www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2021; SP-10(1): 203-206

www.thepharmajournal.com
Received: 22-10-2020
Accepted: 02-12-2020

Bhagyashri V Patkar
M.Sc. (Fruit Science) Student, Department of Fruit Science, PGI, Dr. PDKV, Akola, Maharashtra, India

Rutuja N Deshmukh
M.Sc. (Fruit Science) Student, Department of Fruit Science, PGI, Dr. PDKV, Akola, Maharashtra, India

Dr. SR Dalal
Head, Section of Horticulture, College of Agriculture, Dr. PDKV, Akola, Maharashtra, India

Shrikant Wankhade
M.Sc. Student, Department of Vegetable Science, Department of Vegetable Science, PGI, Dr. PDKV, Akola, Maharashtra, India

Corresponding Author:
Bhagyashri V Patkar
M.Sc. (Fruit Science) Student, Department of Fruit Science, PGI, Dr. PDKV, Akola, Maharashtra, India

Storage studies and sensory evaluation of Mahua wine

Bhagyashri V Patkar, Rutuja N Deshmukh, Dr. SR Dalal and Shrikant Wankhade

Abstract
Mahua flowers are rich in sugar (68-72%), in addition to a number of minerals and one of the most important raw materials for alcohol fermentation. The present investigation was for the development of a non-distilled alcoholic beverage from Mahua flowers. The wine is prepared with addition of mint and lime slices along with peel in different proportion so as to enhance the flavour of wine and to supress the smell of mahua flower after fermentation. Now a days, the researchers are getting attracted toward the underutilized crops for the development of new products as Mahua is not being used widely for preparation of different products the experiment is being carried out for preparation of wine from it by addition of different herbal additives. The wine was prepared and kept for maturation up to 6 months and the observations were recorded, with respect to sensory evaluation from freshly prepared wine and after 6 months of maturation. From the experiment it was observed that, the treatment P_1H_2 (pH-4.0 with herbal additive 1.5% mint) was found suitable for preparation of wine from Mahua.

Keywords: Mahua, wine, yeast, pH, herbal additives, mint and lime

Introduction
Mahua (*Madhuca indica*) is an Indian tropical tree found largely in the central and north Indian plains and forests. It belongs to the family Sapotaceae. It has two species *viz. Madhuca indica (Madhuca latifolia)* and *Madhuca longifolia.* The flowers of Mahua are used to produce an alcoholic drink in tropical India. Several parts of tree including the bark, are used for their medicinal properties. They are used to make syrup for medicinal purposes. They are also fermented to produce the alcoholic liquor. Mahua are edible and have high nutritive value majorly high amount of sugars (sucrose, glucose, fructose, arabinose, few amounts of maltose and rhamnose) and subsequently having good amounts of vitamins, proteins, minerals and fats. Fruit wines are un-distilled alcoholic beverage which are rich in nutrition, more tasty and mild stimulants. Fruit wine provides minerals, vitamins and energy. Wine is a product of sugar metabolism through alcoholic fermentation of yeast having long shelf life. Wine is safe and healthful beverage. Wine has been used long as food and medicine since ages. (Chaudhary *et. al*., 2014) [2].
In this experiment we have used two herbal additives *viz*. Mint (*Mentha arvensis*) belonging to the family Lamiaceae and Lime (*Citrus aurantifolia*) which belongs to the family Rutaceae. Mint leaves and lime slices along with peel suppress the unacceptable odour of mahua and also increase the nutritional value of mahua wine. Mint is rich in nutrient like vitamin A, iron, manganese, folate and also a potent source of antioxidants. Lime peel helps in improving and maintaining bone health and also helps in preventing bone related diseases like inflammatory polyarthritis, osteoporosis and rheumatoid arthritis. Lime supports weight loss, improve skin quality, aids digestion, freshens breath and helps in problems of kidney stones.
Thus, looking to the useful nutritional and medicinal properties of Mahua flower along with the herbal additives which are mint and lime slices the experiment was undertaken for preparation of Mahua wine with different proportions of herbal additives and allowed to mature for 6 months.

Material and methods
The experiment was laid out in Factorized Complete Randomized Design with twelve treatment combinations comprising three different levels of pH (Factor A) *viz*., P_1 (4.0), P_2 (4.5) and P_3 (5.0) and four different lime juicy vesicles concentrations (Factor B) *viz*., H_1 (1% mint), H_2 (1.5% mint), H_3 (1% lime slices with peel) and H_4 (1% lime slices with peel) which were replicated thrice. The wine is stored for 6 months for maturation.

Sensory evaluation

Mahua wine prepared from Mahua were evaluated for sensory parameters *viz*., colour, flavour, taste, texture and overall acceptability. Each attribute was given separate score of 9 points scale according to the method reported by Amerine *et al*. (1965) [1]. Sensory panel consisted of 5 trained panelists evaluated the experimental samples as per the hedonic scale. The score for organoleptic evaluation was reported. They were also provided with potable water to rinse their mouth after evaluating each sample to check taste interference.

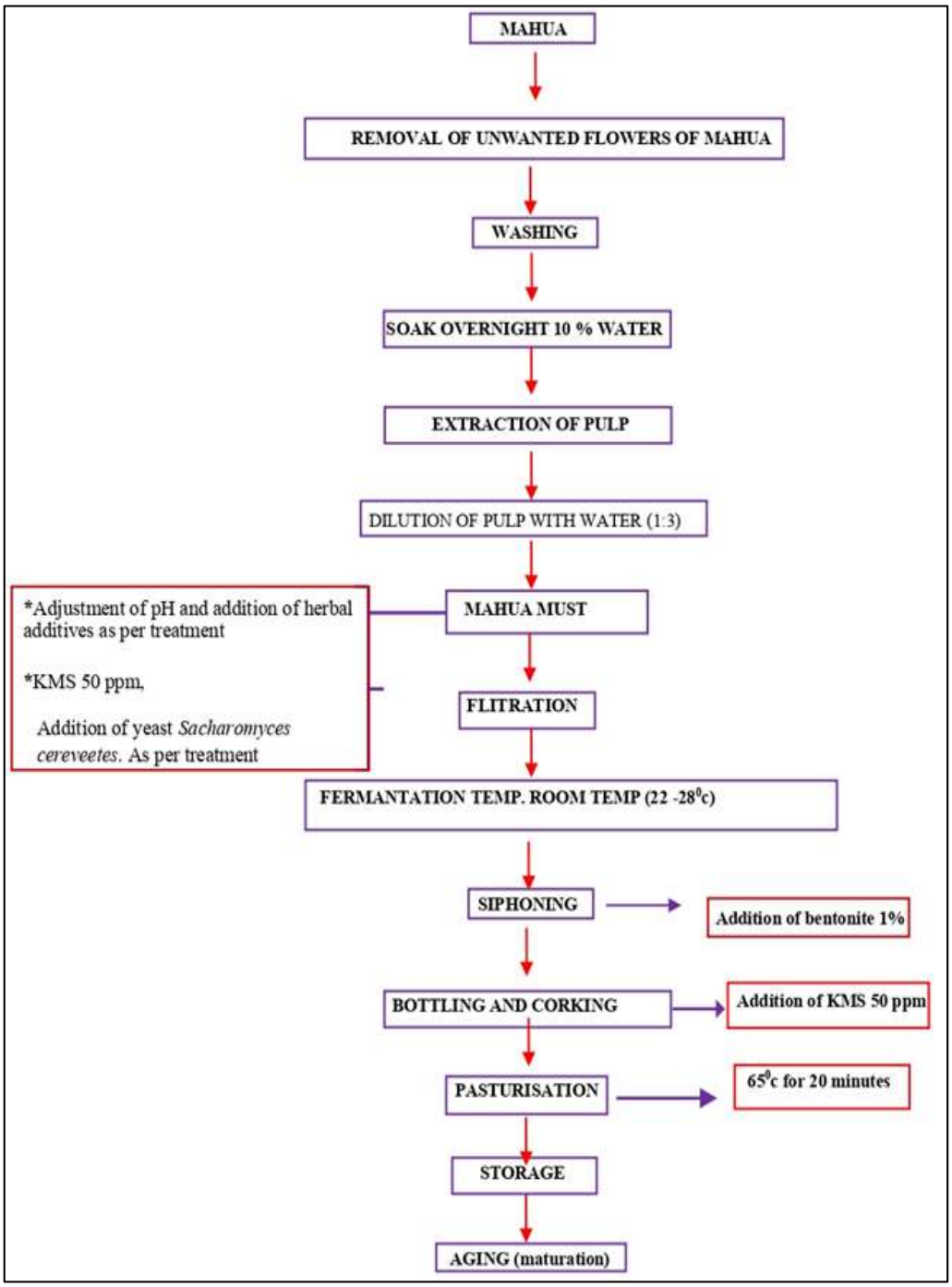

Fig 1: Flow sheet of preparation for mahua wine

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

Results and Discussion

The data in table 1 and 2 along with fig. 1 and 2 shows the organoleptic score respect of taste, aroma, colour, appearance, astringency and overall acceptability of Mahua wine as influenced by effect of different levels of pH and Herbal additives.

Table 1: Effect of different levels of pH and Herbal additives on sensory evaluation of fresh Mahua wine

Treatment combinations	Taste	Aroma	Colour	Appearance	Overall acceptability
P_1H_1	7.25	7.49	7.50	7.63	7.42
P_2H_1	7.05	7.30	7.37	7.51	7.27
P_3H_1	6.47	6.62	6.50	6.61	6.49
P_1H_2	7.30	7.60	7.53	7.66	7.45
P_2H_2	7.10	7.34	7.40	7.54	7.31
P_3H_2	6.67	6.84	6.54	6.87	6.96
P_1H_3	7.14	7.38	7.44	7.57	7.35
P_2H_3	6.95	7.15	7.30	7.44	7.18
P_3H_3	6.14	6.34	6.30	6.33	6.08
P_1H_4	7.20	7.46	7.47	7.60	7.38
P_2H_4	7.00	7.26	7.33	7.47	7.24
P_3H_4	6.24	6.47	6.46	6.43	6.33

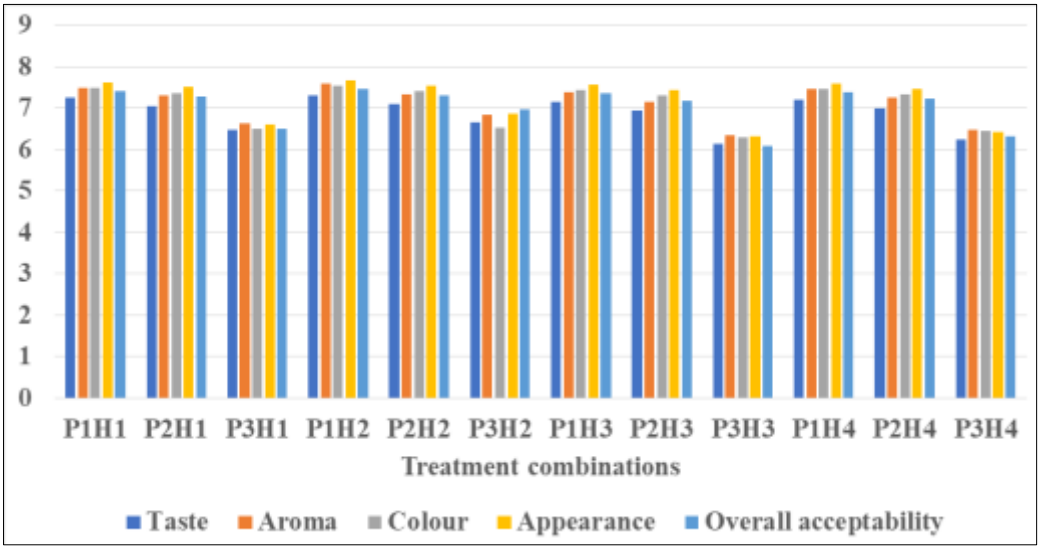

Fig 1: Effect of different levels of pH and Herbal additives on sensory evaluation of fresh Mahua wine

The taste score of Mahua wine was increased in all the treatments up to 6 months of maturation. During evaluation of freshly prepared wine maximum score for taste (7.30) was recorded by treatment combination P_1H_2. This was followed by the treatment combination P_1H_1 (7.25). However, minimum taste score (6.14) was recorded by treatment combination P_3H_3. Whereas, after 6 months of maturation, maximum score for taste (8.79) was recorded by treatment combination P_1H_2. This was followed by the treatment combination P_1H_1 (8.76) However, minimum taste score (7.60) was recorded by treatment combination P_3H_3.

The organoleptic score for aroma was found to be increasing up to 6 months of maturation. Initially the maximum score for aroma was for the treatment combination P_1H_2 which was 7.60 which increased to 8.95 after 6 months of maturation. Whereas, the lowest score was obtained by the treatment P_3H_3 both initially and after maturation.

The score for colour was observed to be increasing wherein, the maximum score in fresh wine was found to be 7.53 for the treatment P_1H_2, which increased to 8.98. The lowest score was observed for the treatment P_3H_3 initially was 6.30 which after 6 months was 7.78.

The organoleptic score for appearance was found to be increasing up to 6 months of maturation. Initially the maximum score for appearance was for the treatment combination P_1H_2 which was 7.66 which increased to 8.97 after 6 months of maturation. Whereas, the lowest score was obtained by the treatment P_3H_3 both initially and after maturation.

During evaluation of freshly prepared wine maximum score for overall acceptability (7.45) was recorded by treatment combination P_1H_2. This was followed by the treatment combination P_1H_1 (7.42). However, minimum taste score (6.08) was recorded by treatment combination P_3H_3. Whereas, after 6 months of maturation, maximum score for taste (8.84) was recorded by treatment combination P_1H_2. This was followed by the treatment combination P_1H_1 (8.84) However, minimum taste score (7.41) was recorded by treatment combination P_3H_3.

Similar results were also reported by Kumar *et al.* (2016) in physico-chemical characteristics of custard apple wine during maturation and sensory quality. A gradual increase in all the sensory characteristics was observed with the advancement of maturation period. 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.

Table 2: Effect of different levels of pH and Herbal additives on sensory evaluation of 6 months maturated mahua wine

Treatment combinations	Taste	Aroma	Colour	Appearance	Overall acceptability
P_1H_1	8.76	8.87	8.94	8.95	8.84
P_2H_1	8.62	8.61	8.82	8.83	8.68
P_3H_1	7.95	7.90	7.99	7.85	7.90
P_1H_2	8.79	8.95	8.98	8.97	8.87
P_2H_2	8.69	8.67	8.87	8.86	8.72
P_3H_2	8.15	8.12	8.08	8.10	8.22
P_1H_3	8.71	8.70	8.90	8.91	8.78
P_2H_3	8.48	8.45	8.70	8.75	8.60
P_3H_3	7.60	7.62	7.78	7.59	7.41
P_1H_4	8.73	8.75	8.92	8.93	8.81
P_2H_4	8.59	8.57	8.78	8.80	8.63
P_3H_4	7.70	7.78	7.87	7.69	7.73

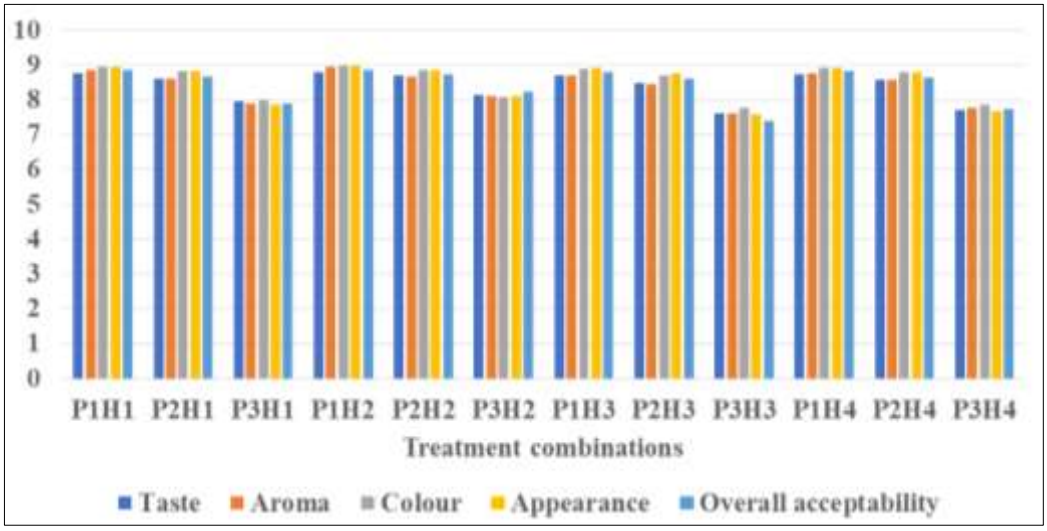

Fig 2: Effect of different levels of pH and Herbal additives on sensory evaluation of 6 months maturated Mahua wine

Conclusions

The Mahua wine prepared from pH level 4 and herbal additive level 1.5% Mint showed better results as compared to other treatment combinations. The taste, aroma, colour, appearance and overall acceptability scores of Mahua wine prepared with different levels of pH and herbal additives were increased continuously during maturation with an advancement of maturation period. Maximum increase in taste, colour, aroma, appearance and overall acceptability scores were recorded when wine was prepared with pH 4 and herbal additive level 1.5% Mint. From the overall assessment of results obtained, it may be concluded that the treatment combination P_1H_2 (pH-4.0 with herbal additive 1.5% mint) was found suitable for preparation of wine from Mahua.

References

1. Amerine MA, Pangborn RN, Roesler EB. Principles of sensory evaluation of food. Academic press, New York 1965.
2. Chaudhary Charul BS, Yadav Grewal. Preparation of red wine by blending of grape (*Vitis vinifera* L.) and jamun *(Syzygium cuminii* L. Skeels) juices before fermentation. International Agricu and Food Sci. Technology 2014;5(4):239-348.
3. Kumar Vikas, Prakriti Jnawali P, Veeranna Goud, Jasleen Kaur Bhasin. Effect of maturation on physico-chemical and sensory quality characteristics of custard apple wine. Cogent Food & Agriculture 2016;2:118-124.
4. Kumbhar SC, Kotecha PM, Kadam SS. Effect of methods of juice extraction on the quality of pomegranate wine. Indian Food Packer 2002, 51-52.
5. Shiradhonkar Rohan, Dukare Atul, Jawelekar Kuldeep, Magar Prutviraj, Jadhav Harshad. Fortification of wine with herbal extracts: Production, Evaluation and Therapeutic applications of such Fortified wine, IOSR Journal of Environmental Science, Toxicology and Food Technology 2014;8(3):9-14.
6. Sims CA, Morris JR. Effect of pH, sulfar Dioxide, storage time and temperature on the colour and stability of Red Muscadine Grape Wine. Amer. J Enol and Vitic 1984;35:35-39.
7. Thakur AD, Anuj Saklani, Somesh Sharma, Joshi VK. Effect of different sugar sources, pectin esterage and acidulat concentration on pumpkin wine production. Int. J. food fermant. Technol 2014;4(1):67-78.