IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

FORMULATION AND EVALUATION OF HERBAL GEL USING LEAVES OF TRIDAX PROCUMBENS LINN

Avinash Goraksh Khade[*1], Yash Santosh Kutal [2*], P.B. Gorde[3*]

[*1,2,]Student, [*3] Professor of Arihant College Of Pharmacy Kedgaon, Ahmednagar, Maharashtra, India.

ABSTRACTS

The present study reveals vial information on anti-bacterial activity on the tridax procumbens L. (Asteraceae) medicinal plant. The present study on phytochemical analysis on the plant is essential. Herbal gel is used in many years. Gel is semisolid dosage form at least two constituents. It has an easy application, easy removal property. It is widely used in dosage form an it has more patient compliance. Tridax procumbens is anti- bacterial drug. The herbal gel is show antibacterial activity on E.coli, S.aureus bacteria. Use of plant for the treatment of certain bacterial infections which are caused due to E. coli, S. aureus as shown effect. The present study to investigate phytochemical present in the leaves extract of Tridax procumbns. Initially dried powder of tridax procumbens was extracted in ehenol and tested for presence of different phytochemical. The present rsearch has been undertaken with the aim to formulate and evaluate the herbal gel containing Tridax procumbens leaves extract.

Keywords: Tridax Procumbens, Dagdipala, Ethanolic Extract, Antibacterial Activity, Phytochemical Screening.

I. INTRODUCTION

Tridax procumbens is a perennial herbal plant belongs to family Asteraceae native to central and south America. It is also known as Coat buttons. Since ancient times, this species is used in Ayurveda in India. Some of the medicinally important species of genus Tridax are T. angustifolia, T. bicolour, T. dubia, T. erecta. The plant contains yellow centered white flowers and the leaves are basically arrow shaped. The fruit have stiff hairs. It contains Flavonoids, alkaloids, carotenoids, hydroxycinnamates, lignans, benzoic acid derivatives, phytosterols, tannins, crude proteins, crude fiber, soluble carbohydrates and calcium oxide. Tridax procumbens is used in various diseases or it has been used in Indian traditional medicine for wound healing, antifungal, antibacterial, insect repellent. Leaf extract is used for or treat to various skin Infectious diseases. It also used in 'Bhringraj' which is well known medicine for liver disorders. Also, haxir growth activity has been found and antioxidant activity have been demonstrated [1].

The presents study reveals vital information on antibacterial activities on the selected medicinal plants. The further study on phytochemical analysis on this plant is essential and may be very much useful for the development the subject in this field[2]. Gel has several adventages over other dosage form gels are semisolid system consisting of dispersion of small or large molecule in an aqueous liquid vehicle rendered jelly like by theaddition of gelling agent. Gelling agent which are used in formulation of gel are synthetic macro molecules like carbolpol 940, triethanolamine. Advantages of gel dosage form over other dosage forms are less irritancy, soften the skin, easily removable[3]. herbal gel is used on topical and herbal gel in used ethanolic extract of leaves of tridax procumbens. The present study is formulated and evaluate the herbal gel.

Fig 1: Tridax procumbens plant

II. AIM & OBJECTIVE

Aim – The aim of the project is to investigate the formulation and evaluation of herbal gel using leaves of Tridax Procumbens Linn.

Objective -

- The major objective of herbal medication is that, in India cultivate more than 80% of ayurvedic plants. Tridax is cheap and effective.
- To prepare ethanolic extract of leaves of tridax procumbens linn.
- To investigate the phytochemical screening of ethanolic extract of Tridax procumbens.
- To prepare the herbal gel formulation using leaves extract.
- To evaluate herbal gel using physical parameters.
- To investigate the activity of herbal gel.

III. MATERIAL & METHOD

MONOGRAPH

- **Scientific name** - Tridax procumbens
- **Kingdom** - Plantae
- **Order**- Asteroids
- **Family** -Asteraceae
- **Tribe** - Heliantheae
- **Genus** -Tridax
- **Species** -T. Procumbens

Common names

Coat buttons and Tridax – English, Jayanthi (ಜಯಂ) - Kannada, cadillo chisaca - Spanish, herbe caille – French, Jayanti Veda – Sanskrit, Ghajadvu - Gujarati, ghamra - Hindi, Tridhara (T T) - Bengali, bishalya karani (6ˆdft 66dl) - Oriya, kambarmodi, Jakhamjudi (₹ ,) - Marathi, Gaddi chemanthi – Telugu.

Synonyms

Chrysanthemum procumbens, Balbisia canescens, Balbisia divaricata, Tridax procumbens var. canescens, Tridax procumbens var. ovatifolia, Balbisia elongate[4] .

Geographical source

Tridax procumbens as a widespread weed and blighter plant. it's native to the tropical Americas, however it's been introduced to tropical, semitropical, and gentle temperate regions worldwide. it's listed as a pernicious weed within the us and has blighter standing in 9 states[5] .

Morphological Characters

Tridax procumbens could be a perennial herb that incorporates a crawl stem which might reach from to 8-30 inches (20-75 cm) long.

The leaves of Tridax procumbens area unit opposite, pinnate, rectangular to ovate, and 1-2 inches (2.55 cm) long with wedge-shaped bases, coarsely serrate margins, and acute apexes. Tridaxprocumbens flowers have white rays and yellow disk flowers. They're regarding zero. 40.6 inches (1-1.5 cm) wide, and remained a 4-12 inches (10-30 cm) long stalk. Flowering happens in spring.

Fruits area unit achene's that area unit dark brown to black in color, oblong, and 0.08 inches (2 mm) long, everywith a head of calyx bristles that adjust from zero.12-0.24 inches (3-6 mm) long. Tridax procumbens is listed as a Federal pernicious Weed. It prefers coarse-textured soils in additional tropical locations. It invades roadsides, crops, waste land, and fallow land. It's native to Mexico and South America, however has become AN invasive drawback round the world[6] .

Microscopical CharactersLeaf

Transverse section (T.S.) of leaf showed Dorsiventral, stratum single superimposed on each the surfaces and coated with thick cuticle. T.S. Passing through the middle rib region showed Slight depression on ventral aspect

and slightly Protuberated on dorsal size. Trichomes were of Covering kind that square measure straightforward, multicelled (3-6 Celled) and additional in variety on dorsal aspect. The Basal cells of the trichomes were swollen and Trichomes seemed like claw. Meristeel consists of Single centrally situated collateral vascular strand encircled by some parenchymatous Cells stuffed with dark content. T.S. passing Through the stratified region shows single superimposed Palisade cells slightly below the stratum followed by 5-7 celled mesophylls, parenchyma principally empty of animate thing areas[7].

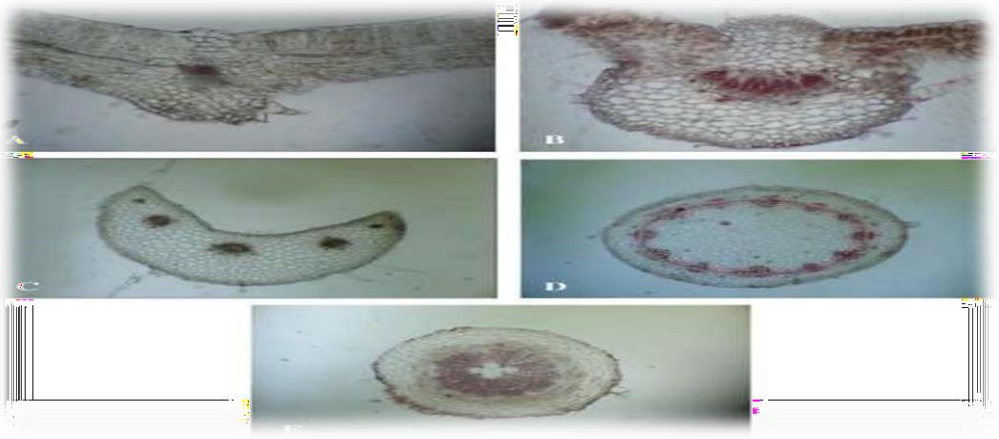

Fig 2: Internal structure of tridax procumbens

Medicinal Uses:

Table no.1: Medicinal uses of tridax procumbens

Preparation/extract		Plant ailment uses	References
Leaves	Juice	Anemia, colds, inflammation, hepatopathies, vaginitis, stomach pain, diarrhea, mucosal inflammation, skin infections, bleeding.	Caceres et al., 1998; Taddei and Rosas-Romero, 2000
	Dried	Reduce inflammation, gastrointestinal and respiratory infections, high blood pressure, diabetes	Poll, 2005, Giovannini etal., 2016

Table No. 2: List of chemical constituents of tridax procubens.

Chemical Constituent	Phytoconstituent
Flavonoid	atechin and its derivatives, Puerarin, Escluetin, Butein
Alkaloid	Akuammidine, , Ferulic acid, Tannins, Stigmasterol,
Other Phytochemicals	erulic acid, Tannins, Stigmasterol, Carotenoids,

METHOD

Collection Of Plant Material

Fresh leaves of tridax procumbens were collected. The leaves were washed under running tap water. Then the leaves were shade dried for about 2-3 weeks. The dry leaves were homogenized to fine powder or coarse powder and stored it[8] .

Preparation of extract

Collected tridax procumbens leaves of shade dried plant materials were 10 g powdered and extracted with 100 ml of 100% ethanol and allowed digestion for 72 hours. The resultant extract was concentrated and separated in to a 250 ml iodine flask[9,10].

Fig 3: Schematic diagram of extraction of tridax procunbens

Procedure

IV. FORMULATION OF GEL

1. Required quantity of carbopol was taken and 20ml of water was added in it; it was stirred at 300- 500RPM in a homogenizer for 15 minutes.
2. After achieving a sticky consistency add triethanolamine and more 10ml of water. Again it was stirred at higher than 500RPM.
3. After another 20 minutes a gel base was formed then Tridax procumbens extract was added; and it was further stirred for 10 minutes at higher rpm, Propylene glycol, Propyl Paraben and methyl paraben were further added in geometric proportions to yield a homogenous gel. Add glycerine in the formulation and stirred for 10 minutes to proper mix up.
4. Finally this whole mixture was stirred for another 45 minutes with small incremental addition of water.

Fig 4: Herbal gel formulation

EVALUATION

Phytochemical screening of tridax procumbens leaves

The phytoconstituents present in the Ethyl alcohol extracts of leaves Tridax procumbens were analyzed qualitatively by using standard procedures

Test for Alkaloids

About 2 ml of extract was taken and added 2 ml of concentrated HCL and then Mayer's reagent was added drop wise. The formation of white precipitate indicates the presence of alkaloids[11,12,13] .

Test for Flavonoids

The extract of 0.1 ml was taken and made up to 5 ml with distilled water, after which 0.3 ml of sodium nitrate was added and incubated for 5 mins at room temperature and then added 3 ml of 10% aluminium chloride which is incubated for 6mins at room temperature. Finally, 2ml of sodium hydroxide (NaOH) was added. The formation of yellow color indicates the presence of flavonoids[14,15].

Test for Saponins

About 2ml of filtrate was mixed with 1ml of distilled water and shaken vigorously for about 3 seconds and it was allowed to stand for few mins and then added 3 drops of olive oil and shaken vigorously. Formation of emulsion indicates the presence of saponins.

Test for Terpenoids

About 1ml of the extract and 2ml of chloroform was taken and followed by the addition of 5ml of concentrated H2SO4 along the sides of the test tubes. Formation of a reddish-brown coloration in the interphase indicates the presence of terpenoids.

Test for Phenolic Compounds

To 1ml of extract, 1ml of Iron (III) chloride was added and mixed well. A deep blue green color was formed which indicates the presence of phenolic compounds[16].

Test for Triterpenoids

A 10 mg of extract was dissolved in 1ml of acetic anhydride and then added 2ml of concentrated H2SO4. Formation of reddish violet color indicates the presence of triterpenoids.

Test for Quinones

To 2ml of plant extract, 1ml of concentrated H2SO4 was added. Formation of red color indicates the presence ofquinones.

Test for Steroids

To 10 mg of plant extract, 2ml of acetic anhydride and followed by 2ml of H2SO4 were added. Formation of violet or blue color indicates the presence of steroids.

Test for Tannins

To1ml of the extract added 0.1% of ferric chloride solution and observed brownish green or a blue-black coloration which indicates the presence of tannins[17].

Test for Glycosides

About 1ml of extract was treated with 2ml of glacial acetic acid containing one drop of ferric chloride solution. This was underplayed with 1ml of concentrated sulphuric acid. A brown ring at the interface indicates deoxysugar which confirms the presence of cardenolides. A violet-green ring appearing below the brown ring in the acetic acid layer indicates the presence of glycosides.

Test for Coumarins

The extract was dissolved in methanol and then added alcoholic NaOH. A yellow color appears which later disappears on addition of drops of concentrated HCl indicates the presence of coumarins [18,19].

ANTIBACTERIAL ACTIVITY

1. LB broth was mixed in 100ml water .
2. The petridishes and media were autoclaved for 30min.
3. Then media was spread over the petridish under the laminar airflow.
4. 100gm E.coli/S.aureus was spread over the media.
5. After the petridish were kept in the refrigerator for 10 min.
6. Under sterile condition drug was poured on plates[20,22,23].

RESULT AND DISCUSSION

Table no. 3: Phytochemical screening

Name of the phytoconstituent	Ethanol Extract
	Leaves
Alkaloids	(+)ve
Flavonoids	(+)ve
Saponins	(-)ve

Terpenoids	(+)ve
Phenolic compounds	(+)ve
Triterpenoids	(-)ve
Quinones	(-)ve
Steroids	(+)ve
Tannins	(-)ve
Glycosides	(-)ve
Coumarins	(+)ve

Table No. 4: Formulation of herbal gel

Sr. no.	Ingredients	F1	F2	F3
1	Extract	0.20gm	0.40gm	0.80gm
2	Carbopol	1.0gm	1.0gm	1.0gm
3	Propylene glycol	10ml	10ml	10ml
4	Methyl paraben	0.2 ml	0.2ml	0.2ml
5	Propyl paraben	0.1ml	0.1ml	0.1ml
6	Glycerine	1.0ml	1.0ml	1.0ml
7	Triethanolamine	Qs	Qs	Qs
8	Water	100ml	100ml	100ml

Table No. 5: Evaluation parameter of herbal gel

Sr.No.	**Parameters**	**Observation**		
		F1	**F2**	**F3**
1	Appearance	Green	Green	Green
2	Colour	Light green	Green	Dark green
3	PH	6.8	6.9	7.0
4	Spreadability	16.25mm	15.47mm	14.13mm
5	Viscosity	18600cp	7890cp	4820cp

Table No. 6: Zone of inhibition antibacterial activity

Sr.No	**Organisms**	**Zone of inhibition for F1**	**ne of inhibitionfor F2**	**Zone of inhibition for F3**
1	E. coli	13mm	15mm	16mm
2	S.aureus	2mm	4mm	6mm

XIX. CONCLUSION

The present study Formulation 2nd batch has shown craved result therefore this gel formulation can be used as antibacterial activities. . The phytochemical present in the different compound and it is active so their bioactive compound for different therapeutic properties. Natural remedies are more acceptable in the belief that they areeffective with lesser side effects then the synthetic ones. Herbal formulations have growing demand globally. It is a very good attempt to establish the herbal gel formulation containing extract of Tridax Procumbens.

XX. REFERENCES

[1] Samantha beck, Heather Mathison, Toma todrov, Esli- calder dn-ju and Olga R. kopp, department of biology, Utah valley university, USA journal of plant studies;Vol.7 ,No. 2018 (19) https://doi.org/10.5539/jps.v7n1p19.

[2] Anand gajanansa kshstriya, Tamilarasan .r, S. Srinivasan, P. Ganapathy, M. gowdhamammorthi and M. Elumalai, journal of xidian university Vol-15 ,Issue 1, 2021(1001-2400)https://doi.org/10.37896/jxu15.7/001.

[3] Loyd v. Allen Jr. , Howard C. Ansel. Ansel pharmaceutical dosage form and drug delivery system , ointement, Creams, and gels, 9th Edition, 2022, 323-325.

[4] Ankita, J., & Jain, A. (2012). Tridax procumbens (L.): A weed with immense medicinal importance: A review. International Journal of Pharma and Bio Sciences, 3(1), 544-552.

[5] Chatterjee A, Pakrashi SC. The Treatise on Indian Medicinal Plants, 2000;2:180-1. Jude CI, Catherine CI, Ngozi MI. Chemical profile of Tridax procumbens Linn. Pak. J. Nutr. 2009;8(5):548- 50.

[6] Pharmacology of Tridax procumbens a weed: review. Int. J. PharmTech Res. 2010;2(2):1391-4.

[7] Nazeruddin GM, Pingale SS, Shaikh SS. Pharmacological review of Tridax procumbens L. DerPharm. Sin.2011;2(4):172-5.

[8] Ravikumar V, Shivashangari KS, Devaki T. Hepatoprotective activity of Tridax procumbens against D-galactosamine/lipopolysaccharide-induced hepatitis in rats. J. Ethnopharmacol. 2005;101(1- 3);55-60. [DOI: 10. 1016/j.jep.2005.03.019] .

[9] Salahdeen HM, Yemitan OK, Alada ARA. Effect of aqueous leaf extract of Tridax procumbens on blood pressure and heart rate in rats. Afr. J. Biomed. Res. 2004; 7:27-9.

[10] Saxena VK, Albert S. β-Sitosterol-3-O-β-D-xylopyranoside from the flowers of Tridax procumbens Linn. J.Chem. Sci. 2005;117(3):263-6.

[11] Tejaswini K, Pradeep BV, Devi KR, Shylaja S, Jyothsna K. Phytochemical screening and antimicrobial activities of plant extract of Tridax procumbens. The Bioscan2011;6(2):321-3.

[12] Verma RK, Gupta MM. Lipid constituents of Tridax procumbens. Phytochemistry 1988;27(2);459- 63. [DOI: 10.1016/0031-9422(88)83120-0].

[13] Wagh SS. Antioxidant and hepatoprotective activity of Tridax procumbens linn, against paracetamol induced hepatotoxicity.

[14] Dewashish Kaushik, Alokit Tanwar, Dr. Joseph Davis (2020) Ethnopharmacological and Phytochemical Studies of Tridax Procumbens Linn: A Popular Herb in Ayurveda Medicine, http://www.ijert.org ,International Journal of Engineering Research & Technology (IJERT).

[15] Caceres, A., López, B., González, S., Berger, I.,Tada, I., Maki, J. (1998). Plants used in Guatemala for the treatment of protozoal infections. I. Screening of activity to bacteria, fungi and American trypanosomes of 13 native plants. J. Ethnopharmacol., 62(3), 195-202. doi:10.1016/S0378- 8741(98)00140-8.

[16] Poll, E. (2005). Medicinal and Aromatic Plants of Guatemala and the Need for Their Conservation. Proc. WOCMAP III, Congress on Medicinal and Aromatic Plants 2: Conservation Cultivation &Sustainable Use of MAPs Eds.: A. Jatisatienr, T. Paratasilpin, S. Elliott, V. Anusarnsunthorn, D. Wedge, L.E. Craker and Z.E. Gardner Acta Hort.,676, 167-170. https://doi.org/10.17660/ActaHortic.2005.676.21.

[17] Singh Central Institute of Medicinal and Aromatic Plants (CIMAP) Lucknow (India) E-mail: jsingh@cimap.res.i , Maceration, Percolation and Infusion Techniques of Extraction of Medicinal and Aromatic Plants (MAPs).

[18] S. D. Paralkar, K. A. Kamalapurkar, L. D. Koli, S.V. Malage , Asian journal of research in chemistry and pharmaceutical sciences Vol- 8(2),2020, 110-113.

[19] Japan patel, British patel, Hardeepsingh Banwait, international journal of drug development and research , 3(1), 2011,156-164.

[20] R. Dhanabalan, a. Doss, M. Jgadeeswari, S. Balachandar, E. Kezia, V.Parivugunna, C. M. Reena Josephine , R. vaidheki and K. Kalamani, 12:1090-95, (2008).

[21] Rajaram S. Sawant and Ashvin G. Godghate et al., (2013) preliminary phytochemical analysis of leaves of Tridax procumbens Linn. International journal of science, environment and technology, Vol-2, No.3, 2013,388-394.

[22] Sunil Christudas, Kulathivel TM, Agastian P , Phytochemical and antibacterial studies of leaves of tridax procumbens L.,Asian pacific journal of tropical biomedicine (2012)S159-S161.

[23] Mohamad sham shihabudeen H, Hansi Priscilla D, Kavitha T. phytochemiacal analysis of selected Indian folk medicinal plant. International journal of pharma Science res 2010;1 430-434.