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Seema Kanojia
M. Sc. (N.S.) Student Deptt. of Nutrition Science, Kanpur, Uttar Pradesh, India

Amena Zaidi
Asstt. Prof. Deptt. of Nutrition Science, Kanpur, Uttar Pradesh, India

Nidhi Pandey
M. Sc. (N.S.) Student Deptt. Of Nutrition Science, Kanpur, Uttar Pradesh, India

Shilpi Gupta
M. Sc. (N.S.) Student Deptt. of Nutrition Science, Kanpur, Uttar Pradesh, India

Dheer Pratap
M. Sc. (Ag) Student Deptt. of Agronomy Monad University Hapur, Uttar Pradesh, India

Garima Dwivedi
M. Sc. (H.Sc) Student Deptt. of F.S.N, N.D.U.A.T, Faizabad, Uttar Pradesh, India

Anushka Singh
M. Sc. (H.Sc.) Student Deptt. of H.D & F.S B.B.A.U, Lucknow, Uttar Pradesh, India

Akansha Nandan
M. Sc. (H.Sc) Student Deptt. of C.D., N.D.U.A.T, Faizabad, Uttar Pradesh, India

Anand Singh
M. Sc. (G.P.B) Student Deptt. of Genetics & Plant Breeding N.D.U.A.T, Faizabad, Uttar Pradesh, India

PK Singh
SMS, KVK, Mashodha, Faizabad, Uttar Pradesh, India

Correspondence
Seema Kanojia
M. Sc. (N.S.) Student Deptt. of Nutrition Science, Kanpur, Uttar Pradesh, India

Preparation of *Aloe Vera* jam along with its chemical constituents

Seema Kanojia, Amena Zaidi, Nidhi Pandey, Shilpi Gupta, Dheer Pratap, Garima Dwivedi, Anushka Singh, Akansha Nandan, Anand Singh and PK Singh

Abstract
Aloe Vera (*Aloe barbadensis* Miller.) is perennial, succulent and drought resistant plant. It is also known as "Ghrit-kumari" and "ghee-Kunwar" in Hindi and other vernacular names are: Aloe, *Aloe Vera*, Indian Alces, Kumari, Ghirita, Gawarpaltra, Barbados aloe and Lu hui. It is originated in South Africa and belongs to the Liliaceae family. In this day and age, one of the most important uses of *Aloe Vera* is in the industry of cosmetics. Besides uses in cosmetic industries, *Aloe Vera* is also use in medical field (health benefit) widely now days. A health product containing *Aloe Vera* gel was examined for its effects on gastric mucosal lesions induced by cold-restraint or by oral administration of 70% v/v ethanol (2 mL/kg), and on plasma glucose levels in alloxan-induced diabetic rats. The plasma glucose level of alloxan-injected rats (120 mg/kg, s.c.) was about twice as high as that of their controls. It was further elevated by a single oral dose of the preparation. Chronic treatment with the preparation, given twice daily for 10 days, produced a sustained increase in the plasma glucose levels. The findings do not support the claimed efficacy of the preparation in treating gastric ulceration and diabetes mellitus. *Aloe Vera* products have long been used in health foods for medical and preservative purposes. There is growing interest in the use of natural antioxidant for expending the shelf life of food without the need of synthetic antioxidant such as, butylated hydroxy anisole (BHA), butylated hydroxy toluene (BHT) and tertiary butylhydroquinone (TBHQ). The standards for the quality of jam are given by different agencies. The Bureau of Indian Standards (BIS) and Prevention of Food Adulteration (PFA) specify that jam should contain more than 68.5% total soluble solids (TSS) and at least 45% fruit. It is a stem less or very short-stemmed plant growing to80-100 cm tall, spreading by offsets and root sprouts. The leaves are lanceolate, thick and fleshy, green to gray-green, with a serrated margin. The flowers are produced on spike up to 0 cm tall, each flower pendulous, with a yellow tubular corolla 2-3 cm long. The tissue in the centre of the aloe leaf contains a gel which yields aloe gel or *Aloe Vera* gel.

Keywords: sprouts, plasma, liliaceae, cosmetics, mellitus

Introduction
Aloe Vera appeared first in Sudan over 6,000 years ago. The popularity of *Aloe Vera* in the medical world has emerged and been amplified for thousands of years. Each year, the value of *Aloe Vera* is around $13 billion in the market.

In this day and age, one of the most important uses of *Aloe Vera* is in the industry of cosmetics. Besides uses in cosmetic industries, *Aloe Vera* is also use in medical field (health benefit) widely now days.

A health product containing *Aloe Vera* gel was examined for its effects on gastric mucosal lesions induced by cold-restraint or by oral administration of 70% v/v ethanol (2 mL/kg), and on plasma glucose levels in alloxan-induced diabetic rats.

The plasma glucose level of alloxan-injected rats (120 mg/kg, s.c.) was about twice as high as that of their controls. It was further elevated by a single oral dose of the preparation. Chronic treatment with the preparation, given twice daily for 10 days, produced a sustained increase in the plasma glucose levels. The findings do not support the claimed efficacy of the preparation in treating gastric ulceration and diabetes mellitus.

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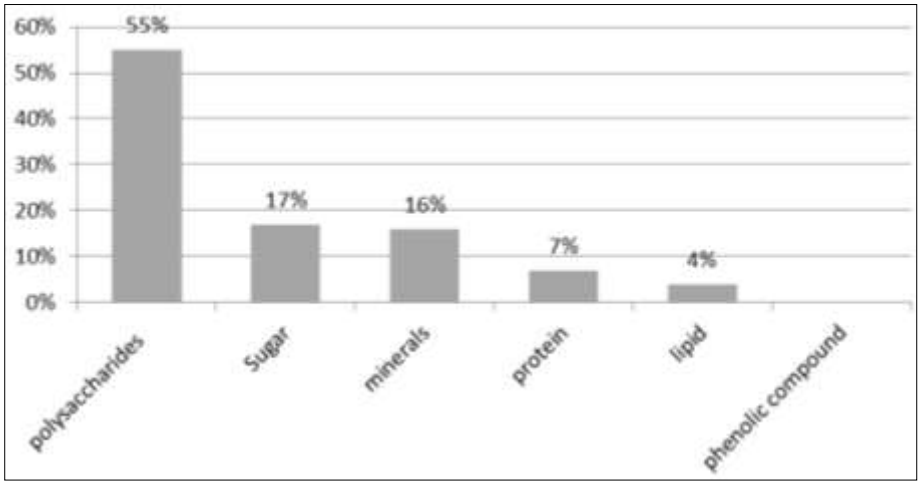

Fig 1: The chemical composition of *Aloe Vera* gel.

These food additives used by the food industry to prevent lipid peroxidation have been reported to possess possible toxic and carcinogenic effect on health. Thus, efforts have been made to search for novel natural antioxidant from tea, fruits, vegetables, herbs and spices.

Jam is an intermediate food prepared by boiling fruit pulp with sugar, acid, pectin and other ingredients for colouring and flavouring with preservatives to a thick consistency and firmness to the hold the fruit tissues.

According to the specification of the Codex Alimentarius Commission the finished jam should contain more than 65% TSS. Sugar constitutes more than 40% of total weight and 80% of total solids in jam.

The objective of the work is to produce jam using *Aloe Vera*. This study, which focuses on the production of jam using *Aloe Vera*. The quality of the jam depends on the proportion of the mixture which can be tested by sensory analysis. In product development and optimisation, Response surface methodology (RSM) is used to model and optimise the response affected by levels of one or more quantitative factors. This method has been successfully applied by several authors to determine the optimum formulation for a food product.

Pectin is a type of fiber that is found in all plant cell walls and tissues. While all may contain pectin, the amount and concentration of pectin varies among plants. Pectin is an important polysaccharide with applications in foods, Pharmaceuticals, and a number of other industries. In the food industry, pectin is used in jams, jellies, frozen foods, and more recently in low-calorie foods as a fat and/or sugar replacer. In the pharmaceutical industry, it is used to reduce blood cholesterol levels and gastrointestinal disorders.

Apple contain a particularly high amount of pectin, according to dietaryfiberfood.com, and the highly co0ncentrated apple pectin delivers many health benefits. Apple pectin is available in the skin and pulp of fresh apples or as a dietary supplement. Apple pectin, a soluble fiber found in apples, also is found in other fruits.

Materials and Methods

This study deals with description of research procedure and techniques based on literature reviewed. The present investigation entitled "Preparation of *Aloe Vera* jam along with its chemical constituents" was carried out in the "Department of Nutrition Science" at Institute of Bioscience and Biotechnology department of Chhatrapati Shahu ji Maharaj University, Kanpur. The material for the present investigation was procured from C.S.A. University of Agriculture & Technology, Kanpur from the Department of Forestry. *Aloe Vera* (L.) selected on the basis of higher yield and better quality was used for the investigation.

The name *Aloe Vera* derives from the Arabic word "Alloeh" meaning "shining bitter substance," while "Vera" in Latin means "true." 2000 years ago. The Greek scientists regarded *Aloe Vera* as the universal panacea. *Aloe Vera* has been used for medicinal purposes in several cultures for millennia: Greece, Egypt, India, Mexico, Japan and China. The botanical name of *Aloe Vera* is *Aloe barbadensis miller*. It belongs to Asphodelaceae (Liliaceae) family, and is a shrubby or arborescent, perennial, xerophytic, succulent, pea- green colour plant. It grows mainly in the dry regions of Africa, Asia, Europe and America. In India, it is found in Rajasthan, Andhra Pradesh, Gujarat, Maharashtra and Tamil Nadu. The leaves of *Aloe Vera* contain a certain amount of water, which brings to this plant a wonderful soothing quality. In *Aloe Vera* gel, we can also find a lot of vitamins and essential minerals that are beneficial for human health, such as vitamins A, C, E, B1, and B6, potassium, calcium and magnesium. There are about 18 amino acids found in *Aloe Vera* and these amino acids work closely with other essential compounds to constitute many health benefits of *Aloe Vera*. Antioxidants in *Aloe Vera* are polyphenols which have powerful influence on the prevention against infections.

Result and Discussion

According to Kerlinger, "Analysis is the categorizing, ordering, manipulation and summarising of data to obtain answer to the research question".

The study deals with chemical analysis of *Aloe Vera* pulp and also chemical analysis and sensory evaluation of *Aloe Vera* jam. The results obtained from the present investigation are presented discussed in this chapter under the following heading and sub- heading:

Nutritive value / Chemical composition of *Aloe Vera pulp.*
Mean score of chemical analysis of *Aloe Vera* pulp

The data of mean score were tabulated and analyzed statistically; result and discussion has been presented in table:

Table 1: Mean score of Nutrient content of *Aloe Vera* pulp.

Parameters (%)	No. of observation	Man's score of Nutrient content of *Aloe Vera* pulp
Moisture	12	96.08
Protein	12	3.45
Fat	12	3.10
Ash	12	17.20
Ph	12	5.4

1. *Aloe Vera* pulp was extracted from fresh *Aloe Vera* after washing and peeling it. The sample was analyzed for various nutrients and results were presented in Table 1. A wide range of nutrients performs various functions in the body. Most foods contain almost all the nutrient in various proportions whereas some food are rich either or deficient in specific nutrients. The nutrient components not only determine shelf- life and nutritional quality but also determine end uses in development of designer foods specific purposes.
2. Moisture profile:
3. Moisture content is very important for its shelf-life, lower the moisture content, the better its storage (Butt *et al*. 2004). The Table 1 shows that the moisture content of *Aloe Vera* pulp was 96.08%. Similar moisture content in *Aloe Vera* has been reported earlier by Arora (2007), Sharma (1999) and Gautam and Awasthi (2007).
4. Protein profile:
5. Table 1 shows that the mean score of protein was 3.45% in *Aloe Vera* pulp. In the earlier evidence, Sharma (1999) and Arora (2007) reported the level of protein in *Aloe Vera* was 3.50%. However, Gautam and Awasthi (2007) have reported higher level of protein i.e. 4.8g/100g in *Aloe Vera*.
6. Fat Profile
7. It is evidence from the Table 1 that the mean score of the fat was 3.10% in *Aloe Vera* Pulp. Similarly, Sharma (1999) in an earlier study, reported fat content of *Aloe Vera* to be 3.2g/100g; Arora (2007) observed fat content to be 2.96 g/100g in *Aloe Vera*.
8. Ash profile
9. Table 1 represents that the mean score value of ash was 17.20% in *Aloe Vera* pulp. Gautam and Awasthi (2007) reported lower ash content i.e. 14g/100g ash in *Aloe Vera*.
10. pH Profile
11. Table 1 represents that the mean score value of pH was 5.4% in *Aloe Vera* pulp.

Summary and Conclusion

The semi-tropical plant, *Aloe Vera*, has a long and illustrious history dating from biblical times. It has been mentioned throughout recorded history and given a high ranking as an all-purpose herbal plant. Aloe's thick, tapered, spiny leaves grow from a short stalk near ground level. It is a member of the tree lily family, know as Aloe barbadensis. The original commercial use of the Aloe plant was in the production of a latex substance called Aloin, a yellow sap used for many years as laxative ingredients. This *Aloe Vera* Gel, beginning in the 50's, has gained respect as a commodity used as a base for nutritional drinks, as a moisturizer, and a healing agent in cosmetics and in drugs. Chemical analysis has revealed that this clear gel contains amino acids, minerals, vitamins, enzymes, proteins, polysaccharides and biological stimulators. The use *Aloe Vera* as a commodity in nutritional foods and cosmetics is due to proper stabilizing procedures that enables processors to store and ship the Aloe Gel without fear of spoilage.

Conclusion

Analytical procedure for chemical attributes of *Aloe Vera* pulp

Aloe Vera pulp was extracted from fresh *Aloe Vera* washing and peeling it. The sample was analyzed for various nutrients i.e. moisture, protein, fat, total ash and pH. The nutrient components not only determine end uses in development of designer foods for specific purposes. The moisture content of *Aloe Vera* pulp was 96.08%.

- The protein content was 3.45% in *Aloe Vera* pulp.
- The fat content was 3.10% in *Aloe Vera* pulp.
- The total ash content of *Aloe Vera* pulp was 17.205.
- The ph content was 5.4% in *Aloe Vera* pulp.

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