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Design, Development and Evaluation of Polyherbal Formulation for Anti-Allergic Activity Containing Some Indigenous Herbs: Acacia Arabica, Butea Monosperma

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ABSTRACT

Objective: The present study describes the anti-allergic, anti-inflammatory, anti-microbial activity of Acacia *arabica* and Butea *monosperma* bark extract.

Methods: For this purpose aqueous extract of bark were prepared by "Soxhlet extraction method". The experimentally induced burn wound model in rats by "Excision method".

Results: As a result of this study it was found that the extract of bark generally revealed antimicrobial and wound healing activity.

Conclusion: The result of the study suggest that the Acacia *arabica* and Butea *monosperma* bark of polyherbal gel effective in accelerating Anti-allergic activity.

Keywords: Acacia arabica, Butea monosperma, Inflammation, Excision method, Soxhlet extraction, Polyherbal Formulation.

INTRODUCTION

In India, medicines based on herbal derivation have been the basis of treatment and cure for various diseases. Moreover, Indian folk medicine comprises numerous prescriptions for therapeutic purposes such as allergy, Skin infection, inflammation, healing of wounds, leprosy, diarrhoea, scabies, venereal disease, ulcers, snake bite. More than 80% of the world's population still depends upon traditional medicines for various skin diseases. Herbal medicines in infection management involve disinfection, debridement and providing a moist environment to encourage the establishment of the suitable environment for the natural healing process. A large number of plants are used by folklore traditions in India for conduct of infection like cuts, wounds and burns. The drugs selected for this work were Acacia *arabica* and Butea *monosperma*. These two important herbs are reported to have significant antibacterial, immunomodulatory and anti-inflammatory activities which are complementary to wound healing process. The growing popularity of natural and herbal medications, easy availability of raw materials, cost-effectiveness and the paucity of reported adverse reaction, prompted us to formulate a polyherbal topical preparation and assess its allergy. The combination is used in order to enhance the anti-allergic activity.

MATERIALS AND METHODS

Materials

The plants were selected on the basis of their antimicrobial activities and their medicinal uses reported in the literature. The herbs (Acacia *arabica* and Butea *monosperma*) were purchased from the Herbal garden of P.Wadhawani College Of Pharmacy,Yavatmal and authenticated by Taxonomist in the department of Botany, Shri Shivaji Science and Arts College, Chikhli. Dist. Buldana All other chemicals were of analytical grade and used without further purification.

Preparation of extract

The powdered of Acacia *arabica* bark and Butea *monosperma* bark were used for extraction. The powder is extracted in soxhlet apparatus with ethanol. The extraction procedure were carried out till a sufficient quantity of extract was obtained. The solvent was removed by distillation method.

Formulation of topical gel

The United State Pharmacopeia (USP) defines gels as semisolid, being either suspensions of small inorganic particles or large organic molecules interpenetrated with liquid. In the first case, the organic particles, such as bentonites, from a three-dimensional "house of card" structure throughout the gel. This is a true two-phase system, as the inorganic particles are not soluble but merely dispersed through the continuous phase[1]. Gels formulations of different concentration using different base were formulated the various ingredients used for the formulations. By using the above ingredients three different formulations were prepared. All formulations were having Carbopol gel base. Formulations I, II, were 1% of each concentration of extract and formulation III was 2% concentration (i.e. 1% of each extract). The concentration of extract of plant Acacia *arabica*, Butea *monosperma* were used on trial and error basis and studying its activity. Finally these three formulations were selected and prepared. The evaluations of all three formulations were made and pharmacological Anti-inflammatory, antimicrobial activity of all formulations were studied. The formulation of prepared herbal gel formulations incorporating the herbal drugs extract is given below.

Table 1. Formulation of Topical gel.

Name of Ingradient	Formulation I (Acacia *arabica*)	Formulation II (Butea *monosperma*)	Formulation III (Both I&II)
Carbopol 940	1gm	1gm	1gm
Glycerin	5ml	5ml	5ml
Tri-ethanolamine	q.s.	q.s.	q.s.
Propyl paraben	q.s.	q.s.	q.s.
Acacia Arabica	1gm	---	1gm
Butea monosperma	---	1gm	1gm
Distilled water q.s.	100 ml	100 ml	100 ml

Anti-allergic studies

The allergy can be produced by a partial thickness burn wound model was employed as per [2]. The rats will be anaesthetized with diethyl ether and the hair on the back will be shaved with a sterile blade. The shaved area was disinfected with 70% (v/v) ethanol. Then burn wound will be created by pouring hot molten wax (2 gm) at (80 °C). The wax circular opening. The wax will be allowed to remain on the skin till it gets solidified. Immediately after injury can produced inflammation at the site of injury and on subsequent days, all the gel will be daily applied topically for 21 d or till complete epitheliazation which ever will earlier. After animal recovered completely from anesthesia, they were kept in individual cages and followed all norms of good laboratory practice in carrying the animals [3]. The animals were randomly divided into 5 groups and each group containing 6 animals. The treatments of each gel (500 mg/rats) were applied topically once a day [4].

Group I: Control group.
Group II: Test group treated with Acacia *arabica* gel. (Formulation I)
Group III: Test group treated with Butea *monosperma* gel.(Formulation II)
Group IV: Test group treated with (Polyherbal gel) (Formulation III)
Group V: (Reference Standard Marketed Preparation)

Inflammation in row wound area, plan metrically on the transparent paper, from which the wound surface area will be evaluated. The tracing was then transferred to 1 mm2 graph sheet, from which the wound surface area was evaluated. The evaluated surface area was then employed to calculate the percentage of wound contraction, taking the initial size of Inflammation of the wound, 300 mm2; as 100% by using the following equation.

Inflammation Contraction (%)
=Initial inflammationsize - Specific day inflammation size/Initial inflammation size X100

Statistical analysis

Experimental data are expressed as mean±(SEM) standard error of mean. Statistical analysis was performed by using one way ANOVA followed by Dunnet test.

RESULTS AND DISCUSSION

The prepared herbal gel formulations incorporating herbal extracts i.e. Acacia *Arabica* and Butea *monosperma* extract are subjected for the in vitro evaluation and stability studies by using various parameters Allergy

contraction. Inflammation is another parameter used to assess wound healing. Significant Inflammation of wound contraction was shown in table.

Table 2: Evaluation of Anti-allergic activity.

Group no.	Formulation	Area of anti-inflammation during different days of observation(%)				
		4 days	8 days	12 days	16 days	21 days
1	Control	8.31±0.8160	8.48 ± 0.8142	8.44±0.7818	8.39 ± 0.8752	8.42 ± 0.9525
2	Formualtion I	10.78 ± 0.4142	24.22 ±0.4340	36.03±0.7057	65.88±0.5407	68.85 ± 0.5512
3	Formulation II	7.72 ± 0.7621	18.16 ±0.5222	48.58±0.5512	70.20± 0.5310	72.27 ± 0.5710
4	Formulation III	9.88 ± 0.8599	28.36 ±0.9320	51.16±0.6677	85.52± 0.3348	88.45 ± 0.3728
5	Reference Standard	12.79 ± 0.7487	29.38 ±0.7175	53.95±0.6435	75.55± 0.6422	89.55 ± 0.2525

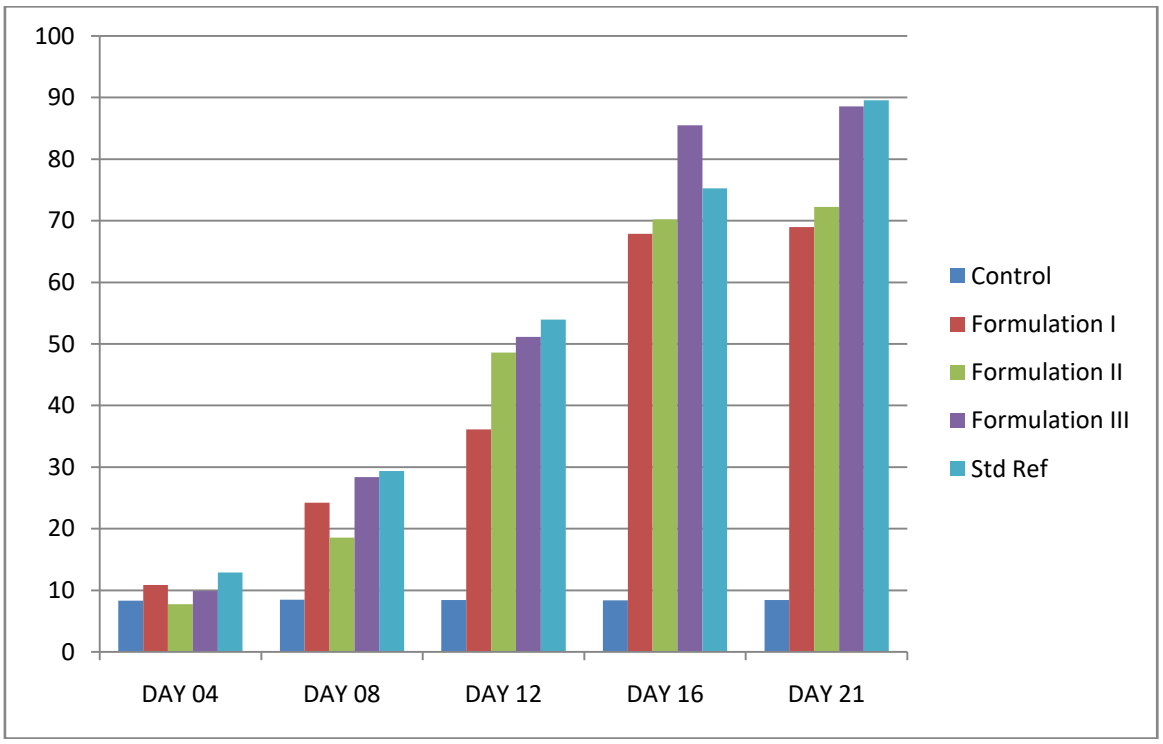

Table1. Evaluation of Anti-inflammatory Activity.

DISCUSSION

From the above remarks, it can be concluded that all the parameters of the selected herbs were within in the Pharmacopeal limit indicates the high-quality of raw materials. The extract studies showed the presence of selected active constituents in significant amount. The microbiological studies indicated that the formulations possess anti-microbial activity against tested organisms. The Inflammation and allergy contraction of injury studies revealed that the wound contraction increases on increasing the concentration of herbal extract. The study also reveal that the better activity of polyherbal formulation may be due to the synergistic action of the plants constituents present in the formulation. Thus, the prepared topical gels possess a versatile approach in healing the wound allergy contraction and inflammation.

CONCLUSION

In pharmacological evaluation, Acacia *arabica* showed significant antiallergic, anti-inflammatory effect as compared to control group, Butea *monosperma* showed significant wound healing effects and anti-inflammatory effect as compared control group. The polyherbal gel that is the combination of these two drugs showed synergistic wound healing activity and also anti-inflammatory effect as compared to all herbal drugs individual activity. The prepared herbal gel showed significant anti-inflammatory activity and the combination of Acacia *arabica*, Butea *monosperma* had synergistic anti-inflammatory and wound healing activity. In present study it is concluded that antiallergic activity,anti-inflammatory potential of polyherbal gel is better than individual gel i.e. Acacia *arabica*, Butea *monosperma* gel. In polyherbal gel there is the higher percentage of wound contraction. The present study is a platform and the work would go on a long a way in extracting the potential of Acacia *arabica*, Butea *monosperma* gel for the various activity.

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