

Pharmacognostical, Phytochemical and Pharmacological Evaluation of *Murrayakoenigii* (Curry Tree)

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Abstract- *Murrayakoenigii(L) Spreng (Rutaceae), is a medicinally important herb of Indian origin native to Asia and is found throughout the Indian subcontinent. It has been used for centuries in the Ayurvedic system of medicines. Murrayakoenigii(Curry leaf tree) has been used in several ancient systems of medicine including Siddha and Unani as a multi-potential medicinal plant. The whole plant is a rich source of carbazole alkaloids and these alkaloids have been reported for their various pharmacological activities such as antiemetics, anti-diarrhoeals, blood purifier and febrifuge. It is also reported as anti-diabetic, antioxidant, antihypertensive, antibacterials, cytotoxic and also in the treatment of various respiratory tract disorders. The whole plant is used as a tonic and stomachic. The leaves are also used externally to treat burns, bruises and skin eruption. It is also used in preventing premature graying of hair. Apart from these medicinal properties the curry leaves are also used from centuries as a species as natural flavoring agents. The extracted oil from the leaves is used in the soap industry. Apart from all these activities, the plant is also reported to possess a wide spectrum of biological activities and has a potential as a valuable herb for the treatment of various diseases as well as for the management of human health. This review incorporates the descriptions of Murrayakoenigii, and its phytochemical constituents, pharmacognostic evaluations and also throws light on its therapeutic potentials for the treatment of various diseases.*

Indexed Terms- *Murrayakoenigii, carbazole alkaloids, phytochemistry, pharmacognostical, pharmacology.*

I. INTRODUCTION

Herbal Medicine, sometimes referred to as Herbalism or Botanical Medicine, herbs are used for their therapeutic or medicinal value. An herb is a plant or plant part valued for its medicinal, aromatic or savory qualities. Herbs produce and contain a variety of chemical substances that act upon the body.

The curry tree (*Murrayakoenigii* or *Berberakoenigii*) is a tropical to sub-tropical tree in the family Rutaceae, which is native to India and Sri Lanka.

Common Indian Vernacular Name

- Common name : Curry leaves
- Hindi name : sweet neem, Kurrupatta
- Karnataka : Karibeva
- Sanskrit : Mahanimb
- Orissa : Bassan





Distribution-This plant especially native to India and Sri Lanka and nearly Asia.

Description-Murrayakoenigii is a small tree, growing 4–6 m (13–20 feet) tall, with a trunk up to 40 cm (16 in) diameter.

- The aromatic leaves are pinnate with 11–21 leaflets, each leaflet 2–4 cm (0.79–1.57 in) long and 1–2 cm (0.39–0.79 in) broad.
- The plant produces small white flowers which can self-pollinate to produce small shiny-black berries containing a single, large viable seed.
- Though the berry pulp is edible—with a sweet but medicinal flavour—in general, neither the pulp nor seed is used for culinary purposes.

II. LITERATURE REVIEW

SI. NO.	Name of the Constituent	Activity
1.	Mahanimbine	Antibacterial
2.	Koenimbin, Mahanimbin, Koenigicine	Anti-oxidant, anti-diabetic
3.	Mahenine	Cytotoxic
4.	Girinimbine	Antitumour potential
5.	Koenine	Anti-oxidant & anti-inflammation
6.	Koenimbine, koenine	Antidiarrhoeal

Antibacterial activity

- Three bioactive carbazole alkaloids named as, mahaninemurrayanol and mahanimbine, disconnected from leaves, which has demonstrated antimicrobial, mosquitocidal, and topoisomerase I and II restraint exercises.

Anti-diabetic and Hypoglycaemic activity

- The water concentrate of the *M. koenigii* leaves demonstrated the blood glucose level diminishing in diabetic rats and alloxan prompted diabetic rabbits with the impact of a standard tolbutamide hypoglycaemic medication.

Anti-inflammatory and Analgesic activity- The ethanol extract of leaves of *Murrayakoenigii* showed anti-histaminic and anti-inflammatory effects (Parmaret *al.*, 2010; Darvekar and Patil 2011).

Antioxidant activity-The antioxidant properties of the extract of *Murrayakoenigii* leaves were screened on the basis of stability index of oil and free radical scavenging ability against DPPH.

Cytotoxic activity-Carbazole alkaloids Mahenine, Pyrayafoline-D and Murrafoline-1 showed important cytotoxicity against HL-60 cells. *Ranunculus sceleratus* has been reported for inhibitory effects on hepatitis B virus (HBV) and Herpes simplex virus type-1 (HSV-1) [4].

III. EXPERIMENTAL WORK

Collection of plant material-The leaves of *Murrayakoenigii*, Rautaceae was collected from the town Baghra, District Muzaffarnagar (India), in the month of December 2021. The authenticated leaves of *Murrayakoenigii* was dried under shade and then coarsely powdered with the help of mechanical grinder. The coarse powder was stored in an airtight container for pharmacognostical studies and successive extraction.

Organoleptic Evaluation

- Colour
- Odour
- Taste
- Texture

Microscopical Evaluation

- Transevers section
- Powder microscopy

Physical Evaluation

- Foreign Organic matter
- Swelling Index
- Moisture content
- Extractive value
- Ash value

Microscopic evaluation

- Transverse section examination of stem, and fruit
- Powder microscopy

IV. PHYSICAL EVALUATION

It was investigate with reference to foreign organic matter, ash value (Total ash, acid insoluble ash and water soluble ash), extractive value, moisture content (loss on drying), swelling index, foaming index.

- Foreign organic matter
- Ash value

Total ash

% Total Ash value

Acid insoluble ash

% Acid insoluble ash value

- Extractive value Extractive values of the plant *Ranunculusscleratus* were carried out by using different solvents i.e. petroleum ether, chloroform, ethanol and water.
- Swelling index
- Foaming index

The foaming index using the following formula: $100/a$
Where a = the volume in ml of decoction used for preparing the dilution in the tube where foaming to a height of 1cm was observed

PART B: PHYTOCHEMICAL STUDIES

Successive Soxhlet Extraction

- Peteroleum Ether
- Chloroform
- Ethanol

- Distilled water

Chemical test

- Various chemical classes like Alkaloids, Glycosides, Flavanoids, etc.
- Successive Extraction
- Petroleum ether
- Chloroform
- Ethanol
- Distilled water

Successive Extraction

- Petroleum ether
- Chloroform
- Ethanol
- Distilled water

PART C: PHARMACOLOGICAL STUDIES

Anticonvulsant evaluation- Anticonvulsant activity of plant extract of *Murrayakoeniigiwas* was carried out using MES test in male Wister rats (125-160g).

The Maximal Electroshock Seizure (MES)

Experimental Design

Five groups of rats, six in each received the following treatment schedule.

- Group I (Control): CMC (0.5 mg/kg, po).
- Group II (Standard): Received Phenytoin (30 mg/kg, i.p).
- Group III Petroleum ether extract 250 mg/kg.
- Group IV Chloroform extract 250 mg/kg.
- Group V Ethanol extract 250 mg/kg.

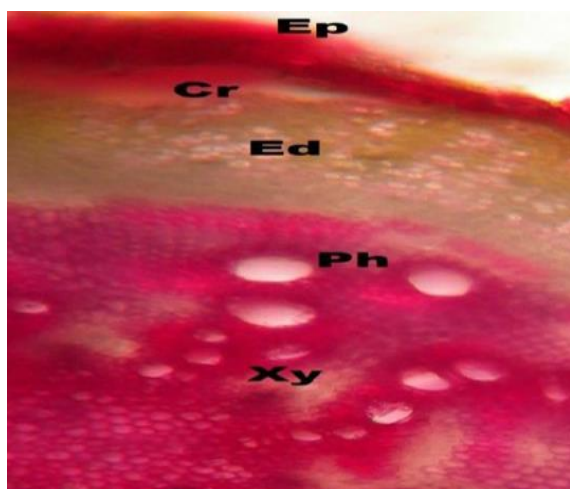
RESULT AND DISCUSSION

PHARMACOGNOSTICAL INVESTIGATION-

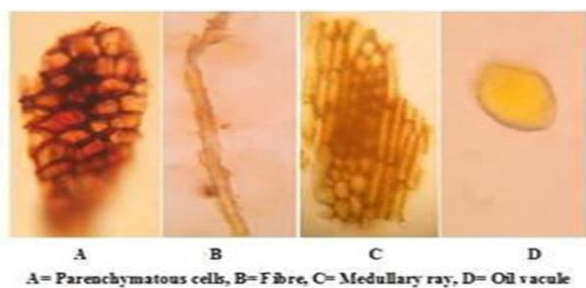
Aerial part	
Characteres	Observation
Colour	Green
Texture	Smooth
Taste	Characteristic taste
Odour	Aromatic

Microscopic evaluation of *Murrayakoenigii*

Sl. NO.	Part of the plant	Characters
1	Stem	Epidermal cell, vascular bundle, cortex, oil gland, pith
2	Leaves	Midrib, Lamina
3	Roots	Epidermis, Cortex, Endodermis, Phloem and Xylem.



T.S. of roots of *Murrayakoenigii*



Powder microscopy of *Murrayakoenigii*

It was performed on powdered parts (Leaves, stem, fruit/flower)

Sl.NO.	Part of the plant	Characters
1.	Dry powder of the aerial part of <i>Opuntia dillenii</i> cactaceae	Uniseriate multicellular trichomes Anisocytic stomata, cruciferous Sclerenchymatus fibers Starch grains Bundle of acicular Cluster crystals

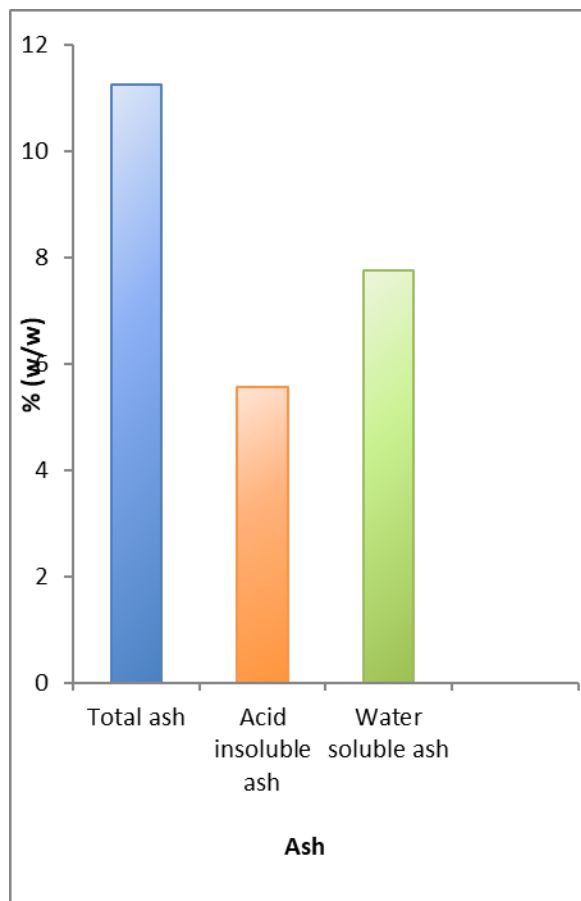
Physico – Chemical Investigation

The different physical constants i.e. foreign organic matter, ash values extractive values, moisture content, swelling index and foaming index were performed.

Foreign Organic matter of plant *Murrayakoenigii*

Sl.NO.	Parameter	% yield (w/w)
1	Foreign Organic matter	0.25

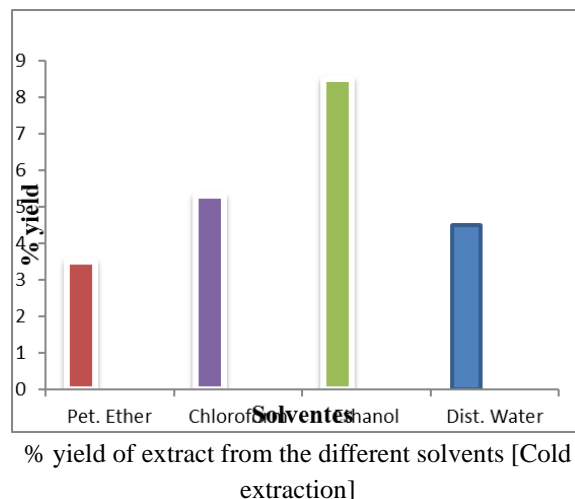
Ash value of aerial part of the plant *Murrayakoenigii*



SLNO.	Parameters	% Values (w/w)
1	Total ash	11.25%
2	Acid insoluble ash	5.57%
3	Water soluble ash	7.75%

Extractive value (Cold extraction) of *Murrayakoenigii* in different solvents

SLNO.	Solvent	% Value (w/w)
1	Peteroleum ether	3.5%
2	Chloroform	5.3%
3	Ethanol	8.5%
4	Distilled water	4.5%



Moisture content of *Murrayakoenigii*

SLNO.	Parameter	% Value (w/w)
1	Moisture content	3.8

Swelling index of *Murrayakoenigii*

SLNO.	Parameter	Value (cm.)
1	Swelling index	No significant result

Foaming index of *Murrayakoenigii*

SLNO.	Parameter	Value
1	Foaming index	No significant result

PHARMACOLOGICAL STUDIES

Anticonvulsant evaluation

- Treatment with the ethanol extract showed significant anticonvulsant activity in rats. The obtained results were compared to that of Phenytoin and as shown below-

Anticonvulsant evaluation of *Murrayakoenigii* by MES method in Rats

- A plant extract of *Murrayakoenigii* prepared and evaluated for anticonvulsant activity after oral administration in the MES model.
- The plant extract were primarily subjected for evaluating their anticonvulsant activity in various

phases of MES. Ethanolic and chloroform plant extract showed significant convulsion protection.

- The pet. Ether plant extract showed less anticonvulsant activity.

CONCLUSION

- The present study is first reported study for aerial roots of *Murrayakoenigii* and demonstrates by pharmacognostical, phytochemical and in vivo model that various fractions can significantly repress the development of convulsion, which is evident from its effect on inhibition of convulsion.
- In conclusion, the ethanolic extract of the whole plant of *Murrayakoenigii* possesses anticonvulsant effects in rodents, possibly by an interaction with GABAergic neurotransmission. An antioxidant action may also contribute to its anticonvulsant effects. This study thus lends support to the folkloric use of this plant in Ghana for the treatment of epilepsy. Future experiments will separate, purify, and attempt to identify the chemical entity or entities in the extract that are responsible for the CNS effects of *Murrayakoenigii*.

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