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FORMULATION AND EVALUATION OF ACECLOFENAC MATRIX TABLETS

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Abstract:

Aim: *The concept of sustained release tablet can be utilized to provide a long lasting and more reliable release of drug in GIT to ultimately develop a once daily formulation. Thus, they prolong the dosing intervals, but also increase patient compliance beyond the level of existing conventional dosage forms. Aceclofenac, an analgesic and anti-inflammatory agent is used in the management of osteoarthritis, rheumatoid arthritis and ankylosing spondylitis. It is a drug with short biological half-life (4 hrs) and dosing frequency more than one per day which makes it an ideal candidate for sustained release. The present investigation was planned to formulate and evaluate the Aceclofenac once daily sustained release tablets.*

Methodology: *The tablets were prepared by direct compression method and were subjected for in vitro drug release studies. The mechanism of drug release was determined using various kinetic models.*

Results: *The results revealed that all the formulated tablets had acceptable physical properties and showed release up to 24 hrs. The kinetic studies revealed that all the formulations followed Higuchi matrix model. The formulations were subjected to the comparative study of in vitro drug release with the marketed formulation, the results of which showed that the drug release from the optimized formulation showed comparatively equal to marketed product. Further the stability studies were carried out as per the ICH guidelines for three months proved that the formulated tablets were stable at the accelerated conditions of temperature and humidity.*

Conclusion: *Based on the in vitro results it was concluded that the matrix tablets prepared with HPMC K4M, Acrycoat G971 provided the oral sustained release of Aceclofenac.*

Key words: *Aceclofenac, Matrix tablets, Sustained release, AcrycoatG971, Hydroxy propyl methyl cellulose, Direct Compression.*

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INTRODUCTION:

The modern controlled-release system is capable of producing sustained release, (i.e., a release rate that is not greatly influenced by the gastrointestinal environment). A sustained release dosage form delivers the drug in a predictable, pre-programmed, pre- determined rate for a longer period of time. The aim of sustained delivery of drugs is to achieve a convenient, self-administered dosage form that yields a constant infusion of the drug for a longer period of time [1,2].

Oral controlled-release drug delivery is thus a drug delivery system that provides the continuous oral delivery of drugs at predictable and reproducible kinetics for a predetermined period throughout the course of GI transit [3,4].

In the exploration of oral sustained release drug administration, one encounters three areas of potential challenges like Development of a drug delivery system, Modulation of gastrointestinal transit time and to minimize hepatic first pass metabolism.

Aceclofenac is a newer derivative of phenyl acetic acid group of non-steroidal anti inflammatory drug (NSAID) that exhibits analgesic and anti-inflammatory activities. It directly blocks the prostaglandin synthesis. It is a first-line drug in the symptomatic treatment of osteoarthritis, rheumatoid arthritis and ankylosing spondylitis. It is a drug with short biological half-life (about 4 hr) and dosing frequency more than one per day which makes it an ideal candidate for sustained release. To reduce the frequency of administration and to improve patient compliance, a once daily sustained release formulation of Aceclofenac is desirable.

MATERIALS AND METHODS:

Materials

Aceclofenac was gift sample from Karnataka Antibiotics Pharmaceuticals Ltd, Bangalore, Karnataka. HPMC K 4 M, Acrycoat G971, Microcrystalline cellulose were purchased from SD Fines Chem Ltd, Mumbai. All other chemicals and reagents used were of analytical grade.

Methods:

Analytical Estimation

Preparation of Standard Solution:

Standard stock solution of Aceclofenac was prepared in methanol. 100 mg of Aceclofenac was accurately weighed into 100 ml volumetric flask and dissolved in small quantity of methanol. The volume was made up with methanol to get a concentration of 1mg/ml i.e. (1000µg/ml) (SS-I). From this 10 ml solution was withdrawn and diluted to 100 ml of phosphate buffer pH 6.8 to get a concentration of 100µg/ml (SS-II).

Preparation of Working Standard Solutions:

Further, from (SS-II) aliquots of 0.2ml, 0.4ml, 0.6ml, 0.8ml, 1.0ml, 1.2ml, 1.4ml, 1.6ml, 1.8ml and 2.0ml were pipette into 10ml volumetric flasks. The volume was made up with phosphate buffer pH6.8 to get the final concentrations of 2, 4, 6, 8, 10, 12, 14, 16, 18 and 20 µg/ml respectively, the absorbance of each concentration was measured at 276nm.

Compatibility Studies of Drug and Polymers [5] :

FTIR study:

Infrared spectra of the physical mixture of the aceclofenac, polymers individually and the mixture of drug and polymer were taken and compared.

Differential Scanning Calorimetry [5]:

Differential scanning calorimetry of the formulation composition, drug and polymers individually and the mixture of drug and polymer were taken and compared. The DSC thermograms were recorded at a heating of 5ºC/ min from 0ºC to 300ºC.

Preparation of Matrix Tablet [6, 7, 8]:

The Matrix tablets were fabricated by direct compression as per the formula shown in Table 1**.** Acrycoat G971 is a granular form of Carbomer. It is extensively used in sustained release formulations. It gives sufficient mixing at pre and post granulation stage so it maintains reproducibility of required release profile and it is also known as pH-dependent material.

The drug, polymers, and gums were mixed for 5 min in mortar with pestle according to geometric spatulation method, except magnesium stearate which was added at last and mixed before passing the mixture through sieve no: 60. Finally the mixture was compressed using 11 mm concave shaped punches in Elit Jemkay Engineers tablet punching machine to get biconvex tablets of 400 mg weight. The resulting matrix tablets were subjected to various evaluation parameters.

Table 1: Formulations of Matrix Tablets of Aceclofenac Using Different Polymer Combinations

Sl. No	Ingradient	F1	F2	F3	F4	F5	F6
1	Aceclofenac	200	200	200	200	200	200
2	HPMC K4M	55.5	73	88	92	98	100
3	Acrycoat G971	55.5	37	22	18	12	10
4	MCC	80	80	80	80	80	80
5	Talc	6	6	6	6	6	6
6	Magnesium stearate	4	4	4	4	4	4

**All the quantities are expressed in mg.*

Evaluation of Powder Blend:

Pre-Compression Parameters [9-11]:

a)Bulk Density:

Both loose bulk density (LBD) and tapped bulk density (TBD) were determined. An amount of powder blend was introduced in a 100 ml measuring cylinder. Then the weight of powder blend was determined by subtracting the weight of empty measuring cylinder from final weight of measuring cylinder. The cylinder was allowed to fall onto a hard surface from a height of 2.5 cm at 2 sec intervals.

b) Carr's Compressibility Index:

An important measure that can be obtained from bulk density determinations is the percent compressibility C, grading of the powders for their flow properties.

c) Hausner's Ratio:

Hausner's ratio is an indirect index of ease of measuring the powder flow. It is calculated by the following formula:

$$\text{Hausner's ratio} = \frac{\text{Tapped density}}{\text{Bulk density}}$$

Lower hausner's ratio (<1.25) indicates better flow properties than higher ones (>1.25).

d) Angle of Repose:

The angle of repose of the powder blend was determined by using funnel method. The accurately weighed powder was taken in a funnel. The height of the funnel was adjusted in such a way that the tip of the funnel just touched the apex of the heap of the powder. The diameter of the powder cone was measured and angle of repose was calculated by using the equation

$$\tan \theta = \frac{h}{r}$$

Where

h and r are the height of pile and radius of the base of pile.

Different ranges of flowability in terms of angle of repose are given below in the table 9.

Post Compression Parameters [12,13]:

All the prepared matrix tablets were evaluated for the following official and unofficial parameter and their values are tabulated in Table 13.

a)Appearance:

Organoleptic properties such as color and odour were evaluated. Ten tablets from each batch were randomly selected and their colors were visually compared and odour was checked.

b) Dimensions:

Thickness and diameter of the tablet was measured using Mitutoyo Digital Vernier caliper. Ten tablets of the formulation were picked randomly and measured individually.

c) Hardness:

Hardness was measured using Monsanto & Pfizer Hardness Tester. For each batch five tablets were used.

d) Friability:

Twenty tablets were weighed and placed in the Electrolab EF2 friabilator USP and apparatus was rotated at 25 rpm for 4 minutes. The tablets were dedusted and weighed again. The percentage friability is measured using the formula:

$$\text{Friability} = \{1-(W_t/W)\} \times 100$$

Where,

F = Friability in percentage

W = Initial weight of tablets
W_t = Weight of tablets after friabiation

e) Weight variation:
Twenty tablets were randomly selected from each batch and weighed, the average weight was calculated and then they were weighed individually to calculate standard deviation.

f)Drug Content Uniformity [14-16]
Twenty tablets were weighed and powdered. The quantity equivalent to 100mg of Aceclofenac was weighed accurately and taken in 100ml volumetric flask. 50ml of methanol was added and stirred/sonicated for 5min. The volume was made up to 100ml with methanol and filtered

From the above solution 25ml aliquot was pipetted into 100ml volumetric flask and the volume was made with methanol. From this 1.1ml and 2.0ml were pipetted into 25ml volumetric flasks and the volume made with phosphate buffer pH6.8. The absorbance was measured at the 276 nm by using phosphate buffer pH6.8 as a blank. The content uniformity was calculated.

g)Water Uptake Study [17]
The swelling of the polymers can be measured by their ability to absorb water and swell. Three tablets from each formulation were kept in a petridish containing phosphate buffer pH 6.8. After a selected time intervals the tablets were withdrawn blotted to remove excess water and weighed. Swelling characteristics of the tablets is expressed in terms of water uptake (WU) which is calculated by using the equation. The values are represented in Table 5.

$$(\%)WU = \frac{\text{Weight of the swollen tablet - initial weight of the tablet}}{\text{Initial weight of the tablet}} \times 100$$

***In vitro* Dissolution Studies [14]:**
Dissolution of the tablets was carried out on USP type I apparatus using basket. The tablet was put in the jars containing 900 ml of dissolution medium and the medium was stirred at 50 rpm and the temperature of the medium was maintained at 37 ± 0.5ºC. For the first two hours the jars were filled with 0.1N Hydrochloric acid. After second hour the jar assembly was lifted and the dissolution fluid was replaced with phosphatefer pH6.8 for a period of 24hours. Samples of 5ml were collected at predetermined time intervals for 24hr. The withdrawn samples of first two hours were diluted to 25ml with 0.1N HCL, filtered and analyzed on UV spectrophotometer at 276 nm using 0.1N HCL as a blank and the further withdrawn samples from phosphate buffer pH6.8 were diluted to 25ml with the same solvent, filtered

and analyzed at 276 nm using phosphate buffer pH6.8 as a blank. Percentage cumulative drug release was calculated. Further the obtained results were compared with the results of *in-vitro* dissolution of the marketed tablet preparation. The values and graphs are represented in Table 6 and graph 6, 7 respectively.

Data Analysis [18,19]:
To analyze the mechanism of release and release rate kinetics of the dosage form, the data obtained were fitted into Zero order, First order, Higuchi matrix, Peppas and Hixon Crowell model. Based on the 'R' value, the best-fit model was selected.

Zero Order Kinetics:
Drug dissolution from pharmaceutical dosage forms that do not disintegrate and release the drug slowly, assuming that the area does not change and no equilibrium conditions are obtained can be represented by the following equation:

$$\mathbf{Q_t = Q_o + K_o t}$$

Where,
Q_t = amount of drug dissolved in time t
Q_o = initial amount of the drug in the solution
and
K_o = zero order release constant.

First Order Kinetics:
To study the first order release rate kinetics, the release rate data were fitted to the following equation:

$$\mathbf{\text{Log } Q_t = \log Q_o + K_1 t/2.303}$$

Where,
Q_t = amount of drug released in time t
Q_o = initial amount of drug in the solution and
K_1 = first order release constant.

Higuchi Model:
Higuchi developed several theoretical models to study the release of water soluble and poorly soluble drugs incorporated into semisolids and or solid matrices. Mathematical expressions were obtained for drug particles dispersed in a uniform matrix behaving as the diffusion media and the equation is:

$$\mathbf{Q_t = K_H \cdot t^{1/2}}$$

Where,

Q_t= amount of drug released in time t.

K_H = Higuchi dissolution constant.

Krosmeyer and Peppas Release Model:

To study this model the release rate data are fitted to the following equation:

$$Mt / M\infty = K \cdot t^n$$

Where,

Mt/M_∞ = fraction of drug release

K= release constant

t= release time and

n= diffusion coefficient.

Comparison of Release Profile:

Several methods are recently proposed to compare the drug release profile. The most important among them are similarity factor and dis-similarity factor.

The similarity factor (f1) is a logarithmic reciprocal square root transformation of one plus the mean squared (the average sum of squares) differences of drug percent dissolved the test and the reference products given by the equation,

$$F1= 50\times\log \{[1+ (1/n) \Sigma_{j=1}^{n} (R_j - T_j)^2]^{-0.5} \times100\}$$

The dis-similarity factor (f2) measures the percent error between two curves over all time points. By the equation,

$$F2= \{[\Sigma_{j=1}^{n} |R_j - T_j|] / [\Sigma_{j=1}^{n} R_j]\} \times100$$

Where n is the sampling number, R_j and T_j are the percent dissolved of the reference and test products at each time point.

In order to consider the similar dissolution profiles, f1 values should be close to 100 and f2 values should be close to 0. In general, f1 values higher than 50 (50-100) and f2 values lower than 15 (0-15) show the similarity of the dissolution profile in Table 6.

Accelerated Stability Studies for the Optimized Formulation:

Stability studies were carried out as per ICH guidelines, at 40 ± 2^0C/75 ± 5% RH. Stability studies were carried out using Neutronics stability chamber. The temperature and relative humidity values selected at 40 ± 2^0C/75 ± 5% RH for a period of 3 months.

RESULTS AND DISCUSSION:

Oral drug delivery system represents one of the frontier areas of sustained drug delivery system; such dosage forms are having a major advantage of patient compliance. Sustained release oral delivery system are designated to achieve therapeutically effective concentrations of drug in the systemic circulation over an extended period of time, thus achieving better patient compliance and allowing a reduction of both the total dose of drug administered and the incidence of adverse side effects.

Matrix systems still appear as one of the most attractive from both economic as well as the process development and scale-up points of view. It has been shown that the suitable combination of more types of polymers as matrix-forming materials enables appropriate modifications of the release characteristics of the drug from the dosage form.

In keeping with the concept of reducing production costs, a simple, directly compressed formulation consisting of two principal components was envisaged. These components are the drug and a material that retards drug release. With appropriate choice of the retardant, compaction of the mixture would lead to the formation of a matrix tablet. In the manufacture of tablets, in general, direct compression is a cost effective production method. When the technique is applied to sustained release medication, the savings in time and labour are very attractive. Hence the direct compression technique was applied to the formulation of tablets in the present study. Polymers such as HPMC K4M (14-25%), Acrycoat G971 (2.5-14%) in different ratios were employed.

Preformulation Parameters:

Analytical Estimation

UV scanning of the drug revealed that the drug had λmax of 276nm in methanol.

From the standard curve Aceclofenac; it was observed that the drug obeyed beer's law in concentration range of 2-20 µg/ml in methanol. The linear regression equation generated was used for the calculation of amount of drug (y=0.035x+0.009).

Compatibility Study:

Physical mixture of drug and polymer was characterized by FTIR & DSC spectral analysis for any physical as well as chemical alteration of the drug characteristics. From the results it was concluded that there was no interference of the functional groups as the principal peaks of the Aceclofenac were found to be unaltered in the spectra of the drug- polymer physical mixture. Their respective generated scans are shown in Fig 1 -4.

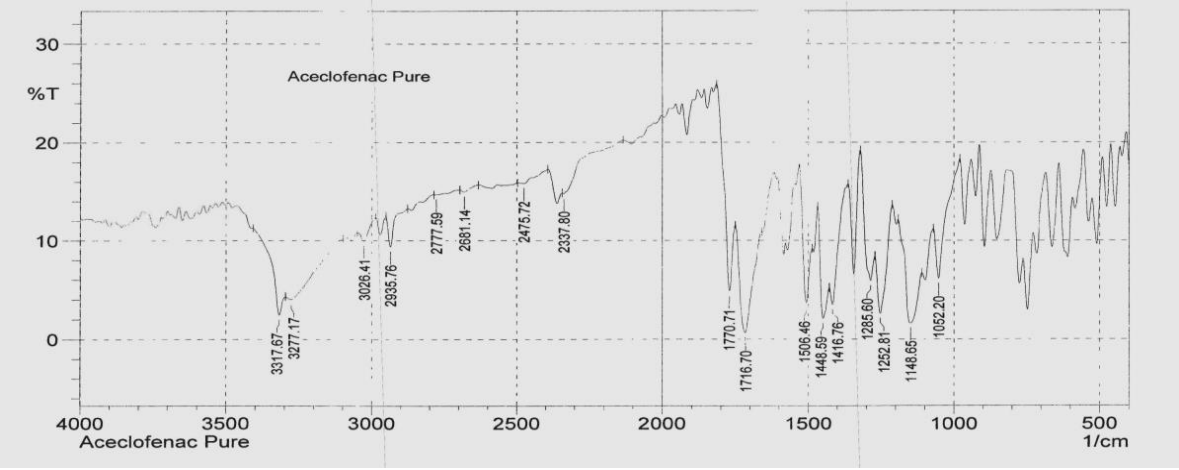

Fig 1: FTIR Spectra of Aceclofenac.

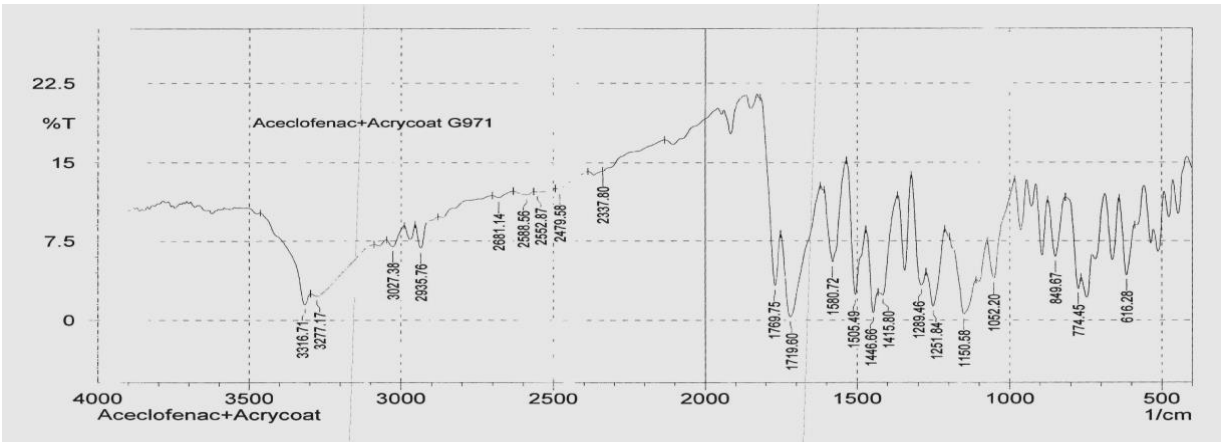

Fig 2: FTIR Spectra of Optimized Formulation

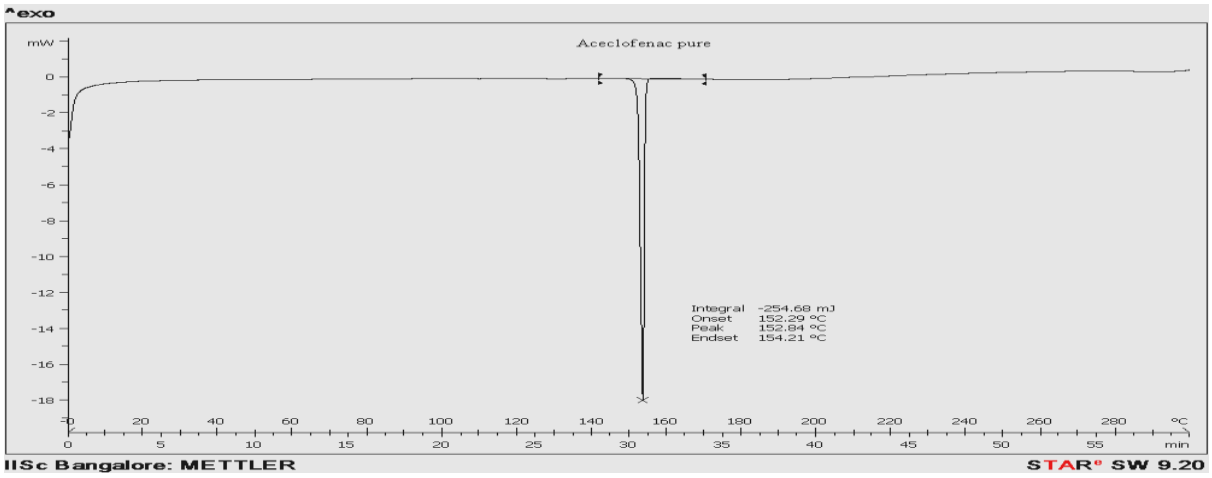

Fig 3: DSC Spectra of Aceclofenac

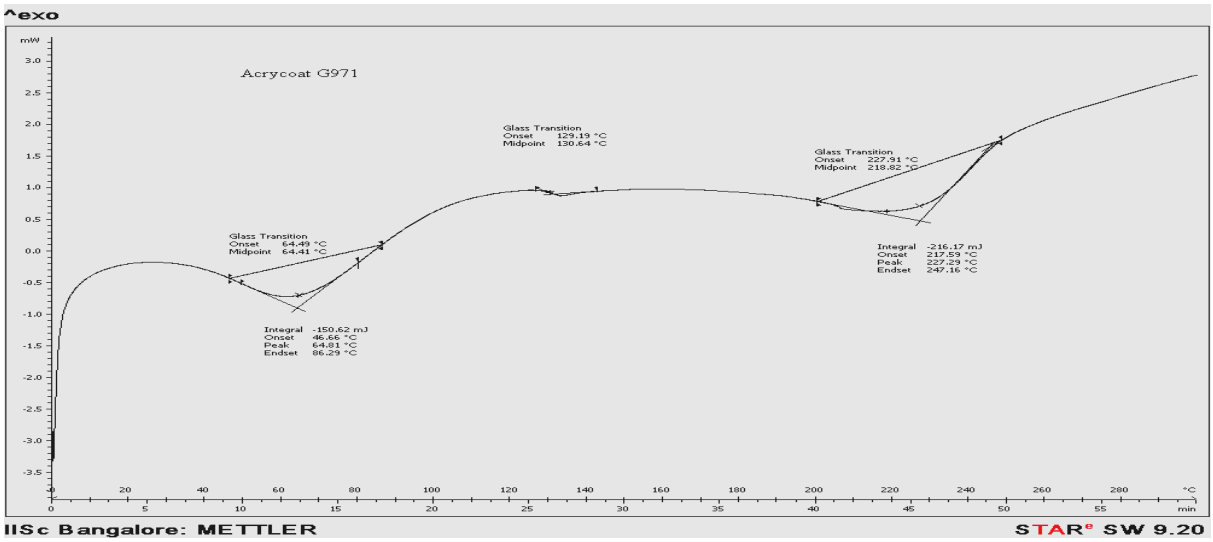

Fig 4: DSC Spectra of Optimized Formulation

Formulation Design:

Six formulations of matrix tablets were prepared (F1 to F6) as given in Table 2. Using various polymers such as HPMC K4M and Acrycoat G971 in different ratios. The tablets were prepared by Direct Compression method. The formulated matrix tablets are shown in Fig 5.

Microcrystalline cellulose was used as diluents, talc as a glidant and Magnesium stearate as a lubricant in appropriate concentration.

All the formulations were prepared by keeping constant tablet weight of 400mg with an average hardness 6.5 kg/cm².

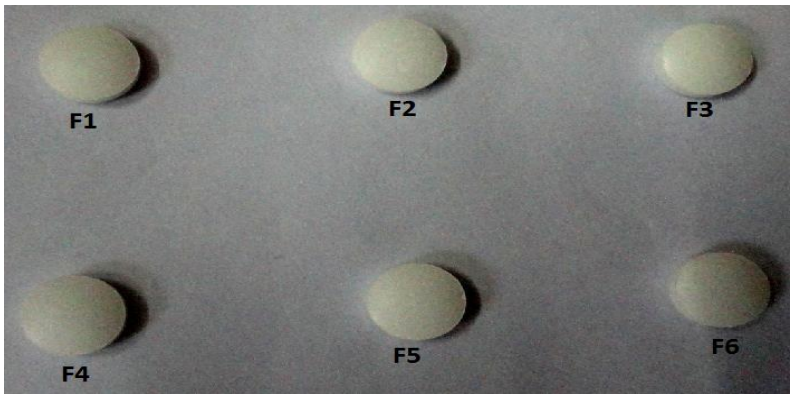

Fig 5: Formulated Matrix tablets

Table 2: Ingredients used in the Formulation

Sl. no.	Ingredients	Quantity P\er Tablet	Amt. in (%)
1	Aceclofenac	200mg	50%
2	HPMC K4M	55-100mg	14-25%
3	Acrycoat G971	10-55mg	2.5-14%
4	Microcrystalline cellulose	80mg	20%
5	Talc	6mg	1.50%
6	Magnesium stearate	4mg	1%

Evaluation Parameters:

Pre Compression Evaluation:

Carr's compressibility index was found to be less than 15% for all the formulations indicating that the powder is compressible. Bulk density and True densities were found to be <1 for all the formulation powders. The results of repose angle studies indicated that, the powders of all the formulations have free flow and easily compressible and values were mentioned in Table 3.

Post Compression Evaluation:

a)Physicochemical Properties:

The prepared tablets were subjected to preliminary characterization such as hardness, thickness, % weight variation, friability and drug content. Evaluation studies indicated that, the values of various parameters were within the permissible limits of pharmacopoeia for all the formulations. All values are tabulated in Table 4.

b)Water Uptake Study (Swelling index):

All the formulations showed increases in weight indicating that, the polymer employed in the present investigation were having a capacity to swell the tablets. The percentage water uptake ranged from 131-138% after 24 hrs for formulation. The values are shown in Table 5.

Table 3: Angle of Repose, Loose Bulk Density, Tapped Bulk Density and Carr's Compressibility Index

Formulations	Angle of repose	Loose bulk density (g/ml)	Tapped bulk density (g/ml)	% Compressibility	Hausner's ratio
F1	24^0 65'	0.51	0.583	12.52	1.14
F2	$23^0$73'	0.416	0.482	13.69	1.15
F3	$24^0$16'	0.423	0.492	14.54	1.17
F4	$22^0$68'	0.309	0.309	12.46	1.14
F5	$24^0$89'	0.306	0.306	13.8	1.16
F6	$23^0$58'	0.322	0.322	14.36	1.16

Table 4: Evaluation Parameters of Prepared Aceclofenac Matirix Tablets

Formulation code	Evaluation parameters					
	Thickness±SD (mm)(n=10)	Diameter±SD (mm) (n-10)	Hardness±SD (kg/cm2) (n=5)	Friability %	Average weight variation (n=20) mg	Drug content
F1	6.03±O.O29	9.55±0.007	6.62±0.636	0.3	404.9±8.066	97.77
F2	6.06±0.023	9.55±0.019	6.88±0.460	0.6	402.4±7.260	96.5
F3	6.04±0.031	9.94±0.020	5.96±1.138	0.6	403.2±9.964	96
F4	6.05±0.018	9.55±0.022	5.86±0.506	0.5	405.5±6.639	97.48
F5	6.06±0.023	9.54±0.026	6.98±1.153	0.5	404.2±8.642	96.1
F6	6.05±0.026	9.55±0.019	6.12±0.135	0.6	405±4.404	95.45

Table 5: Percentage Water Uptake (Swelling Index) Study

Time in hours	Formulation code (n=3)					
	F1	F2	F3	F4	F5	F6
2	59.02±7.96	63.27±8.23	62.77±8.23	63.22±10.44	67.37±8.0	63.5±6.46
4	87.06±8.23	81.21±5.87	83.63±11.70	80.98±9.89	82.43±11.01	82.16±7.04
6	98.50±6.78	99.79±7.15	104.05±7.50	98.02±8.76	101.3±8.39	99.36±4.59
8	106.50±9.47	113.60±7.29	110.74±4.02	112.98±7.44	108.4±7.23	105.1±2.86
24	137.14±9.98	134.57±9.25	131.57±8.15	132.14±6.94	135.39±9.68	133.98±7.97

c) *In-vitro* Drug Release Profile

In vitro drug release studies were carried out in dissolution test apparatus USP TDT- 08L with basket type in 900ml of 0.1N HCL for first two hours and 900ml of phosphate buffer pH 6.8 up to 24 hours. These release studies revealed that, the order of release was found to be:

F6>F5>F4>F3>F2>F1

In vitro release profiles were shown in table 6, Fig 6 and 7. Based on the results of *in vitro* release studies F5 were selected as optimized formulation. These formulations were compared with the marketed preparation. The release rate of the optimized formulation was comparatively similar to the Marketed preparation.

Table 6: Cumulative Drug Release of F1 to F7 and Marketed Product

Time in hr	%CDR of formulations ± S.D.						
	F1	F2	F3	F4	F5	F6	Marketed Product
1	0.39 ± 0.0103	0.39 ± 0.0041	0.39 ± 0.0041	0.64 ± 0.0083	1.16 ± 0.0051	1.67 ± 0.0200	1.41 ± 0.0150
2	0.77 ± 0.0200	1.03 ± 0.0126	0.77 ± 0.0044	1.29 ± 0.0204	1.66 ± 0.0107	2.19 ± 0.0103	1.93 ± 0.0100
3	3.09 ± 0.0103	2.69 ± 0.0083	19.67 ± 0.0163	26.49 ± 0.0060	20.18 ± 0.0401	21.21 ± 0.0202	19.93 ± 0.0155
4	3.21 ± 0.0103	3.99 ± 0.0165	23.91 ± 0.0084	29.70 ± 0.0047	25.58 ± 0.0301	26.49 ± 0.0025	25.84 ± 0.0068
5	3.99 ± 0.0103	4.50 ± 0.0082	26.23 ± 0.0163	31.89 ± 0.0209	28.54 ± 0.0067	31.24 ± 0.0300	28.67 ± 0.0100
6	4.63 ± 0.0300	5.91 ± 0.0123	30.47 ± 0.0124	33.81 ± 0.0123	33.42 ± 0.0092	35.87 ± 0.0100	34.33 ± 0.0100
7	7.20 ± 0.0200	9.26 ± 0.0083	30.73 ± 0.0051	37.67 ± 0.0163	37.67 ± 0.0200	38.83 ± 0.0200	37.54 ± 0.0101
8	9.90 ± 0.0300	11.96 ± 0.0083	32.01 ± 0.0084	38.19 ± 0.0130	41.27 ± 0.0200	48.21 ± 0.0103	41.40 ± 0.0100
12	11.44 ± 0.0201	14.40 ± 0.0125	38.19 ± 0.0060	41.91 ± 0.0246	51.82 ± 0.0103	61.46 ± 0.0201	52.07 ± 0.0100
24	21.60 ± 0.0153	24.17 ± 0.0082	59.91 ± 0.0130	72.26 ± 0.0128	93.73 ± 0.0151	98.74 ± 0.0101	93.99 ± 0.0050

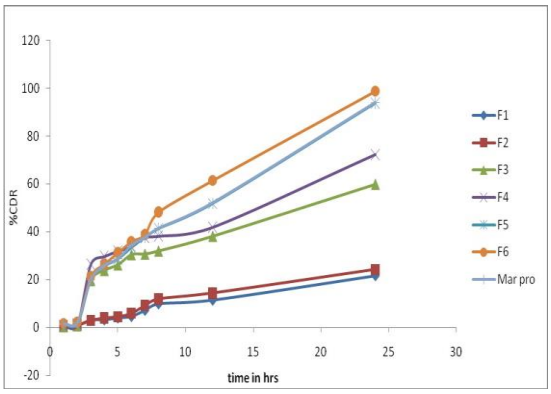

Fig 6: *In Vitro* Drug Release Profile of Aceclofenac Matrix Tablets

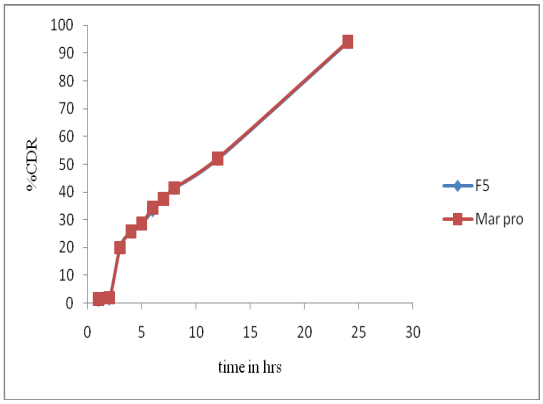

Fig 7: *In Vitro* Drug Release Profile of Optimized Formula and Marketed Product

Data Analysis:
The curve fitting results of the release rate profile for the designed formulations was subjected for data analysis. It was found that all the formulations were fitted into Higuchi matrix model, which is the best fitted model. From the Higuchi equation k and R values were calculated. The results indicated that, the release mechanism of Aceclofenac is diffusion controlled, followed by non-fickian transport.

The comparison release profile for Optimized formula was done by similarity and dis-similarity factors and formulation F5 showed was Optimized (Table 7).

Table 7: Comparison of release profile

Formulation code	Similarity factor	Dissimilarity factor
F5	0.8466	101.3081
F6	8.5431	131.3813

Stability Studies:
Accelerated Stability studies were carried out for the formulations as per ICH guidelines for 3 months. The formulation showed good stability and values are under permissible limits. No changes in drug release profiles were observed. FTIR study showed that no significant interaction after 3 months between the drug and excipient [Fig 8].

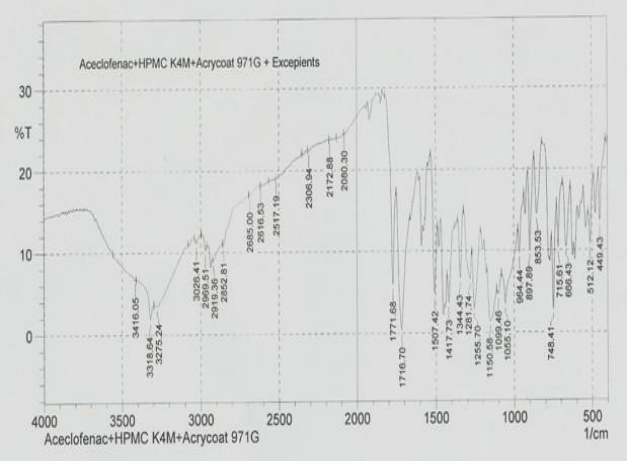

Fig 8: FTIR Spectra after 3 Months of Stability Study.

CONCLUSION:

The powder blend of the mixture of Aceclofenac, HPMC K4M and Acrycoat G971 and other excipients has a good flow property and compressibility index. As the time increased the swelling index also increased. The release of Aceclofenac from matrix tablet is in a sustained manner. The formulation prepared in combination with HPMC K4M and Acrycoat G971 (F5) showed better similarity to the marketed product and has been optimized. The overall drug release of the optimized formulation is less than that of the marketed product but it has comparatively similar release pattern compared to marketed product. Sustained drug release following Higuchi matrix kinetics of Aceclofenac matrix tablets prepared from the polymers HPMC K4M and Acrycoat G971 can be successfully employed as a once daily oral sustained drug delivery dosage form. Optimized formulations, F5 were found to be stable for a period of 3 month at accelerated conditions of temperature and humidity. Promising sustained release matrix tablet of Aceclofenac has been developed. From the above experimental data it can be concluded that a successful matrix sustained drug delivery system for Aceclofenac have been developed by using the polymers such as HPMC K4M and Acrycoat 971G.

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