

Research Article

DEVELOPMENT, RECOVERY AND SENSORY EVALUATION OF FRESH MUSHROOM CHIPS

***Dadasaheb Desayi**

*Department of Post Harvest Technology,
Kittur Rani Chennamma College of Horticulture Arabhvi-591310*

**Author for Correspondence*

ABSTRACT

The present study was conducted to prepare the fresh mushroom chips as influenced by different pretreatments. Fresh mushroom chips were prepared by frying the fresh mushrooms in oil with use of different pretreatments like one per cent salt, one per cent KMS, 0.5 per cent citric acid and in combinations for five minutes and partially dehydrated for two minutes, whereas partially dehydrated fresh mushrooms without pretreatment were kept as control. Among the different treatments fresh mushroom chips prepared by soaking in one per cent salt+ one per cent KMS+ + 0.5 per cent citric acid for five minutes along with partial dehydration for two minutes recorded higher scores for organoleptic parameters like colour and appearance, flavour, crispness, taste and overall acceptability. one per cent salt+ one per cent KMS+ + 0.5 per cent citric acid for five minutes along with partial dehydration for two minutes was better in preparation of fresh mushroom chips.

INTRODUCTION

Button mushroom have short shelf life of about 24 hours at ambient temperatures due to high moisture, delicate texture and unique physiology (blackening and autolysis; Saxena and Rai, 1990). The shelf-life of horticultural produce can be extended by simply harvesting them before refining which is not applicable to the mushrooms. Even after harvesting button mushrooms continue to respire, mature and thus results in veil opening, weight loss, browning and microbial spoilage(Lal and Sharma, 1995; Rai, 1995). In India, the fresh mushroom market is largely a contribution of marginal and small farmers who have limited resources and, therefore, are dependent on the local market for sale of their produce. The growers face consequences of over saturated market and distress sale at highly known remunerative prices. The retention of fresh mushroom at the level of grower, whole seller, retailer and consumer further results in deterioration in the quality of the produce and economic loss. Presently, long-term preservation of mushrooms by canning and pickling are popular(Chandrasekar *et al.*, 2002). But, in the peak periods of harvesting, gluts in the market can be checked by adapting appropriate post harvest technology to process surplus mushrooms into novel value added products rather going only for canning or pickling. These value added products are the need of the hour for the mushroom growers not only to reduce the losses but also to enhance the income by value-addition and boost the consumption of this important horticultural crop. The study was conducted to develop some value-added products namely mushroom murabba, mushroom ketch-up, mushroom candy and mushroom chips from fresh button mushrooms. The study was undertaken to see the effect of different pretreatments on development and evaluation of fresh mushroom chips.

MATERIALS AND METHODS

Fresh oyster mushroom (*Pleurotus florida*) was procured from the Department of Agricultural Microbiology, washed thoroughly with cleaned tap water. The chips were made by partial dehydration of mushrooms with the help of potato chips dehydrator to remove excess moisture. Before partial dehydration mushrooms were pre-treated with salt, citric acid and KMS. The different pre-treatments used in preparation of mushroom chips were as follows.

Treatment Details

T₁: Soaking in 1% salt (5 min) + Partial dehydration (2 min)

Research Article

- T₂: Soaking in 1% salt +0.5% citric acid (5 min) + Partial dehydration (2 min)
- T₃: Soaking in 1% KMS (5 min) + Partial dehydration (2 min)
- T₄: Soaking in 1% KMS +0.5% citric acid (5 min) + Partial dehydration (2 min)
- T₅: Soaking in 1% salt +1 % KMS +0.5% citric acid (5 min) Partial dehydration (2 min)
- T₆: Partial dehydration for 2 min (control).

The pretreated mushrooms were partially dehydrated to remove excess moisture and they were fried in refined oil. The excess oil was removed with the help of tissue paper, to enhance taste salt and chilli powder was added. The chips were packed in 200 gauge polyethylene bags, kept at room temperature for further analysis.

The weight of fresh mushroom chips at the end of frying obtained from each treatment was noted down and the percentage recovery of fresh mushroom chips was calculated.

$$\text{Recovery percentage} = \frac{\text{Fried mushroom weight}}{\text{Weight of fresh mushrooms}} \times 100$$

At the time of frying before and after refined oil was weighed to calculate oil uptake, it was the difference in weight before oil uptake and weight after oil uptake after frying.

Organoleptic evolution of fresh mushroom chips were carried out by a panel 10 semi trained judges including teachers and post graduate students of Kittur Rani Chennamma College of Horticulture Arabhavi. The organoleptic characters viz., colour and appearance, crispiness taste and overall acceptability of fresh mushroom chips were evaluated on five point hedonic scale (Ranganna, 1986) using the score card mentioned below. The mean score given by ten judges were used for statistical analysis.

RESULTS AND DISCUSSION

The data pertaining to the recovery and oil uptake of fresh mushroom chips was influenced by different treatments were presented in Table 1.

Table 1: Effect of different treatments on recovery (%) and oil uptake (ml/ 400 g) of fresh mushroom chips

| Treatments | Recovery (%) of chips | Oil uptake (ml/ 400 g) |
|---|-----------------------|------------------------|
| T ₁ : Soaking in 1 % salt (5 min) + partial dehydration (2 min) | 20.52 | 49.0 |
| T ₂ : Soaking in 1 % salt +0.5% citric acid (5 min) + partial dehydration (2 min) | 20.01 | 41.00 |
| T ₃ : Soaking in 1 % KMS (5 min) + partial dehydration (2 min) | 19.51 | 42.00 |
| T ₄ : Soaking in 1 % KMS +0.5% citric acid (5 min) + partial dehydration (2 min) | 20.27 | 38.00 |
| T ₅ : Soaking in 1 % salt +1 % KMS +0.5% citric acid (5 min) + partial dehydration (2 min) | 21.77 | 32.00 |
| T ₆ : Partial dehydration 2 minutes (Control). | 14.51 | 58.04 |
| Mean | 19.43 | 43.36 |
| S.Em± | 0.37 | 1.40 |
| CD 1% | 1.62 | 6.30 |

The data on recovery of fresh mushroom chips revealed that there were significant differences among the treatments, Significantly highest score for recovery percentage was recorded by soaking mushrooms in one per cent salt + one per cent KMS + 0.5 per cent citric acid for five minutes along with partial dehydration of two minutes (21.77 %), whereas lowest per cent recovery was observed in partial dehydration for two minutes (14.51%). Significantly lowest uptake was recorded in treatment with one per cent salt + one per cent KMS + 0.5 per cent citric acid for five minutes along with partial dehydration of

Research Article

two minutes (32 ml/ 400 gm), whereas highest oil uptake was recorded in partial dehydration for two minutes (58.04 ml/ 400 gm).

The data pertaining to the organoleptic evaluation of fresh mushroom chips was influenced by different treatments were presented in Table 2.

Table 2: Organoleptic evaluation of fresh mushroom chips for colour, flavour, crispiness, taste and overall acceptability (Score out of 5)

| Treatments | Colour and appearance | Flavour | Crispiness | Taste | Overall acceptability |
|---|-----------------------|---------|------------|-------|-----------------------|
| T ₁ : Soaking in 1 % salt (5 min) + partial dehydration (2 min) | 3.90 | 3.65 | 3.60 | 3.30 | 3.69 |
| T ₂ : Soaking in 1 % salt +0.5% citric acid (5 min) + partial dehydration (2 min) | 3.85 | 3.75 | 3.70 | 3.22 | 3.79 |
| T ₃ : Soaking in 1 % KMS (5 min) + partial dehydration (2 min) | 3.40 | 3.50 | 3.60 | 3.60 | 3.60 |
| T ₄ : Soaking in 1 % KMS +0.5% citric acid (5 min) + Partial dehydration (2 min) | 3.95 | 3.70 | 3.75 | 3.75 | 3.80 |
| T ₅ : Soaking in 1 % salt +1 % KMS +0.5% citric acid (5 min) + partial dehydration (2 min) | 4.50 | 4.30 | 4.30 | 4.34 | 4.40 |
| T ₆ : Partial dehydration 2 minutes (Control). | 3.20 | 3.40 | 2.80 | 3.20 | 3.40 |
| Mean | 3.80 | 3.72 | 3.63 | 3.56 | 3.78 |
| S.Em± | 0.12 | 0.12 | 0.12 | 0.11 | 0.12 |
| CD @1% | 0.55 | 0.53 | 0.52 | 0.51 | 0.54 |

The data on colour and appearance revealed that there were significant differences among the treatments, significantly highest score for colour and appearance was recorded by soaking mushrooms in one per cent salt + one per cent KMS + 0.5 per cent citric acid for five minutes along with partial dehydration of two minutes (4.50), whereas lowest score was recorded in partial dehydration for two minutes (3.20). Significantly highest score for flavour was recorded by soaking mushrooms in one per cent salt + one per cent KMS + 0.5 per cent citric acid for five minutes (4.30), whereas lowest score was recorded in partial dehydration for two minutes (3.40). Significantly highest score for crispiness was recorded by soaking mushrooms in one per cent salt + one per cent KMS + 0.5 per cent citric acid for five minutes (4.30), whereas lowest score was recorded in partial dehydration for two minutes (2.80). Significantly highest score for taste was recorded by soaking mushrooms in one per cent salt + one per cent KMS + 0.5 per cent citric acid for five minutes (4.34), whereas lowest score was recorded in partial dehydration for two minutes (3.20). Significantly highest score for overall acceptability was recorded by soaking mushrooms in one per cent salt + one per cent KMS + 0.5 per cent citric acid for five minutes (4.40), whereas lowest score was recorded in partial dehydration for two minutes (3.40).

Oyster mushrooms have shorter shelf life of about 24 hours at the ambient temperatures due to high moisture, delicate texture and unique physiology. Even after harvest oyster mushroom continues to respire and thus result in weight loss, browning and microbial spoilage. The value addition of oyster mushrooms into chips could provide solution as short term storage of mushrooms upto three months of storage (Armuganathan *et al.*, 2005).

In the present investigation on preparation and organoleptic evaluation of mushroom chips, the per cent recovery and oil uptake (Table 1) were influenced by different treatments. Higher per cent recovery (21.77%) and lower oil uptake (32 ml/400g) were recorded in the treatment imposed by soaking fresh mushrooms in one per cent salt + one per cent KMS + 0.5 per cent citric acid for five minutes along with partial dehydration for two minutes. Higher recovery and lesser oil uptake of chips could be attributed to the action of pretreatments that might had helped to maintains cell integrity and prevented damage of mushroom cells during frying.

Research Article

The organoleptic evaluation of fresh mushroom chips was influenced by different pretreatments (Table 2). Higher scores for colour and appearance (4.50), flavour (4.30), crispiness (4.30), taste (4.34) and overall acceptability(4.4) was recorded in the treatment soaking fresh mushrooms in one per cent salt + one per cent KMS+ + 0.5 per cent citric acid for five minutes along with partial dehydration for two minutes. This was due to the effect of salt and citric acid which enhances the taste and flavour and potassium metabisulphite helped in better retention of colour and appearance. The results on preparation and organoleptic evaluation of fresh mushroom chips are in conformity with Armuganathan *et al.* (2005) in *Agaricus bisporus*.

REFERENCES

Arumuganathan T, Rai RD and Anilkumar H (2005). Studies on development value added products from fresh button mushroom *Agaricus bisporus*. *Mushroom Research* **14**(2) 84-87.

Chandrasekhar V, Rai RD, Srinivasa G and Verma RN (2002). Preparation and storage of mushroom curry in retort pouches. *Mushroom Research* **10**(2) 103-107.

Devina V, Gaur S, Rai RD and Sharma PC (2008). Development and quality evaluation of white button mushroom noodles. *Journal of Food Science Technology* **45**(6) 513-515.

Lal BB and Sharma KD (1995). Post harvest technology of mushrooms. In *Advances in Horticulture (Mushroom)* Volume 13 Chadha KL and Sharma SR, *Malhotra Publishing House, New Delhi* 553-565.

Rai RD (1995). Nutritional and medicinal values of mushrooms. In *Advances in Horticulture (Mushroom)* Volume 13 Chadha KL and Sharma SR, *Malhotra Publishing House, New Delhi* 537-551.

Ranganna S (1986). Handbook of analysis of and quality control of fruit and vegetable products. 2nd edition *Tata Mc Grawhill Publishing Company Ltd, New Delhi*.

Saxena S and Rai RD (1990). Post Harvest technology of mushrooms. Technical bulletin No. 2, NRCM, Solan, India.