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ALOE BARBEDANSIS MILL- A REVIEW OF ITS ETHNOBOTANY, PHYTOCHEMICAL AND PHARMACOLOGICAL PROFILE

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ABSTRACT

Aloe vera is species of succulent plants belonging to family Liliaceae. It is easily available, cheap, multipurpose, mucilaginous plant. Various herbal formulation of *Aloe vera* are available in market like herbal soap, face wash, shampoo, cream etc Moreover, *Aloe vera* has been reported to have various pharmacological activities like wound healing, anti-inflammatory, antioxidant, analgesic, antibacterial, antiviral, antidiabetic, anti-hypercholestremic etc. Present review article will provide a guideline for new researchers.

Keywords: *Aloe barbedansis*, Ghritakumarika, Antioxidant, Anxiolytic.

INTRODUCTION

Aloe vera (*Aloe barbedansis* miller) is a plant, belonging to family of Liliaceae and is mostly succulent with a whorl of elongated leaves. The name is derived from the Arabic words "aloeh" which means "bitter" referring to the taste of the liquids present in leaves[1].Plants derived natural products such as flavonoids, terpenoids and steroids etc. have received considerable attention in recent years due to their diverse pharmacological properties such as antitumor, antioxidant [2]. *Aloe vera* has been medicinally used for several thousand years in many cultures from Egypt, Greece, Rome, China and India [3]. Different bioactive constituent medicinal value of *Aloe vera* treat different type of disease [4]. *Aloe vera* is such a plant which is known to process a wide spectrum of medicinal and therapeutic properties scientifically established by the modern scientific practioner [5]. *Aloe vera* has been promoted for large variety of conditions such as diabetes mellitus, hyperlipidemia, inflammation, treatment of acne etc. and has come to play a prominent role as a contemporary folk remedy [6]. Several herbal preparations that can enhance the body's immune system status are extensively being used in the indigenous system of medicine. There are upsurges in the clinical usages of indigenous drugs as they are free from serious side effect [7].

Probably native to North Africa along the upper Nile in the Sudan, and subsequently introduced and naturalized in the Mediterranean region, most of the tropics and warmer areas of the world, including Asia, the Bahamas, Central America, Mexico, the southern United States of America, southeast Asia and the West Indies [8].

TAXONOMICAL HIERARCHY

Besides the usual classification medicinal plants can be classified according to the parts used, habits, habitat, therapeutic value etc. But the botanical classification is the most comprehensive and scientific classification which is following:

Kingdom	**Plantae**
Subkingdom	Viridaeplantae
Phylum	Lilliacae
Class	Magnoliopsida
Order	Asparagales
Family	Xanthorrhoeceae
Genus	**Aloe**
Species	**barbedansis**

VERNICULAR NAMES

English: Indian Aloe, Barbados aloe

Hindi	:Ghikunwar, Ghikumari
Kannada	:Kathaligida
Bengali	:Ghritakumari
Marathi	:Korphad
Telugu	:kalabanda
Tamil	:Kattalai
Gujarati	:Kumarpathu
Malayalam	:Kattuwal
Urdu	:Musabbar, Ailiva, Siber

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Synonymes: Kumari, Grihakanya, Ghritkumarika, Kanya
Plants parts used: Leaf, Leaf-juice, dried juice of leaf

MORPHOLOGY

Leaves large,succulent,subulate,sessile,20-50 cm long and 5-10 cm wide.Apex in the form of as harp and acute spine.Both the surface are strongly cuticularized.Dried leaf juice dark chocolate brown to black in colour and of irregular masses.Odour characteristic and taste very bitter.In trasverse section pericycle cells are thin walled and large containing yellow fluid.The fluid under microsope show crystal in form of innumerable needdles varyng in size and shape Powder of dried juice when mounted in glycerin lactophenol and examined under microscope, show innumerable crystalline,yellowish brown to chocolate coloured particle of varying shape and size [8].

DISTRIBUTION

The plant aloe is as old as human civilization and its properties for varrious purpose has been well documented the genous is found in Tropical and South Africa,Malagasy and Arabic and introduce in to other places for ornamental and medicinal purposes .*Aloe vera* is succulent plants almost sessile perenial plants with multiple tuberous roots and many fibrous supporting roots and manyfibrous roots penetrates in to the soil.Each leaf is 30-50 cm long and 10 cm broad at base and margine is indented[9]

Phytochemistry

The chief constituents are hydroxyanthaquinone-barbaloin(a mixture of aloin A and B, the distereoisomeric 10-C glucoside of aloe emodine anthrone) and γ-hydroxyaloin isomers.The other constituents include aloe emodin,chrysophanol, chromone derivative-aloeresin B with its p-coumaryl derivative aloeresin A and C and the glycon aloesone[8].Leaves identified their constituents of bioactive compounds(viz., glycosides, antiquinone, phlobatannins, carbohydrates, alkaloids, terpenes, saponines, tannines, steroids, flavonoids), which believe to be responsible for their medicinal use[10]

Folk remedies and traditional uses

Traditionally the aloe leaf juice are most useful for healing of fracture and bones.Plants has been documented in Ayurvedic for antihelmentic,apparent carminative, deobstruent, diuretic, opthalmic and alexeteric, juice used in dyspepsia, amenorrhoea, burn, colic hyperdenosis, hepatopathy, skin disease, tumor etc

Toxicity study

Plants extract at a dose of 100 and 200 mg/kg did not show any toxicity in rats. Prolong used may severally affect the electrolyte balance loss of potassium may ultimately reduce the laxative action and disturb cardiac rhythm in heart patient. Longer use may cause accumulation of blood in pelvic region and reflex stimulation of uterine muscle and may bring about abortion [8]. Cytotoxicity *Aloe vera* gel crude extract on vero cells was determined by calculation of CC50 which is 3238 ug/ml [22].

Table 1. Class of compound according to their amount in percentage

Class of Compound	Group of component	Amount
Resin wax and Fatty acid	Flavonoids, Phenolic acid and Ester	45-55%
Wax and Fatty acid	Bee wax and plant origins	23-35%
Essential oil	Volatiles	10%
Pollen	Protein(16 Free amino acid>1%) arginine and praline together total of 45%	5%
Other organics and minerals	14 trace minerals, Iron and zinc most common Ketone,lactone, Quinone most common, vitamins, sugar	5%

Table 2. Varrious traditional uses are of *Aloe barbedansis*

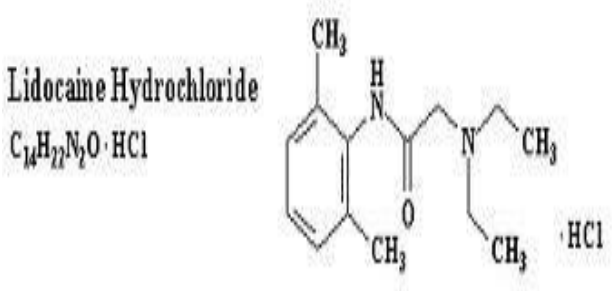
Plant Part used	Activity	Active Constituent	Reference
Leaf juice	Photo protective effect	Resin and Polysaccharides	[11]
Leaf juice	Wound healing	Glycoprotein	[12]
Leaf juice	Burn wound healing	Mannose 6-Phosphate	[13]
Leaf juice	Nitric oxide production	Arginine	[14]
Leaf juice	Cosmetic ingredients	Aloinodides, alloin	[15]
Leaf juice	Reduce obesity	Glycosides, mannoses, fructose	[16]
Leaf juice	Cooling, constipation, hepatopatho, Skin disease, dysmenorrhoea	Aloin, alosion	[8]
Leaf juice	Anti-tumor	Flavonoids, triterpinoids, steroids	[2,17]

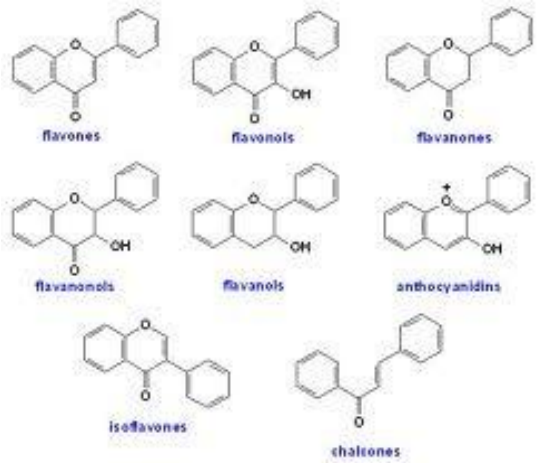
Leaf juice	Inflammation,Diabeties	Saponin, sterol	[18]
Leaf juice	Multi drug resistance	Anthraquinon	[19]
Leaf juice	Synergistic effect in bacteria	Aloin	[20]
Leaf juice	Hemorrhagic shock	Aloin	[21]

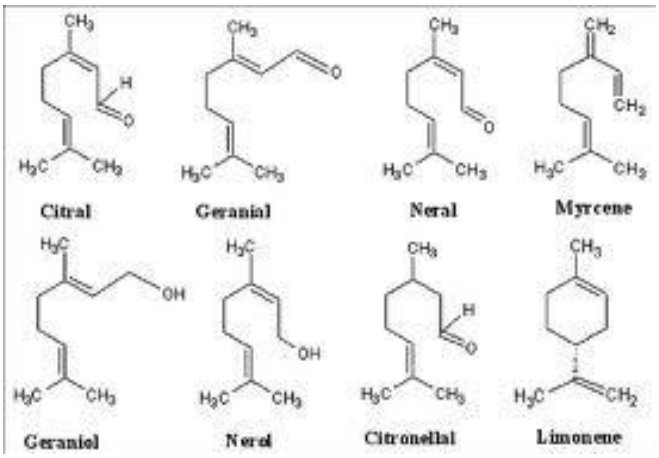
Table 3. Pharmacological study of *Aloe barbedansis*

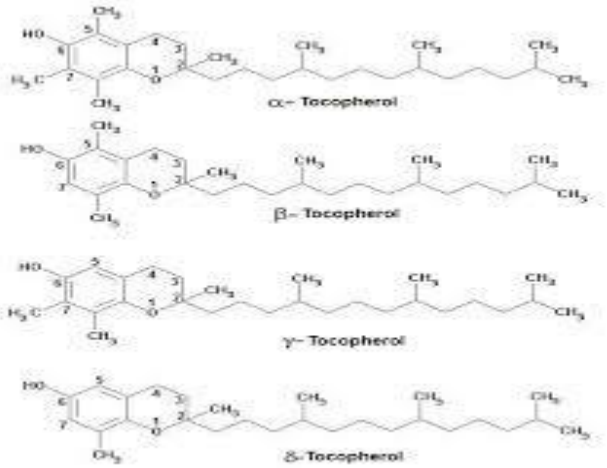
Pharmacological study	Active Constituent	Reference
Antioxidant activity	Polysaccharide, flavonoids	[23]
Analgesic activity	Lignin, Saponin, Anthraquinon	[24]
Analgesic and anti-inflammatory activity	Mallic acid, Acylated carbohydrate	[25,56]
In vitro antibacterial activity	Mannans, Polymannans, Anthraquinons, C-Glycosides, Lectin	[26]
Antimicrobial activity	Phenol, lignin Saponin, Sterol, Amino Acids,flavonoid	[27,45,52]
Antitumor activity	Flavonoids, Triterpenoids, Steroids	[28]
Antiviral activity	Monosaccarides(Mannose-6-Phosphate)	[29]
Anxiolytic activity	Mannose, Glucose,	[30]
Burn wound healing	Mannose -6- Phosphate	[31,40]
Diabetic control	Triglyseride	[32,41]
DNA degradation activity	Aloin, Aloe emodin	[33]
Degenerative CNS disorder activity	Phenol, Flavonoids	[34]
Immunomodulatory activity	Polysaccharides', Glycoprotein	[35]
Increase Nitric oxide production activity during inflammation	Arginine	[36]
Photo protective activity	Resin, Polysaccharides	[37]
Toxicological activity	Polysaccharides, mallic acid.	[38]
CNS activity	Chlorides	[39]
Antifungal activity	Sugar, lignin, Anthraquinon, Saponin.	[42,44]
Hepatoprotective activity	Glycoside, Aloe emodin, Glucose, Mannose	[43,48,50]
Antifungal and antioxidant activity	Lignin, Anthraquinon	[44]
Anticarcinogenic activity	Flavonoids, terpinoids, Steroids	[46]
Hypoglycemic and atherogenic activity	Phenol, flavonoids	[47]
Genotoxic and antixenotoxic effect	Polysaccharides,	[49]
Hypocholestromic effect	Flavonoids	[51]
Antinociceptive activity	Flavonoids, Salicylates	[53]
Antiseptic ulcer activity	Calcium Carbohydrate, Phosphate	[54]
Protective nephrotoxic activity	Flavonoids	[55]
In vitro antileishmanic activity	Tannins, Flavonoids	[57]
Haemopoitic activity	Flavonoids	[58]

Figure 1. Chemical Structure









CONCLUSION

Phytochemical and pharmacological investigation carried out in the plant reveals its multi-disciplinary usages. The plant was found to be very useful to reduce obesity, anti-inflammatory, analgesic, antioxidant, hepato protective, antitumor property, etc. Several investigators have reported the plants as valuable antimicrobial, antidiabetic, antifungal, antipeptic ulcer, antileishmanial etc, and also active against other plants pathogens. According to the proper documentation the plant Aloe do not show the toxic effect in animal in normal amount but it is used in combination with other plant herb and biological preparation like Panchagavya to show the synergistic effect with combination to treating the various ailments. Thin layer chromatography (TLC) profile of *Aloe Vera* extract was carried out to confirm the presence of different phytoconstituents different combination of solvent system of varying polarity has been used for the optimization of solvent system in high performance liquid chromatography [59].

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