

Studies on Standardization and Development of Value Added Product of Aloe Vera

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Abstract- *Aloe vera* gel, well known for its nutraceutical potential, is being explored as a functional ingredient in a wide array of health foods and drinks. The present study was undertaken on standardization and development of value added product of *aloe vera* and produce blended Ready-to-Serve (RTS) beverage with different blending proportion of *aloe vera* (10%, 20%, 30%, 40%) and mango pulp (90%, 80%, 70%, 60%) and assess their storage life at ambient temperature. The prepared products were passing through organoleptic evaluation by adopting 9 point hedonic scale. Among different blended ratio for RTS beverage, sample with 10 and 20 percent of *Aloe vera* juice reached the highest hedonic scores.

Key Words: Blended Ready-to-Serve (RTS) beverage, *Aloe vera*, Mango.

I. INTRODUCTION

Aloe vera commonly known as Gheegwar/Ghritkumari belongs to family *lilaceae*. It is a desert plant having a very popular herbal remedy. *Aloe* is derived from Arabic word "*alloe*" means "bitter". *Aloe vera* leaf contains 95% of water, 75 nutrients, 200 active compounds, 20 minerals, 18 amino acids, 12 vitamins and 92 enzymes. It can be used as the source of vitamins like A, B₁, B₂, B₆, B₁₂, C, E, Folic acid, Niacin etc. Owing to its succulent properties, it is a rich source of nutrients and essential minerals. It is among the oldest known medicinal plants gifted by nature; hence often called miracle plant, known by many names. There are more than 300 species of *Aloe vera* and of these only 4 or 5 are commonly used in medicines. The most widely used species of *Aloe vera* is *Barbadensis millar*. [1]

Aloe vera substances are recognized as antiseptics because they kill or control mold, bacteria, fungus and viruses. It helps to control a broad spectrum of immune system diseases and disorders. β - sitosterol is a powerful anti-cholesterol which helps to lower harmful cholesterol levels, its more beneficial for heart patients. *Aloe vera* are highly effective in treatment of burns, cuts, scrapes, abrasions, allergic reactions, rheumatoid arthritis, rheumatic fever, acid indigestion, ulcers, plus many inflammatory conditions of the digestive system and other internal organs, including the stomach, small intestine, colon, liver, kidney and pancreas.[1]

Aloe vera can be utilized as a valuable ingredient for food application due to its biological activities and functional properties. *Aloe vera* has a bitter taste which can be unpleasant in raw state and its palatability could be enhanced with addition of some other fruit juices like mango, papaya, orange etc. [3]

Mango (*Mangifera indica* L.) is one of the most cultivated tropical fruits in the World; with over 25.1 million tons world annual production. Asia accounts for approximately 77% of global mango production and the Americas and Africa account for approximately 13% and 9%, respectively. Mango is the cherished fruit not only for its taste but also for nutritional values. It is an excellent source of fiber, vitamins A, C and the B complex, iron and phosphorus etc. Some of the key components that contribute for the production and acceptance of high quality fresh mangoes by the consumer are flavour, volatiles, texture and chemical constituents. The shelf life of mango varies among its varieties depending on storage conditions. It ranges from 4 to 8 days at room temperature and 2-3 weeks in cold storage at 13°C. In spite of the low stability of the fresh fruit and its seasonal supply, the share of its production that is processed is very limited. In order to make the mango fruit available during the off season it is processed to make juices, jams, squashes, nectars, chutney, pickles, toffees, canned mango slices etc. Processing of

mango fruits into juice, jam or dried products ensures its consumption throughout the year besides recovery of bio-constituents such as vitamin A. [4]

Fruit beverages are well enjoyed by all age groups of the society. Blended drinks are good alternative for development of new products to provide benefit of taste, nutrition as well as medicinal properties. [3]. It has been proposed in the past to utilize *Aloe vera* gel in the formulation of blended beverages. Hence, present work was undertaken to optimize level of *Aloe vera* juice and mango juice incorporation in development of blended beverage with desirable characteristics.

The rest of the paper is organized as follows. Materials and Methods used for development of value added product are explained in section II. Experimental results are presented in section III. Concluding remarks are given in section IV.

II. MATERIALS AND METHODS

A. Selection of Ingredients

Raw materials such as fresh *Aloe vera* leaves were obtained from field of *Aloe vera* grower of Aurangabad and Mango fruit, Sugar, citric acid, ascorbic acid obtained from the local market of Aurangabad. Chemicals and glassware's were obtained from Department of Agricultural Engineering Maharashtra Institute of Technology, Aurangabad.

B. Processing of raw materials

a. *Aloe vera* juice

The chemical composition of juices depends majorly upon the method of juice extraction. *Aloe vera* gel was extracted using cold extraction method and processed into juice. Freshly harvested *Aloe vera* leaves were dipped into 500 ppm KMS solution and washed thoroughly with tap water and kept for flash cooling to 5°C for gel stabilization. Further leaves were cut vertically into two half and gel was separated using stainless steel knife, it was allowed to settle for 12 hrs and then homogenized using mixer grinder. Then it was filtered and pH was adjusted to 3.0 by adding citric acid and ascorbic acid to control browning. Further it was deaerated, pasteurized, flash cooled and stored. The obtained juice was stored refrigerated temperature until further use.

b. Mango pulp

The fruits after washing, peeling and coring were subjected to slicing and feasible for macerating in an electric blender to get homogeneous pulp. Then pulp was pasteurized in a water bath at a temperature of $82 \pm 2^\circ\text{C}$ for 30 min to reduce the microbial load. The acidity was adjusted to 1.0% by addition of citri cacid of commercial grade.

C. Product development

a. Blended *Aloe vera* Mango beverages Ready-to-Serve formulation

Blended RTS beverages were prepared using 13% TSS, 0.3% acidity and 10% blended juices of different blending ratio of 90% Mango juice + 10% *Aloe vera* juice (B), 80% Mango juice + 20% *Aloe vera* juice (C), 70% Mango juice + 30% *Aloe vera* juice (D), 60% Mango juice + 40% *Aloe vera* juice (E) and controlled RTS containing 100% Mango juice without *Aloe vera* (A-Control).

b. Flow sheet of development of RTS.

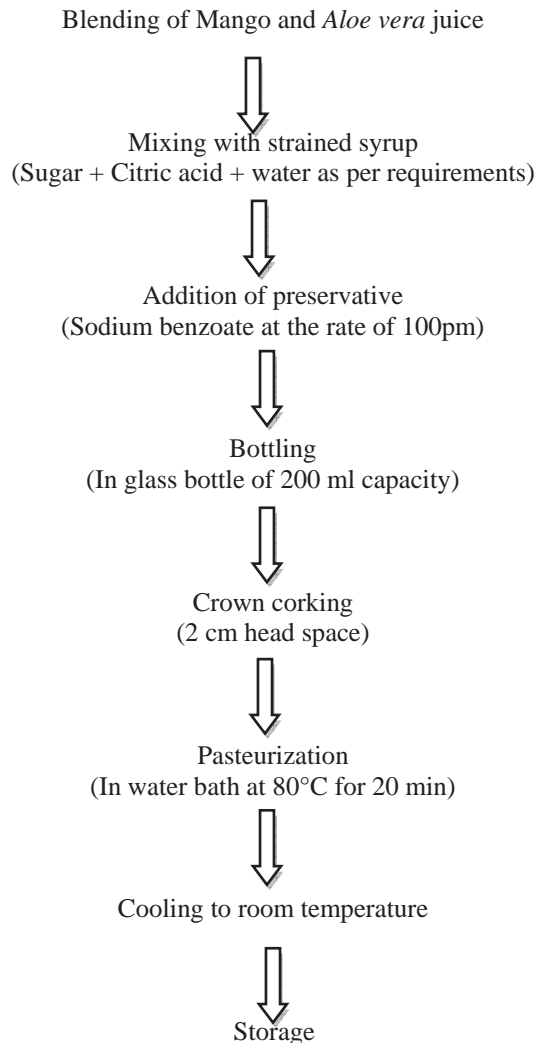


Figure1. Flow Chart for Preparation of Aloe vera Mango beverages RTS

III. RESULTS AND DISCUSSION

Organoleptic quality characteristics of blended RTS beverage (Table-1) were determined on 9 Point Hedonic Scale. It could be observed from the Table-1 that mouth feel of beverage improved with increase in concentration of *Aloe vera* juice up to the level of 20% while further increase in *Aloe vera* juice content reduced of taste due to imparted bitterness. Flavour profile of sample B and C found to be superior to that of control sample; this may be due to improvement mouth feel of product by *Aloe vera* juice while further increase resulted in decrease in flavour. Overall acceptability was calculated considering the average of all the organoleptic parameters and it was observed that Sample B containing 10% *Aloe vera* juice was preferred by the judges.

Table-1 Organoleptic quality characteristics of blended RTS beverage

| Sample Code | Color | Flavor | Taste | Mouth feel | Overall Acceptability |
|---------------|-------|--------|-------|------------|-----------------------|
| A- Controlled | 8.9 | 8.9 | 8.9 | 8.8 | 8.90 |
| B | 8.0 | 7.9 | 8.0 | 8.0 | 7.98 |
| C | 6.9 | 6.9 | 6.8 | 6.9 | 6.88 |
| D | 5.9 | 5.9 | 5.6 | 5.8 | 5.80 |
| E | 3.9 | 3.9 | 3.9 | 4.0 | 3.93 |

* Each value represents the average of 25 determinations.

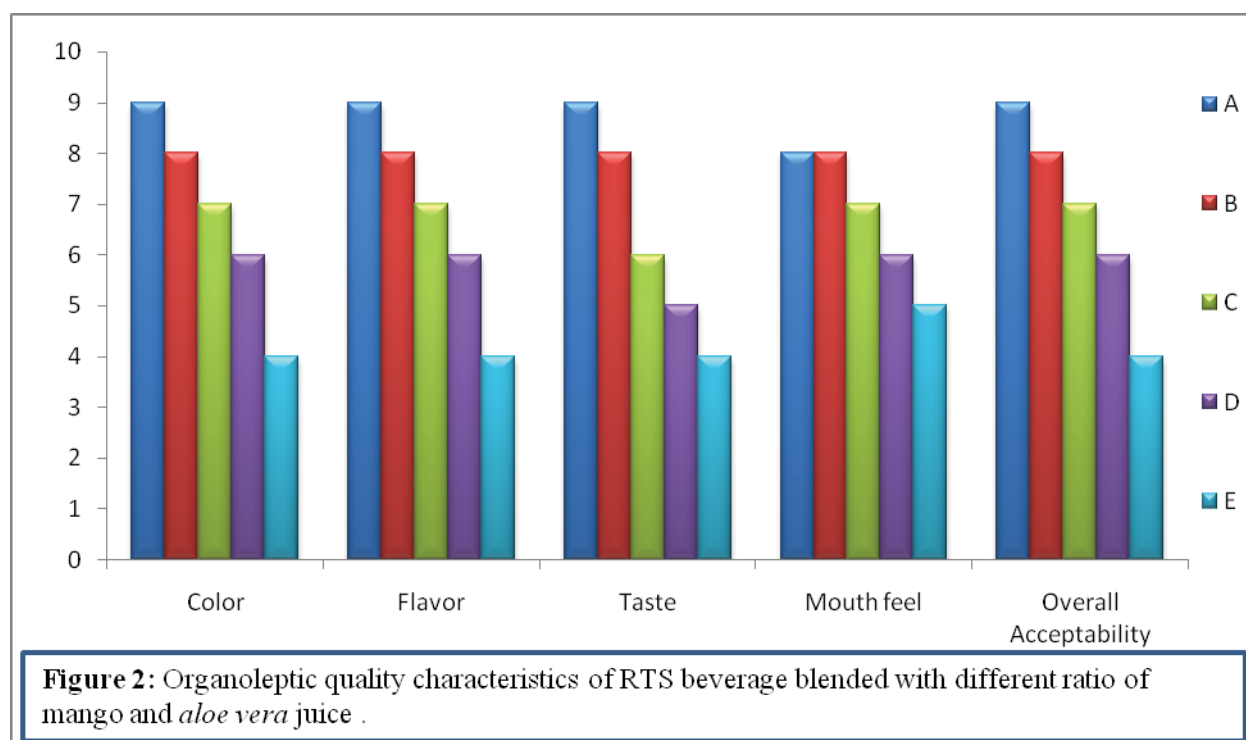


Table-2 Physicochemical properties of Aloe vera Mango RTS beverages

| Sr. No. | Physicochemical Properties | A Controlled | B |
|---------|---|--------------|-------|
| 1 | Total soluble solids (°B) | 13.4 | 13.4 |
| 2 | %Acidity | 0.33 | 0.31 |
| 3 | pH | 3.87 | 3.90 |
| 4 | Vit C (mg/100gm) | 41.58 | 41.88 |
| 5 | Specific gravity | 1.04 | 1.04 |
| 6 | Colour values by X-Rite Spectrophotometer | | |
| A | L | 38.45 | 38.96 |
| B | A | 3.06 | 2.99 |
| C | B | 15.43 | 16.01 |
| 7 | Viscosity (centipoises) | 145 | 145 |

*- Each value was an average of three determinations.

VI. CONCLUSION

Thus it may be concluded that *Aloe vera* Mango Ready to serve beverages was found to be highly acceptable considering the organoleptic, physicochemical and nutritional qualities. The aloe vera juice incorporated helped in improving the organoleptic quality as well as keeping quality of beverages. In addition to that physicochemical and nutritional qualities of final products were also improved. Thus acceptable and good quality Mango Ready to serve beverages can be prepared with addition of 10 percent *Aloe vera*. The storage studies revealed that blended Mango-*Aloe vera* gel could be successfully stored for the period of 3 months without significant changes in chemical and organoleptic qualities.

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