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FORMULATION AND EVALUATION OF HERBAL CREAM CONTAINING EXTRACT OF *AMARANTHUS TRICOLOR* LINN.

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ABSTRACT

The present work was an attempt to formulate and evaluate cream with extract of Amaranthus tricolor Linn. and subjected to physical and microbiological evaluations. The result of the study indicates that prepared formulation showed characteristics properties of specific formulation and also possesses antimicrobial potential. Result concluded that plant extract can be utilized as cream for the treatment of topical microbial infections.

Keywords: Herbs, Formulation, Cream, Amaranthus Tricolor Linn.

INTRODUCTION

Amaranthus tricolor Linn. is a medicinal plant, which belongs to family *Amaranthaceae*. It is used for the treatment of blood disorders, tooth ache and dysentery. Yellow, green and red dyes can be also obtained from whole plant [1, 2]. The leaves, up to 5" long, are notched or rounded at the tips. The flowers are whitish-green while the seeds are very small, black or red-brown [3]. Plant are rich in minerals (calcium, iron, magnesium, phosphorus, potassium, zinc, copper and manganese) and vitamins (vitamin A, vitamin B_6, vitamin C, riboflavin. and foliate) [4, 5]. The major unsaturated fatty acids in *A. tricolor* are linoleic acid, while the major saturated fatty acid in seeds, stems and in leaves is palmitic acid [6]. Mature leaves of *A. tricolor* and *A. caudatus* contain red violet pigments *betacyanins, amaranthin* and *isoamaranthin* [7]. Looking towards therapeutics importance of plant; it was thought worthwhile to carry-out the antimicrobial screening of formulation of *A. tricolor* to establish its traditional medicinal importance.

MATERIALS AND METHODS

All the chemicals used in this investigation were of analytical reagent (AR) grade. Distilled water was used throughout the study.

Preparation of Extracts

The shade dried material of leaves was pulverized to coarse powder then defatted by petroleum ether and then subjected to Soxhlet extraction with methanol. The solvent was removed using rotary evaporator to get dry residue. Finally vacuum dried to get coarse powder.

Formulation of Herbal Cream

Herbal cream was prepared as per the composition mentioned in **Table 1**. Accurately weighed amount of stearic acid was taken and kept on water bath at 80^{o}C. Extract was dissolved in water which was also kept at same temperature then potassium hydroxide was added to this extract solution. All the other oils were dissolved in melted stearic acid. The extract solution was added slowly to the stearic acid with stirring and allowed the mixture to cool. Then cream base was incorporated with all the necessary ingredients.

Table 1: Formulation of Herbal Cream

Ingredients	Quantity
Extract	5 gm
Methyl Paraben	0.1 mg
Propyl Paraben	0.02 mg
Potassium hydroxide	0.4 gm
Glycerin	1.5 gm
Stearic acid	9.0 gm
Distilled water	Q.S.

Antibacterial Activity

The formulation was subjected to preliminary antibacterial screening using cup plate method. The method for antibacterial activity was based on diffusion of antibacterial compound to the surrounding agar medium such that the growth of the microorganism is inhibited as a circular zone. *Staphylococcus aureus, Bacillus subtilis, & Escherichia coli* were selected for the study.

Nutrient agar was used as base medium for screening of antibacterial activity and nutrient broth for the preparation of inoculums. The nutrient agar plates were seeded with standardized inoculums of each test organism. The inoculums were spread evenly over plate with loop or sterile glass spreader. The seeded plates were allowed to dry in the incubator. Uniform wells were prepared on the surface of the nutrient agar and samples were introduced into the well. The inoculated plates were incubated at 35-37^{o}C for 24 hours and zone of inhibition was measured.

FORMULATION EVALUATION [8, 9]:

Various characteristics parameters were performed to establish quality of cream formulation and results were mentioned in **Table 2.**

pH: The pH of formulation was determined by using Digital pH Meter. Cream was dissolved in 100 ml of distilled water and stored for two hours. The measurement of pH of formulation was done in triplicate

Viscosity: The measurement of viscosity of prepared cream was carried out with Brookfield Viscometer and the determinations were carried out in triplicate and the average of three reading was recorded.

Determination of Spreadability:

The Spreadability was expressed in terms of time in seconds taken by two slides to slip off from the cream, placed in between the slides, under certain load. Lesser the time taken for separation of the two slides, better the Spreadability. Two sets of glass slides of standard dimensions were taken. The herbal cream formulation was placed over one of the slides. The other slide was placed on the top of the formulation, such that the cream was sandwiched between the two slides weight was placed upon the upper slides so that the cream between the two slides was pressed uniformly to form a thin layer. The weight was removed and the excess of formulation adhering to the slides was scrapped off. The upper slide allowed slipping off freely by the force of weight tied to it. The time taken for the upper slide was noted.

Determination of Extrudability:

The formulation was filled in standard caped collapsible tube and sealed. The tube was weighed and recorded. The tube was placed between two glass slides and was clamped. A weight was placed over the glass slide and then cap was opened. The amount of cream extruded were collected and weighed. The percent of cream extruded was calculated.

Table 2: Results of Quality Control Evaluation

Parameter	Value
pH	6.5
Viscosity (cps)	1601
Spreadability (g cm/sec)	13.11
Extrudability (%)	68

RESULT AND DISCUSSION

The cream formulation with extract of *Amaranthus tricolor* Linn. was prepared and subjected to quality control and microbiological evaluations. The characteristics of cream in terms of pH, viscosity, spreadability and extrudability were analyzed by reported method. The result of the study indicates that prepared formulation showed optimum range of characteristics properties of cream formulation. The results of this investigation showed that developed formulation had inhibitory effect on the selected microorganism. Results of antimicrobial evaluations indicated that formulation possesses significant zone of inhibitions against selected microorganism as mentioned in **Figure 1**. This suggests that the active ingredients of the formulations may have contributory antibacterial activity.

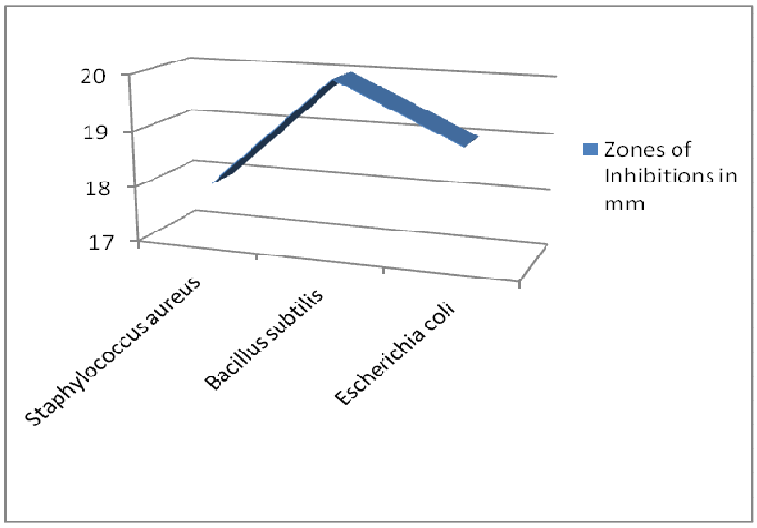

Figure 1. Results of Antibacterial Activity

CONCLUSION

The present work involves formulation and evaluation of an herbal cream. The extract of *Amaranthus tricolor* Linn. was used for the preparation of cream formulation. Result concluded that plant extract can be utilized as cream for the treatment of topical microbial infections.

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