



Centella asiatica: An Important Ayurvedic Herb

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Medicinal plants have been used in traditional health care practices across all regions of world for centuries. Health care system in different countries depends upon medicinal plant from wild as well as cultivation. The global interest in traditional health care systems has increased especially after emergence of COVID-19. Even the developed countries are witnessing this era of shift to herbal medicines. Nowadays, herbals are looked for providing holistic health care. *Centella asiatica* is valued as an important medicinal herb that is widely used in traditional systems of medicines for thousands of years for different ailments like asthma, skin disorders, ulcers and body aches etc. Monographs of the plant describing mainly its wound healing and memory enhancement effects exist in the European Pharmacopeia.

Centella asiatica (L.) Urban. Commonly known as Mandukparni, is a perennial, creeper herb belonging to family Apiaceae. In India, the plant is known by various names such as Gotu Kala, Indian Pennywort or Mandukparni. It is one of significant herb used in Medhya Rasayana (an Ayurvedic preparation) alongside Shankpushpi, Guruchi and Yashtimadhu (Kumar *et al.*, 2017). The whole herb finds its medicinal use as blood purifier, for treating high blood pressure, memory enhancement and promoting longevity.

Habit and habitat

The plants are found in tropical and subtropical countries including parts of India, Pakistan, Sri Lanka, Madagascar, South Africa, South Pacific and Eastern Europe. The plant flourishes extensively in shady, marshy, damp and wet places of tropical and subtropical regions of India upto an altitude of 600-1800 meter amsl. The plant has been reported to occur also at high altitudes of 1550m in Sikkim and 1200m in Mount Abu (Rajasthan). Mandookparni grows well in sun or shade. The plant creeps along the ground in marshy, swampy soil, it continually re-roots itself at nodes creating an ever increasing mat of ground cover.

Adulteration

In India the plant was earlier confused with *Bacopa monnieri* Wettst., as both plants have been sold in the market by the name "Brahmi". However, the controversy has been resolved and it is concluded that Brahmi is *Bacopa monnieri* and mandookaparni is *Centella asiatica* (Singh *et al.*, 2010).

Morphological description

It is a tasteless, odourless plant that thrives in and around water. It has small fan shaped green leaves with white or light purple to pink or white flowers and bears small oval fruit. The leaves are edible, yellowish-green in color, 1-3 from each node of stems, 2-6cm long, 1.5-5cm wide and long petioled, crenate margins, glabrous on both sides, reniform, orbicular, or oblong-elliptic shapes with seven veins. Flowering occurs in the month of April-June. The

flowers can be found hidden beneath the leaves. Flowers are pink and white in fascicled umbels. Gotu Kola bears a small oval fruit. The fruits are oblong, dull brown, laterally compressed, pericarp hard, thickened and woody white. The leaves have culinary uses and are often eaten as food source in salads or side dishes. It is important to identify the source of plants used for curative purposes because plant is often harvested from the places susceptible to water contaminants.



Centella asiatica plant

Chemical constituents

The main chemical constituents of the plants are saponins (also called triterpenoids), volatile & fatty acids, alkaloids, glycosides, flavonoids and vit B, C, G and amino acids etc. Various glycosides have been isolated from this plant which includes Asiaticoside, Madecassoside, Brahmoside, Centelloside, Thakuniside, etc. Centelloside and its derivatives are found to be effective in the treatment of venous hypertension and triterpene saponins and their sapogenins are mainly responsible for the wound healing and vascular effects by inhibiting the production of collagen at the wound site (Gohli *et al.*, 2010). Essential oil from the aerial parts of Mandookparni contains high levels of sesquiterpenes and monoterpenoids including α -humulene, β -caryophyllene, bicyclogermacrene, germacrene-D, and myrcene as the major constituents. Saponins account up to 8% of the dry mass of the herb.

Medicinal use

The entire plant is used for medicinal purposes. The whole plant, including the root can be dried and powdered and taken orally or used as a topical ointment. Also, juice can be extracted from the aerial parts of the plant and the leaves can be eaten whole as a preventative. Gotu Kola has been used as a Medhya Rasayana in Indian Ayurveda. Medhya Rasayana slows brain aging and regenerates neural tissues in addition to providing anti-stress and memory enhancing properties. Decoction of the plant is given in the treatment of leprosy and other skin conditions, lupus, varicose ulcers, urinary conditions and female genital issues. Juice of leaves is also used as a general tonic and to relieve hypertension. Poultice of leaves can be used to treat open sores as it reduces inflammation and scar tissue development. It is anti-leprosy, diuretic, stomachic and used in insomnia, asthma, abdominal disorders and fever.

Pharmacological properties

The plant has significantly drawn the attention of scientific groups in the recent years as it has multiple usages in the treatment of ailments. In Fig. 1, major pharmacological usage in the treatment of ailments has been outlined.

Side effects

Centella asiatica has no known toxicity in recommended doses. However, high doses of the herb can cause skin allergy and burning sensations, headache, stomach upset, nausea, dizziness and extreme drowsiness.

Propagation and yield

The plant is propagated by rooted suckers and seeds. Regeneration from seed is difficult as the seeds can remain dormant for a long time until conditions are conducive to germination. The planting can be done in February-March at a spacing of 45X45 cm with irrigation. It is an irrigated crop. NMPB has recommended that 300 kg root suckers are required to plant 1 hectare of land. The crop matures in 90 days period after planting. The harvest obtained in a year is 10-12 t/ha which is obtained by 3 harvests. It is harvested through hand-cutting at fully grown leaf stage. The leaves are harvested in sunny weather to facilitate drying. The cost of cultivation for 1 ha land is Rs. 40000. (NMPB, 2014).

Varieties

CSIR-CIMAP has released varieties of *Centella asiatica* called CIM Medha, RK-2, CA-7 and CA-4 for commercial cultivation. High yielding cultivar Vallabh Medha of Mandookparni was also identified by ICAR, with fresh herbage yield of 12,331 kg/ha and dry herbage yield of 2113 kg/ha. *Centella asiatica*- Arka Divya (CA-1), suitable for vegetable purpose with broad leaf, high biomass yield, mineral and vitamin A (32.33mg/100gm) content; *Centella asiatica*- Arka Prabhavi (A-13) was also released by IIHR Bangalore with higher asiaticoside content (73%) and suitable for active ingredient extraction industry.

Future Prospects

Centella asiatica is now met from natural population only, leading to the gradual depletion of species. It is placed in the list of threatened species by IUCN. Much of the ancient and contemporary lore surrounding this plant with its chemistry and pharmacology related to efficacy of both herbal preparations and chemical isolates are justified on the basis of experimental evidences. The plant has immense importance as economic plant with great medicinal value. Various products namely Mandukparni, Mentat, Gertiforte, Abana, Menosan, Nourishing skin cream by Himalayan Drug Company, Bangalore (India) are there in markets which reveals its demand. After the outcome of COVID, the demand for medicinal herbs like Mandukparni has increased and it holds a significant market potential in near future.

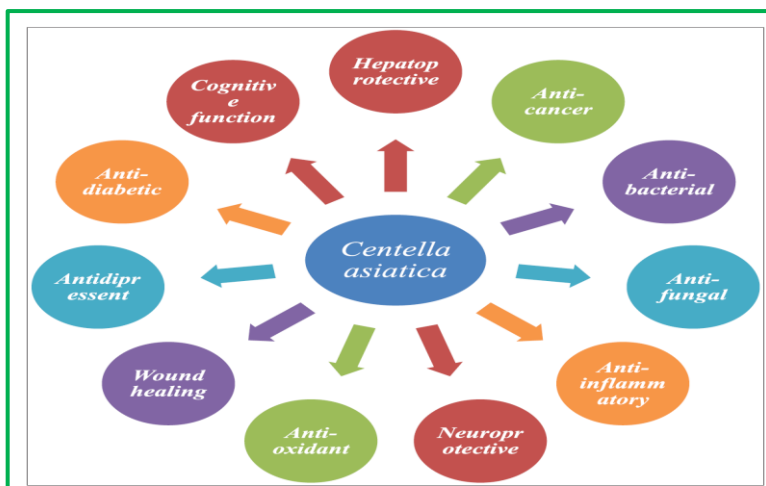


Fig.I: Pharmacological properties of *Centella asiatica*





Products of *Centella asiatica*

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