

Formulation and Evaluation of Herbal Antibacterial Cream

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ABSTRACT

The creation of a more potent antibacterial dosage form is the aim of this study. The antibacterial qualities of *T. procumbens*, also referred to as coat button or Tridax daisy, have long been recognised. Because of its antimicrobial qualities, curcumin is a widely used traditional medicine not only in India but all around the world. The synergy between *T. procumbens* and curcumin yields remarkable results. With less ethyl acetate and a significant amount of curcumin isolated, Soxhelt's extraction method for both herbs produces a useful extract. Triadax and curcumin extracts were used to make the cream, and a number of evaluative and microbiological tests were performed. Positive results from microbial testing were shown by a decrease in bacterial growth. Tests for evaluating visual formulation were conducted. Keywords: Soxhelt extraction, curcumin, and *T. procumbens*

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1. INTRODUCTION

Creation of a dosage form with certain advantages and no risk for any antibacterial activity: Combining turmeric (curcumin) and *Tridax procumbens* contains antibacterial qualities and is used for. A more powerful product is produced at about the same cost when two distinct varieties of herbs are combined. Since hundreds of years ago, people have used herbs to cure and prevent a wide range of physiological and medical diseases. Herbs are also used to make pharmaceuticals, but using them typically has no harmful side effects or pharmacological action.

Tridax procumbens, often known as tridax daisy, is a type of flowering plant belonging to the Asteraceae family. It is a weed that is found throughout many Indian states, including Gujarat, Orissa, Maharashtra, and Madhya Pradesh. Usually, it has *procumbens*, a flavonoid. Among the many chemical compounds found in the *tridax* plant are sterols, esters, carotenoids, pentacyclic terpenes, fatty acids, and polysaccharides. *Procumbens* contains flavonoids and terpenoids, which are significant bioactives with antibacterial and wound-healing qualities. *T. procumbens* is a naturally occurring plant that has several sanitary advantages throughout the world. Since ancient times, it has been used to cure a variety of illnesses [1].

Curcumin longa L., also known as turmeric, is a member of the Zingiberaceae family and is native to Indonesia and southeast India. Its large rhizome and short stem are accompanied by lengthy leaves. Typically, they consist of Regional considerations influence the percentage composition of curcumoids

[2]. Fresh *Tridax procumbens* (tridax daisy) leaves had an 80% curcumin content, 3% bisdemethoxcurmin content, and 17% demethoxycurcumin content. The leaves were collected from nearby places. Curcumin exhibits a multitude of therapeutic benefits, including as anti-viral, hepatoprotective, antibacterial, anti-inflammatory, and antioxidant qualities [3]. Curcumin's antimicrobial properties are attributed to curcumoids, tridax flavonoids, and terpenoids [4].



Fig 1 Tridax and curcumin

2. MATERIALS AND METHODS

Materials:

2.1 Material for Curcumin:

We bought the dried turmeric rhizome from a local trader. The process of extraction was continued. Ethyl acetate was used as the extraction solvent.

2.2 Material for *Tridax Procumbens*:

Fresh leaves of *Tridax procumbens*, often known as tridax daisies, were gathered from the premises of Lokmangal College of Pharmacy and the surrounding localities.

3. EXTRACTION

3.1 Extraction of Curcumin using Soxhelt

To make powder, the dried rhizome was triturated in a mortar and sieved. The extracting solvent, ethyl acetate, was then added to Soxhelt, containing 12g of curcumin. At 60 degrees, the extraction process took an hour. Following extraction, the solvent was separated and warmed for two seconds on the heating mantle before the curcumin-containing petri dish was placed inside of it.

3.2 Extraction of *Tridax Procumbens* using Soxhelt:

After crushing the *Tridax procumbens* leaves in a mortar, g of the tridax was added to a Soxhelt and gradually filled with ethyl acetate, the extraction solvent, at 60 degrees for eight hours. The tridax extract was preserved in a desiccator after the solvent was drained off.

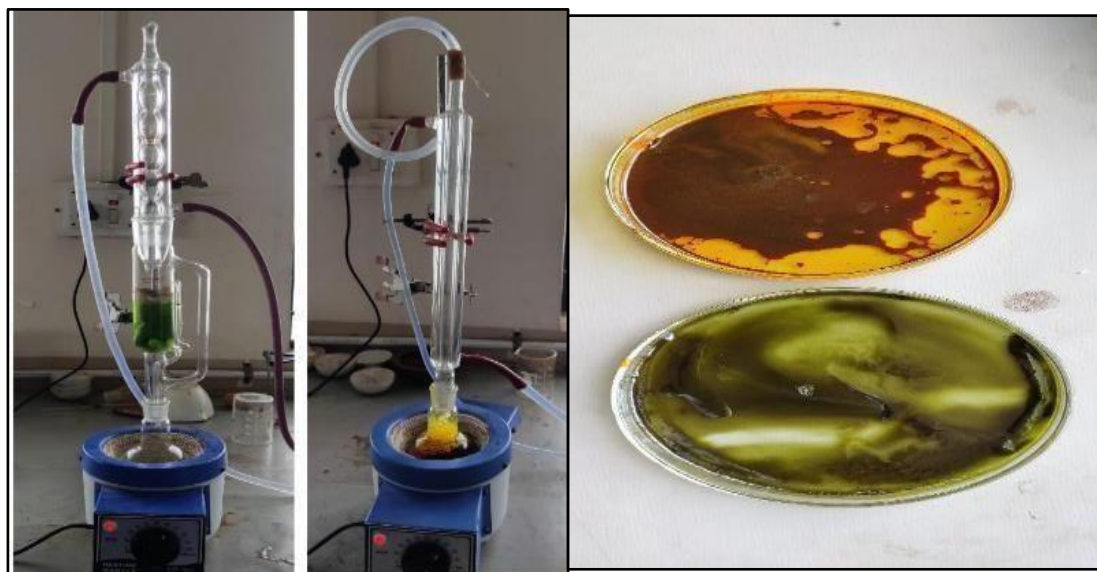


Fig 2. Extraction of Tridax and curcumin by Soxhelt

4. FORMULATION OF CREAM

Use the slab method to prepare the cream formulation. In a borosilicate glass beaker, heat liquid paraffin and beeswax to 75 °C and keep it there. Phase of oil. Borax and methyl paraben should be dissolved in distilled water in a different beaker, and the mixture should be heated to 75 °C to produce a clear solution. Phase of water. Then, add the aqueous phase gradually to the heated, oily phase.

1. Using a heating mantle, 3.2 g of bee wax and 10 g of liquid paraffin were heated together until the wax dissolved while being constantly stirred.
2. The mixture was liquefied and then 4 g of curcumin extract and 9 g of tridax procumbens were added gradually.
3. To make cream, this mixture was added drop by drop.
4. Finally, after continuous stirring for the next 45 minutes, consistency was obtained.
- 5.

Sr no.	Ingredients	Formulation
1	Curcumin	4 gm
2	Tridax Procumbin	9 gm
3	Bees wax	3.2 gm
4	Liquid Paraffin	10 gm
5	Borax	0.16 gm



Fig 3. formulation- cream

5. EVALUTION

5.1 Test for flavonoids in tridax :-

Before being treated with concentrated sulfuric acid, a portion of the crude drug extract was treated with 5 ml of a mild ammonia solution; the emergence of a vivid yellow hue indicates the presence of flavonoids.

5.2 Test for Terpenoids in Tridax (Salkowski Test):

To construct a layer, 5 ml of extract was combined with 2 ml of chloroform, and 3 ml of strong sulfuric acid was carefully added. The interface's reddish-brown coloration indicates the presence of terpenoids.

5.3 Antibacterial Test: -

1. LB broth was dissolved in 100 ml of water.
2. Petri dishes and medium were autoclaved for 30 minutes.
3. Laminar air flow was then used to disperse the media throughout the pasture.
4. 100 g of *E. coli*/*S. aureus* [Table 3] was dispersed over the media.
5. After that, the petridishes were placed in the refrigerator for 10 minutes.
6. The medication was put on plates under sterile circumstances.



Fig 4. Bacteria - S. aureus

5.4 Physical parameter

It has a thick consistency, a silky texture, a reddish-yellow tint, and a fragrant scent.

a. pH

A tabletop pH metre was used to determine the PH. After calibrating the PH metre by dissolving a small amount of sample in a suitable solvent, dip the electrode into the sample whose PH has to be found. A PH reading is produced once the PH nob is placed in PH mode and the display is allowed to stabilise.

b. viscosity

The viscosity was measured using a Brookfield viscometer. Select a suitable speed to calibrate the viscometer first. After that, insert a sample into the proper containers and spin it around such that it stays out of the bottom or corners of the container. On the screen is the viscosity expressed as degrees Celsius.

c. Spreadability

1 mg of cream was placed in between two moveable slides. A sufficient amount of effort is applied to one slide for the cream to move and spread (Table 2).

d. Smear type

It is ascertained if, following application, a thin smear or film forms.

e. Extrudability

Cream removal ease is measured by a process called extrudability.

Table no. 1: Formulations

Sr no.	Ingredients	Formulations
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2	Tridax Procumbens	9 gm
3	Bee wax	3.2 gm
4	Liquid paraffin	10 gm
5	Borax	0.16 gm

Table no.2: Evaluation parameters

Sr no	Parameters	Observation
1	Colour	Reddish yellow
2	Texture	Smooth
3	Odour	Aromatic
4	PH	5.4
5	Viscosity	9000cp
6	Spreadability	9.7gm.cm/s
7	Irritancy	No
8	Type of smear	Thin film produced
9	Extrudability	13gm

Table 3: Zone of Inhibition for Bacteria

Sr no	Organisms	Zone of inhibition
1	E.coli	15mm
2	S.aureus	4mm

6. RESULT AND DISSCUSSION

After testing is finished, we can say that the formulations of tridax and curcumin are antibacterial [4]. Investigations were conducted into the antibacterial activity of tridax and curcumin against several microorganisms (Table 3). After examining the MIC values of tridax and curcumin against *S. aureus* and *E. coli*, the formulation was developed. The ongoing process of systemic screening antimicrobial plant extracts aims to find a new compound that may be able to combat pathogenic bacteria and fungi that are resistant to many drugs. The antibacterial activity of curcumin and *T. procumbens* crude extracts against pathogens was examined in this study. To evaluate the effectiveness of the extraction techniques under discussion, the extraction of curcumin and *Tridax procumbens* utilising a variety of extraction techniques was examined. The Soxhelt extraction method was selected as the foundational technique due of its convenience. One of the most significant and popular extraction methods for getting target chemicals is soxhlet extraction; moreover, extraction yield can be increased by often contacting the solvent with tridax *procumbens* and turmeric. [5]

7. FUTURE SCOPE

Due to its antibacterial activity and other varied activities including wound healing [1, antioxidant, anti-inflammatory, and so on], it may have a future in several pharmaceutical sectors. The body of knowledge regarding the use of plants as medicine is growing. Curcumin is being made into medicinal target-oriented nanoparticles. Numerous medical conditions are treated using it, such as psoriasis, Alzheimer's disease, and anti HIV medications. Conversely, *Tridax procumbens* possesses a multitude of medicinal properties and is employed in the treatment of typhoid, asthma, inflammation, and other conditions.

8. CONCLUSION

This study evaluated the microbiological inhibitory effect of turmeric and the crude medication's tridax *procumbin* extract on a number of pathogenic bacterial strains, including *S. aureus* and *E. coli*. Considerable antibacterial action against the pathogens under research has been shown by turmeric and *Tridax procumbin*. *T. procumbin* is used as an easily accessible material for the production of herbal medications intended to cure bacterial infections, when combined with turmeric cream. The results showed that *T. procumbin* and curcumin significantly increased the sensitivity of both gram-positive and gram-negative bacteria. Significant antibacterial action is exhibited by both extracts, albeit exclusively against *E. Coli* and *S. aureus* types of bacteria. They both have a strong inhibitory impact. After passing multiple evaluation tests, the formulation showed promising results and can be used.

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10 . REFERENCES

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