up in 10 days to 2 weeks.

Major ulcers: These are bigger and deeper, often with a raised or irregular border. This type of ulcer can take several weeks to heal and may leave a scar in the mouth [8,9].

Herpetiform ulcers: This type of ulcer is a cluster of dozens of smaller sores about the size of pinheads [10].

Ulcerative Conditions: Mouth ulcers are very common and are mainly due to trauma such as from ill-fitting dentures, fractured teeth, or fillings. However, biopsy or other investigation should be done for patients with an ulcer of over three weeks duration to exclude malignancy or other serious conditions such as chronic infections [11,12].

*Correspondence

Dr. Ujjwal Nautiyal

Associate Professor

Himachal Institute of Pharmacy,

Paonta Sahib, Sirmour, India

E.Mail: ujjwal_nautiyal@rediffmail.com

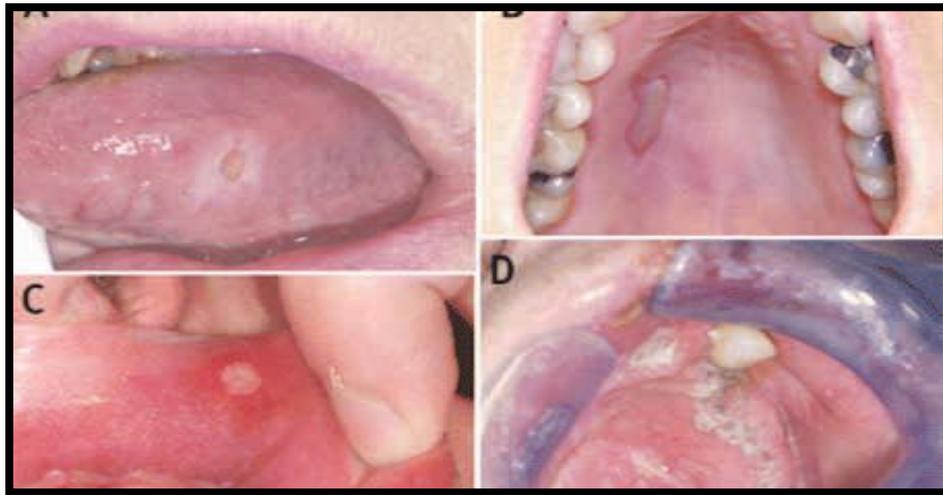


Fig No.1: Mouth Ulcer in Oral Cavity

Causes of oral ulcers

Microbial Disease	Malignant Neoplasms
Herpetic stomatitis	Blood disorder <ul style="list-style-type: none"> • Anaemia • Leukaemia • Neutropenia • Other white cell dyscrasias
Chickenpox	Gastrointestinal disease <ul style="list-style-type: none"> • Coeliac disease • Ulcerative colitis • Crohn’s disease
Herpes zoster	Rheumatoid Diseases <ul style="list-style-type: none"> • Lupus erythematosus
Hand, foot and mouth diseases	
HIV infections	
Fungal infections	

Factors responsible for the mouth ulcers

- Toothpastes and mouthwashes that contain sodium lauryl sulfate
- Emotional stress / Psychic stress
- Hormonal changes
- Nutritional deficiencies

- Mechanical trauma
- Viral infections
- Allergies and sensitivities
- Genetics
- Infectious agents (both bacterial and viral)
- Medical conditions [13,14].

Herbal Remedies for Mouth Ulcer

Phytogenic agents are traditionally used by herbalists and indigenous healers for the prevention and treatment of ulcer. This article reviews the anti-ulcer properties of the most commonly employed herbal medicines and their identified active constituents [15,16]. Botanical compounds with anti-ulcer activity include flavonoids (i.e. quercetin, naringin, silymarin, anthocyanosides, sophoradin derivatives) saponins (i.e. from *Panax japonicus* and *Kochia scoparia*), tannins (i.e. from *Linderaeumbellatae*), gums and mucilages (i.e. gum guar and myrrh). Among herbal drugs, liquorice, aloe gel and capsicum (chilli) have been used

extensively. Ethnomedical systems employs several plant extracts for the treatment of ulcer [17,18].

Advantages of herbal medicines

- Herbal medicines have a long history of use and better patient tolerance and public acceptance.
- Medical plants have a renewable source, so that we can have sustainable supplies of cheaper medicines for the worlds growing population [19].
- Because of the rich agro-climatic, cultural and ethnic biodiversity of developing countries like India availability of medicinal plants is not a problem.
- The cultivation and processing of medicinal herbs are eco-friendly.
- Prolong and apparently uneventful use of herbal medicines is safe and efficacious [20].

Table No. 1: Herbs used for the treatment of mouth ulcer

Common Name	Botanical Name	Parts Used	Uses
Aloe vera	<i>Aloe barbadensis</i>	Leaves, flowers, stems, roots, fruits, seed.	analgesic, antibacterial, antiviral, antifungal, antioxidant immune modulating, antiseptic, anti-inflammatory.
Guava	<i>Psidium guajava</i>	Leaves, roots, fruits.	Guavas are extensively used to make candies, preserves, jellies, jams.
Capsicum	<i>Capsicum annum</i>	Fruit	As a spice: the sweeter variety are called as bell peppers and the hot ones as chillies. In GI disorders: Intestinal gas, upset stomach, cramps, stomach pain, diarrhea etc.
Papaya	<i>Carica papaya</i> Linn	bark, leaves and fruit	Papain is used extensively for tenderizing meat. Another use of this enzyme is an ingredient in cleansing solution for soft lenses. Papain is used as digestant for protein.
Turmeric	<i>Curcuma longa</i>	Rhizomes and stem	canned beverages, baked products, dairy products, ice cream, yogurt, yellow cakes, orange juice, biscuits, popcorn color, cereals, sauces, and gelatine.
Liquorice	<i>Glycyrrhiza glabra</i> L.	Roots and stolon	tonic, demulcent laxative emollient are used in genito-urinary diseases.
Noni fruit	<i>Morinda citrifolia</i> linn	Fruit	abnormal menstruation, acne/ boils, constipation, diarrhea, arthritis, diabetes, fever, high blood pressure, gastric ulcers.

Aloe vera: The biological source of Aloe vera is *Aloe barbadensis*. It belongs to the family Xanthorrhoeaceae.

Morphology: Aloe vera is a stemless or very short-stemmed plant growing to 60–100 cm (24–39 in) tall, spreading by offsets. The leaves are thick and fleshy, green to grey-green, with some varieties showing white flecks on their upper and lower stem surfaces. The margin of the leaf is serrated and has small white teeth. The flowers are produced in summer on a spike up to 90 cm (35 in) tall, each flower being pendulous, with a yellow tubular corolla 2–3 cm (0.8–1.2 in) long. Like other Aloe species, Aloe vera forms arbuscular mycorrhiza, a symbiosis that allows the plant better access to mineral nutrients in soil.

Plant part used: Leaves, flowers, stems, roots, fruits, seed.

Chemical constituents: The chemical constituents in Aloe vera are Anthraquinones, Saccharides, Prostaglandins and fatty acids. Others: Enzymes, amino acids, vitamins, minerals. Other compounds: Cholesterol, triglycerides, steroids, uric acid, lignins, beta-sitosterol, gibberellin, salicylic acid.

Uses: It is analgesic, antibacterial, antiviral, antifungal, antioxidant immune modulating, antiseptic, anti-inflammatory. Aloe vera is used in the sites of periodontal surgery, toothpick injuries, chemical burns, aphthous ulcers, gum abscesses, dry socket, lichen planus, benign pemphigus and gingival problems associated with AIDS, leukemia, migratory glossitis, geographic tongue and burning mouth syndrome, denture sore mouth, candidiasis, desquamative gingivitis, vesiculobullous diseases, acute monocytic leukemia, xerostomia [21].

Guava: The biological source of Guava is *Psidium guajava*. It belongs to family Myrtaceae.

Morphology: Guava fruits, usually 4 to 12 centimetres (1.6 to 4.7 in) long, are round or oval depending on the species. They have a pronounced and typical fragrance, similar to lemon rind but less sharp. The outer skin may be rough, often with a bitter taste, or soft and sweet. Varying between species, the skin can be any thickness, is usually green before maturity, but may be yellow, maroon, or green when ripe. The pulp inside may be sweet or sour and off-white ("white" guavas) to deep pink ("red" guavas). The seeds in the central pulp vary in number and hardness, depending on species.

Plant part used: Leaves, roots, fruits.

Chemical constituents: Guava leaves contain both carotenoids and polyphenols like (+)-galocatechin and leucocyanidin. As some of these phytochemicals produce the fruit skin and flesh color, guavas that are red-orange tend to have more polyphenol and carotenoid content than yellow-green ones.

Uses: Because of its high level of pectin, guavas are extensively used to make candies, preserves, jellies, jams, and marmalades (such as *Brazilian goiabada* and Colombian and Venezuelan bocadillo), and as a marmalade jam served on toast. Red guavas can be used as the base of salted products such as sauces, substituting for tomatoes, especially to minimize acidity. A drink may be made from an infusion of guava fruits and leaves, which in Brazil is called chá-de-goiabeira, i.e., "tea" of guava tree leaves, considered medicinal [22].

Capsicum annuum L. Capsicum consists of dried fruits of *Capsicum annuum* and also of small sized dried fruits of *Capsicum frutescens*. It belongs to Family Solanaceae.

Morphology: The single flowers are an off-white (sometimes purplish) color while the stem is densely branched and up to 60 cm (24 in) tall. The fruit are berries that may be green, yellow, orange or red when ripe. While the species can tolerate most frost-free climates, *C. annuum* is especially productive in warm and dry climates.

Plant part used: Fruit.

Chemical constituents: The chemical constituents of *Capsicum annuum* are capsaicin, paprika oleoresin, and Dihydrocapsaicin.

Uses: Capsicum is useful in many ways in many conditions as follows: As a spice: the sweeter variety are called as bell peppers and the hot ones as chillies. In GI disorders: Intestinal gas, upset stomach, cramps, stomach pain, diarrhea etc. In cardiovascular disorders: Prevents heart disorders and improves blood circulation and helps decrease blood cholesterol. In skin disorders: Due to its counter irritant property it is used in the form of ointments, plasters etc to treat rheumatism, shingles, lumbago etc. In neuronal disorders: It is used to relieve nerve pain associated with diabetes, HIV, fibromyalgia and back pain.

Capsicum has been used extensively for the treatment of mouth ulcer [23].

Papaya: The biological source of papaya is *Carica papaya* Linn. It belongs to the family Caricaceae and well known for various medicinal properties. The fruits are reported to possess antiulcer activity. The seeds are reported to exert antimicrobial, anthelmintic, antiamoebic properties.

Morphology: Papaya plant is a large, single-stemmed herbaceous perennial tree having 20–30 feet height (Fig. 1). The leaves are very large (upto 2 ½ feet wide), palmately lobed or deeply incised with entire margins and petioles of 1-3 feet in length. Stems are hollow, light green to tan brown in color with diameter of 8 inches and bear prominent scars.

Plant part used: bark, leaves and fruit.

Chemical constituents: The papaya's principal active ingredient, papayina, is a powerful digestive it very useful in different uses. The fruit is rich in vitamins C and E and minerals (especially potassium). Contains papain and chymopapain, strong proteolytic enzymes.

Uses: Papain is the dried and purified latex of the fruit of *Carica papaya*. Papain is substance which contains a mixture of proteolytic enzymes found in the unripe fruits of papaya tree. Papain is used extensively for tenderizing meat. Another use of this enzyme is an ingredient in cleansing solution for soft lenses. Papain is used as digestant for protein because it has an action much like that of pepsin. It is used to relieve the symptoms of episiotomy that acts on the casein of milk [24].

Turmeric: The biological source of Turmeric is *Curcuma longa* which belongs to the family Zingiberaceae. Evaluation of turmeric has been done for gastric and duodenal antiulcer activity in rats. Volatile oil of *Curcuma longa* possess anti-inflammatory and anti-arthritis activities. Water and fat soluble extracts of curcumin exhibited strong antioxidant activity comparable to vitamins C and E. **Morphology:** Turmeric is a perennial herbaceous plant that reaches up to 1 m (3 ft 3 in) tall. Highly branched, yellow to orange, cylindrical, aromatic rhizomes are found. The leaves are alternate and arranged in two rows. They are divided into leaf sheath, petiole, and leaf blade. From the leaf sheaths, a false stem is formed. The petiole is 50 to 115 cm (20–45 in) long. The simple leaf blades are usually 76 to 115 cm (30–45

in) long and rarely up to 230 cm (91 in). They have a width of 38 to 45 cm (15 to 18 in) and are oblong to elliptical, narrowing at the tip.

Plant part used: Rhizomes and stem

Chemical constituents: Phytochemical components of turmeric include diaryl heptanoids, a class including numerous curcuminoids, such as curcumin, demethoxycurcumin, and bisdemethoxycurcumin. Curcumin constitutes up to 3.14% of assayed commercial samples of turmeric powder (the average was 1.51%); curry powder contains much less (an average of 0.29%). Some 34 essential oils are present in turmeric, among which turmerone, germacrone, atlantone, and zingiberene are major constituents.

Uses: Most turmeric is used in the form of rhizome powder to impart a golden yellow color. It is used in many products such as canned beverages, baked products, dairy products, ice cream, yogurt, yellow cakes, orange juice, biscuits, popcorn color, cereals, sauces, and gelatin. It is a principal ingredient in curry powders. Although typically used in its dried, powdered form, turmeric also is used fresh, like ginger. It has numerous uses in East Asian recipes, such as pickle that contains large chunks of soft turmeric, made from fresh turmeric [25].

***Glycyrrhiza glabra* L., *Glycyrrhiza glabra* L.,** is a sweet, moist, soothing, flavouring herb commonly known as Liquorice belonging to the family Fabaceae.

Morphology: it is a herbaceous perennial, growing to 1 metre (39 in) in height, with pinnate leaves about 7–15 cm (3–6 in) long, with 9–17 leaflets. The flowers are 0.8–1.2 cm (1/3–1/2 in) long, purple to pale whitish blue, produced in a loose inflorescence. The fruit is an oblong pod, 2–3 cm (3/4–1 1/8 in) long, containing several seeds. The roots are stoloniferous.

Plant part used: Roots and stolon

Chemical constituents: The roots of *Glycyrrhiza glabra* Linn. contain glycyrrhizin, which is a saponin that is 60 times sweeter than cane sugar; Flavonoid rich fractions include liquiritin, isoliquirtin, liquiritigenin and rhamnoliquiritin and five new flavonoids-glucoliquiritin apioside, prenyllicoflavone A, shinflavanone, shinpterocarpin and 1-methoxyphaseolin isolated from dried roots 13. Isolation and structure determination of licopyranocoumarin, licoaryl coumarin, glisoflavone and new coumarin-GU-12 also isolated. Four new isoprenoid-substituted phenolic constituents – semilicoisoflavone B, 1-

methoxyfolicolinol, isoangustone A, and licoriphenone isolated from roots.

Uses: This plant species are reported in the literature for its biological activities such as: anti-inflammatory and expectorant, controls coughing and has hormonal effects. It detoxifies and protects the liver. Medicinally, it is used internally for Addison's disease, Asthma, Bronchitis, Peptic ulcer, Arthritis, Allergic complaints and steroid therapy. Externally, liquorices are used for Eczema, Herpes and Shingles. Liquorice decreases serum testosterone level in women and is beneficial in aplastic anemia. Since, liquorice extract is used in auto-immune conditions and has therapeutic benefit in immunodeficiency conditions like AIDS. Components of licorice root have both estrogenic and anti-estrogenic activity. It is thus, an important herb for treating hormone-related female problems. It is used as an energy tonic, particularly for the spleen and stomach, and the root is added to many formulae. Roots of *Glycyrrhiza glabra* being tonic, demulcent laxative emollient are used in genito-urinary diseases [26].

Noni Fruit: Noni (*Morinda citrifolia* Linn.) also known as Indian Mulberry, Nuna, Cheese fruit, Tookunja, Great morinda, Mouses'pineapple, Yellow root, belonging to family Rubiaceae.

Morphology: It is an evergreen tree having stem diameter of 13 cm. Sapwood is yellowish-brown soft in nature and the bark is of gray or brown color smoothish to slightly rough in nature. Twigs are light green and four-angled.

Part used: fruit

Chemical constituents: The anthraquinones, flavonoids and phenolics are the major groups of secondary metabolites responsible for the therapeutic activities of the plant Indian Mulberry [24]. Oligo- and polysaccharides, glycosides, alkaloids components, octoanoic acid, potassium, vitamin C, terpenoids, anthraquinones (nordamnacanthal, morindone, rubiadin, and rubiadin, methyl ether, anthraquinone glycoside), carotene, vitamin A, flavones glycosides, linoleic acid, alizarin, amino acids, acubin, L-asperuloside, caproic acid, caprylic acid, ursolic acid, rutin, and a putative proxeronine are mainly present in Noni.

Uses: Noni fruit juice traditionally has been used in different disorders such as abnormal menstruation,

acne/ boils, constipation, diarrhea, arthritis, diabetes, fever, high blood pressure, gastric ulcers, sprains, mental depression, senility, poor digestion, atherosclerosis, blood vessel problems, and drug addiction [27].

Conclusion

From this review it is clear that medicinal plants play a vital role in the treatment of mouth ulcer. The anti ulcer activities probably due to the presence of flavanoids in herbal plants due to their better compatibility with human body and lesser side effects. The herbal medicine is the best choice for the treatment of mouth ulcer due to the presence of chemical constituents which are naturally available and with their great uses and healing effects.

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Source of Support:Nil

Conflict of Interest: Nil