

# A REVIEW ON *ACORUS CALAMUS* L-AN IMPORTANT ETHNOMEDICINAL HERB OF ANCIENT TIMES

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**Abstract-** *Acorus calamus* L, commonly known as sweet flag or calamus, is a semi aquatic rhizomatous perennial herbaceous plant native to Asia, Europe, and North America, that has been traditionally used in various traditional systems of medicine like Ayurveda, traditional Chinese medicine, and traditional European herbal medicine. It is known for its potential medicinal properties, including antimicrobial activity. Literature review reveals that this herb has several medicinal properties like Anti- inflammatory and Analgesic activity, digestive activity, Nervine Tonic and has a calming Effect. It also has Memory Enhancement property and helps in Cognitive Support, used as an Expectorant, has Hepatoprotective activity Astringent activity and Detoxifying Property. This review gives an idea about the various uses of *Acorus calamus* in health management that explores its wide utility in the medical field for fresh researchers.

**Key words:** asarone, anti- microbial activity, Calamus oil, antifungal activity, *Acorus calamus*

## INTRODUCTION

Medicinal plants, also known as herbal medicines or phytotherapy, are plants that have been historically and culturally used for their therapeutic properties and healing benefits. These plants contain a variety of natural compounds with medicinal properties, such as alkaloids, flavonoids, essential oils, other bioactive substances that can promote health and treat various ailments in humans and animals. The utilization of medicinal plants dates back thousands of years and spans across different cultures and traditions. Ancient texts from civilizations like the Egyptians, Greeks, Chinese, Ayurveda, and Native Americans contain valuable knowledge about the medicinal properties and uses of various plants. These plants were essential in treating a wide range of conditions, from minor ailments to more serious diseases. *Acorus calamus* (L) belongs to the family Aroideae or Araceae is a well-known medicinal plant in Indian medicine before centuries (Mehrotra et al, 2003). It is a semi-aquatic perennial herb that grows up to a height of maximum 6 feet, with sword shaped leaves, branched rhizome, and small yellow or green flowers in sessile cylindrical spadix (Sabitha et al.2000). However, it's important to note that the scientific evidence regarding the antimicrobial activity of *Acorus calamus* is not as extensive or well established as for some other plants. This review focuses on the different aspects of *Acorus calamus* in the medical field that enables to develop new drug with wide spectrum of applications.

## Taxonomic classification

Kingdom: Plantae

Division: Mangnoliophyta (Angiosperms)

Class: Liliopsida (Monocots)

Order: Acorales

Family: Acoraceae/ Araceae/ Aroideae

Genus: Acorus

Species: calamus

**Synonym:** *Acorus griffithii* Schott, *Calamus aromaticus* Garsault, opus utique oppr.

## Vernacular Names

Language	Name
Bengali	Boch, Bach, Buch
English	Sweet flag, sweetroot, calamus
Hindi	Khodavacha, Gorbach, Bach, Vasabach
Kannada	Baje
Malayalam	Vayampu
Marati	Vekhanda
Sanskrit	Vacha, Golomi, ugragandha
Tamil	Vahsambu,
Telugu	Vasa, Vacha, Vasha, Vadaja
gujarati	Vaja, ghodavaja
urudu	gurbach

## Plant Description

*Acorus calamus* L is a semi aquatic perennial herb with branched, thick, fragrant, cylindrical creeping rhizome with leaves dark green, distichous, ensiform base equitant, thickened in the middle, margins wavy and flowers light brown densely packed in sessile cylindrical spadix. The fruits are oblong turbinate berries with a pyramidal top and the seeds inside are free, pendent from the apex.

## Chemical constituents

Brown to brownish yellow colored volatile oil called CALAMUS OIL is extracting from this plant. Asarone and its  $\beta$  isomer are the chief constituent of this plant and the other important constituents are calamenol; calamine, calamonone, methyleugenol, eugenoland pinene and camphene. Presence of small quantities of palmitic, heptylic and butyric acids, asaronaldehyde, calamol, calamine, and azulene has also been reported. Sesquiterpenic ketones like acorone, calarene, calacone, calacorene, acorenone, acolamone, isoacolamone, epishyobunone, shyobunone, isoshyobunone, and acoragermacrone, and alcohols like isocalamendiol and preisocalamendiol are also present. (Lander and Schreier 1990; Oprean et al. 1998; Raina et al. 2003; Venskutonis and Dagilyte 2003).

## Anti-microbial Activity

It's very important to note that the effectiveness of *Acorus calamus* as an antimicrobial agent may vary based on several factors including the part of the plant used, the method of extraction, the specific microbial strain being targeted, and the concentration or dosage of the extract. Several reports are available on the effect of extracts of different parts including stem and rhizome of *Acorus calamus* against different microbes. (Grosvenor et al. 1995; Mungkornasawakul 2000; MacGaw et al. 2002; Rani et al. 2003; Phongpaichit et al. 2005)

## Antibacterial Activity

Some studies have reported that extracts of *Acorus calamus* possess antibacterial properties against a range of bacteria. These bacteria may include both Gram-positive and Gram -negative strains. The active compounds in *Acorus calamus*, such as  $\beta$ -asarone and  $\alpha$ -asarone, are believed to contribute to its antibacterial effects (McGraw et al. 2002; Phongpaichit et al. 2005; Rani et al. 2003).

## Antifungal Activity

*Acorus calamus* has also shown antifungal activity against various fungal strains. The essential oils and extracts derived from the plant have been tested against different types of fungi, including *Candida* species and *Aspergillus* species and have demonstrated inhibitory effects on their growth. (Lee et al. 2004; Lee et al. 2005; Phongpaichit et al. 2005).

## Antigonadal activity in Insects

Alcoholic extraction of the rhizomes yields aromatic oils which are used in different pharmaceutical and oenological industries. Several clinical studies reported that the essential oils present in *Acorus calamus* have antigonadal activity in different insects. (Mathur and Saxena, 1975; Koul et al. 1977a, b; Saxena et al. 1977; Schmidt and Brochers 1981; Berteau et al. 2005).

## Anti-inflammatory and Analgesic activity

*Acorus calamus* is known for its anti-inflammatory properties that can help to reduce inflammation in various parts of the body. In addition to this it also possesses analgesic properties which can aid in pain relief. (Mohammad and Mohammad, 2012)

## Digestive activity in Human

*Acorus calamus* is often used to support digestion and alleviate gastrointestinal issues. It can help with conditions such as indigestion, bloating, and flatulence, promoting overall digestive health. (Asha Devi et al, 2014)

## Nervine Tonic and Calming Effect

*Acorus calamus* acts as a nervine tonic, benefiting the nervous system. It has a calming effect and is used to reduce stress, anxiety, and nervousness, promoting relaxation and mental well-being. (Dr. Jina Pattanaik et al, 2013)

## Memory Enhancement and Cognitive Support

Certain traditional uses of *Acorus calamus* suggest that it may enhance memory and cognitive function, and overall mental clarity. (Ebrahim et al, 2018)

## Expectorant and Respiratory Health

This herb acts as an expectorant, helping to clear mucus and phlegm from the respiratory tract. It is used to alleviate symptoms of respiratory conditions like cough and colds. (Abdul Jabbar and Anwarul, 2010)

## Astringent and Detoxifying Property

*Acorus calamus* possesses astringent properties, which can help tighten tissues and reduce secretions. It also considered to have detoxifying effects on the body. (Santhosh Kumar et al, 2015)

## Hepatoprotective Activity

*Acorus calamus* is believed to have hepatoprotective properties, promoting liver health and assisting in the detoxification processes within the liver. (Kishori et al 2014)

## Antispasmodic and Muscle Relaxant Activity

This herb is known to have antispasmodic properties, aiding in relieving muscle spasm and cramps. It can also help to relax muscles and to reduce tension. (Anwar et al 2006)

## Conclusion

*Acorus calamus* is a semi-aquatic perennial herb with branched rhizome, sword shaped leaves and small yellow or green flowers in sessile cylindrical spadix. It has a long history of medicinal use and a range of potential health benefits. Extracts of different parts of this plant have several medicinal properties that include antimicrobial, anti-fungal, antibacterial activities and also in the Anti-inflammatory and Analgesic activity, digestive activity, Nervine Tonic and Calming Effect, Memory Enhancement and Cognitive Support, Expectorant and Respiratory Health, Hepatoprotective activity. Astringent and Detoxifying Property. The diverse properties from digestive aid to cognitive enhancer, make it a subject of ongoing research and interest in the field of herbal medicine.

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