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Effect of different chemical preservatives for enhancing shelf life of sporophores of *Pleurotus florida*

RL Sharma and MP Thakur

Abstract
The present investigation entitled "Effect of different chemical preservatives for enhancing shelf life of sporophores of *Pleurotus florida*" was undertaken with the objectives of post harvest management of *P. florida.* The chemical preservatives used for enhancing the shelf life of sporophores of *P. florida* worked better under blanched conditions than unblanched one. Amongst the combination of different chemical preservatives, T_{11} and T_{13} were highly effective in preserving the sporophores of *P. florida* till 125-150 days. T_6, T_8, T_{10} and T_{14} were equally good as they preserved the sporophores till 100-125 days. Freezing (10°C) and deep freezing (-15 °C) conditions highly favoured the storage of the sporophores for a period of 7 and 11 days, respectively, without being much influencing the colour, texture, appearance and overall acceptability. Packaging material of higher density (250 μ) with no perforation had better shelf life of sporphores of *P. florida* (4 days) as compared to only 2 days in low density (80 μ) perforated bags at ambient temperature.

Keywords: Post harvest management, chemical preservatives, packaging material, *Pleurotus florida*

Introduction
Mushrooms are reproductive structures of edible fungi and considered as delicacy of food. They have been in existence for millions of year and were known to us even before the origin of man (Kohli, 1990). Mushroom occurs seasonally all over the world in various habitats varying from sandy plains to thick forests or green meadows to roadside pathways. There are over 10,000 kinds of fleshy fungi, of which over 100 are widely consumed and over 50 are traded Internationally (Kohli, 1990). But, only a few species have been brought under cultivation on commercial scale. World production of mushroom is around 7.2 million tones (Thakur, 2005) with an average annual growth of 7.5 percent and the production is mainly concentrated in Asia (77.4%), Europe (16.3%) and North America (7%). During 1990, oyster mushroom was estimated to be 24.1 percent of the total world production of commercial mushrooms (Bahl, 1995).

In India, majority of the people are vegetarian and mushroom became an important source of nutrition in the cereal- based diet. The nutritive value of mushroom varies with the genotype, maturity, substrate, cultivation technology, post harvest care and processing (Chadha and Sharma, 1995) [6]. It is considered in between fruits and vegetables. It contained 20-30 percent protein with all essential amino acids (Leucine, lysine and tryptophan) which is deficient in most of the staple cereals and vegetables. Digestibility of mushroom protein is about 60 to 70 percent with digestive coefficient of about 87 percent. It is an excellent source of folic acid and contains a good amount of vitamin C and vitamin B complex group (thiamine, riboflavin, niacin) with minerals like calcium, sodium, potassium, iron, copper, zinc, manganese and magnesium). It contains low fat and sugar, which makes them a choice diet for those suffering from diabetic, obesity and hypertension.

Oyster mushrooms has very short life and retention at the level of grower, whole seller, retailer and consumer for one reason or the other may result in deterioration in the quality of the produce which led to 100 percent economic loss. Some studies have been conducted to increase the shelf life of oyster mushroom for short term by chemical preservation. Still, the efforts required in this direction are not systematic and a variety of chemicals in different combinations and concentrations needs to be studied for short term storage of oyster

mushroom. Keeping in view of the above, the present investigation was carried out with the objectives to study the post harvest management of *P. florida*.

Materials and Methods

The research experiments were conducted in the Mushroom Research Laboratory, Department of Plant Pathology, College of Agriculture, Indira Gandhi Krishi Vishwavidyalaya, Raipur and College of Agriculture and Research Station, IGKV, Jagdalpur (C.G.). Completely Randomized Design was employed for all the statistical analysis work. The critical difference (C.D.) or least significant difference (L. S. D) was calculated at 5% probability level. The pure cultures of *Pleurotus spp*. used during present experiment were procured from Mushroom Research Laboratory, Department of Plant Pathology, IGKV, Raipur (C.G.). The straw substrates used were paddy, wheat, til, maize, moong, gram, arhar, linseed, safflower, mustard, sugarcane baggasse, lucerne, pea, kodo, kutki, ragi soybean, sesamum, sunflower, groundnut pods and ramtil. These were obtained from the Instructional Farm, College of Agriculture, IGKV, Raipur. The empty glucose bottles, polyethylene bags, cereal grains (wheat, rice, sorghum, maize, bajra, kodo and kutki), supplements (rice bran, rice flour, gram, dal powder, wheat bran, soybean meal), chemicals and other things used during the study were made available in the Department of Plant Pathology, College of Agriculture, IGKV, Raipur.

In order to study the quality and storage, the sporophores of *P. florida* with and without blanching were steeped in solution of different chemicals. The fresh sporophores (150 g) were blanched at 98ºC for 5 minutes using double layer of muslin cloth. Thereafter, the sporophores were transferred in the steeping solutions prepared from various chemicals and their concentrations forming sum of 17 treatments. The steeping solution of 500 ml was taken in a plastic container of 1 litre capacity and lid was screwed. These containers were, then stored at room temperature and observations on colour, texture, appearance and overall acceptability (in days) were recorded following different scales at different time intervals. The treatments different chemical preservatives are T_1- 5 percent salt, 0.2 percent citric acid, 0.1 percent potassium metabisulphide (without blanching), T_2- 5 percent salt, 0.2 percent citric acid, 0.1 percent potassium metabisulphide (with blanching), T_3 - 2 percent salt, 1 percent sugar, 0.3 percent citric acid, 0.1 percent potassium metabisulphide (without blanching), T_4 -2 percent salt, 1 percent sugar, 0.3 percent citric acid, 0.1 percentpotassium metabisulphide (with blanching), T_5- 2.5 percent salt, 0.1 percent acetic acid, 0.2 percent citric acid and 0.1 percent sodium benzoate, 0.1 percent potassium metabisulphite, (without blanching), T_6 -2.5 percent salt, 0.1 percent acetic acid, 0.2 percent citric acid and 0.1 percent sodium benzoate, 0.1 percent potassium metabisulphite (with blanching), T_7 -0.2 percent acetic acid, 0.2 percent acitic acid, 0.2 percent potassiummeta bisulphate (without blanching), T_8- 0.2 percent acetic acid, 0.2 percent acitic acid, 0.2 percent and potassiummeta bisulphate (with blanching), T_9 -0.5 percent citric acid(with blanching), T_{10}- 0.1percent acitic acid,0.2 percent propionic acid and 0.1 percent potassium metabisulphite (with blanching), T_{11} -5 percent salt, 0.2 percent citric acid and 0.1 percent potassium metabisulphide (with blanching), T_{12} - 0.1 percent acitic acid, 0.3 percent citric acid, 0.1 percent KMS and0.1 percent Ascorbic acid (with blanching), T_{13} -1 percent salt, 0.1 percent Acetic acid, 0.1 percent citric acid, 0.05 percent sodium benzoate and 0.05 percent potassium metabisulhite (with blanching), T_{14}- 0.1 percent acitic acid, 0.1 percent citric acid and 0.1 percent KMS (with blanching), T_{15}- 1 percent salt, 0.1 percent citric acid (with blanching), T_{16}- 0.1 percent KMS, 0.2 percent acetic acid (with blanching) and T_{17}-Simple boiled water.

The fresh sporophores of *P. florida* (200 g) were taken and cleaned with water. These were then kept in polyethylene bags and preserved at 10 ºC in refrigerator and at -15 ºC in deep freeze. The stored samples were monitored regularly for any change in colour, texture and overall acceptability. The observations on quality parameters were recorded using 1-5 scale for colour, 1-7 scale for texture and 1-6 scale for appearance. Four replications were maintained. The fresh sporophores of *P. florida* (200 g) cleaned in water were kept in different thickness of polyethylene bags viz. 80, 150 and 250 with and without perforation and preserved at room temperature. The stored samples were monitored regularly for any change in colour, texture, appearance and overall acceptability. Four replications were maintained.

Result

Effect of chemical preservatives on storage and colour of sporophores of *P. florida*

Effect of different steeping solutions on storage and colour of sporophores of *Pleurotus florida* was studied and the data is presented in Table 1. The observations of the study revealed that the treatments, T_{11} and T_{13} retained good colour (2) of the sporophores of *Pleurotus florida* till 125 days. Thereafter, it became slight dull (3) but, it was too acceptable up to 150 days. It was followed by T_6, T_8, T_{10} and T_{14} which could equally preserve the sporophores till 100 days and up to the acceptable colour by 125 days. In remaining treatments, the acceptable colour of the sporophores could not be maintained even up to 5 days. The sporophores kept under these treatment started quick deterioration. The chemical preservatives become turgid, less transparent and profuse growth of fungal contaminants occurred on the top of the solution which gave fowl smell.

Effect of chemical preservatives on storage and texture of the sporophores of *P. florida*

Effect of different chemical preservatives on storage and texture of the sporophores of *Pleurotus florida* was studied and the results are depicted in Table 2. It is evident from table 30 that the texture of sporophores preserved in steeping solutions of T_{10} and T_{11} was almost fresh (2) up to 100 days and was acceptable (3) up to 150 days. In T_6, T_8, T_{13} and T_{14}, the sporophores were like fresh (2) till 75 days and up to the acceptable period of 100 days. In rest of the treatments, the sporophores preserved in steeping solutions of different chemicals showed more sogginess (4), rotted (6) leathery (7) and became unacceptable for consumption within 5 to 25 days. In T_{11}, T_9, T_{17} and T_{15} the sporophores of *Pleurotus florida* exhibited fast deterioration starting from 2 to 3 days. The part of the sporophores get rotted and dissolved in steeping solutions within 5 days of storage.

Effect of chemical preservatives on storage and appearance of the sporophores of *P. florida*

The effect of chemical preservatives on storage and appearance of the sporophores of *Pleurotus florida* was carried out and the data is presented in Table 3. Sporophores of *Pleurotus florida* preserved in steeping solution of T_6, T_8, T_{10}, T_{11}, T_{13} and T_{14} appeared well (2) up to 75 days and were

good up to 125-150 days of storage period. In other treatments, the sporophores kept with and without blanching and steeped in solutions of different chemicals seemed to be fair (4) and became unacceptable (6) in appearance within 1-25 days of storage. The appearance of the sporophores after blanching and steeping in lower concentrations of the chemical was extremely good.

Effect of chemical preservatives on storage and quality of the sporophores of *P. florida*

Seventeen preservatives in different combinations and concentrations were tried to see their effect on storage and quality of sporophores of *Pleurotus florida*. The data recorded on the same are presented in Table 4. It is evident from the table that T_{11}, T_8, T_{13} and T_{16} could preserve the mushroom (*Pleurotus florida*) up to 125-150 days followed by T_{10} and T_{14} (100-125 days) without much adverse effect in colour, texture, appearance and overall acceptability. Mushroom remained unaffected up to 5-25 days under the treatment, T_{12} and T_{16}. Rest of the treatments were found to be effective for preservation of mushroom only up to 5 days.

Effect of freezing and deep freezing on quality and storage of sporophores of *P. florida*

Effect of freezing and deep freezing on quality and storage of sporophores of *Pleurotus florida* was studied (Tabel 5). It was observed during the study that the sporophores of *Pleurotus florida* retained good colour till 7 days under freezing condition of storage while in deep freezing condition, the colour was retained up to 11 days. Similarly, the texture of the sporophores was good till 7 and 9 days under freezing and deep freezing conditions, respectively. As regards to appearance, it was good till 5 days under freezing conditions and 7 days under deep freezing conditions. However, the appearance of sporophores was fair up to 7 and 11 days under freezing and deep freezing conditions respectively.

Effect of thickness of packaging material on quality and storage of sporophores of *P. florida*

During the period of study, it was observed that the sporophores of *Pleurotus florida* kept in different thickness of polyethylene bags with and without perforation showed varying colors, texture and appearance (Table 6). The polyethylene bags of 250µ thickness without perforation was found to be better for maintaining good colors of the sporophores up to 4 days as compared to 3 days with perforated bags. The polyethylene bags of 150µ thickness was equally good as it could effectively retain the colour up to 3 days with and without perforations. However, bags of 80µ thickness were least effective as the sporophores could well retain the colour up to 2 days in both with and without perforation. Thereafter, the colour of the sporophores started turning light brown. The texure of the sporophores remained good till 2 days in the polyethylene bags of 150-250µ with and without perforations. Similarly, appearance of the sporophores was good up to 3 days only in the bags of 150µ with no perforations and the polyethylene bags of 80-250µ thickness with and without perforation showed least acceptability.

The chemical preservatives used for enhancing the shelf life of sporophores of *P. florida* worked better under blanched conditions than unblanched one. Amongst the combination of different chemical preservatives, T_{11} and T_{13} were highly effective in preserving the sporophores of *P. florida* till 125-150 days. T_6, T_8, T_{10} and T_{14} were equally good as they preserved the sporophores till 100-125 days. Freezing (10 °C) and deep freezing (-15 °C) conditions highly favoured the storage of the sporophores for a period of 7 and 11 days, respectively, without being much influencing the colour, texture, appearance and overall acceptability. Packaging material of higher density (250 µ) with no perforation had better shelf life of sporphores of *P. florida* (4 days) as compared to only 2 days in low density (80 µ) perforated bags at ambient temperature.

Table 1: Effect of chemical preservatives on colour and storage of sporophores of *Pleurotus florida*

T. No.	Treatment details*	**Colour of sporophores at different time intervals (days)							
		1	5	25	50	75	100	125	150
T_1	5% Salt, 0.2% C.A.,0.1%KMS (WOB)	1	3	5					
T_2	5% Salt, 0.2% C.A.,0.1%KMS (WB)	1	4	5					
T_3	2% Salt,1% Sugar,0.3% C.A.,0.1% KMS (WOB)	1	3	5					
T_4	2% Salt,1% Sugar,0.3% C.A.,0.1% KMS (WB)	1	3	5					
T_5	2.5% Salt, 0.1%A.A.,0.2% C.A.,0.1% S.B.,0.1% KMS(WOB)	1	2	5					
T_6	2.5% Salt, 0.1%A.A.,0.2% C.A.,0.1% S.B.,0.1% KMS(WB)	1	1	1	1	2	2	3	3
T_7	0.2% A.A.,0.2% C.A.,0.2% KMS (WOB)	1	4	5					
T_8	0.2% A.A.,0.2% C.A.,0.2% KMS (WB)	1	1	1	1	2	2	3	3
T_9	0.5% C.A.(WB)	1	3	5					
T_{10}	0.1%A.A.,0.2% P.A.,0.1%KMS (WB)	1	1	1	1	1	2	3	3
T_{11}	5% Salt, 0.2% C.A.,0.1% KMS(WB)	1	1	1	1	2	2	2	3
T_{12}	0.1% A.A.,0.3% C.A.,0.1% KMS, 1% ASA(WB)	1	2	4	5				
T_{13}	1% Salt,0.1% A.A.,0.1%C.A.,0.05% S.B.,0.05% KMS (WB)	1	1	1	1	1	2	2	3
T_{14}	0.1%A.A.,0.1%C.A.,0.1%KMS(WB)	1	1	1	1	2	3		
T_{15}	1% Salt,0.1% C.A. (WB)	1	3	5					
T_{16}	0.1% KMS,0.2% A.A(WB)	1	2	5					
T_{17}	Simple boiled water	1	4	5					

* SB-Sodium benzoate, ASA. Ascorbic acid, C.A.-Citric acid, KMS-Potassium metabisulphide,**Scale White-1, Like white-2, Slight dull-3, A.A-Acitic acid, P.A.-Propionic acid, W.B.-With blanch, WOB-Without blanch Light brown-4, Dark brown-5

Table 2: Effect of chemical preservatives on texture and storage of sporophores of *Pleurotus florida*

T. No.	Treatment details*	**Texture of sporophores at different time intervals (days)							
		1	5	25	50	75	100	125	150
T_1	5% Salt, 0.2% C.A.,0.1%KMS (WOB)	1	6						
T_2	5% Salt, 0.2% C.A.,0.1%KMS (WB)	1	5						
T_3	2% Salt,1% Sugar,0.3% C.A.,0.1% KMS (WOB)	1	4						
T_4	2% Salt,1% Sugar,0.3% C.A.,0.1% KMS (WB)	1	4						
T_5	2.5% Salt, 0.1%A.A.,0.2% C.A.,0.1% S.B.,0.1% KMS(WOB)	1	5						
T_6	2.5% Salt, 0.1%A.A.,0.2% C.A.,0.1% S.B.,0.1% KMS(WB)	1	1	1	2	2	3	4	4
T_7	0.2% A.A.,0.2% C.A.,0.2% KMS (WOB)	1	5						
T_8	0.2% A.A.,0.2% C.A.,0.2% KMS (WB)	1	1	2	2	2	3	3	4
T_9	0.5% C.A.(WB)	1	7						
T_{10}	0.1%A.A.,0.2% P.A.,0.1%KMS (WB)	1	1	2	2	2	3	3	3
T_{11}	5% Salt, 0.2% C.A.,0.1% KMS(WB)	1	2	2	2	2	2	3	3
T_{12}	0.1% A.A.,0.3% C.A.,0.1% KMS, 1% ASA(WB)	1	2	3	4				
T_{13}	1% Salt,0.1% A.A.,0.1%C.A.,0.05% S.B.,0.05% KMS (WB)	1	2	2	2	2	2	3	3
T_{14}	0.1%A.A.,0.1%C.A.,0.1%KMS(WB)	1	2	2	2	2	3	4	5
T_{15}	1% Salt,0.1% C.A. (WB)	1	6	7					
T_{16}	0.1% KMS,0.2% A.A(WB)	1	3	5					
T_{17}	Simple boiled water	1	7						

* SB-Sodium benzoate, ASA. Ascorbic acid, C.A.-Citric acid, KMS-Potassium metabisulphide,**Scale Fresh-1, Like Fresh-2, Less sogy-3, A.A-Acitic acid, P.A.-Propionic acid, W.B.-With blanch, WOB-Without blanch More sogy-4, Coarse-5, Rotting-6, Leathery-7

Table 3: Effect of different chemical preservatives on appearance and storage of sporophores of *Pleurotus florida*

T. No.	Treatment details*	**Appearance of sporophores at different time intervals (days)							
		1	5	25	50	75	100	125	150
T_1	5% Salt, 0.2% C.A.,0.1%KMS (WOB)	1	5						
T_2	5% Salt, 0.2% C.A.,0.1%KMS (WB)	2	6						
T_3	2% Salt,1% Sugar,0.3% C.A.,0.1% KMS (WOB)	2	4						
T_4	2% Salt,1% Sugar,0.3% C.A.,0.1% KMS (WB)	2	4						
T_5	2.5% Salt, 0.1%A.A.,0.2% C.A.,0.1% S.B.,0.1% KMS(WOB)	1	4						
T_6	2.5% Salt, 0.1%A.A.,0.2% C.A.,0.1% S.B.,0.1% KMS(WB)	2	2	2	2	2	3	3	3
T_7	0.2% A.A.,0.2% C.A.,0.2% KMS (WOB)	2	5						
T_8	0.2% A.A.,0.2% C.A.,0.2% KMS (WB)	1	2	2	2	2	3	3	3
T_9	0.5% C.A.(WB)	2	6						
T_{10}	0.1%A.A.,0.2% P.A.,0.1%KMS (WB)	1	2	2	2	2	3	3	3
T_{11}	5% Salt, 0.2% C.A.,0.1% KMS(WB)	1	2	2	2	2	3	3	3
T_{12}	0.1% A.A.,0.3% C.A.,0.1% KMS, 1% ASA(WB)	1	2	2	6				
T_{13}	1% Salt,0.1% A.A.,0.1%C.A.,0.05% S.B.,0.05% KMS (WB)	1	2	2	2	2	3	3	3
T_{14}	0.1%A.A.,0.1%C.A.,0.1%KMS(WB)	1	2	2	2	2	3	3	
T_{15}	1% Salt,0.1% C.A. (WB)	2	5						
T_{16}	0.1% KMS,0.2% A.A(WB)	2	3	6					
T_{17}	Simple boiled water	2	6						

* SB-Sodium benzoate, ASA. Ascorbic acid, C.A.-Citric acid, KMS-Potassium metabisulphide, **Scale Fresh-1, Very Good-2, Good-3, Fair-4 A.A-Acitic acid, P.A.-Propionic acid, W.B.-With blanch, WOB-Without blanch Slight femented smell-5, Unacceptable-6

Table 4: Effect of chemical preservation on appearance and storage of sporophores of *Pleurotus florida*

Treat. No.	Treatment details*	Storage period (days)
T_1	5% Salt, 0.2% C.A.,0.1%KMS (WOB)	5
T_2	5% Salt, 0.2% C.A.,0.1%KMS (WB)	5
T_3	2% Salt,1% Sugar,0.3% C.A.,0.1% KMS (WOB)	5
T_4	2% Salt,1% Sugar,0.3% C.A.,0.1% KMS (WB)	5
T_5	2.5% Salt, 0.1%A.A.,0.2% C.A.,0.1% S.B.,0.1% KMS(WOB)	5
T_6	2.5% Salt, 0.1%A.A.,0.2% C.A.,0.1% S.B.,0.1% KMS(WB)	125-150
T_7	0.2% A.A.,0.2% C.A.,0.2% KMS (WOB)	1-5
T_8	0.2% A.A.,0.2% C.A.,0.2% KMS (WB)	125-150
T_9	0.5% C.A.(WB)	1-5
T_{10}	0.1%A.A.,0.2% P.A.,0.1%KMS (WB)	100-125
T_{11}	5% Salt, 0.2% C.A.,0.1% KMS(WB)	125-150
T_{12}	0.1% A.A.,0.3% C.A.,0.1% KMS, 1% ASA(WB)	5-25
T_{13}	1% Salt,0.1% A.A.,0.1%C.A.,0.05% S.B.,0.05% KMS (WB)	125-150
T_{14}	0.1%A.A.,0.1%C.A.,0.1%KMS(WB)	100-125
T_{15}	1% Salt,0.1% C.A. (WB)	3-5
T_{16}	0.1% KMS,0.2% A.A(WB)	5-25
T_{17}	Simple boiled water	5

* SB-Sodium benzoate, ASA. Ascorbic acid, C.A.-Citric acid, KMS-Potassium metabisulphide, A.A-Acitic acid, P.A.-Propionic acid, W.B.-With blanch, WOB-Without blanch

Table 5: Effect of freezing and deep freezing on quality and storage of sporophores of *Pleurotus florida*

Specification	Days	Colour*	Texture*	Appearance*
Freezing (10 °C)	1	1	1	1
	3	1	1	2
	5	2	2	3
	7	3	3	4
	9	4	6	6
Deep freezing (-15 °C)	1	1	1	1
	3	1	1	2
	5	1	2	2
	7	2	2	3
	9	2	2	3
	11	3	3	4
	13	4	3	5
	15	5	6	6

*****Colour: 1-Absolute white, 2- Like white, 3-Slight dull, 4 - Light brown, 5- Dark brown
*Texture: 1-Fresh, 2-Like fresh, 3-Less sogy, 4-More sogy, 5-Coarse, 6-Rotting, 7-Leathery
*Appearance: 1-Fresh, 2-Very good, 3-Good, 4-Fair, 5-slight fermented smell, 6-Unacceptable

Table 6: Effect of thickness and packaging material on storage and quality of sporophores of *Pleurotus florida*

Thickness (gauge)	Perforations	Days	Colour*	Texture*	Appearance*
80	WP	1	2	2	3
		2	3	3	5
		3	4	6	6
		4			
	WOP	1	1	2	2
		2	3	3	4
		3	4	6	6
		4			
150	WP	1	1	1	1
		2	2	3	3
		3	3	4	3
		4	4	5	6
	WOP	1	1	1	1
		2	3	3	3
		3	3	4	4
		4	4	5	5
250	WP	1	1	1	1
		2	2	3	3
		3	3	4	4
		4	4	5	5
	WOP	1	1	1	1
		2	2	2	2
		3	3	4	4
		4	3	5	5

WP -With perforation, WOP - Without perforation
*Colour: White-1, Like white-2, Slight dull-3, Light brown-4, Dark brown-5
*Texture: Fresh-1, Like fresh-2, Less sogy-3, More sogy-4, Coarse-5, Rotting-6, Leathery-7
*Appearance: Fresh-1, Very good-2, Good-3, Fair-4, Slight fermented smell-5, Unacceptable-6

Discussions

In the present findings, the chemical preservatives used for preservation of sporophores of *P. florida* were performed better under blanched conditions than un balanced one. Amongst the combination of different chemical preservatives, T_{11}, T_8, T_{13} and T_6 were highly effective in preserving the sporophores of *P. florida* till 125 –150 days, without much influencing the colour, texture, appearance and overall acceptability. T_{14} and T_{10} were also good as they preserved the sporophores till 100-125 days. Adsule *et al.*, (1981) [1] reported the preservation of *P. sajor caju* fruit bodies only upto 3 months in chemical solution of 5% salt, 0.2% citric acid and 0.1% potassium metabisulphite with branching. Namdev (2000) [16] reported the preservation of *P. flabellatus* fruit body upto 165-175 days in chemical solution of 5 percent salt, 0.2 percent CA, 0.1 percent KMS with blanching. Freezing (10 °C) and deep freezing (-15 °C) conditions highly favoured the storage of the sporophores for a period 7 and 11 days, respectively, without much change in colour, texture, appearance and overall acceptability. Sporophores of *P. ostreatus* could be well stored for 3 months at –30 °C with pre freezing treatments (Gormley and O' Riordain, 1976) [10]. Similar findings were also reported by Namdev (2000) [16] in *Pleurotus flabellatus*, Ramaswamy and Kandaswamy (1978) [20] in paddy straw mushroom, while Sethi and Anand (1978) and Saxena and Rai (1988) [22] in white button mushroom.

Packaging material of higher density (250 µ) with no perforation had better shelf life of sporophores of *P. florida* (4 days) as compared to only 2 days in low density (80 µ) perforated bags at ambient temperature. Similar findings were reported by Namdev (2000) [16] in *Pleurotus florida*. Mehta and Jandaik (1989) [15] also reported the shelf life of freshly harvested fruit bodies of *Pleurotus sapidus* in non perforated bags for 3 days at room temperature (20-30 °C). The findings

of Rajarathnam *et al.*, (1983) [18] are in agreement with the present results who reported the shelf life of fresh sporophores of *P. flabellatus* in low density polythene perforated bags (25μm) for 24 hrs. at ambient temperature.

Conclusion

The chemical preservatives used for enhancing the shelf life of sporophores of *P. florida* worked better under blanched conditions than unblanched one. Amongst the combination of different chemical preservatives, T_{11} and T_{13} were highly effective in preserving the sporophores of *P. florida* till 125-150 days. T_6, T_8, T_{10} and T_{14} were equally good as they preserved the sporophores till 100-125 days. Freezing (10 °C) and deep freezing (-15 °C) conditions highly favoured the storage of the sporophores for a period of 7 and 11 days, respectively, without being much influencing the colour, texture, appearance and overall acceptability. Packaging material of higher density (250 μ) with no perforation had better shelf life of sporphores of *P. florida* (4 days) as compared to only 2 days in low density (80 μ) perforated bags at ambient temperature.

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