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Formulation And Evaluation Of Herbal Hair Dye

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Abstract:

Chemical methods of hair colouring leads to environmental and health problems and is used all over the world. Present study includes use of herbal drugs like Eclipta prostrate, murraya koenigii, Emblica officinallis, Ficus benghalensis roots aerial, Aloe vera for the formulation of herbal hair colour which is natural and will minimize the side effects of chemicals like eye irritation, hair breakage, dandruff, chemical burns and sometimes cancer as well. present study aims to prepare and standardize the herbal hair dye preparation for its quality and stability aspects

Keywords

Herbal hair dye, Herbal Drugs, hair colour, quality, stability.

Introduction

Chemical hair dyes have side effects like allegic reactions, skin rashes, itching, hair loss, eye rashes, its manufacturing causes health and environmental hazards like pollution and health hazards to the labour who are involved in the manufacturing process as compared to the herbal hair dye formulation as it is obtained from the natural resourses and extracted. herbal drugs are used for healthy hair without any side effects. Nowadays many people are facing the problem of baldness, hair loss and whitening of hair due to this symptoms ageing occurs earlier.graying of the hair may be due to ageing or it may be due to hereditary problem, or use of drugs in illness.

Hair colouring or dying is art of converting the gray hairs or white hairs into its original colour

Which has been decolured by sun bleaching or ageing or other factors. In the present formulation contains goodness of natural ingredients. herbal extracts from plant sources are easily availablesafe, efficient and less expensive and has less side effects. In the present study hair dye preparation is done from the natural plant sources like Eclipta prostrate, murraya koenigii, Emblica officinallis, Ficus benghalensis roots aerial, Aloe vera, coffee, custard apple seeds powder.

2. Use of Ingredients in Formulation:

2.1. Eclipta prostrate: It is a weed branched, annual or perennial herb having white flowers obtained from the family Asteraceae.It is also called as Bringraj found in the tropical and subtropical region, it grows in the moist areas It is used in the treatment of various Gatrointestinal Infections, urinary infections, Jaundice, cough, respiratory infection, to treat wound. In the present study it is used as an natural hair coluring agent.chemical constituents present in this herb are saponins,steroids, flavonoids, thiophene derivatives,

coumestan derivatives, alkaloids, triterpene saponins.It ha santioxidant activity, antimicrobial activity, hepatoprotective activity, hair growth promoting activity, Immunomodulatory activity.

2.2. Murraya koenigii:It is also called as curry leaves is a tropical and subtropical plant belonging to the family Rutaceae, the plant is also called as Sweet Neem. It is rich source of Vitamin A, Vitamin B, vitamin C, Vitamin B2, calcium and iron. It helps in the treatment of diabetes, Blood pressure, dysentery diarrhea, morning sickness, nausea. In the present study it is used as natural hair dye.

2.3. Emblica officinalis: It is also commonly known as Amla. It belongs to the family Phyllantaceae. The fruits are a rich source of Vitamin C, it is the traditional system of medicine amla is used in treatment of variety of diseases such as anemia, diarrhea, eye inflammation, jaundice, liver complaints, cough. It has antifungal, antiviral, antioxidant, anti pyretic, analgesics, antiinfammatory, antidiarrheal activity. In the present study fruits of it is used as natural hair dye.

2.4. Ficus benghalensis roots aerial: It is obtained from the roots of Ficus benghalensis Linn family (Moraceae) It has antibacterial and hair growth promoting activity. In the present study aerial roots are used as hair dye and prevention of hair loss during the dyeing process.

2.5. Aloe vera: is a dried juice of Aloe barbadensis miller, It belongs to Liliaceae family
It has anti-oxidant and antibacterial properties, it reduces constipation,it improves skin and prevents wrinkles, it lowers blood sugar levels, it is used in wound healing. It contains Vitamin A, C and E it is used as anti oxidant in the preparation of hair dye. It contains vitamin B12 and folic acid.It contains enzymes. Minerals, sugar, lignin,saponins, salicylic acid, aminoacids.

2.6.Custard Apple seed powder:It is also called as Annona squaamosa. It belongs to the family Annonaceae.It is also called as sitafal or sharifa.
Custard apple is rich in fibres whih jelps in digestion, detoxification and prevents constipation.
It contains antioxidants like flavonoids and Vitamin C that is used in cancer and heart disease.
In the present study dried powder of seesds is used as natural hair colour and to prevent the loss of hair.

2. MATERIALS AND METHODS:

The selection of the plants was based on their availability as raw materials, scientific evidence and traditional use as natural hair dye.
In the present study for the preparation of hair dye we have selected 7 natural ingredients like Eclipta prostrate, Emblica officinallis, Ficus benghalensis roots aerial, Aloe vera, custard apple seeds powder, Lemo oil. Eclipta prostrate was collected from the farms near river, ficus Benghalencis roots aerial, Aloe vera were collected from the medicinal plant garden of PRES's Institute of Pharmacy Loni, They were authenticated for its quality in Pharmacognosy Lab of our institute. Eclipta prostrate leaves, Emblica officinalis fruits, Ficus benghalensis aerial roots, custard apple seeds were dried and size reduced into a coarse powder in Mortar and pestle , then further it was reduced to a fine powder.Aloe vera juice was extracted and powder was made in a spray dryer, Lemon oil was extracted from the lemon peels. All the ingredients were mixed together to form a fine powder a homogeneous mixture was done. Following ingredients are given in the table 1 below:

Table 1: Ingredients used in the formulation of herbal hair dye:

Sr.no	Ingredients	Quantity
1.	Eclipta prostrate,	**25 gm**
2.	murraya koenigii,	**5 gm**
3.	Emblica officinallis,	**5 gm**
4.	Ficus Benghalensis roots aerial	**6 gm**
5.	Aloe vera	**5 gm**
6.	custard apple seeds powder	**4 gm**
7	Lemon oil	**5 drops**

3.1 Application of herbal hair dye:

The powder form is mixed in water to make a paste and it is applied on wet hair. It should be applied evenly by brush on the wet hair.

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Steam distillation process was separately performed for *Ocimum sanctum* (Tulsi) leaves , 720.80 g; *Curcuma longa* (Turmeric) rhizomes , 700.00 g;*Citrus sinensis* (Sweet Orange) peels1121.1g , lemon grass, 1000gm, murraya koeiniggi 1,115.12 g using Clevenger-arm apparatus. Water was added to the weighed quantity of plant material in a round bottom flask which was placed on a heating mantle and the flask was connected with the Clevenger-arm apparatus. Flow of water was allowed to run in the condenser. While boiling, the volatile oils were carried along with the steam into the graduated distillate receiving tube and excess water returned to the flask. A layer of solvent, mixture of dichloromethane and diethyl ether (1:1 ratio), was added to the distillation arm. The essential oils dissolved in the organic solvent mixture which was in the graduated distillate receiving arm. Heating was continued for about 5 hours and assembly was allowed to cool. At last, aqueous layer and organic layer were collected separately. Then the organic layer was allowed to dry over anhydrous sodium sulphate and aqueous layer was extracted twice with dichloromethane. Finally, the combined solvents were evaporated and essential oil was obtained. Essential oil was weighed and stored in refrigerator at 4ºC until it was used for the experiment.

Essential oils of , *Eucalyptus globulus* leaves [10] , *Syzygium aromaticum* (Clove) buds[2] were purchased from market.

Preparation of the Test Solutions:

10% (v/v%) plant extract or essential oil containing ethanol solutions were prepared using each plant extract and essential oil. 0.4 ml of plant extract or essential oil was mixed with 4 drops of Tween 80. Then ethanol was added until the volume was 3 ml.

In order to prepare the control test solution, ethanol was added to 4 drops of Tween 80, until the volume was 4 ml.

Testing the Mosquito Repellent Activity of Plant Extracts/Essential Oils Using Arm-In-Cage Method:

The mosquitoes for this experiment were caught using a net while biting humans between 7 pm and 11 pm. Mosquitoes were starved for 24 hours and 20 mosquitoes were placed in the cage (45×15×30 cm). Test timing was between 7 pm and 11 pm since the mosquitoes typically bite at night. Host-seeking behaviour of the mosquitoes was tested prior to the experiment. This was done by placing a pre-cleaned hand in the cage and counting the number of mosquitoes that aligned within 10 seconds. If at least 5 mosquitoes aligned on the hand, the mosquitoes inside the cage were regarded as host-seeking and the repellency experiment was continued.

Volunteer's forearm which had been rubbed with 1 ml of the test solution was exposed to the cage and the number of mosquitoes that aligned or biting the arm was recorded in each minute for 5 minutes. Mosquitoes were given an over one hour interval and the above procedure was followed for each of the other plant extracts and essential oils. Each test was repeated thrice to get a mean value of mosquito repellent activity.

RESULTS AND DISCUSSION:

The yields of the extracts and the essential oils were determined as a percentage (w/w%) using the formula,
Percentage yield of plant extract or essential oil =
×100
Table 2 shows the percentage yields (w/w%) of the extracts and the essential oils which were obtained in the laboratory,

TABLE 1: PERCENTAGE YIELDS OF THE EXTRACTS AND THE ESSENTIAL OILS

Extracts and Essential Oils	Initial Weight of the Plant Material (g)	Weight of the Extract or Essential Oil (g)	Percentage Yield (%)
Neem extract	900.77	156.06	17.32
Tulsi essential oil	720.80	7.70	1.06
Turmeric essential oil	700.00	12.39	1.77
Sweet Orange essential oil	1121.1	15.01	1.33
Lemon grass	1000	13.5	1.35
murraya koeiniggi	1115.12	14.41	1.29

Percentage the mosquito repellency for plant extract/essential oil shown in **Table 3** was calculated as below,
Percentage mosquito repellency = ×100
Where, C= Number of mosquitoes aligned/left and aligned/bit when the solvent was used;
N= Number of mosquitoes aligned/left and aligned/bit when the extract or the essential oil was used

Table 2 indicates the number of mosquitoes which aligned/left and aligned/bit the volunteer's treated area of the arm out of 20 mosquitoes within 5 minutes of an exposure time to the mosquito cage in replicate 1.

Replicate 1				
Extracts and Essential Oils	**Exposure Time (min)**	**Number of Mosquitoes Aligned/Left**	**Number of Mosquitoes Aligned/Bit**	**Total Number of Mosquitoes Aligned/Left and Aligned/Bit**
Neem extract 10% (V/V%)	1	0	0	4
	2	1	0	
	3	0	0	
	4	1	1	
	5	0	1	
Tulsi essential oil	1	0	0	0
	2	0	0	
	3	0	0	
	4	0	0	

	5	0	0	
Turmeric essential oil	1	0	0	2
	2	1		
	3	0		
	4	0		
	5	1		
Sweet Orange essential oil	1	0	0	1
	2	0		
	3	0		
	4	1		
	5	0		
Lemon grass	1	0	0	2
	2	0		
	3	0		
	4	1		
	5	1		
murraya koeiniggi	1	0	0	1
	2	1		
	3	0		
	4	0		
	5	0		
Eucalyptus essential oil 10% (V/V%)	1	0	0	0
	2	0		
	3	0	0	
	4	0		
	5	0		
Clove bud essential oil 10% (V/V%)	1	0		0
	2	0	0	
	3	0		
	4	0		
	5	0		
Solvent (Ethanol and Tween 80)		2	0	15
			4	
		2	1	
		3	1	
		2	0	

Table 3 indicates the number of mosquitoes which aligned/left and aligned/bit the volunteer's treated area of the arm out of 20 mosquitoes within 5 minutes of an exposure time to the mosquito cage in replicate 2.

Replicate 2				
Extracts and Essential Oils	**Exposure Time (min)**	**Number of Mosquitoes Aligned/Left**	**Number of Mosquitoes Aligned/Bit**	**Total Number of Mosquitoes Aligned/Left and Aligned/Bit**
Neem extract 10% (V/V%)	1	0	0	4
	2	1	0	
	3	0	0	
	4	1	1	
	5	0	1	
Tulsi essential oil	1	0	0	0
	2	0	0	
	3	0	0	
	4	0	0	
	5	0	0	
Turmeric essential oil	1	0	0	2
	2	1		
	3	0		
	4	0		
	5	1		
Sweet Orange essential oil	1	0	0	1
	2	0		
	3	0		
	4	1		
	5	0		
Lemon grass	1	0	0	2
	2	0		
	3	0		
	4	1		
	5	1		
murraya koeiniggi	1	0	0	1
	2	1		
	3	0		
	4	0		
	5	0		
Eucalyptus essential oil 10% (V/V%)	1	0	0	1
	2	1		
	3	0		
	4	0		
	5	0		

Clove bud essential oil 10% (V/V%)	1	0	0	0
	2	0	0	
	3	0	0	
	4	0	0	
	5	0	0	
Solvent (Ethanol and Tween 80)	1	2		16
	2	3	0	
	3	2	2	
	4	3	1	
	5	2	1	

Table 4 Indicates the number of mosquitoes which aligned/left and aligned/bit the volunteer's treated area of the arm out of 20 mosquitoes within 5 minutes of an exposure time to the mosquito cage in replicate 3.

Replicate 3				
Extracts and Essential Oils	**Exposure Time (min)**	**Number of Mosquitoes Aligned/Left**	**Number of Mosquitoes Aligned/Bit**	**Total Number of Mosquitoes Aligned/Left and Aligned/Bit**
Neem extract 10% (V/V%)	1	0	0	3
	2	0	1	
	3	0	0	
	4	2	0	
	5	0	0	
Tulsi essential oil	1	0	0	0
	2	0	0	
	3	0	0	
	4	0	0	
	5	0	0	
Turmeric essential oil	1	0	0	0
	2	0		
	3	0		
	4	0		
	5	0		
Sweet Orange essential oil	1	0	0	1
	2	0		
	3	0		
	4	1		
	5	0		
Lemon grass	1	0	0	2
	2	0		
	3	0		
	4	1		
	5	1		

murraya koeiniggi	1	0	0	1
	2	1		
	3	0		
	4	0		
	5	0		
Eucalyptus essential oil 10% (V/V%)	1	0		1
	2	0		
	3	1		
	4	0		
	5	0		
		0		
Clove bud essential oil 10% (V/V%)	1	0		0
	2	0		
	3	0		
	4	0		
	5	0		
Solvent (Ethanol and Tween 80)	1	2	0	17
	2	2	4	
	3	3	1	
	4	2	1	
	5	2	0	

No skin irritations or rashes were observed on the arms of the test volunteers with extracts, essential oils . However, a hot sensation was observed on the arms of the test volunteers with Clove bud essential oil.

CONCLUSION: Plant essential oils showed higher mosquito repellent activities compared to plant extracts for outdoor and indoor field trials which were carried out for six hours each day for two days.

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