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TO STUDY THE EFFECT OF ALOE VERA GEL ON THE DRUG RELEASE OF CAPSAICIN

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ABSTRACT

The objective of the study is to provide the drug release profile of Plain Capsaicin and Capsaicin with Aloe gel. In-vitro drug release profile showed that Capsaicin with Aloe gel improves the release profile of capsaicin as compared to Plain capsaicin. It improves patient compliance and reduced the irritancy of plain capsaicin.

KEYWORDS: CAPS, Aloe Gel.

1. INTRODUCTION

Aloe (Aloe Vera) is a traditional medicinal plant belonging to the family Liliaceous. It has a major potential to use for medicinal purpose. The lower leaf of the plant is used for medicinal purpose. If the lower leaf is sliced open, the gel obtained can be applied to the affected area of the skin.[1] Aloe Vera gel is useful for skin treatments. Aloe Vera has been applied topically to treat various skin conditions. Aloe Vera gel has a soothing property which increases patient compliance and reduces the irritating properties of the drug and other ingredients. In the present study, we observed the potential of Aloe Vera with capsaicin and compared the drug release profile of plain CAPS and CAPS with Aloe gel.

Capsaicin is an alkaloid extracted, belongs to the family of Capsicum. Capsaicin is less employed because of its adverse effects as stinging, burning and erythema at the application site.[2,3,4]

Materials: Stearic acid, Glycerol monostearate, polyvinyl alcohol, TWEEN 80, Capsaicin (DRUG), White soft paraffin, Aloe Vera, Carbopol 940, Methylparaben, Chloroform.

Methods

Standard curve of CAPS in methanol (30%v/v): By using the UV –Vis double beam spectrophotometer (Shimadzu, Japan), the absorbance of the solution (concentration range 1-10µg/mL) was recorded at 280nm (regression coefficient R2 – 0.999).

Formulation of nanoparticles (by o/w Nanoemulsion solvent evaporation method)

Using the method of "one variable at one time". In this method, the lipids were melted on a hot plate. The drug was dissolved in a solvent and added in a melted lipid. Lipids solution containing the drug was added dropwise into the aqueous solution then added a small portion of PVA solution under magnetic stirring for 1 hour. After that sonicated the o/w emulsion for 15 minutes and lastly, lyophilized and dry.[5] Then incorporated into an Aloe Vera gel.

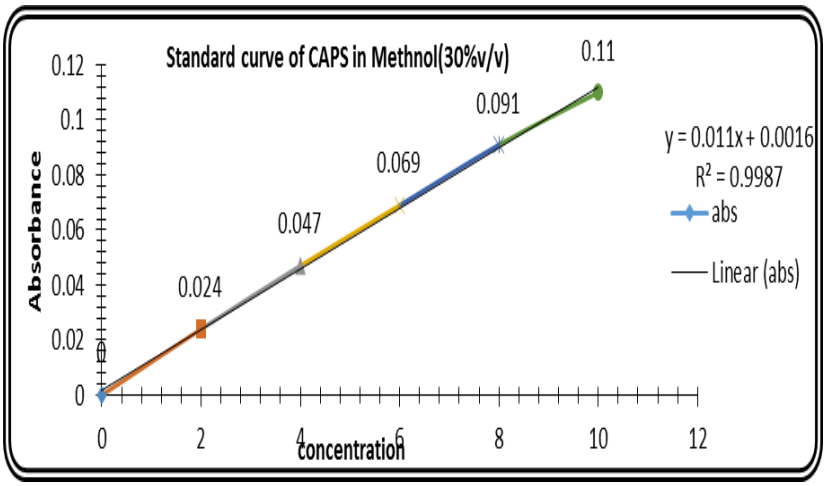

Fig. No. 1: Standard curve of CAPS.

Formulation of Aloe Vera Gel: Aloe Vera gel was prepared from the aloe juice, the central parenchymatous pulp was scooped out with a spatula from the aloe leaves. The pulp was washed repeatedly with water. The pulp was blended, to obtain a juice. The obtained juice was filtered using a cotton bed to remove the rind Particles. Carbopol 934 was added and dispersed in a liquid, it is used as a gelling agent. 0.5%w/w methylparaben was added to the liquid. A solution of 0.5N NaOH solution was added dropwise until a gel was formed. Aloe Vera gel was stored in an airtight container**.**

Characterization of Aloe Vera Gel

Determination of pH, Spreadability, and viscosity

• The pH of the gel was determined using Digital pH meter, standardized using pH4.0, pH7.0, and pH10.0.

• The spreadability of a gel was determined using the technique: 0.5g gel was placed within the circle 1cm diameter pre-marked on a glass plate over which a second glass plate was placed. A weight of 500g was allowed to rest on the upper glass plate for 5min. the increase in the diameter due to spreading of the gels was noted.

• A sample (30g) was placed in a beaker and was allowed to equilibrate for a min. Using spindle no 4, at rpm 60. All reading was taken in triplicates.

Determination of drug content: Drug content of nanoparticles based gel was determined by dispersing a predetermined amount of gel in methanol. Absorbance was measured at 280nm. Compared with the plain solution of CAPS. Measured the drug release pattern.

In vitro release: The release of drug from the solid lipid nanoparticles based gel was studied in pH 7.5 phosphate buffer using self-fabricated modified diffusion cell. An appropriate amount (0.500 g) of a gel was placed in a double cut tube whose one end was tied with pretreated cellophane membrane. This acted as a donor compartment. The tube was dipped in a beaker filled with 100ml of phosphate buffer of pH 7.5, this acted as a receptor compartment. The tube was mounted above a beaker of phosphate buffer in such a way that the surface of the membrane was remaining in contact with the receptor compartment. The whole assembly was placed on a magnetic stirrer with constant agitation speed and temperature maintained at 37˚C ± 2˚C.

3. RESULTS AND DISCUSSION

Characterization of CAPS loaded ALOE GEL

Evaluation of pH, Spreadability and Viscosity of gel

The pH was found to be 6.8 that are in acceptable limits. Spreadability is also an important property of the topical formulation. The diameter was found to be 6.8 cm, which indicates the good spreadability of the SLN based gel. Viscosity - The viscosity of gel was found to be 1340±4.950cps at 60 rpm at room temperature.

Table No. 1.

Evaluation parameter	Result
pH	6.8
Spreadibilty	6.8cm
Viscosity	1340±4.950cps

Drug release of plain capsaicin

In-vitro release of CAPS, was found 98.6±1.21% at 120 min.

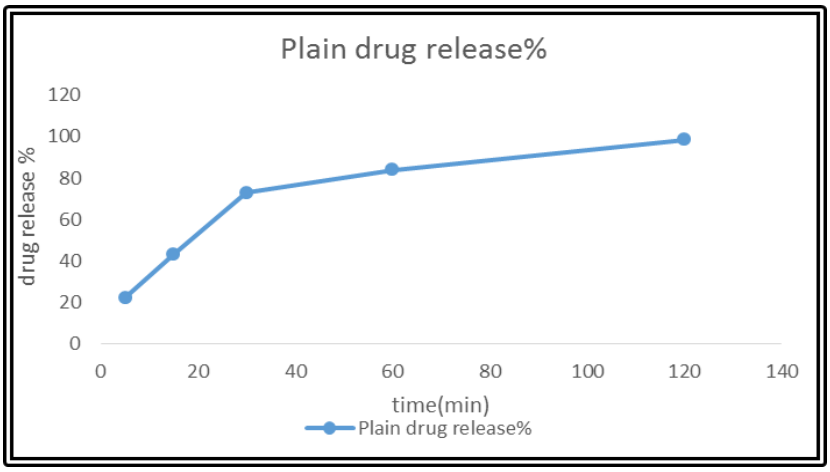

Fig No. 2: Plain CAPS release.

Drug release from Aloe gel: In-vitro release of gel presented in fig no-3, which showed the slower release of drug as compared to the capsaicin plain gel. Drug release from Aloe Vera gel of SLN was found 69.59±1.21% at 360 min.

Table No. 2: Drug release from Aloe gel.

S. No.	Time (min)	% Drug release from Aloe gel
01	5	14.85±2.21
02	30	25.09±1.51
03	60	39.266±0.55
04	120	46.66±3.34
05	180	53.35±1.53
06	240	64.30±4.21
07	300	69.59±1.21

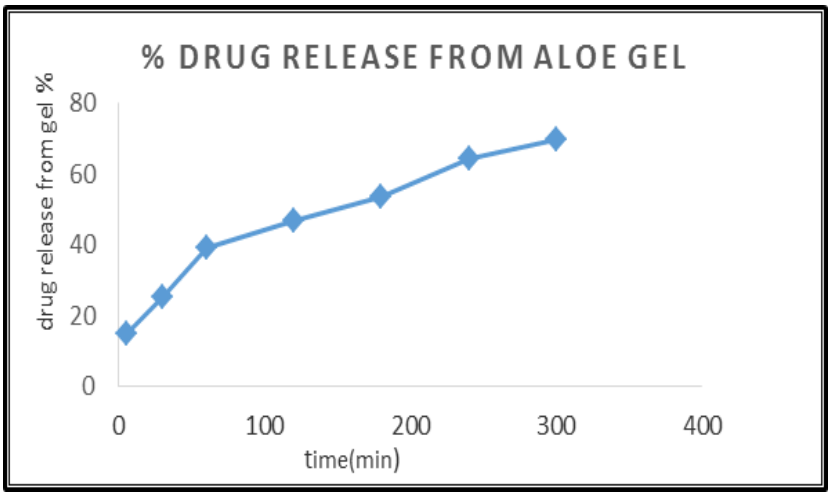

Fig No. 3: Drug release from Aloe gel.

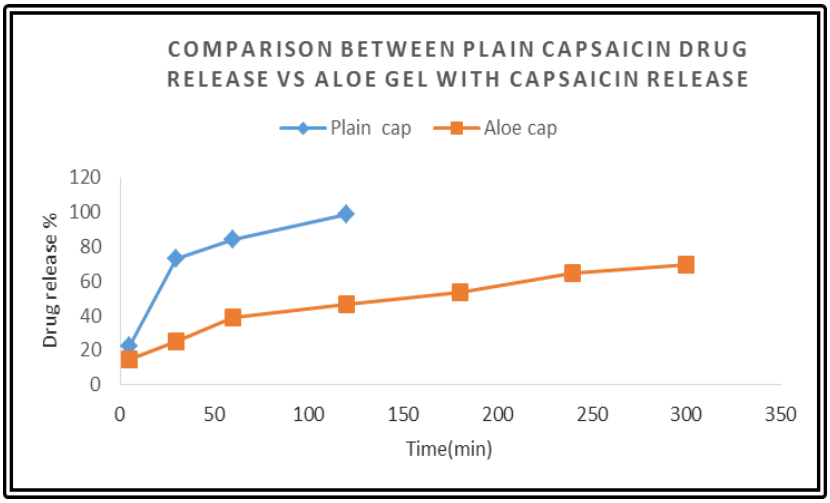

Fig No. 4: Comparison between Plain CAPS and CAPS with Aloe gel.

4. CONCLUSION

Capsaicin is an irritating chemical constituent with a shorter half-life.The release study shows the prolonged release pattern in the CAPS loaded Aloe gel formulation in comparison to the plain Capsaicin. The gel formulated by the incorporation of capsaicin loaded gel is shown further retardation of drug release. So, according to the in-vitro drug release pattern, concluded that Aloe gel in a promising approach for the topical delivery of capsaicin. Therefore, Aloe gel represents an easy to manufacture, the stable, physiologically compatible system with prolonged drug release and reduced irritancy.

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