



STRATEGIES, TECHNIQUES, APPLICATIONS AND RESOURCES

Dr. Arceloni Neusa Volpato
Dr. B. Balaji
Dr. S. Karthikeyan
Dr. Divya R. Panjwani

STRATEGIES, TECHNIQUES, APPLICATIONS AND RESOURCES

Editors:

Dr. ARCELONI NEUSA VOLPATO

Dr. B. BALAJI

Dr. S. KARTHIKEYAN

Dr. DIVYA R. PANJWANI

@ All rights reserved with the publisher.

First Published: November 2023



ISBN: 978-93-91303-83-9

DOI: <https://www.doi.org/10.47715/JPC.B.978-93-91303-83-9>

Pages: 374 (Front Matter: 18; Inner Content: 356)

Price: 700/-

Publisher:

Jupiter Publications Consortium

22/102, Second Street, Virugambakkam

Chennai, Tamil Nadu, India.

Website: www.jpc.in.net

Email: director@jpc.in.net

Imprint:

Magestic Technology Solutions (P) Ltd.

Chennai, Tamil Nadu, India.

49.	A Study on Impact of Leadership Style on Employee Retention in a Hybrid Model Rajani H. Pillai Nooren Fatima	270
50.	Impact of Big Data Analytics in Healthcare Dr. Mohd. Suhaib Kidwai	276
51.	A Comparative Study of Multidimensional Poverty between EAG and Non-EAG States of India Dr. Rashmi Shukla	281
52.	Implications and Challenges of Incorporating Emotional Intelligence in Personnel Hiring Nida Iqbal Dr. Yasir Arafat Elahi	287
53.	A study on Problem faced by Higher Education students in Tamil-Nadu Dr. S. Saranya	293
54.	Contextual marketing and its effects on Bangalore city's online customer purchasing behavior for organic food products Monica Janet Clifford	300
55.	An Analytical Study about Teachers' Professionalism and Teachers as Professionals Wahida Rais Dr. Vivek Rogers	308
56.	High Gain Low power (Non-Isolated) DC-DC Converter Review Mohammed Asim Anas Ahmad	312
57.	Social Hierarchy in Buchi Emecheta's the Joys of Motherhood and P. Sivakami's the taming of women Athira S Kumar	319
58.	Assessment of cumulative effect of modified atmosphere packaging, packaging material and chemical treatments on post-harvest life of button mushroom (Agaricus bisporus) Dr. Pallavi Srivastava	324
59.	Synthesis of opposites in Bhabani Bhattacharya's Music for mohini Deepshikha Upadhyay	328
60.	Portrayal of the Predicament of Individual and Society in so many hungers! of Bhabani Bhattacharya Dr. Puneet Kumar Upadhyay	330
61.	A Study on Human Capital Development on Firm Performance Dr. R. Alagesan	332
62.	Portrayal of Class Struggle, Poverty in Aravind Adiga's The White Tiger Through The Lens of Class Consciousness Mamta Chaudhary	334
63.	Application of Artificial Intelligence in Education: Advantages and Disadvantages Shabana Tasnim	336
64.	Learning, Unlearning and Relearning: A dynamic process of knowledge management under different development stages Dr. Divya R. Panjwani	341

Assessment of Cumulative Effect of Modified Atmosphere Packaging, Packaging Material and Chemical Treatments on Post-Harvest Life of Button Mushroom (*Agaricus Bisporus*)

Dr. Pallavi Srivastava

Department of Agriculture, Integral Institute of Agricultural sciences & Technology
Integral University, Lucknow

ABSTRACT

Due to increasing numbers of vegans and vegetarians globally all around the world is shooting up demands for food items derived from plant sources like, mushrooms, which not only very delicious in taste but also good source of protein and other minerals. The post-harvest shelf life of button mushroom is nearly 1-3 days at ambient temperature and 8–10 days under low temperature storage. For improving shelf life of button mushroom, we have combined Modified Atmosphere Packaging (MAP) with different chemical treatments and packaging material which leads to successful increment in its shelf life up to 12-14 days. Button mushrooms were treated with CaCl₂, citric acid, and sorbitol and packed under three MAP air composition (MAP₁: 6%O₂, 12%CO₂; MAP₂: 12%O₂, 6%CO₂; MAP₃: 20.95% O₂, 0.04% CO₂) then packed under two different Packaging Materials PM₁ (Polyamide 20µm-Polyethylene 70µm) and PM₂: (Polyamide 40µm-Polyethylene 120µm) and stored at 8°C. Packaging material with higher thickness showed beneficial effects on ascorbic acid content, protein content, electrolyte leakage rate as it had less gas permeability and less water vapour transmission rate of 1.5 g m⁻² day⁻¹. Packaging button mushrooms in thin films causes outer air to accumulate inside packed samples and causes its fast browning and degradation.

Keywords: Button Mushroom, Packaging material, modified atmosphere packaging

1. Introduction

Cultivated white button mushroom can be considered as important food source globally all around the world. The increased button mushrooms production and advances in post-harvest technology has resulted in high demands for safe and good quality button mushrooms. Button mushrooms are heterotrophic fungi that grew on dead and degraded organic matter (Ban *et al.*, 2023). Changing the head space gas concentration in polyethylene packages are considered as important tool for enhancing shelf life and maintaining market value. Types of packaging material, initial gas composition and the interaction between mushroom respiratory rates and gas permeation determines the equilibrium gas concentration in the packages (Srivastava *et al.*, 2020). High CO₂ concentration in combination with low Oxygen concentration shows enhanced shelf life due to low respiratory rates. CO₂ and O₂ concentration are very difficult to maintain because of high gas permeability values of packaging material.

2. Purpose of research

Fresh button mushrooms are bright white in colour, firm and can easily be chewed. But during long term storage these parameters undergo very rapid change leading to quality deterioration (Kumar *et al.*, 2014). Deterioration of button mushrooms are mainly due to browning of button mushroom, stipe elongation, cap opening, water loss which ultimately leads to spongy texture (Jiang *et al.*, 2012). Button mushrooms have a very short post-harvest shelf life and are very sensitive to browning mechanical damage. This perishable nature of button mushroom can cause severe problem in enlarging the market and long- distance transport.

3. Research Gap

The post-harvest shelf life of button mushroom is nearly 1-3 days at ambient temperature and 8–10 days under low temperature storage. Packaging material proves to be very importance aspects in quality control of the mushroom. Carbon dioxide and oxygen gas permeability rate and water vapour transmission rate are the most effective parameters for selection of packaging material. Permeability of gases is the important factor for determination of atmosphere around the product.

4. Methodology

Button mushroom has been widely produced and consumed globally all around over the world. Button mushroom are perishable in nature and its commercial value continues to degrade after harvest due to water loss, browning and microbial attack. Button mushroom were obtained from Department of Plant Pathology and Mycology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi in the morning hours. Matured button mushroom which were physically free from any injury were sorted and selected for the experiment. Fresh and uninjured button mushrooms were taken to the Centre of Food Science and Technology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi.