



PHYTOCHEMICAL INVESTIGATION AND PHARMACOLOGICAL ASSESSMENT OF CARALLUMA ADSCENDENS (ROXB.)

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Abstract:

The present study focus on microscopy, phytochemical and morphological investigation of ethanolic extract of Caralluma adscendens (Roxb.) Bark. These plant shown various activity. Pharmaceutically valuable varieties of Caralluma adscendens from nodal explant, is described. The morphology of the Caralluma treated cells, control, and positive control were observed under reverse phase inverted microscope. , used by tribal Indians to suppress hunger and known as “famine food” with no history of adverse effects, which contains pregnane glycosides. This plant has been investigated for its myriad biological effects such as antihyperglycaemic and hypolipidaemic, hepatoprotective, antioxidant activity and came out with promising results. study of microscopy and phytochemical investigation take plant from hatti village, tahsil chandwad, district Nashik. Hese plants due to their several medicinal values are fast disappearing and are threatened to become rare due to indiscriminate collection and over exploitation by the pharmaceutical industry, agriculture, mining activities, and lopping for fodder used as an anti-obesity agent and appetite suppressor. It is also seen that the pregnane glycosides isolated and identified from African Hoodia are reported as anti-obesity and appetite-suppressant compounds. On reviewing the studies undertaken on the chemistry, pharmacology, and therapeutic potential of Caralluma is currently used as a “natural slimming” food supplement, likely due to its content in pregnane glycosides. In the present study, a commercially available

Keyword : Caralluma adscendens (Roxb.), makad shingi, morphology, microscopy, phytochemical investigation, traditional use, medicine use

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Introduction:

India is generally called as the largest production of herbal medicine and is appropriately called as the botanical garden of the world. The herbal plants which are related to traditional medicinal system continues to provide primary health care. We in this study were examined the phytoconstituent Every plant possesses medicinal properties, in today's context of medical field plants, the contribution is very essential, and most of the countries had interested to that ancient medicinal plants have reinvestigate to the discovery of active compounds and it is too established for disease curative In all over the world, in same category plant shown *Caralluma adscendens* (Roxb) is an edible succulent cactus and wild medicinal plant in the family Apocynaceae, growing in dry places, used by tribal Indians to suppress hunger and known as "famine food" with no history of adverse effects, which contains pregnane glycosides. The plant *Caralluma adscendens* has been used in different system of traditional medication for the treatment of disease and ailments of human being. It is reported to contain various glycosides, flavonoids and steroids. It has been reported as an anti-inflammatory, antioxidant, anti-diabetic, analgesic, anti ulcers, antibacterial, hypoglycemic activities. *Caralluma* 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 [5]. It is more common in peninsular India. 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. *Caralluma adscendens* 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 *Caralluma Adscendens* Some people in Pakistan have started growing *Caralluma* in ceramic plastic containers to produce fresh vegetables for home consumption.

Authentication and collection of plant

This plant collected from Hatti village, Chandwad Tahsil, Nashik District, Maharashtra Dr. A. S. Wable, Assistant professor and research guide, Dept. of Botany of Research Centre Padmashri Vikhe Patil College, Loni, India. Did the

authentication of plant by comparing morphology of feature

The plant sheet has been deposited on at P.V.P College Loni, India the ref. no:

PVC/BOT/2022-23/96 Dated 21st December 2022

Chemicals, reagents and solvents

Ethanol (90%), Acetacaramine, Methanol, Acetic acid, Cyclophosphamide, DMSO, Iuginol Blue stain

Extraction process of leaves of *Caralluma adscendens roxb.*

- **Maceration:** This is an extraction method in which a container is filled with finely powdered drug material, such as leaves, stem bark, or root bark. The menstruum is then poured on top, covering the drug material entirely. After that, the container is sealed and preserved for a minimum of three days.(6)
- Take 200gm of *Caralluma adscendens roxb.* stem powder
- Take 400ml of 90% Ethanol and mix in stop close conical flask
- These mixtures shake after 1 hrs. these procedure repeated 3 days

Finally filter solution and collect liquid solution for evaporation

Macroscopic feature of stem part

This study contains morphology description of the stem of *Caralluma adscendens roxb.* Plant which seen by naked eye also be magnified lens

MICROSCOPIC FEATURE:

The study include stem of *Caralluma adscendens roxb.* stem was dip in Chloral hydrate solution until he deep from colour pigment T.S mature another selected for the study. Fine section move on glass slide with help of glycerin without any staying reagent were used were placed under microscope. Were various character observe under microscope and recorded

Powder microscopy:

The microscopy done by using electron microscope and motic microscope in that Phloroglucinol: HCL is adding as (1:1) with powder under observation detect various important characteristic

Pharmacological Activity (In-Vitro)**1) Onion root tip assay**

For entities to mature, grow, maintain tissues, repair and synthesize new cells, cell division is required. Cell division is of two types:

Mitosis
Meiosis

Mitosis

In [mitosis](#), the nucleus of the Eukaryotic cells divides into two, subsequently resulting in the splitting of the parent cells into two daughter cells. Hence, every cell division involves two chief stages:

- Cytokinesis – Cytoplasm division
- Karyokinesis – Nucleus division

Basically 4 phases found in mitosis Prophase, Metaphase, Anaphase, Telophase

Procedure of the Experiment

- Place an onion on a tile
- With the help of a sharp blade, carefully snip the dry roots of the onion
- Place the bulbs in a beaker containing water to grow the root tips
- It may take around 4 to 6 days for the new roots to grow and appear
- Trim around 3 cm of the newly grown roots and place them in a watch glass
- With the help of forceps, shift it to a vial holding freshly prepared aceto-alcohol i.e., a mixture of glacial acetic acid and ethanol in the ratio 1:3
- Allow the root tips to remain in the vial for one complete day
- With the help of forceps, pick one root and set in on a new glass slide
- With the help of a dropper, allow one drop of N/10 HCl to come in contact with the tip of the root. Additionally, add around 2 to 3 drops of the acetocarmine stain
- Heat it lightly on the burner in such a way that the stain does not dry up
- Excessive stain can be carefully treated using filter paper
- The more stained part of the root tip can be trimmed with the help of a blade.
- Discard the lesser stained part while retaining the more stained section
- Add a droplet of water to it
- With the help of a needle, a coverslip can be mounted on it
- Gently tap the coverslip with an unsharpened end of a needle in order for the meristematic tissue of the root tip present under the coverslip to be squashed properly and to be straightened out as a fine cell layer
- The onion root tip cells' slide is now prepared and ready to be examined for different stages of mitosis
- Observe and study mitosis by placing the slide under the compound microscope. Focus as desired to obtain a distinct and clear image

Formula: mitotic index = number of cells with visible chromosomes ÷ total number of cells

2) Potato Disc Assay:

Principle:

Agrobacterium species lives in soil or in the roots or stem of plants where they produce galls (tumor like growth). They are particularly noted for the ability cause galls in plants. Galls are disorganized masses of plant cells, some large and swollen, others small and rapidly dividing. As they developed they may cut off the flow of water and nutrients in the plant (cell), resulting in death. Crown gall or plant cancer may occur on fruit trees, sugar beets, and other broad leafed plants, where the stem comes out of the ground. The causative agent of crown gall *Agrobacterium tumefaciens* has the unique ability of transforming normal plant cells into tumor cells. *Agrobacterium tumefaciens* are the only bacteria known to be involved in any form of cancer like growth.

Procedure:

Obtain fresh Russet potatoes from a local grocery store. Sterilize the lab area using a 20% bleach solution. Wash the potatoes under cold running water, peel, and immerse in a 10% bleach solution for 2 min. Prepare 10 ml of the following solutions of test extracts in disposable culture tubes: 10 mg/ml (DMSO) followed by dilution with sterile water to achieve 0.5, 0.05 and 0.01 mg/ml. Similar solutions containing the same concentrations of cyclophopamide (German Remedies, Mumbai) can also be prepared and will serve as standard solutions. Also, prepare a 10 ml control solution containing 5% DMSO in sterile water. Rinse the potato with deionized water, trim the outer sections, and cut the potato into rectangular blocks (1 cm x 1 cm base), and soak in sterile water for 20 min.

Transfer 1 ml warm 1.5% agar solution into each of the culture plate. Transfer the potato discs into the center of the wells, keeping them 2/3 submerged in the Agar solution. Using a sterile micropipette, combine 400 µl bacteria solution with 400 µl of the appropriate test or control solution in test tubes. Within 30 minutes after placing the potatoes in the wells, inoculate each potato with 1 drop (50 µl) of the test or control solution. taking care to spread the

Material And Methods:

liquid evenly over the disc surface. Cover the plates, tape the lids, using parafilm (to minimize moisture loss), and incubate under dry conditions

at room temperature for 7-12 days. After 7-12 days inoculation, the potatoes discs are analyzed using a dissection microscope at 10 X magnification after staining with Lugol's Solution. The tumors lack starch and will turn orange in the presence of the stain while the potato discs will turn dark blue.

Results

Macroscopic study of stem Bark

The macroscopic study of *Caralluma adscendens* roxb. leaves done with naked eyes the leaves show colour Green, odour Characteristic, test Spicy and texture slightly rough

Morphological Evaluation	Observation
Color	Green
Odour	Pleasant aromatic
Taste	Spicy
Size	15- 30 cm thick
Shape	Cylindrical
Fracture	Long Fracture

Table no 1: Macroscopic Analysis of *carallumma adscends roxb* Stem

Microscopic study:

T.S of stem of *carallumma adscends roxb* plant which show the epidermis, dermis, cortex, phloem, stomata and presence of oil globule etc.

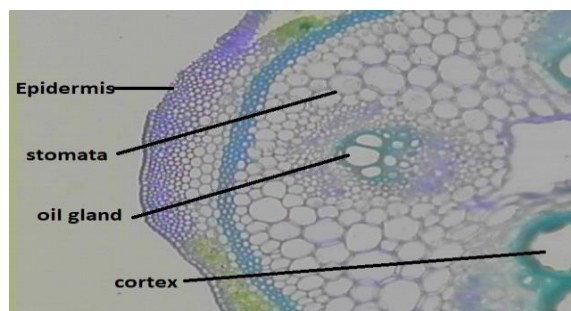
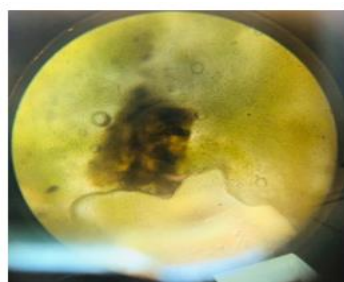


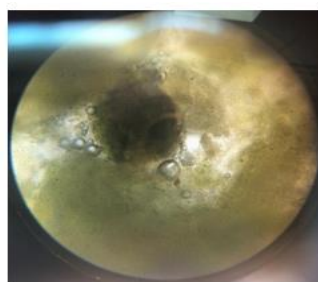
Fig no 1: T.S of of *carallumma adscends roxb* Stem

Powder Study

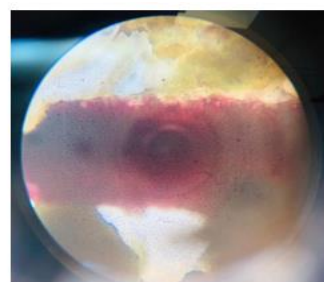
Stem powder appear greenish showing thick walled elongated phloem fibers; lignified stone cells and lignified phloem fibers, Sclerides, Tracheid's thick walled uniseriate multicellular trichomes Powder characteristics of the Stem have been shown in Fig



Oil globule



Cortex



Lignified cells

Pharmacological Activity (In-Vitro)

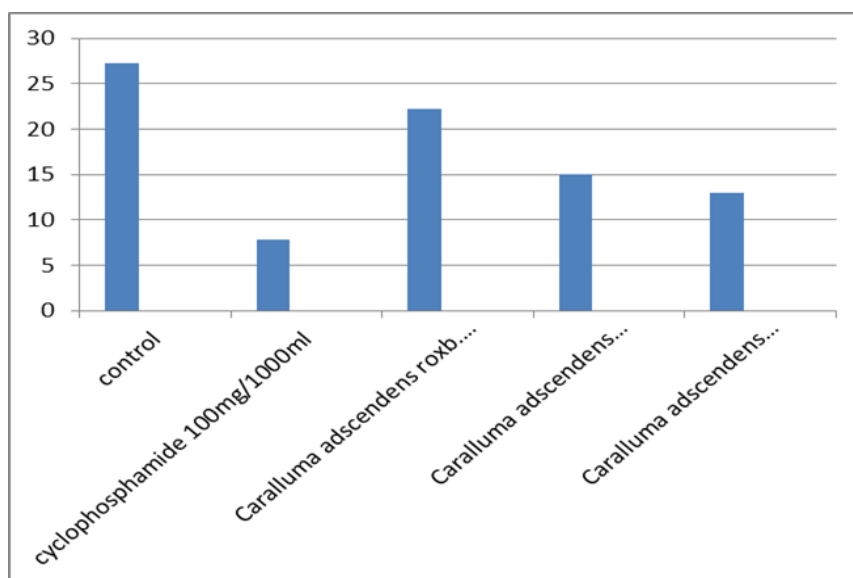
1) Onion root tip assay

The *Caralluma adscendens* roxb. leaves extract was screen for the Anti-peptic ulcer activity.

Treatments g/L	No of examined cells	Prophase	Metaphase	Anaphase	Telophase	Total Mitosis	Mitotic Index
Control	411	41	26	20	25	112	27.25%
Cyclophosphamide 100mg/1000ml	396	12	4	6	9	31	7.82%
<i>Caralluma adscendens</i> roxb. 25mg/1000ml	382	25	19	18	23	85	22.25%
<i>Caralluma adscendens</i> roxb. 50mg/1000ml	445	24	13	12	18	67	15.05%
<i>Caralluma adscendens</i> roxb. 100mg/1000ml	392	17	10	9	15	51	13.01%

The Onion root tip mitosis of Standard anticancer Cyclophosphamide and Ethanolic extract of Stem parts of *Caralluma adscendens* roxb. (25, 50, 100

mg) was observed in vitro.The data represent mean of total mitosis and % inhibition of Mitotic index.



Mitotic index of Ethanollic extract of *Caralluma adscendens roxb.* Stem compare standard Cyclophosphamide

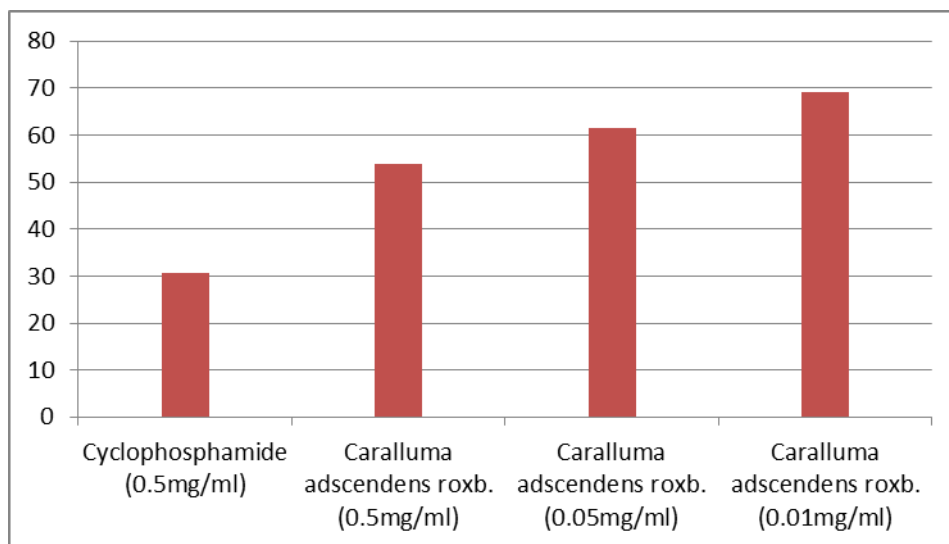
2) Potato disc assay

2) Potato disc assay

Sr no	Treatment	Tumor no.	Percentage inhibition
1	Control	13	
2	Cyclophosphamide (0.5mg/ml)	4	30.7%
3	<i>Caralluma adscendens roxb.</i> (0.5mg/ml)	6	53.8%
4	<i>Caralluma adscendens roxb.</i> (0.05mg/ml)	8	61.5
5	<i>Caralluma adscendens roxb.</i> (0.01mg/ml)	11	69.2%

The Antitumor Capacity of Standard anticancer mixture and Ethanollic extract of Stem parts of *Caralluma adscendens roxb* (0.5, 0.05, 0.01

mg/ml) was observed in vitro. The data represent Percentage inhibition



Antitumor activity of Ethanollic extract of *Caralluma adscendens roxb.* Stem compare standard Cyclophosphamide

Results & Discussion

Caralluma adscendens roxb. belong to Family-Apocynceae. After authentication of the plant need to be confirmed. Microscopic examination of crude drug is essential for the detection of

grounded or powdered materials. This was a study of the organoleptic properties of the plant's fresh leaves, as revealed by the morphology analysis of the Stem of *Caralluma adscendens Roxb.* Revealed that the Stem has a slightly rough texture, is green in color, tastes Characteristic, and has no discernible odor. microscopic analysis, several anatomical traits that are useful for

diagnosis were found. Transverse section (TS) of the Stem of *Caralluma adscendens roxb.* Reveal a cup shaped shape. The lamina segment spanning the midrib has both trichomecontaining epidermises. The mid rib contains the vascular bundle that contains the xylem and the phloem that is externally located. (Situated within). A trichome was visible, and a core mass of parenchymatous cells had formed. powder. Initially, the Mitotic index value and Potato disc assay of standard anti-Cancer mixture was determined for the comparison with of. Ethanolic extract of *Caralluma adscendens roxb.* Shows prominent antimitotic activity (Anti-Cancer) we take three different solution of *Caralluma adscendens* extract (25, 50, 100 mg/1000ml) but 100mg shows prominent activity in mitotic index activity compare control sample

The potato disc assay take three different solution of *Caralluma adscendens roxb.* (1.0, 0.5, 0.05 mg/ml) compare with Control and standard as cyclophosphamide

In observation Ethenolic extract of *Caralluma adscendens roxb.* stem 1.0 mg/ml solution give prominent activity against tumor compare with control

Conclusion

Microscopic and Powder characterstic studies Pharmacological In-Vitro activities and studies it was concluded that Ethanolic extract of stem of *Caralluma adscendens roxb.* shows Anti-Cancer activity

References:

1. Liu Y and Wang MW. Botanical drugs: Challenges and opportunities: Contribution toLinnaeus Memorial Symposium. Life Sci. 2008;82:445-449.
2. Council of Scientific & Industrial Research, "Wealth of India: A Dictionary of Indian Raw Materials and Industrial Products," Council of Scientific & Industrial Research, Delhi, 1985.
3. Kasahara S and Hemini S. Medicinal Herb Index in Indonesia, Bogor, Indonesia, P.T. Eisai Indonesia. 1998:1-2.
4. Evans WC, Trease and Evans. Pharmacognosy. 15th ed. W.B.Saunders Company, London, Toronto, Sydney; 2002.
5. Rebecca Kuriyan, Tony Raj, Srinivas SK. Effect of *Caralluma fimbriata* extract on appetite, food intake and anthropometry in adult Indian men and women. Appetite. 2007; 48: 338-344

6. Preparation of Medicinal Plants: Basic Extraction and Fractionation Procedures for Experimental Purposes Abdullahi R. Abubakar1 and Mainul Haque2
7. Zeaxanthin Induces Apoptosis via ROS-Regulated MAPK and AKT Signaling Pathway in Human Gastric Cancer Cells Ya-Nan Sheng,, Ying-Hua Luo, 2020 Mar 19.
8. *Allium willeianum* Holmboe exerts anticancer activities on metastatic breast cancer cells MCF-7 and MDA-MB-231, Ovgu Isbilen, Ender Volkan, 2021 Aug, national library of medicine
9. Anticancer activity of milk fat rich in conjugated linoleic acid against Ehrlich ascites carcinoma cells in female Swiss albino mice, Abdelrahman M. Abd El-Gawad, Diea G. Abo El-Hassan, 2021 March, vaterniry world
- 10.13-Methyltetradecanoic Acid Exhibits Anti-Tumor Activity on T-Cell Lymphomas In Vitro and In Vivo by Down-Regulating p-AKT and Activating Caspase-3