

Formulation of Herbal Ointment from Khandu Chakka (*Ehretia Laevis* Roxb) Extract

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ABSTRACT

Ehretia laevis Roxb. (Boraginaceae) has been extensively used as a traditional remedy for the treatment of a diverse range of ailments related to the respiratory system, and against several infections. This review, is the fragmented information on *E. laevis*, including its botanical description, folklore uses, bioactive Phyto metabolites and pharmacological activities. The goal is to explore this plant therapeutically. Quantitative and qualitative phytochemical investigations of *E. laevis* showed the presence of important phytoconstituents such as phenolic compounds, flavonoids, Amino acid alkaloids, protein, carbohydrates, vitamins and minerals. Fresh plant parts, crude extracts, have been reported to exhibit broad spectrum of therapeutic activities the Study is planned to assess the antimicrobial activity of leaves of this plant against gram positive and gram-negative organism responsible for wound infection Which will be helpful to provide the cheap convenient and alternative medicine for wound healing. *Ehretia laevis* Roxb Plant is a rich source of phytochemicals. The aim is to carry out to identify the Phytoconstituents present in the Ethanolic, Methanolic & crude extract of *Ehretia laevis* Roxb Preliminary phytochemical screening of extracts were done, the HPLC, UV, & FTIR test studies were carried out on Methanolic, Ethanolic and crude extract. *Ehretia Laevis* is also known as Khandu Chakka used in fracture in various forms by the tribal people. Here we tried to make a ointment from the extract Khand Chaka plant which is used for metatarsal fracture, swelling and for pain relief.

Keyword: *Ehretia laevis* (Khandu Chakka), Fracture, Pharmacological activities, phytochemistry, Antimicrobial Activity, Boraginaceous, HPLC, FTIR, UV, Ethanolic Extract, Methanolic Extract

1. INTRODUCTION

The discovery and mass manufacturing of chemically synthesized drugs has revolutionized fitness care in maximum parts of the sector over the last one hundred years. Orthodox practitioners and herbal medicines are also utilized by tremendous segments of the populace in growing countries for number one care. natural medicine is one of the most crucial branches of natural medicinal drug international. In growing countries like India, the bulk of the world's population additionally relies on natural drugs to fulfil their health wishes. in step with the arena health organization, eighty percent of people use herbal drug treatments for any issue of their number one health care, exposing them to lesser-known side outcomes and dangers related to chemically synthesized pharmacological pills. As a end result, bioactive extracts of medicinal flora, as properly as their natural medication formulations, are a possible opportunity to chemically synthesized drug treatments. For the herb to be used greater extensively in medicinal practice, scientific confirmation of those claims is needed. long-term, seemingly unproblematic use of an herbal remedy will attest to its safety and efficacy.

1.1 Khandu Chakka Plant

Ehretia laevis is a rapidly growing medium sized tree of the Boraginaceae. The genus *Ehretia* contains more than 50 species. The plant is primarily distributed throughout tropical and subtropical regions of Asia, Africa and Australia. The plant has also been documented in the traditional system of medicine (e.g., Ayurveda and Siddha). This is due to its extensive uses to treat respiratory system diseases (e.g., asthma and cough), gastrointestinal tract infections (e.g. jaundice, diarrhea, ulcers, dysentery, liver diseases), endocrine system diseases (e.g. diabetes mellitus), microbial infections (e.g. diphtheria, scabies, ringworm, gonorrhea, syphilis and venereal diseases) Several research groups have shown the presence of alkaloids, glycosides, flavonoids, phenolic acids, tannins, saponins, proteins and carbohydrates in the plant . The pharmacological activities and outcomes of these investigations have not been able to sufficiently authenticate the possible mechanisms of action of these molecules. Therefore, the plant should be subjected to mechanistic studies at the molecular levels. Additionally, only a few toxicity studies have been published yet, including acute oral toxicity studies on the crude extracts of *E. laevis*, confirming that the plant is safe through oral route at the dose of 2000 mg/kg.

1.2 Why Ointment from Khandu Chakka Extract.

I. It has very good pain relief activity. Peoples can use plant leaves with oil for pain relief. It is very beneficial for old peoples suffering from joint pains. It will save the side effects of pain killer medicines and save the money of general public, as income sources are restricted due to lock down.

II. Ehretia Laevis Roxb plant shows antimicrobial activity. This antimicrobial property can be used for secondary infection and associated infections in viral treatment and to maintain general hygiene

III. Alkaloids, Flavonoids, Carbohydrates, Proteins and Amino Acids Are present. It can be useful in Metatarsal Fracture, Remedies for Arthritis and on swelling.

2. MEDICINAL USES OF CHEMICAL IN PLANT

SN	Name of chemical	Medicinal Uses
1	Naphthoquinone derivative	antibacterial, antifungal, antiviral, insecticidal, cytotoxic, anti-inflammatory, antipyretic, antiparasitic (Babula et al., 2007)
2	Baurenol	analgesic, in swellings (Villaseñor et al., 2004)
3	Ursolic acid	anti-inflammatory, anti-oxidant, anti-apoptotic, cytotoxic, obesity, diabetes mellitus, heart disease, brain & liver disease, muscle wasting (Seo et al., 2018)
4	Minerals such as Na, NH ₃ , Fe, Mn, K, P, Zn, Cu, Si, Mg, Ca	immune system, antioxidants, antiviral activity, preventing viral mutations (Chaturvedi et al., 2004)
5	Gallic acid	antiviral property (Balachander et al., 2020)
6	Tannic acid	bacteria, fungi, yeasts, viruses' growth is prohibited by tannins. Clotting of blood, reduce hyper tension, control
8	Vitamin C-ascorbic acid	Improve immune system (Wintergerst et al., 2006)
9	Decanoic acids	antiseizure (Sills et al., 1986), Larvicidal activity (Santos et al., 2017)
10	Phytol	antinociceptive and Antioxidant (Santos et al., 2017), anticancer and immune-enhancing effects, inhibit cellular senescence (Jeong, 2018), arthritis, asthma, mosquito repellent, useful for malaria (Okiei et al., 2009)
11	Piperazine	anti-helminthic, antiviral (Aggarwal et al., 2017)
13	Betulin & Betulinic acid	antitumor, anti-viral, antibacterial, anti-inflammatory, antimalarial (Alakurtti et al., 2006)
14	Lupeol	antiprotozoal, antimicrobial, anti-inflammatory, antitumor and chemo preventive properties (Gallo and Sarachine, 2009). anti-diabetic, cardio protective, anti-inflammatory, skin protective, hepatoprotective, nephroprotective (Siddique and Saleem, 2011)
15	Di - n octyl phthalate	anti-venom (Ibrahim et al., 2012)
16	Ornithine	decrease stress and enhance sleep quality related to fatigue (Miyake et al., 2014) Hepatic Encephalopathy (Li et al., 2018)
17	Cysteine	wound healing, antitumor Salas et al. (2008), Antioxidant, skin-whitening (Sakamoto et al., 2017)
18	Histidine	Precursor for several hormones, anti-inflammatory, anti-oxidant, and anti-secretory functions within the body, neurotransmitter, maintenance of the myelin sheath, gastric acid secretion and regulation, chelator of metal ions like copper, zinc, manganese, and cobalt, anemia (Kessler and Purich, 2019)
19	Serine	psychiatric disorders (de Koning et al., 2003)
20	Hydroxy proline	promotes collagen which maintains the structure and strength of connective tissue like bones, cartilage, blood vessels & skin (Li and Wu, 2018)
21	Glutamic acid	proper metabolism & nervous tissue functions Weil- Malherbe (1950)
22	Lysine	Reduce the recurrence, severity, and healing period of Herpes simplex virus infections (Chen et al., 2011). Treatment for schizophrenia Wass et al. (2011) Absorption of calcium, building of muscle protein, post surgery recovery, sports injuries, production of hormones, enzymes, & antibodies, osteoporosis, anxiety and mood disturbances, migraine, alzheimer's dementia, loss of hairs, shingles, malignancy, heart diseases and aging (Singh et al., 2011)
23	Tryptamine	hallucinations, used in psychotropic drugs (Araújo et al., 2015)

2.1 Chemical Properties

- Alkaloids
- Carbohydrates
- Saponins Steroids and Tri Terpenoids
- Phenolic Compounds and Tannins
- Protein And Amino Acids
- Flavone And Flavonoids
- Anthraquinone Glycosides

2.2 Study of Native Places

- | | | |
|-----------------|-----------|-----------------|
| • Wardha | • Myanmar | • Konkani |
| • Utter Pradesh | • China | • South Andaman |
| • Pune | • Burma | • Laos |
| • Punjab | • Vietnam | • Baluchistan |

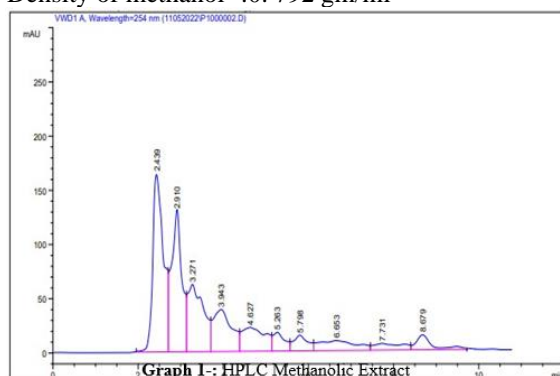
3. METHODOLOGY (EXTRACTION)

Soxhlet Extraction Is Used with Methanol and Ethanol as an extract

For Methanolic Extraction

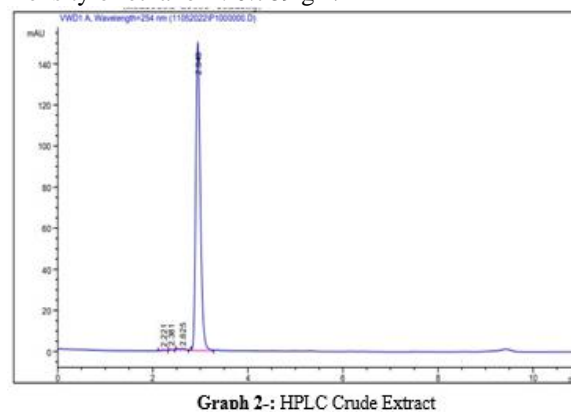
Analysis And Material Balance Inputs :- (All values are in gm)

Weight of Round Flask :- 304 gm
 Sample of powder :- 20 gm
 Weight of Filter Paper :- 3.55 gm
 Weight of methanol :- 316.8 gm
 Boiling point of methanol :- 64.70C
 Density of methanol :- 0.792 gm/ml



Outputs :- (All values are in gm)

Weight of filter paper + Leaf powder + flask (58.73 gm) :- 115.43 gm
 Weight of extract :- 258 gm
 Weight of wet leaves :- 46.93 gm
 Density of ethanol :- 0.789 gm/ml



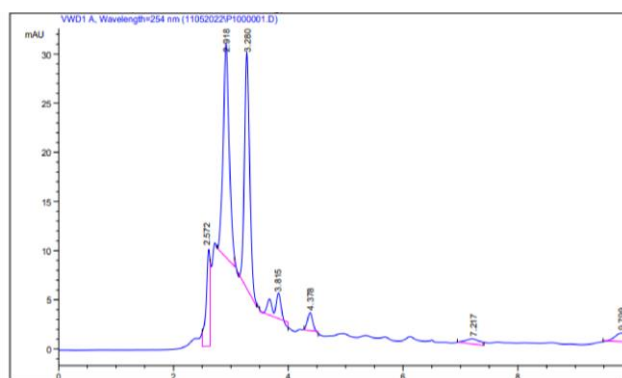
For Ethanolic extract

Inputs :- (All values are in gm)

Weight of Round Flask :- 304 gm
 Sample of powder :- 20 gm
 Weight of Filter Paper :- 3.4 gm
 Weight of ethanol :- 316 gm
 Boiling point of ethanol :- 78.370C

Outputs :- (All values are in gm)

Weight of filter paper + Leaf powder+ flask (58.73 gm) :- 106.95 gm
 Weight of extract :- 269 gm



3.1 Solvent Recovery (Simple Distillation)

Procedure -:

- We Take Khandu Chakka Extract (Ethanol) as feed for simple distillation column
- We maintained the temperature of column between 300-500 C
- Recovery started and vapours get collected and cooled with help of condenser
- As result 2/3 recovery of Ethanol takes place in collection flask

Analysis and Material Balance

Ethanolic Extract -: 300gm (367 ml)

Recovery of Ethanol -: 222gm (282 ml)

Concentrated Extract -: 78gm (82 ml)



Fig -1 Setup of simple distillation unit

3.2 Formulation of Ointment

• Procedure:

- Water immiscible components e.g., oils, fats, waxes are melted together over water bath (700C).
- Aqueous solution of all heat stable, water soluble components are heated (700C).
- Aqueous solution is slowly added to the melted bases with continuous stirring until the product cools down and a semi-solid mass is obtained.
- N.B. The aqueous phase is heated otherwise high melting point fats and waxes will immediately solidify on addition of cold aqueous solution.

Here We Are Preparing Ointment By Using Fusion Method With Use Of Khandu Chakka Leaves Extract And Ointment Base Was Prepared by Using Hard Paraffins, Cetostearyl Alcohol, Wool Fat, White Petroleum Jelly.

Alternative Method -:

- Alternatively, the preparation of ointment takes place with help of 3 different extracts
 - Methanolic
 - Ethanollic
 - Crude
- For Our alternative method we select white petroleum jelly as an ointment base

3.3 Methanolic/Ethanollic Extract

- Firstly, we take 10 gm of white petroleum jelly which is soft paraffin as a base and add 0.12 gm of methanolic extract / ethanollic extract in it
- Mixing up to 30 min of both components takes place
- After mixing, for the purpose of settling and cooling we put it into the refrigerator up to 24 hrs.
- Similarly, For 5 gm of white petroleum jelly



Fig-2: Ointment From methanolic extract

4. CONCLUSIONS

- Ehretia laevis Roxb plant is being used for various ailments traditionally. This review presents the ethnobotanical description, ethanopharmacological uses, bioactive phytochemicals and pharmacological properties of E. laevis.
- The test like Fourier transform infrared spectroscopy (FTIR), ultraviolet visible spectroscopy (UV) and High performance liquid chromatography (HPLC) conducted on Ethanolic, Methanolic and crude sample of khandu chakka. Gives idea about the sample contains all properties of alkaloids, flavonoids and carbohydrate etc and also the chemical content like Rutin, Betulin, ursolic acid, etc are present in our plant.
- The formulation of ointment is possible as the khandu chakka plant have various medicinal properties like antibacterial, anti-inflammatory, anti-carcinogenic etc. The preparation of ointment is possible and it becomes a media to use these medicinal properties effectively and easily.
- The ointment is most suitable for any age person. The prepared ointment shows most of desired property of pain relief ailments. The ointment is used as remedies for arthritis, metatarsal fracture, swelling etc.
- The use of this herbal ointment in pain management will minimize the side effect of modern medicine like non-steroidal anti-inflammatory drugs.
- The medicinal activity of plant will open the door for further research and will provide good opportunities for employment and farming to strengthen the economy of world.

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