

Caralluma Pharmacological Attributes

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Abstract

Caralluma genus having different nutritional, pharmaceutical value and important phytochemical ingredients which have various healing activity, most important *Caralluma* spp. claimed to have antidiabetic properties. Traditionally it is used in raw form for treatment of diabetes because of its hypoglycemic activity, having key active compound that having fruit full effects against diabetes.

Keywords: *Caralluma*; Antidiabetic properties; Hypoglycemic activity; Phytochemical study

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Introduction

The *Caralluma* spp. grown in Asia and Mediterranean region [1]. More than 200 species of the genus *Caralluma* grow throughout Africa and Asia [2]. The genus *Caralluma* belongs to the Asclepiadaceae family, which is also known as the milkweed family because many of its members contain milky latex [3,4]. Important phytochemical ingredients of *Caralluma* include pregnane aglycones, flavone glycosides, bitter principles, pregnane glycosides, saponins, triterpenes and various flavonoids that were explore for various healing purposes against different infectious agents and metabolic disorders (Table 1). *Caralluma* is famous for hypoglycemic, weight reduction and anti-rheumatic effects. It also used as vegetable during famine, worldwide it is neglected genus and not cultivated on commercial scale [1].

Due to recent DNA analysis and morphological studies, Asclepiadaceae have been classified as a sub-group of the family Apocynaceae [5]. Plants of the genus *Caralluma* are perennial, small and usually leafless [6,7]. Some of these plants are edible and succulent [8,9]. *Caralluma fimbriata* is an endemic, succulent cactus and wild medicinal plant in the family Apocynaceae, growing in dry places, and various medicinal uses of *Caralluma*

spp. in traditional medicine such as treatment of cancer, diabetes, tuberculosis, snake and scorpion bites, skin rash, scabies, fever and inflammation [10]. Diabetes mellitus is a metabolic disorder which is associated by hyperglycaemia with multiple disorders. A major metabolic defeat associated with diabetes is the failure of peripheral tissues in the body to utilize glucose that ultimately leads to chronic hyperglycaemia and further to other diabetes-related complications [11]. *Caralluma attenuata* consume in raw form for diabetes treatment and its juice with addition of black pepper used for migraine cure [12]. A global survey has stated that one forty-two million people are suffering from diabetes in the world and this figure will possibly double in the year 2030. Over 90 percent of diabetic patients are diagnosed with type 2 diabetes. For the cure of diabetes mellitus, different kinds of synthetic hypo-glycaemic agents are used like sulphonyl-urea and biguanides but these have side effects related to their usages. Therefore, it is a basic need to explore drugs from natural source which has lesser side effects. Different types of plants including *Caralluma* used to cure the serious diseases such as diabetes. Traditionally, *Caralluma* spp. claimed to have antidiabetic properties, but there are only few scientific reports prove the same [13,14] (Table 2). Hypoglycemic synergistic consequence

Table 1 Key active compound in *Caralluma* [4].

Pregnane glycosides	Appetite suppressants
Flavone glycosides	Antioxidants
Megastigmane glycosides	Anti-inflammatory
Polyphenols	Antioxidants
Flavonoids	Antioxidants
Saponins	Immune system enhancers
Bitter principles	Protectors of digestive system and pancreas

Table 2 Pharmacological activities of *Caralluma* spp. [1].

Caralluma species	Pharmacological activity
<i>Caralluma tuberculata</i>	Diabetes, cancer, malaria, ulcer and fever
<i>Caralluma attenuate</i>	Migarine and antinociceptive
<i>Caralluma fimbriata</i> and <i>C. siniaca</i>	Appetite suppressant and weight loss promoter
<i>Caralluma Edulis</i>	Diabetes and anti obesity

Table 3 Aerial parts of *Caralluma adscendens* var. *Caralluma fimbriata* [19].

Proximate composition	
Moisture	82 ± 0.5
Lipid	5.6 ± 0.1
Carbohydrates	55.4 ± 0.4
Protein	3.5 ± 0.7
Total free amino acid	27.5 ± 0.5
Crude fibre	15.3 ± 0.2
Ash	2.1 ± 0.8

Table 4 Amino acid composition (mg/100 g dry weight) of aerial parts of *Caralluma adscendens* var. *Caralluma fimbriata* [19].

Aspartic acid	Glutamic acid	Alanine	Methionine	Tyrosine	Lysine	Theronine	Proline
21.6	negligible	120.72	22.56	130.08	316.56	negligible	483.8
Isoleucine	Phenylalanine	Tryptophane	Glycine	Arginine	Histidine	Valine	
1578.24	141.58	157.36	108.29	51.58	84.48	342.95	

was noticed when *C. edulis* and *C. attenuate* used in combination with the extract of phlorizin for reduction of urine and blood glucose level [15]. The phytochemical study showed the presence of polyphenols suggesting it may have hypoglycaemic activities, the plant polyphenols are known to have hypoglycaemic activities [16,17]. In Indian tribals and hunter *Caralluma fimbriata* extract used to suppressant appetite and weight loss promoter [18]. *Caralluma fimbriata* and *Caralluma siniaca* also play key role to reduce blood glucose level and body weight [14,19] (Tables 3 and 4).

Wild form *Caralluma umbellata* is very useful for treatment of abdominal and stomach problems [20].

Conclusion

This mini review of genus *Caralluma* conducted to explore the different nutritional and pharmaceutical vale of *Caralluma*. Different type of plant having medicinal value including *Caralluma* used for treatment metabolic disorders, *Caralluma* species claimed to have antidiabetic properties, having hypoglycemic activity.

References

- Noreen S (2017) A mini review on a *Caralluma tuberculata* N. E. Br. uncommon and wild succulents but having exciting pharmacological attributes. Pure Appl Biol 6: 748-761.
- Surveswaran S (2007) Molecular Phylogenetics and Medicinal Plants of Asclepiadoideae from India. PhD Thesis. University of Hong Kong.
- Bensuzan K (2009) Taxonomy and conservation status of Moroccan Stapeliads (Apocynaceae-Asclepiadoideae-Ceropegieae-Stapeliinae). Bull Misc Inf 121: 1913.
- Bader A, Braca A, De Tommasi N, Morelli I (2003) Further constituents from *Caralluma negevensis*. Phytochemistry 62: 1277-1281.
- Endress ME, Bruyns PV (2000) A revised classification of the Apocynaceae sl. Bot Rev 66: 1-56.
- Heyood VH (1978) Flowering Plants of the World. Oxford University Press, London and Melbourne, pp: 260-265.
- Saxena AK, Sarbhai RP (1975) A Text Book of Botany. Oxford Press, High Court Road, Kitab Ghar.
- Marwah RG, Fatope MO, Al Mahrooqi R, Varma GB, Abadi HA, et al. (2007) Antioxidant capacity of some edible and wound healing plants in Oman. Food Chem 101: 465-470.
- Reddy KD, Rao BVA, Babu GS, Kumar BR, Braca A, et al. (2011) Minor pregnanes from *Caralluma adscendens* var. *gracilis* and *Caralluma pauciflora*. Fitoterapia 82: 1039-1043.
- Abdel-Sattar E, Ahmed AA, Hegazy MEF, Farag MA, Al-Yahya MAA (2007) Acylated pregnane glycosides from *Caralluma russeliana*. Phytochem 68: 1459-1463.
- Rother KI (2007) Diabetes treatment bridging the divide. N Engl J Med 356: 1499-1501.
- Kumar AS, Kavimani S, Jayaveera K (2011) A review on medicinal plants with potential antidiabetic activity. Int J Phytopharm 2: 53-60.
- Latha S, Rajaram K, Kumar PS (2004) Hepatoprotective and antidiabetic effect of methanol extract of *Caralluma fimbriata* in streptozocin induced diabetic albino rats. Int J Pharm Sci 6: 665-668.
- Habibuddin M, Daghiri HA, Humaira T, Al Qahtani MS, Hefzi AAH (2008) Antidiabetic effect of alcoholic extract of *Caralluma sinaica* L.

- on streptozotocin-induced diabetic rabbits. *J Ethnopharmacol* 117: 215-220.
- 15 Venkatesh S, Reddy GD, Reddy BM, Ramesh M, Rao AA (2003) Antihyperglycemic activity of *Caralluma attenuate*. *Fitoterapia* 74: 274-279.
- 16 Shanmugam G, Ayyavu M, Rao DM, Devarajan T, Subramanian G (2013) Hepatoprotective effect of *Caralluma umbellata* against acetaminophen induced oxidative stress and liver damage in rat. *J Pharm Res* 6: 342-345.
- 17 De Sousa E, Zanatta L, Seifriz I, Creczynski-Pasa TB, Pizzolatti MG, et al. (2004) Hypoglycemic effect and antioxidant potential of Kaempferol-3, 7-O-(r)-di rhamnoside from *Bauhinia forficata* leaves. *J Nat Prod* 6: 829-832.
- 18 Sreelatha RV, Pullaiah T (2010) Induction of somatic embryogenesis and plant regeneration from intermodal explants of *Caralluma stalagmifera*. *Bot Res Int* 3: 17-20.
- 19 Maheshu V, Priyadarsini DT, Sasikumar JM (2012) Antioxidant capacity and amino acid analysis of *Caralluma adscendens* (Roxb.) Haw var. *fimbriata* (wall.) Grav and Mayur aerial parts. *J Food Sci Technol* 51: 2415-2424.
- 20 Medikundu K, Surendrababu K, Hanumantharao Y, Naga hima bindu G, Janardhan M (2010) Chemical examination of medicinal plant *Caralluma umbellate* (asclepiadaceae) roots. *Int J Appl Biol* 1: 545-549.