

# Health benefits of *Cuscuta*

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*Cuscuta reflexa* is a parasitic plant, which belongs to the group of plants in the morning glory family, convolvulacea. It is commonly known as dodder plant, amarbel, akashabela and urisanamcha. Plant is rootless, perennial, slender threadlike, leafless climbing parasitic plant on shrubs or trees. The present article will collect the detailed description of synonyms, different name, habitat, scientific classification, chemical constituents from different literature as well as modern research journal. Present article deals with health benefits of *Cuscuta*. Further researches need to be done for popularization and utilization of this plant.

**Key Words :** *Cuscuta*, Amarbel, Uri sanamacha, Health benefits

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## INTRODUCTION

*Cuscuta* is the name of a group of plants in the morning glory family, Convolvulacea. It is known as 'Dodder' in English, 'Amarbel' in Hindi and 'Uri Sanamacha' in Manipuri. It is a parasitic plant. The genus is found throughout the temperate to tropical regions of the world. With the greatest species diversity in subtropical and tropical regions, the genus becomes rare in cool temperate climates. Dodder is a genus of about 100 to 170 species of orange or red, yellow (rarely green) parasitic plants. Among the species of *Cuscuta*, one of the medicinal plants which could be fully exploited after further studies and confirmation is *Cuscuta reflexa* (Dodder). *Cuscuta reflexa* is slender threadlike parasitic plant growing on shrubs or trees. Plant does not have

leaves. Flower solitary or in clusters of the fruits capsules, depressed- globose, with 2-4 black seeds (Kritikar and Basu, 1981). Branches are greenish or yellowish green. When the branched contact with a host tree, they spread rapidly and ultimately kill the plant or that branch.

*Cuscuta reflexa* contains a number of compounds like flavonoids, coumains and flavonoid glycosides *Cuscuta epithimum* contains compounds like flavonoid, glycoside, alkanoid carbohydrates, saponins and steroid in the plant extract. No side effects have been reported when *Cuscuta* is used in doses prescribed by herbalist.

The stem of *Cuscuta* is used in western herbalism and the seed is used in traditional Chinese medicine. *Cuscuta* is also used in the Indian system of Ayurvedic healing to treat jaundice, muscle pain, coughs and problems with urination. Ayurveda completely depends on the plant systems for the evaluation of new chemical entities having therapeutic potentials (Kumar *et al.*, 2012). Medicinal properties of the plants are due to the active phyto- constituents present in the plants, these phyto-constituents are alkaloids, flavonoids, glycosides, saponin, tannins, terpenoids, steroids etc. These photochemical possess potential health benefits, contributes in the prevention of cardio-vascular disease, cancer, osteoporosis, antioxidant activity and many more.

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Polyphenols have advantageous effects on cardiovascular system and plays an important role in prevention of neurodegenerative diseases and Diabetes mellitus (Inamdar *et al.*, 2011 and Balakrishnan *et al.*, 2010). Research performed at New York medical college indicates that the combination of ingredients in equiguard may be effective in the treatment of prostate cancer. The *Cuscuta reflexa* plant is common throughout India, found widely in the plains West Bengal, growing on thorny or other shrubs as parasite annuals. Various part of this plant was used in tribal medicine for the disease like fits, melancholy, and insanity (Agrawal and Dutt, 1935). It is also useful externally against itch and internally in protracted fevers, retention of wind and indurations of liver. The plant is also used as anthelmintic, diuretic, bronchitis and in the treatment of jaundice.

**Table 1: Scientific classification**

Kingdom	Plantae
Order	Solanales
Family	Convolvulaceae
Genus	Cuscuta
General name	Dodder
English name	Dodder
Common name	Giant dodder
Manipuri	Uri Sanamacha
Bengali	Swarnlata
Hindi name	Amarbel, Akasbela, Akash bail
Origin	China. <i>Cuscuta reflexa</i> was described by William Roxburgh in 1798
Taste of dodder	Better, sweet, astringent
Part use	Whole plant

## METHODOLOGY

*Cuscuta*, or Dodder plant, is an annual parasitic vine that wraps around other plants for nourishment. *Cuscuta* is a genus of about 170 species of yellow, orange or red (rarely green) parasitic plants. Out of 12 species reported from India's. *Cuscuta campestris* and *Cuscuta reflexa* are more common. As weeds, *Cuscuta* spp. is economically one of the most import groups of parasitic plants. Embryos and seedling have a small, swollen root like organ, which persists only a few days after emergence, and a shoot (Haccius and Trolll, 1961 and Truscott, 1966). Seedlings of *Cuscuta* spp. Can absorb and presumably assimilate nitrogen from ammonium

sulphate, potassium nitrate and ammonium nitrate (Srivastava and Chauhan, 1977). It has a high level of flavonoids giving it strong antioxidant properties. The plant has no chlorophyll and cannot make its own food by photosynthesis (Tripathi, 2006). The fleshy mature stem of *Cuscuta* spp. Function as storage organs. They accumulate starch, minerals and phytic acid (Dawson *et al.*, 1994 and Weinberg *et al.*, 2003). In this way, the parasitic may complete its life cycle, even if the host plant has died (Wolswinkel, 1974 and Singh *et al.*, 1963 and 1968).

### Habitat :

This parasitic herbaceous plant climbs over the shrubs and trees. It is common throughout India, abundant in Bengal plains (Sastry and Vijnana, 2006). The plants require the right combination of soil moisture and warm temperatures to generate and grow. Initially the starter plant would have had some roots. Within a few days of germination of the plant, which is touch sensitive, finds a host or dies. After establishing itself on a host body, it draws nutrition from the host as a stem parasite and the root wither away. This plant is purgative in nature. The weed will continue to grow through summer as long as the host plants remain active.

### Chemical constituents:

*Cuscuta* contains flavonoids such as quercetin and kaempferol, other vital chemicals such as cuscutine, cuscutamide, cuscutalin, fatty acids such as palmitic oleic and linolenic acid and beta sitosterol and stigmasterol, laurotetanine (alkaloid) it create convulsion, if use in large quantity then cause death, scoparone, melanetlin, hyperoside, aromadendrin, taxifolin, luteolin (Bais and Kakkar, 2014).

### Germination of *Cuscuta*:

Seeds of *Cuscuta* are spheroid, mostly 0.5 to 1.0 mm in diameter and have a hard rough seed coat. Seeds of *Cuscuta* can survive upto 50 years or more in dry storage depending on the species (Gaertner, 1950) and at least 10 years in the field (Menke, 1954). Unlike root parasites, *Cuscuta* seeds do not require a specific stimulant to induce germination. A high percentage (often more than 95%) of newly matured *Cuscuta* seeds is impervious to water (Dawson, 1965 and Hutchinson and Ashton, 1980). Such hard seeds may remain viable but ungerminated in soil for many years. Breakdown of the

seed coat depends on environmental conditions, such as wetting and drying, freezing and thawing, mechanical abrasion in the soil and microbial activity. Immature seeds showed higher germination (47%) than mature seeds (15%) probably due to variation in seed coat thickness (Berrie,1992), but the independent life duration of seedlings from immature seeds was six days shorter than mature seeds (19 days) (Marambe *et al.*, 2002). The seed will germinate in response to favourable conditions of temperature (30-33°C) (Zaki *et al.*,1998) and moisture. (Zaki *et al.*,1998) obtained better seed germination in sandy soils than in clay soils.

### Health benefits of *Cuscuta*:

Although many people have considered *Cuscuta* as weed, it has been now known for its medicinal properties in many places. *Cuscuta*, more commonly known as dodder plant, has a high level of flavonoids giving it strong antioxidant properties. It has been found to have positive effect on reproductive health, osteoporosis, alopecia, diabetes, baldness, liver diseases etc. Some of the relation of *Cuscuta* with health condition is given below:

#### *Osteoporosis*:

In an article appearing in Wegiel and Persson (2010), 'Physiotherapy Research', drynol cibotinins, a newly developed botanical combination including *Cuscuta chilensis* was investigated for its therapeutic benefits for treating osteoporosis. The researcher assessed the effects of drynol cibotin on cell growth, programmed cell death,

calcium uptake and production of bone matrix protein. The result showed that drynol cibotin significantly increased cell proliferation and inhibited cell death in osteoblast, which are bone cells. The authors concluded that drynol cibotin either alone or in combination with amino acids and vitamins might have therapeutic potentials for osteoporosis.

#### *Alopecia or hair fall*:

In an article appearing in (Pandit *et al.*, 2008), issue of 'journal of cosmetic Dermatology' researcher evaluated *Cuscuta reflexa* for hair growth activity in test animal with alopecia. The researcher used petroleum extract of *Cuscuta reflexa* an albino mice with testosterone-induced alopecia for 20 days. The ability to inhibit is evaluated by follicular density and microscopic observation of skin section. The study found that the extract exhibited promising hair growth activity as reflected in follicular density and skin section observation. Inhibition of the enzyme activity suggested that the extract-reversed androgen induced alopecia by inhibiting conversion of testosterone.

#### *Male infertility*:

In an article appearing in (Yang *et al.*, 2006), 'Chinese Archives of Traditional Chinese Medicine' documented the damage caused by the reactive oxygen species, ROS, to human sperm and the mechanism by which *Cuscuta japonica* can treat male infertility. Sperm cells with normal physiological function were



**Fig. 1: Varieties of *Cuscuta* used for health benefits**

selected and different concentration of extract were incubated with sperm in the ROS environment. The cells integrity was calculated and the sperm structured were observed. The study found that extract from *C. japonica* could significantly protect the sperm cell membrane, as well as its structure and the cellular function from the damage caused by ROS.

#### Skin cancer:

The beneficial effect of cuscuta against skin cancer has also been reported. Effect of cuscuta chilensis water extract on 7,12 di methylbenz – a anthracene induced skin papillomas and carcinomas in mice ethnopharmacol (Nisha *et al.*,1986). From the study, it was found that oral administration of the extract delayed the appearance and retarded the growth of papillomas and the incidence of carcinoma.

#### Liver damage:

Tu-si-zi, the seeds of *Cuscuta chinensis* is a traditional Chinese medicine that is commonly used to nourish and improves the liver and kidney condition in china and other Asian countries. The protective effect of *Cuscuta* on liver from acetaminophen damage in rat was highlighted in a study done at J. Ethnopharmacol (Yen *et al.*, 2007). From the study, it was found that the ethanol extract of *Cuscuta chinensis* can prevent hepatic injuries from acetaminophen – induced liver toxicity in rats and this likely mediated through its antioxidant activities.

#### Side effects:

*Cuscuta* is inadvisable for pregnant women and patient with profuse uterine bleeding, a prolonged erection of penis and constipation.

#### Conclusion:

As for the conclusion, the origin of the therapeutic use of herbal medicine can be traced back to China about 5000 years ago. The extract of several plants have been used as therapeutic agents. Many drugs, which are currently prescribed by physicians, are either directly isolated from plants or are artificially modified versions of natural products (Wang *et al.*, 2007). These medicines are safe and environment friendly. According to WHO about 80 per cent of the world's population relies in traditional medicine for their primary health care (Behera, 2006). This herbal drug provide strength to the body,

stimulates the normal functioning, and acts as selectively and gently without disturbing to other systems.

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