

A review of Aloe vera as *Ghritakumari* in Classics

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ABSTRACT

Aloe vera is very known herb due to its multiple uses in pharmaceutical and cosmetic industries. It is known as Ghritkumari or Kumari in Ayurvedic literature and indicated for the treatment of various diseases such as *jwara* (fever), *shula* (colic), *agnimandya* (indigestion), *krimiroga* (worm infestation), spleenomegaly, liver disorder, skin disease, burn etc. It is also used as powerful detoxifier *vishaghana* (detoxifier) and *rasayana* (immune-booster). Today, it is used frequently as a solo drug as well as an essential ingredient of numerous compound formulations and prescriptions of *Ayurvedic* medicine as well as modern medicine. Aloe vera has various phytochemicals such as Lignins, saponins, anthraquinones, minerals, vitamins, amino acids, enzymes and sugars etc, which have eminent significance in different areas of medicine. Aloevera has various numbers of pharmacological activities and many beneficial effects on human body. In some laboratory studies it also has been shown antimicrobial and anticancer effect. The objective of this article is to re-orient the knowledge and information about Aloevera in classical texts as well as modern science. This article highlights synonyms, pharmacodynamics, therapeutic actions and uses, and different formulations of Aloe vera as described in *Ayurvedic* literature with special reference of *Nighantus*. The present study also attempts to describe phytochemistry and biological activities of A. vera and makes an effort to update our current knowledge on this plant.

Keywords: Ghritakumari, Nighantus, phytochemistry, pharmacology, anthraquinones.

INTRODUCTION

Herbs are the earliest source of medicines. Throughout the world, medicinal plants have been used to treat all kinds of common ailments and have evolved to become recognized as traditional medicines and have since been woven into the cultures and civilization of people.

The Indian Traditional Medicine mainly comprising of *Ayurveda* is the treasure of Medicinal plants where about ninety five percent *Ayurvedic* formulations are derived from the plant sources. Aloevera is one of them commonly known as *Ghritakumari* or *Kumari* has been used widely for a very long time. *Kumari* in *sanskrit*, means a young virgin girl as the herb imparts youthful energy and enhances femininity. It also mitigates *kumari roga* i.e. menstrual disorders.¹ The fresh gel or solid extract of A. vera is used for medicinal purpose. The plant is equally salutary both, internally as well as externally. It is indicated in number of diseases by *Ayurvedic* physicians. It is an effective appetizer, digestant, liver stimulant, and used in different skin diseases. It is considered as magic herb throughout the world due to its cosmetic effects and medicinal value. It has been used as an all-purpose herbal plant in folk remedies around the world for over 2000 years. The word "Aloe" is derived from the Arabic word *alloeh* which means bitter and shiny substances. Aloe

describes more than 350 closely related plants that grow all over the world. The ancient Chinese used it to relieve stomach ailments. The South American and cenetral American Indians use Aloe gel to treat kidney and bladder problems, and to increase longevity.

Aloe vera also known as *Aloe barbadencis* Miller belongs to *Liliaceae* family. It is a perennial stem less or very short-stemmed succulent plant which grows to 60-100 cm tall and its leaves are very thick and fleshy. The leaves contain two types of liquids, one is yellow bitter latex under the skin, and other viscous gel in the inner section. During the season of summer yellow or orange flowers are blossomed on a spike up to 90 cm (35 in) in height.

The Aloe vera is found throughout most of the tropics and warmer regions of the world, including the West-Indies and Bahamas, southern USA, Mexico, Central America, Arabia, and India and other parts of Asia. It is distributed almost throughout India especially in the hot dry valley of North-western Himalyas. It can be easily cultivated in almost all parts of India, even under constant drought conditions. It is propagated through suckers. It tolerates poor marginal soils and higher ph with high Na and K salts. However its growth is faster on moderately fertile heavier soils viz. black cotton soil. An Aloe plant gives

commercial yield from 2nd year to an age of 5 years where after it needs re-plantation².

The main feature of the *Aloe vera* plant is its high water content, ranging from 99% to 99.5%, while the remaining 0.5–1.0% solid material is reported to contain over 200 different potentially active compounds,

including vitamins, minerals, enzymes, simple and complex polysaccharides, phenolic compounds, and organic acids.³ A summary of the chemical constituents of *Aloe vera* is describing here on the basis of “A review of the chemistry of *Aloe vera*” by Reynolds⁴.

Type of compounds and its derivatives

| | |
|---------------------------------|---|
| 1. Anthraquinone/ anthrones | Aloin A and B (collectively known barbaloin) aloë-emodin, emodin, aloëctic acid, anthranol, isobarbaloin, and ester of cinnamic acid. |
| 2. Carbohydrate | Acetylated mannan, acetylated glucomannan, galatan, xylan, glucogalactomannan, galactogalacturan, arabinogalactan, galactoglucoarabinomannan, pectic substance, cellulose. |
| 3. Chromones | 8-C-Glucosyl-(2'-O-cinnamoyl)-7-O-methylaloëdiol A, 8-C-glucosyl-(S)-aloësol, 8-C-glucosyl-7-O-methyl-(S)-aloësol, 8-C-glucosyl-7-O-methylaloëdiol, 8-C-glucosyl-noreugenin, isoaloëresin D, isorabaichromone, neoaloësin A |
| 4. Enzymes | Alkaline Phosphatase, amylase, carboxypeptidase, catalase, lipase, cyclooxygenase, cyclooxygenase, , oxidase, phosphoenolpyruvate carboxylase and superoxide dismutase. |
| 5. Minerals | Calcium, chlorine, chromium, copper, magnesium, manganese, potassium, phosphorous, sodium, iron, and zinc. |
| 6. Lipids/ Organic compounds | Arachidonic acid, linolenic acid, triglycerides, triterpenoid, lignin, gibberellins, potassium sorbate, salicylic acid and uric acid |
| 7. Amino acids | Alanine, arginine, aspartic acid, glutamic acid, glycine, histidine, hydroxyproline, isoleucine, leucine, lysine, methionine, phenylalanine, proline, threonine, tyrosine, valine. |
| 8. Vitamins | B1, B2, B6, C, β -carotene, choline, folic acid, s-carotene, folic acid, α -tocopherol |
| 9. Proteins | Lectins, lectin-like substance |
| 10. Saccharides | Mannose, glucose, L-rhamnose, aldopentose |
| 11. Sterols: | Campesterol, cholesterol and β -sitosterol |

Adapted from Hamman (2008)

Several different types of these phytochemicals are the base of various pharmacological action of plant Aloe vera. Aloin is major constituent of A. vera which is listed in the United states Pharmacopoeia as a drug and is approved for use as a laxative.⁵

It is rich in all vitamins and minerals especially the antioxidant selenium and vitamin A, C and even contains a traces of the vit. B12. Various types of enzymes aid digestion by breaking down fat and sugars. One is particular the Bradykinase helps to reduce excessive inflammation when applied to the skin topically and therefore reduces pain, whereas others help digest any dead tissues in wounds⁶. The plant produces at least 6 antiseptic agents such as lupeol, salicylic acid, urea nitrogen, cinnamonic acid, phenols and sulphur. All of these substances are recognized as antiseptics because they kill or control mold, bacteria, fungus and viruses, explaining why plant has the ability to eliminate many internal and external infections⁷. Thus Aloe is a powerful detoxifier, antimicrobial and immune-boosting drug.

Aloe vera in Ayurvedic classics

During twelfth century onwards many treatises exclusively on medicinal plants were written in different languages called *Nighantus*, successively in each treatise the number, properties & other related description of medicinal plants is seen as an addition to previous one. These descriptions of medicinal plants are usually available in the form of various synonyms in different *Nighantus*. These are summarized in table1.

The renowned physician of *Ayurveda*, *Acharya Sharangdhara* in 13th century described a famous formulation of *Ghritakumari* (Aloe vera) known as *Kumariasava*⁸. *Acharya Shodal* for the first time in 14th century introduced this plant into the *Nighantus*. He described it as *Kushthavinashini*⁹ that means the drug which destroys all types of skin diseases. *Acharya kaiyadeva* considered *Kumari* as *vrasya* (aphrodisiac) as well as *rasayana* (rejuvenator). It is interesting to note that the properties of its flower also mentioned in *Kaiyadeva nighantu*. He specifically mentioned its flower as *guru* (heavy) and *krmihara* (vermicidal).¹⁰ The last encyclopedic book *Bhav-Prakash* was published in the sixteenth century written by *Acharya Bhavaprakash*, has given a good description of the pharmacological actions and therapeutic indications of the drug *Ghritakumari*. According him *Ghritakumari* is bitter and sweet in taste, and cold in nature. By these virtues it

performs many pharmacological actions such as *Bhedan* (choleagogue), *Rajahpravartaka* (mensuration stimulator), *Chakshushya* (beneficial for eyes), *Bramhan* (improve body mass), *Balya* (improve body strength), *Vrashya* (aphrodisiac), *Rasayana* (rejuvenator), and alleviates specifically *vata and visha* (toxins) etc. He recommends the drug in the treatment of various diseases such as *Gulma* (abdominal mass), spleen and liver disorders, *Jvara* (fever), *Jeerna jvara* (chronic fever), *Granthi*, *Aganidagdha* (burn), *Visphota*, *Tvakaroga* (skin disease) etc¹¹. In *Rajnighantu Pandit Narhari* described twenty one synonyms of *Ghritakumari*. He states that it alleviates *Kapha pitta dosha*, *kushtha* (skin disease), *visha* (toxins) and it is a good *rasayan* (rejuvenator).¹² The fresh juice 10-20 ml or aqueous extract of A. vera leaves 100-300 ml is used for medication.¹³ Aloe vera also used in form of dried juice known as *Kumarisara* or *Alua*. *Acharya Yadav ji Tikram Ji* has given detail description of *Kumarisara*. He recommended it in the condition of severe constipation, worm infestation, dysmenorrhoea, amenorrhoea, urticaria, headache, fever, indigestion, and spleen disorders. He also described contraindications of *Kumarisara* in the condition of piles, pregnancy, menorrhagia, and liver and kidney disorders¹⁴. Famous Ayurvedic formulations of *Ghritakumari* are *Kumaryasava*, *Rajahpravartani vati*, *Kumarika vati* and *Kumaripaka*.

A. vera is a very versatile plant that has many different pharmacological activities. Numerous scientific studies on *A. vera* are demonstrating its analgesic, anti-inflammatory, wound healing, immune modulating and anti-tumor activities as well as antiviral, anti-bacterial, and antifungal properties¹⁵.

As a general health tonic *Aloe vera* is a useful source of vitamins and amino acids required by the human body. Vitamins namely A, B1, B2, B6, B12, C and E, which the human body cannot prepare by itself, are available in *A. vera*. Vitamin B complex and C are to play an important role in reducing stress and inflammation. *Aloe vera* Gel contains 19 of the 20 amino acids needed by the human body and seven of the eight essential ones that just cannot be made. *Aloe* plant contains 25 percent of solid fraction that contain sugars. Sugar acts as immune modulators capable of enhancing and retarding the immune response. Minerals found in *A. vera* are calcium, zinc, chromium, potassium, etc. Magnesium lactate inhibits histidine decarboxylase and prevents the formation of histamine from the amino acid histidine.

In traditional medicine *A. vera* is used in the condition of indigestion. Today it has revealed that it contains the enzymes amylase and lipase which are responsible for digestion of starch, fats and sugars. *A. vera* also contains the carboxypeptidase metallo-enzymes which inactivates bradykinin and produces an anti-inflammatory effect.

Anthraquinone is a phenolic compound found in the sap. These compounds exert a powerful purgative effect, which are potent antimicrobial agents and possess powerful analgesic effects. *Aloe* contains saponins which are soapy substances form 3 per cent of the gel and are general cleansers, having antiseptic and anticarcinogen properties. *Aloe* contains Campesterol, F2 Sitosterol and Lupeol It is an aspirin like compound present in *Aloe* plant possessing anti-inflammatory and anti-bacterial properties.

The research studies conducted on *Aloe vera* plant have revealed that through strengthening the T-lymphocyte cells of the blood, it is able to heal the wounds and improve immunity.¹⁶

Tanaka *et al.* identified five phytosterols of *Aloe vera* which have the property to act against diabetes and reported its consequence on hyperglycemia and hyperlipidemia using animal studies.¹⁷

Numerous studies have elucidated the antagonistic activity of *Aloe vera* against fungi, virus and bacteria. Aggary *et al.* (2005) have shown the potent antimicrobial properties of the gel and leaf of *aloe vera* against bacteria and fungi.¹⁸ A purified sample of *aloe emodin* was effective against infectivity of herpes simplex virus Type I and Type II and it was capable of inactivating all of the viruses, including varicella-zoster virus, influenza virus, and pseudorabies virus. It has also proved that anthraquinones extract of plants are directly virucidal to enveloped viruses such as herpes simplex, varicella zoster and influenza. These actions may be due to indirect effect due to stimulation of the immune system.^{19,20} Another beneficial property of *Aloe*

vera is chemo-preventive activity against tumor enlargement and it has been proved with the help of an animal model. Evidences for hepato-protective components in *Aloe vera* are reported based on a study on mice. Habeeb *et al.* found that *Aloe vera* can be beneficial to treat genital herpes and psoriasis. Pathogenic *Salmonella* and *Shigella* induced inflammations are also found to be suppressed by *Aloe vera*. In addition, it is also helpful in healing insect bites, rashes, vaginal infections, conjunctivitis and allergic reactions, which have been described by Vogler and Ernst²¹.

Plant extract at oral dose of 100 and 200 mg/kg did not show any toxicity in rats. Larger doses lead to accumulation of blood in pelvic region and reflux stimulation of uterine muscles and may bring about abortion. Active principles generally appear in milk during lactation. Due to these the drug is contraindicated in pregnancy, lactation, kidney complaints and irritable bowel conditions.

CONCLUSION

A careful, critical and unbiased study of the classical and modern texts shows that *Ghrītakumari* is undoubtedly an important drug and widely used in *Ayurveda*. It performs many therapeutic functions and it is recommended by *Ayurvedic* physicians in various diseases. The plant has importance in everyday life to soothe a variety of skin ailments such as mild cuts, antidote for insect stings, bruises, poison ivy and eczema along with skin moisturizing and anti ageing. It is an immunity booster and detoxifies the systems. Its use in cosmetics as well as in the other areas of medicine makes it a boon to mankind. The facts which had been described in classics so many years back about the *Aloe vera*, are clinically being proven and re-established with the help of modern technology today. The knowledge of our ancestors about herbal medicine was very vast and accurate.

Synonyms in different Nighantus

| Synonyms | DN | MP | BN | RN | KN |
|----------------|----|----|----|----|----|
| Grihakanya | | | + | + | + |
| Kumari | | | + | + | + |
| Kanyaka | | | + | + | |
| Dirghpatrika | | | | + | |
| Sthaleruha | | | | + | |
| Mridukanya | | | | + | |
| Bahupatra | | | | + | |
| Ajara | | | | + | |
| Amara | | | | + | |
| Kantakpravrita | | | | + | |
| Veera | | | | + | |
| Bhringeshta | | | | + | |
| Vipulsrava | | | | + | |
| Vranghani | | | | + | |
| Taruni | | | | + | |
| Rama | | | | + | |
| Kapila | | | | + | |
| Ambudhisrava | | | | + | |
| Sukantaka | | | | + | |
| Sthuldala | | | | + | |
| Kanya | | | + | | + |
| Ghritakumarika | | | | | + |
| Mandala | | | | | + |
| Mata | | | | | + |
| Phalmatasya | | | | | + |
| Aakshikirasa | | | | | + |
| Rasayani | | + | | | |
| Katikini | | + | | | |
| Savara | | + | | | |
| Anyā | | + | | | |
| Vanodbhava | | + | | | |

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