



## Development of *Aloe vera* Beverage to Prevent/Combat PCOS among Women of Reproductive Age

Megha M. Katte<sup>1\*</sup>, Vijayalakshmi D.<sup>2</sup>, M.L. Revanna<sup>3</sup>, Savita S. Manganavar<sup>4</sup>, M.T. Lakshminarayana<sup>5</sup>, G.B. Mallikarjuna<sup>6</sup>

PhD Scholar<sup>1</sup>, Professor<sup>2</sup> (HAG), Professor and Head<sup>3</sup>, Senior scientist and Head<sup>4</sup>, Assistant Professor<sup>5</sup>, Former Professor and Head<sup>6</sup>,

<sup>1,2,3</sup>Dept. of Food Science and Nutrition, UAS, GKVK, Bengaluru – 560 065

<sup>4</sup>Krishi Vigyan Kendra, Chandurayanahalli, Kalya post, Magadi Taluk, Ramanagra District – 562 120

<sup>5</sup>Dept. of Agril. Extension, UAS, GKVK, Bengaluru- 65

<sup>6</sup>Dept. of Agril. Statistics, UAS, GKVK, Bengaluru – 65

\*Corresponding Author E-mail: [meghakatte91@gmail.com](mailto:meghakatte91@gmail.com)

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### ABSTRACT

*Aloe vera* being called the natural healer has various health benefits on consumption. It is being used to treat various diseases like hypercholesterolemia, Polycystic Ovarian syndrome (PCOS). PCOS is the most common endocrine disorder among women of reproductive age characterized by hyperandrogenism, insulin insensitivity and chronic anovulation. Current available mode to treat insulin insensitivity is use of insulin sensitizers like metformin having their own side effects upon prolong usage. In this context, the role of medicinal plant *Aloe barbadensis* Mill. has shown to have hypoglycemic effect could possibly manage this disorder. Hence, the present study was taken up to develop beverage from *A. vera* to prevent/combat PCOS among women of reproductive age and test its consumer acceptance. Non-bitter *A. vera* was procured locally and processed by traditional method. Extracted *Aloe vera* gel was blended along with citric acid, other herbs and spices to prepare the *Aloe vera* juice. Different processing methods were considered in the preparation of juice. Commercially available *A. vera* juice was considered to be the control. The preparations were tested for their acceptance by 9-point hedonic scale by a set of 26 trained panelists against the control and was subjected to statistical analysis. Sensory attributes of prepared products were acceptable in all sensory parameters. There was a significant difference between control and prepared *A. vera* juice. *A. vera* juice prepared by straining method had better consumer acceptance compared to control.

**Key words:** *Aloe vera*, Poly cystic ovarian syndrome, Insulin insensitivity, Sensory evaluation

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## INTRODUCTION

*Aloe vera* (L.). *A. barbadensis* Mill. Is one of the oldest known medicinal plants gifted by nature and is often called miracle plant or natural healer. It belongs to liliaceae family which includes about 250 species; however only two species, viz. *A. barbadensis* Mill. and *A. arborescens* Mill. Are considered as the most important ones<sup>8,10</sup>. The innermost part of *A. vera* leaf is a clear, soft moist and slippery tissue which contains vital ingredients, viz. polysaccharides, vitamins, minerals, amino acid, saponins, anthraquinones etc<sup>9</sup>. Most of the health benefits associated with this plant have been attributed to polysaccharides contained in the mucilageous gel of leaves<sup>10</sup>.

The cell possesses a number of biological and therapeutic activities, viz. wound healing, antifungal, antiandrogenic, antiseptic, hypoglycemic, anti-inflammatory, immunomodulatory and gastro-protective properties<sup>7, 16</sup>. Compounds like tetradecanoic acid, hexadecanoic acid, methyl ester, n-hexadecanoic acid<sup>3, 12</sup> Eicosadienoic acid, olic acid, squalene are known to have hypercholesteraemic effect on consumption.

*A. vera* has been used in various food, confectionery and cosmetic products including flavoured milk, icecream, chewing gum, face cream, hair cream, lotion, soap, shampoo, as flavouring agent etc<sup>1, 3</sup>. Presently the interest and use of *A. vera* as a valuable ingredient for health food and pharmaceutical industry has increased dramatically due to its biological activities and functional properties<sup>5, 8, 11</sup>. Food which has physiological benefits beyond basic nutrition, also known as functional food is being preferred now-a-days to reduce the risk of chronic diseases<sup>12</sup>. Various authors have suggested the use of *A. vera* juice in food commodities such as beverages, jams, candies, wines, and dairy products<sup>8, 6, 14, 2, 13</sup>. Therefore, the present study was taken up to develop *A. vera* based functional beverage for PCOS.

Since ages, *A. vera* has been used for treating various ailments in Ayurveda, specially to treat uterus related disorders like amenorrhea, dysmenorrhea and in treatment of PCOS. Polycystic Ovarian syndrome (PCOS)

is the most common endocrine disorder among women of reproductive age (25%). PCOS is a heterogeneous disorder that may be present with very different clinical patterns. Many of these differences are probably related to differences in genetic expression of androgen excess and/or insulin resistance, but some may depend on environmental influences on body weight and fat distribution. In particular, increased abdominal fat mass worsens hyperandrogenism and insulin resistance and chronic anovulation. Current available mode to treat insulin insensitivity is use of insulin sensitizers like metformin having their own side effects upon prolong usage. In this context, the role of medicinal plant *Aloe barbadensis* Mill. shown to have hypoglycemic, hypocholesterolaemic and antiandrogenic effect could possibly manage this disorder.

**OBJECTIVE** – The aim of the present study was to develop beverage from *A. vera* for women with PCOS and to test its acceptability.

## MATERIAL AND METHODS

**Raw materials:** Fully matured *A. vera* leaves were procured from Botanical garden, University of Agricultural Sciences, GKVK, Bengaluru. Other raw materials, viz. coriander leaves, mint leaves, cumin seeds, cinnamon, sugar and salt were procured from the local market.

**Extraction of Aloe vera gel:** *A. vera* was processed using a traditional method, wherein after cutting the *A. vera* leaves it was allowed to stand for 20 minutes to remove the aloin content. After that external green part was removed with a sterilised knife to get the *A. vera* gel without scraping too much to avoid aloin content in the extracted gel.

**Preparation of Aloe vera beverage:** To the extracted gel, lemon juice, sugar, salt, mint leaves and coriander leaves, cumin seeds and cinnamon were added in different proportions. The amount of ingredients were standardised by trial and error method to obtain the final acceptable product. The mixture was blended together in a blender and the volume was made

up to 180ml using water. Different processing methods were employed (Fresh juice, Strained juice, Boiled and Strained Juice).

**Sensory evaluation:** Commercially available *A. vera* juice was considered to be the control. The beverage was tested for its acceptance by 9-point hedonic scale by a set of 26 trained panelists against the control and was subjected to statistical analysis.

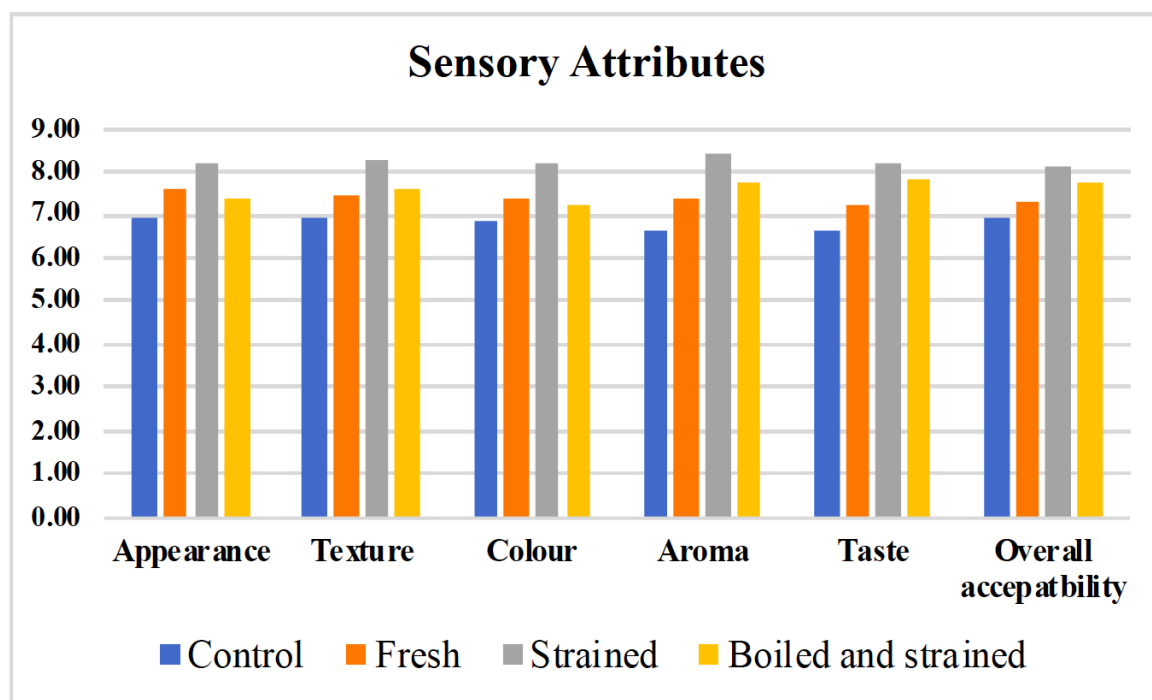
## RESULTS AND DISCUSSION

The prepared *aloe vera* beverages were ready to serve and contained 30 g of *A. vera* gel per 180 ml of the beverage. Sensory attributes of prepared product was acceptable in all sensory parameters. There was a significant difference between control and prepared *A. vera* juice variations with respect to all the sensory attributes (Table 1 and Figure 1).

**Table 1: Mean sensory scores of *Aloe vera* beverage**

Variations	Appearance	Texture	Colour	Aroma	Taste	Overall acceptability
Control	6.96 ± 1.00	6.92 ± 1.02	6.83 ± 0.90	6.65 ± 0.80	6.62 ± 1.05	6.96 ± 0.87
Fresh	7.62 ± 0.94	7.46 ± 0.65	7.38 ± 0.90	7.35 ± 1.09	7.19 ± 0.94	7.29 ± 1.15
Strained	8.19 ± 0.62	8.27 ± 0.53	8.21 ± 0.64	8.38 ± 0.48	8.17 ± 0.34	8.13 ± 0.52
Boiled and strained	7.35 ± 0.94	7.58 ± 0.86	7.23 ± 0.76	7.73 ± 1.00	7.81 ± 0.94	7.77 ± 0.94
F – value	8.86**	12.89**	13.47**	17.80**	16.40**	8.61**
SEm±	0.03	0.02	0.03	0.03	0.03	0.03
CD	0.12	0.09	0.10	0.12	0.11	0.12

\*\* - significant at 1 per cent



**Figure 1: Sensory score of *aloe vera* beverage**

The commercially available product was found to be too bitter and the taste was unacceptable when compared to the developed product. The beverage can act as a source of hydration other than its claimed therapeutic benefits.

## CONCLUSION

Prepared *A. vera* juice had better sensory attributes compared to that of the control and has more acceptance than the commercially available *A. vera* juice.

**Recommendations:** Clinical trial should be taken up to validate benefits of developed beverage on PCOS women.

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