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EXTRACTION OF FOOD COLORANT FROM POMEGRANATE PEEL

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Abstract

The palatability of food is enhanced by attractive colours. Colour, possibly more than any other factor, influences the acceptances of product by consumers. Colour is often seen as synonymous with quality and is used as a strong indicator of product safety and value. The pomegranate (*Punica granatum* L.) is an ancient fruit it has been widely consumed in various cultures for thousands of years. The pomegranate belongs to the family 3 Punicacea. This study was aimed to Extraction of food colourant from *Punica granatum* (Pomegranate) peel extract. To isolate colour pigment from Pomegranate peel extract.then Pigment extraction. To evaluate Stability test (pH and Temperature). To evaluate the Sensory analysis. To evaluate Product development (Jelly). This concludes that the acetone was very active in extracting polyphenolic compounds but it was not effective as methanol in extracting antibacterial and antifungal compounds from pomegranate peel.

Key words: *Punica granatum* L., colour pigment, anti bacterial, anti fungal

Introduction

The palatability of food is enhanced by attractive coolers. Colour, possibly more than any other factor, influences the acceptances of product by consumers. Colour is often seen as synonymous with quality and is used as a strong indicator of product safety and value. Foods with characteristic appeal and colour are generally preferred (Abdel-Rahim *et al*., 2013; Adams *et al*., 2006; Afaq *et al*., 2005; Akhtar *et al*., 2013; Altunkaya *et al*., 2013). The pomegranate (*Punica granatum* L.) is an ancient fruit; it has been widely consumed in various cultures for thousands of years. The pomegranate belongs to the family Punicacea Fig. 2. It is native from the area of Iran to the Himalayas in northern India, and has been cultivated and naturalized over the entire Mediterranean region since ancient times. Recent years have seen increased interest on the part of consumers, researchers, and the food industry into how food products can help maintain health; and the role that diet plays in the prevention and treatment of many illnesses has become widely accepted (Lekshmi & Praseetha, 2019; Lekshmi *et al*., 2019; Devatkal *et al*., 2012). Bioactive fractions of pomegranate peel, particularly the minerals and fibers have been reported to be utilized as dietary ingredients for earning associated health benefits. The inorganic residues of pomegranate peel in addition to the promising concentration of dietary fibers (12.17%) and plant phenolics (1.261%) are reported to embrace health promoting features particularly prebiotic, anti-inflammatory, apoptotic, hypoglycemic and anti-parasitic properties (Dhingra *et al*., 2012; Giridhari Lal *et al*., 1986; Gil *et al*., 2000). The present study is to highlight the importance of pomegranate peel as a food bulking agent and its biological fractions as valuable substitutes to the natural food additives. To investigate antioxidant and antimicrobial potential of locally consumed pomegranate peel extracts. To evaluate lipid per-oxidation inhibitory effects of peel extract to enhance product shelf life. To explore nutritional potential of pomegranate peel (yield after solvent extraction) and its utilization in jellies. To produce organoleptically acceptable peel and peel extracts based jellies and their evaluation for antioxidant and stabilizing potential in foods. To evaluate peel extracts are supplemented jellies for their safety aspects using animal models (Holland *et al*., 2009; Anooj *et al*., 2019;

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Indu Rani *et al*., 2004).

Material and methods

Collection of Sample

The *Punica granatum* (Pomegranate) extract used in formulation of jelly was collected in the month of December 2018. *Punica granatum* (pomegranate) were purchased from the local market of Chennai (Koyambedu) in Tamil Nadu, India. The collected fruit were gently washed with tap water twice, then they were rinsed with distilled water. The skin of fruits were peeled out and stored at 4°C for futher use.

Extraction of Colour Pigment

Pomegranate peel were thawed at room temperature and homogenized by mortar and pestle. The extract was collected and mixed with different concentration of hydrocholric acid : water (2.0 and 10%)(mg/ml) at room temperature overnight. Then the sample was filtered with Whatmann No.1 filter paper. The filterate were concentrated under reduced pressure at 40°C and stored in a refrigerator at (2-8)°C for use in subsequent experiments.

Stability Test:

pH:

Degradation of carotenoids extracted from pomegranate peel sample caused by different pH value were measured. The retention of carotenoids extracted from pomegranate peel after refrigerator at 4oC using different buffer solution with pH values ranged from (5,7 and 9) was calculated. Buffer solution with pH value of 5,7 and 9 were prepared by addition of 1N HCL and 1N NaOH respectively. The dye was measured at wavelength 480nm and the loss of colour was calculated according to the following equation: Colourless (%) = x 100 ODi = Initial OD ODf = Final OD.

Temperature

Stability of the dye were tested after incubation in different temperature (25, 50, 75 and 100°C) for five hours as well as in light and dark for 24 hours. The absorbance of dye was measured at wavelength 480nm and the loss of colour was calculated according to the following equation:

Colourless (%) = x 100 ODi = Initial OD ODt = Time OD

Formulation

Jelly formulation were prepared at pH (5, 7 and 9) and with concentration (2% and 10%) of fresh Pomegranate peel extract. Taking 50ml of beaker were kept in a hot plate was added 5ml of initial content of the extraction juice and then add 2.0g of Gelatin powder and 0.2g of Ascorbic acid are boiled to dissolved at room temperature and melted to form homogeneous mixture. The mixture was heated when the temperature reached 80°C. 0.3ml of lemon juice and 3.5g of sucrose was added to it. The mixture was boiled for few minutes till a gel consistency is reached. Jelly was taken in spoon and allowed to fall when stop to cook. Finally, hot jelly was poured into a glass jar with screw caps and stored in refrigerator (4°C) at overnight.

Determination of End Point

Drop test: A drop of the concentrated mass is poured-into a glass containing water. Setting down of the drop without disintegration denotes the end point.

Sheet or flask test: A small portion of jelly is taken out during boiling in a spoon or wooden ladle and cooled slightly. It is then allowed to drop. If the products falls off in the form of a sheet or flakes instead of flowing in a continuous stream or syrup, it means that the end point has been reached and the product is ready otherwise, boiling is continued till the sheet test is positive.

Results

Extraction of color pigment:

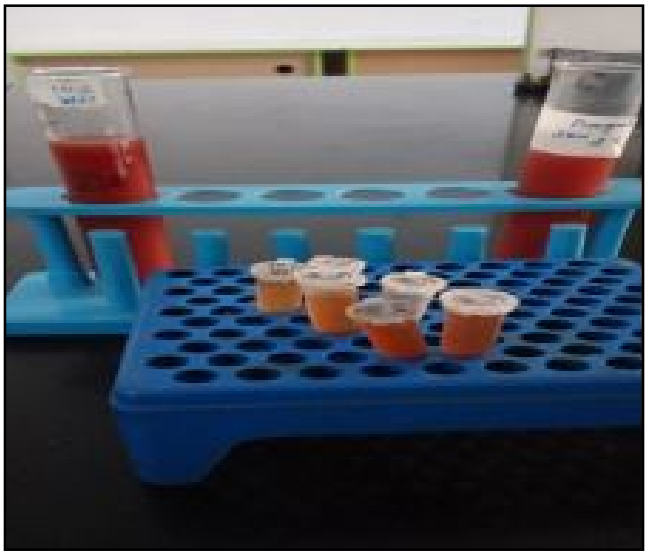

Fig. 1: Extraction of color pigment Stability test PH.

Table 1: Result showed that Stability test for pH of color pigment.

Concentration	pH		
	5	7	9
2%	23.4	18.3	13.2
10%	18.9	6.31	34.7

Temperature:

Table 2: Result showed that Stability effect on Temperature.

Concentration	Temperature(°C)			
	25	50	75	100
2%	0.75	0.71	0.57	0.90
10%	0.99	0.53	0.83	0.67

Formulation of Jelly:

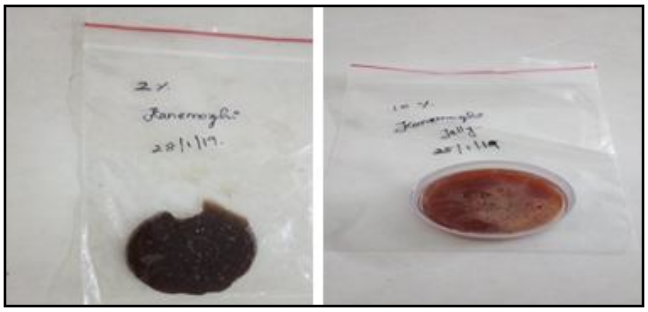

Fig. 2: Formulation of jelly 10%, 2%.

Protein test:

Fig. 3: Protein test.

Discussion

Pomegranate peel is a valuable waste of juice processing industry and rich source in biomolecules of immune health significance 92%. of antioxidant present in the pomegranate peel. The result showed that

Sensory evaluation of jelly:

Table 3: Result showed that Average score of Sensory Evaluation of Jelly.

Formulation	Sensory Attributes					
	Colour	Appearance	Texture	Flavour	Taste	Overall Acceptability
I	7.3	6.5	6.6	6.5	6.5	6.9
II	7.3	6.8	6.7	6.6	6.6	7.1
III	7.8	8.4	8.0	7.6	8.8	8.3

extraction of colour pigment from pomegranate peel to analysis the colour to develop the food product. The result of Stability test to analyzes pH ranged from 5, 7 & 9 and regarding the temperatures 25°C, 50°C, 75°C & 100°C using colour pigments due to different concentration 2% and 10%. The result of Product Development is Jelly which is now becoming popular both for edible & cosmetic purpose. The preparation of good quality of Jelly from Pomegranate Peel is certainly becoming a matter of very much importance as it benefits the mankind in various manner. The overall result have clearly indicated that the extract could be used as a food product development. Due to various adverse effect of available food preparation the present work by used to formulate a jelly having minimal or no side effect which will extensively used by the food product of our community will great surely and satisfaction.

Conclusion

This concludes that the acetone was very active in extracting polyphenolic compounds but it was not effective as methanol in extracting antibacterial and antifungal compounds from pomegranate peel. This research provides guideline on the use of ingredients on the preparation of jelly having minimal or no side effects .The natural ingredients like gelatin, citric acid honey were used in the preparation of natural jelly along with *punica granatum* as colouring agent. The present study proves that pomegranate peel containing jelly was best among both natural jelly. The prepared jelly were show excellent properties like colour, taste, odour, flavor, texture and smoothness of jelly. The research finding also provides a guideline on effects of ingredients towards the physical properties and consumer acceptance of the jelly formulations. The Formulation-III was found to be the best and more stable among the two formulation of jelly as per the outcomes of evaluations tests. So far, the use of the natural colourants in jelly formulations having no or minimum side effects. Thus we can move towards the use of the natural colourants to prepare the jelly. Hence

the use of natural colour is step towards healthy jelly and which we can be widely utilized by the food products with great pleasure.

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