



# ‘EVALUATION AND FORMULATION OF HERBAL OIL USING TRIDAX PROCUMBENS’

Name	Guide :1	Principal :2
Nagare Pratiksha Lahanu	Prof.R.Shinde	Dr. L.D Hingane(M.Pharm, PH.D)

ADITYA PHARMACY COLLEGE BEED

## ABSTRACT

The proposed topic involves formulation, development, and evaluation of hair oil using Tridax procumbens. The need for such a product is to reduce white hair, reduce fungal infection, and prevent hair loss. Tridax procumbens contain chemical constituents like tannins, flavonoids, Saponin and it shows antimicrobial activity antioxidant activity.

Antioxidants are helpful in increasing the blood circulation and thus help in hair growth as well as in the treatment a lot of diseases. The Antioxidant property of plant and oil can be utilise in hair fall. The objective of present study involves preparation of herbal hair oil using amla, brahmi, tridex, neem, shikakai and its evaluation for increase in hair growth activity

The oils with two different drug concentrations 5% & 10% were prepared using direct boiling, paste and cloth method Herbal hair oil formulation showing moderate antioxidant activity when compared with standard. It can be used as herbal hair oil for hair growth and other Free radical damage within cells has been linked to a range of disorders including cancer, arthritis, atherosclerosis, Alzheimer's disease, and diabetes.

**Keywords – Antioxidants ,Herbal formulation ,Tridex microbial activity, Antibacterial Activity**

## INTRODUCTION

In India herbal medicines are the principal form of medicines. In India around 6000 manufacturers for herbal medicines are available. According to WHO around 80% people of the world uses herbal medicines. Herbal formulations have always attracted considerable attention because of their good activity and comparatively lesser or nil side effects as compared to synthetic drugs. Alopecia is a dermatological disorder with psychosocial implications on patients with hair loss.

The objective of present study involves preparation of herbal hair oil using **amla, brahmi, tridex, shikakai, neem**, Antioxidant activity and its evaluation for increase in hair growth activity and other uses of antioxidants. Hair oils are the hair care preparations used for the prevention and treatment of baldness or other ailments, aggression of hair. They also promote luxurious growth hair. Hair oil containing herbal drugs are used as hair tonic. Hair care products are categorized in to main category.

The mechanism of increased hair growth is not known, may involve: (a) Enhanced microcirculation around hair follicles.

(b) Direct stimulation of resting hair follicles. (c) Alteration of androgen effect on genetically programmed hair follicles.

On the basis of market survey carried out on crude drugs used presently for herbal hair oils gives us clue for selection of drugs for hair oil. Hence the present study was aimed to evaluate the hair growth activity of herbal formulations, which includes oil extract of all the mentioned drugs in various concentrations. In order to justify the traditional claims now a days multi ingredient hair oils are prepared and tested for their hair growth activity and antioxidant activity due to this used other diseases.

**Amla (*Emblica officinalis*)** : belong to family Euphorbiaceae is rich in vitamin c , tannins and minerals such as phosphorus ,iron and calcium which provide nutrition to hair and also causes darkening of hair. **Brahmi (*Bacopa monnieri*)** : belong to family scrophulariaceae contains alkaloids which enhance protein kinase activity and also used for treatment for Dementia.)

**NEEM (*Azadirachta indica*)** : belongs to family Meliaceae contains glycerides of saturated and unsaturated fatty acids. The main fatty acids are oleic and stearic acids. These oils are used in the treatment of dandruff in hair and relief in itching.

**Shikakai** : its botanical name is *Acacia Concinna*. The bark contains saponin, which on hydrolysis yields lupeol, spinasterol and acacic acid lactone. The sugars identified are glucose, arabinose and rhamnose. It also contains hexacosanol. The saponin of bark shows spermicidal activity against human semen. The tender leaves, which are acidic, are used in chutneys.

**Tridax procumbens Linn. (Compositae)**, : a weed found throughout India is employed as indigenous medicine for a variety of ailments including jaundice.

It is commonly used in Indian traditional medicine as anticoagulant, antifungal and insect repellent; in bronchial catarrh, diarrhoea and dysentery. Moreover it possesses wound healing activity and promotes hair growth.

Tridax procumbens is also dispensed as 'Bhringraj', which has a great reputation in Ayurvedic medicines for liver disorders. The hepatoprotective action has been demonstrated.

We have reported recently the antioxidant property of Tridax procumbens on the protective potential of Tridax procumbens

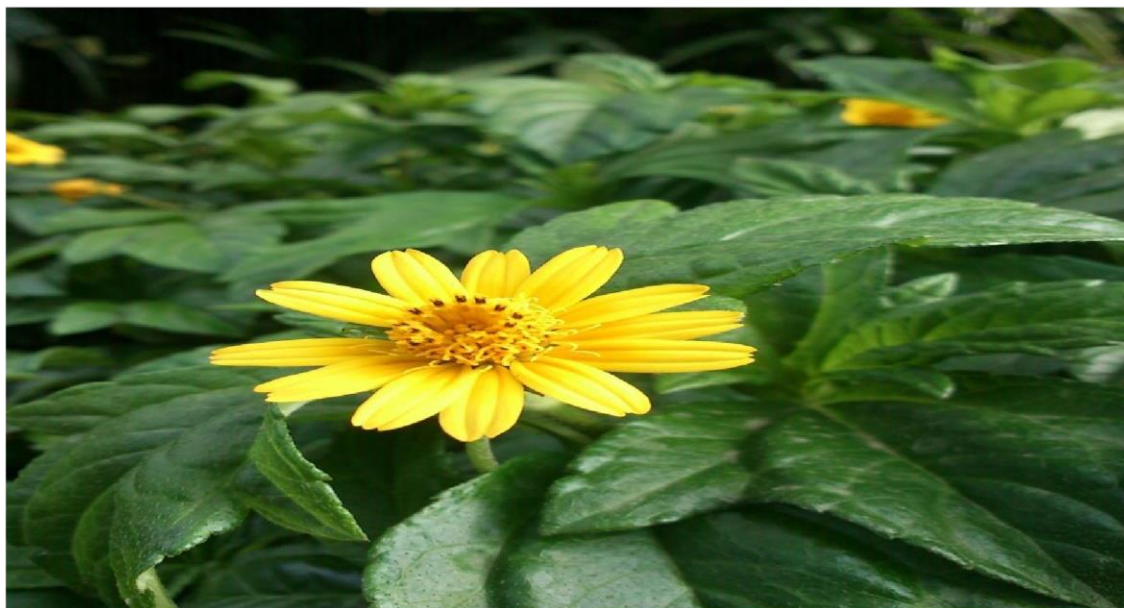
are **Curry leaves** commonly known as 'Kadi Patta'. ... Curry leaves are loaded with properties that can work wonders for your hair and lead to hair growth. They are rich in antioxidants and proteins, these antioxidants neutralize the free radicals and keep your hair healthy and strong.

#### Benefits of fenugreek

The mucilage content replenishes the hair and provides smoothness allowing us to detangle our hair easily post every wash. This also helps restore luster. In addition, fenugreek has antioxidant and anti-inflammatory properties that help with dandruff, scalp irritation and acne.

# PLANT DESCRIPTION AND CHEMICAL CONSTITUENTS

## Plant Description →



## **Tridax Procumbence** →

LOCAL NAME :

GUJARAT : Ek Dandi

INDIA : Bisalyakarmi , Mukkuthipoo

ENGLISH :Coat Buttor (Flower Appearance)

The taxonomic status of this species is clearly defined and universally accepted. The name tridax refers to the ray flowers while procumbens refers to the prostrate trailing habit of stem (Holm et al., 1997)

**Taxonomy :-**

<b>Kingdom :</b>	Plantae
<b>Order :</b>	Asterales
<b>Family :</b>	Axteraceae
<b>Genus :</b>	Tridax
<b>Species :</b>	Procumbens
<b>Binomial Name :</b>	Tridax Procumbens L.

The plant native of tropical America and naturalized in tropical Africa, Asia and Austrilia. Local people knew it as

“Ghamara”, in English popularly called ‘coat buttons’ and is dispensed for “Bringraj” by some of the practitioners for hair growth in Ayurveda.

The plant bears daisylike yellow-centered white or yellow flowers with three-toothed ray florets. The leaves are toothed and generally arrowhead-shaped. Its fruit is a hard **achene** covered with stiff hairs and having a feathery, plumelike white pappus at one end. Calyx is represented by scales or reduced to pappus. The plant is invasive in part because it produces so many of these achenes, up to 1500 per plant, and each achene can catch the wind in its pappus and be carried some distance. This plant can be found in fields, meadows, croplands, disturbed areas, lawns, and roadsides in areas with tropical or semi-tropical climates.<sup>1</sup> It is listed in the United States as a Noxious Weed and regulated under the Federal Noxious Weed Act.

Plant	Pharamalogical Activity
Whole plant	Antimicrobial activity anticoagulant, hair tonic, antifungal and insect repellent, in bronchial catarrh, diarrhea, dysentery, and wound healing.
Flowers, Leaves	Anti septic, Insecticidal, Parasiticidal, AntiCancer Activity infectious skin diseases, antidiabetic properties (Pareek et al., 2009).
Aerial Parts	Hepatoprotective
Leaves	Wound Healing Antidiabetic activity. Dysentery, Diarrhea. Against conjunctivitis. Hemorrhage from cuts. bruises and wound. liver disorders or hepato-protective nature, gastritis and heart burn (Wani et al., 2010).

## Chemical Constituents ⑨

The flavonoid procumbenetin has been isolated from the aerial parts of *Tridax procumbens*. d procumbenetin has been isolated from the aerial parts of *Tridax procumbens*.

Other chemical compounds isolated from the plant include

1) alkyl esters,

2) sterols

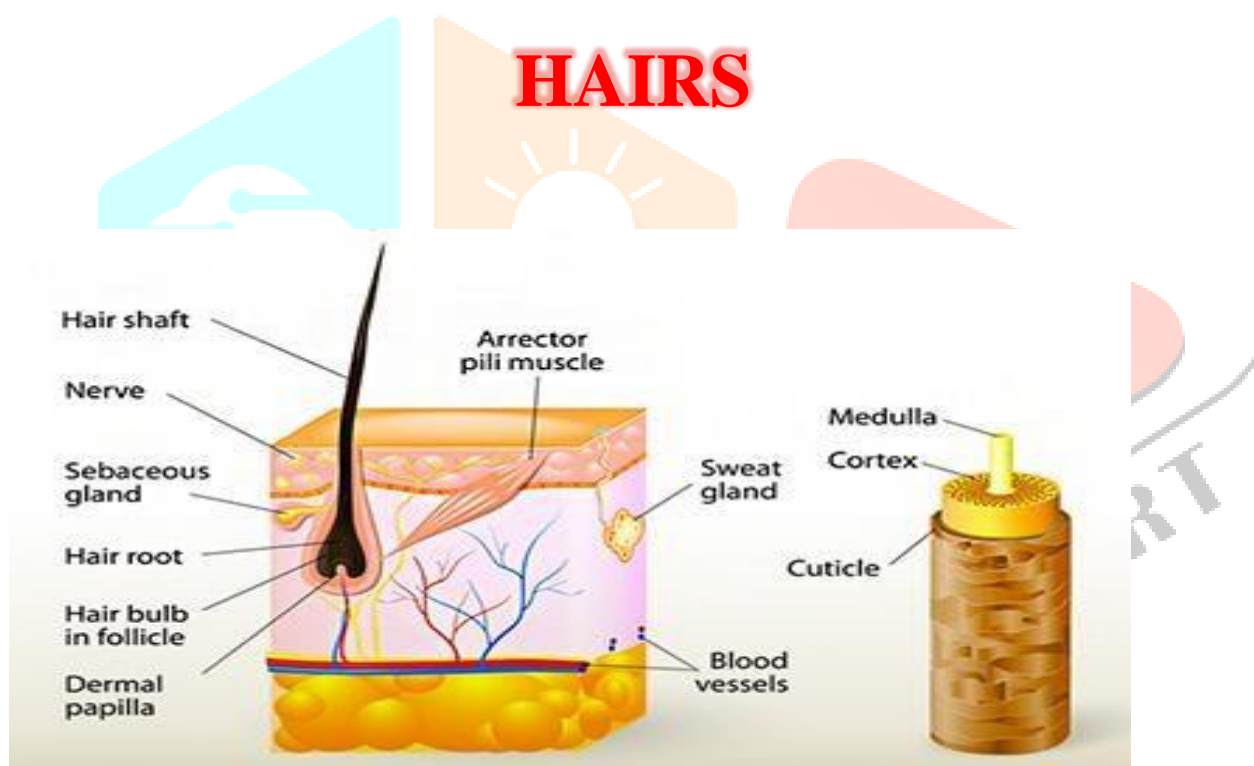
,3) pentacyclic triterpenes, 4) fatty acids, 5)

polysaccharides.

**Gluco luteolin**- Reducing dandruff, Prevent breakage **Tannin**- Convert gray hair into black hair.

**Beta-Sitosterol**- Reduce hair loss.

**Saponins**- Antifungal and Antibacterial Activity **Flavonoids**-Antioxidant effect.



### Hair Structure

Hair is often a protein filament that grows from follicles found within the dermis. Hair is one altogether the defining characteristics of mammals. The build, apart from areas of glabrous skin, is roofed in follicles that produce thick terminal and fine vellus hairs.

1. The part beneath the skin called the **hair follicle**, or when pulled from the skin, the bulb.
2. **The shaft**, which is that the tough filamentous portion that spreads above the skin surface.

Hair fibers have a structure consisting of several layers, starting from the outside:

1. The cuticle which carries with it several layers of flat, thin cells laid out overlapping one another as roof shingles

2. The cortex, which contains the keratin bundles in cell structures that remain roughly rod-like

3. The medulla, a disorganized and open area at the fiber center.

The time of development and rest cycles is coordinated by many endocrine, vascular and neural stimuli and depends not only on the localization of the hair but also on several factors, like age and nutritional habits

### Hair disorder ☹

**1.Scarring alopecia-** It is also known as cicatrice alopecia is the loss of hair. It destroys the hair follicle, replace with scar tissue and cause permanent hair loss Cause-Lichen planopilaris,pseudopelade

**2.Folliculitis-** In which hair follicle becomes inflamed caused by a bacterial or fungal infection. It looks like a small red bump or white-headed pimples. Cause-Staphylococcus aureus, Pseudomonasaeruginosa.

**3. Seborrheic dermatitis-** It is a very common condition causes redness, scaly patches, dandruff Causes-Malassezia yeast

**4. Tinea Capitis-** Dry scaling, black dots, yellow crusts. It is a fungal infection on a scalp attack on the hair shaft.

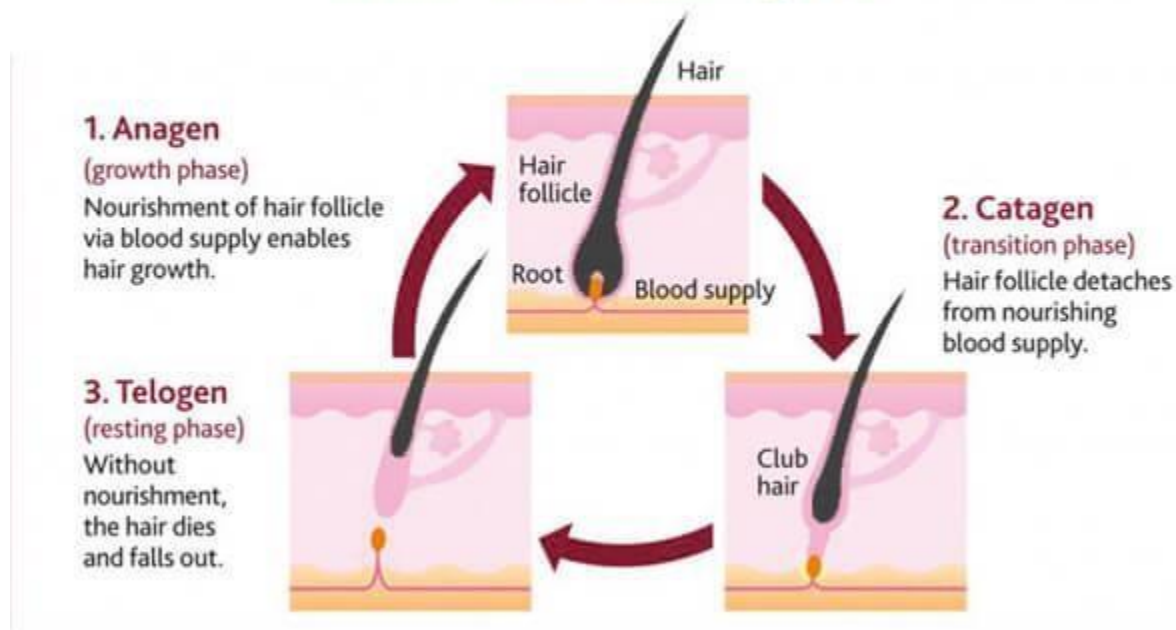
Cause-Microsporumgypseum

**5. Impetigo-** Forms blisters may look inflamed and crusty release yellow fluid, sores. It is a contagious bacterial infection. Causes-Streptococcus, Staphylococcus aureus

### Hair Growth ☹

- The three stages of hair regrowth are:- 1) Anagen Phase - 2) Catagen Phase – 3) Telogen Phase
- Each strand of hair on the human body is at its stage of development.
- Once the cycle is complete, it restarts and a new strand of hair begins to form.
- The rate or speed of hair growth is about 1.25cm or 0.5inches per month, or about 15cm or 6inches per year.

# Hair Growth Cycle



## MATERIALS

### Plant Material

Amla (*Emblca officinalis*), Brahmi (*Bacopa monnieri*), NEEM (*Azadirachta indica*), Shikakai (*Acacia Concinna*), *Tridax procumbens* Linn. (Compositae), Curry leaves, fenugreek were collected locally from Aditya college Garden, Beed and rose oil were purchased from local market. The selection of plants and the procedure followed was as per Ayurvedic and traditional texts.

#### **Amla:**

Biological source: Dried fruits of *Phyllanthus emblica*

Family: *Phyllanthaceae*

Use: hair conditioner, treats scalp ailments, promotes hair growth.

#### **Curry Leaves:**

Biological source: Dried leaves of *Murraya koenigii*

Family: *Rutaceae*

Use: Prevents hair fall and premature greying of hair.

#### **Neem:**

Biological source: Dried leaves of *A. Indica*

Family: *Meliaceae*

Use: Leaves Antimicrobial, antiseptic, antidandruff

**Coconut oil:**

Biological source: Oil derived from dried fruits of *Cocos nucifera*.

Family: Arecaceae

Use: moisturiser, vehicle, stimulates hair growth by unclogging pores.

**PROCEDURE**

- 1) Accurately weigh all the dried and fresh herbs and leaves powder.
- 2) Mix coconut oil, arendal oil and castor oil uniformly.
- 3) After that mixing add almond oil, fenugreek powder, Amla extract and keep aside for overnight.
- 4) Then add curry leaves, neem extract and boil until colour of curry leaves changes to dark brown colour.
- 5) After the colour change whole preparation was filtered through muslin cloth.
- 6) Finally small amount of color and flavoring agent was added to the oil and it was placed in amber colored bottle.

Formulation 1







## EVOLUTION TEST

The formulated herbal oil was evaluated for parameters like pH, acid value, saponification value, refractive index, viscosity and organoleptic parameters<sup>9, 10</sup>.

### 1. Acid value:

10ml of oil was added with 25ml of ethanol and 25ml of ether. Phenolphthalein was added as indicator and titrated

with 0.1M potassium hydroxide solution, Acid value =  $5.61n/w$  Where, n= Number of ml of 0.1M KOH w= Weight of oil

### 2. Saponification value:

2g of oil was accurately weighed and transferred into a 250ml of iodine flask. 25ml of 0.5M alcoholic potassium hydroxide was added and boiled under reflux on a water bath for 30mins. Phenolphthalein was added as indicator and titrated against 0.5M HCl ('a' ml). Similarly blank was performed ('b' ml) without the sample. Saponification Value:  $28.05(b-a)/w$  Where,

w= weight in grams of the solution.

### 3. pH:

pH of the herbal oil was detected using pH meter.

### 4. Viscosity:

Viscosity was determined using Ostwald's viscometer.

### 5. Specific gravity:

Specific gravity of the prepared oil was determined using pycnometer or specific gravity bottle.

## 6. Refractive index:

It was determined using refractometer.

## 7. Organoleptic property:

Colour, odour, skin irritation was determined manually. Oil was applied on hand and exposed to sunlight for 5mins to check for any irritation over skin.

### OBSERVATION

### OBSERVATION

Sr . No.	Parameters	Observation
1	Colour	<b>Greenish Brown</b>
2	Odour	<b>characteristics</b>
3	Specific Gravity	<b>1.093</b>
4	Viscosity	<b>0.961 Poise</b>
5	pH	<b>6.8</b>
6	Acid Value	<b>4.5</b>
7	Saponification Value	<b>112.05</b>
8	Irritation Test	<b>No irritation</b>
9	Refractive Test	<b>1.402</b>

### RESULT

The prepared formulation of hair oil showing good antioxidant activity when compared with standard our result revealed that the antioxidant capacity of the herbal oil is comparable to the antioxidant activity of ascorbic acid. Tridax procumbens extract was prepared. It contains chemical constituent like Tannins, Flavoids, Saponin and it shows antimicrobial activity against E.coli, P. aeruginosa, Bacillus subtilis, Staphylococcus aureus. Herbal Oil was formulated on trial and error basis by using tridax procumbens extract .

The prepared polyherbal hair oil using the above mentioned ingredients was evaluated for the following parameters and the results are tabulated

## CONCLUSION

This research provides guideline on the use of herbal ingredients on the preparation of Herbal Hair oil having minimal or no side effects.

The present work involves formulation, development, and evaluation of hair oil. Tridax procumbens was used to reduce white hair, reduce fungal infection, and prevent hair loss. Stability parameters of the formulations showed that there was no significant variation during stability study, thus the present study concluded that it is possible to develop hair oil using Tridax procumbens.

The Herb Tridax Procumbens found growing commonly in tropical countries is endowed with antimicrobial and antioxidant properties.

In general, the herbal formulation provides good blend of vitamins, antioxidants, terpenoids, and essential oils. All the values in the evaluation of finished product showed that they are within the acceptable limits. Hence, it is concluded that the oil is beneficial in maintaining good growth of hairs, turning grey hairs to black, providing protection from dandruff and results in lustrous looking hairs

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