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Formulation, Evaluation and Medicinal Properties of Medicated Herbal Cream Containing Extract of Tridax Procumbens

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Abstract: *At present, herbal medicine has a great impact on human health and diseases herbal medicine plays an important role in general aspects such as economy and medicine. The use of this herbal medicine is increasing day by day due to its quality, efficacy and safety. The present study explored a novel formulation containing extracts of Tridax procumbens, Ficus religiosa, Azadirachta indica and Curcuma longa in cream form (O/W). The formulation was characterized by determining the pharmaceutical properties such as pH, appearance, viscosity, spreadability, etc. The chemical constituents such as carbohydrates, alkaloids, steroids, etc. were detected using identification assays. The cream formulation was designed using excipients such as stearyl alcohol, beeswax, sorbitol monooleate, methylparaben, propylparaben and liquid paraffin. Compared with the control drug, the herbal drug was found to be safer. While allergy medications are associated with some side effects, the formulation of cream is much better than other formulations in terms of absorption and penetration of the active ingredient in the tropics.*

Keywords: Tridax procumbens, extract, herbal cream formulation (O/W).

I. INTRODUCTION

The compositae (Asteracae) is an progressed and botanically profoundly specialized family of herbaceous plants, herbs, bushes, or less commonly trees and are apparently the biggest family of blossoming plants, comprising approximately 1400 species out of which 674 species are found in India. A few of them are tropical trees and bushes whereas few are individuals of herbs. Tridax procumbens could be a species of blossoming plant within the daisy family (compositae) a common weed in West Africa. subregion and other tropical zones of world and known coat button in English, Jayanti Veda in Sanskirit, Ghamra in Hindi and Dagadi Pala in Marathi. It is best known as far reaching weed and bother plant can be found in fields, meadows, croplands, aggravated zones, gardens and roadsides. It may be a semi prostate yearly creeper herb.

Stem in ascending 30-50 cm height, branched, sparsely hairy, rooting at nodes. Leaves are simple, opposite, exstipulated, lanceolate to ovate. 3-7 cm long irregularly toothed margin, base wedge shaped, shortly petioled, hairy on both surfaces[1].

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Scientific categorising

- **Kingdom** - Plantae,
- **Subkingdom** - Tracheobionta,
- **Division**- Magnoliophyta,
- **Class** - Magnoliopsida,
- **Subclass** - Asteridae,
- **Order** - Asterales,
- **Family** - Asteraceae,
- **Genus** - Tridax
- **Species** - Tridax procumbens [2]

Botanical Name: Tridax procumbens Linn.

Synonym

- **Bengali:** Tridhara/Bishalya Karani
- **Hindi:** Khal muriya, Ghamra
- **Sanskrit:** Jayanti Veda
- **English:** Coat buttons, Tridax Daisy, Mexican Daisy
- **Oriya:** Bishalya Karani
- **Marathi:** Gaddi Chemanthi
- **Tamil:** Vettukaya thalai, Thatha
- **Telugu:** Gayapu aku/Palaka aku [2]

II. METHODS AND MATERIAL

Collection of Plant

Collection of the leaves of Tridax Procumben: The plant leaves (Tridax Procumben Linn.) collected from campus of Aditya Pharmacy College, Beed .

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Soxhlet extraction: The leaves of Tridax Procumben Linn. was shade dried. Aftershade drying, the dried leaves were powdered using electrical grinder. Powdered leaves were allowed for extraction by using Soxhlet extraction. 300gm of powdered leaves were extracted using water and ethanol (70:30)[3].

Phytochemical Screening Study:

Test for Alkaloids: Add 2ml of extract in concentrated hydrochloric acid, and then add few drops of Mayer's reagent. Presence of green colour or white precipitate
indicates the presence of alkaloids.

Test for Flavonoids: Add 2ml of extract in 1ml of 2N sodium hydroxide. The present mixture turns in yellow colour that indicated presence of flavonoids.

Test for Carbohydrates: 2ml of extract is treated with 1ml of Molisch's reagent then add few drops of concentrated sulphuric acid. If above mixture turns in purple or reddish colour then it indicates the absence of carbohydrates. Test for Tannins: Add 1ml of extract in 2ml of 5% ferric chloride. The formation of dark blue or greenish black colour indicates the presence of tannins. Preparation of Herbal Cream:

Preparation of Herbal Cream:

The oil phase and aqueous phase were taken in a beaker and heated at 700C respectively. Oil phase was comprised of ingredients such as stearic acid, white beeswax and cetyl alcohol whereas aqueous phase was comprised of glycerine and methyl paraben. Then oil phase was added to water phase little by little on stable stirring. Ethanolic extracts of plant were mixed. with uniform stirring in the formulated cream base. Water and aromatic agent such as rose water was added finally and mixed[4].

Table 1 Composition of different Herbal cream formulation : For 5gm

Ingredients	F1	F2	F3	F4
Tridax Procumbens Extract	2.5	2.5	2.5	2.5
Steric Acid (x1)	0.05	0.05	0.05	0.1
Glycerine (x2)	0.2	0.4	0.6	0.6
White bee wax	0.7	0.7	0.7	0.7
Cetyl alcohol	0.4	0.4	0.4	0.4
Methyl paraben	0.25	0.25	0.25	0.25
Rose water	q.s.	q.s.	q.s.	q.s.
Water	q.s.	q.s.	q.s.	q.s.

Evaluation of Herbal Cream:

Physical aspects of Herbal cream:

The cream formulation was observed for their physical aspects such as,
Appearance
Color
Consistency
Transparency.

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Measurement of pH:

The pH was measured using a pH meter, which was calibrated before each use with standard buffer solutions at pH 4,7 and 9. 1gm of cream was dissolved in 100ml of distilled water and pH, was measured.

Measurement of Viscosity:

The viscosity of the formulations was evaluated at room temperature by using Brookfield Viscometer at 50 rpm using spindle no. 7. The formulations were placed in beaker and dipped the spindle in beaker taking care that spindle did not touch the bottom of the beaker and readings were recorded.

Measurement of Spread ability:

Adequate amount of sample is taken between two glass slides and a weight of 100gm was applied on the upper slide to smash the cream present between the slide for 5 minutes. Then 50 g weight was added to the pan and the time (in seconds) required to separate the two slides were calculated.

Spread ability was calculated using the formula,

$$S= m*1/t$$

Where, m = weight tied to upper slide.

1= length of the glass slide.

t = time taken[5]

Material used and it's Uses:

- **Tridax procumbens extract:** Wound healing agent
- **Stearic acid**: Moisturizing Agent
- **White Bees wax**: Stiffening agent
- **Cetyl alcohol:** Thickening agent
- **Glycerine:** Humectant
- **Methyl paraben:** Preservatives
- **Rose water:** Fragrant [6].

TRADITIONAL USES:

1. Tridax procumbens, a common flowering weed, offers a range of therapeutic benefits.
2. Traditionally used in India, it serves as a wound healer, insect repellent, anticoagulant, and antimicrobial agent.
3. It is also effective for treating blisters and boils.
4. As a folk remedy, it is widely applied for hair health and ulcers.
5. In ethnomedicine, leaf decoctions are used to address infectious skin conditions.
6. Known for its hepatoprotective properties, this plant is a popular Ayurvedic treatment for liver disorders.
7. Additionally, its extracts help manage heartburn and gastritis[7].
8. It is frequently applied to stop bleeding from cuts, bruises, and wounds, aiding the healing process.
9. The herb is also used to manage severe diarrhea, dysentery, high blood pressure, and blood sugar levels.[8,9,10].
10. It promotes hair growth and can prevent hair loss [11].
11. Additionally, it helps treat respiratory issues and exhibits strong insect repellent and immunomodulatory effects [12].
12. In West Africa and tropical regions, its leaves are used by tribal communities and rural practitioners as a remedy for conjunctivitis[13].
13. In ethnic medicine, this plant has also been used to treat liver diseases, jaundice, and kidney stones with ethanol decoctions of Tridax procumbens[14].

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BIOLOGICAL PROPERTIES

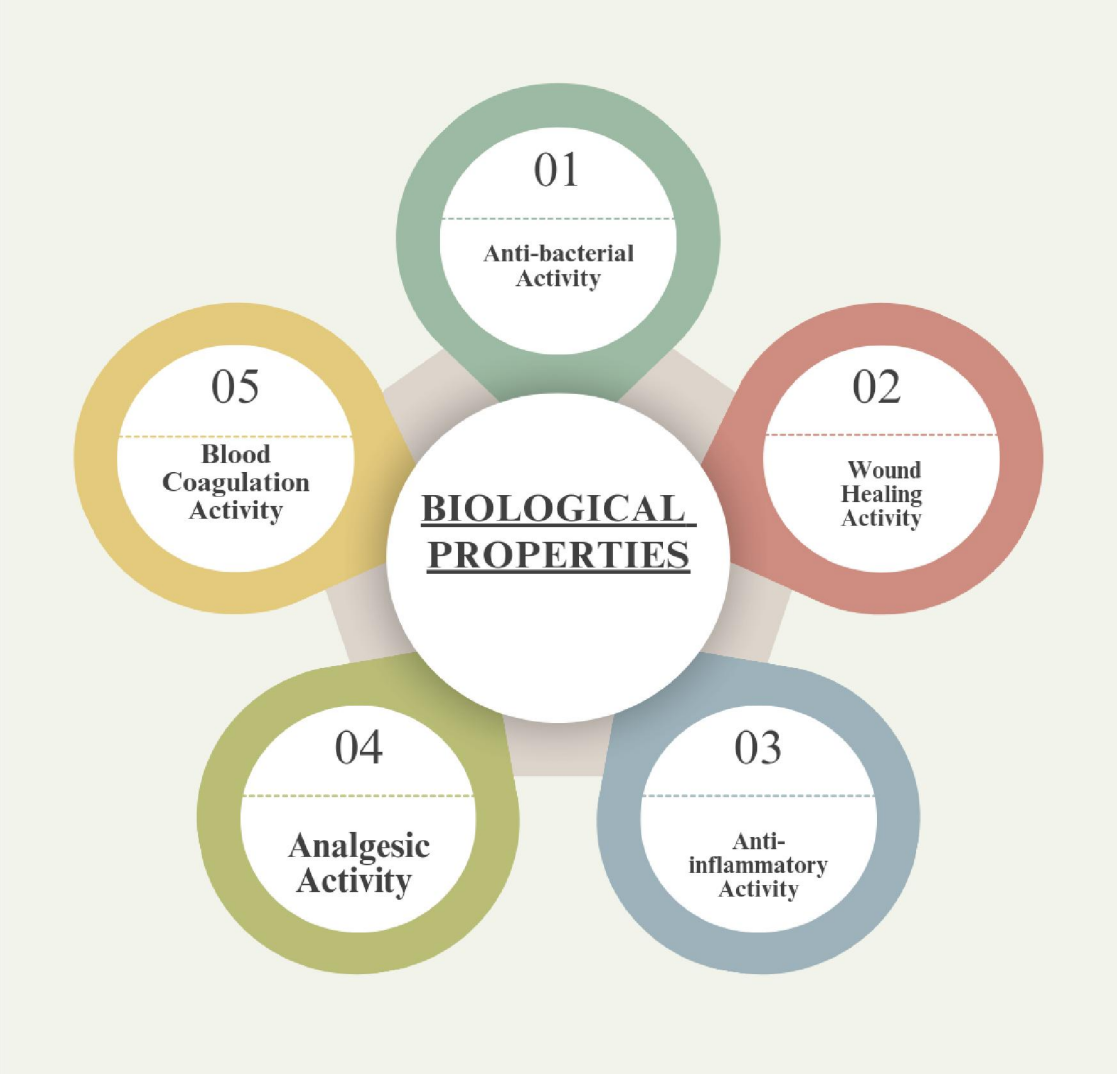

Fig. 1. Chart of Biological Properties.

Extract of Tridax Procumbens have been studied ; these extract have various biological activity in animal , and have been found to Anti-bacteria activity l, Wound Healing activity, Anti-inflammatory activity, Analgesic Activity, Blood Coagulation Activity.

Anti-bacterial Activity:

Antibacterial activity In previous studies, the whole plant parts of Tridax procumbens showed antibacterial activity against various bacterial species.To extract the juice from the whole plant, squeeze it in the palm of your hand and apply it to wounds and cuts twice a day for 4-5 days.Using disk diffusion experiments, only the whole plant extract showed antibacterial properties against Pseudomonas aeruginosa.Among the four bacterial strains used in the tests were two Gram-positive strains, Bacillus subtilis and Staphylococcus aureus, and two Gram-negative strains, Escherichia coli and Pseudomonas aeruginosa[15]. This effect could only be clearly demonstrated using an ethanol extract against the Pseudomonas aeruginosa strain. Significant susceptibility to the extract was demonstrated in multidrug-resistant nosocomial Pseudomonas strains isolated from bloodstream infections, urinary tract infections, and ventilator-associated pneumonia.This study demonstrated the efficacy of Tridax procumbens as a source of

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formulations for the treatment of nosocomial infections caused by P.aeruginosa and the efficacy of as an antipseudomonal drug[16].

Wound Healing Activity:

The wound healing ability of the plant decoction is attributed to the complex interactions between plasma-derived proteins, extracellular matrix, controlled angiogenesis, and epidermal and dermal cells, all of which are controlled by growth factors and cytokines[17]. Although not as potent as the whole plant decoction, the water leaf decoction was successful in increasing lysyl oxidase. Leaf extracts of this plant have been shown to promote wound healing in both immunocompromised and healthy rats. Due to the increased glycosaminoglycan content, the plant can increase lysyl oxidase, protein, and nucleic acid levels in granulation tissue.[18]

Anti-inflammatory Activity:

The wound healing ability of the plant decoction is attributed to the complex interactions between plasma-derived proteins, extracellular matrix, controlled angiogenesis, and epidermal and dermal cells, all of which are controlled by growth factors and cytokines[19]. Although not as potent as the whole plant decoction, the water leaf decoction was successful in increasing lysyl oxidase.Leaf extracts of this plant have been shown to promote wound healing in both immunocompromised and healthy rats.Due to the increased glycosaminoglycan content, the plant can increase lysyl oxidase, protein, and nucleic acid levels in granulation tissue[20].

Analgesic Activity:

It has been shown that a freeze-dried decoction of the plant may have analgesic properties.Antihypertensive Effects The cardiovascular effects of were examined by a water decoction of the leaves in anesthetized animals. Depending on the dose, the water decoction could lead to a significant reduction in mean arterial blood pressure. Higher doses caused a significant reduction in heart rate, while lower doses did not produce the same heart rate changes[21].

Blood Coagulation Activity:

The decoction of the leaves shows strong blood clotting properties and hence water can be used as a powerful hemostatic agen[22]t.The hemostatic properties of the leaves of the plant in different solvent extracts were determined in vitro using the Lee-White method since the ethanol extract reduced the clotting time of the blood samples obtained in all studies[23].

III. CONCLUSION

Since ancient times, we have been using herbal ingredients and herbs as medicines. However, a new cream has been used in this study. Plants such as Tridax procumbens (whole plant), Ficus religiosa (leaves), Azadirachta indica (leaves), and Curcumalonga (rhizome) and their ingredients were used in this study and formulated into a cream and its properties.

This cream formulation (O/W) showed good properties in terms of pH, viscosity, spreadability, etc. Furthermore, honey and eucalyptus oil were added to the formulation.

This formulation was successfully prepared using a cream base containing stearyl alcohol, beeswax, sorbitol monooleate, etc. Methylparaben and propylparaben were used as preservatives.Samples of this formulation show antibacterial activity against Staphylococcus aureus.

These individual extracts have different properties such as anticoagulant activity, wound healing, etc., which have already been proven in other studies. The mixture of these extracts gives these properties and creates a new cream formulation that is effective and safe.Therefore, it can be concluded that the demand for herbal formulations in the market is increasing day by day as they are safe and effective.

One of the reasons for this formulation is that it allows better absorption and penetration of the active ingredients into the systemic circulation resulting in faster and better effects. Moreover, different active ingredients can be used in the formulation. And if this research shows promising results, long-term studies and clinical trials are also possible. This formulation can also be incorporated into various suitable dosage forms such as ointments, gels, etc.

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