

Preparation and Processing Of Orange Flavoured Aloe vera Gel

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Abstract: Aloe Vera has gained more attention over the last decade due to its reputable, medicinal, and pharmaceutical and food properties. In present research, firstly the different concentrations of pectin and gum acacia were augmented with aloe vera gel and the products so prepared were assessed for texture and stickiness. The selected preparation was then supplemented with orange flavour at different levels. The samples were again analysed for taste, color and stickiness and the final product so prepared was subjected to various nutritional, organoleptic and microbial analysis. On the basis of sensory characteristics and nutritional value, Aloe vera gel when added with 1.5% pectin, 9% gum acacia and 15g orange flavour resulted in better quality gel with smooth texture, acceptable appearance and aroma and attractive colour and good nutritional value (protein content 4%, carbohydrate content 18.6%, TSS 41.7 °B, fibre content 2.83% and mineral content 1.29%).

Keywords: Aloe vera gel, flavour, pectin, gum acacia.

I. Introduction

Aloe vera is a nutraceutical having loads of nutrients has a beneficial effect on human health and can cure many diseases. Aloe vera boosts immune function and destroys tumours (L. Ralamboranto 1982). Galal et al, 1975 studied the effect of Aloe vera gel on ease of inflammation of joints. They suggested it not only reduces inflammation but also reduces arthritis pain when used topically. It was also suggested when used internally, reduced inflammation throughout the body from the inside out. People who drink aloe vera for two weeks typically begin to experience a significant reduction of inflammation symptoms. Aloe Vera gel when used internally, it improves the quality of the blood and helps rebalance the blood chemistry in a way that lowers cholesterol and total triglycerides, in people with elevated levels (Joshi and Dixit, 1986).

Imanishi et al, 1981, Suzuki, 1979 reported that polysaccharides in the aloe vera plant have curative effects on numerous digestive disorders like IBS, ulcers, Crohn's disease. Sai Lakshmi et al., 2011 studied the impact of Aloe vera based antimicrobial coating on storage life of papaya; the typical polysaccharides of Aloe vera possess antifungal activity. Zhan Hai Yu et al. 2009 studied the effect of Aloe vera polysaccharides on immunity and antioxidant activities in oral ulcer animal models. The results showed that A. vera polysaccharides enhanced immunity activity and exerted antioxidant effects compared with vehicle controls. These results demonstrate, for the first time, that A. Vera polysaccharides are effective in enhancing innate immunity and suppressing oxidative injury in oral ulcer animals. Compounds extracted from Aloe vera have been used as an immunostimulant that aids in fighting cancers in cats and dogs (King et al., 1995). Aloe vera emodin, an anthraquinone, has the ability to suppress or inhibit the growth of malignant cancer cells making it to have antineoplastic properties (Thomson, 2004). Qian He et al. 2005, developed an ISO9000: 2000 and safety (HACCP) management systems for the food industry to ensure the biological integrity, the organoleptic stability, and the quality of the Aloe vera juice.

D. Jasso de Rodríguez et al. 2005 studied the antifungal activity in vitro of Aloe vera pulp and liquid fraction against plant pathogenic fungi. The Aloe vera leaves were cut from plants grown under greenhouse conditions at the University Antonio Narro, disinfected with sodium hypochlorite, and separated in two groups. In the first group, the pulp was manually scraped out; in the second, a laboratory roll processor was used for the pulp and liquid fraction separation. Both types of extracts were pasteurized. Antifungal activity of pulp and liquid fraction was evaluated on the mycelium development of *Rhizoctonia solani*, *Fusarium oxysporum*, and *Colletotrichum coccodes* that were isolated from a potato crop by the hyphae point and monospore techniques. The results showed an inhibitory effect of the pulp of A. Vera on *F. oxysporum* at 104 µl l⁻¹ and over a long period.

Keeping in view the nutritive and health benefits of Aloe vera, the present investigation was aimed to produce orange flavoured gel, as it possess bland taste and also Aloe vera gel is not available in the market. Aloe vera gel can serve as the best functional food because of ever responsiveness in consumers towards their health and quality, moreover can meet the demands made by Vegetarians. Besides providing health benefits Aloe vera also have provision for nutrition supplement that can be consumed by every age group.

II. Materials and Methods

The raw materials Aloe vera was obtained from Herbal Garden, Jamia Hamdard University, New Delhi, while pectin (Siscoresh. Lab Pvt.), gum acacia, citric acid (S d fine-chemicals), sodium benzoate, potassium sorbate (Thomas Baker) and orange flavour (International flavour and color fragrance Pvt Ltd) were obtained from the local market.

Sample preparation Process optimization was done by preparing four samples of Aloe vera, 100g each and were augmented with pectin and gum acacia at the rate of (1g, 5g), (1.25g, 7g), (1.5g, 9g) and (1.75g, 11g) respectively. Then all the samples were assessed for texture and stickiness. The sample 3 (containing pectin 1.5g and gum 9g) was selected and then supplemented with orange flavour at 5g, 10g, 15g and 20g levels. These flavoured samples were again analysed for taste, color and stickiness and the final product selected contained 15g orange flavour was subjected to various nutritional, organoleptic and microbial analysis.

Physio-chemical characteristics Moisture, ash and fat content were determined according to AOAC 2000 methods. Protein content was determined as per (IS: 7219:1973): Kjeldhal Method, protein content was obtained by using the conversion factor of 6.25, Crude fibre was determined by (IS: 11062) and carbohydrate content by difference method. TSS was determined by refractometer, pH by pH meter (Toshcon instruments).

Gel Preparation The Aloe vera leaves were harvested from the Herbal Garden field and then taken to the processing place. The leaves were then washed by tap water followed by chlorine wash and then again by fresh water. The leaves were then kept in upright position for 15 min in a bowl to remove some of the yellowish fluid coming from skin. The head portion was removed and the leaves were then cut in the middle lengthwise and the gel was obtained. The gel was obtained gently without contaminating it with sap of the skin.

The gel was then subjected to grinding (Usha Grinder) at room temperature for 10 min only to avoid browning. Then filtration was done by allowing it to pass through carbon coated plates and muslin cloth (to remove alion and alieemodin present in peels not in gel). Citric acid was then added to the gel in order to stabilize it and stop browning and the pH was adjusted to 3 to 3.5. Gel was then pasteurised at 89 °C for 1- 2 min and then immediate cooling to 5 °C. after pasteurisation the other ingredients like orange color, preservatives (sodium benzoate, potassium sorbate), sugar (7g), pectin and gum acacia was added. The gel was then again mixed thoroughly for 3 min. Gel so prepared was then transferred to air tight bottles and stored under refrigerated conditions for further nutritional analysis.

Microbial analysis Yeast, mold and Salmonella growth was checked. Analysis at different intervals of time was done at different temperatures for example; for yeasts and molds at 28°C, for salmonella at 36°C.

Sensory evaluation Gel was evaluated for overall acceptability (colour, texture, aroma, stickiness and taste) and was carried out as per 9 point Hedonic scale, by the help of ten semi trained judges.

III. Results and Discussion

Proximate composition of Aloe vera gel The nutritional value of the processed and flavoured gel was found within acceptable limits. The carbohydrate content was slightly increased due to added sugar, Table 1.

Microbial Analysis No growth of yeasts, molds and salmonella was found in any of the samples of processed Aloe vera gel.

The Sensory evaluation was carried out as per 9 point Hedonic scale, Table 3. The sensory attributes that were taken into consideration include: color, texture, aroma, taste, stickiness, overall acceptability and rank. The values are the means of ten readings.

IV. Figures



Fig. 1: Aloe vera plant



Fig. 2: Aloe vera gel (Top view).



Fig. 3: Aloe vera gel (side view).



Fig. 4: Gel kept for Salmonella growth

V. Tables

Table 1: Proximate composition^a of orange flavoured Aloe vera gel.

S. No.	Moisture, %	Ash, %	Protein, %	Crude Fibre, %	Carbohydrate, %	pH	TSS, °B
Aloe vera gel	76.33 ± 0.52	1.29 ± 0.04	4.03 ± 0.06	2.50 ± 0.41	18.09 ± 0.09	3.53 ± 0.05	41.77 ± 0.73

^aMean value ± standard deviation (n = 3).

Table 2: Sensory score^a of orange flavoured gel.

S. No.	Color	Texture	Aroma	Taste	Stickiness	Overall acceptability	Rank
Flavoured Gel	8.10 ± 0.54	7.8 ± 0.60	8.10 ± 0.54	8.10 ± 0.30	7.8 ± 0.60	8.00 ± 0.45	8.10 ± 30

^aMean value ± standard deviation (n = 10).

VI. Conclusion

A novel orange flavoured Aloe vera gel was successfully produced with unique sensory attributes like attractive color, sweet taste, and good consistency and non-sticky. Citric acid improved the stability of the gel against browning. Besides imparting sweet taste, sugar also improved the texture of the gel. From the nutritional and sensory characteristics gel when augmented with 1.5% pectin, 9% gum acacia and 15g orange flavour resulted in better quality gel with smooth texture, acceptable appearance and aroma and attractive colour and good nutritional value (protein content 4%, carbohydrate content 18.6%, TSS 41.7 °B, fibre content 2.83% and mineral content 1.29%).

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