



Pharmacognostic Study, Extraction, Formulation and Evaluation of Polyherbal Gel

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ABSTRACT:

Substances derived from plants and herbal therapy have attracted the attention of customers due to the presence of bioactive compounds and the least side-effects. *Tridax procumbens* have been used as an excellent anti-inflammatory and wound-healing drug. The other active pharmaceutical component of this formulation is *Murraya Koenigii* which has the ability to show anti-inflammatory action. Keeping these things in mind, we have formulated poly-herbal gel. Extraction and evaluation of the crude drug were carried out. The hydro-alcoholic extract was used for the formulation. After the completion of the polyherbal formulation, it was evaluated with its physicochemical studies like color, pH, Spreadability, consistency, etc. The stability of the formulation was evaluated at various temperature conditions which shows no change in the irritancy, or spreadability.

Keywords: *Tridax Procumbens*, *Murraya Koenigii*, Topical Gel, Polyherbal Gel, Brookfield viscometer

INTRODUCTION:

Polyherbal Gel the name itself explains that it is made of more than two drugs this polyherbal formulation is made from two herbs which is *Tridax procumbens* and *Murraya Koenigii* which is known for its antioxidant and anti-inflammatory action.⁽¹⁾

Traditional Drugs and indispensable drugs are both heavily reliant on herbal remedies, both in developed and developing nations. The supposition that plants are safe, secure, and have minimal side effects has conducted considerable interest in medications produced from them. A review of the literature reveals that traditional plant medications are helpful for several skin-related problems and for crack mending. World Health Organization (WHO) as well as our country has been elevating the use of traditional drugs because they are less precious, easily available, and comprehensive, especially in developing countries.

The best thing about using herbal drug is that they can be applied by people of any age group and has no side goods or ineffective cures. Multiple explorations have used the extracts of *Tridax procumbens*L., which belongs to the Asteraceae family, and *Murraya Koenigii*(curry leaves), which belongs to the Rutaceae family.

For a variety of skin conditions, further than 80 of the world's population still uses traditional treatments. Herbal remedies for crack care involve cleaning, debridement, and creating a wettish terrain to promote the creation of the ideal conditions for the natural mending process. Literature reveals that simple traditional shops (*Adhatodavasica*, *Boerhaaviadiffusa*, *Caesalpinia sappan*, *Curcuma longa*, *Cyperus rotundus*, *Eclipta alba*, *Glycyrrhiza glabra*, *Gymnemasylvestre*, *Oryza sativa*, *Piper longum*, *Plumbago zeylanica*) are helpful in the treatment of several skin- related problems.

The present exploration reflected exploring the presumptive part(s) of active excerpts of *Tridax procumbens* (whole factory), *Murraya Koenigii*(leaves), *Calendula officinalis*(flowers), and *Aloe barbadensis*(leaves) formulated as ointment product. The formulations were characterized by determining the pharmaceutical extrudability, swelling indicator, and washability⁽¹⁻²⁾

PLANT DETAILS:

1) *Tridax procumbens*:

ACTIVITY FOUND:

1. Antiviral
2. Anti-oxidant

3. Antibiotic
4. Insecticidal
5. Anti-inflammatory
6. Hair Tonic
7. Anti-Diabetic
8. Anti-Fungal

- **Kingdom-Plantae**
- **Family- Asteraceae**
- **Genus- Tridax**
- **Species-T. Procumbens**

Common Name- A) Coatbuttons

B) Tridax Daisy

Chemical constituents-

The plant exhibits a variety of chemical components, including methyl, 14-oxoacagaecunoate, 14-oxononacosanoate, 3-methyl-non dodecylbenzene, heptacosanyl cyclohexane carboxylate, 12-hydroxytetracos-15-one, -amyrone, fecosterol, and sitosterol, as well as arachidic.

2] *Murraya Koenigii* (Linn.) Spreng.

ACTIVITY FOUND:

1. **Anti-Pyretic**
2. **Hypoglycaemic**
3. **Anti-Microbial**
4. **Hepatoprotection**
5. **Anti-inflammatory**
6. **Cytotoxic**

Kingdom-Plantae

Family-Rutaceae

Genus-Murraya

Species-M. Koenigii

Common Name-A) Sweet Neem

B) Curry Leaf Tree

C) Karwa Pale

D) Karapincha

Chemical constituents-

Leaves contain essential oil [0.14 to 0.32 percent (v/w)] whose main constituents are mono and sesquiterpenes. The major constituents of the essential oil are sabinene (31.8 to 44.8 percent) β - caryophyllene (24.4 percent) , α - pinene (19 to 19.7 percent) and β - Phellandrene.

COLLECTION OF PLANT:

1) *Tridax procumbens*- (FIG – 1)

- *Tridax procumbens* L. leaves were gathered from various locations in Pune and its environs and properly cleaned with distilled water.
- After the cleaned plant pieces have dried completely in the shade, they are ground into a fine powder using a mechanical grinder and placed in an airtight container. ⁽⁵⁾

2) *Murraya Koenigii*- (FIG – 2)

- The plant *Murraya Koenigii* was collected from the agricultural areas of Pune.
- The fresh leaves were collected and separated from the plant and used for extraction⁽⁶⁾



FIG-1



FIG-2

PREPARATION OF EXTRACT:

1. *Tridax Procumbens*⁽⁵⁾

- The collected material that is leaves of *Tridax Procumbens* were shade dried and powdered.
- The powder was macerated in ethanol and water which was taken in ratio of 30:70 for 24 hours.
- The solution is filtered with Whatman filter paper. This solution was the evaporated-on room temperature to get the desired extract and TLC was performed to analyse the constituents.
- The extract was then further used for making the formulation.

2. *Murraya Koenigii*⁽⁶⁾

- The powder of leaves *Murraya Koenigii* was macerated in water and methanol.
- The prepared solution was then filtered after 24 hours using Whatman filter paper.
- This solution was the evaporated-on room temperature to get the desired extract and TLC was performed for investigating the constituents present in the extract. This extract was then further used for making the formulation.

EVALUATION AND RESULTS OF DRUG:

1. TLC of the Powder:

A] *Murraya Koenigii* (Fig. 5)

1. With the help of TLC preliminary test was performed for the conformation of constituents in the extract.
2. Mobile phase as Toluene and ethyl acetate in the ratio of 3:7 for the separation was taken.
3. Three mixtures were taken for mixing the drug Benzene, Water, and alcohol i.e., methanol and best separation and presence of alkaloid was found in methanol and hence preparation of extracts was done in alcohol.⁽¹¹⁾

B] *Tridax Procumbens* (Fig. 6)

1. Thin layer chromatography for Tridax Procumbens for Beta-sitosterol developed at 25 + 2 degree.
2. Mobile Phase Chloroform, Methanol, acetic acid in ratio 8:0.5:0.5 V/V as mobile phase in an image.
3. Then developed 8 cm then dried.
4. Derivatized with anisaldehyde is spraying agent (0.2ml Anisaldehyde +20 ml acetic acid + Concentrated 0.5 ml Sulphuric acid) in the derivatising chamber for 20 min again dried it. After drying heated 105 degrees Celsius for 10 min.

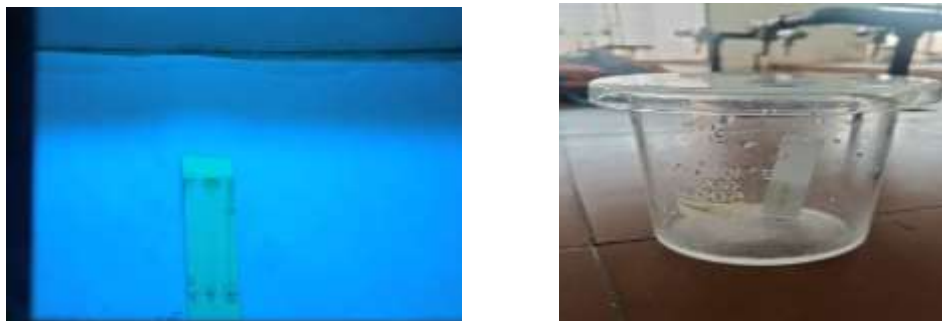


FIG – 5



FIG – 6

	Murraya Koenigii	Tridax Procumbens
Rf Values	0.8	0.5

2. Ash Value⁽¹¹⁻¹²⁾

The residue remaining after incineration is the ash content of the medicine. Contains inorganic salts of carbonates, phosphates, and silicates of Na, K, Ca, and Mg. A high ash value indicates impurity, contamination, or neglectfulness in preparing crude medicine.

Methods to determine ash value:

Total Ash (Fig - 7)

- Measures the total amount of material remaining after ignition.
- Physiological ash: plant-derived
- Non-physiological ash: sand/soil adhered to plant tissue.
- %Total ash=100* Wash/Wdr

Water soluble ash (Fig - 8)

- Difference in weight between total ash & residue after treatment of total ash with water.

Insoluble ash

- Residue obtained after boiling total ash + dil. HCl and igniting remaining insoluble matter.

Measure the amount of silica present.

Sr. No	Particular	Murraya Koenigii	Standard	Tridax Procumbens	Standard
1.	Total Ash	7.2%	7.2%	18%	20.4%
2.	Water Soluble Ash	9%	10.4%	6%	6.5%
3.	Acid Insoluble Ash	18%	35.6%	6%	7.1%



FIG – 7



FIG – 8

Preliminary Phyto-Chemical Screening:

Various preliminary Phyto-chemical screening tests are conducted, and the test results are shown in the table below:

Sr.no	Test	Tridax Procumbens	Murraya Koenigii
1)	Test for carbohydrates	(+ve)	(+ve)
2)	Test for steroids	(+ve)	(+ve)
3)	Test for alkaloids	(+ve)	(+ve)
4)	Test for saponins	(+ve)	(+ve)
5)	Test for Flavonoids	(+ve)	(+ve)
6)	Test for Tannin and phenolic compounds	(+ve)	(+ve)

PREPARATION OF GEL: -

Instrument:

- The instrument for formulating or mixing the gel was Mechanical Stirrer of Remi Motor Type nQ-122.
- The speed for stirrer was set of 500-600 RPM for proper mixing.

Preparation of Carbopol: (FIG – 9)

- Carbopol was soaked in water overnight for making the gel.
- The quantity of water was 1/4th of the total quantity which was to be mixed in the whole formulation.
- As after the soaking the Carbopol swells which makes it easier for uniform mixing.



FIG – 9

Color and appearance of Carbopol 934:

TEST	RESULT
Color	White
Appearance	Powder

Procedure for Gel:

1. The soaked Carbopol which was prepared were mixed with the help of mechanical stirrer for making the homogenised mixture.
2. Additional water was added for mixing the gel and the drug extracts of Tridax Procumbens and Murraya Koenigii in the ratio of 1:1.
3. Addition of Triethylamine was done for getting the desired viscosity and pH of the Gel.
4. Triethanolamine was added for adjusting the pH of gel for with skin pH
5. In last preservatives methyl paraben and propyl paraben was added.^(8,9)

Sr. no.	Ingredient	Quantity
1.	Carbopol - 934	2 g
2.	Tridax Procumbens	0.5 g
3.	Murraya Koenigii	0.5 g
4.	Triethylamine	0.1 ml
5.	Methyl Paraben	0.1 g
6.	Propyl Paraben	0.05 g
7.	Water	q.s to 100ml

EVALUATION OF FORMULATION OF HERBAL GEL⁽¹³⁾

- 1) **Physical Evaluation:** Aspects of the body, such as colour and look, were assessed.
- 2) **Homogeneity:** After being put in the container, all generated gels were visually inspected for uniformity for existence of any aggregate.

- 3) **pH:** A digital pH meter was used to determine the pH of different gel compositions. A precise 2.5gm of gel was weighed, mixed with 25ml of purified water, and kept for two hours. Three samples of each formulation's pH were used to measure it, and the average results are shown. Using a pH meter, the pH of the dispersions was determined.
- 4) **Viscosity:** Herbal gel's viscosity was measured using a Brookfield rotating viscometer at 50 rpm with spindle no. 64. At the conclusion of the two minutes, when the sample had reached equilibrium, each reading was obtained. Three samples' viscosities were determined three times.

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- 5) **Irritability:** Human subjects' skin was exposed to test formulations, and the results were tracked.
- 6) **Stability analysis:** The formulations underwent a four-week physical stability test at a range of temperatures, including 2°C and 25°C. Within four weeks, it was discovered that the formulation was physically stable at various temperatures, such as 2°C and 25°

RESULTS OF HERBAL GEL:

- **Physical Evaluation (FIG - 10)**

Sr. no	Particulars	Evaluation
1.	Colour	Greenish-Brown
2.	Appearance	Uniform
3.	Odour	Pleasant
4.	Texture	Smooth



Fig – 10

Homogeneity (FIG - 11)

After the generated gels were put in the container, they were all visually inspected for uniformity.

Sr.no	Batch	Homogeneity
1.	F1	Homogenous
2.	F2	Homogenous
3.	F3	Homogenous



FIG-11

pH (FIG - 12&13)

Using a digital pH metre, the pH of several gel compositions was measured. A precise 2.5gm of gel was weighed, mixed with 25ml of purified water, and kept for two hours. Each formulation's pH was measured three times, and the average results are shown in Table below. Using a pH metre, the pH of the dispersions was determined.

Sr no	Batch	pH
1)	F1	6.08
2)	F2	6.1
3)	F3	6.42



FIG-12



FIG-13

- **Viscosity (FIG - 14)**

Using a Brookfield rotating viscometer at 50 rpm, the viscosity of the gel was measured. At the conclusion of the two minutes, when the sample had reached equilibrium, reading was obtained.

Rpm	Cp
50	36640



Fig – 14

DISCUSSION:

Herbal drug has come an item of global significance both medicinal and provident. Although the operation of these herbal drugs has increased, their quality, safety, and effectiveness are serious enterprises in industrialized and developing countries. Herbal remedies are getting adding patient compliance as they're devoid of typical side goods of allopathic drugs. The present exploration has been accepted with the end to formulate and estimate the polyherbal gel containing *Tridax procumbens* splint excerpt and *Murraya Koenigii*. The gel expression was designed by using Carbopol 940, *Tridax procumbens* and *Murraya Koenigii* excerpt, methyl paraben, propyl paraben, and the needed quantum of distilled water. The skin pH was maintained by the dropwise addition of Tri-ethanolamine. The physicochemical parameters of phrasings (pH, spreadibility, density, etc.) were determined. Herbal specifics are considered safer than allopathic drugs as allopathic drugs are associated with side goods. One of the styles for its survival is the medication of excerpts and their phrasings for better immersion and penetration of the active half into the systemic rotation.

CONCLUSION:

This study has positively opened new avenues for treating wounds of diverse origins. The developed polyherbal wound healing and an anti-inflammatory formulation contain an active extract of *Tridax procumbens* (leaves) and *Murraya Koenigii* (leaves). The Phytochemical constituents such as alkaloids, steroids, carotenoids, flavonoids, phytosterols, and tannins are believed to play a pivotal role as anti-inflammatory agents. The leaf extract of the *Tridax procumbens* plant belonging to the family Asteraceae was taken and formulated for the topical gel and its properties.

The herbal gel formulation was successfully prepared with Carbopol 934 as a gelling agent, and methyl and propylparaben as preservatives. The gel prepared was found to be good gel characteristics with respect to homogeneity, spreadibility, pH, and viscosity. The results of different chemical and physical tests of gel showed that the formation could be used topically to reduce inflammation and to treat wounds. Herbal medications are considered safer than allopathic medicines as allopathic medicines are associated with side effects.

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