



## Storage life extension of cherry tomato by alginate-based edible coating in combination with UV-C treatment

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### ARTICLE INFO

#### Original Article

#### Article history:

Received 29 May 2021

Revised 6 August 2021

Accepted 14 August 2021

Available online 11 October 2021

#### Keywords:

Alginate-based edible coating

Postharvest

Quality

*Solanum lycopersicum* L.

Ultraviolet irradiation

DOI: 10.22077/jhpr.2021.4390.1215

P-ISSN: 2588-4883

E-ISSN: 2588-6169

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### ABSTRACT

**Purpose:** The aim of this work was to determine the effects of UV-C and alginate coating, alone or in combination, on extending the storability and the quality of cherry tomato. **Research method:** Tomatoes were covered with a 2% alginate coating in combination with UV-C treatment or alone and stored at 10°C with 90-95% relative humidity for 20 days. Tomatoes were evaluated for weight loss, respiration rate, total soluble solids, titratable acidity, ascorbic acid, lycopene content, total phenolic content, antioxidant content and overall appearance every 5 day. **Findings:** The results indicated that UV-C +Alginate treatment was highly effective in preserving fruit quality and delaying senescence. Alginate coating preserved brightness and visual quality of fruit while preventing decay. Overall, the integration of UV-C irradiation with alginate coating was the best treatment that could strongly inhibit the increase in the weight loss and respiration and achieved the highest ascorbic acid, total phenolic and antioxidant content. Single UV-C treatment had a positive effect on biochemical compounds at the beginning, but could not maintain this effect at the end of storage. Moreover, lycopene concentration increased as the senescence progressed, but observed higher lycopene contents in control samples. **Limitations:** No limitations to report. **Originality/Value:** UV-C + alginate treatment may be a promising method of improving quality and extending the postharvest life of cherry tomatoes.

## INTRODUCTION

Tomatoes are a climacteric fruit and have a very short life span usually 2-3 weeks. The postharvest storage of tomato is affected by numerous interrelated factors such as tomato variety, climatic conditions, cultivation conditions, degree of ripeness during harvest and storage conditions (Chiumarelli & Ferreira, 2006). For longer-term storage, ripe tomatoes can be stored at temperatures of about 10-15°C and 85-95% relative humidity. At these temperatures, both ripening and chilling injuries are reduced to the minimal levels (Castro et al., 2005). Degradative processes associated with postharvest senescence impact fruit quality traits, i.e., aspect, texture, taste, aroma and nutritional characteristics, leading to consumer rejection and important economic losses for the fruit industry (Pott et al., 2020). Therefore, the development of new technologies to effectively control ripening and decay would be very importance.

Packaging is a crucial intervention for extending the effectiveness of food preservation and distribution chain. It helps in bringing down the physical, physiological, microbiological and biochemical changes in cherry tomatoes. Food packaging is a necessity but then again its disposal is becoming a burgeoning problem (Kumar et al., 2020). The application of edible coatings is one of the most innovative alternative methods to plastic packaging for extending the commercial shelf-life of fruits and vegetables.

Edible coating has drawn attention in food industries due to the increased interest in using natural preservatives over the chemicals ones' food industries due to the increased interest in using natural preservatives over the chemicals one (Huang et al., 2018). Edible coatings have the ability to control moisture, gas exchange, respiration and oxidative reaction rate by forming a semi-permeable barrier around the fruit. They are classified as hydrocolloids (polysaccharide, starch and proteins), lipids (fatty acids, waxes) and composites combination of proteins, polysaccharides, and lipids (Dhall, 2013).

Alginates are naturally occurring, indigestible polysaccharides commonly produced by and refined from various genera of brown algae. Alginate-based edible coatings and films attract interest for improving/maintaining quality and extending the shelf-life of fruits by reducing dehydration, controlling respiration, enhancing product appearance, suppressing microbial growth and improving mechanical properties (Senturk et al., 2018). Alginate-based edible coatings have been effective in maintaining postharvest quality of peach (Maftoonazad et al., 2008), sweet cherry (Díaz-Mula et al., 2012; Chiabrando & Giacalone, 2015), plum (Valero et al., 2013) and tomato (Zapata et al., 2008). Furthermore, studies have shown that the combination of edible coatings with other preservative methods has achieved great success in quality maintenance in fresh produce. One of these methods is UV irradiation (Bal, 2019). However, so far the combined effect of UV-C treatments and the use of edible coatings to extend the postharvest life of cherry tomatoes have not been evaluated.

UV-C is non-thermal treatment for inactivation of microbial in food industry. The advantage of this technology is safety, and leaving no chemical residue on the produce. UV-C radiation (254 nm) in fresh fruits and vegetables has been reported to exert beneficial effects by delaying microbial growth and senescence of produce during their postharvest storage (Srivastava & Sharma, 2013). Moreover, enhancements of several bioactive compounds, mainly phenolic compounds, during storage of UV-C pretreated fruit and vegetables have been widely reported (Liu et al. 2012; Pinheiro et al. 2015). All metabolites produced after exposure to UV-C were associated to positive physicochemical changes and improvements in postharvest quality and shelf life (Mditshwa et al., 2017).

The present study was conducted to investigate the effects of postharvest alginate-based edible coating and UV-C treatment on fruit quality attributes and bioactive compounds of "Yeniçeri F1" cherry tomato cultivar during a 20 days storage period at 10°C.

## MATERIALS AND METHODS

### Plant material and treatments

Cherry tomatoes (cv. 'Yeniçeri F1') were obtained from a commercial supplier at red-ripe stage (red is more than 90% of the surface), selected according to the uniformity of size and undamaged before treatments. Tomatoes were divided into four groups (1000 fruits per group and 3 replications / treatment). Treatments can be summarized as follows:

1. Control: Control fruits were dipped in distilled water at 20°C for 1 minute, and then dried for 1 hour at ambient temperature.
2. UV-C Irradiation: Tomatoes were irradiated using six germicidal, low-pressure vapor lamps (Osram HNS OFR). Each lamp (2.5 cm tube diameter; 88 cm length) had a nominal power output of 30 W and a peak wavelength emission of 253.7 nm. The UV lamps (three lamps at the top and bottom) were assembled 15 cm apart and the UV-C field area under the lamps was 60×100 cm (Nigro et al., 1998). They were fixed at 50 cm above the sample placing spot and these were enclosed in a wooden box covered with aluminum foil. Fifteen minutes prior to use, the device was switched on for the purpose of stabilization. Then fruits were irradiated for 4 min. After that fruits were immersed in distilled water at 20°C for 1 minute, and then dried for 1 hour at ambient temperature.
3. Alginate coating treatment: Alginate (alginic acid sodium salt from brown algae purchased from Sigma) was prepared according to a previous paper (Zapata et al., 2008) at 2% concentration (w/v), dissolved in hot water (45°C) with continuous shaking until the solution became clear. After cooling to 20°C, glycerol at 2% (v/v) was added as a plasticizer, and treatments were performed by dipping the fruit twice in fresh coating solutions for 1 min to ensure the uniformity of the coating of the whole surface and allowed to drain for 1 hour at ambient temperature.
4. UV-C treatment followed by Alginate coating (UV-C+Alg): Tomatoes were firstly irradiated 4 min at 253.7 nm ultraviolet, and then they were wholly dipped into 2% of alginate solution for 1 min. Afterward the strawberries were taken out and dried for 1 hour at ambient temperature.

The treated tomatoes were sealed in polypropylene baskets (0.250 kg) and stored at 10°C and 90-95% relative humidity for 20 days. Measurements of all parameters started at the beginning of the storage and then continued until the day of 20 with 5 days intervals.

### Analysis of quality attributes

The weight loss of tomatoes was evaluated using a digital balance by weighing the individual fruits on the initial day and at the regular intervals of sampling. Weight losses of tomatoes were expressed as percent (%).

The respiration rate was determined by incubating tomatoes of known mass and volume in a hermetic container for 1 h, and then determining the CO<sub>2</sub> concentration in the container by using a Systech Gaspacer advance GS3L gas analyzer. It was expressed in mg kg<sup>-1</sup> h<sup>-1</sup>.

The determination of total soluble solids (TSS) was done by applying a refractometer, which is represented as %. Titratable acidity (TA) was determined by titration method and calculating the result as grams of citric acid per 100 g fresh weight.

Ascorbic acid (AsA) content was measured using 2,5-6 dichlorophenol indophenols' method described by A.O.A.C (2012) and expressed as mg 100 g<sup>-1</sup>.

Lycopene content in the cherry tomato fruit was determined according to procedures described by Suwanarung (2016). Lycopene was extracted using a mixture of hexane: acetone: ethanol (2:1:1). The lycopene content of cherry tomato fruit was measured spectrophotometrically at 503 nm. The results were expressed in mg 100 g<sup>-1</sup>.

The total phenolic content was determined using a colorimetric assay and the Folin-Ciocalteu reagent (Sigma) by the reagent method (Slinkard & Singleton 1977). Results are expressed in mg of gallic acid equivalent 100 g<sup>-1</sup>.

Antioxidant content was determined according to the Brand-Williams et al. (1995). Briefly, an aliquot (0.1ml) of the extract was added to 3.9 ml of a 2,2-Diphenyl-1-picrylhydrazyl methanolic solution. After 30min of incubation at room temperature in the dark, the absorbance was measured at 515 nm. The results were expressed as mmol trolox equivalent g<sup>-1</sup> fw.

Overall appearance (decay, shriveling, color and brightness) was rated on the same fruits using a scale with five different categories by panelists, in which 5 = excellent; 4 = good; 3 = fair, 2 = poor, and 1 = very poor. Fruit receiving a rating of three and above was considered to be marketable (Safari et al., 2020).

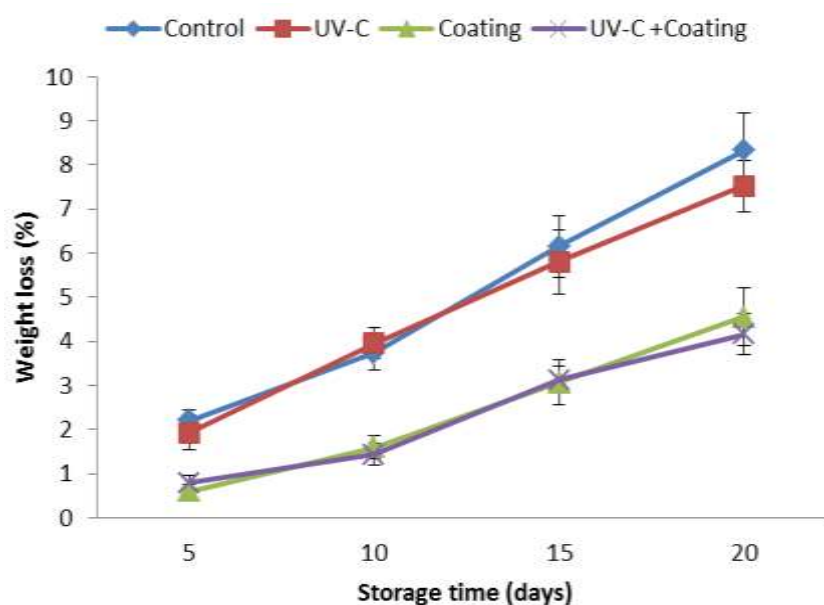
### Data analysis

The present experiment was carried out in factorial completely randomized design each treatment containing three replicates. The data of various parameters were presented as the mean  $\pm$  standard error (SE). Significant difference between different treatments was determined by Tukey's test at  $P \leq 0.05$  level of significance using the SPSS software (Version 15.0).

## RESULTS AND DISCUSSION

### Weight loss

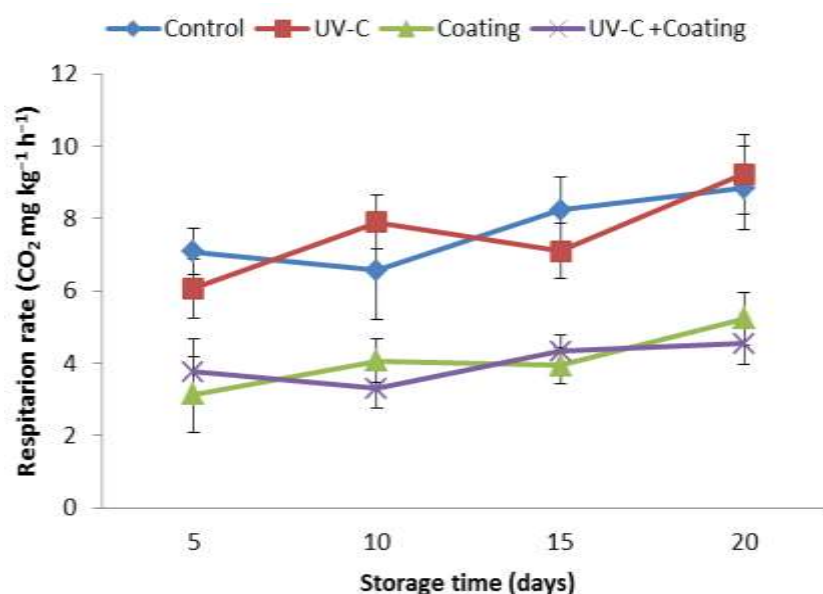
Epidermal cell layer and cuticles reduce weight loss in fruits and vegetables. Edible coatings create an additional extra barrier layer on the stomata and decrease transpiration (Díaz-Mula et al., 2012). In the present study, weight loss of tomato increased progressively in all the treatments with the storage period (Fig. 1); however, coated tomatoes were noted to have relatively lower weight loss. Edible coatings are considered to reduce weight loss due to their effects as semi-permeable barrier against moisture loss (Dilmacunal et al., 2011; Kocira et al., 2021). Alginate treatment (as single or in combination with UV-C) compared with the control inhibited weight loss with more efficiency throughout the storage period. Similarly, Zapata et al. (2008) reported that coatings based on alginate or zein were effective tools for reducing weight loss and delaying the tomato-ripening process during postharvest storage. In previous research with cherry tomatoes, different edible coatings also decreased weight loss compared to uncoated samples (Barreto et al., 2016; Pobiega et al., 2020). At the end of storage time, the highest weight loss was recorded in control fruits (8.33%), while the minimum weight loss was 4.16% for the combination treatment, which indicated that alginate and UV-C treatment can effectively reduce weight loss of tomato fruits. The role of edible coating and UV-C in preventing weight loss in fruit may be associated with limiting transpiration and ripening, which in turn reduces water loss in treated fruits (Abdipour et al., 2020).



**Fig. 1.** Effect of melatonin treatment on weight loss of tomato fruit during storage. Vertical bars indicate standard error.

### Respiration rate

The respiration rate in fruit and vegetables is considered a good index for determination of storage life. In the study, CO<sub>2</sub> production showed to be slightly increasing in all treatments during storage. However, the respiration rate of the coated tomato fruits was lower than that of the control fruits and UV-C treated fruits for the whole duration of cold storage (Fig 2). This trend is facilitated by the reduced oxygen and carbon dioxide permeability by the coating. Edible coatings have the potential to reduce fruit respiration rate by blocking peel pores and reducing permeability to water vapor and gas exchanges. At the end of 20 days, the highest respiration rate was determined in UV-C treatment (9.23 mg CO<sub>2</sub> kg<sup>-1</sup> h<sup>-1</sup>) followed by control fruits (8.83 mg CO<sub>2</sub> kg<sup>-1</sup> h<sup>-1</sup>) and lowest respiration rate was determined in UV-C + Alg treated fruits (4.53 mg CO<sub>2</sub> kg<sup>-1</sup> h<sup>-1</sup>) followed by Alginate (5.23 mg CO<sub>2</sub> kg<sup>-1</sup> h<sup>-1</sup>) treated fruits. According to results, UV-C irradiation alone did not significantly affect the respiration rate, but alginate coatings had a good effect on reducing the respiration rate of tomatoes. Similar findings were observed in the case of strawberry treated with the chitosan-based coating with UV irradiation, indicating the delay in the respiration rate, as compared with UV-C alone and the control (Bal, 2019). In addition, previous studies revealed that the edible coating treatments in tomatoes reduced the respiration rate (Zapata et al., 2008; Meena et al., 2020; Safari et al., 2020).



**Fig. 2.** Effect of melatonin treatment on respiration rate of tomato fruit during storage. Vertical bars indicate standard error.

**Table 1.** Changes in quality parameters (TSS, TA, Ascorbic acid and Overall appearance) in treated and untreated tomato fruits during storage period

Parameters	Treatments	Storage time (days)				
		0	5	10	15	20
TSS (%)	Control	6.8±0.2a	7.0±0.2a	7.5±0.2a	7.8±0.2a	7.9±0.3a
	UV-C	6.8±0.2a	7.1±0.2a	7.4±0.3a	7.3±0.2a	7.8±0.2a
	Alginate	6.8±0.2a	6.8±0.2a	6.9±0.3a	7.2±0.2a	7.4±0.2a
	UV-C +Alg	6.8±0.2a	6.9±0.2a	7.1±0.2a	7.4±0.1a	7.2±0.2a
	+Alg					
TA (%)	Control	0.52±0.02a	0.53±0.03ab	0.48±0.01a	0.44±0.02a	0.41±0.03a
	UV-C	0.52±0.02a	0.49±0.01b	0.50±0.03a	0.46±0.01a	0.40±0.01a
	Alginate	0.52±0.02a	0.51±0.02ab	0.52±0.02a	0.47±0.02a	0.44±0.02a
	UV-C +Alg	0.52±0.02a	0.55±0.01a	0.50±0.03a	0.45±0.02a	0.43±0.03a
	+Alg					
Ascorbic acid (mg 100 g <sup>-1</sup> )	Control	31.7±3.4a	32.5±1.8a	27.7±2.3a	23.4±2.4b	21.0±1.8b
	UV-C	31.7±3.4a	34.9±1.6a	29.4±2.0a	25.5±1.2ab	22.3±1.8ab
	Alginate	31.7±3.4a	33.3±1.8a	30.3±1.9a	27.8±1.5ab	25.5±1.8ab
	UV-C +Alg	31.7±3.4a	34.3±2.1a	32.3±2.1a	29.5±1.9a	26.4±2.0a
	+Alg					
Overall appearance (1-5 point)	Control	5.0a	4.6±0.5a	4.3±0.2a	3.3±0.2b	2.5±0.3b
	UV-C	5.0a	4.8±0.2a	4.4±0.1a	3.3±0.2b	2.4±0.3b
	Alginate	5.0a	5.0a	4.6±0.2a	4.0±0.4ab	3.4±0.3a
	UV-C +Alg	5.0a	5.0a	4.8±0.2a	4.2±0.2a	3.6±0.2a
	+Alg					

All values are mean ± standard deviation of three replicates. Values within the same column with different letters for each parameter are significantly different at  $p < 0.05$ .

### TSS and TA Content

TSS and TA are among the most important parameters of the postharvest storage quality and important determinants for consumer acceptance. During ripening, the increment of TSS is caused by biosynthetic processes or the degradation of polysaccharides, whilst the amount of organic acid usually decreases because it is substrate of respiration (Sualeh et al. 2016).

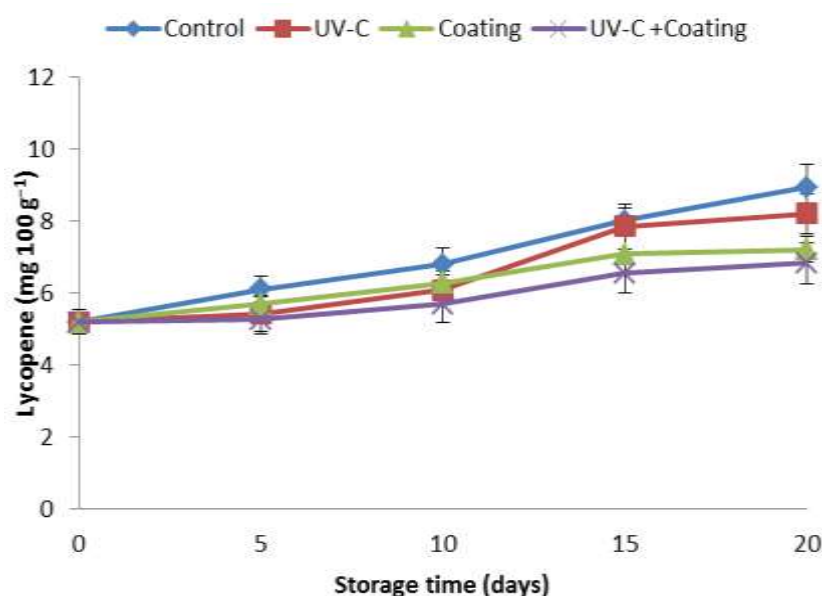
Present results showed that regardless of treatments, TSS of tomatoes showed fluctuation during storage but increased compared to initial value (6.8%) at the end of the storage (Table 1). UV-C +Alg (7.26%) was the best treatment for maintaining the TSS of tomatoes followed by Alginate (7.46%), UV-C (7.83%) 174 and Control (7.96%), but there were no significant ( $p > 0.05$ ) differences among all groups. Contrary to the TSS, TA of tomatoes decrease overtime compared to initial value (0.52%) varying between 0.40% (UV-C) and 0.44% (Alginate) at the end of the storage (Table 1). However, there was almost no obvious change of TA between the control and treated fruit during tomatoes storage.

### Ascorbic Acid

AsA content in fresh tomatoes depends on genotype, climatic conditions, fruit development, maturation, senescence and time of storage. AsA content in tomato fruit increases reaching a maximum and then began to decline with ripening (Malewski & Markakis, 2006). Similarly, in the study, AsA content of the fruits was found to have a slight increase during the initial period of the storage duration and then it was noted to have a rapid decrease (Table 1). The initial AsA of tomato was  $31.73 \text{ mg } 100 \text{ g}^{-1}$ . At the end of cold storage, the lowest AsA value was determined in control fruits ( $21 \text{ mg } 100 \text{ g}^{-1}$ ), while the highest ascorbic acid value was determined in UV-C +Alg treatment ( $26.43 \text{ mg } 100 \text{ g}^{-1}$ ) followed by alginate ( $25.5 \text{ mg } 100 \text{ g}^{-1}$ ) and UV-C treatment ( $22.33 \text{ mg } 100 \text{ g}^{-1}$ ). Results of the present study showed that alginate with UV-C alone or combined treatment significantly protects the AsA content and delays its decrease. A decreased during storage period, which may be due to the action of AsA oxidase, which converted AsA to dehydroascorbic acid and phenol oxidase (Suseno et al., 2014). Edible coating results in lower oxygen permeability followed by reduction in the enzyme activity and thereby, resulting in reduction of AsA oxidation (Wang & Gao, 2013). The results of this study were consistent with those reported by Zapata et al. (2008), who reported a significant retention in the AsA of the coated tomato fruits. Similar results were reported for carambola (Gol et al., 2015), guava (Nair et al., 2018) and Ber fruit (Rao et al., 2016) which were treated by 1% or 2% alginate.

### Lycopene content

Lycopene is one of the carotenoids found predominantly in tomatoes, and forms the principal pigment responsible for the red color. The content of lycopene varies widely among tomato varieties and increases dramatically during ripening (Clinton, 1998). The changes in the lycopene content of treated and untreated tomatoes during their storage period are presented in Figure 3. The initial lycopene content of tomatoes was  $5.2 \text{ mg } 100 \text{ g}^{-1}$ . Lycopene of both treated and untreated tomatoes increased throughout their storage period, but treated tomatoes showed a lesser increase. This retention in lycopene biosynthesis could be attributed to the retardation of the fruit maturity process caused by the combination of UV-C and edible coating. After 20 days of storage, the control samples showed significantly ( $p < 0.05$ ) higher amount of lycopene i.e.  $8.93 \text{ mg } 100 \text{ g}^{-1}$  compared to UV-C ( $8.2 \text{ mg } 100 \text{ g}^{-1}$ ), alginate ( $7.21 \text{ mg } 100 \text{ g}^{-1}$ ) and UV-C +Alg ( $6.83 \text{ mg } 100 \text{ g}^{-1}$ ) treatments. These changes are in agreement with Jagadeesh et al. (2011) and Davila-Avina et al. (2014), meaning that UV-C and edible coating treatments lead to less lycopene content of tomatoes compared to the non-treated. Severo et al. (2015) and Tiecher et al. (2013) also reported that UV-C slowed the accumulation of lycopene and  $\beta$ -carotene in tomatoes, which explained the lower intensity of the characteristic red color.

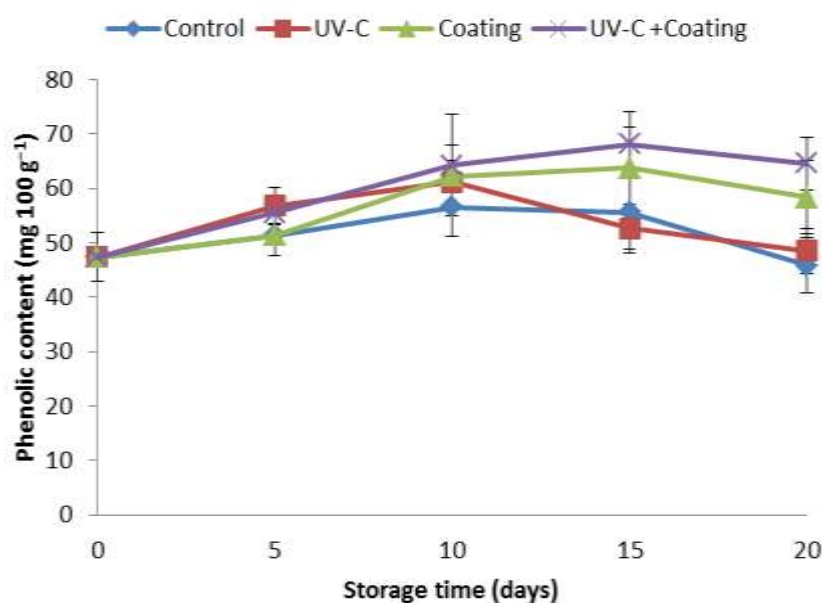


**Fig. 3.** Effect of melatonin treatment on lycopene of tomato fruit during storage. Vertical bars indicate standard error.

### Total phenolic content

Tomato is known as health stimulating fruit owing to the characteristic array of phytochemicals and phenolics are the main bioactive compounds present in ripened tomatoes (Chaudhary et al., 2018). As shown in Figure 4, total phenolic contents were 47.33 mg 100 g<sup>-1</sup> at harvest, and then exhibited an increase trend in all treated fruits between day 0 and day 10 of storage. On 15th day, total phenolic contents in control (55.63 mg 100 g<sup>-1</sup>) and UV-C (52.63 mg 100 g<sup>-1</sup>) treatments decreased, but in UV-C +Alg (68.16 mg 100 g<sup>-1</sup>) and Alginate (63.76 mg 100 g<sup>-1</sup>) treatments continued to increase. At the end of the storage, total phenolic content of all tomato samples decreased, but UV-C +Alg (64.56 mg 100 g<sup>-1</sup>) and Alginate (58.4 mg 100 g<sup>-1</sup>) treated samples had significantly ( $p < 0.05$ ) high phenolic content as compared to other samples. This result is in line with the findings of Lin et al. (2017) who reported that UV treatment combined with coating was found to be effective treatment for maintaining total phenolics content of longan fruit. The positive effect of UV-C and alginate coating in this study, in minimizing loss of phenolic compounds, might be attributed to delayed oxidation of phenolics by suppressed activities of these enzymes. These results are consistent with previous studies demonstrating that UV irradiation induces the accumulation of phenolic compounds in tomatoes (Liu et al., 2012; Pinheiro et al., 2015; Mditshwa et al., 2017). Saurabh et al. (2019) also reported that the protective layer of edible coating created a barrier for movement of gases and moisture, which prevented the cellular breakdown and action of polyphenol oxidase and peroxidase on phenolic constituents present in vacuoles. Earlier studies have demonstrated the restricted loss in total phenolic compound as effect of coating in various fruits such as strawberries coated with alginate (Peretto et al., 2017); blueberries coated with alginate and chitosan (Chiabrando & Giacalone, 2015) and sweet cherry coated with alginate (Diaz-Mula et al., 2012).

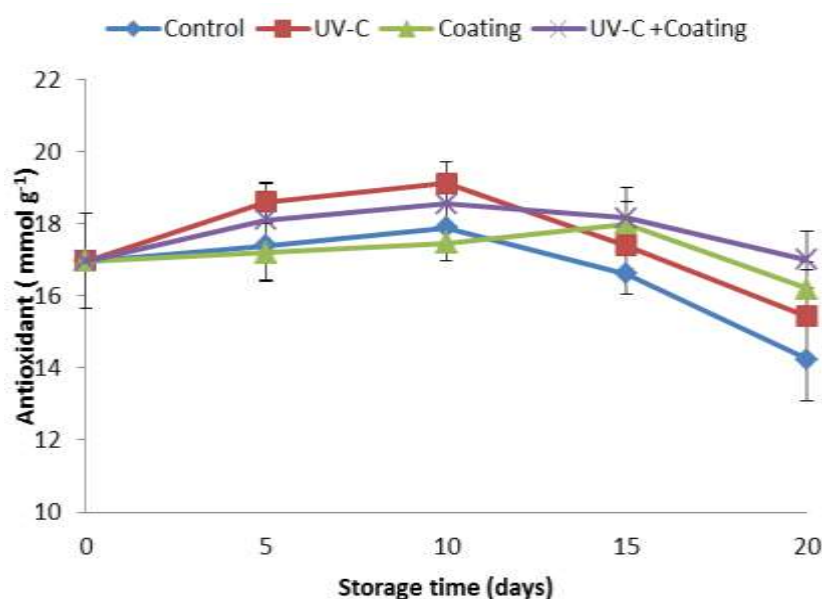




**Fig. 4.** Effect of melatonin treatment on firmness of tomato fruit during storage. Vertical bars indicate standard error.

### Antioxidant content

Tomatoes are a rich source of antioxidants such as vitamin C, lycopene, phenolics, flavonoids and  $\beta$ -carotene, which contribute to their antioxidant or free radical scavenging effects (Lenucci et al., 2006). As shown in Figure 5, increases and decreases were determined in the antioxidant content of tomatoes during the storage period in all treatments, but control sample showed highest decrease. The initial antioxidant content of tomatoes was  $16.96 \text{ mmol g}^{-1}$  just after the harvest and it was measured as  $14.23 \text{ mmol g}^{-1}$  for control fruits at the end of the storage period. This could be ascribed to fruit senescence and higher respiration rates of degradation of biochemical compounds in control fruits. In the study, UV-C treatment triggered both the accumulation of antioxidants in tomato and was effective to slow-down the loss of antioxidants as compared with control during storage. In this sense, the highest antioxidant content was determined in UV-C treated tomatoes ( $19.13 \text{ mmol g}^{-1}$ ) on 10th day. This finding is in agreement with Kocak and Bal (2017) and Esua et al. (2019) who showed that UV-C treatment delayed the antioxidant loss in sweet cherry and tomatoes, respectively. Although the application of single treatments (UV-C or Alginate coating) could be significantly effective in retaining antioxidant content, alginate coating treatment in combination with UV-C ( $17 \text{ mmol g}^{-1}$ ) maintained a better antioxidant content on the 20th day than those observed for single treatments. This could be due to coating barrier properties, which modified internal atmosphere thus inhibiting oxidative destruction of antioxidant compounds, or may be due to showing a synergetic effect on antioxidants by combinational treatment. Similarly, Lin et al. (2017) and Bal et al. (2019) also reported that coating treatments combined with UV-C maintained the biochemical compound of fruits.



**Fig. 5.** Effect of melatonin treatment on antioxidant of tomato fruit during storage. Vertical bars indicate standard error.

### Overall appearance

Cherry tomato fruits have increased in popularity due to their high content of antioxidants as well as their convenience of use; they are consumed either as an ingredient (such as in salads) or alone (Chaudhary et al., 2018). Overall appearance is one of the critical components for the consumer's perception of tomato fruit quality. Main components of appearance quality include color and color uniformity, glossiness, and absence of defects in shape or skin and lack of disease (Farneti, 2014). As shown in Table 1, in the beginning days of storage, there were no much significant differences were recorded in overall appearance. Differences were noticed as storage days extended from 15 to 20 days. The overall quality of the coated tomatoes was also evaluated to be very high, which may result in high consumer acceptability. In marketable score study performed at 20th day of storage shown that score given in respect to texture, decay, shriveling and brightness of fruit was much higher in Alginate coating and UV-C + Alg treated fruits compared to control. At the end of the storage, only UV-C + Alg and Alginate treated fruits were marketable. This result indicated that effect of alginate coating on tomatoes helped according to slow down the ripening process (Zapata et al., 2008; Meena et al., 2020) that influenced the quality attributes of the samples evaluated. Moreover, the synergistic effect of combination treatment on inhibition of fungal growth, retention of texture and color proved significantly beneficial in maintaining higher overall acceptability of treated tomatoes compared to uncoated fruits during storage (Fagundes et al., 2013; Safari et al., 2020).

### CONCLUSION

The present study shows that combination of Alginate coating with UV-C treatment in cherry tomato (cv. 'Yeniçeri F1') is more effective for preserving fruit quality than treatment of UV-C or Alginate alone during storage at 10°C up to 20 days. This treatment could retard weight loss, reduce respiration rate, delay changes in ascorbic acid, lycopene, total phenol, antioxidant content and improved overall appearance in cherry tomato. In conclusion, UV-C +

Alginate treatment can be a promising strategy to improve the quality of cherry tomato during storage.

### Conflict of interest

The author has no conflict of interest to report.

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