www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; 12(3): 2631-2633

www.thepharmajournal.com
Received: 03-01-2023
Accepted: 11-02-2023

Dr. Smita Gautam
Assistant Professor, Department of Home Science, N.S.P.S. Govt. P.G. College, Magraha, Mirzapur, Uttar Pradesh, India

Corresponding Author:
Dr. Smita Gautam
Assistant Professor, Department of Home Science, N.S.P.S. Govt. P.G. College, Magraha, Mirzapur, Uttar Pradesh, India

Aloe vera (*Aloe barbadensis*) leaf as an ingredient of functional food

Dr. Smita Gautam

Abstract
Aloe-vera (*Aloe barbadensis*) is one of the most important medicinal plants, which has several medicinal and therapeutic properties. The virtues of *Aloe-vera* have been recorded for thousands of years by many ancient civilizations. Nowadays *Aloe-vera* is used as a functional ingredient of so many food products. This study was carried out to evaluate *Aloe-vera* leaf powder as a functional ingredient of food. So in this context *Aloe vera* leaf powder was prepared and incorporated in Aloe-*Laddu*. Aloe- pickle was also prepared by using fresh *Aloe-vera* leaf. These two food products were evaluated for proximate composition, sensory quality characteristics and storage stability. It was found that Aloe-*laddu* had 27.38% and Aloe-pickle had 17.39% crude fiber, while protein content of Aloe-*laddu* and Aloe-pickle was 10.02% and 9.77% respectively.
The data obtained for different sensory quality characteristics of developed products were evaluated on nine point hedonic scale. Mean scores for overall acceptability for the products *viz*. Aloe-*laddo* and Aloe-pickle were found to be 7.91 and 7.92 respectively. The mean sensory scores of overall acceptability showed that products were liked very much by the panelists.
The storage quality of Aloe-*laddu* and Aloe-pickle were evaluated for period of one month and three months respectively. It was found that there was significant decrease in sensory attributes in Aloe-*laddu* during storage period whereas significant increase was observed in sensory attributes of Aloe-pickle during storage.
This study suggests that food products developed by using *Aloe-vera* leaf have very good nutritional properties along with its medicinal value. Therefore these food products can be used in day to day life for health benefits.

Keywords: *Aloe-vera*, functional food, proximate-analysis, sensory, storage

Introduction
The use of medicinal and aromatic plants is as old as the human civilization. Our country has a glorious tradition of health care system based on plants. Current estimations suggest that in many developing countries a large proportion of the population relies heavily on traditional practitioners and medicinal plants to meet primary health care needs. *Aloe vera* is known as the plant of immortality because of its anti-asthmatic, antiburn, antifungal, antibacterial, anti-hypercholesterolemic, anti-hyperglycemic and anti- inflammatory effects (Grewal, 2000) [4]. Besides its medicinal values *Aloe vera* also contains a number of nutrients such as vitamins, minerals, amino acids, sugars, enzymes, fatty acids and saponins, which have the positive effect on human body (Nandlal *et al*., 2012) [6].
Aloe vera contains 18.5% crude fiber, 4.8% crude protein, 2.2% crude fat, 14.0% total ash, 48.0% carbohydrate and 231 kcal energy value. It contains substantial amounts of iron (64.8mg/100g), ascorbic acid (27.0mg/100g) and beta-carotene (333.8mg/100g). Dietary fiber was also present in good amount i.e.21.3% (Gautam S, 2007) [5].
Functional foods are those foods which contain significant levels of biologically active components that impart health benefits beyond basic nutrition. A study conducted on 502 community college students from Arizona revealed that students who were supplemented with *Aloe-vera* along with vitamin-C, vitamin-E and minerals significantly increased energy and reduced stress. *Aloe-vera* supplemented young adult perceived more health benefits than non supplemented group (Eldrige *et al*., 1994) [3].
Aloe-vera is used as a dietary supplement because of its health benefits (Dubick, 1983) [2]. Nowadays people are suffering with lots of health problem along with nutritional deficiency. Therefore there is a need to evolve food based strategies to combat the health related problems. In this context *Aloe vera* food products were developed and evaluated for their proximate composition, sensory quality characteristics and storage stability.

Method and Materials

Aloe vera leaf was used as a functional ingredient in the preparation of functional foods. *Aloe vera* leaf powder was used to prepare Aloe-*laddu* and it was incorporated in *laddu* in prescribed amount (0.5 g/d). The other product which was made using fresh whole leaf was Aloe-pickle.

Both the products made using *Aloe vera* namely Aloe-*laddu* and Aloe-pickle were evaluated for sensory quality characteristics using nine point hedonic scale to test various attributes such as colour, taste, flavor, texture, appearance and over all acceptability. The sensory characteristics of products were determined using semi-trained panel of fifteen members. The panelists were asked to record their level of liking for the products on nine point hedonic scale.

Storage stability of both the products namely Aloe-*laddu* and Aloe-pickle were evaluated for a period of one month and three months respectively. The products were evaluated for sensory quality characteristics on 0 day, 15 days and 30 days storage period for Aloe- *laddu* whereas Aloe-pickle was evaluated on 30 days, 60 days and 90 days storage period.

Statistical analysis: The data obtained on sensory quality characteristics and nutritional values of the products were calculated as mean value and their standard deviation. One way ANOVA was used to find out the significant difference for the entire data (Snedecor and Cochran.1967) [7].

Result and Discussion: The data on sensory quality characteristics of Aloe-*laddu* are given below. The mean sensory scores for colour, taste, flavor, texture, appearance and overall acceptability for Aloe-*laddu* were found to be 7.66, 8.00, 7.53, 7.55, 7.72 and 7.91 respectively while mean sensory scores of colour, taste, flavor, texture, appearance and overall acceptability for Aloe-pickle were found to be 7.53, 7.55, 7.72, 7.58, 7.56, and 7.92 respectively. Thus the mean scores of the sensory attributes for both the products showed that developed products were liked very much by the panelists.

Table 1: Mean sensory scores of Aloe-*laddu*

Sensory quality Characteristics	Aloe-*laddu*	
	Scores	Preference
colour	7.66	Liked very much
Taste	8.00	Liked very much
Flavour	7.53	Liked very much
Texture	7.55	Liked very much
Appearance	7.72	Liked very much
Overall acceptability	7.91	Liked very much

Table 2: Mean sensory scores of Aloe-pickle

Sensory quality Characteristics	Aloe-pickle	
	Scores	Preference
colour	7.53	Liked very much
Taste	7.55	Liked very much
Flavour	7.72	Liked very much
Texture	7.58	Liked very much
Appearance	7.56	Liked very much
Overall acceptability	7.92	Liked very much

Changes in mean sensory scores of Aloe-*laddu* during storage

Storage stability of Aloe-*laddu* was evaluated for one month period. On zero day the mean sensory scores of Aloe-*laddu* for different attributes such as colour, taste, flavor, texture, appearance and over all acceptability were found to be 7.63, 7.93, 7.56, 7.58, 7.65 and 8.03 respectively while the mean sensory scores on 30th day of storage were found to be 7.53, 6.66, 6.86, 6.80, 6.90 and 7.20 for colour, taste, flavor, texture, appearance and over all acceptability respectively. Thus data revealed that there were significant differences in decreasing order in all the mean scores of sensory attributes except for colour during the storage period.

Table 3: Mean sensory scores of Aloe-*laddu* during storage

Storage period (days)	Sensory quality characteristics					
	Colour	Taste	Flavour	Texture	Appearance	Overall acceptability
0 day	7.63	7.93	7.56	7.58	7.65	8.03
15 days	7.40	7.39	7.53	7.47	7.60	7.61
30 days	7.53	6.66	6.86	6.80	6.90	7.20
SEM	0.237	0.194	0.221	0.224	0.202	0.202
CD at 5%	0.678	0.554	0.632	0.640	0.578	0.578

Changes in mean sensory scores of Aloe-laddu during storage: Storage stability of Aloe-pickle was evaluated for three months period. On 30th day the mean sensory scores of Aloe-pickle for different attributes such as colour, taste, flavor, texture, appearance and overall acceptability were found to be 7.20, 7.13, 7.16, 7.26, 7.46 and 7.61 respectively while the mean sensory scores on 90th day of storage of Aloe-pickle were found to be 7.86, 8.01, 7.79, 7.25, 7.70 and 8.03 for colour, taste, flavor, texture, appearance and overall acceptability respectively. Thus the data revealed that there were significant differences in increasing order in mean scores of taste and flavor as the storage period was increased from 30 days to 90 days.

Table 4: Mean sensory scores of Aloe-pickle during storage

Storage period (days)	Sensory quality characteristics					
	Colour	Taste	Flavour	Texture	Appearance	Overall acceptability
30 day	7.20	7.13	7.16	7.26	7.46	7.61
60 days	7.56	7.33	7.03	7.58	7.50	8.16
90 days	7.86	8.01	7.79	7.25	7.70	8.03
SEM	0.222	0.222	0.190	0.612	0.267	0.190
CD at 5%	0.633	0.544	0.544	0.512	0.762	0.543

Nutritional evaluation of *Aloe-vera* food products

Proximate composition of Aloe-*laddu*: Data obtained on proximate composition of Aloe-*laddu* revealed that it contains high amount of crude fiber (27.58±1.28 percent), good amount of crude protein (10.02±0.5 percent) and fair amount of moisture (4.50±0.5 percent), total ash (2.30±0.27 percent), crude fat (9.13±0.12 percent) and carbohydrate (46.91v0.398 percent). The energy value of Aloe-*laddu* was found to be 308±0.920 kcal/100g.

Table 5: Proximate composition of Aloe-*laddu**

Proximate principles	Aloe-*laddu*
Moisture (%)	4.50±0.5
Total ash (%)	2.30±0.27
Crude fiber (%)	27.58±1.28
Crude fat (%)	9.13±0.12
Crude protein (%)	10.02 ±0.5
Carbohydrate (%)	46.91±0.398
Energy (kcal/100g)	308±0.920

*Value are mean of 5 replications

Proximate composition of Aloe-pickle: Result obtained from analysis of proximate composition of Aloe-Pickle revealed that it contains high amount of moisture (56.7±0.28 percent) and total ash (22.3±0.26 percent). Crude fiber was present in considerable amount i.e. 17.39±1.67 percent and crude protein was found to be 9.77±0.04 percent. Crude fat content of Aloe-pickle was found to be 28.33±1.26 percent. Carbohydrate content was present in less amount i.e. 21.58± 0.42 percent while energy value was found to be 381±0.76 kcal/100g.

Table 6: Proximate composition of Aloe-pickle

Proximate principles	Aloe-*laddu*
Moisture (%)	56.70±2.08
Total ash (%)	22.30±0.26
Crude fiber (%)	17.39±1.67
Crude fat (%)	28.33±1.26
Crude protein (%)	9.77±0.04
Carbohydrate (%)	21.58±0.42
Energy (kcal/100g)	381.4±0.76

*Value are mean of 5 replications

Conclusion

The present study was evidenced that both the developed functional food products had very appealing sensory quality characteristics. Storage stability of Aloe-*laddu* was found very good during one month of storage periods as the time passes the taste of the Aloe-*laddu* got deteriorated While all the sensory attributes enhanced during storage period in case of Aloe-pickle. Therefore these food products must be used in day to day life for health benefits.

References

1. A.O.A.C. Official methods of analysis of the association of official analytical chemists. Horrvitz. ed. Association of official Analysis Chemist, Washington D.C.; c1975.
2. Dubick, Michael A. Dietary supplements and health aids; A critical evaluation: Part 3; Natural and miscellaneous products. Journal of Nutrition Education (USA). 1983;15(4):123-129.
3. Eldrige AL, Sheehan ET. Food supplement use and related beliefs; survey of community college students. Journal of Nutrition Education (USA). 1994;26(6):259-265.
4. Grewal RC. Medicinal plant; c2000. p. 101-121
5. Gautam S, Awasthi P. Nutrient composition and physio-chemical characteristics of *Aloe vera* (Aloe barbadensis) powder. J Food Sci. Technol. 2007;44(2):224-225.
6. Nandlal U, Bhardwaj RL. *Aloe vera* for human nutrition, health and cosmetic use-A review. International Research journal of Plant science. 2012;3(3):038-046.
7. Snedecor GW, Cochran WG. Statistical methods. Oxford and IBH Publishing C., Calcutta; c1967.