PHYTOCHEMICAL SCREENING OF SELECTED PLANT SPECIES RELATED TO COSMETICS

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ABSTRACT

The use of plant extracts in cosmetic formulation is increasing, mostly because of the poor image that animal-derived extracts have acquired during the past few years. Herbal 'total extracts' as well as 'selective extracts' are been used in cosmetics. There are a rising number of consumers concerned about ingredients such as synthetic chemicals, mineral oils who demand more natural products with traceable and more natural ingredients, free from harmful chemicals Present study deals with the phytochemical screening of the 5 selected plants which are regularly used as cosmetics traditionally viz. *Cyperus rotundus* Linn., *Curcuma zedoaria* Rosc., *Cajanus cajan* (L.) Millsp., *Myristica beddomei* Linn., *Mesua ferrea* L.

Key Words: Cosmetic formulation, natural products, *Cyperus, Curcuma, Cajanus, Myristica, Mesua,* etc.

INTRODUCTION:

Cosmetics are substances or products used to enhance or alter the appearance or fragrance of the body. Many cosmetics are designed for use of applying to the face and hair. They are generally mixtures of chemical compounds; some being derived from natural sources (such as coconut oil), and some being synthetics (Günther, 2005). Cosmetics are intended to be applied externally. They include but are not limited to products that can be applied to the face: skin-care creams, lipsticks, eye and facial makeup and colored contact lenses; to the body: deodorants, lotions, powders, perfumes, baby products, bath oils, bubble baths, bath salts, and body butters; to the hands/nails: fingernail and toe nail polish, and hand sanitizer; to the hair: permanent chemicals, hair colors, hair sprays, and gels. Handmade and certified organic products are becoming more main stream, due to the fact that certain chemicals in some skincare products may be harmful if absorbed through the skin. Products claimed to be organic should, in the U.S., be certified "USDA Organic (Singer, 2007).

The use of plant extracts in cosmetic formulation is increasing, mostly because of the poor image that animal-derived extracts have acquired during the past few years. This is due, in part, to news reports regarding bovine spongiform encephalitis (BSE). Some animal derived products need to be replaced, but synthetic chemicals cannot always do this well. Natural molecules derived from plant extracts offer a particularly exciting avenue for further research. Plant extracts, however, are often ill-defined as to the method of extraction, plant-to-solvent ratio and the content of active ingredients. Moreover, the stability of the colour, odour, transparency and/or active ingredients with time is also often a limiting factor. Plant extracts are different in several respects from purified therapeutic agents. Firstly, they are more dilute than the pure chemicals that are familiar to us; secondly herbs often contain additional active principles that may be closely related both chemically and therapeutically to the constituent primarily responsible for its effects (Dweck, 1996).

Herbal 'total extracts' as well as 'selective extracts' are used in cosmetics. Total extracts are applied mainly according to the historical tradition of their use. On the other hand selective extracts are employed more by reason of investigation into their specific activity. Some selective extracts are introduced for different areas of use: licorice for skin irritations; ginkgo as a free radical scavenger; bearberry for skin lightening (complexion); walnut for skin tanning; and wheat germ for stimulating cell proliferation (Marks, 1997).

Herbal cosmetics are natural and free from all the harmful synthetic chemicals which otherwise may prove to be toxic to the skin. Instead of traditional synthetic products different plant parts and plant extracts are used in these products, e.g. aloe-vera gel and coconut oil. They also consist of natural nutrients like Vitamin E that keeps skin healthy, glowing and beautiful. For example, Aloe vera is an herbal plant species belonging to Liliaceae family and is naturally and easily available (Akinyele and Odiyi, 2007). There are a rising number of consumers concerned about ingredients such as synthetic chemicals, mineral oils who demand more natural products with traceable and more natural ingredients, free from harmful chemicals and with an emphasis on the properties of botanicals (Escamilla et al., 2012). Present study deals with the phytochemical screening of the 5 selected plants which are regularly as cosmetics traditionally viz. *Cyperus rotundus* Linn., *Curcuma zedoaria* Rosc., *Cajanus cajan* (L.) Millsp., *Myristica beddomei* Linn., *Mesua ferrea* L.

MATERIALS AND METHODS

For the investigation of cosmetic plants. The selected plants collected from various location of Akola district. The collected plants are dried and herbarium specimens are prepared. These plants are identification by using floras like Flora of Maharashtra State volume I and II and Flora of Marathawada, Naik (1989). The different plants parts are used in treatment of skin diseases the parts are separated derived and line powder is prepared by using mixture grinder. Later on time powder is used for various types of secondary metabolites test / phytochemical resent in various parts of plants.

The five plants are selected for the study are *Cyperus rotundus* Linn., *Curcuma zedoaria* Rosc., *Cajanus cajan* (L.) Millsp., *Myristica beddomei* Linn., *Mesua ferrea* L.

Preliminary phytochemical screening

It involves testing of different classes of compounds. The methods used for detection of various Phytochemical were followed by quantitative chemical test to give general idea regarding the nature of constituents resent in crude drug.

Test of sterols: Salkowski test- few drops of concentrate sulphuric acid was added to the chloroform solution, shaken and allow to stand, appearance of red color in lower layer indicate the presence of sterols.

Test for Tri terpenes: Salkowski test-few drops of concentrate sulphuric acid was added to the chloroform solution, shaken and allow to stand, appearance of red color in lower layer indicate the presence of tri- terpenes.

Test for saponin: Foam test- small amount of extract fraction was shaken with little quantity of water, if foam produced for 10 minute, it indicate the presence of saponin.

Test for glycosides: Kellar Killiani test-the test extract was dissolve in glacial acetic acid and after cooling, 2 drops of ferric chloride solution was added. These content were transferred to test tube containing 2 ml of sulphuric acid. A raddish brown color ring observe at the junction of two layer.

Test for alkaloids: Mayer's test- (Potassium Mercuric Iodide Solution) the acid layer was treated with few drops of Mayer's reagent. Formation of creamy white precipitate indicate the presence of alkaloids.

Test for carbohydrate: Molisch test- the extract was treated with Molisch's reagent with concentrated sulphuric acid was added from the side of test tube to form a layer. A radish violet ring shows the presence of carbohydrate.

Test for tannin: Ferric chloride test- to extract a few drops of 1% neutral ferric chloride solution was added, formation of blackish blue color indicate the presence of tannin

Test for flavonoids: Lead acetate test- to the extract, few drops of aqueous basic lead acetate solution were added. Formation of yellow precipitate indicate the presence of flavonoids

Test for amino acid and proteins: Millon's test- mixed the extract with million's reagent. Formation of brick red precipitate indicate the presence of protein

Test for Coumarin: 1 gm powdered drug kept with water in test tube, covered with paper soaked in NaOH and diluted and boiled. Yellow flurescence indicate the presence of caumarin.

Test for anthocyanin and betacyanin: 1 ml of leaf extract was added to 1 ml of 2N sodium hydro-oxide and heated for 5 min. at higher temperatures. Formation of bluish green color indicates the presence of anthocyanin and yellow color indicates the presence of betacyanin.

Test for Anthraquinone: To 3 ml of extract, dil. H_2SO_4 was added. The solution was then boiled and filtered. The filtrate was cooled and to it equal volume of benzene was added. The solution was shaken well and the organic layer was separated. Equal volume of dilute Ammonia solution was added to the organic layer. The Ammonia layer turns pink showing the presence of Anthraquinone.

OBSERVATION AND RESULTS

Phytochemical analysis: Preliminary phytochemistry was done according to Harborne (1973), Sofowora (2000) and Krishnaiah (2009). The chemical composition was tested only in the shade dried plant materials. The results obtained are put up in the table below.

Table No. 1: Phytochemical Qualitative test for the selected plants.

Sr. No.	Tests	*C. rotundus* Linn.		*C. zedoaria* Rosc.		*C. cajan* (L.) Millsp.		*M. beddomei* Linn.		*M. ferrea* Linn.	
		EtOH	D.W	EtOH	D.W	EtOH	D.W	EtOH	D.W	EtOH	D.W
1	Sterols	+	-	+	+	-	-	+	+	+	+
2	Terpenoids	-	+	-	-	-	-	-	-	-	-
3	Saponins	-	-	+	-	+	+	-	-	+	+
4	Glycosides	+	+	+	+	+	-	+	+	+	-
5	Alkaloids	+	-	-	-	-	-	+	+	+	+
6	Carbohydrates	+	+	+	+	+	+	-	-	+	+
7	Tannin & Phenolics	+	+	-	-	-	+	+	+	+	-
8	Flavonoids	-	-	+	-	+	+	+	+	-	+
9	Protein & amino acids	+	+	+	-	+	-	+	-	-	-
10	Coumarins	-	-	-	-	-	-	-	-	-	-
11	Anthocyanin	-	-	-	-	-	-	-	-	-	-
12	Betacyanin	+	+	-	-	-	-	-	-	-	+
13	Anthraquinone	-	-	-	-	-	-	-	-	-	-

*EtOH- Ethanol; D.W=Distilled water

DISCUSSION

The preliminary phytochemical studies were carried out in the solvents viz. Ethanol and Distilled water. In ethanol solvent of plant *Cyperus rotundus* Linn., when the extract were studied the test were positive for sterols, glycosides, alkaloids, carbohydrates, tannins and phenols, betacyanin, amino acids and proteins. whereas, negative for terpenoids, saponins, flavonoids, coumarins, anthocyanin, and anthraquinones. In aqueous solvent of plant *Cyperus rotundus* Linn., when the extract were studied the test were positive for terpenoids, glycosides, carbohydrates, tannins and phenols, amino acid and protein, betacyanin. whereas, negative for sterols, saponins, alkaloids, flavonoids, coumarins, anthocyanin, and anthraquinines.

In ethanol solvent of plant *Curcuma zedoaria* Rosc., when the extract were studied the test were positive for sterols, saponins, glycosides, carbohydrates, flavonoids, amino acids and proteins. whereas, negative for, tannins, phenols, terpenoids, alkaloids, coumarins, anthocyanin, betacyanin and anthraquinones. In aqueous solvent of plant *Curcuma zedoaria* Rosc.when the extract were studied the test were positive for sterols, glycosides, carbohydrates. whereas, negative for terpenoids, saponins, alkaloids, tannins, phenols, flavonoids, amino acids and protein, coumarins, anthocyanin, betacyanin and anthraquinones.

In ethanol solvent of plant *Cajanus cajan* (L.) Millsp., when the extract were studied the test were positive for saponins, glycosides, carbohydrates, flavonoids, amino acids and proteins. whereas, negative for sterols, alkaloids, terpenoids, saponins, tannins, phenols, coumarins, anthocyanin, betacyanin and anthraquinines. In aqueous solvent of plant *Cajanus cajan* (L.) Millsp. when the extract were studied the test were positive for

saponins, carbohydrates, flavonoids, tannins, phenols. amino acids and proteins whereas, negative for sterols, terpenoids, glycosides, alkaloids, amino acids and proteins coumarins, anthocyanin, betacyanin and anthraquinones.

In ethanol solvent *Myristica beddomei* Linn., when the extract were studied the test were positive for sterols, alkaloids, glycosides, tannins, phenols, flavonoids, amino acids and proteins. whereas, negative for, terpenoids, saponins, carbohydrates, coumarins, anthocyanin, betacyanin and anthraquinones. In aqueous solvent of plant *Myristica beddomei* Linn., when the extract were studied the test were positive for sterols, glycosides, alkaloids, tannins, phenolics, flavonoids. whereas, negative for saponins, terpenoids, carbohydrates, amino acids and proteins coumarins, anthocyanin, betacyanin and anthraquinones.

In ethanol solvent of plant *Mesua ferrea* L., when the extract were studied the test were positive for sterols, saponins, glycosides, alkaloids, carbohydrates, tannins and phenols, betacynin. whereas, negative for terpenoids, flavonoids, amino acids and proteins, coumarins, anthocyanin, and anthraquinones. In aqueous solvent of plant *Mesua ferrea* L., when the extract were studied the test were positive for sterols, saponins, alkaloids, flavonoids, and carbohydrates, whereas, negative for terpenoids, glycosides amino acids and proteins, tannins and phenols, coumarins, anthocyanin, betacyanin and anthraquinones.

CONCLUSION

Natural ingredients are everywhere and are continually gaining popularity, and the use of plant extracts in cosmetic formulation is on the rise. A cosmetic formulation including active principles of natural origin can protect the skin against exogenous or endogenous harmful agents, and help to remedy many skin conditions. In addition, natural products can be used in hair care, and as hair colorants or dyes. Aromatic plants and oils have been used for thousands of years, as incense, perfumes, cosmetics, and for their medicinal and culinary applications. Essential oils impart many benefits, such as a pleasant aroma, especially in perfumes and to impart shine or conditioning in a hair care product, and for improving the elasticity of the skin. In the future, it is possible that many new plants, extracts and oils of commercial significance will be identified, and many ethnobotanical uses and claims of many widespread herbs will be proven, new isolation and extraction techniques will be shown to give higher quality products. But this requires the multidisciplinary cooperation of botanists, preparative chemists, analytical chemists, toxicologists and biologists to assess cosmetic, rather than just pharmaceutical, activity.

Herbal cosmetics are prepared, using permissible cosmetic ingredients to form the base in which one or more herbal ingredients are used to treat different skin ailments and for the beautification. The chemical formulation of all these cosmetic products includes addition of various natural additives like waxes, oils natural color, natural fragrances and parts of plants like leaves, etc. The cosmeceuticals are agents that lie somewhere between pure cosmetics (lipstick and rouge) and pure drug (antibiotics, corticosteroids) methods. The cosmetic products are the best option to reduce skin problems such as hyper pigmentation, skin wrinkling, skin aging and rough skin texture etc. The demand of herbal cosmetic is rapidly expanding. The advantages of herbal cosmetics are lower cost, side effects free, environmental friendly, safe to use etc. Also has a great future ahead as compared to the synthetic cosmetics. Proper regulation of these herbs and standardization will lead to tremendous and significant growth in herbal cosmetics field.

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