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DEVELOPMENT OF ANTIOXIDANT CREAM USING EXTRACT OF TURMERIC

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ABSTRACT: The purpose of this study was to develop a herbal cream using turmeric extract. The formulated Curcumin containing moisturizing conditioning cream was evaluated for several physiochemical tests and the results were found according to the standard value. Curcumin is a natural pigment obtained from Curcuma longa with considered medicinal values. This herbal cream is one of the good alternatives in place of synthetic cream. Further detailed stability studies are needed to improve the overall quality of the products.

KEYWORDS: Rhizome, Inflammation, Preservatives, Antibacterial, Extract

INTRODUCTION: The perennial rhizomatous plant turmeric has its origins in South Asia (curcuma longa). The spices used in kitchens as food coloring and preservatives get their bright yellow color from the plant's rhizome. Traditional Chinese and Indian medicine, primarily, uses turmeric to treat inflammatory illnesses. It is used to reduce inflammation and clean the blood as well as to heal wounds. Additional pharmacological activities include antibacterial and antioxidant properties. The primary focus of this essay is on curcumin's anti-inflammatory properties as a cancer treatment. Curcumin, which is regarded to be the substance responsible for turmeric's medical effectiveness in a range of disorders like ulcerative colitis, inflammation, and other inflammatory diseases, is one of the most investigated components edemas. 8 IBS, dyspepsia, gastric ulcer, osteoarthritis, and rheumatoid arthritis are some of the disorders that might affect the joints. Not only that, but several in vivo studies have shown that turmeric has therapeutic potential for Alzheimer's disease.

MATERIALS AND METHODS:

Reagents and Chemicals: 10% sodium carbonate solution, Folin–Ciocalteu reagent, aluminum chloride solution, 1M potassium acetate solution, methanol, gallic acid, and quercetin standard solution, DPPH solution, 0.1 M phosphate buffer (pH 5.0), hydrogen peroxide solution, ABTS, ammonium solution, potassium persulfate, phosphate buffer, ethanol. All chemicals should be analytical grade.

Plant and chemicals procurement: Curcuma longa rhizomes used in this study were collected and rhizomes were washed with running water to remove dust particles and air dried under shed. The moisture content of dried rhizome was 0.01±0.04 g water/g. Dried rhizomes were grinded to coarse powder and ready for extraction process.Fresh turmeric leaves were harvested between September and November and washed several times to eliminate soil and impurity. -en, the leaves were hot-air dried at 50°C for 24 hr using a convection oven for storage and further extraction. After that, the dried leaves were ground as powder and stored at room temperature.

ISOLATION OF CURCUMIN:

Curcumin were isolated from Curcuma longa dried rhizomes powder

Process flow chart of Curcumin isolation:

Coarsely crushed grinded Powder

↓Extraction

Extracted with Ethylene dichloride (EDC) for 4 hours in extraction unit at 50°C-60°C

↓Filtration

Filtered the extract through Buchner funnel & collected in a beaker forconcentration

↓Concentration

Concentrated under vacuum at 50°C-60°C up to 40% of raw herb

↓Crystallization

Collected in a beaker and left for 24 hours for crystallization

↓ Filtration

Filtered the crystal through a centrifuge

↓ Purification

Refluxed the filtered crystal with 50% Ethyl acetate & water for half an hour at60°C & collected in a beaker and allow cooling at 5°C for 4 hours

↓ Filtration & Washing

Separated the precipitate of curcumin through a centrifuge

↓ Drying

Collected curcumin & dried under vacuum/oven

↓ Grinding

Grinded the dried curcumin through a grinder

↓ Curcumin (93%)

Figure 1 turmeric Extraction assembly

RESULT AND DISCUSSION:

Table.1 List of ingredients of Formulation

S. No.	Ingredients	Quantity
1.	Curcumin	2gm
2.	Steric acid	25g
3	Liquid paraffin	10gm
4.	Glycerin	25gm
5.	Cetyl alcohol	4gm
6	Propyl paraben	0.08gm
7.	Triethanolamine	5gm
8.	Sodium metabisulphite	0.4gm
9.	EDTA (ethylene di amine tetra acetic acid)	0.4gm
10.	Water	q.s

Homogeneity & Appearance:

After the cream has been set in the container, the formulation wastested for homogeneity by visual appearance and by physical touch. The appearance was determined by examining the pearlescence , the roughness, and the color.

Grittiness:

Formulation was evaluated with the help of compound microscope to observe for the presence of any particles.

Determination of Ph:

A calibration by a standard buffer solution was done to the pH meter and then 0.5g of the formulated herbal cream was taken and mixed properly with 50 ml distilled water. Then, the pH of the cream was determined by the pHmeter at room temperature.

Spreadability:

Spread ability is measured by time in seconds utilized by two glass slides to slip off from cream, lesser time taken for separation of two slides, denotes the better the spreadability. Measuring the spreadability was done by adding 3g of the herbal cream between twoslides and pressed it to get a thin layer which is uniform and then a 1000g weight was placed for 5 minutes. Using a pan, 10g of weight was added to it. The upper plate was attached to a string which is alsoattached to a hook so that the plate can be pulled. The time taken for the upper plate to go over the lower one to cover 10 cm of distance was recorded. After that, the spreadability was calculatedusing the following formula.

Drug content:

To judge the uniformity of prepared cream, a UV-Visible spectrophotometer was used. About 2g of the formulated herbal creamwas dissolved and mixed with 100 ml of the phosphate buffer of a pH 7.4. Then, this solution was filtered using a filter paper and then it was collected.

Evaluation of antioxidant cream

The prepared curcumin cream was observed visually and homogeneity, grittiness, viscosity, spread ability, pH, and its stability studies were recorded.

Viscosity

Using a Brookfield viscometer, the viscosity of the formulated herbal cream was measured by pouring the herbal cream into the viscometer adaptor and then observed the angular velocity that was 0.5 and then increased to reach20 rpm.

Test for microbial growth in formulated cream

The prepared herbal cream was tested for any microbial growthby streak plate method by inoculating the formulated herbal cream and the control which didn't contain the formulated cream in agar media plates. After that the plates were incubated in the incubator for 24 hours with a temperature of 37°C and then it was examined and compared with the control to observe any microbial growth.[11] analyzed at a wavelength of 254 nm against a blank that consist ofbuffer of a pH 7.4 .

Stability study

Stability study over a period of three months was conducted.The physical appearance, pH value, drug content, were determined periodically after the 1st, 2nd and 3rd month after cream preparations. The stability of the formulated herbal cream was tested under different temperature which are 2°C, 25°C and 37°C.

SUMMARY AND CONCLUSION:

Curcumin was isolated from *Curcuma longa* and the percentage yield was satisfactory. Curcumin containing cream was formulated and the color was bright yellow and had a cosmetically appealing appearance and it was homogenous with no indication of two phase formation. Formulated cream was easily spreadable, with fair mechanical properties and acceptable bio adhesion. The pH of the skin normally ranges from 4 to 6 and pH of the formulated creamwas found to be 4.5 at room temperature and was similar to the skin's normal pH value. Stability studies results showed that there were no significant changes in the pH value, physical appearance and drug content of the cream, after storing at different temperature conditions for three months

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