

THE PLANT OF REGENERATIVE THERAPY

GOTU KOLA

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Gotu Kola is the English name for Centella (*Centella asiatica* (L.) Urban, syn. *Hydrocotyle asiatica* L.). It is a short, herbaceous plant belonging to the Apiceae (Umbelliferae) family. The plant's name originates from the Greek words hydor, meaning water, and cotyle, meaning cup. It is a tasteless, odourless plant that thrives in and around water. It has small, fan-shaped leaves with white or light purple-pink flowers and it bears small, oval fruit.

Gotu Kola is native to India, Japan, China, Indonesia, South Africa, Sri Lanka, and the South Pacific. The plant is cultivated for commercial application. The leaves and stems are used for medicinal purposes.

In some countries Gotu Kola is used raw or cooked, in salads or curry dishes and herbal teas in combination with ginseng.

Gotu Kola properties are well-known in the regions where it grows. The plant is one of the best means of regenerative therapy and has for centuries been used in the medicine of China and India. According to the ancient records of oriental herbalists, Gotu Kola has been called one of the "miracle elixirs of life" because one Chinese legend tells that an ancient herbalist lived for more than 200 years as a result of using the herb!

In Southeast Asia Gotu Kola is used as a stimulating and toning remedy, to improve metabolism and in the treatment of bronchitis, bronchial asthma and tuberculosis. It is included in the pharmacopeias of India and China. In Madagascar the plant is used to treat tuberculosis and leprosy; it is applied as a diuretic, antiseptic, laxative and antirheumatic agent and also in dermatology.

Traditionally Gotu Kola was used for wound healing and to treat skin lesions. Nowadays, due to its wound healing properties, its ability to prevent scar formation, and to enhance the integrity and vascularization of connective tissues, the plant is successfully used in the treatment of surgical wounds, superficial burns, dermatitis of varying aetiology, ulcers, etc.

According to pharmacological studies, the effect of Gotu Kola is connected with the balancing influence on the body's cells which are involved in the healing process, especially the healing of connective tissues.

The primary active constituents of Gotu Kola are triterpene saponins (asiaticoside, madecassoside, madecassic and asiatic acids, brahmoside, centelloside, etc., the total content of which in the plant makes up from 1 to 4%). The plant also contains essential oils, flavonoids, sterols (beta-sitosterol, campesterol, stigmasterol, etc.). Gotu Kola extract activity is determined by its triterpenoid

content (from 10% saponin content to the concentrated extracts with 80-90% saponin content).

Only a few plants can stimulate the increase of collagen synthesis, and according to in vitro studies on fibroblasts Gotu Kola has proven its efficacy in this.

Experiments with animals have shown that asiaticoside and asiatic acid are the most active constituents of saponins, though all triterpenoids have shown the ability to stimulate collagen synthesis in the formation of glycosaminoglycans. Radiation damage of rats' skin was treated with madecassol, which not only promoted tissue regeneration but, also had an anti-inflammatory effect. Studies of the effects of asiaticoside on small wound healing (tests with pigs) have shown that solutions at concentration 0,2-0,4% increased hydroxyproline production by 56% and, accordingly, collagen growth and epithelization.

Other pharmacological experiments have proven the antioxidant activity of asiaticoside, the application of which within a week has shown an evident increase of enzymic and nonenzymic antioxidants, namely peroxide dismutase (35%), catalase (67%), peroxidase glutaminyl-cysteinil- glycine (49%), vitamin E (77%) and ascorbic acid (36%), in newly generated tissues. Such an increase of antioxidant levels in the early healing stage is an important indicator of the wound healing properties of Gotu Kola extract.

The ability of Gotu Kola to regenerate connective tissues, i.e. the ability to enhance appearance and regenerate the skin, hair and nails, is widely used in cosmetology.

Today a lot of cosmetic preparations with Gotu Kola are produced, such as anti-cellulites, and anti-wrinkle (face and eyes) creams, creams for dry and sensitive skin and acne, and to promote the rapid recovery of skin structure.

Another important property of Gotu Kola is its ability to improve the circulation of the blood, including venous and capillary. Its ability to improve peripheral circulation, reduce oedema and pain in the extremities, allows the use of the plant for the treatment of phlebitis, varicose veins, spasms and other cases of venous insufficiency.

It has also been found that Gotu Kola improves placentofetal blood flow, and the postnatal taking of Gotu Kola extract by women promotes more rapid tissue regeneration.

One more unique property of this plant is its ability to boost the nervous system and to restore brain cell function. Over the last few years it has become very popular in Europe as a tonic for nerves, promoting relaxation and improving memory, and Gotu Kola preparations are called "brain food".

There are also new applications for Gotu Kola, such as improving blood circulation in the brain, boosting memory, attention and intelligence and improving speech function. Pharmacological animal studies conducted by K.Nalini in 1992 (Kastrurba Medical College, India) showed that Gotu Kola considerably improves memory function. These tests showed very impressive results and were achieved after taking Gotu Kola extract daily for 14 days.

The sedative properties of Gotu Kola promote energy restoration, decrease both mental and physical weariness, soothe anxiety, and relieve stress and insomnia.

Gotu Kola extracts are used for various disorders of the nervous system: increased intracranial pressure, depression, schizophrenia, epilepsy, anorexia nervosa, etc.

Patients suffering neuroses took part in a 6 week experiment and used Gotu Kola extract during this period. The treatment showed a decrease in anxiety and improvement of memory and brain activity. The treatment of mental defectiveness with Gotu Kola extract has shown a significant improvement of general ability and behavior. Children who took 0,5 g. of the extract powder a day for one year demonstrated significant improvement of their intellectual level. After 6 months there was a substantial improvement in mental ability, general condition and mental concentration.

All the above mentioned properties of Gotu Kola, its ability to strengthen connective tissues, improve brain and immune system function, its wound healing, antioxidant and hypotensive properties, make this plant an important part of regenerative medicine, which allows the successful application of Gotu Kola preparations in antiage phytotherapy.