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## A review on *Terminalia bellirica* and *aloe barbadensis*

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### Abstract

Many medicinal plants are used in Ayurveda to treat disorders such as obesity, diarrhoea, digestive system weakness, greying of hair, kidney stones, memory loss, ageing, eye sight strengthening, immunity building, and many other diseases. The fruits of *Terminalia bellirica* have therapeutic properties. These have laxative, astringent, anthelmintic, and antipyretic properties. Hepatitis, bronchitis, asthma, dyspepsia, piles diarrhoea, coughs, hoarse of the voice, eye disease, Scorpio-sting, and hair tonic are all treated with its fruits. The fruit's pulp can help with dysentery, diarrhoea, dropsy, piles, and leprosy. Purgatives are made from half-ripe fruit. The fruit's kernel is narcotic. *A. barbadensis* is a natural product that is currently widely utilized in cosme, despite the fact that there are several indications for its usage. In Ayurveda, *Aloe barbadensis* is called as Kumari or Grit Kumari. This article provides a brief overview of *T. belerica* and *A. barbadensis*.

**Keywords:** Aloe vera, bibhitak, aloe vera bibhitak, aloe barbadensis, *Terminalia bellirica*, ghritkumari

### 1. Introduction

Ayurveda is one of the oldest systems of medicine, and it has been used to prevent and treat disease for thousands of years. It is believed that around 25% of all prescription medications currently in use are made from plants, <sup>[1]</sup>. Furthermore, between 1981 and 2006, nearly 75% of novel anti-cancer medications were derived from plant compounds <sup>[2]</sup>. *Terminalia bellirica* is an Ayurvedic herb that has been utilized for both preventative and medicinal purposes. Bheda is made out of dried fruit pericarp. Triphala is made up of Bheda, Amla, and Hard. *Terminalia bellirica* Roxb. Is a huge deciduous tree with widely elliptical leaves <sup>[3]</sup>. It contains antibacterial, antioxidant, and anthelmintic proper <sup>[4, 5]</sup>. It is widely used all throughout the world, particularly in India, Sri Lanka, Pakistan, Nepal, and Southeast Asia. Because of the vast range of pharmaco. Properties linked with the biological active secondary metabolites present in Terminalia, it is used in the medicinal system. Alkaloids, coumarins, flavones, steroids, lignans, tannins, glycosides, terpenoids, saponin, and other phytochemicals have been identified from diverse parts of plants <sup>[6]</sup>. *A. barbadensis*, on the other hand, is well-known for its health, beauty, therapeutic, and skin-care benefits. The name aloe vera comes from the Arabic word ALLOEH, which means bright bitter stuff, and Vera, which means plant <sup>[7]</sup>. Aloe vera as an herbal medicine in the treatment of metabolic syndrome <sup>[8]</sup>.

#### 1.1 Bibhitaki

Baheda and Bibhitaki are other names for *T. belerica* <sup>[7]</sup>.

Botanical names	<i>Terminalia bellirica</i>
Family	Combretaceae

#### 1.1.2 Gana <sup>[9]</sup>

Acharya charka	Jawarhar, Virechanopag
Acharya sushrut	Triphala, Mustadi

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### 1.1.3 Vernacular names

**Table 1:** Vernacular names

Hindi	Bahera, Bhera, Buhura
English	Belleric Myrobalan
Sanskrit	Aksa, Akshka, Vibhitak
Kashmiri	Babelo, Balali
Kannad	Tanrekai
Gujrati	Bahedan, Baheda Munjhad, Bahedo, Baheda
Marathi	Behera, Bhira
Urdu	Bahera
Malayalam	Tannikka, Thani
Telegu	Tani, Tandi

### 1.1.4 Habitat

India, Madhya Pradesh, U.P., Punjab, Maharashtra and Sri Lanka, as well as Malaya [10, 11].

### 1.1.5 Classified by the size of the fruits [9]

1. Large fruits
2. Very few fruits

### 1.1.6 Macro level features [12]

Color: A slightly silvery hairy surface covers fresh ripe fruit. Ripe fruit is wrinkled and dark or greyish brown.

1. Spherical to oval shape.
2. 2.5–4cm Diameter
3. Typical scent [9].

### 1.1.7 Chemical constituents [13-19]

**Table 2:** Chemical constituents

Fruit	Gallic acid, ellagic acid, $\beta$ -sitosterol 22, 23. Taintermilignan, thannilignan, 7-hydroxy-3',4'-(methylenedioxy) flavones, anolignan B 5,
Seed	Seed contained 12.28% oil on dry basis; Moisture, Epigallocatechin gallate, ash and crude fiber contents of the seed kernel were found to be 8.43, 2.54, and 8.78% respectively Cardenolide, cannogenol 3-O-D galactopyranosyl 14-O-L-rhamnopyranoside and phospholipids 14, 13
Plant Body	Tannins, ellagic acid, ethyl gallate, galloyl glucose and chebulagic acid, Beta sitosterol, tannins, Coloring matter, resins and a greenish yellow oilphenyllembin, $\beta$ -sitosterol, mannitol, glucose, fructose and rhamnose

### 1.1.8 Ras panchak [20]

**Table 3:** Ras panchak

Ras	Kasaya
Gun	Ruksha, Laghu
Virya	Ushan
Vipak	Madhur
Karma	Caksusya, Kesya, Rasayan.

### 1.1.9 Doshkarma

Tridoshar. Mainly used to cure kapha dosh [12].

### 1.1.10 Mala karma

BHEDANA karma due the presence of chemical constituents in this plant it will forcefully eliminate Mala (metabolic by-products) in either consolidated or unconsolidated form, [12]

### 1.1.12 Standards

Total ash: not more than 4.5

LOD: not more than 10%

Acid insoluble ash: not more than 0.2%

Alcohol soluble extractives: not less than 17.0%

Water soluble extractives: not less than 26.0% [10]

### 1.1.13 Therapeutic Properties

#### 1. Circulatory System

Because of its astringent proper. It is employed as a blood coagulant, [9]. An astringent is a substance that causes the body's tissues to contract or shrink.

#### 2. Analgesic activity [21-23]

It serves as an analgesic by lowering acetic acid secretion [24]. Acetic acid causes an inflammatory response in the abdominal cavity, followed by nociceptors activation.

#### 3. Dyspepsia and Diarrhoea

Due to astringent property of *Terminalia bellirica* provides treatment from dyspepsia and diarrhoea, [10, 25, 26]

#### 4. Purgative property

The presence of Fixed oil gives the half-ripe fruit its purgative property. The hydrolysis of the oil produces an irritating recipe. Oil is utilised in the production of soap. Gum is a demulcent and purgative substance [10].

#### 5. KAS- SWASH

Because of its Chedan karma, *Terminalia bellirica* is utilised to treat kas swash illnesses [12].

#### 6. Antimicrobial

Tannins in *T. belerica* fruit extract may hinder the development of germs by precipitating microbial protein and rendering nutritious proteins inaccessible to them [7], [27-32].

#### 7. Satmikaran

Madhur Vipak is Rasa, Rakta, Mansa, Medogami, and Dhaturvardhak because of it. Astringent is a property that causes something to shrink or constrict. *Terminalia bellirica* is used for the kas swash disorders due to its Chedan karma [12].

#### 8. Antihypertensive effects

*Terminalia bellirica* reduces blood pressure by acting as a Ca<sup>++</sup> antagonist, providing a solid mechanism foundation for its usage as a hypertension treatment [33-34].

#### 9. Protective

The presence of Gallic acid in *Terminalia bellirica* makes it beneficial in the treatment of liver and kidney damage [35-38]

#### 10. Haemostatic

Its antisecretory properties aid to stop blood flow in a burst blood vessel [24, 39].

#### 11. Antioxidant

Many natural antioxidants, including as ellagic acid and gallic acid, have been found in *T. belerica* fruits, giving it antioxidant properties. It is also antifungal [40-44].

#### 1.1.14 Therapeutic uses

1. In the Asmary (Kidney Stone), the powder of bibhitak seed is combined with honey.
2. The bibhitak Maja's lepa is used in all kinds of soth, dah.
3. Bibhitak majja is triturated with water until it forms a paste, which is then used in pit jvar and relieve dah

shanti.

- Equal amounts of bibhitak and asv gandha powder are mixed with gud (jaggery) and taken with ushnodak, which is excellent for haridiyagat vat.
- The bibhitak phal majja paste is heated in the granthi visarp portion.<sup>[12]</sup>

### 1.1.15 Part used

Phal, Phal Maja.

### 1.1.16 Matra

Churn 1-2 gram

### 1.1.17 Formulations

**Table 4:** Formulations

1.	Bibhitak tail
2.	Phaltrikadi Kwath
3.	Lavangadivati
4.	Triphala.

### 1.1.18 Substitute

In the tanning industry, fruit is used as a substitute for *Terminalia chebula*<sup>[12]</sup>.

### 1.2 Aloe barbadensis

Immune modulation, anticancer, antioxidation, wound healing and bone proliferation stimulation, neuroprotection, and digestive health are just a few of the properties of aloe vera<sup>[45-47]</sup>. It has gastroprotective, anticancer, and anti-diabetes properties<sup>[48]</sup>. Ingestion of aloe preparation causes diarrhoea, hypokalemia, kidney failure, phototoxicity, and hyper. Rexn<sup>[49]</sup>. It also has antibacterial properties<sup>[50]</sup>. It comprises a carboxy that inactivate bradykinin *in vitro*, salicylates, and a chemical that inhibits thromboxane production *in vivo*, among other pharmacologically active substances. Aloe vera may help to reduce pain and the severity of muco. Issues<sup>[51]</sup>.

**Table 5:** *Aloe barbadensis*

Botanical name <sup>[9]</sup>	<i>Aloe barbadensis</i>
Family	Liliaceae

**Table 8:** Chemical components

<b>Vitamins</b>	<b>Antioxidants A (beta-carotene), vitamins C and E are available. Free radicals are neutralized by antioxidants.</b>
Anthraquinones	Anthraquinones Contains 12 anthraquinones, phenolic chemicals used in the past as laxatives.
Sugars	Monosaccharides (glucose and fructose) and polysaccharides (glucose and fructose): (glucomannans/polymannose). Mucopolysaccharides are polysaccharides produced from the mucilage layer of the plant. Mannose-6-phosphate is the most common monosaccharide, while glucomannans [beta-(1, 4)-acetylated mannan] are the most common polysaccharides. Acemannan, a well-known glucomannan, was also discovered. Aloe vera gel has recently produced an antiallergic glycoprotein called alprogen, as well as a new anti-inflammatory chemical called C-glycosyl chromone.
Enzymes	Aliaase, alkaline phosphatase, amylase, brady kinase, carboxypeptidase, catalase, cellulase, lipase, and peroxidase are the eight enzymes found in it. When applied topically to the skin, Brady kinase helps prevent excessive inflammation, while others help break down carbohydrates and fats.
Fatty acids	Omega-3 fatty acids Cholesterol, campesterol, -sitosterol, and lupeol are the four plant steroids found in it. All have anti-inflammatory properties, and lupeol is both antimicrobial and analgesic.
Hormones	Auxins and gibberellins aid wound healing and have an anti-inflammatory effect. Others offer 20 of the 22 essential amino acids and 22 of the 22 essential human amino acids.
Minerals	It is found in the minerals Calcium, chromium, copper, selenium, magnesium, manganese, potassium, sodium and zinc. Only a handful of antioxidants are essential for the proper functioning of various enzyme systems in various metabolic pathways.
Others	Lignin, an inert chemical, improves the penetration of other substances into the skin when added to topical treatments. Saponins, or soapy chemicals, make up roughly 3% of the gel and have antibacterial and cleansing properties.

### 1.2.10 Therapeutic properties

- Antiseptic effect:** Lupeol, salicylic acid, urea nitrogen, Cinnamomum acid, phenols, and sulphur are all anise. comp. found in aloe Vera. Fungi, bacteria, and viruses are

### 1.2.2 Vernacular names<sup>[9, 12]</sup>

**Table 6:** Vernacular names

Hindi	Gvarpatha, Gheekumvar
Sanskrit	Kumari, Ghritkumari
English	Aloe plant
Marathi	Korphad

### 1.2. Macroscopic description

- It is a 30-60 cm shrub with a macroscopic description.
- Leaves: thick, juicy files with 3-4 figures in circumference and 1-2 feet in length. The leaf's edge is covered in spikes.
- Flower: Between the leaves, a long pedicle appears. The blossoms are yellow.
- Gum: The solid gum obtained after boiling Kumari's juice is known as alia bol or kala bol<sup>[9]</sup>.

### 1.2.4 There are four varieties

- Curacao or Barbados:** both are chocolate brown in color.
- Socotrine aloes:** Yellowish colored
- Zangibar aloes:** Brownish-colored Zangibar
- Cape aloes:** Greenish aloes

### 1.2.5 Distribution

India.<sup>[12]</sup>

### 1.2.6 Raspanchak<sup>[52]</sup>

**Table 7:** Raspanchak

Ras	Tikt
Gun	Guru, Snigdha, Pichhila
Virya	sheeta
Vipak	Katu
Prabhav	Bhedan

### 1.2.7 Dosh karama: Tridosh ghana

### 1.2.8 Mala karama: Bhedan<sup>[12]</sup>

### 1.2.9 Chemical components<sup>[53, 54]</sup>

all inh by them.<sup>[53]</sup>

- Wound healing:** Aloe Vera promotes the proliferation and migration of fibroblasts and keratinocytes, which speeds up wound healing<sup>[55, 56, 57]</sup>

3. **Moisturizing and anti-aging properties:** Aloe Vera contains mucopolysaccharides, which help to bind moisture to the skin. It softens the skin by having a cohesive effect on the surface flaky epidermal cells. Aloe encourages the production of collagen and elastin fibres in the skin, making it more elastic and wrinkle-free<sup>[53]</sup>.
4. **Anti-inflammatory:** Aloe vera has anti-inflammatory properties by blocking the cyclooxygenase enzyme, which converts arachidonic acid to prostaglandins<sup>[53]</sup>.
5. **Laxative effects:** -Latex contains anthraquinones, which are powerful laxatives. It promotes intestinal peristalsis, raises intestinal water content, and stimulates mucus secretion<sup>[53]</sup>.
6. **UV and gamma radiation effects on the skin:** It lowers output. UV-induced inhibition of delayed type hypersensitivity is prevented by the release of immunosuppressive cytokines such as interleukin-10 (IL-10) from skin keratinocytes<sup>[53]</sup>.
7. **Rasayan:** Kumari performs doshas sodhan and pachan in dhatus and assists in dhatuposhan<sup>[12]</sup>.
8. **Deepan Pachan:** Its modest dose is beneficial in the deepan pachan karma because of its Tikt Ras<sup>[12]</sup>.
9. **Cardioprotective:** It is yakritgami, raktavahasrotgami, and is useful in blood cleansing, cardio protection, and liver ailment<sup>[12]</sup>.
10. **KAMLA:** Kumari + Arogyavrdhni perform the sanchit pit sodhan in Deepan karma is beneficial in the kamla, ykritt and sira<sup>[12]</sup>.

#### 1.2.11 Used part

Sar, Patra Majja

#### 1.2.12 Propagation

Root sucker.

#### 1.2.13 Dose

**Table 9:** Dose

Juice of leaf	2-4 spoons
Kala bol	1-4 rati

#### 1.2.14 Formulations

**Table 10:** Formulations

1.	Kumaryasav
2.	Rajhpravaratni
3.	Kumarivati
4.	Kumarpak

#### 1.2.15 Side effects

##### 1. Topical

In sensitive people, it can produce redness, burning, stinging, and in rare cases, widespread dermatitis. It's better to try it on a small area first to see whether you're allergic to it.

##### 2. Oral

Abdominal pains, diarrhoea, blood in the urine, hepatitis, dependence, or constipation worsening. Long-term use has been linked to a higher risk of colorectal cancer. Electrolyte abnormalities may result from the laxative effect (low potassium levels).

##### 3. Pregnancy and breastfeeding

Oral aloe is not suggested during pregnancy because it may

stimulate uterine contractions, and it may induce gastrointestinal irritation in the nursing infant in breastfeeding moms

#### 4. Interactions

Using aloe on the skin can help steroid creams like hydrocortisone absorb better. Due to its potassium-lowering effect, it lowers the effectiveness and may aggravate the negative effects of digoxin and digitoxin. When Aloe vera and furosemide are used together, the risk of potassium depletion increases. It lowers blood sugar levels and so may interact with insulin and oral hypoglycemic medications<sup>[24]</sup>.

#### 5. Conclusion

*Terminalia bellirica* fruits offer medicinal qualities. Laxative, astringent, anthelmintic, and antipyretic effects are all present. Its fruits are used to cure, bronchitis, asthma, indigestion, piles diarrhoea, cough, Half-ripe fruit is used to make purgatives. The fruit's kernel has narcotic properties. Despite the fact that there are numerous indications for its use, *Aloe barbadensis* is a natural substance that is presently frequently used in cosmetology. *Aloe barbadensis* is known as Kumari or Grit Kumari in Ayurveda. Both the plants produce very beneficial effects on our body. They are antimicrobial, anti-inflammatory, helped in sunburn, protective in nature.

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