

In vivo activity of polyherbal gels prepared using carbopol

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ABSTRACT

Pain and inflammation are the basic defense responses of the body that the result of the injury and any other damage to the body. During the years the concerns were raised towards the inflammation that is caused to the oxidative damage that is resulted in the physiological stress due to oxidation. There are a lot of drugs that are used to treat the condition effectively and the typical examples are NSAID's and SAID's which have a noted mechanism to show the anti-inflammatory activity. They have serious problems with the side effects like Gastrointestinal irritation, Gastric pain, Gastric perforations and peptic ulcers. Herbs have been used as better alternatives that are used to treat diseases. The significance of the medicinal plants had been emphasized significantly in tradition rich countries like India and all over the world. The research proof of those herbs for their activities and their traditional claims were proven. Poly Herbal Gels were prepared using the root extracts of the plant *Corchorus olitorius*. The gels were prepared using the Carbopol 940 and the prepared gels were investigated for their anti-inflammatory property and the gels showed a significantly better activity compared to the plant extract and the standard drug too. The addition of other drugs in to the gels added and advantage to the increase in the activity and faster onset of action as the gel was applied directly in the place of the inflammation.



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INTRODUCTION

Pain and inflammation are the basic defense responses of the body that the result of the injury and any other damage to the body. During the years the concerns were raised towards the inflammation that is caused to the oxidative damage that is

resulted in the physiological stress due to oxidation [1]. There are over half a million people in India that are suffering from chronic inflammations due to other conditions like physical injuries and other wounds [2]. This is also triggered by many issues like infection due to microorganisms, allergenic stimuli and immunity problems and other chronic medical conditions. This is a complex issue where the series of events in the inflammation that are associated are pain and pain mediators that also result in many other diseases [3]. Due to inflammations, the pain and swelling that occur in the surrounding tissues that are due to the interleukins and cytokinin molecules and these molecules will further aggravate the inflammation process [4].

There are a lot of drugs that are used to treat the condition effectively and the typical examples are NSAID's and SAID's which have a noted mechanism

Table 1: Preparation of PolyHerbal Gel using carbopol

Slno.	Material	Quantities
1	Corchorus olitorius Extract	2g
2	Piperine	150mg
3	Menthol	Qs
4	Cabapol 940	10g
5	Distilled water	100ml
6	Stabilizer (SLS)	1mg

to show the anti-inflammatory activity. They have serious problems with the side effects like Gastrointestinal irritation, Gastric pain, Gastric perforations and peptic ulcers [5]. Herbs have been used as better alternatives that are used to treat diseases. The significance of the medicinal plants had been emphasized significantly in tradition rich countries like India and all over the world. The research proof of those herbs for their activities and their traditional claims were proven.

The plant *Corchorus olitorius* was already investigated for the activity and proven for anti-inflammatory property [6]. So, in this research, the ethanol extracts were extracted from the plant roots. The plant extract was used to make a cream formulation and investigated for the anti-inflammatory activity compared with the normal extract and standard drug too.

Extraction

The plant *Corchorus olitorius* was identified in the area and was authenticated. The plant herbarium was made and then submitted in the college. Roots of the plant were collected and dried under sun light during the month of April. After 4 days of complete drying the dried roots were collected and then powdered using a rotary mill. The powder was passed through the sieve 40 to ensure it is even and finely powdered. This powder was used for extraction using ethanol 60%v/v with water. The extraction was carried out by maceration with the above solvent for 5 days with occasional shaking and then filtered off. This filtrate was evaporated using a water bath and the thick paste like extract as weighed and it was 17.48 % w/w yield of the extract. It was yellowish brown colour is used for preparation of the gels.

Preparation of the Carbopol gels

The gel base was prepared using carbapol 940. This was weight to 10g and is dissolved in 100ml of distilled water and then mixed well with a magnetic stirrer until the gel is formed. There was a clear gel formed with a paste like consistency and

into this weighed amount of extract and penetration enhancer, Piperine was added according to the Table 1. A minute quantity of menthol is added to act a counter irritant and cooling effect. The prepared gel was stored at 25^oC for the use in further experiments.

Experimental rats

Albino wistar rats were used in the study of the anti-inflammatory property of the extract and the prepared gels. The rats were procured from a seller in the city which weight around 180-200g and were healthy looking. The rats were active and no diseases signs were noticed in them. They are maintained in the cages isolated from one another and acclimatized at 24±2^oC in an air conditioned area with normal humidity. They were given free allowance for food and water.

They are left in the lab for 2 days and after two days they were separated into 4 groups. Each groups contained just 5 animals according to the study. The first group that is control group was administered with the normal solution of 1ml of 1% saline via oral route. Group two that is the standard group received only standard drug, Indomethacin at a dose of 10mg/kg. third group that is extract group was administered with the plant root extract at a dose of 200mg/kg. All the groups were induced with the induction agent that is carrageenan [7] , [8]. This was made into a suspension with 1% solution of 0.1ml of the carrageenan was suspended into saline solution. This was injected into the right hind paw in the plantar region. After administering the carrageenan, for the group 4 animals, the prepared gels were rubbed on to the same region. The animals were prevented from rubbing off the gels from the area by covering the surface of the application. The volume of the paws was checked and the animals were left alone for 15mins. Then the paw volume increase was checked for every 15,30,45,60 and 90mins of the administration of the carrageenan. After calculating the increase in the paw volumes, the percentage inhibition of the inflammation was

Table 2: In vivo activity of the prepared polyherbal gels

Drugs		Poly herbal Gels	Extract 200mg/kg	at Indomethacin 10mg/kg	Saline water
Paws Volume (ml)	0 min	1.12±0.17	0.81±0.13	0.93±0.08	0.78±0.14
	15 min	1.25±0.03	1.50±0.15	1.17±0.01	1.34±0.7
	30 min	1.38±0.54	1.45±0.09	1.13±0.11	1.56±0.12
	45 min	1.43±0.61	1.76±0.18	1.15±0.24	1.62±0.16
	60 min	0.78±0.46**	1.02±0.14*	0.84±0.32**	1.93±0.10
	90 min	0.61±0.19**	0.93±0.27*	0.72±0.05**	1.80±0.13
Percent inhibition		66.46	57.32	70.73	-

calculated using the below formula.

$$\text{Percentage of inhibition of edema} - \%I = \frac{V_{\text{test}} - V_{\text{control}}}{V_{\text{control}}} \times 100$$

RESULTS AND DISCUSSION

Carrageenan worked well for the induction of the inflammation into the paws of the animals. This was also evident from the increase in the paw volumes of the rats in group I. there was a significant increase in the paw volumes. With the administration of just normal saline there was no reduction of the volume of the paw, because normal saline didn't possess any anti-inflammatory properties. This induction of the inflammation animals became very uncomfortable and usually inflammation in human body also leads to same effects [9]. The continuous prolonged and untreated inflammation causes the lowering of body functions and lead to increase in the damage [10]. (Table 2)

In the group administered with the standard drug, indomethacin, there was a significant lowering of the paw volumes therefore the inflammation too. This was similar to the extract administered group also and was similar activity was shown in the gel administered group too. the basic mechanism involved in the inhibition of the inflammation was by the increase in the synthesis of prostaglandins and cytokinin and some other inflammation mediators [11]. This is evident from the mechanism of action of the indomethacin drug which lowers the synthesis of the inflammatory mediators [12].

The gel showed a better activity compared with the extract and the standard drug because of the administering the gel directly on the place of inflammation and also the gels have added with enhancers that enabled us to counter act the barriers of permeability in the skin which made the gel pass through easily. Usually, the mechanism of action of the NSAID [13] as discussed was by inhibiting the

inflammatory mediators which was nothing different from the standard drug so the same mechanism was attributed to the chemical constituents that are present in the extract and the gels too.

CONCLUSION

Poly Herbal Gels were prepared using the root extracts of the plant *Corchorus olitorius*. The gels were prepared using the Carbopol 940 and the prepared gels were investigated for their anti-inflammatory property and the gels showed a significantly better activity compared to the plant extract and the standard drug too. the addition of other drugs in to the gels added and advantage to the increase in the activity and faster onset of action as the gel was applied directly in the place of the inflammation.

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Conflict of Interest

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