

A Medicinal Importance and Chemical Composition of *Caralluma Umbellata* Haw

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Abstract: *Plants are a vital component of the world's biodiversity and essential natural resource for human well-being. Besides sustenance, the plants have been used as therapeutic aid for alleviating human ailments from very ancient times. Such plants commonly referred to as medicinal plants, have been one of the valuable tools in the traditional system of medicine and are also known to provide ingredients for formulations of new medicines in pharmaceutical industry.*

The present review article explores the phyto-chemical activities in Caralluma umbellata plant by using different extraction methods with different solvents. Caralluma umbellata is a Succulent plant species, which belongs to Asclepiadaceae family. It is an important medicinal plant, which is used to cure diabetes & fat accumulation. Till the date more than 26 variety of medicinally important chemicals are isolated by different methodologies. Most of them are Alkaloids derivatives namely Carumbelloside -1,2,3,4,5,6 etc., the literature survey states that chemical compounds other than alkaloids are pregnane glycosides, steroidal glycosides, bisdesmosidic glycoside etc.,

Isolation of all compounds selectively extracted from roots, stem, flowers or combined. In pharmacological studies of the isolated compounds effectively explained in anti-inflammatory activity, the analgesic activity, antioxidant activity, invitro Antibacterial activity, Anti hyperglycaemic activity etc.

1. INTRODUCTION

Caralluma umbellata Haw belonging to the Asclepiadaceae family. It is a thick, erect, leafless, branching, succulent thorny perennial herb. Caralluma is found in Africa, Spain, Saudi Arabia Middle East, Pakistan and India. In India Occasionally, it was found in Hilly Regions of Orissa, Andhra Pradesh, Tamil Nadu and in Karnataka.

Caralluma Umbellata have different local names in different regions.

Sanskrit Name: Dugdika, Uttamphalini.

Telugu Name: Kundete Kommulu.

Tamil Name: Eluman, Elumanpul i, Kallimulayan

Kolli Hills Name: Chirukalli. (Malabar Tribes)

The Stem of Caralluma Umbellata Haw used to prepare with salt and oil as pickles or chutneys.

2. MEDICINAL IMPORTANCE

Preganes, pregnane glycosides, sapanoins, flavanoids, triterpenoids, flavones glycosides, steroidal glycosides are the phyto chemical constituents, which are present in Caralluma Umbellata Haw.

The stem juice & mixed with turmeric powder were used to cure stomach disorder & abdominal pains. It was also used for treatment of obesity and diabetes. The stem of the plant burn in direct fire and eaten for five days regularly in empty stomach to cure ulcer problems.

The Etymology of ‘Caralluma’ was derived from the Arabian word ‘qarhal-luhum’ meaning wound in the Flesh or abscess. Various medicinal uses of caralluma spices, have been documented in Arabic and Indian traditional medicine including treatment of diabetic, cancer, tuberculosis, snake and scorpion bites, skin rashes, scabies, fever and inflammation. It is used as vegetables in different regions of Pakistan. Caralluma Umbellata is eaten by the Oddan tribals, hence it is called Oddankallivan.

3. ALKALOIDS & TERPENOIDS

M. Kishore et al isolated two pregnane glycosides (table no: 1) from the roots of Caralluma Umbellata Haw. They were used different solvents in Soxhlet Extraction. But they were used Hexane as solvent in Soxhlet Apparatus, two new pregnane glycosides were obtained. The structure of the compound is elucidated by spectral analysis.

M. Ramesh et al isolated new steroid from Caralluma Umbellata Haw. It was named as Carumbelloside-1.

Sayantan ray et al isolated a new steroidal glycosides from the whole plant of Caralluma Umbellata Haw. By using Soxhlet Apparatus, they were extracted with different solvents like ethylalcohol, diethyl ether, ethyl acetate & n-butanol. From Ethylacetate extract obtain a new compound Carumbelloside-2.

The structure of the compound elucidated & identified by spectroscopic methods.

Sayantan Ray et al isolated steroidal glycosides from the Bark & Flowers of Caralluma Umbellata Haw. They are extracted successively with hexane, petroleum ether, Chloroform, Ethylacetate, methanol & water. But they are identify the new steroidal glycoside from Soxhlet Apparatus, concentration aqueous methanol as a solvent.

From TLC & spectral analysis, the structure of the glycoside is named as carumbelloside - 3.

Sayantan Ray et al isolated steroidal glycosides from the whole plant of Caralluma Umbellata Haw. A new Steroidal glycoside was obtained from soxhlet apparatus by using Ethyl acetate & n-butanol as a solvents. The steroidal glycoside structure is identify by spectral analysis. It named as Carumbelloside-4.

Sayantan Ray et al isolated a new steroidal glycoside from the whole plant of the Caralluma umbellata Haw.

They were extracted by using different solvent, but a new steroidal glycoside was obtained from Soxhlet Apparatus by using methanol as a solvent. The new Steroidal glycoside is named as Carumbelloside-5. The structure of the Carumbelloside-5 is identified by spectral studies.

K. Kalyani et al isolated a Novel pregnane glycosides from the roots of Caralluma Umbellata Haw. They were used ethyl alcohol as a solvent in Soxhlet extraction process. A novel pregnane glycoside was obtained. The partial structure of the compound was identified by spectral studies.

4. BIOLOGICAL ACTIVITY OF ISOLATED COMPOUNDS

The biological activity of Carumbelloside-1 (M. Ramesh et al) was evaluated in mice using the writhing test method and also in rats using the Paw edema test. These methods were used to verify the antinociceptive & anti-inflammatory activities.

Carumbelloside-1 shows significant antinociceptive activity and it has no anti inflammatory.

From research documents on indigenous Herbal Medicines, Pankaj Oudia et al identify the Caralluma Umbellata Haw used for Sexual Health.

The phyto chemical compound Carumbelloside-2 shows significant biological activities. Applying on Albino mice, it shows the results of antinociceptivity in abdominal constriction test in mice. Carumbelloside-2 also apply on Carrageenan induced rat in Paw edema model shows anti inflammatory activity. So Carumbelloside-2 shows both antinociceptive & anti inflammatory activities.

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In pharmacological studies in Carumbelloside-3 (ray et al) shows anti inflammatory activity. It was evaluated in Wister rats employing the method of Winte et al. It was also evaluated in Carrageenan induced rats of Paw Oedema model. It shows significant anti inflammatory activity.

The steroidal glycoside Carumbelloside-4 (ray et al) of caralluma umbellata Haw shows anti inflammatory activity by Carrageenan induced rat in Paw edema method. It shows Maximum inhibition.

Ray et al studied biological activity of Carumbelloside-5. It was applied on Albino mice of either sex by acetic acid induced writhing method, Random sampling Technique. According to statistical analysis, Carumbelloside-5 shows significant antinociceptive activity.

K . Kalyani et al isolated the plant material from roots & stems of Caralluma Umbellata Haw. They were used Aquoes methanol extract in Soxhelt extraction process. The plant materials have good quality of phenols contents. In vitro system, it shows good antioxidant activity. It also used in nonpathogenic diseases.

Anburaja et al identified as pollinater in flowers of caralluma umbellata Haw, which was found in Panchamali Hills, Eastern Ghats, Tamil Nadu.

K. Suresh Babu et al isolated plant material from roots & stems of Caralluma Umbellata Haw. It was extracted in Soxhelt extract process using different solvents like Hexane, Benzene, Diethyl ether, Chloroform, Acetone & Methanol. The Chloroform Root & stem extracts were exhibited anti bacterial activity against gram positive & gram negative bacteria except pseduo monos-aeruginosa.

Bellamkandi. Pk. Et al isolated plant material from Caralluma Umbellata Haw. They were used Methanol as solvent in Soxhelt Extraction process. In this Methanol Extract contains glucose uptake and also shows significant activity in inhibiting alpha amylase and pancreatic lipase. So methanol extract of Caralluma umbellata Haw shows anti hyperglycemic activity.

G. V. Sampath Kumar et al isolated plant material from stems of Caralluma Umbellata Haw. They were used Methanol as a solvent in macreation chamber. This plant extract shows Nephrotoxicity against cisplatin and gentamicin. So Methanol extract shows Nephroprotective activity.

5. CONCLUSION

Table1.

Name of the Compound	Medicinal Properties
Carumbelloside-1	Antinociceptive activity
Carumbelloside-2	Anti-inflammatory activity& Antinociceptive activity
Carumbelloside-3	Anti-inflammatory activity
Carumbelloside-4	Anti-inflammatory activity
Carumbelloside-5	Antinociceptive activity

Table2.

Source of plant name	Solvent extractor	Identified compound	Isolated compound	Medical properties
Caralluma umbellata roots	Soxhelt extractor	CRUDE-1&CRUDE-2	(pregn-3, 5-ene)3 β , 14 β -dihydroxy pregn-5-ene	-
Caralluma umbellata whole plant	Soxhelt extractor	Carumbelloside-1	3-O- β -D-glucopyranosyl (1-6)- β -D-glucopyranol-3 β , 14 β -dihydroxy-pregn-5-en-20-one)	Antinoceiptive & anti-inflammatory actives
Caralluma umbellata stem& roots	Soxhelt extractor	Carumbelloside-2	3-O- β -D-glucopyranosyl-3 β , 14 β -dihydroxypregn-5-ene-20-one	Antinoceiptive&anti-inflammatory actives
Caralluma umbellata bark& flowers	Soxhelt extractor	Carumbelloside-3	carallumagenin 3-O- β -D-glucopyranosyl(1-4)- β -D-digitalopyranoside-20-O- β -D-glucopyranoside	Anti inflammatory activity
Whole plant	Soxhelt extractor	Carumbelloside-4	carallumagenin 3-O- β -D-glucopyranosyl(1-4)-	Anti inflammatory activity

			β -D-digitalopyranoside-20-O- β -D-glucopyranoside	
roots	Soxhelt extractor	Carumbelloside-5	caralumagenin 3-O-[6-O-benzoyl]- β -D-glucopyransoyl (1-4)- β -D-digitalopyransoide-20-O-(2-O-benzoyl)- β -D-glucopyranoside.	Antinoceptive activity
Roots&stem	Soxhelt extractor	Carumbelloside-6		
Roots&stem	Soxhelt extractor			Antioxidant activity
flowers	Soxhelt extractor			pollinator
flowers	Soxhelt extractor			Sexual health
Roots&stem	Soxhelt extractor			Antibacterial activity
stem	Maceration chamber			Nephroprotective activity
Whole plant	Soxhelt extractor			Antihyperglycemic activity
Whole plant	Soxhelt extractor			Hepatoprotective activity

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