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## Studies on sensory evaluation of pumpkin wine prepared from different variety

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### Abstract

Pumpkin (*Cucurbita moschata*) has a significant position among vegetables due to its great output, nutritional value, superior storage capacity, prolonged availability, improved transport capabilities, and widespread cultivation in subtropical and tropical regions of the world. It is used both in matured and immature stage as a vegetable. It is also consumed as processed and stock feed. The flesh is delicious when fried, stewed, boiled or baked. Pumpkin is the natural source of  $\beta$ -carotene, the precursor of vitamin A. Though, pumpkin is commercially not processed for production of value added product but preparation of high value added product such as pumpkin wine can also be one of the alternatives to utilize this vegetable. Very less work had been carried out to exploit pumpkin for value addition. Advantage of maximum productivity of pumpkin and low cost productions and medicinal properties may have great scope for preparation of pumpkin wine in wine industry. Nutritional and medicinal properties of pumpkin fruit, the experiment was undertaken to conduct the research work regarding studies on wine making from different varieties of pumpkin. The wine was prepared and kept for maturation up to 6 months and the observations in respect of sensory evaluation were recorded periodically at fresh and then after one-month interval upto 6 months of maturation of pumpkin wine. From the experiment it was observed that, the treatment combination Arka Chandan variety and sugar concentration 24<sup>0</sup>B (VIT1) was found superior for pumpkin wine preparation.

**Keywords:** Pumpkin, wine, yeast, pH, Arka chanda, sugar concentration, pumpkin processing

### Introduction

Pumpkin (*Cucurbita moschata*) occupies a prominent place among vegetables owing to its high productivity, nutritive value, good storability, long period of availability, better transport qualities and extensive cultivation in subtropical and tropical parts of the world. It is used both in matured and immature stage as a vegetable. It is also consumed as processed and stock feed. The flesh is delicious when fried, stewed, boiled or baked. The fruits are sweet when fully mature and can be used in preparing sweet, candy or fermented into beverages. Yellow or orange fleshed pumpkin are rich in carotene. In India, it is grown mainly in Assam, West Bengal, Tamil Nadu, Karnataka, Maharashtra, Madhya Pradesh, Uttar Pradesh, Orissa and Bihar. (Chadha. 2009) [2] Pumpkin pulp is also useful for the preparation of GTF (Glucose tolerance factor) pumpkin milk powder. Mature fruit are also used as industrial raw material for carotene production. The seed after removing the seed coats are used in confectionary. Pumpkin is particularly important for the supply of antioxidant and especially  $\beta$ -carotene in the foods. It help to alleviate cardiovascular disease and consumption. It also diuretic food because of having high K: Na ratio. Its combination with sugar and honey has soothing effect to ulcers and blisters. It's used in the treatment of diabetes, rheumatism, eczema, and burns and against worms and other parasites. The seeds along with sugar are taken to kill tape worms and are useful in urinary disease. Wines are un-distilled alcoholic beverages which are nutritive, more tasty and mild stimulated. Being fruit vegetables based beverages, wine provides minerals and vitamins. Wine is a product of metabolisms through alcoholic fermentation of yeast having long shelf life. Wine is safe and healthful beverage. The alcohol in wine stimulates gastric secretions and depresses nervous system. Wine has been used as food and medicine since ages (Chaudhary *et al.*, 2014) [3].

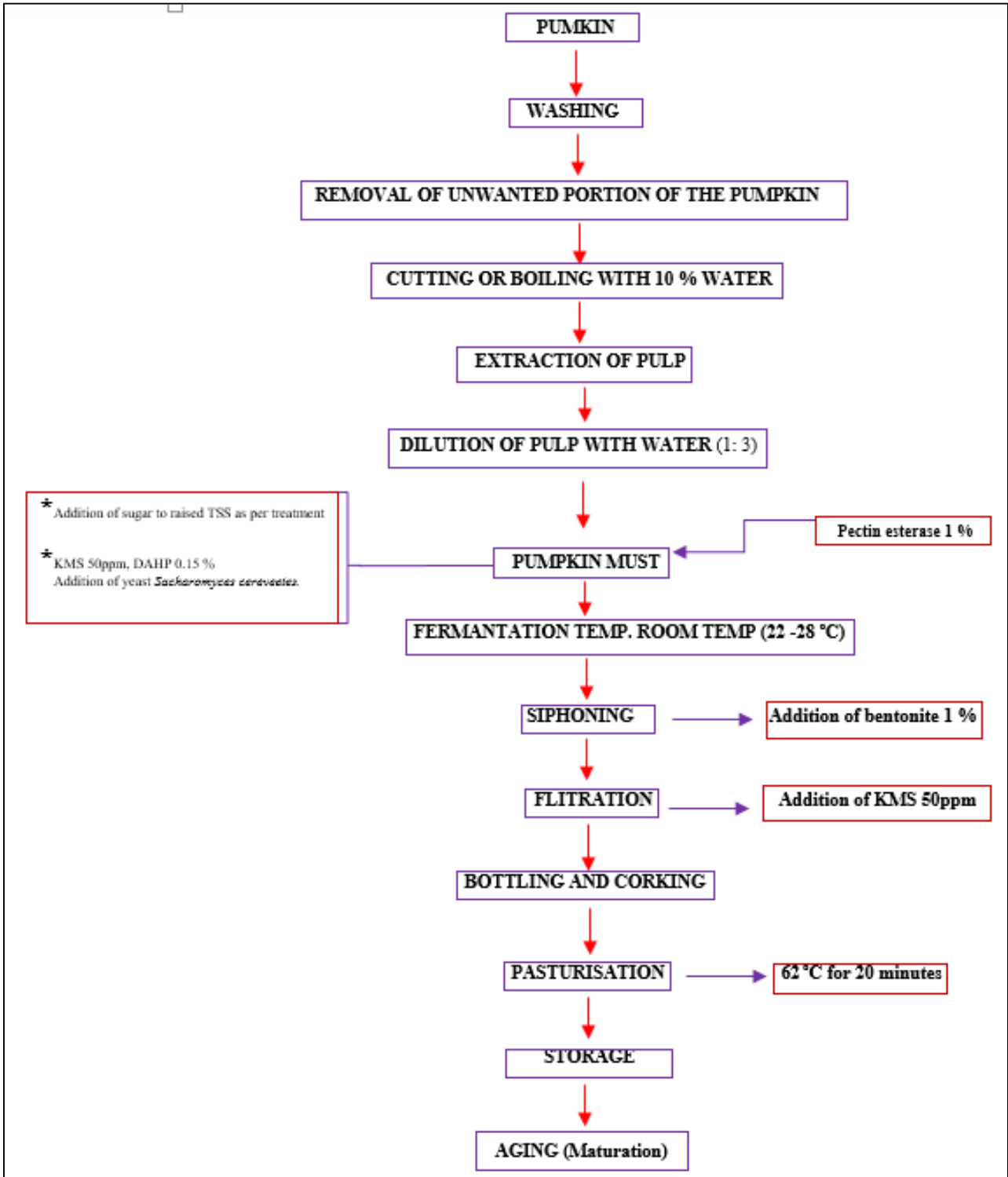
In this experiment we have used two factors, factor A as three varieties of pumpkin *viz.* Arka Chandan, Pusa Biswas and Ambeli and factor B consist of three levels of sugar concentrations *viz.* 24<sup>0</sup>B, 26<sup>0</sup>B and 28<sup>0</sup>B and in all nine treatment combinations. The observations in respect for sensory evaluation were recorded periodically at fresh and then after one-month interval upto 6 months of maturation of pumpkin wine.

**Material and Methods**

The experiment was laid out in Factorized Complete Randomized Design with nine treatment combinations comprising factor A as three varieties of pumpkin viz. Arka Chandan, Pusa Biswas and Ambeli and three different levels of TSS (Factor B) viz., viz. 24<sup>o</sup>B, 26<sup>o</sup>B and 28<sup>o</sup>B. The wine is stored for 6 months for maturation.

**Sensory evaluation**

Pumpkin wine prepared from pumpkin fruits were evaluated for sensory qualities viz. colour, taste, aroma, appearance, astringency and overall acceptability. Each attribute was given a separate score of 09 points hedonic scale according to the method reported by Amerine (1986) [1]. Sensory evaluation will be carried out by serving the chilled and coded samples kept randomly by a group of five trained panelists. The mean values of score for sensory evaluation was calculated and reported.



**Hedonic scale**

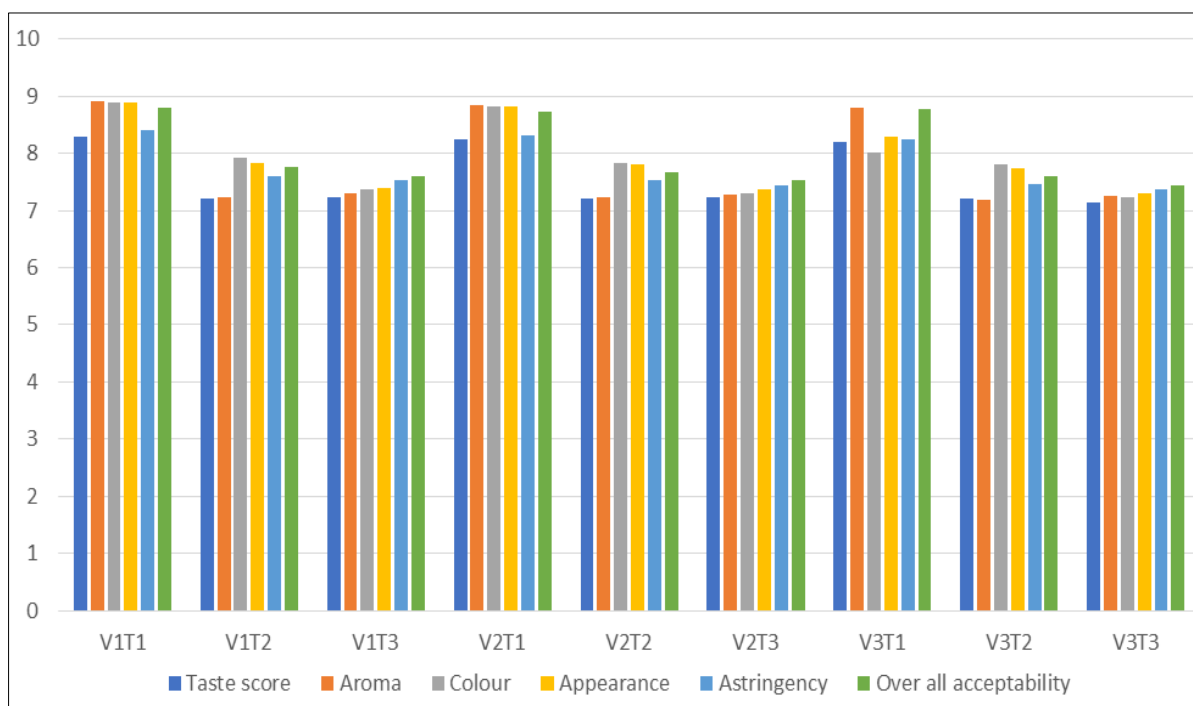
- |                     |                              |                        |
|---------------------|------------------------------|------------------------|
| Like extremely – 9  | Like slightly – 6            | Dislike moderately – 3 |
| Like very much – 8  | Neither like nor dislike – 5 | Dislike very much – 2  |
| Like moderately – 7 | Dislike slightly – 4         | Dislike extremely – 1  |

**Fig 1:** Flow sheet of preparation of pumpkin wine

**Results and Discussion**

**Table 1:** Effect of sugar concentrations on sensory evaluation of fresh pumpkin wine prepared from different varieties of pumpkin

Treatments combinations	Taste score	Aroma	Colour	Appearance	Astringency	Over all acceptability
V <sub>1</sub> T <sub>1</sub>	8.29	8.92	8.88	8.89	8.40	8.80
V <sub>1</sub> T <sub>2</sub>	7.21	7.24	7.93	7.84	7.59	7.76
V <sub>1</sub> T <sub>3</sub>	7.24	7.29	7.38	7.40	7.52	7.61
V <sub>2</sub> T <sub>1</sub>	8.25	8.84	8.81	8.82	8.32	8.73
V <sub>2</sub> T <sub>2</sub>	7.21	7.24	7.84	7.81	7.54	7.67
V <sub>2</sub> T <sub>3</sub>	7.22	7.27	7.31	7.36	7.44	7.53
V <sub>3</sub> T <sub>1</sub>	8.20	8.80	8.01	8.30	8.25	8.77
V <sub>3</sub> T <sub>2</sub>	7.21	7.18	7.81	7.74	7.47	7.61
V <sub>3</sub> T <sub>3</sub>	7.14	7.26	7.24	7.30	7.38	7.44



**Fig 2:** Effect of sugar concentrations on sensory evaluation of fresh pumpkin wine prepared from different varieties of pumpkin

The taste score of pumpkin wine was increased in all the treatment combination up to 6 months of maturation. During evaluation of freshly prepared wine significantly maximum (8.29) score for taste was recorded by treatment combination V<sub>1</sub>T<sub>1</sub> and it was significantly superior among all the treatment combination. However, significantly minimum (7.14) taste score was recorded by treatment combination V<sub>3</sub>T<sub>3</sub>. During sensory evaluation of 6 months matured pumpkin wine, maximum (8.63) score for taste was recorded by treatment combination V<sub>1</sub>T<sub>1</sub> and it was significantly superior among all the treatment combinations. However, significantly minimum (7.29) taste score was recorded by treatment combination V<sub>3</sub>T<sub>3</sub>. The aroma score of pumpkin wine was increased in all the treatments up to 6 months of maturation.

During evaluation of freshly prepared wine significantly maximum (8.92) score for aroma was recorded by treatment combination V<sub>1</sub>T<sub>1</sub> and it was significantly superior among all the treatment combination. However, significantly minimum (7.18) aroma score was recorded by treatment combination V<sub>3</sub>T<sub>2</sub>. During sensory evaluation of 6 months matured pumpkin wine, maximum (8.99) score for aroma was recorded by treatment combination V<sub>1</sub>T<sub>1</sub> and it was significantly superior among all the treatment combinations. However, significantly minimum (7.27) aroma score was recorded by treatment combination V<sub>3</sub>T<sub>2</sub>.

The data in respect of colour score influenced due to the combined effect of different varieties and sugar concentrations on pumpkin wine are presented in table A and B and graphically represented in Fig. 1 & 2. The colour score of pumpkin wine was increased in all the treatments up to 6 months of maturation. During evaluation of freshly prepared wine significantly maximum (8.88) score for colour was recorded by treatment combination V<sub>1</sub>T<sub>1</sub> and it was significantly superior among all the treatment combination. However, significantly minimum (7.24) colour score was recorded by treatment combination V<sub>3</sub>T<sub>3</sub>. During sensory evaluation of 6 months matured pumpkin wine, maximum (9.00) score for colour was recorded by treatment combination V<sub>1</sub>T<sub>1</sub> and it was significantly superior among all the treatment combinations. However, significantly minimum (7.40) colour score was recorded by treatment combination V<sub>3</sub>T<sub>3</sub>.

The appearance score of pumpkin wine was increased in all the treatments up to 6 months of maturation. During evaluation of freshly prepared wine significantly maximum (8.89) score for appearance was recorded by treatment combination V<sub>1</sub>T<sub>1</sub> and it was significantly superior among all the treatment combination. However, significantly minimum (7.30) appearance score was recorded by treatment combination V<sub>3</sub>T<sub>3</sub>. During sensory evaluation of 6 months

matured pumpkin wine, maximum (9.00) score for appearance was recorded by treatment combination V<sub>1</sub>T<sub>1</sub> and it was significantly superior among all the treatment combinations. However, significantly minimum (7.46) appearance score was recorded by treatment combination V<sub>3</sub>T<sub>3</sub>.

The astringency score of pumpkin wine was increased in all the treatments up to 6 months of maturation. During evaluation of freshly prepared wine significantly maximum (8.40) score for astringency was recorded by treatment combination V<sub>1</sub>T<sub>1</sub>. However, significantly minimum (7.38) astringency score was recorded by treatment combination V<sub>3</sub>T<sub>3</sub>. During sensory evaluation of 6 months matured pumpkin wine, maximum (8.61) score for astringency was recorded by treatment combination V<sub>1</sub>T<sub>1</sub> and it was significantly superior among all the treatment combinations. However, significantly minimum (7.59) astringency score was recorded by treatment combination V<sub>3</sub>T<sub>3</sub>.

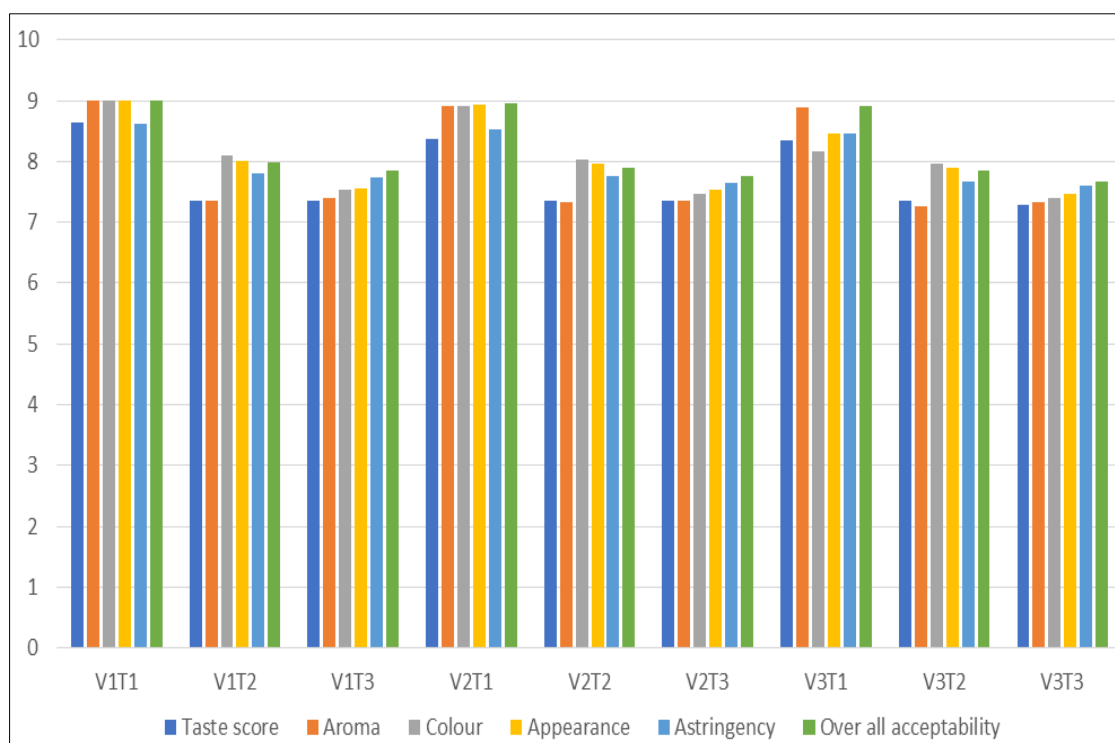
During evaluation of freshly prepared wine significantly maximum (8.80) score for overall acceptability was recorded by treatment combination V<sub>1</sub>T<sub>1</sub> and it was significantly superior among all the treatment combination. However, significantly minimum (7.44) overall acceptability score was recorded by treatment combination V<sub>3</sub>T<sub>3</sub>. During sensory evaluation of 6 months matured pumpkin wine, maximum

(9.00) score for overall acceptability was recorded by treatment combination V<sub>1</sub>T<sub>1</sub> and it was significantly superior among all the treatment combinations. However, significantly minimum (7.67) overall acceptability score was recorded by treatment combination V<sub>3</sub>T<sub>3</sub>.

Similar results have also reported by Kumar *et al.* (2016) [6] the changes in physico-chemical characteristics of custard apple wine during maturation reflected in sensory quality characteristics. Custard apple wine matured for 6 months was preferred by the judges. A gradual increase in all the sensory characteristics was observed with the advancement of maturation period except astringency which is desirable also. The improvement in the colour might be due to the precipitation of the TSS during the maturation as discussed earlier which resulted in the clarified wine after 6 months of maturation. Improvement in the aroma, taste and flavour might be due to the hydrolysis of non-reducing sugars into reducing sugars which is one of the desirable effects from taste point of view and formation of esters which is responsible for fruity flavor in wine. Lakshamana *et al.*, (2006) [7] observed from the sensory evaluation at the end of storage (360th day) that, the carambola wine prepared from 24°B must has scored the highest (18.64) sensory points out of 20.00 score in terms of appearance, colour, aroma, acidity and flavour.

**Table 2:** Effect of sugar concentrations on sensory evaluation of 6 months matured pumpkin wine prepared from different varieties of pumpkin

Treatments combinations	Taste score	Aroma	Colour	Appearance	Astringency	Over all acceptability
V <sub>1</sub> T <sub>1</sub>	8.63	8.99	9.00	9.00	8.61	9.00
V <sub>1</sub> T <sub>2</sub>	7.35	7.35	8.09	8.00	7.80	7.99
V <sub>1</sub> T <sub>3</sub>	7.35	7.39	7.54	7.56	7.73	7.84
V <sub>2</sub> T <sub>1</sub>	8.37	8.91	8.92	8.93	8.53	8.95
V <sub>2</sub> T <sub>2</sub>	7.35	7.33	8.03	7.97	7.75	7.90
V <sub>2</sub> T <sub>3</sub>	7.36	7.35	7.47	7.53	7.65	7.76
V <sub>3</sub> T <sub>1</sub>	8.34	8.89	8.17	8.46	8.46	8.90
V <sub>3</sub> T <sub>2</sub>	7.35	7.27	7.97	7.90	7.68	7.84
V <sub>3</sub> T <sub>3</sub>	7.29	7.34	7.40	7.46	7.59	7.67



**Fig 3:** Effect of sugar concentrations on sensory evaluation of 6 months matured pumpkin wine prepared from different varieties of pumpkin

## Conclusions

From the present investigation it can be concluded that, Different pumpkin varieties and sugar concentrations exerted significantly positive effect on sensory characters of all stages of matured pumpkin wine. Maximum increase in taste, aroma, colour, appearance, astringency and overall acceptability scores of pumpkin wine were recorded with variety Arka Chandan V<sub>1</sub> and sugar concentration level T<sub>1</sub> i.e. 24 °B. From the overall assessment of results obtained, it may be concluded that the variety Arka Chandan with 24°B TSS (V<sub>1</sub>T<sub>1</sub>) was found suitable for preparation of wine from pumpkin.

## References

1. Amerine MA, Berg HW, Kunkee RE, Ough CS, Singleton VL, Webb AD. (B) The Technology of Wine Making. 4th ed. AVI: Westport; CT; c1986. p. 794.
2. Chadha KL. Handbook of Horticulture, 2<sup>nd</sup> Ed. directorate of information and publications, ICAR New Delhi; c2009.
3. Chaudhary C, Yadav BS, Grewal. Preparation of red wine by blending of grape (*Vitis vinifera*L.) and jamun (*Syzygium cuminii* L. Skeels) juices before fermentation. Int. J of Agriculture and Food Science Technology. 2014;5(4):239-348.
4. Joshi VK, Thakur NK, Lai BB. Effect of debittering of kinnow juice on physico-chemical and sensory quality of kinnow wine. Indian Food Packer. 1997;51:5-10.
5. Joshi VK, Gill A, Kumar V, Chauhan A. Preparation of plum wine with reduced alcohol content: effect of must treatment and blending with sand pear juice on physico-chemical and sensory quality. Indian Journal of Natural Products and Resources. 2014 Nov 20;5(1):67-74.
6. Kumar V, Jnawali P, Veeranna PG, Bhasin JK. Effect of maturation on physico-chemical and sensory quality characteristics of custard apple wine. Cogent Food & Agriculture. 2016 Dec 31;2(1):118-124.
7. Lakshmana D, Abdul BR, Lingaiah HB. Effect of quality of must on quality of carambola wine. Karnataka J Agric. Sci. 2006 May 14;19(2):352-356.
8. Thakur AD, Anuj Saklani, Somesh Sharma, Joshi VK. Effect of different sugar sources, pectin esterase and acidulat concentration on pumpkin wine production. International Journal of Food and Fermentation Technology. 2014 Jun 1;4(1):67-78.