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Design and development of medicated jelly as preventative measure for cancer.

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Abstract

Recently cancer is measure cause leading to death, So Herbal formulations always have been attracted considerable attention because of their good activity and comparatively lesser or nil side effect with drug. Herbal formulation of *Brassica juncea* along with natural pomegranate syrup and carrageen as natural gelling agent was prepared. The prepared Oral medicated jellies have significant advantages of both solid and liquid dosage forms which were prepared by simple method using extract of *Brassica juncea* powder and pomegranate syrup. For all formulations, physical appearance, stickiness, pH, viscosity and In-vitro dissolution studies were assessed. The physical examination of the all batches was giving the potential results but, the optimized Batch B jelly gives best result as compared to other batch. From above result, it was concluded that the optimized medicated jelly having 97.17% dissolution rate showed significant anticancer and Neutraceuticals activities and hence will be safe and effective than allopathic medications.

Keywords: *Brassica juncea*, Pomegranate, Carageenan, Medicated jelly, Neutraceuticals.

INTRODUCTION:

Herbal formulations always have attracted considerable attention because of their good activity and comparatively lesser or nil side effects with drugs. Herbal formulation of medicated jelly is prepared using natural ingredients having anti-cancer activity for pediatric purpose. Recently cancer is measure cause leading to death, so we have taken Neutraceuticals as preventative measure for cancer**.** Plants have history of use in treatment of cancer. The many natural products isolated from plants source possess anticancer activity. The plant derived compounds constituents more than 50%of anticancer agents. The herbal medicine has become a tropic of globule importance, making an impact on the both world health and international tread. Many traditional herbals and herbalists have been treating cancer patients for many years using various medicinal plant species. Despite the long history of cancer treatment using herbal remedies. Information of traditional herbal practice is passed from one generation to other through oral tradition. [1]

The natural plant compounds are highly varied in structure many are aromatic substances, most of which are flavonoids, phenol, carbohydrates and proteins. Traditional use of medicine is recognized as way to learn about potential future medicine. The WHO estimate the 80% population are used the herbal medicine. The term neutraceuticals are emerging out of benefits from foods that goes beyond those attributable to essential nutrients these are promote the quality of life. [1,6]

The plants are containing flavonoids, phenol, carbohydrates and proteins, all these property gives in one plant such plant is *Brassica juncea.*[2,3,4]

Brassica juncea are medicinal plant belong to family-Cruciferae. It is commonly called as the Brown Mustard. In this plant mainly seed part is used .The size of seed is 1-1.6 mm in diameter and nearly spherical in shape. These plants are generally cultivated in India, Europe, U.S. A. and also in Utter Pradesh, Bihar and Bengal. The presence of compound like Glucosinolates, Mirosinase and Allyl isothiosinate in mustard seed are known as phytochemical to inhibit the growth of cancer cells. They are containing several medicinal properties like anti-oxidants, anti-inflammatory, anti-bacterial, analgesic and cardio protective.[2,3,4] The formulation is the totally herbal due to use of natural pomegranate syrup which also reported the neutraceutical as well as anti-cancer activity.[5,6]

Oral medicated jellies have significant advantages of both solid and liquid dosage forms as they remain solid during storage which aid in stability of dosage form, transform in liquid like form within few seconds to minute after its administration. Medicated jelly has been very well received by the parents for their use in children with full dentition.[8]

The present work is aimed at preparing formulation of medicated jellies as preventative measure for cancer using *Brassica juncea* along with natural pomegranate syrup.

MATERIALS AND METHODS:

Materials:

The raw materials like drug, polymers, excipients and chemical required for the present work were procured from different sources. Following materials were used for the formulation and evaluation of jelly.

Sr. No.	Materials	Manufacturer
1	*Brassica juncea*	Marketed
2	Pomegranate juice	Marketed
3	Carageenen	Yellow Chem Product
4	Sodium benzoate	Loba Chemie Pvt.Ltd.
5	Citric acid	Loba Chemie Pvt.Ltd.
6	Lemon juice	Marketed
7	Ethanol	Changshu Hongsheng Fine Chemical Co., Ltd.

Table 1 List of materials:

Experimental:

Extraction of pomegranate fruit-[11]

- The fully matured pomegranate fruits are selected.
- Then they are washed and cut properly.
- The arils are separated and press the arils.
- Then juice are collected.
- After collection of juice they are filtered.

Extraction of *Brassica juncea* powder-[12]

- To collect the *Brassica juncea* seed.
- Then this seeds are grinding to using mixer.
- After the grinding of seed they are available in powder form then these powders are sieved.
- Then taking accurate weight of powder and treated with organic solvent like ethanol.

Preparation of jelly [7]

- Weight accurately all ingredients (Pomegranate juice, *Brassica juncea* powder, carrageen, Citric acid, Lemon juice, Sodium benzoate etc.)
- Take pomegranate juice and heating on flame at 90^0C.
- Add sugar in juice with continous stirring to get desired consistency.
- At that time carrageen was socking with juice.
- Prepared citric acid and lemon juice take in another beaker for adjust the acidic pH.
- After the getting desired consistency addition of carrageen at the 60^0C with stirring.
- Then adjust the acidic pH for prepared solution of citric acid and lemon juice at same temperature.
- Heat the solution then pour into glass container.
- Stored in well closed container at room temperature.

Table 2: Formulation of Oral Medicated Jelly:

Sr. No.	Name of Ingredients	Quantity Taken		
		Batch A	Batch B	Batch c
1	*Brassica juncea*	1 gm	2 gm	3gm
2	Pomegranate juice	50gm	50gm	50gm
3	Suger	50gm	50gm	50gm
4	Carrageene	1gm	1.5gm	2gm
5	Citric acid	1gm	1gm	1gm
6	Sodium benzoate	0.02gm	0.02gm	0.02gm
7	Lemon juice	Q.S.	Q.S.	Q.S.

Determination of λ max:

Accurately weighed 10 mg *Brassica juncea* was taken, transferred to a 10 ml volumetric flask and volume was made to 10 ml with organic solvent ethanol.(Stock 1) From the stock-I solution, aliquots of 1mL were transferred to 10 ml volumetric flasks and final volume was made to 10 ml with phosphate buffer pH 6.8 to prepared solution. The wavelength of these solutions was measured using double beam UV spectrophotometer against a blank of phosphate buffer pH 6.8.

Calibration curve:

Accurately weighed 100 mg *Brassica juncea* was taken, transferred to a 100 ml volumetric flask and volume was made to 100 ml with phosphate buffer pH 6.8 (stock-I). The final dilutions of stock-I were then prepared in phosphate buffer pH 6.8. From the stock-I solution, aliquots of 0.5, 1.0, 1.5, 2.0,2.5,3.0 were transferred to 10 ml volumetric flasks and final volume was made to 10 ml with phosphate buffer pH 6.8 to prepare solution in the concentration range of 50-300µg/ml. The absorbance values of these solutions were measured at 229.5 nm using double beam UV spectrophotometer against a blank of phosphate buffer pH 6.8.

Evaluation of Medicated jelly:

Physical appearance:[4]

The prepared medicated jelly is inspected visually for color, odour and appearance.

Stickiness: [4]

Texture of the medicated jelly in term of stickiness has been evaluated by visual inspection of the product after mildly rubbing the jelly sample between two fingers.

Determination of pH: [4]

The pH of prepared jellies was measured using a digital pH meter at room temperature. For this purpose, 0.5gm of jelly was dispersed in 50mL of distilled water to make a 1% solution,and the pH was noted.

Viscosity: [4]

Brookefield Viscometer (Model DV-E) with helipath stand was used for rheological studies. The sample (50 g) was placed in a beaker and was allowed to equilibrate for 5 min before measuring the digital reading using a spindle No. 64 at 6 rpm. At this speed, the corresponding reading on the viscometer was noted.

In vitro dissolution study: [4]

An in-vitro dissolution study will performed with USP basket apparatus using pH 6.8 Phosphate buffer solution. Dissolution media was kept at 37^0C and 50 rpm. The sample (5ml) withdrawn after 5,10,15,20,30 and 35 minute and replaced with fresh pH 6.8 phosphate buffer solution. 5 ml sample then dilutd upto 10 ml in volumetric flask.The sample were determined for the drug content using UV spectrophotometer at wavelength 229.5nm.

RESULT AND DISCUSSION:

Determination of λ max:

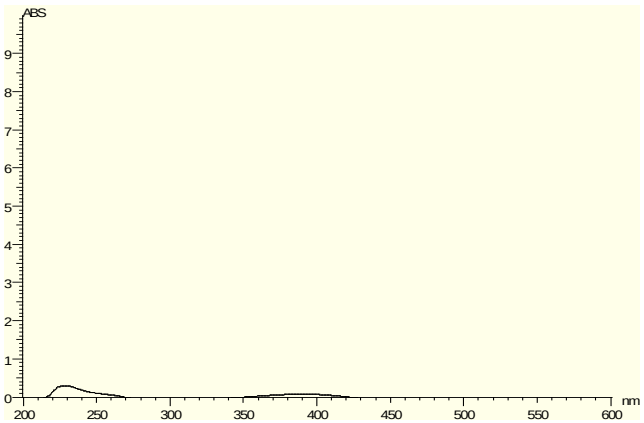

Figure 1: λ max of *Brassica juncea.*

The λ max of *Brassica juncea* was found to be 229.5nm.

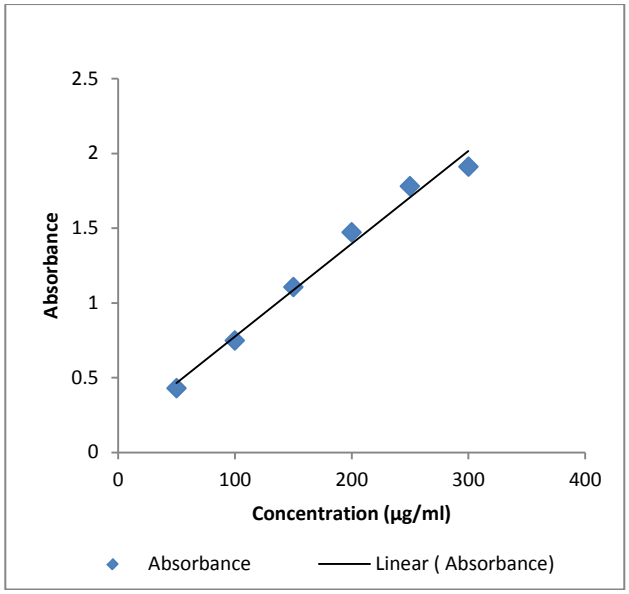

Figure 2: calibration of curve of *Brassica juncea.*

Sr. No.	Concentration(µg/ml)	Absorbance
1.	50	0.4295
2.	100	0.7486
3.	150	1.1045
4.	200	1.4710
5.	250	1.7801
6.	300	1.9099

Table 3: Observations for calibration curve of *Brassica juncea*.

Equation of straight line is:
Y = mX + C
Where,Y =absorbance, m = slope, X = concentration and C = the intercept

Sr.No.	Parameters	Values
1	λ max	229.5nm
2	Slope(m)	0.006207
3	Intercept(c)	0.1543
4	Correlation Coefficient(r^2)	0.9927

Table 4: Parameters of calibration curve of *Brassica juncea* pH 6.8

Physical evaluation of formulated *Brassica juncea* jelly:[4]
The prepared jelly was found to be following colour, odour and appearance shown in table 5.

Batch No.	Colour
Batch A	Dark pink
Batch B	Dark Pink
Batch C	Dark Pink

Table 5: physical evaluation of formulated *Brassica juncea* jelly

Stickiness of *Brassica juncea* jelly: [4]
The prepared jelly the stickiness was found to be following table no.6

Batch No.	Stickiness
Batch A	Sticky
Batch B	Sticky
Batch C	Sticky

Table 6: stickiness of *brassica juncea* jelly

pH measurement of *Brassica juncea* jelly:[4]
The pH of *Brassica juncea* jelly was found to 6.5, 6.3 and 6.4 in batch A, B and C respectively shown in Table 7.

Sr. No.	Batch No.	pH
1	Batch A	6.5
2	Batch B	6.3
3	Batch c	6.4

Table 7: PH Measurement Of *Brassica Juncea* Jelly

Viscosity measurement of formulated *Brassica juncea* jelly:[4]

The viscosity of jelly are shown in following table in batch A, B and C respectively.

Sr. No.	Batch No.	Viscosity (Cps)
1	Batch A	52390
2	Batch B	52390
3	Batch c	52390

Table No.8: Viscosity Measurement of Formulated *Brassica Juncea* Jelly

In vitro dissolution study: [4]
The percent cumulative drug release are shown in table in batch A, B and C respectively. The B batch gives the maximum percentage cumulative drug release as compared to other batches.

Sr.No.	Time(min.)	%Cumulative Drug Relese		
		Batch A	Batch B	Batch C
1	5	18.17%	20.95%	40.93%
2	10	39.22%	47.20%	47.14%
3	15	57.6%	54.02%	59.16%
4	20	65.03%	65.64%	74.32%
5	25	74.49%	74.26%	86.74%
6	30	90.29%	89.68%	91.62%
7	35	94.81%	97.17%	94.29%

Table 9: *In vitro* Dissolution Study

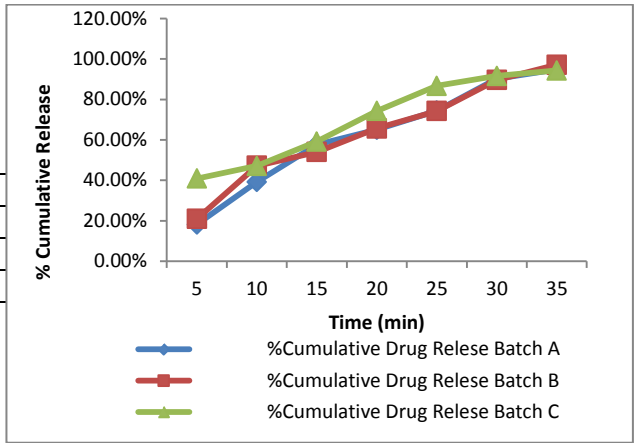

Figure 3: *In vitro* Dissolution Study

From the above result it was found the Batch-B is the most optimized batch having good result as compared to other batch.

CONCLUSION:

The above formulation of medicated jelly was concluded that the Batch A, batch B and Batch C gives the good result. The physical examination of the all batches were giving the good result but, the formulated Batch B gives optimum result as compared to other batch .The formulated Batch B gives the high dissolution rate 97.17%. Hence, from the overall results, finally it was concluded that the formulated herbal medicated jelly Batch B have significant anticancer and neutraceutical properties and hence will be better, safe and effective than allopathic medications.

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