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DEVELOPMENT AND ASSESSMENT OF SINDOOR FORMULATED WITH ROSE AND HERBAL HIBISCUS EXTRACTS FOR REDUCED ALLERGENICITY AND ANTI-CANCER PROPERTIES

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ABSTRACT

In Hinduism, a married woman is identified by her sindoor. As a dot on the forehead or at a woman's hair parting (also known as mang in Hindi or simandarekha in Sanskrit). Application of "Kumkum or Sindoor" may cause lichen planus pigmentosa and pigmented contact dermatitis. "Bindis" and "Alta" stickers cause contact leukoderma (White Patch). Thus, the development of natural products is necessary. Kumkum is use on the daily basis and cause the harmful reaction on skin due to presence of the synthetic colour used while preparations. To avoid the harmful reaction, we can use the herbal preparation of the Kumkum powder. Kumkum can cause allergic contact dermatitis due to dyes used to enhance its colour. Nowadays, there is a global trend towards using herbal goods and living a more natural lifestyle. A method for preparing Kumkum Powder has been devised to create a non-toxic and safe alternative product. This process uses natural dye to colour Kumkum, making it an innovative approach.

I. INTRODUCTION

The only people who use coloured cosmetics called "Kumkum" are Hindus. Although the precise contents of commercial "Kumkum" formulation are unclear, known ingredients include groundnut oil, maize starch, turmeric powder, perfumes, and different pigments. It is well known that Kumkum, which is produced with slaked lime, turmeric, and colour-enhancing pigments, can result in allergic contact dermatitis. Among the potential contact allergens in Kumkum include Sudan-1, brilliant lake red R, 4-aminoazobenzene, and turmeric. Kumkum can cause allergic contact dermatitis because of the dyes applied to enhance the colour.

The purpose of this study was to use hibiscus and rose to prepare natural Kumkum in order to prevent different allergic reactions and cancer cells. Due to this there are less adverse effects and good acceptance rates for the prepared Kumkum.

The vibrant red colour of hibiscus flowers makes them an excellent natural dye for sindoor, offering a chemical free alternative to synthetic colours. Hibiscus has antioxidant and anti-inflammatory properties, which may benefit the skin. Using hibiscus-infused sindoor can provide additional nourishment. Utilizing hibiscus promotes sustainable practices by using plant-based materials instead of synthetic ones, supporting eco-friendly traditions.

The presence of antioxidants in rose powder can offer some skin health benefits.

Hibiscus:

Hibiscus Powder is well known for its ability to even out skin tone and reduce pigmentation if used regularly. Hibiscus Sabdariffa is known to be rich in natural AHAs & BHAs which means it works great as a natural exfoliator. Hibiscus has a great reputation for increasing skin elasticity to give a stunning natural youth-boost. This keeps the skin healthy, youthful, and glowing. Hibiscus has been studied for its potential health benefits, including its effects on skin health and cancer. Its antioxidant properties may help protect skin cells from damage caused by free radicals. Some research suggests that hibiscus extracts may inhibit the growth of certain cancer cells and could potentially support skin pigmentation by promoting an even skin tone and reducing hyperpigmentation.

Rose:

The plants of genus Rosa not only has great ornamental value and commercial use, but also displays good biological activity and nutrition due to its many chemical constituents. Pharmacological effects such as

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antineoplastic and anti-cancer properties, anti-inflammatory, antioxidant, liver protection, regulate blood sugar, antimicrobial activity, and antiviral activity.

Anti-inflammatory Properties: Rose extracts can help reduce inflammation, which may contribute to uneven skin tone and pigmentation issues. Antioxidant Effects: Rich in antioxidants, rose oil can combat oxidative stress, potentially reducing hyperpigmentation. Moisturizing Benefits: Well-hydrated skin is healthier and may exhibit more even pigmentation.

For Cancer Treatment: Antioxidants: The antioxidants in rose extracts can help neutralize free radicals, potentially lowering the risk of cancer. Antimicrobial Properties: Some studies suggest that rose extracts may have antimicrobial effects, which could support skin health. Chemo preventive Potential: Certain compounds in roses, like flavonoids, have shown promise in laboratory studies for their ability to inhibit the growth of cancer cells.

Need for the study:

An extensive review of the literature has shown that Cananga oil, Sudan-1, 4-aminoazobenzene, turmeric, and brilliant lake red are among the potential contact allergens in Kumkum. Kumkum can cause allergic contact dermatitis because of the dyes that are applied to enhance the colour. Therefore, it is essential to devise a process for making a substitute, safe, and non-toxic Kumkum powder.

Synthetic dyes that are frequently used in histopathology to stain tissue sections are hazardous to lab workers and can result in skin allergies, respiratory tract infections, irritability, and a variety of malignancies when exposed to them for an extended period of time. Dyes that have azo bonds, nitro groups, or amino groups, for instance, can cause tumours that lead to renal and hepatic carcinomas. Finding specific natural materials with staining qualities that are also eco-friendly, biocompatible, and degradable is necessary to stop the negative consequences of synthetic dyes. Natural colours are derived from plant sources such as fruits, leaves, roots, and bark.

Researchers have investigated the use of natural compounds such curcumin, beetroot, ginger, Pterocarpus Osun, rose, henna, and Hibiscus sabdariffa in colouring tissues and microorganisms. Rose geranium oil is utilized for its natural anti-oxidant and anti-inflammatory properties, which improve skin health and radiance. Ashwagandha work as anti-inflammatory qualities can help alleviate scalp irritation. This product helps to maintain skin health and soothes sensitive or breakout-prone skin, making it effective against severe weather and acne.

Drawbacks of synthetic Kumkum:

Kumkum, a mixture of turmeric and slaked lime, gives tissues a crimson colour. Kumkum powder can be manufactured using both natural and commercial methods. Kumkum is traditionally made by combining turmeric, lime water, camphor, saffron, or a combination of turmeric and slaked lime. Commercial preparations include azo colours, maize starch, perfumes, chalk powder, powdered nut oil, tragacanth gum, turmeric powder and parabens. Kumkum, available in powder and liquid form, is typically placed to the centre of the forehead, front of the neck, or hair parting as "Sindoor" (vermilion) to indicate a woman's marital status. Kumkum is commonly used by Hindu women, however it might cause dermatitis. This may be due to individual vulnerability or long-term use. Males, particularly priests, often utilize Kumkum for religious purposes.

Fig 1.1: Kumkum induced pigmented contact dermatitis

Some researcher found pigmented contact dermatitis in 76% of patients and allergic contact dermatitis in 24% of those who used Kumkum. The most prevalent location was the forehead, followed by the glabellar area, hair

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parting, and neck. If Kumkum drips down the skin after sweating, it may affect the surrounding skin. Other appearances include brown or slate grey hyperpigmentation without overt dermatitis or lichen planus pigmentosa. The phrases Kumkum and bindi overlap slightly but are not synonymous. Kumkum is typically applied as a paste or powder to cover the face or other portions of the body. A bindi is a paste or sticker worn exclusively between the eyes. Self-adhesive bindis, often known as sticker bindis, are a popular and convenient alternative to traditional liquid bindis.

One of the most common side effects of sticker bindis is contact leukoderma. 104 cases (12%) of sticky bindi were discovered in a study of 864 patients with chemical leukoderma. While erythema, pruritus, and irritation may be present before depigmentation develops, chemical leukoderma must be ruled out in every case of idiopathic vitiligo. It is possible that bindi-induced depigmentation is more common in patients who are predisposed to vitiligo. There can be anywhere from a few weeks to several years as the lag time between use and depigmentation. Other manifestations include granuloma development and allergic contact dermatitis.

Sticker bindis consist of circular PVC discs with a high concentration of para-tertiary butyl phenol (PTBP) glue. These chemicals cause depigmentation due to their Melano cytotoxic action. Bindi-related contact dermatitis can also be caused by other allergens such as epoxy resins, Disperse Blue 124, Disperse Blue 106, nickel, and a combination of thimerosal and gallate. Early detection and discontinuation of sticker bindi use are crucial for treating bindi leukoderma, which can be challenging for married Hindu women who are accustomed to wearing bindis at all times. Other treatment options include topical steroids and melanocyte transfer surgery.

II. METHOD AND MATERIAL

People prefer natural foods, herbal medications, and curing techniques for a healthier lifestyle. This process uses natural dye to colour Kumkum, making it an innovative approach.

Figure 2.1: All Ingredient of Herbal Kumkum

1. Gathering and verifying plant material herbs.
2. Ingredients in the recommended amounts for making natural Kumkum.

Table 2.1: Ingredient with their prescribed quantity

Sr. no	Ingredient	F1	F2	F3	Role
1	Hibiscus Powder	2.2	2.5	2.0	Dye
2	Rose power	1.6	1	1.5	Fragrance
3	Catechu powder	5.0	6.0	5.0	Anti-bacterial
4	Kesar	1.0	0.5	1.5	Aroma

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5	Almond oil	Quantity sufficient (q.s)	Quantity sufficient (q.s)	Quantity sufficient (q.s)	Stabilizer
6	Water	Quantity sufficient (q.s)	Quantity sufficient (q.s)	Quantity sufficient (q.s)	Binder

Note: Composition for 10 gm is prepared.

Acacia Catechu:

Is also known as katha (Urdu), khair and babul (Hindi), kaath (Marathi). A catechu has been used as an antimicrobial, anti-inflammatory and antifungal, coagulant, vermifuge, antidiarrheal, and astringent, and has also been employed to heal wounds, treat obesity and diabetes, and maintain oral hygiene. Acacia catechu heartwood extracts have also been used traditionally in the preparation of betel quid (paan masala), which consists of Piper beetle leaves, A. catechu paste, chopped Areca nut, lime, and various spices with or without tobacco. Betel chewing is used to produce euphoria, a sense of well-being, heightened sense of alertness, and psycho-stimulation.

Saffron:

Is a spice derived from the flower of Crocus sativus, commonly known as the "saffron crocus". The vivid crimson stigma and styles, called threads, are collected and dried for use mainly as a seasoning and colouring agent in food. Saffron has been studied for its potential benefits in skin health, including pigmentation issues and cancer prevention. It contains antioxidants like crocin and safranal, which may help reduce inflammation and protect skin cells from damage. Some research suggests saffron could lighten pigmentation and improve skin tone. Regarding cancer, its compounds have shown anti-cancer properties in some studies, potentially inhibiting the growth of cancer cells and reducing oxidative stress.

PROCEDURE:

1. Petals of Rose and Hibiscus were shade dried.
2. The crude drug was ground into the fine powder by using mortar and pestle.
3. Then pass the fine powder through mesh sieve.
4. After combining the crude drug in powder form water was added for to create a thick slurry.
5. Using the stirrer the slurry was blended to create a liquid colour paste.
6. The slurry was filter and evaporated till dry powder of paste was obtained.
7. The resulting powder was then ground into the fine powder to create herbal Kumkum.

Fig 2.2: Herbal Kumkum

III. EVALUATION TEST

1. Test for Solubility:

a. Take a small amount of Kumkum and place it in a test tube.

b. Add small amount of water or alcohol to the test tube.

c. Gently shake or stir mixture.

d. It remains undissolved it results that insoluble.

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2. Test for Sensitivity:

a. Choose a small area of skin inside of wrist or elbow.

b. Then place a small amount of Kumkum on that area.

c. Leave it for 24 hours, monitor the area for any sign of irritation such as redness, itching or swelling.

d. There is no reaction observed after 24 hours. Hence it results that Kumkum is not sensitive.

3. Test for pH:

a. Dissolve small amount of Kumkum in water.

b. Miss thoroughly.

c. Dip the pH strip into the solution.

d. Compare the colour change of the strip to the pH scale.

e. The pH was found to be 7.

IV. RESULT AND DISCUSSION

Table 3.1: Evaluation of formulated herbal Kumkum

Sr no	Evaluation Parameter	Formulation
1	Solubility Ethanol Water Chloroform	 Insoluble Insoluble Insoluble
2	Angle of Repose	20.42
3	Sensitivity	Not sensitive
4	Colour Change	Not Observed
5	Water Washability	Washable
6	PH	7

It was found that formulation 2 was effective. The market samples displayed skin redness and irritation on the forehead. The red stain was deeply ingrained in the synthetic interior and was not removable with water. The prepared Kumkum offers the safe, stain-free, and environmentally beneficial alternative by using natural dyes instead of synthetic ones and salt-based sindoor heavy metals. The prepared Kumkum offers a harmonious blend of coloured, dry powder that adheres well to skin and is readily removed with a mop or water wash. With less negative effects, this herbal sindoor is a superior option for ladies.

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