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NATURAL COLOUR ADDETTIVES PREMITTED FOR USE IN COSMETICS

(The world of colours in cosmetics)

Shalaka Shet, Shivani Bhalekar, Rushikesh Shinde, Anisha Kanthale, Sharad Ujagire

Student, Student, Student, Student, Student

"IIPER, College of pharmacy ,Talegaon Dabhade ,410507"

Indrayani Vidya Mandir, Pune, INDIA

ABSTRACT: Colourants widely used in food, pharmaceutical, textile and cosmetic industry to improve customer acceptance. The hazardous effect of synthetic colour on skin now a days minimises their application thus, natural colours (pigments) is in trend. Now a days plant pigments widely used as substitutes for chemical (synthetic) colourant. Not only because of their high availability as colouring agent, but they exhibit effect of health-promoting values such as antioxidants and antimicrobial activity. In 20th generation people aware about the potency of natural colours and their value in cosmetics so their was huge demanding market for natural colour cosmetics in market. This review focuses on the natural colours from plant sources, production method/technologies and uses of natural colours especially extracted from plant sources.

Index Terms - Premitted, Antioxidants, Pigments.

INTRODUCTION:

Nature It's always best over artificial, from the start of this world as nature was the only best option for person then to minimises their risks and now with advantageous feature of naturally obtain substances over synthetics giving them priority. Colour has always played an significant role within the formation of various cultures of person everywhere the planet . It can affects an every moment of our lives, strongly influencing the clothes we wear. In the past, many painters had used natural dyes extracted from plants, insects, molluscs and minerals for their paintings. It is a varnishes and lacquers liable for cohesion of the pigments and protection of the layers destroyed by environmental effects. Natural dyes were also used in a textile, as well as in cosmetic industry (Henna, Catechu), pharmaceutical industry (Saffron, Rhubarb) and in food industry (Annatto, Curcumin and an Cochineal).

Colours are an important in our daily life as they offer us the suspicion of fruits, foods, fabric and even medicines; and impact on people's choice. Colorant can be categorized into three types as follows :

- 1.Natural
- 2.Synthetic and
- 3.Inorganic colours

The natural colours are naturally supplied by living organisms such as plants, animals and microorganisms.

Synthetic colours are manufactured in laboratories and cannot be established in nature. The organic compounds used for this type of colorant can be acquired by chemical synthesis. Inorganic colours refer to minerals such as gold, silver and titanium dioxide; and can be found in nature or obtained by synthesis.

Growth in the natural products industry has led to great attentiveness in natural ingredients. While the FDA does not have a legal precision for the term "Natural" when it comes to Colorants, it is commonly recognized that colorants Not Subject to Batch Certification that are derived from fruits, vegetables, plants and spices are considered as Natural. IFC Solutions provide a full line of FDA-accepted Natural Colorants for use in cosmetic and personal care products.

METHODOLOGY:

[A] Natural color Pigments used in cosmetics :-

[1] MICROBIAL PIGMENTS:

Microbes are the major source of producing natural coloured pigments. Some microorganisms produced coloured pigments which can be used in cosmetics and other industry. These microbial pigments are fixed to light and heat. Microorganisms are commonly found in the environment which can be grown easily in the suitable environment to obtain natural coloured pigments. Microorganisms like fungi, bacteria and algae produce a variety of coloured pigments which has various properties like anticancer property.

Examples-

- 1) Zeaxanthin is a pigment responsible for yellow and golden yellow colours which is produced by both *Staphylococcus aureus* and *Flavobacterium sp.*
- 2) Prodigiosin is a microbial pigment which is responsible for red colour is produced by *Serratia marcescens*
- 3) Pyocyanin Blue is a microbial pigment responsible for green colour is produced by *Pseudomonas aeruginosa*.

[2] ANIMAL PIGMENTS:

Animals also produce pigments. Animal pigments are produced to protect the animal from the predators, it serves as warning coloration. The animal pigments are sometimes generated to attract their mates. The best example for animal pigment is the melanin.

Example-1) Melanin is responsible for the color of hairs, skin and fur of the animals.

2) Cochineal beetle which is present in the prickly pear plant is responsible for the production of red color used in lipsticks and rarely in eye shadow.

[3] PLANT PIGMENTS:

Plants produce lot of secondary metabolites which are known as phytochemicals. These phytochemicals are not essential for the growth and development of the plant. The phytochemicals have medicinal property which tends them to be used in pharmaceutical industry. Phytochemicals also possess different attractive colors and flavors which tends them to be used in the cosmetics and food industry.

Example- Major classes of plant pigments include-

1) **Anthocyanins:** Purple colour-Anthocyanins possess antidiabetic, anticancer, anti-inflammatory, antimicrobial, and anti-obesity effects, as well as prevention of cardiovascular diseases.

2) **Carotenoids:** Yellow, orange, or red-decreasing the risk of disease, eye diseases.

Other are Betalains, Flavones, Chlorophylls, Lycopene etc

(a) **CAROTENOIDS:** Carotenoids are responsible for the various colors such as orange, yellow and red. Carotenoids are mostly lipid secondary metabolites. There are approximately more than 700 carotenoids available. Carotenoids are also responsible for the vitamin A content in some of the vegetables and fruits like carrot. They are responsible

for colours in cheese and some grains. These carotenoids are found in annatto seeds, saffron, carrot, tomato, pumpkins, corns and marigold.

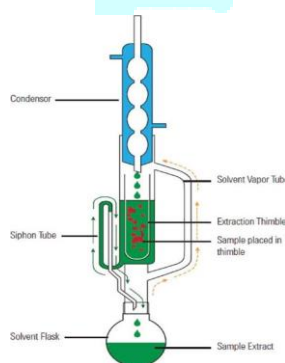
(b) BETALAINS: Betalains are phytochemicals responsible for red and purple colors. These betalains are found in cactus, beetroot and amaranths etc., These pigments are water soluble pigments. They are not stable to heat. The food items containing these pigments are kept in low level of light, oxygen and humidity. When compared to an anthocyanin betalains are more stable. Betalains possess a major advantage that is highly stable in different pH.

B) Soxhlet and Sub critical water extraction apparatus in detail:

(1) Soxhlet Apparatus:

(a) Principle: The fat extractor uses the solvent reflux and siphon principle to consistently extract the solid matter by pure solvent, which saves the solvent extraction efficiency and high efficiency. The solid material is ground previous to extraction to rise the area of solid-liquid contact. The solid material is then set down in a filter paper holder and set down in an extractor. The bottom end of the extractor is attached to a round bottom flask containing a solvent, and is attached to a reflux condenser. The bottom flask is heated to boil the solvent, the vapour rises through the branch pipe of extractor, is condensed and drops into the extractor, and the solvent is contacted with the solid for extraction. When the solvent surface excel the highest point of the siphon, the solvent carrying the extract is siphoned back. The flask, thus extracting a portion of the material, is repeated such that the solid material is consistently taken as a pure solvent and the extracted material is concentrated in the flask.

b) Diagram:



(c) Conclusion: It was therefore concluded that natural yellow dyes can be extracted by using a mixture of alcohol and distilled water. The powdered roots were extracted with n -hexane in soxhlet apparatus upto the colour of the decoction became very light.

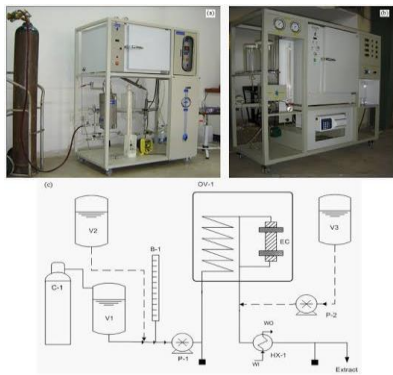
(2) Sub critical water extraction:

(a) Principle:

Subcritical water is liquid water below pressure at temperatures above normal boiling point, 100 °C (212 °F). ... The extraction is normally processed at temperatures from 120 °C to 160 °C with enough pressure (10-20 bar) to maintain the water in liquid state.

(b) Diagram:













(c) Conclusion: The results obtained in this study demonstrate that SWE is a highly efficient and rapid method for extracting bioactive compounds such as phenolics and flavonoids.













C) Table with name and extracted colours:

Sr No	Object	Pictures	Colour Extract
1	ACAI		Purple(Extract), Green(Oil)
2	ALKANET		Red / Purple
3	ANNATTO		Orange / Red
4	AVOCADO		Green / Yellow
5	BEETROOT		Red / Pink
6	BLUE TANSY		Blue
7	BURITI		Red / Orange

8	BUTTERFLY PEA		Purple / Blue
9	CALENDULA		Orange
10	CARROT ROOT		Orange
11	CHAMOMILE (GERMAN)		Blue
12	DYER'S ROCKET		Yellow
13	ELDERBERRY		Red / Purple
14	HEMP		Green
15	HENNA		Red / Orange

16	HIBISCUS		Red / Pink
17	INDIGO		Blue / Mauvel
18	IRIS		Pu rple / Blue / Green
19	MADDER		Red / Purple
20	MONASCUS PURPUREUS		Red / Purple
21	NETTLE		Green
22	PAPRIKA		Red / Purple
23	POMEGRANATE		Red / Purple
24	RED CABBAGE		Pink / Purple
25	RED CLOVER		Golden Yellow
26	RED SANDALWOOD		Red
27	ROSEHIP		Red / Orange

28	SAFFLOWER		Yellow / Red
29	SAFFRON		Yellow
30	SEA BUCKTHORN		Orange
31	SPINACH		Green / Yellow
32	SPIRULINA		Blue / Green
33	ST. JOHN'S WORT		Red
34	TOMATO		Red / Orange
35	TURMERIC		Yellow / Orange
36	WALNUT		Orange / Brown
37	WOAD		Blue / Indigo
38	YARROW		Blue

Marketed formulations of "Natural Colour Products":

Sr no.	Plant (colour)	Product
1	Acai(Purple)	Navitas organic Acai powder
2	Alkanet(Red)	Pure Ratanjot root full (hair dye)
3	Beet root (Red)	Belora(lip tint)
4	Blue tansy(Blue)	Do TERRA international LLC
5	Butterflypea(Purple/Blue)	Butterflypea Lemomode Cold Brew
6	Hemp seed(Green)	Hemp seed oil
7	Hibiscus(Red/Pink)	Bio Organic Hibiscus Flower Powder
8	Paprika(Red/Purple)	McCormick culinary smoked paprika
9	Red Sandalwood(Red)	Red Sandal Powder, Red Sandalwood cream
10	Saffron(Red)	Saffron Yellow Food Colour
11	Turmeric(Yellow/Orange)	Vicco turmeric cream Kiehls cream(Turmeric granberry seed

CONCLUSION:

Here we concluded that, the natural colour used in cosmetic are more preferably used since two decade because to reduce risk of skin infections that associated with chemically prepared cosmetics. But the fact remain the use of chemical to prepared cosmetics are much more as compare to naturally color prepared cosmetics.

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