

## Caralluma fimbriata - Pharmacological review

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### ABSTRACT

*Caralluma fimbriata* has been used as an appetite suppressant herb for millennia. It also has antioxidant, anti diabetic, and nootropic actions. It is proved that it is a natural anti obesogenic agent and is widely consumed in India. It's actions like anti atherosclerotic and analgesic is of high medicinal value. The objective of this article is to highlight various uses of *caralluma fimbriata* along with its use in medical problems.

**Keywords:** *Caralluma fimbriata*, appetite suppressant, adiposity

### Introduction

*Caralluma* is an edible plant used by tribes in India to suppress hunger and enhance endurance <sup>[1, 2]</sup>.

*Caralluma* is an erect branched herb, 20-30 cm tall. Stems are leafless, 4-angled, fleshy, green, tapering to a point. Leaves are minute, present only on young branches, soon falling off, leaving a tooth-like projection on the angles. Flowers are borne at the end of branches, singly or 2-3 together on short stalks. Flowers are like wheels, 2 cm across. Petals are narrow, purple with yellow marking, and margins frilly with hairs. Fruits are 10-12 cm long, cylindrical with one of the pairs often suppressed. It has been eaten in rural India for centuries, raw, as a vegetable with spices, or preserved in chutneys and pickles, and is often found as a roadside shrub or boundary marker. It has been used as a portable food and thirst quencher for hunting. It is also used for its purported ability to suppress hunger and appetite and enhance stamina. <sup>[3]</sup> Tribesmen on a day's hunt will often only pack some *Caralluma* to sustain themselves and hence it is commonly considered a "famine

food" in India. <sup>[4]</sup>

*Caralluma* (Fam. Asclepiadaceae) is a genus containing 50 variable species of succulent plants. It is a widespread dwarf stem succulent that occurs throughout western Africa, southwest Asia, and the Indian subcontinent <sup>[5]</sup>. It is more common in peninsular India. <sup>[6,7]</sup>

It is a new arrival in the family of succulent plants that are becoming increasingly popular for their appetite suppressant <sup>[8]</sup> and weight loss properties <sup>[9]</sup> as well as their ability to lower blood sugar <sup>[10]</sup>. Studies have also revealed the nootropic <sup>[11]</sup>, nociceptive <sup>[12]</sup> and anti oxidant actions <sup>[13]</sup> of *caralluma fimbriata*.

### Apetite suppressant

*Caralluma* is used as an appetite suppressor and can be used as supplement for reducing weight. *Caralluma* contains pregnane glycosides, a class of naturally occurring compounds thought to inhibit the formation of fat. show that supplementation with *Caralluma fimbriata* can lead to a clinically meaningful reduction in central adiposity, a key component of metabolic syndrome associated with other risk factors such as elevated blood pressure and cardiovascular disease. Although very little is known about the safety of using *caralluma* on long term. <sup>[8]</sup>

### Anti diabetic action

Through a study on effect of methanol extract of *Caralluma fimbriata* (MCF) on streptozocin (STZ) 50 mg/kg b.w. induced diabetic rats proved that the methanolic extract of *Caralluma fimbriata* significantly controlled the diabetic condition including oxidative stress in liver and kidney. This finding has a significant role in maintaining the health of

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individual in the modern life style and food habits, where diabetes is a constant companion of mankind.<sup>[10]</sup>

### Action against high-fat diet-induced insulin resistance

In a study done to investigate the beneficial effects of hydro-alcoholic extract of *Caralluma fimbriata* (CFE) on high-fat diet feeding on insulin resistance and oxidative stress in Wistar rats. The study concluded that intake of CFE may be beneficial for the suppression of high-fat diet-induced insulin resistance and oxidative stress.<sup>[14]</sup>

### Anti obesogenic action

One human intervention (n=62 at baseline, 50 completions) on *Caralluma* ingestion in overweight persons noted that 1g (made from aerial parts of the plant, 40/60 aqueous/ethanolic extract; 12:1 concentrated extract equivalent to 12g dried plant) was able to induce 2.5% weight loss in 60 days whereas placebo induced 1.2% weight loss when both groups were subject to 'standard weight loss through caloric restriction'. Only waist circumference decreased in a statistically significant manner, while weight and body fat trended towards significance with P values of 0.15 and 0.07; respectively.

Anti obesogenic action of *caralluma fimbriata* was proved by a study in which the Diet-Induced Obesity (DIO) rat model was used to investigate CFE's anorexigenic effects. Rats were randomly divided into three groups: (i) untreated control (C), (ii) control for cafeteria diet (CA), and (iii) cafeteria diet fed + CFE treated. Rats in the test group received cafeteria diet and CFE from day one onwards. CFE was administered by gavage at three doses (25, 50, 100 mg/Kg BW per day) for 90 days. The antiobesogenic effects of CFE were evaluated by monitoring changes in feed intake, body weight, serum lipid and hormonal (leptin) profiles, fat pads, and liver weight.<sup>[15]</sup>

### Nootropic action

Ramaswamy Rajendran, Digambar Balkrishna Ambikar, Rakesh Arun Khandare, Vrushali Dattatraya Sannapuri, Niraj Sudhakar Vyawahare, Paul Clayton investigated the effects of a standardized extract of *Caralluma fimbriata* Wall (CFE) on learning and memory in mice using various behavioural models. It was proved that CFE exerts both nootropic and anxiolytic activity.

### Anti-nociceptive action

A study used petroleum ether, chloroform and aqueous methanolic extracts of dried leaf of *Caralluma fimbriata* at the doses of 100 and 200 mg/kg and was evaluated for the analgesic activity using the hot plate and acetic acid induced abdominal constrictions in mice. *Caralluma fimbriata* leaf extract showed significant analgesic properties in all the models studied.

### Anti oxidant action

The levels of total phenolics and flavonoids of the extracts were determined in a study done on Antioxidant capacity and amino acid analysis of *caralluma fimbriata*. The study revealed that Methanol and water extracts had good total phenolic and flavonoid contents showed potent antioxidant and free radical scavenging activities. The antioxidant activity was correlated

well with the amount of total phenolics present in the extracts. The extracts and its components may be used as an additive in food preparations and nutraceuticals.

### Effect on long term hypo perfusion

A research done on Effect of *Slimaluma*, an enriched phytochemical composition of *Caralluma fimbriata* in long term hypoperfusion injury in rats has investigated the effect of *Slimaluma* (SL), a branded product and an enriched phytochemical composition developed from *Caralluma fimbriata* (CF) a traditionally claimed neuroprotective agent, against long term hypoperfusion induced damage using two different paradigms for the behavioral studies in the rats. 36 male wistar rats were used for two different models (open field test, morris water maze), each having 3 groups (sham operated control, vehicle treated control, SL- 500mg/kg p.o.) The permanent BCCAO was carried out with the 3.0 silk suture followed by the survival surgery. The research concluded that SL treatment showed significant attenuation showing improvement in the spatial memory impairment. The altered spatial discrimination and induction of anxiety are common outcomes of permanent BCCAO which was significantly attenuated by SL treatment.

### Conclusion

Nature has provided a complete store-house of remedies to cure all ailments of mankind. This is where, nature provides us drugs in the form of herbs, plants and algae's to cure the incurable diseases without any toxic effect. There is evidence that the principles present in the widely consumed Indian food plant *caralluma fimbriata* extracts suppress appetite and provide anti obesogenic and metabolic benefits. *Caralluma* has anti oxidant and anti diabetic action apart from the role of appetite suppressant. It has been proved that it also has analgesic property which adds on to its medicinal value. All these qualities suggest the importance of *caralluma fimbriata* in different aspects.

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