ETHNOMEDICINAL USES OF CRINUM ASIATICUM: A REVIEW

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ABSTRACT

Crinum asiaticum can be found in various Asian countries and also the South Pacific islands. The plant has multiple ethnomedicinal uses and in various parts of Asia and the South Pacific islands, the plant or plant part is used for gastrointestinal disorders, skin diseases, fever, earache, boils, tonsillitis, mumps, hernia, rheumatism, urinary troubles, bone fracture, edema, and antidote to poison. This review shall discuss the various ethnomedicinal uses of the plant and explore the scientific validation of such uses based on scientific reports on phytoconstituents present in the plant and pharmacological properties of plant extracts and phytoconstituents.

Key Words: Crinum asiaticum, Amaryllidaceae, ethnomedicine, phytoconstituents.

INTRODUCTION

Crinum asiaticum L. belongs to the Amaryllidaceae family group of plants. The plant is native to southern China, Hong Kong, Jeju-do in South Korea, India, Nansei-shoto (Ryukyu Islands), Ogasawara-shoto (Bonin Islands), Mainland Japan, Taiwan, Assam (India), Bangladesh, India, the Maldives Islands, Sri Lanka, the Andaman & Nicobar Islands (India), Cambodia, Laos, Myanmar (Burma), the Paracel & Spratly Islands, Thailand, Vietnam, Mauritius, Borneo, Cocos Island, Java, Lesser Sunda Islands, Peninsular Malaysia, Sulawesi, Sumatra, Philippines, Christmas Island, the Bismarck Archipelago, New Guinea, Norfolk Island, Australia, Fiji, New Caledonia, Samoa and Vanuatu. It is regarded as naturalized in Mexico, the West Indies, Florida, Louisiana, Micronesia, Polynesia, Melanesia, Madagascar and the Chagos Archipelago. \(^1\) It is known as spider lily, Crinum lily and poison bulb in English, naagadamani in Ayurveda, bakong in Malaysia, and morabau in Papua New Guinea.
Reported phytoconstituents from the plant include lycorine and its glucoside, crinamine, crinine, crinidine, hamayne, stigmasterol, cycloartenol, cycloaudenol, crinasiadine, phenanthridones, palmilycorine, ambeline, hippadine, ungeremine, criasbetaine, flexinine, pratorimine, pratoririne, and haemanthamine.\[2\]

**Ethnomedicinal uses**

The plant reportedly has multiple ethnomedicinal uses, and is used in traditional medicinal systems across a range of countries and tribes. Briefly, ethnomedicinal uses of the plant include use for gastrointestinal disorders, skin diseases, fever, earache, boils, tonsillitis, mumps, hernia, rheumatism, urinary troubles, bone fracture, edema, and antidote to poison. The versatility of uses suggests that the plant is an important medicinal plant and has therapeutic potential.

In the South Pacific Islands, leaves of the plant are used for healing wounds and applied during body swelling. Preparation of the root is given to aid childbirth and for postpartum hemorrhage. In Micronesia, the leaves are heated and applied to back aches. The leaves are also used for permanent retraction of the testes. Bulbs are used as an emetic and as antidote to poison.\[2\]

In Dinajpur district, Bangladesh, leaf juice and fruit is orally taken on an empty stomach thrice daily for 14 days as treatment for acidity and dysentery.\[3\] The local people of Mahendergarh district, Haryana, India uses the bulb of the plant as a laxative and for urinary troubles. The bulbs are crushed and roasted followed by using the extract for ear ache.\[4\] In Vanuatu, the leaves are squeezed in water and the resulting solution taken for indigestion. The latex is mixed with water and drunk as an emetic.\[5\]

The Baiga tribals in Amarkantak Meikal Forest of Madhya Pradesh, India use the plant for ear pain and fever.\[6\] The tribal of Rajasthan, India use the plant for ear ailment and wound healing.\[7\] The Meena community in Rajasthan, India use tubers and leaves of the plant for ear ache and wounds.\[8\] In Mehsana district, North Gujarat, India, the plant is used for ear, nose and throat diseases.\[9\] In Kutchum district, Yasothon Province, Thailand, the leaves are used to treat fever.\[10\]

The Chakma community of Chittagong Hill Tracts, Bangladesh uses root of the plant to treat boils.\[11\] The Bede community of Savar in Dhaka district, Bangladesh uses leaves of the
plant to treat severe rheumatic pain. Leaves are mixed with leaves of *Datura metel* L. (Solanaceae), leaves of *Calotropis gigantea* (L.) Ait.f. (Asclepiadaceae), roots of small plants of *Bombax ceiba* L. (Bombacaceae), bark of *Terminalia arjuna* (Roxb. ex DC.) Wight & Arn. (Combretaceae), leaves of *Hydrolea zeylanica* (L.) Vahl. (Hydrophyllaceae), camphor, and oil of turpentine (little amount) and macerated together. The mixture is then boiled with ½ cup mustard oil [oil obtained from seeds of *Brassica napus* L. (Cruciferae)] for 1 hour. The decoction is then massaged on painful areas. The folk medicinal practitioners of Daulatdia Ghat, Kushtia district, Bangladesh use whole plants to treat edema, pain, and rheumatism. The folk medicinal practitioners of Lalmonirhat district, Bangladesh uses tubers of the plant along with roots of *Ocimum sanctum* L. (Lamiaceae) and black peppers to treat menstrual pain. The three items are macerated and taken daily in the morning on an empty stomach for 3 days. Folk medicinal practitioners of Rajshahi district, Bangladesh use the plant to treat chest diseases and vomiting tendency, where crushed roots of the plant are mixed with ginger and fruits of *Piper nigrum* L. (Piperaceae) and massaged on the chest. Folk medicinal practitioner in Aria Bazar village in Bogra district, Bangladesh reportedly uses roots of the plant to treat coughs, mucus and fever. Folk medicinal practitioners of three villages in Chuadanga and Jhenaidah districts, Bangladesh use rhizomes of the plant to treat tonsillitis. The Chakma community of Rangapanir Chara area in Khagrachaari district, Bangladesh uses stems of the plant to treat jaundice.

Folk medicinal herbalists and Tipuri tribe medicinal practitioners of Tripura State, India use bulb of the plant to treat tonsillitis. Juice is extracted from fresh bulbs and following sun drying is rubbed with soft cotton on areas of tonsillitis. On the other hand, the Tripura tribe of Comilla district, Bangladesh uses leaf juice mixed with oil obtained from seeds of *Ricinus communis* L. (Euphorbiaceae) to treat swelling of fingers or toes. In Bagerhat district of Bangladesh, the plant is used by folk medicinal practitioners to treat hernia. The Temuan villagers in Kampung Tering, Negeri Sembilan, Malaysia topically apply heated leaves to bone fractured area.

The Gond tribe of Adilabad district, Andhra Pradesh, India eats boiled bulbs as anthelmintic and aphrodisiac. The Chakma community of Tripura State uses leaf juice against rheumatism. Crushed and roasted bulbs are eaten by the rural population of Varanasi region of Eastern Uttar Pradesh, India for rheumatism and piles. In Myanmar, the leaves are used to treat arthritis, injuries, skin infections, and herpes.
Overall, the ethnomedicinal consensus favors use of the plant primarily against pain, particularly rheumatic pain and ear pain, and secondarily for wound healing, fever, and tonsillitis.

**Scientific validation of some ethnomedicinal uses**

The analgesic and anti-inflammatory properties of ethanolic leaf extract of the plant has been investigated in acetic acid-induced writhing model and formalin-induced licking model in Swiss albino mice, and carrageenan-induced paw edema model in rat. Both analgesic and anti-inflammatory effects were seen with the extract, the analgesic activity being seen at a dose of 2g per kg body weight in both writhing and licking models. At this dose, the extract caused 42.3% inhibition in acetic acid-induced writhings, and 27.1% inhibition in late phase of formalin-induced pain. [27] Antinociceptive and anti-inflammatory activities have also been reported with methanolic extract of bulb in acetic acid- and formalin-induced pain model and carrageenan-induced inflammation model in mice and rats. [28] Antinociceptive activity of leaf extract has been reported in carrageenan-induced paw hyperalgesia method in rats. [29] Scientific reports therefore strongly justify the use of the plant against pain. It may be noted in this regard that a subspecies of the plant, namely *Crinum asiaticum* var. *japonicum* is used as a rheumatic remedy, anti-pyretic and anti-ulcer treatment, and for alleviation of local pain and fever in Korea and Malaysia. The anti-inflammatory activity of root of the plant has been demonstrated. [30]

Alcoholic extract of leaves of the plant showed wound healing capability in terms of wound contracting ability, wound closure time, and tensile strength. [31] Antibacterial activity of aqueous and ethanol extracts of leaves have been demonstrated again *Pseudomonas aeruginosa, Klebsiella pneumoniae, Escherichia coli, Staphylococcus aureus, and Bacillus subtilis*. [32] Thus the plant can prove useful against gastrointestinal tract disorders and other infections.

**Phytochemical constituents and their relevant pharmacological properties**

Antinociceptive, anti-inflammatory, and hepatoprotective effects of lycorine (a constituent of *C. asiaticum*), and also isolated from *Sternbergia fischeriana* (Herbert) Rupr. (Amaryllidaceae) has been reported. [33] Lycorine, isolated from *Sternbergia clusiana* (Ker Gawler) Ker Gawler ex Sprengel (Amaryllidaceae) also reportedly demonstrated analgesic effect. [34] Thus this phytochemical constituent can be a potential therapeutic agent against pain. The antinociceptive, anti-inflammatory and hepatoprotective activities demonstrated by
lycorine also validates the ethnomedicinal uses of the plant against pain arising from different causes, as well as jaundice.

Crinamine, present in *C. asiaticum* and also in *Crinum amabile* Donn. (Amaryllidaceae), reportedly has antimalarial properties, and so could prove useful against malarial fever. Stigmasterol, a phytochemical present in *C. asiaticum*, and isolated from the plant, *Phyllanthus corcovadensis* Müll. Arg. (Euphorbiaceae), has been shown to inhibit acetic acid- and formalin-induced pain in mice. The spasmolytic effect of cycloartenol isolated from *Herissantha tiubae* K. Schum. (Malvaceae, the compound is also present in *C. asiaticum*) has been reported; the compound can potentially be useful in treatment of diarrhea. Thus, overall it can be concluded that some reported phytoconstituents of the plant (Figure 1) and their reported bioactivities justify the plant's ethnomedicinal uses in gastrointestinal disorders, jaundice, pain, and possibly fever.

![Lycorine](image1.png)

![Crinamine](image2.png)
CONCLUSION

*Crinum asiaticum* is a plant with multiple reported ethnomedicinal uses. Available scientific reports on pharmacological activities of the plant extract and bioactivities of reported phytocomponents of the plant validate a number of the ethnomedicinal uses. The plant has good therapeutic potential to be used against pain and gastrointestinal disorders like diarrhea.

REFERENCES


