

# Economic Significance of Creeping Anchors *Tribulus Terrestris* L

Perdebaeva G.A., Azhiev A.B.

Nukus State Pedagogical Institute named after Azhiniyaz

## Annotation

The article gives the economic significance of creeping anchors-*Tribulus terrestris* L. A complete botanical description, scientific classification, synonyms of the plant, distribution and habitat, brief chemical composition, pharmacological properties, economic significance: food and medicinal, procurement of raw materials, use in medicine, contraindications and side effects are given.

**Key words:** creeping anchors, *Tribulus terrestris* L., application of anchors, botanical description of anchors, chemical composition of anchors, etc

Anchors creeping – covered with sharp thorns, creeping, annual plant. Preparations from it have antimicrobial, anti-sclerotic, anti-inflammatory, vasodilating, anticoagulant, choleric and diuretic effects. They also regulate the water-salt balance and have a stimulating effect on the male sex glands.

The creeping anchors (Lat. *Tribulus terrestris* L.) are the most famous representative of the genus of annual herbaceous plants Anchors (Lat. *Tribulus*), belonging to the family of Zygophyllaceae (Lat. Zygophyllaceae) or Parophyllaceae. Although more than 40 plants also belong to the genus Anchors, they have no pharmacological value.

The scientific name of the genus is a romanization of the Greek word `tribolos,~treis,~tria` - `three,~triple`, `bolas`-`point,~dot`, apparently derived from the remarkable appearance of the fruits of the plant, which have characteristically arranged three thorns; the species from the Latin `terrestris, ~e` - `ground`. Introduced into modern botanical nomenclature by Carl Linnem, "Species plantarum", 386.(1753), "Genera plantarum", Ed.5. 183. (1754);

Английское: Puncture vine, Land-Caltrops, hornet devil`s thorn, car-head, goat head;

Аптечное: Трава якорцев стелющихся - Herba Tribuli terrestris;

Арабское: ينكول Hasak, hasaka;

Болгарское: Бабини зъби;

Индийское: Gokshura, Gakshuraka, Kshudra (Laghu) Gokharu, Shvadamshttraa;

Китайское: 蒺藜 jili / цзили;

Немецкое: Erd-Burzeldorne;

Русское: Арбузики, земляной чилим, якорцы, якорец;

Тибетское: Gze-ma;

Японское: ハマビシ Hamabishi;

Botanical description. *Tribulus terrestris* L. is an annual creeping herbaceous plant with a thin, taproot. Stems 40-60 (120) cm long, prostrate. The leaves are opposite and alternate, paired-feathered, with 6-8 pairs of oblong leaflets, as well as the stems are pubescent with short, pressed and longer spaced hairs. The flowers are solitary, actinomorphic, axillary on short pedicels, few, 1-1.2 cm in diameter; the calyx consists of 5 ovate-lanceolate, pointed sepals; the corolla consists of 5 yellowish, obovate, several truncated petals at the top. There are 10 stamens attached to the base of the annular disc, five of them (alternating with petals) carry glands at the base. There is one pistil, the ovary is five-nesting, the column is faceted, with a bearded five-lobed descending stigma. The formula of the flower of the creeping anchor is: \*Ca5Co5A5+5G(5). The fruits are prefabricated, consist of five star-shaped angular fruits - mericarpii, planted outside with 2-4 sharp thorns. Outside, the fruits are planted with strong and sharp thorns in the number 2-4, tubercles and bristles. The seeds are 2.5-3 mm long, ovoid, light brown. Blooms from May to autumn. It bears fruit in August-November. Fertility – up to 5000 fruits. The weight of 1000 seeds is about 3-6 g.

Distribution and habitat. It originates from the Mediterranean, but due to seed dispersal, it is a cosmopolitan found in hot and temperate regions of all parts of the world. On the territory of the former USSR, their range covers the southern regions of the European part, steppe and desert regions of Transcaucasia, Central Asia and Southern Kazakhstan to the east to the southern shore of Balkhash and Lake. Alakolya. It grows in the steppe and desert zone, rarely enter the forest-steppe areas. It grows on clay-silty, saline, sandy and sandy loam soils, gray soils, in river valleys, on pebbles, dry beds, often as a weed in crops (especially on melons and in row crops), near roads and in garbage places. In the mountains it rises to the mid-mountain belt.

Chemical composition. The composition of creeping anchors includes steroid saponins, including trillin, dioscin, diosgenin and gracillin, as well as flavonoids, alkaloids, resins, ascorbic acid and fatty acids, tannins. The plant is able to concentrate chemicals such as barium, selenium, zinc and strontium from the environment.

Pharmacological properties. Steroid saponins – nitrogen-free glycosides – have an antisclerotic effect on the body, enhance intestinal peristalsis and promote intense bile secretion, have a slight hypotensive effect. They show high antimicrobial and antifungal activity. The flavonoids contained in the plant dilute the blood, prevent the formation of blood clots.

Economic importance. A food plant. In Russia, it is part of 12 biologically active food additives, complex products allowed for sale to the population through a pharmacy chain and specialty stores, retail chain departments as an additional source of steroid saponins.

**Medicinal plant.** The ancient Greeks used this plant as a diuretic and as a tonic that improves mood. In Indian Ayurveda, it was used as a diuretic, as an antiseptic and as an anti-inflammatory agent. The Chinese used it in various therapies for liver, kidney and heart problems. The whole plant is used as a raw material. Raw materials are harvested during flowering and fruiting of plants. The collected grass is dried in the sun, in attics or in dryers, spread out in a thin layer on dry soil, plastic wrap, fabric, paper.

In oriental medicine, they are considered one of the most effective means of increasing "masculine strength", a good diuretic, crushing kidney stones and bladder, which also has a restorative effect. In Chinese and Tibetan traditional medicine, it is used as a diuretic, tonic and anti-inflammatory agent. In Indian medicine, the fruits of anchovies are used for diseases of the kidneys, urinary tract, impotence and as a tonic. In Chinese medicine, they are used for spermatorrhea, as well as as a diuretic, tonic and tonic. This plant has a close application in Europe, so in Italy, Bulgaria and Turkey, the flowering herb is prescribed as a diuretic, stimulating the sexual sphere with impotence, useful for male infertility and prostatic hypertrophy. There is information about the use of anchors for recuperation after serious illnesses.

According to some experimental data, the oil from the fruits of the anchors enhances the sexual potency of men. Similarly, a decoction of herbs taken orally or used in the form of enemas works. In the Caucasus, in medieval Armenian folk medicine, a decoction of the herb of anchors is taken as a diuretic. In a mixture with other plants, creeping anchors are used for male infertility and impotence.

Procurement of raw materials. In Uzbekistan, the natural resources of the plant fully meet the needs for medicinal raw materials. The creeping anchors are pulled out by the roots, the aboveground part is cut off. When harvesting, it is very important to wear tight gloves so that sharp spikes do not dig into your hands. Raw materials are harvested during the flowering and fruiting period, lasting from the beginning of summer to the beginning of autumn. Since anchors bear fruit for a long time and at different times, harvesting can be carried out on the same arrays for many years in a row. Foreign plants are removed from the collected raw materials, and the grass of the creeping anchors is dried for 1-2 days. You can dry the anchors in the fresh air, under canopies, spreading out a layer no thicker than 20 cm. For industrial purposes, the plant is dried in special dryers. The finished raw materials can be stored for up to 5 years in a dry place with good ventilation.

In medicine. In clinical medicine, drugs that include creeping anchors. they are an effective antisclerotic agent, which is particularly popular in the treatment of atherosclerosis, combined with angina and hypertension. They are also able to enhance intestinal peristalsis and contribute to a more intense secretion of bile. The extract of creeping anchors is prescribed to patients in need of increased diuresis, with hypersecretion of gastric juice. The plant contains glycosides, from which a number of hormonal drugs are synthesized, such as progesterone and cortisone. On its basis, medicines such as Tribusponin tablets are

produced - they are prescribed for the treatment and prevention of hypertension, atherosclerosis and coronary heart disease and Speman. The latter drug is prescribed for prostatic hypertrophy and oligospermia. Other diseases in the treatment of which creeping anchors are effective include erectile dysfunction, spermatorrhea, flatulence, diarrhea and dysentery, anemia, asthenia, atopic dermatitis, psoriasis, urticaria, ascites, urinary tract and kidney diseases. This plant has proven itself well in the fight against gout, hemorrhoids, respiratory diseases, high blood pressure and cholesterol levels, as an anthelmintic and decongestant. Creeping anchors for women are of particular value, as they can help with mastitis and reduced milk secretion.

The subject of scientific discussions was the effect of drugs based on anchors creeping on athletes. Initially, it was assumed that as part of dietary supplements, the plant is able to act as an anabolic agent, promote accelerated growth of muscle mass, increase strength indicators. A number of experiments proved the inconsistency of this hypothesis. However, creeping anchors can be useful for bodybuilders, as they are able to raise testosterone levels and thereby combat depressive states and decreased libido caused by taking anabolic steroids.

Contraindications and side effects. Preparations of creeping anchors should not be taken by pregnant women, diabetics, hypotonics and those who suffer from prostate adenoma. These drugs are not recommended for people under 18 years of age. There are concerns that with prolonged use, creeping anchors contribute to the development of uterine cancer and breast cancer, as well as increase the size of the prostate.

In cosmetologists, antimicrobial, antimycotic and anti-inflammatory properties of creeping anchors are appreciated. The plant is able to cope with seborrheic dermatitis, so it is added to various shampoos, balms and hair masks. It is part of the care products for problem and irritated skin.

Currently, liquid extract of creeping anchors (Extractum Tribuli fluidum), the medicinal preparation Tribusponin Tribusponinum ® (Georgia) and Tribestan Tribestan ® (Bulgaria) containing the sum of steroid saponins (furastanolic glycosides) from the grass of anchors are allowed for sale to the population. It is prescribed mainly in the complex therapy of atherosclerosis and to activate spermatogenesis, it is also recommended to improve erection and stimulate sexual function.

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