



To Study Formulation And Evaluation Of Polyherbal Hair Oil

Prof.Gayatri V. Dusane , Akash S.Pagar,Krushna B. Moin

College name – NandKumar Shinde College of Pharmacy,Vaijapur 423701 dist. Chh.Sambhajinagar.

Abstract :-

This study aims to develop a polyherbal hair oil to lessen hair problems using traditional remedies/herbs used since ancient times by our ancestors. Today, herbal hair oil formulations are used due to their minimal side effects and enhanced dermatological activities. The herbal hair oils available in market contains various traditional remedies like Amla, Aloe vera, Coconut oil, Curry leaves, Fenugreek, Garlic, Fish Scales, Neem, Hibiscus, Soapnut, Corn powder, Almond, Henna, Castor oil, Jatamansi, Shatavari, Shankpushpi, Kapur, Jasmine oil, Tiloil, Kalajeera, Durbaghas, Bramhi, gorakmundi, kalakuda, bhringraj, Banayan, Eclipta, Vetiver, onion, Ashwagandha, Triphala, Nirgudi, Licorice, Lavender, Pudina, Shikhakai, Sesame oil, Cowmilk, Yashtimadhu, etc. The developed formulation comprise of herbs such as Amla(*Emblica officinalis*), Aloe vera(*Aloe barbadensis*), Curry leaves(*Murraya koenigii*), Garlic(*Allium sativum*), Onion(*Allium cepa*) Fenugreek(*Trigonella foenum graecum*), Jasmin(*Jasminium*), Coconut oil (*cocos nucifera*), which are well known for their cosmetic properties. The developed formulation was further investigated for different physicochemical parameters such as organoleptic properties, pH, viscosity ,specific gravity, Acid value , value of saponification and iodine value . Very good results were expected.

Key words: herbal hair oil, herbs, physicochemical properties.

INTRODUCTION:

Hairs are vital parts of human which helps in increasing appearance and elegance of person to look young and charming. They also acts as protective appendage. Hairs are protein filaments that grows from follicles into dermis. Basic parts of hair are bulb, root, shaft. The growth of hair having cyclic phase divides into three phases-

- a) Anagen, which is known as growth phase,
- b) Catagen, which is known as involution phase and
- c) Telogen, Also known as resting phase.

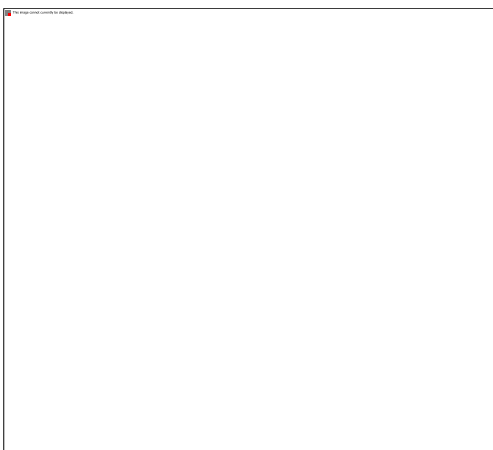
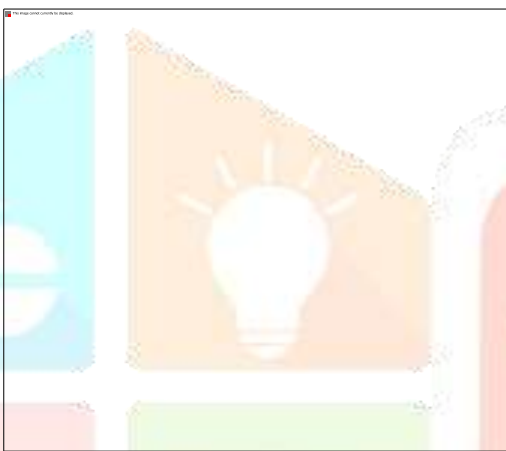


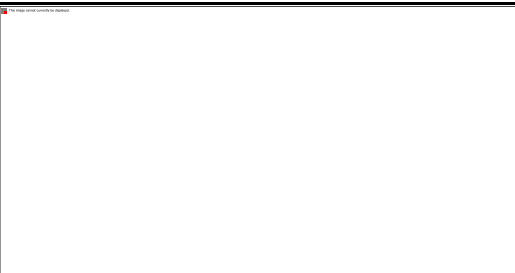
The anagen phase can last as short as 2-6yr. Catagen phase is between 2-3 weeks. While Telogen phase lasts for 2-3 month. Nowadays, there is increase in exposure to chemicals and pollution, modern lifestyle, improper diet has been resulted in hair quandary. Pigmentation (fading), dandruff, falling of hairs(shedding), hairloss (alopecia) are the main problems associated with the hair.

The concept of beauty, elegance and cosmetics is very old to mankind and civilization. So, Various beauty products consisting herbs have been well accepted by them. Hair oil is one of them used to cure all hair problems. Due to its nil or less side effects and ease of availability, demand for herbal hair oil has been increased. Hair oil is preferred in many hair disorders as they not only promotes hair growth but also prevent scalp drying, hair drying, hair thinning, improve blood circulation and provide nourishment to scalp to nurture beautiful and glossy, wavy hairs.

Hair is an epidermal derivative which is one of the vital parts increasing the overall Elegance of the body. Hair fall, dandruff, lice, split ends, and grey hair are a few problems involved with Hair faced by humans. To overcome these, the human takes many measures by applying many Cosmetics. Hair oil is one of them used to solve almost all of these problems. Herbal cosmetics are in high demand due to the increasing interest of mankind in them because they are more effective with nil or fewer side effects, easily available ingredients, etc. Hair care cosmetics are now added with herbs and they are well-recognised compared with Synthetic ones. Herbal hair oil is preferred and is used in many ailments of hair. They promote Hair growth, improve the elegance of hair, and prevent hair fall. Hair oil not only promotes hair Growth it also provides necessary moisture to the scalp rendering beautiful hair. Hair oils are the hair care preparations used for the prevention and treatment of baldness or other ailments, and aggression of hair. They also promote the luxurious growth of hairs. Hair oil containing herbal drugs is used as a hair tonic. Hair care products are categorized into two main categories, hair tonics and hair grooming aids. These are the extracts of medicinal plants in an oil base. A plethora of herbs have been employed for hair treatments. A few of these herbs are amla, henna, neem, methi, lemon, tulsi, brahmi, shikakai, reetha, liquorice root, musk root, mahabhringraj, jantamasi, chitraka, marigold, hibiscus, nutmeg, parsley, rosemary, thyme. The synthetic drug, minoxidil is a potent vasodilator and appears safe for long-term treatment. After five years of use of 2 and 3% topical minoxidil, the improvement has been shown to peak at one year with a slow decline in regrowth over subsequent years. Long-term treatment with local side effects may be a problem with continuing use of minoxidil lotion. Based on a market survey carried out on crude drugs used presently for herbal hair oils gives us a clue for the selection of drugs for hair oil. Hence the present study aimed to evaluate the hair growth activity of herbal formulations, which includes oil extract of all mentioned drugs in various concentrations. To justify the traditional claims nowadays multi-ingredient hair oils are prepared and tested for their hair growth activity. Amla is rich in vitamin C, tannins, and minerals such as phosphorus, iron, and calcium which provide nutrition to hair and also cause darkening of hair. Hibiscus consists of calcium, phosphorus, iron, vitamin B1, riboflavin, niacin, and vitamin C, used to stimulate thicker hair growth and prevent premature graying of hair. Brahmi contains alkaloids which enhance protein kinase activity. Methi contains high protein fodder which supplies required protein nutrition to hair. There are various methods available for the preparation of hair oils direct boiling method, paste method, and cloth method.

Ingredients table:

For the preparation of herbal hair oil following ingredients were used: _

Sr.no	Ingredients		Biological Source	Uses
1	Amla		Emblica officinalis	Hair conditioner Promotes hair growth
2	Aloe Vera		Aloe Barbadensis	Antimicrobial Hair conditioner
3	Coconut oil		Cocos nucifera	Hair growth stimulant Moisturizer vehicle
4	Curry leaves		Murraya Koenigii	Prevent hair fall Prevent Hair thinning Strengthen hair follicles Acts as antioxidant Prevent premature grey hair Reduces dandruff and irritation
5	Fenugreek		Trigonella foenum graecum	Antifungal Prevent Dandruff Hair regrowth

6	Garlic		Allium Sativum	Prevents Hair loss
7	Onion		Allium copa	Improves Blood circulation in scalp Promotes hair growth
8	Jasmine		Jasminium	Flavouring substance

Table 1: Ingredients and their uses.

Materials And Method

A) Emblica officinalis (Euphorbiaceae)

Emblica officinalis is rich in vitamin C, tannins and minerals such as phosphorus, iron and calcium which provides nutrition to hair and also causes darkening of hairs.

Chemical constituents:

Alkaloids (Phyllantidine, Phyllantine), Vitamin C, Gallotannis (5%), Carbohydrates (14%), Pectin, Minerals, Phenolic acid, Gallic acid, Ellagic acid, Phyllemblic acid, Emblicol, Amino acid (Alanine, Aspartic acid, Glutamic acid, Lysine, Proline). Gupta et al investigated increase in hair growth activity of Emblica officinalis.

Use :-

- Amla is best anti-ageing herb (vayastapna).
- It improves vision and good for overall health of eyes (chakshushya).
- This herb is useful to pacify all three dosha (sarvangdosha) in various disorders of body.
- It is very effective in various bleeding disorders (rakatpittaghna).
- Amla is anti-diabetic and reduces sugar level in urine (premaghna).



Figure no.1
Emblica officinalis fruits

B) Aloe barbadensis (Liliaceae)

Aloe barbadensis is rich in aloin, vit A, vit C, vit E which contributes to cell growth and shiny hairs. Vit B₁₂ and folic acid are also present in Aloe vera.

Chemical constituents:

Glycosides(aloin), aloe emodin, barbaloin, iso barbaloin, resins, it also contains macronutrients such as Vit A, vit C, vit E, vit B₁₂, vit B₉ (folic acid) .



Figure No.2
Aloe barbadensis

C) Cocus nucifera (Arecaceae)

Cocus nucifera consists of ascorbic acid, folic acid, ions like calcium, iron, magnesium, phosphorous, zinc, sulphur, etc. Which helps in moisturising scalp removing clogged pores, dandruff and dead skin.

Chemical Constituents:

Amino acids (alanine, glycine, aspartic acid), Vitamins C, B₉, B₁₂, etc. Ascorbic acid, folic acid, ions like calcium, iron, magnesium, phosphorous, zinc, sulphur, etc

Use :-

- High in lauric acid. Lauric acid is one of the main ingredients in coconut. ...
- High in protein. ...
- High in vitamins C, E, B-1, B-3, B-5, and B-6. ...



Figure No.3
Cocos nucifera

D) *Murraya Koenigii* (Rutaceae)

Murraya Koenigii has huge amount of beta carotene and proteins which decrease hair loss and enhances hair growth. They also comprise amino acids and anti-oxidants which are helpful in strengthening the hair follicles and moisturise the scalp. Curry leaves also helps to remove the dead hair follicles and can serve as ingredient against dandruff.

Chemical Constituents:

Amino acids, carbohydrates, proteins, fibres, calcium, phosphorus, iron, magnesium, copper, minerals and vitamins like nicotinic acid, vitamin B, C, A and E, antioxidants, plant sterols, glycosides and flavonoids. The oil is used externally for bruises, eruption, in soap and perfume industry (Prajapati et al., 2003). essential oil from leaves yielded di- α -phellandrene, D-sabinene, D- α -pinene, dipentene, D- α -terpinol and caryophyllene (Gopalan et al., 1984).

Use :-

- Can curry leaves or curry leaf oil affect hair growth
- The hypothesis is that the rich nutrients in curry leaves
- prevent thinning hair or hair loss. The leaves may also help remove dead hair follicles



Figure No.4
***Murraya Koenigii* leaves**

E) *Trigonella foenum graecum* (Leguminosae)

Trigonella foenum graecum seeds contains antioxidants and protects cellular structures from oxidative damage. moisturises hair and replenishes hair growth. They also possess some antifungal activity. Helps in hair regrowth.

Chemical Constituents:

The *Trigonella foenum graecum* seeds rich source of galactomannan, carbohydrates and sugar. amino acid, fatty acid, vitamins, and saponins. The seeds of fenugreek contain a large quantity of folic acid. The main chemical constituents of *T. foenum-graecum* are fibers, flavonoids, polysaccharides, saponins, flavonoids .

Use :-

- Revives Damaged Hair. ...
- Fights Dandruff. ...
- Controls Scalp Inflammation. ...
- Adds Shine And Soft Texture. ...
- Prevents Premature Grey Hair.



Figure No.5
Trigonella foenum graecum

F) Allium Sativum (Liliaceae)

Allium Sativum has alkyl propyl disulphides, dialkyl sulphides, allinin and allicin which promotes hair growth and useful in preventing oxidation. These are proven antimicrobial Promoting hair growth in patients suffering from alopecia.

Chemical Constituents:

Carbohydrates(29%), Proteins (56%), fat, mucilage, volatile oil, iron, copper, phosphorous, enzyme allinylase, alkyl propyl disulphides, dialkyl sulphides, allinin and allicin .

Use :-

- Hair growth
- Cool And dry



Figure No.6
Allium Sativum

G) Allium copa (Liliaceae)

Allium copa are rich source of Ferulic acid, gallic acid, protocatechuic acid, quercetin, and kaempferol^[29], which contributes to treat skin disease, pimples, wounds, skin infections (cavero et al,2011). These are antibacterial promoting blood circulation thus important in hair loss treatment (Hazare,2015)

Chemical Constituents:

Phenolic compounds, [ferulic acid (13.5–116 lg/g), gallic acid (9.3–354 lg/g), protocatechuic acid (3.1–138 lg/g), quercetin (14.5–5110 lg/g), and kaempferol].

Use:-

- stimulation of hair regrowth process and help keep hair healthy and shiny.
- It treats as well as prevents baldness.



Figure no.7
Allium copa

H) Jasminium (Oleaceae)

Jasminium is well known for its sweet, light fragrance and aromatherapy. Jasmine oil is known for its soothing effect on mind, stress and muscle tension reducing action . It serves as anti-microbial, conditioning agent and also imparts good odor to the oil and the shampoo .

Chemical Constituents:

The primary chemical constituents of Jasmine absolute extracted by CO₂ are benzyl alcohol 5.11%, linalool 9.43%, phenylmethyl acetate 7.91%, 6-ethenyl-tetrahydro-2, 2, 6-trimethyl-2H-pyran-3-ol 0.41%, cis-3-hexenyl-benaoate 28.77% and 1-tetracosanol 10.14%.

Use :-

- It's a mood-booster
- It can make you feel more energetic
- It has antiseptic properties



Figure no.8
Jasminium

EXPERIMENTAL METHODOLOGY**Collection of ingredients:**

All the required raw materials were collected from local market of Aurangabad. Amla, garlic, curry leaves, coconut oil, jasmine oil, fenugreek, onion . All these ingredients were proposed to be examined in pharmacognosy laboratory of NandKumar Shinde of Pharmacy, Vaijapur.

Preformulation requirements:

Take required quantity of *Emblica officinalis* fruits , dry *Murraya Koenigii* leaves and *Trigonella foenum graecum* seeds. And grind it to powder.

Make incision on *Aloe barbadensis* and take out juice from it. Mix it uniformly in coconut oil and keep it aside for overnight.

Formulation of herbal hair oil:

Take required amount of powdered preparation of *Emblica officinalis* fruits , *Murraya Koenigii* leaves and *Trigonella foenum graecum* seeds. Take small chopped pieces of *Allium copa* and *Allium Sativum*. Add it to the coconut oil and Aloe mixture which is previously prepared. Boil it until colour changes to dark brown . Filter this mixture through muslin cloth . Finally Add Small Quantity of Jasmin oil to mask the odour of prepared herbal oil. Place it in suitable container.

Table :2

Sr.No	Ingredients	Quantity (%)
1	Amla	6
2	Aloe vera	10
3	Curry leaves	3
4	Fenugreek	1.5
5	Onion	2
6	Garlic	1
7	Coconut oil	qs
8	Jasmine oil	2%

Table 2: Proposed formulation**STANDERDIZATION/EVALUATION OF HAIR OIL:**

The formulated herbal oil was expected to be examined for parameters like Organoleptic Parameters, pH, Acid value, Saponification value, Viscosity, Specific gravity.

Organoleptic Characteristics:

In these test prepared formulation was proposed to be evaluated for sensory tests like aroma, colour, flavor, etc .

PH :

The pH of herbal hair oil was to be determined by using pH meter.

Acid value:**Preparation of 0.1M KOH solution :**

Weigh 0.56 g KOH pellets and dissolve in 100 ml of distilled water and stir continuously. Prepared 0.1M KOH solution was filled in the burette.

Preparation of sample :

Measure 10 g of oil sample and dissolve in 25 ml ethanol & 25 ml ether mixture and shake. Add 1 ml of phenolphthalein as an indicator. And titrate with 0.1M KOH solution.

- Acid value = $5.61V \cdot N / W$.
- Where, V= Volume of KOH used in ml
- N= Normality of KOH
- W= weight of sample (g).

Value of saponification:

Accurately weigh 1g of oil sample into a 250ml conical flask and 10ml of ethanol : ether mixture (2:1) was added. To this flask, 25ml of 0.5N alcoholic KOH was added. Keep the flask 30 min for reflux then cool the solution . The cooled solution is then titrated against 0.5N HCL solution. Use phenolphthalein as an indicator (a).

Similarly, blank titration is performed without taking oil sample (b). Calculate the amount of KOH in used in mg.

$$\text{Saponification value} = 28.05 \cdot (b-a) / W$$

Where,

b= ml of KOH required for blank,

a= ml of KOH required to neutralize the substance.

W= weight of sample (g).

Viscosity:

It is an index of resistance of liquid to flow, higher the viscosity of a liquid, greater is the resistance to flow.

The viscosity was determined by using Ostwald's viscometer.

Specific gravity:

Take the specific gravity bottle, rinsed it with distilled water, dry it in oven for 15 minutes, cool, close it with cap and weigh . Take this value as (a).

Now fill the same specific gravity bottle with the sample and close it with cap and again weigh it . Take this reading as (b).

Determine the weight of sample per milliliter by subtracting the weight (b-a).

RESULT AND DISCUSSION:

Herbal hair oil is one of the most recognized cosmetic used by masses to treat the Hair and dermatological disorders. It not only cures the dermatological problems but also nurture the scalp to grow healthy weavy hairs but also resolves conditions dry scalp and dry hair.It provides essential nutrients that helps in maintaining functions of sebaceous glands which improves natural hair growth.The proposed herbal hair oil was developed using ingredients mentioned above (Table 2: Proposed formulation).The following parameters were expected to be performed (Table 3: Evaluation of herbal hair oil).But due to pandemic situation we were unable to perform the experiment and evaluation .

Table 3:

Sr. No	Parameters	Results
1	Colour	Natural Green
2	Odour/aroma	Characteristics
3	pH	5.4
4	Acid value	4.4
5	Saponification value	105
6	Viscosity	30 cps
7	Specific gravity	1.110

Table 3: Evaluation of herbal hair oil.**CONCLUSION:**

The objective behind development of polyherbal hair oil was to provide an safe efficous secure alternative for the synthetic and substandard marketed products.The ingredients we proposed in the formulation of the product have been proved helpful in treating dermal problems like **.Pigmentation (fading), dandruff, falling of hairs(shedding), hairloss (alopecia) , dry hair, dry scalp** . These ingredients contains many essential nutrients which promote hair growth and treat above mentioned dermatological conditions .

With reference to this article, we were sure that the proposed formulation could be helpful in curing such dermatological conditions. But, due to ongoing pandemic we were unable to perform the experiment and standardization of the proposed formulation .We are sure that, further experimentation and evaluations over this can lead to fruitful results. In future we would like to work on the same.

REFERENCES:

1. Kashyap Rakesh, Dr. Shukla Karunakar, Dr. Mahajan SC, Mr. Sharma Alok ; Formulation and evaluation of hair oil for hair loss disorders. ISSN 2320-3862 JMPS 2016; 4(3): 13-17 © 2016 JMPS Received: 04-03-2016 ; Accepted: 31-03-2016.
2. NS Yamani, Sudha, Jyotsna, K Pratyusha, J Pratyusha and Kartheeka Formulation and evaluation of polyherbal hair oil. E-ISSN: 2278-4136 P-ISSN: 2349-8234 JPP 2018; 7(3): 3254-3256 ; Received: 23-03-2018 ; Accepted: 27-04-2018.
3. R. M. Thorat**, V. M. Jadhav*, V. J. Kadam. Development and evaluation of polyherbal formulation for hair growth promoting activity ,International Journal of PharmTech Research ; CODEN (USA): IJPRIF ISSN : 0974-4304, Vol.1, No.4, pp 1251-1254, Oct-Dec 2009.
4. PK. Jain^{1*}, D. Das², P. Jain³ , Evaluating Hair Growth Activity of Herbal Hair Oil International Journal of PharmTech Research CODEN (USA): IJPRIF, ISSN: 0974-4304, Vol.9, No.3, pp 321-327, 2016.
5. B. Ramya Kuber*, Ch. Lavanya, Ch.Naga Haritha, S. Preethi, G. Rosa; Preparation and evaluation of poly herbal hair oil ; Journal of Drug Delivery & Therapeutics. 2019; 9(1):68-73 . Received 10 Nov 2018; Review Completed 20 Dec 2018; Accepted 28 Dec 2018; Available online 15 Jan 2019.
6. Kolhe S.* , Indore P., Shewale S., Pol A., Hanmante L.; Formulation and evaluation of polyherbal hair oil for alopecia; Journal of Drug Delivery & Therapeutics. 2019; 9(2-s):387-390.
7. Hati D.^{a*}, Bhatnagar S. P.^a, Sethi Kalyan K.^{b*} ;Development and Evaluation of Polyherbal Antidandruff Hair Oil; Copyright: © 2010 Phcog.net.
8. Sabarwal Neetu*, Varghese Dhanila, Barik Rakesh, Khandelwal Anjali, Jain Ashish, Jain Sanjay; Development and Evaluation of Polyherbal Formulations for Hair Growth Activity ; © 2009 Phcog.net
9. P.Suresh Kumar^{1*}, S.Sucheta¹, A.Umamaheswari ², V.Sudarshana Deepa¹ ; In vitro and in vivo evaluation of anti-dandruff activity of formulated polyherbal hair oil. P.Suresh Kumar et al. / Journal of Pharmacy Research 2010, 3(12),2956-2958 Received on: 15-08-2010; Revised on: 18-09-2010; Accepted on:13-11-2010.
10. Amol A. Joshi, Pravin M. Dyawarkonda; Formulation and evaluation of polyherbal hair oil International Journal of Green Pharmacy Jan-Mar 2017 (Suppl) 11 (1) | S135, Received: 26-01-2017; Revised: 08-02-2017; Accepted: 18-02-2017.
11. L. Purwal, S. Prakash , B.N Gupta* and M. S. Pande[#]; Development and Evaluation of Herbal Formulations for Hair Growth ; E-Journal of Chemistry Vol. 5, No. 1, pp. 34-38, January 2008.
12. Amitkumar K. Jadhav¹, Ulhas S. Surwase², Aditya V. Thengal; Formulation and Evaluation of Polyherbal Hair Oil ; International Journal of Science and Research (IJSR) ISSN: 2319-7064 ResearchGate Impact Factor (2018): 0.28 | SJIF (2018): 7.426.
13. Khedkar Rohan*, Kolhe Shilpa S. and Dr. Jadhav S. L. ;Development of polyherbal hair oil; wjpmr,

2018,4(3), 242 - 246; Article Received on 04/01/2018; Article Revised on 25/01/2018; Article Accepted on 15/02/2018 .

14. X. Fatima Grace*, S. RahulRaj,S.Shanmughanathan,D.Chamundeeshwar;Preparation and evaluation of polyherbal hair oil; International Journal of Pharmaceutical Chemistry and Analysis .Vol.1, No.1, October 2014.
15. Banerjee Pooja S¹., Sharma Megha², Nema Rajesh Kumar*³ ; Preparation, evaluation and hair growth stimulating activity of herbal hair oil; Journal of Chemical and Pharmaceutical Research, 2009, 1(1): 261-267.
16. Md. Shahinoor Rahaman Dulal* ¹ , Hasib Sheikh ², Mohammad Abu Taher ³, Mohammad Sayeed Ur Rahaman ¹, Zakia Rahman ¹ and M.A. Malek; Formulation and finding out the efficacy of the herbal hair oil over simple coconut oil (purified) - A Formulation and clinical study in Bangladesh ; , IJPSR, 2014; Vol. 5(5): 1801-1805. ISSN: 0975-8232; P-ISSN: 2320-5148.
17. K. D. Mali*, R. M. Shroff, S. D. Chaudhari, S. S. Bacchav; . Formulation and Evaluation of Ayurvedic Herbal Oil. Indo American Journal of Pharmaceutical Research.2017:7(03). ISSN NO: 2231-6876 ; Received 30/03/2017; Available online 12/04/2017.
18. R Saxena Pal¹*, Y. Pa¹, Dr.V. Singh¹ ,Dr.P Wal², Formulation and biological evaluation of some Herbal hair nourishing Formulations; International Journal of Pharmaceutics & Drug Analysis; VOL.4 ISSUE 7, 2016; 351 – 354 ; <http://ijpda.com>; ISSN: 2348-8948 Date Received: 23rd June 2016; Date accepted: 18thJuly 2016; Date Published: 19th July 2016.
19. Chothe C. , Shaha R. ,Dakare S. ; Comparative study of formulated herbal hair oil with marketed preparation ; Asian Journal of Pharmaceutical and Development. 2018; 6(1):1-3.
20. Petchimuthu Ramya, Angelin Jenit Franklin, Maria Agnes Roganzia Sahayaraj, Abisha Gopalan, Mari Selva Sundari Raju, Vanavil B. ;Formulation and Examination of Organic Oil and Shampoo from Fish Scales; International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-9, Issue-2S2, December 2019.
21. Gautam S., Dwiwedi S* , Dubey K. and Joshi H. ; Formulation and evaluation hair oil; Int. J. Chem. Sci.: 10(1), 2012, 349-353 ISSN 0972768X,www.sadgurupublications.com.
22. K.Sudheer Kumar*, S.Gomathi*, S.Seetarm Swamy* ;Formulation and Evaluation of Poly Herbal Hair Oil- An Economical Cosmetic; International Journal Of Advanced Research In Medical & Pharmaceutical Sciences, (IJARMPS-ISSN:2455-6998) Volum1,Issue.2,March.2016.