



# Plant Archives

Journal homepage: <http://www.plantarchives.org>  
DOI Url : <https://doi.org/10.51470/PLANTARCHIVES.2023.v23.no2.009>

## HIBISCUS ROSA-SCIENSIS: BOON FOR HERBAL FORMULATIONS (SOAPS AND MEDICATED OILS)

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(Date of Receiving : 06-04-2023; Date of Acceptance : 10-06-2023)

### ABSTRACT

India is a diverse country with biodiversities, deserts, forests and landfills. Therefore, India has a wide range of plants; it consists of different variety which can be edible and medicinal. Medicinal plants engage an important source for producing effective drugs used for treatment of various infectious diseases. *Hibiscus rosa-scinensis* (Fam. Malvaceae) used for various purposes which include making of drugs, cosmetics and herbal products. In this paper, formulation of herbal products such as soaps (Neem soap and Hibiscus soap) and medicated oil was prepared by using combination of some described medicinal plants which herbal benefits. Their antimicrobial and other bio-efficacies such as impact on the skin and hair growth along with physico-chemical characteristics were evaluated. On the basis of physico-chemical evaluations and biological experiments the herbal formulations are proved effective and acceptable for public domain.

**Keywords :** Therapeutic potentials, *Hibiscus rosa-scinensis*, moisture content, total alkali matter, antimicrobial potentials.

### Introduction

India is one of the seventeen mega biodiversity centers in the world that also includes four biodiversity hotspots, namely, Western Ghats-Sri Lanka, Indo-Burma, Sunderland and Himalaya. Out of 45,000 species of plants documented so far, the Botanical Survey of India (BSI) has reported at least 30,000 which are of significant use as they might have therapeutic potential (Anand *et al.*, 2021). Some of these plants are used by the local populations as herbal medicines that are beneficial against a variety of ailments. In India, a well-established and widespread practice to treat epidermal (skin) conditions is by using traditional remedies. The general availability of herbal products, their lower cost with minimal or absence of side effects develop a great market of these natural sources for treatments in skin diseases (Ekor 2013). Several traditional medicines from herbal sources have been used in India to cure skin conditions, such as acne, bruising, burn, for treating wounds, cuts, ringworm, scabies, leprosy, eczema and other skin conditions (Goyal *et al.*, 2022).

*Hibiscus rosa-sinensis* (Fam. Malvaceae) is widely grown as an ornamental plant throughout the tropical as well as subtropical regions of the world. Its flowers are large, generally red but different in other varieties. The plant has been used as a folk medicine in the orient for the cure of hematochezia, dysentery, obstruction due to wind phlegm, and vomiting of food. This plant is economically very essential owing to the herbal products and medicinal uses (Udo *et al.*, 2016). Each part of *H. rosasinensis* contains a wide range of compounds. Phlobatannins, glycosides, saponins, flavonoids, terpenoids, thiamine, riboflavin and niacin reported in whole plant. The flowers are edible supplemented with nitrogen, fibres, calcium, phosphorus, and

iron. The flower pigments reports cyanidin-3,5-diglucoside, quercetin-3,5-diglucoside along with kaempferol-3-xylosylglucoside (Patel and Adhay, 2016). Other pharmacological important flavonoids  $\beta$ -sitosterol, teraxeryl acetate, and malvalic acids were also found in stems and leaves (Jadav *et al.*, 2009).

Using mass spectrum GC-MS interpretations, it was found that methanol extracts of *Hibiscus* flowers contained components such as Ethanimidic acid, Hexadecanoic acid and Methanecarbothiolic acid (Rassem *et al.*, 2017). These components were shown to have anti-cancer, antioxidant, pesticide, hypocholesterolemic, dermatitogenic, and anemiagenic properties.

An antimicrobial is a substance that kills or inhibits the growth of microbes such as bacteria, fungi, or viruses. Plants have evolved the ability to synthesize chemical compounds to defend themselves against attack from insects, fungi and herbivorous mammals. These compounds whilst being toxic to plant predators turn out to have beneficial effects against human diseases.

*H. rosa-sinensis* were shown to have antimicrobial activities against *Pseudomonas aeruginosa*, *Escherichia coli*, *Enterobacter aerogenes*, and *Streptococcus pyogenes*. These microorganisms caused skin infection (Hemarana *et al.*, 2014). In other study antimicrobial action of cardiac glycosides, anthraquinones, and phlobatanins were observed against *Bacillus subtilis*, *E. coli* and *S. aureus* (Udo *et al.*, 2016). A pathogenic microorganisms are getting resistant to current antimicrobial agents, scientific research has continued to search for other sources of antimicrobial compounds/cosmetic products made from flowers and leaves extract that can be used as vital antibiotics components against different skin diseases.

Soap is a lubricating and cleansing agent manufactured using fatty acids, containing one of the primary constituents of sodium or potassium salts. Lye is typically a concentrated alkaline solution principally consisting of sodium and potassium hydroxide which is used in the manufacturing of soaps.

In present experiment, soaps are manufactured from herbs such as hibiscus plant flowers, mango leaves, basil leaves, rose flower, turmeric, saffron, gist of lemon with few drops of essential oils.

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, grey hair human. To overcome these, human takes many measures by applying many cosmetics for each. Hair oil is one among them used to solve almost all of these problems. Herbal cosmetics are in high demand because they improve elegance of hair and prevent hair fall. As they are synthetic chemical provide only temporary relief. Long term usage results in hair loss, costly treatment and permanent damage to hair follicles. In the present work, herbal hair oil containing herbs like curry leaves, amla powder, hibiscus flower, fenugreek, coconut oil and kalonji seeds was prepared. All these herbs have well known traditional potential in the treatment of hair care.

As in previous investigation dandruff causing fungi (*Candida albicans*, *Aspergillus niger*, *Candida parapsilosis* and *Trichophyton rubrumhese*) were effectively inhibited by *H. rosa-sinensis*, methanolic extract (Udo *et al.*, 2016). Similarly extract of *Hibiscus rosasinensis* was proven to be a good hair growth promoter in laboratory experiments with Wister albino rats. Alopecia was induced by exposure to sonic stress, and compared to synthetic hair growth promoting ointment (minoxidil), 5% hydrolcholic leaves extract ointment exhibited promising results (Pathan *et al.*, 2012; Singh *et al.*, 2012).

## Materials

### Materials required for soap preparation

#### Hibiscus (*Hibiscus rosa-sinensis* L.)

It is rich in antioxidants called anthocyanins, which fights off free radicals that help to prevent skin aging and decrease inflammation. It also has natural surfactants (called saponins) that cleanse the skin in the process. It also prevents acne, cleanses skin pores, hydrate skin well, improves and even skin tone, fights aging signs (Goyal *et al.*, 2022).

#### Rose (*Rosa rubiginosa* L.)

Antioxidants in rose prevent cell damage and help in regenerating skin tissues. They also neutralize free radicals, providing anti – aging benefits to the skin as well (Michalak *et al.*, 2022).

#### Rose water (*Rosa rubiginosa* L.)

It gently removes excess oil and other environmental impurities, and thus reduces blackheads and whiteheads. It also helps combat dark spots, acne scars, and discolorations on the skin, thus giving you a radiant appearance. Rose toner offers various benefits, including hydrating the skin, cleansing pores, and tightening the skin (Michalak *et al.*, 2022).

#### Basil (*Ocimum basilicm* L.)

Basil helps prevent acne, It also soothes and calms the skin, swelling and pain that may come with acne. Basil is an excellent agent that helps combat bacteria and inflammation. Basil protects the skin from the harmful effects of pollution, UV rays, and skin infections due to its detoxifying properties. This helps in retaining moisture while nourishing the skin (Cohen, 2016).

#### Neem (*Azadirachta indica* L.)

Neem is a medicinal plant having anti-inflammatory and healing properties. Neem leaves have Nimbin, Nimbolide, and azadirachtin to prevent skin problems like acne. Neem has antiseptic qualities that can benefit the face. Neem leaves also cure wrinkles and dry skin and gives you a healthy, glowing face (Alzohairy, 2016).

#### Mango leaves(*Mangifera indica* L.)

Mango leaves have antibacterial properties that help treat bacterial skin infections such as staph Infections and skin burns. It also helps in collagen production that may reduce the wrinkles and fine lines from the face (Tollenaere *et al.*, 2022).

#### Turmeric (*Curcuma longa* L.)

It has anti-inflammatory, antimicrobial and antioxidant properties that help to manage several skin issues like signs of aging, pigmentation, acne, etc. It is a powerful antioxidant ingredient that can reduce dark spots, blemishes and hyperpigmentation (Vaughn *et al.*, 2016).

#### Glycerin soap base

Glycerin, also known as glycerol, is a thick, transparent and non-toxic liquid that is commonly found in soaps. Glycerin is a natural by-product of the saponification process.

#### Lemon (*Citrus limon* L.)

They are high in vitamin C, which is an antioxidant and a brightening aging. They remove excess oil from your skin and reduce acne (Bertuzzi *et al.*, 2013).

The ingredients used in soap was given in table no. 1 and 2.

**Table 1 :** Ingredients quantity in leaf soap.

S. no.	Neem soap	Botanical name	Family	Quantity (in gm)
1.	Neem leaves	<i>Azadirachta indica</i> L.	Meliaceae	200
2.	Hibiscus leaves	<i>Hibiscus syriacus</i> L.	Malvaceae	200
3.	Mango leaves	<i>Mangifera indica</i>	Anacardiaceae	100
4.	basil leaves	<i>Ocimum basilicm</i>	Lamiaceae	100
5	Fresh turmeric	<i>Curcuma longa</i> L.	Zingiberaceae	20
6.	Fresh rose water	<i>Rosa rubiginosa</i>	Rosaceae	10 ml
7.	Lavender oil			Few drops
8.	Glycerin soap base			5

9. Zest of lemon 5

**Table 2 : Ingredients quantity in flower soap.**

S. no.	Hibiscus Soap	Botanical name	Family	Quantity (in gm)
1.	Hibiscus flower	<i>Hibiscus syriacus</i> L.		200
2.	Rose flower	<i>Rosa rubiginosa</i>	Rosaceae	200
3.	Turmeric	<i>Curcuma longa</i> L.	Zingiberaceae	50
4.	Rose water	<i>Rosa rubiginosa</i>	Rosaceae	20 ml
5.	Saffron	<i>Crocus sativus</i> L.	Iridaceae	4-5 strands
6.	Glycerin soap base			100

### Preparation of paste

The ingredients were washed properly to remove any impurities. After washing dip the leaves and flower petals into the water for 30 min. All the leaves with some rose water into a grinder to make a paste and also add zest of lemon. Similarly for flower soap petals of plants with rose water and turmeric was grind to form a firm paste. After the paste is prepared, strain both the mixture with big sieve.

### Soap formation

Use double boiler to melt the soap base. Once the soap base is almost melted, add the strained mixture. By adding few drops of lavender oil, a sweet fragrance is attained. Grease any plastic mold or silicon mold using Vaseline. Pour the soap mixture into the bowl and let it set for minimum 4-5 hours.

### Characterization of herbal soap

#### Physicochemical evaluation:

- Organoleptic parameters:** colour, odour and texture were evaluated manually.
- Determination of pH:** 2g of the prepared soaps were dissolved in 10ml of distilled water and stirred till dissolved completely. The pH was determined using pH meter.
- Determination of foam formation:** 2g of the soap was dissolved in 50 ml of distilled water and shaken vigorously. Dissolved sample was allowed to stand for 10 min. The height of the foam was measured. The results was taken in triplicate and the mean calculated.
- Determination of total fatty matter (TFM):** 10 g of the prepared soap were weighed dissolved to 150 ml distilled water on heating. The soaps were dissolved in 15% Sulphuric acid (20 ml) till clear solution. Fatty acids on the surface of the resulting solution was solidified on addition of 7g bee wax. The above mixture was allowed to cool to form cake.

$$\text{Total fatty matter (in \%)} = (A - X)/W \times 100$$

(Where; A= weight of wax+ oil, X= weight of wax, W= weight of soap)

- Determination of moisture content:** 10g of the soap was weighed and transferred to a petri plate of known weight and kept in a hot air oven (100 – 105°C for 1 hr). It was then compared with control petriplate.  
Moisture content = (Difference in weight/initial weight) x 100
- Total Alkali:** 1 gram of the prepared soap was weighed added to 5ml of ethanol. To the prepared mixture, 1M H<sub>2</sub>SO<sub>4</sub> solution (0.5 ml) was added and heated until the soap sample dissolved completely. The test solution was

titrated against 1.0M NaOH using phenolphthalein indicator.

$$\% \text{ Alkali} = [(VA-VB)/W] \times 3.1$$

(Where; VA= volume of acid, VB= volume of base, W= weight of soap)

### Results

**Table 3:** Physico-chemical characteristics of herbal soap with compared to market soap.

Parameters	Neem Soap	Hibiscus Soap	Market soap
Color	Dark brown	Dark pink	Green
Odor	Pleasant smell	Fruity smell	Lavender smell
pH	9.08	8.4	9.28
Foaming index	8 cm	10 cm	20 cm
Moisture content	25.2%	25.5%	20.23%
Total fatty matter	34%	37.5%	36.7%
Total Alkali matter	0.03%	0.01%	0.99%

\*Control-Cinthol soap purchased from local market.

The pH of the herbal soaps prepared were found to be 8~9, which lies between the normal pH range 8-10 as reported by National Agency for food and Drug administration and Control (NAFDAC). The obtained pH value is similar to that of control soap.

The foaming index of the prepared herbal soap were 8 cm and 10 cm which is low to control (20 cm). Foam formation determine cleansing ability of a soap and it is found to be satisfactory for commercial usage. Total Fatty Matter (TFM) indicate the amount of fat substance the soap has, the more it has better the quality of the soap. The Total Fatty Matter of the prepared herbal soaps were 34% and 37.8% respectively, closer to 36.7% reported for market purchased.

Higher concentration of fatty acids has good effects on the skin in the sense of rehydration and overall enhanced cleansing properties. Moisture content is a shelf life of a product, high moisture content lead excess of water retention and hydrolysis of soap on storage. Moisture content of the soap is 25.2 % and 25.5 % respectively compared to standard and control (20.23%). This might be due to the difference in soap preparation methods. The alkali content of the soap was found to be 0.03% and 0.01% which is lower than 0.99% as shown by control. Lower the alkali content lower the corrosiveness to the skin.

### Antimicrobial activity

**Disc Diffusion method** was used to evaluate the antimicrobial property of prepared soaps. Kenamycin was used as standard positive control. The zone of inhibition of

kanamycin was found to be 27 mm in case of *E. coli* and 30 mm in case *S. aureus*. The antibacterial activity of the plant based

**Table 4 :** Antimicrobial activity of Soap with compared to standard antibiotics.

Organism	Zone of inhibition (mm) of soap						
	(Kenamycin 200 mcg)	Neem (100 mg)	Hibiscus (100 mg)	Neem (200 mg)	Hibiscus (200 mg)	Neem (300 mg)	Hibiscus (300 mg)
<i>E. coli</i>	27 mm	12.00 ± 0.00	11.33 ± 0.33	14.00±0.81	16.00±0.00	21.00±0.57	23.00±0.00
<i>S. aureus</i>	30 mm	14.00± 0.57	12.33±0.32	13.66±0.32	15.33±0.32	21.33±0.66	19.33±2.02

Results were performed in triplicate expressed in ± SE

#### Materials required for oil preparation

**Table 5:** List of ingredients and quantity used in herbal oil preparation.

S.No.	Botanical name	Genus	family	Parts used	Quantity (in gm)
1	Hibiscus	<i>Hibiscus rosa-sinensis</i> L	Malvaceae	Flower	200
2	Amla powder	<i>Phyllanthus emblica</i> L.	Phyllanthus	Fruit	100
3	Kalonji seeds	<i>Nigella sativa</i> L.	Ranunculaceae	Seeds	50
4	Fenugreek seeds	<i>Trigonella foenum-graecum</i> L.	Fabaceae	Seeds	50
5	Curry leaves	<i>Murraya koenigii</i> L.	Rutaceae	Leaves	100
6	Coconut oil	<i>Cocos nucifera</i> L.	Arecaceae	Oil	400 ml

#### Benefits of herbs used:

##### Hibiscus (*Hibiscus rosa-sinensis* L):

Stop hair loss. Make hair look healthy and prevent premature graying. Thicken hair and add volume. Treat dandruff (Adhirajan *et al.*, 2003).

##### Anola (*Phyllanthus emblica* L.)

Conditions scalp. Promotes healthy hair growth. Prevent premature graying of hairs. Boost hair volume. Reduce dandruff (Yu *et al.*, 2017).

##### Curry leaves (*Murraya koenigii* L.)

Curry leaves contain vitamin C, D, proteins and antioxidants which contribute to cellular regeneration and promotes healthy circulation to the blood vessels in the scalp. It prevents premature graying. Controls hair loss. Add shine to the hairs. Aids in the growth of hairs (Mankar *et al.*, 2021).

##### Onion seeds (*Nigella sativa* L.)

Onion seeds or kalonji make the hair healthy and shiny. It has anti-fungal properties that keep infections away, and also reduce the chances of scalp diseases which cause hair fall. Onion seeds are rich in essential oils which nourish the hair and help it grow (Sharquie and Obaidi, 2002).

##### Fenugreek seeds (*Trigonella foenum-graecum* L.)

Prevents Hair Loss. Fenugreek contains lecithin, which acts as a natural emollient that conditions and moisturizes your scalp and hair deeply. Revives Damaged Hair. Fights Dandruff. Controls Scalp Inflammation. Adds Shine And Soft Texture. Prevents Premature Grey Hair (Medizin *et al.*, 2006).

##### Coconut oil (*Cocos nucifera* L.)

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. Prevent hair loss. Restores dry hair and scalp. Gets rid of dandruff (Vala and Kaadiya, 2014).

#### Preparation of extract

Fresh flowers of hibiscus were collected from university of Kota in the month of December 2022. They

were washed properly to remove dust and other pollutants and were dried using hot air oven for 5 hours. After the drying process, the samples were powdered using mortar and pestle and transferred into the extraction unit. The resulting dried and powdered sample was subjected to extraction under preheated 70°C ethyl acetate. The extract was collected after 6 hrs. The final product was purified using whatmann filter paper.

#### Preparation of oil

Different ingredients used are presented in table no 5. Precisely all the dried and fresh herbs such hibiscus extract, anola powder, fenugreek seeds, *Nigella sativa* seeds and curry leaves were weighed and mixed in 400 ml of coconut oil. The above content was boiled until the concentration of oil reduces to 1/4<sup>th</sup>. The oil was kept in an iron pot and left for a night. Then it was filtered using muslin cloth.

#### Evaluation of Herbal Hair Oil Preparation

##### a) Physical Appearance

The characters like color and odor were monitored manually.

##### b) pH Test

The pH meter was calibrated with buffer solutions of pH 4-7. The results were obtained using pH meter (digital) bathed in hair oil for a few minutes until the reading stabilize (Gousia Begum *et al.*, 2017).

##### c) Saponification Value

In 250 mL conical flask, 1 mL of oil was measured, to the sample solution 10 mL of ethanol: ether (2: 1) was added. To the reaction mixture 25 mL of alcoholic KOH (0.5 N) was added. After 30 minutes phenolphthalein indicator was added and titrated against HCl (0.5 N). The blank titration was carried out against control sample. The amount of KOH used in mg was calculated (Joshi and Dyawarkonda, 2017).

##### d) Phytochemical Screening of Herbal Hair Oil Preparation

Using standard procedure, the herbal oil was subjected to sulphur, ascorbic acid, and saponins quantification (Joshi and Dyawarkonda, 2017).

### Ascorbic Acid Test

In oil sample 1 drop of freshly prepared sodium nitroprusside solution (5 percent w/v), sodium hydroxide solution (2 ml), 2 percent w/v oil sample (1 ml) was added to 5ml of water. 0.6ml of hydrochloric acid was added to drop by drop in the reaction mixture and results were calculated (Gousia Begum *et al.*, 2017).

### Sulphur Test

On the test paper, a drop of hydrogen peroxide was placed. On exposure to fumes, the paper turns brown (Kuber *et al.*, 2017).

### Saponin Test

Oil and water was mixed and stable froth was observed on shaking (Kuber *et al.*, 2019).

### Specific Gravity

Specific gravity bottle was taken, dried in the oven for 15 minutes, cooled, and then weighed (a). Herbal hair oil was filled in the given bottle, closed, and weighed again (b).

$$\text{Specific gravity} = (b-a)$$

Weight of the sample was given per millilitre (Yamani *et al.*, 2018).

### Anti-microbial Evaluation by Disc diffusion method

The zone of inhibition approach was used to investigate the antifungal activity of herbal hair oil that was diffusion dependent. The plate was incubated for two days at 37°C. The inhibitory zone was measured (Suresh Kumar, 2010)

### Primary Skin Irritation Test

A basic skin irritation test was performed on shaved undamaged skin of rat with a small amount of the produced herbal hair oil. For 3 to 4 hours, the test site was monitored for erythema and edema (Yamani *et al.*, 2018).

### Stability Studies

The herbal hair oil was kept in the bottle at room temperature for stability study (Kuber *et al.*, 2019).

The above-mentioned substances were used to make the herbal hair oil, which was then tested qualitatively.

### Evaluation of Herbal Hair Oil

Formulated herbal hair oil was reddish brown in color with a transparent appearance, on application, it was smooth. The pH of medicated herbal hair oil was 8.6, which was suitable for hair implication. The viscosity of herbal hair oil was determined to be 26 cps (Table 6).

**Table 6 : Evaluation parameters of herbal hair oil.**

Parameters	Results
Physical appearance	Reddish brown
Odour	Pleasant
pH	6.8
Viscosity (cps)	30
Saponification value	24.32
Skin irritation test	No irritation
Specific gravity	0.83

The value is expressed as mean, n=3.

**Table 7: Antifungal activity of oil with compared to standard antibiotics.**

Organism	Zone of inhibition (mm) of soap			
	(Flucanazole 200 mcg)	Neem (100 mg)	Neem (200 mg)	Coconut oil (100 mg)
<i>C. albicans</i>	27 mm	20.00 ±0.00	22.00±0.00	18.00±0.57

Results were performed in triplicate expressed in ± SE

### Phytochemical Screening

Herbal hair oil contains ascorbic acid, sulphur, and saponins, according to phytochemical analysis (Table 7). Because of its powerful antioxidant action and nutritional importance, ascorbic acid is one of the most commonly used natural antioxidants. Along with antioxidant potential, it has therapeutic properties also. It is a water-soluble vitamin that is easily absorbed and not stored in the body. Vitamin C is helpful in the preservation of collagen, making one-third of the total protein in the body. It also prevent oxidative degradation of the oils.

Sulphur is commonly referred to as one of the building blocks of hair. Sulfur is key aliment needed for proteins (like keratin) to keep their structure, which helps maintain hair's overall health and strengthens, alleviation, and prevention of psoriasis, dandruff, eczema, and folliculitis. Saponins are natural surfactants provides body and gloss to hair, making it feel fuller, silkier, and smoother.

**Table 8 : Phytochemical evaluation of herbal hair oil.**

Tests	Observations	Results*
Ascorbic acid test	Color change from yellow to blue	+
Sulphur test	Appearance of brown color	+
Saponin test	Appearance of foam	+

\*The value is expressed as mean ±SD, n=3.

Soaps have the plant materials which contain various properties act as anti-inflammatory, anti-bacterial and anti-fungal. Described soaps prevent skin problems like dryness, infections and problems caused by fungus and bacteria. Soaps removes dirt and sweat from your body, have therapeutic, healing, moisturizing and nourishment characteristics.

Herbal oil is reddish brown in color with smooth texture. This herbal hair oil provide moisturizer and nourish dry and frizzy hair. It supplemented with various vital nutrients that helps in natural hair growth reduces premature graying of hairs. The hibiscus present in this oil has antifungal activity which helps in preventing dandruff problems. There is no sensitivity and irritation effect of this oil. This herbal oil is the best remedy to treat various types of hair issues and has promising effect on hairs with no negative side effects. The ingredients added have many advantages, this oil will help in maintaining good growth of hair, turning hair grey to black, protects from dandruff and results in lustrous looking hair.

### Conclusion

There are many ongoing studies to discover plants that can act as medicine and use in cosmetic products. As *Hibiscus rosa-sinensis* leaves have been used in healing processes due to their antioxidant, anti tyrosinase, and anti-bacterial activities. It's usage as traditional medicine is, however, still limited and warrants further studies. Allopathic drugs are widely used to cure hair loss and skin diseases, but

fear of side effects cannot be ignored. The high treatment cost is also a big dealing issue regarding their wide applications. Herbal remedy to cure skin infections disease should be incorporated into the mainstream of medical care system but due to limited scientific experimentation evidences, not widely accepted in public domain. Hence, it is believed that above discussed experiment on Hibiscus herbal products provides an alternative option to promote plant based traditional practices. Because of insufficient current pharmacological information, there is not much scientific research or clinical trials conducted on the chemical extracts of *Hibiscus rosa-sinensis* that could be crucial in exploring its fast potential medicinal applications.

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