

# Impact of different atmosphere packaging systems on the on the shelf-life of *Phyllostacys edulis* fresh shoot

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## Introduction

Bamboo (*Phyllostacys edulis*, Poaceae) shoot is a traditional delicacy in several countries. Many studies have demonstrated that shoot was the ideal food being of low fat, high dietary fibres and rich in mineral content. and several bioactive compounds [1]. This study aimed to compare the effect of different modified atmosphere packaging (MAP) on the postharvest shelf-life of fresh bamboo shoots during storage of 28 days at 4°C.

## Materials and methods

**Materials and packaging condition.** Fresh bamboo shoot were collected in Tiziano Falco farm (Corigliano, CS, Italy) and peeled. were pre-treated in a chlorinated water solution and then and subsequently dried and packaged in MAP using heat-sealable polyamide and polyethylene (PA/PE) trays. The tested gas mixtures are 2%O<sub>2</sub>, 5%CO<sub>2</sub>, 93%N<sub>2</sub> (ATM1), and 3% O<sub>2</sub>, 7% CO<sub>2</sub>, 90 % N<sub>2</sub> (ATM2). Samples were stored at 4°C for 28 days.



Figure 1: Shoot packaged in ATM1

**Effect of quality parameters.** The effects of MAP systems were assessed by the changes of their chemical physical parameters (moisture content, water activity, pH, respiration rate and firmness). CIELab colorimetric parameters and microbial growth test were also assessed [2].

**Total polyphenols content (TPC) and radical scavenging activity.** TPC was determined by using the Folin-Ciocalteu method as previously reported [3]. The radical scavenging activity was investigated by using 2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) diammonium salt (ABTS) and 2,2-diphenyl-1-picrylhydrazyl (DPPH) tests as previously described [3]. Ascorbic acid was used as positive control in both assays.

**Statistical analysis.** Experiments were performed in triplicate. Prism GraphPad Prism Software (San Diego, CA, USA) was used to calculate the concentration causing 50% inhibition (IC<sub>50</sub>). Data were analysed by One-way analysis of variance (ANOVA) and significant differences were calculated according to Tukey's multiple range tests.

## Results and discussion

Results showed that after 28 days of storage a<sub>w</sub> values of 0.957 and 0.950 for ATM1 and ATM2, were recorded. A linear reduction of weight loss was observed during storage (Figure 2). At the end of storage period significant variations of the colorimetric parameters are observable between the apical portion of the shoot and the basal one regardless of the MAP applied (Figure 3). Shoots packaged in ATM1 showed a greater microbiological decay particularly evident after 28 days of storage.

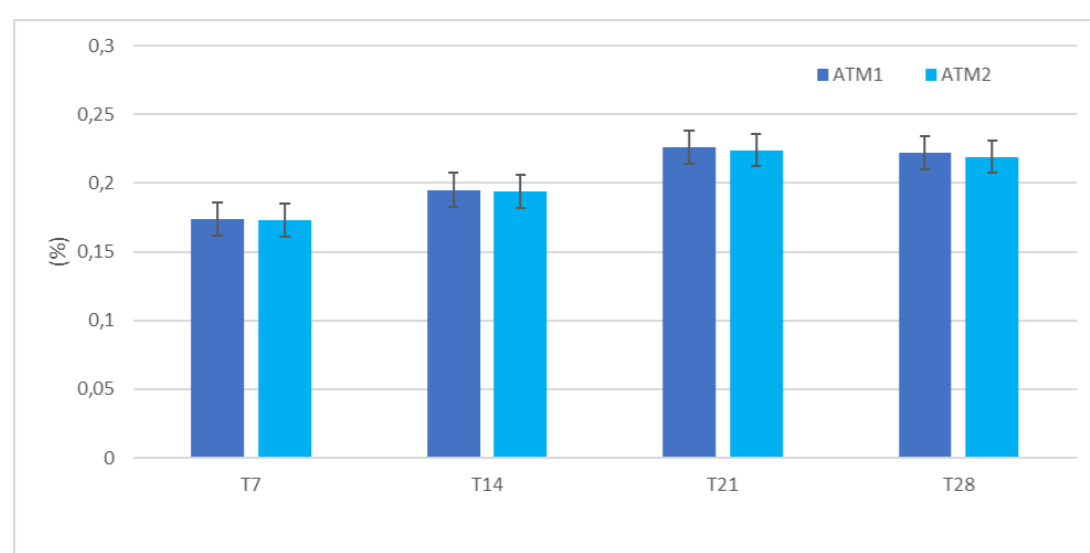


Figure 2: Weight loss during storage

Shoots packaged in ATM1 showed a greater microbiological decay particularly evident after 28 days of storage.

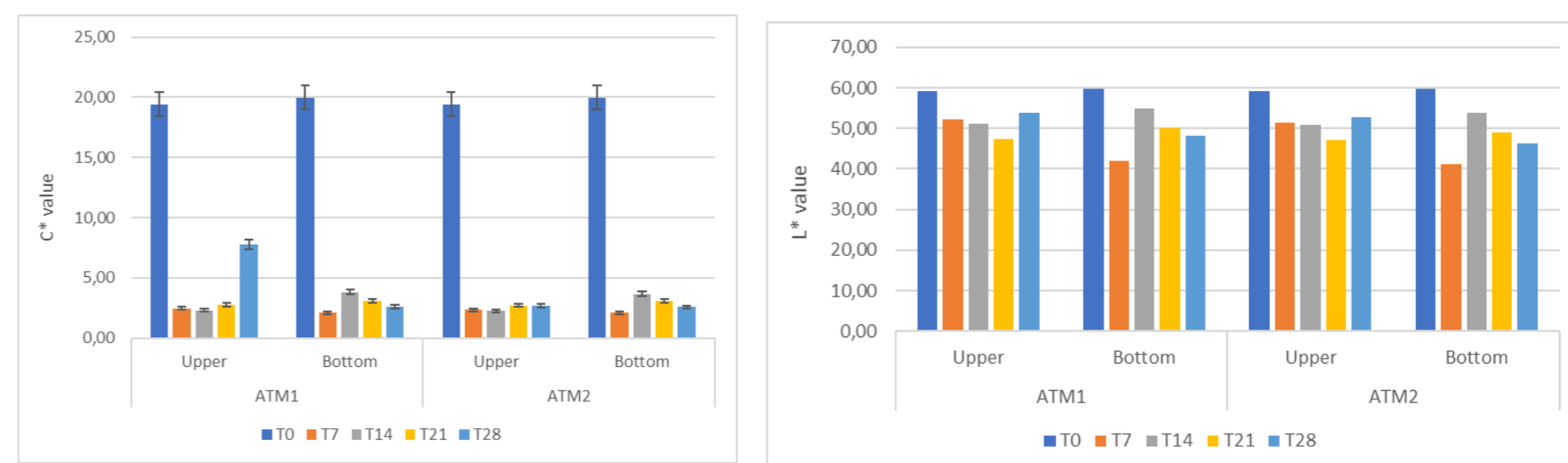


Figure 3: Evolution of chroma C\* and L\* parameters during storage

As regards TPC, a fluctuating trend was observed with a reduction in the first 7 days of storage followed by an increase. A linear reduction in radical scavenging activity was evidenced during samples storage independently by the typology of MAP applied (Table 1)

Table 1: Radical scavenging potential of bamboo shoot during storage

	ATM 1	ATM 2
<b>Sample</b>	<b>IC<sub>50</sub> (µg/mL)</b>	<b>IC<sub>50</sub> (µg/mL)</b>
T0	24.77±3.14 <sup>a</sup>	24.77±3.14 <sup>a</sup>
T7	39.92±0.48 <sup>e</sup>	39.02±2.03 <sup>c</sup>
T14	37.44±0.27 <sup>d</sup>	38.00±1.56 <sup>c</sup>
T21	33.26±1.04 <sup>c</sup>	34.98±3.37 <sup>b</sup>
T28	31.97±0.27 <sup>b</sup>	32.74±3.67 <sup>b</sup>
<b>Sign</b>	<b>**</b>	<b>**</b>
<b>Positive control</b>		
Ascorbic acid	5.0 ± 0.8	

Data are reported to mean ± Standard Deviation (SD) (n = 3). Differences within and between groups were evaluated by one-way ANOVA followed by Tukey's multiple range test. Results followed by different letters in a same column are significantly different at \*\*p < 0.01.

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## References

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