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Hydrogel Preparation: A New Approach To *Lepa Kalpana*

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ABSTRACT:

In today's fast-paced lifestyle, following our age old, time-consuming treatments can be difficult but health is a priority. This paper presents the modification of one such treatment, *lepa kalpana,* in a new form, Hydrogel. It is a neo formulation that is a 3-D hydrophilic structure and this concept is used for modification of formulation. The drug chosen is *Triparnikaa* (*Naregamia alata* Wright & Arn) which has recently been proven effective in *Parikartika* as a *lepa.* The study was to attempt to create a Hydrogel form of *Triparnikaa* (*Naregamia alata* Wright & Arn).

Keywords: Lepa, Hydro gel, Neo-formulation, Advantages, Disadvantages

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INTRODUCTION:

Amongst the many techniques prescribed to deal with various disorders, *Lepa kalpana* (paste application) is common but the time required for the process is too long for the current lifestyle. An alternative pharmaceutical preparation called Hydrogel, a cross-linked, 3D network of water-soluble polymers[1] which requires maximum aqueous extract and minimum excipients, is used to preserve drug, overcome practical issues and enhance aesthetic and user-friendly appeal, hence presenting an ideal new dosage form from a classical *Lepa kalpana*. *Parikartika* (Acute fissure-in-ano) is an extremely common disorder in the Indian Subcontinent. This is now aggravated with erratic food and lifestyle choices. A recently conducted study on *Parikartika* shows benefits of using *Triparnikaa Kalka Lepa* (paste of *Naregamia alata* Wright & Arn)[2] which is presenting practical drawbacks as it is seasonal and available only in coastal regions. In the present study, Hydrogel was prepared from *Triparnikaa* aqueous extract in an attempt to overcome practical drawbacks.

MATERIALS AND METHODS:

Procurement of Raw Materials:

Whole plant of *Triparnikaa* (*Naregamia alata* Wright & Arn) was collected and authenticity verified by experts. The chemicals used were Carbopol, Sodium Benzoate, Poly Ethyl Glycol (PEG) and Tri Ethanol Amine (TEA) and were procured from authorized supplier with quality specification. Distilled water was used, wherever needed.

Preparation of Hydrogel:

The whole plant was weighed and ground to paste like consistency. It was soaked in water at 1:10 ratio so that adequate quantity of liquid extract (500 ml) was obtained. It was kept standing for 2 hours with intermittent shaking. The liquid part was filtered using filter paper. This was divided into 5 samples of 100 ml each. 0.5g of Sodium benzoate was added to each sample. Carbopol was added in different ratios to different samples (1.5%, 2%, 2.5%, 3%, 3.5%). The sample was kept for 24 hours and observed. Appropriate sample was triturated with mortar and pestle. 1.2 ml Poly Ethyl Glycol was added during trituration. Tri Ethanol Amine was added drop by drop (3 drops) until gel consistency was obtained.

RESULTS:

FIG. 1: Texture with different ratio of Carbopol

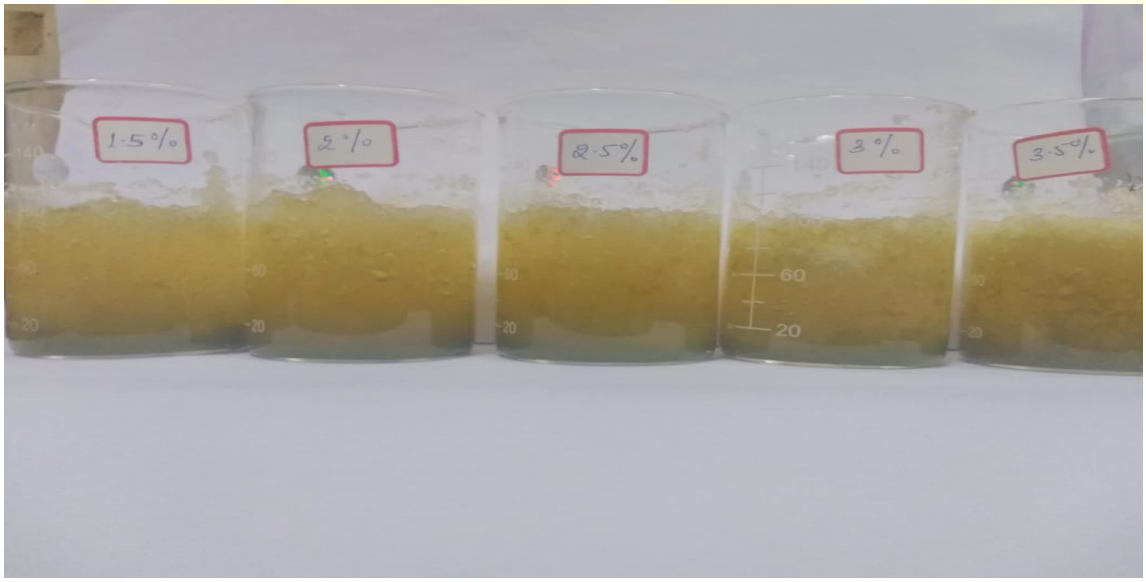

FIG. 2 Hydrogel after adding PEG and TEA

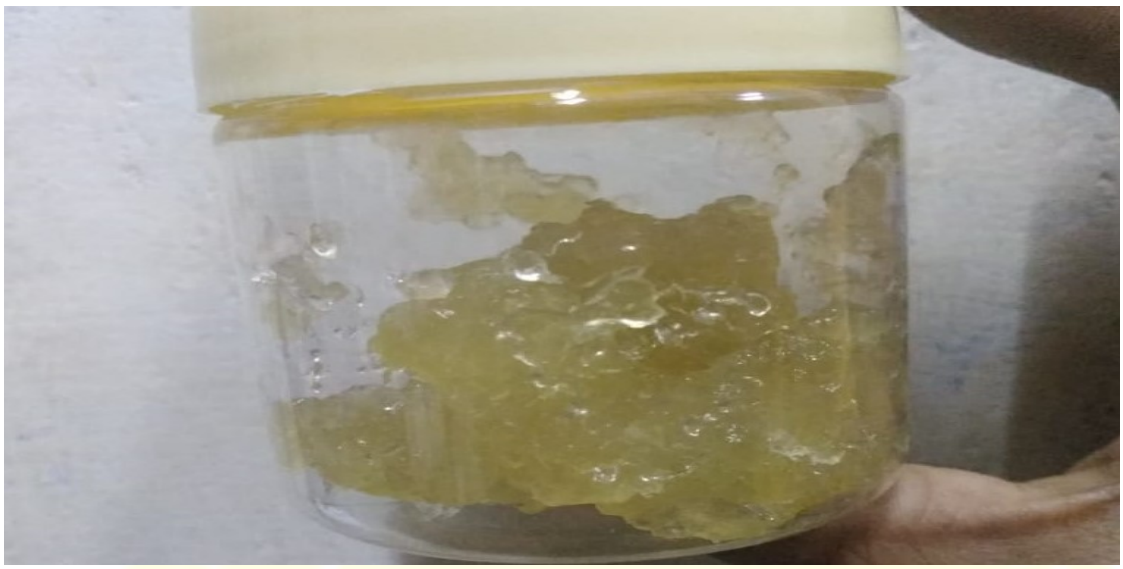

TABLE 1: Observation of Carbopol Ratio samples

SAMPLE	OBSERVATION
1.5% (1.5g)	Watery
2% (2g)	Semi solid, cool and non-sticky gel
2.5% (2.5g)	Semi solid, sticky on gel preparation
3% (3g)	Very thick
3.5% (3.5g)	Almost solid

TABLE 2: Quality parameters of Hydrogel with 2% Carbopol

pH	5.6
Spreadability	Easy to spread, non-sticky
Color	Light green
Smell	Herbal, pleasant
Touch	Smooth and Cool on application
Consistency	Semi- solid
Texture/Appearance	Homogenous, Translucent

DISCUSSION:

The advantages of Hydrogel include that it resembles natural living tissue more than any other synthetic material because of the high amount of water content. This allows for high drug absorption. It has controlled drug release that is influenced by diffusion, swelling or chemical initiators[3]. It also allows for internal uses as well as external but the excipients, preservatives and method of preparation of Hydrogel differs with safety norms. Internal uses are possible through temperature or pH sensitive Hydrogel, which will release drug only when triggered by changes in pH or temperature inside the body.

The disadvantage lies in the preparation. The proportion of ingredients varies based on the amount of extract and hence is difficult for standardizing. In drug delivery, surgical implantations, lenses may be difficult to use as it is non-adherent and may require further dressing or binding. The formulation is also limited to aqueous soluble extracts and no lipid-based ingredients can be used.

In this particular Hydrogel, the cooling sensation which is one of the parameters of a good hydrogel provides immediate relief to burning sensation associated with *Parikartika.* Further clinical evaluation and more in-depth analysis needs to be done.

CONCLUSION:

In short, this 3D hydrophilic structure of polymers can help release the aqueous extracts of drugs given in *Lepa* formulations as it has high absorption and better penetrability. In this fast-paced life, this appears to be an extremely effective alternate to time consuming *lepas* told in the classics. Neo- formulations like Hydrogel, which have high drug content and minimal excipients can change the face of some of our classical formulations and bring it level with Modern Pharmaceutics and cosmetics by eliminating some of the practical problems observed in application of classical formulations

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Conflict of interest :- Nil

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