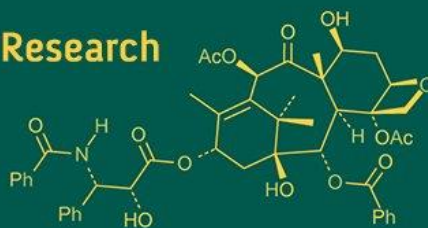


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Studies on the effect of edible coating treatments on physico-chemical properties of sapota (*Manilkara zapota* L.)

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Abstract

The current study entitled “Studies on the effect of edible coating treatments on physico-chemical properties of sapota (*Manilkara zapota* L.)” was conducted at the Post Harvest Management lab of Pt. KLS, College of Horticulture and Research Station, Rajnandgaon, MGUVV, Durg (C.G.) during the academic year 2024-25. The experimental work was laid out under Completely Randomized Design (CRD) with three replications and the eleven different treatment combinations. The investigation consists total 11 treatments i.e. control along with *Aloe vera* gel 75%, sago 5%, acasia gum 5%, paste of tulsi leaves 20% and their combinations i.e. *Aloe vera* gel 75% + sago 5%, *Aloe vera* gel 75% + acasia gum 5%, *Aloe vera* gel 75% + paste of tulsi leaves 20%, sago 5% + acasia gum 5%, sago 5% + paste of tulsi leaves 20%, acasia gum 5% + paste of tulsi leaves 20% were used as edible coating materials. Among all treatments, the application of 75% *Aloe vera* gel showed the best results, with the minimum PLW i.e. (4.09%, 6.32% and 10.92%) and Spoilage i.e. (20%, 40% and 63.33%) at 4th, 6th and 8th day of storage, respectively. Similarly, the finding for bio-chemical parameter were significantly influenced by the application of 75% *Aloe vera* gel has been recorded lowest TSS (17.36%), Total sugar (14.08) and Reducing sugar (5.96%) along with maximum Ascorbic acid (21.03%) and Titrable acidity (0.216%). While, maximum pH (6.19) observed in *Aloe vera* gel 75% + acasia gum 5% and non-reducing sugar (8.60%) in 8th day of storage was observed in *Aloe vera* gel 75%.

Keywords: Sapota, edible coating, *Aloe vera* gel, acasia gum, sago, Tulsi leaf paste, physico-chemical

Introduction

Sapota is a member of the Sapotaceae family, which has 700 species across a wide range and 35 or 40 inadequate taxa. Sapodilla, chickoo, and sapota are all popular names for *Manilkara zapota* (L.) P. Royen. The Spanish word *zapotilla*, which means “sapote” (a soft edible fruit) comes from the name Sapodilla (Bano and Ahmed, 2017) [2]. Sapota is a native tropical fruit that grows in tropical areas and belongs to the Sapotaceae family (Ehteshami *et al.*, 2024) [6]. In India, sapota is introduced firstly in Maharashtra’s village “Gholwad” by Irani brothers in the year 1898 and then spread to other nearer states and now it is cultivated widely in the country (Chundawat, 1991) [5].

Sapota is one of the important fruit used for taste purpose. It is consumed as dessert fruit and the pulp of the fruit may utilized in preparation of sherbets, halwas and mixed jam. This is also canned into slices. The fruit pulp has got medicinal properties. The fruit pulp is also a great source of raw material for the manufacturing of industrial glucose and pectin. Sapota fruit is a good source of sugar which ranges between 12 and 14 per cent. A 100 g of edible portion of fruit contains 73.7 g moisture, 21.49 g carbohydrates, 0.7 g protein, 1.1 g fat, 28 mg calcium, 27 mg phosphorus, 2 mg Iron and 6 mg ascorbic acid as reported by Bose and Mitra (1990) [3].

Edible coatings are green environmental treatments that are popularly used to extend shelf life and maintain the quality of fresh products (Saha *et al.*, 2015) [21]. Edible coatings delay ripening and improve qualitative features (taste, aroma, texture, and appearance) by creating an obstacle against water vapor, O₂ and CO₂ gas diffusion (Mahajan *et al.*, 2013) [12]. Fruit coatings are one such alternative as they not only improve external appearance, but also

modify the internal atmosphere of fruits (Saftner, 1999) [20]. The leaves of *Aloe vera*, an important medicinal plant, contain clear gel in central mucilaginous pulp which can be used for coating as it cannot be detected after drying. Acacia gum or gum Arabic is natural secretion from stems and branches of acacia trees and used as edible coating to increase shelf life and microbial safety of fruits. Sago starch based edible films have good qualities like odorless, tasteless and colorless. Tulsi leaves which is used for coating contain bioactive compounds with antioxidant and antioxidant properties.

Materials and Methods

The experiment was carried out during the year 2024-25 at Post Harvest Management lab of Pt. KLS, College of Horticulture and Research Station, Rajnandgaon (C.G.). The fresh, firm, healthy sapota fruits of uniform size and maturity, free from pests and diseases, injuries, bruises and blemishes were collected. The fruits were rinsed with regular tap water to eliminate dust and dirt and pesticide traces and then allowed to dry in shade. Then, fruits were immersed in the corresponding edible coating solutions i.e. control along with *Aloe vera* gel 75%, sago 5%, acacia gum 5%, paste of tulsi leaves 20% and their combinations i.e. *Aloe vera* gel 75% + sago 5%, *Aloe vera* gel 75% + acacia gum 5%, *Aloe vera* gel 75% + paste of tulsi leaves 20%, sago 5% + acacia gum 5%, sago 5% + paste of tulsi leaves 20%, acacia gum 5% + paste of tulsi leaves 20% for 5 minutes. Following the dipping, the fruit's exterior was left to air dry for 30 minutes. Fruits were subsequently stored in CFB boxes. A CFB box holds 10 fruits in each box. The physico-chemical parameters like physiological loss in weight (PLW), spoilage, total soluble solids (TSS), pH, acidity, ascorbic acid, reducing sugar, non-reducing sugar and total sugar were estimated at 4th, 6th and 8th days during storage. The weight of the fruits in each replication was recorded on every 4th, 6th, and 8th day and subtracted from the initial weight. The loss of weight in relation to initial weight was calculated and expressed as percentage. On the 4th, 6th and 8th days of the storage period, the number of fruits that were rotten or overripe was counted and tallied as a percentage over the total number of fruits. The TSS (%) of sapota fruits recorded by using erma hand refractometer. The pH levels of each sapota fruit sample were measured using a digital pH meter. The acidity of fruit was determined by standard sodium hydroxide titration method (Ranganna, 1986) [19]. Ascorbic acid content of pulp was determined by 2, 6-dichlorophenol indophenol titration method. The titrimetric method of Lane and Eynon described by Ranganna (1986) [19] was adopted for the estimation of reducing sugar and total sugar. Non-reducing sugar of fruit pulp from each sample separately calculated by using formula = Total sugar (%) - Reducing sugar (%). The experiment was conducted in completely randomized design with each treatment replicated thrice. The data were subjected to statistical analysis as per the procedure outlined by Panse and Sukhatme (1985) [17].

Results and Discussions

Physiological loss in weight (%)

The table 1 indicated that various edible coating treatments exerted considerable influence on PLW (%) on the 4th, 6th and 8th days of the storage period. The treatment T₂ involving (75% *Aloe vera* gel) showed the lowest PLW (%),

specifically 4.09, 6.32 and 10.32 respectively, followed by T₇ (*Aloe vera* gel 75% + acacia gum 5%) on the 4th and 6th day of the storage period. The highest PLW (%) was observed in the T₁ (control), reaching 7.83% on the 4th day duration of storage, correspondingly. The minimum PLW (%) recorded in 75% *Aloe vera* gel coating on weight loss will be due to the formation of a barrier to water diffusion between fruit and environment, thus avoiding its external transference (Morillon *et al.*, 2002) [16]. The findings were supported by Vahdat *et al.* (2010) [25] in strawberry, Ergun and Satici (2012) [7] in apple, Marpudi *et al.* (2011) [14] in papaya and fig, Valverde *et al.* (2005) [26] in grape.

Spoilage (%)

The data in Table 2 showed that T₂ 75% *Aloe vera* gel recorded the lowest spoilage (%) i.e. 20.00, 40.00% and 63.33% followed by T₇ (*Aloe vera* gel 75% + acacia gum 5%) at 4th, 6th and 8th day of storage period respectively. The highest fruit spoilage was recorded in T₁ (control) treatment i.e. 60% at 4th day of storage period respectively. This is due to *Aloe vera* gel is capable of reducing the rate of respiration and ripening process as well as it can significantly retard the growth of rotting causes bacteria, fungi and moulds. *Aloe vera* induces a strong defence system in coated fruits. A similar observation was done by Jawandha *et al.* (2014) [9] in lemon fruits.

Total soluble solids (TSS)

The Table 3 showed that various coating treatments exerted their significant effects on TSS (%) during 4th, 6th and 8th days of storage period. The treatment T₂ (75% *Aloe vera* gel) recorded the highest TSS i.e. 24.26% at 8th day of storage followed by T₇ (*Aloe vera* gel 75% + acacia gum 5%) i.e. 24.10% respectively. It is may be due to coating material creates a barrier for transpirational losses, which actually create a modified atmosphere for fruit which results in building of internal CO₂ and depletion of O₂. This might result in slowdown in carbohydrate metabolism which in turn reflected in delayed starch depletion (Jholgiker and Reddy, 2007) [10].

pH

The table 4 showed that treatment with edible coating material T₇ (*Aloe vera* gel 75% + acacia gum 5%) observed the highest pH values in 8th day (6.19), whereas the untreated T₁ (control) showed the lowest values in 4th day (5.42). Increased hydrogen ion concentrations and moisture evaporation from the sapota fruit may be the cause of the pH values retention over storage. The increased percentage of acidity that is retained during the storage period of coated ones is another factor contributing to the decrease in pH levels. This result is supported by Sahu (2018) [22] who confirmed that pH increased gradually with the progression in storage of treated custard apple fruits.

Acidity (%)

Table 5 showed that during the acidity (%) of sapota fruit decreased as the ripening process progressed. The highest acidity (%) was found in T₂ (*Aloe vera* gel 75%) among the various edible coating treatments. At the 4th day and 6th day of storage, respectively, the acidity levels were 0.216 and 0.197%, which was at par with T₆ (*Aloe vera* gel 75% + sago 5%) and T₇ (*Aloe vera* gel 75% + acacia gum 5%) 0.204 and 0.208% respectively in 4th day and in T₇ (*Aloe*

vera gel 75% + acasia gum 5%) 0.193% in 6th day, whereas the T₁ (control) treatment showed the lowest acidity level 0.152% On the 4th day of storage. The acidity (%) of the sapota fruits treated with T₂ (75% *Aloe vera* gel) was recorded based on mean data in 8th day of storage was 0.170%. All the coating materials used in this study exhibited a similar decreasing acidity trend as seen in the uncoated fruits. Organic acids typically decrease during ripening because they are either respired or converted into sugars. Selvan and Bal (2005) [23] also noted that the reduction in titratable acidity is due to the conversion of acids into sugars and their use in the respiration process. The higher acidity levels in *Aloe vera* coated fruits may be because the coating delayed the ripening process during storage. Similar results were reported by Mahajan *et al.* (2005) [11] for kinnow fruits and Sahu (2018) [22] for custard apple fruits.

Ascorbic acid (mg/100gm)

In comparison with uncoated fruits, coated fruits exhibit higher ascorbic-acid content shown in Table 6 on the 4th, 6th and 8th days of storage. The maximum retention of ascorbic acid in 4th day was observed in fruits treated with T₂ (*Aloe vera* gel 75%) 21.03 mg/100 gm, at par with T₇ (*Aloe vera* gel 75% + acasia gum 5%) 20.98 mg/100gm. In 8th day ascorbic acid was observed in fruits treated with T₂ (*Aloe vera* gel 75%) 18.02 mg/100 gm, at par with T₇ (*Aloe vera* gel 75% + acasia gum 5%) 17.94 mg/100gm. The minimum retention of ascorbic acid was recorded in T₁ (control) 15.32 mg/100gm at 4th day of storage, The coating of *Aloe vera* and its combination with acasia gum likely slowed the oxidation of acids, resulting in the elevated ascorbic-acid values. Togrul *et al.* (2004) [24] commented that the coatings serve as a protective layer and control the permeability of O₂ and CO₂, thus decreasing the autoxidation potential of the fruit. Such results were also noted by Marpudi *et al.* (2011) [14], Brishti *et al.* (2013) [4] in papaya, Adetunji *et al.* (2012) [1] in pineapple and Sahu (2018) [22] in custard apple.

Reducing sugar (%)

The Table 7 indicated that different levels edible coating treatments exerted their significant effects on reducing sugar (%) during 4th, 6th and 8th days of storage period. On 4th day of storage T₁ (control) treatment was showed significantly maximum reducing sugar (8.99%). The treatment T₆ (75%

Aloe vera gel + sago 5%) recorded the maximum reducing sugar (11.56%) at 8th day of storage, respectively. The slow rise in reducing sugar observed in T₂ (*Aloe vera* gel 75%) i.e. 10.86% at the 8th day of storage. The increased level of total sugar was might be due to conversion of starch into simple sugar. Reducing sugars are responsible for justifying the table consumption. Coatings based on *Aloe vera* gel modify the internal microenvironment of a fruit resulting in the reduction of respiration process (Mendy *et al.* 2019) [15] and gradually slow rise in reducing sugar.

Non-reducing sugar (%)

The data presented in Table 8 showed that the different edible coating treatments had significant impacts on non-reducing sugar (%) during the storage periods of the 4th, 6th, and 8th days. Notably, T₂ (75% *Aloe vera* gel) recorded the highest levels of non-reducing sugar (8.6%) at 8th day followed by T₇ (*Aloe vera* 75% + acasia gum 5%) which is (8.27%). The application of 75% *Aloe vera* gel may have the hydrolysis of starch and pectin substances converted from water insoluble to water soluble fractions. In conformity of these findings Ganvit (2014) [8] in mango and Patel (2015) [18] in sapota.

Total sugar (%)

The data shown in Table 9 revealed that edible coating treatments had significant effects on total sugars (%) during the 4th, 6th, and 8th days of the storage period. The T₁ (control) recorded the highest total sugars (18.23%) on the 4th day of storage, which was at par with T₅ (Paste of tulsi leaves 20%) and T₁₀ (Sago 5% + paste of tulsi leaves 20%) i.e. 18.08 and 17.83 respectively. Furthermore, the fruits treated with T₇ (*Aloe vera* gel 75% + acasia gum 5%) exhibited the highest total sugars, amounting to 19.86%, on the 8th day of storage, which was also at par with T₆ (*Aloe vera* gel 75% + sago 5%) and T₂ (*Aloe vera* gel 75%) i.e. 19.81 and 19.46% respectively on that day of storage. The rise in total sugar can be linked to the conversion of starch into sugar over the storage duration. The significant rise in total sugars during storage results from enhanced activity of the enzymes that facilitate starch breakdown and a reduction in the rate of sugar degradation through respiration. These findings align closely with the studies conducted by Mani *et al.* (2017) [13] on ber.

Table 1: Effect of edible coating treatments of sapota on physiological loss in weight (%)

Treatments	4 th (day)	6 th (day)	8 th (day)
T ₁ (Control)	7.83	0.00	0.00
T ₂ (<i>Aloe vera</i> gel 75%)	4.09	6.32	10.92
T ₃ (Sago 5%)	6.87	0.00	0.00
T ₄ (Acasia gum 5%)	5.95	8.91	0.00
T ₅ (Paste of tulsi leaves 20%)	7.49	0.00	0.00
T ₆ (<i>Aloe vera</i> gel + sago 5%)	4.79	7.92	14.96
T ₇ (<i>Aloe vera</i> gel 75% + acasia gum 5%)	4.58	7.43	16.17
T ₈ (<i>Aloe vera</i> gel 75% + paste of tulsi leaves 20%)	5.69	8.39	0.00
T ₉ (Sago 5% + acasia gum 5%)	6.03	9.17	0.00
T ₁₀ (Sago 5% + paste of tulsi leaves 20%)	7.17	0.00	0.00
T ₁₁ (Acasia gum 5% + paste of tulsi leaves 20%)	6.38	9.86	0.00
SE(m)	0.164	0.09	0.095
C. D.	0.485	0.267	0.28
C. V.	4.683	2.973	4.299

Table 2: Effect of edible coating treatments of sapota on spoilage (%)

Treatments	4 th (day)	6 th (day)	6 th day (sqrt)	8 th (day)	8 th day (sqrt)
T ₁ (Control)	60.00	100	10.02	100	10.02
T ₂ (<i>Aloe vera</i> gel 75%)	20.00	40	6.36	63.33	7.99
T ₃ (Sago 5%)	50.00	96.66	9.85	100	10.02
T ₄ (Acasia gum 5%)	40.00	70	8.40	100	10.02
T ₅ (Paste of tulsi leaves 20%)	50.00	96.66	9.85	100	10.02
T ₆ (<i>Aloe vera</i> gel + sago 5%)	40.00	60	7.78	96.66	9.85
T ₇ (<i>Aloe vera</i> gel 75% + acasia gum 5%)	40.00	50	7.11	96.66	9.85
T ₈ (<i>Aloe vera</i> gel 75% + paste of tulsi leaves 20%)	50.00	60	7.78	100	10.02
T ₉ (Sago 5% + acasia gum 5%)	46.66	70	8.40	100	10.02
T ₁₀ (Sago 5% + paste of tulsi leaves 20%)	53.33	93.33	9.68	100	10.02
T ₁₁ (Acasia gum 5% + paste of tulsi leaves 20%)	50.00	80	8.97	100	10.02
SE(m)	1.421	1.741	0.089	1.741	0.096
C. D.	4.196	5.138	0.262	5.138	0.282
C. V.	5.416	4.061	1.796	3.139	1.689

Table 3: Effect of edible coating treatments of sapota on total soluble solids (%)

Treatments	4 th (day)	6 th (day)	8 th (day)
T ₁ (Control)	22.55	0.00	0.00
T ₂ (<i>Aloe vera</i> gel 75%)	17.36	19.90	24.26
T ₃ (Sago 5%)	21	0.00	0.00
T ₄ (Acasia gum 5%)	19.93	23.11	0.00
T ₅ (Paste of tulsi leaves 20%)	22.39	0.00	0.00
T ₆ (<i>Aloe vera</i> gel + sago 5%)	18.88	21.83	23.05
T ₇ (<i>Aloe vera</i> gel 75% + acasia gum 5%)	18.08	20.48	24.10
T ₈ (<i>Aloe vera</i> gel 75% + paste of tulsi leaves 20%)	19.64	22.00	0.00
T ₉ (Sago 5% + acasia gum 5%)	20.28	23.32	0.00
T ₁₀ (Sago 5% + paste of tulsi leaves 20%)	21.64	0.00	0.00
T ₁₁ (Acasia gum 5% + paste of tulsi leaves 20%)	20.86	0.00	0.00
SE(m)	0.441	0.206	0.131
C. D.	1.302	0.607	0.388
C. V.	3.776	3.001	3.506

Table 4: Effect of edible coating treatments of sapota on pH

Treatments	4 th (day)	6 th (day)	8 th (day)
T ₁ (Control)	5.42	0.00	0.00
T ₂ (<i>Aloe vera</i> gel 75%)	5.87	6.05	6.07
T ₃ (Sago 5%)	6.13	0.00	0.00
T ₄ (Acasia gum 5%)	5.99	6.21	0.00
T ₅ (Paste of tulsi leaves 20%)	6.29	0.00	0.00
T ₆ (<i>Aloe vera</i> gel + sago 5%)	5.79	6.09	6.11
T ₇ (<i>Aloe vera</i> gel 75% + acasia gum 5%)	5.68	6.13	6.19
T ₈ (<i>Aloe vera</i> gel 75% + paste of tulsi leaves 20%)	5.90	6.16	0.00
T ₉ (Sago 5% + acasia gum 5%)	6.04	6.19	0.00
T ₁₀ (Sago 5% + paste of tulsi leaves 20%)	6.16	0.00	0.00
T ₁₁ (Acasia gum 5% + paste of tulsi leaves 20%)	6.09	0.00	0.00
SE(m)	0.155	0.076	0.014
C. D.	0.458	0.224	0.042
C. V.	4.521	3.919	1.492

Table 5: Effect of edible coating treatments of sapota on acidity (%)

Treatments	4 th (day)	6 th (day)	8 th (day)
T ₁ (Control)	0.152	0.000	0.000
T ₂ (<i>Aloe vera</i> gel 75%)	0.216	0.197	0.170
T ₃ (Sago 5%)	0.176	0.000	0.000
T ₄ (Acasia gum 5%)	0.164	0.173	0.000
T ₅ (Paste of tulsi leaves 20%)	0.191	0.000	0.000
T ₆ (<i>Aloe vera</i> gel + sago 5%)	0.204	0.187	0.163
T ₇ (<i>Aloe vera</i> gel 75% + acasia gum 5%)	0.208	0.193	0.162
T ₈ (<i>Aloe vera</i> gel 75% + paste of tulsi leaves 20%)	0.196	0.170	0.000
T ₉ (Sago 5% + acasia gum 5%)	0.186	0.163	0.000
T ₁₀ (Sago 5% + paste of tulsi leaves 20%)	0.173	0.000	0.000
T ₁₁ (Acasia gum 5% + paste of tulsi leaves 20%)	0.180	0.000	0.000
SE(m)	0.005	0.002	0.001
C. D.	0.015	0.007	0.003
C. V.	4.678	3.953	3.846

Table 6: Effect of edible coating treatments of sapota on ascorbic acid (mg/100gm)

Treatments	4 th (day)	6 th (day)	8 th (day)
T ₁ (Control)	15.32	0.00	0.00
T ₂ (<i>Aloe vera</i> gel 75%)	21.03	19.99	18.02
T ₃ (Sago 5%)	16.53	0.00	0.00
T ₄ (Acasia gum 5%)	17.30	16.38	0.00
T ₅ (Paste of tulsi leaves 20%)	16.05	0.00	0.00
T ₆ (<i>Aloe vera</i> gel + sago 5%)	20.18	18.03	17.06
T ₇ (<i>Aloe vera</i> gel 75% + acasia gum 5%)	20.98	19.18	17.94
T ₈ (<i>Aloe vera</i> gel 75% + paste of tulsi leaves 20%)	18.30	17.68	0.00
T ₉ (Sago 5% + acasia gum 5%)	17.00	15.03	0.00
T ₁₀ (Sago 5% + paste of tulsi leaves 20%)	16.00	0.00	0.00
T ₁₁ (Acasia gum 5% + paste of tulsi leaves 20%)	16.56	0.00	0.00
SE(m)	0.281	0.218	0.095
C. D.	0.830	0.643	0.280
C. V.	2.744	3.907	3.413

Table 7: Effect of edible coating treatments of sapota on reducing sugar (%)

Treatments	4 th (day)	6 th (day)	8 th (day)
T ₁ (Control)	8.99	0.00	0.00
T ₂ (<i>Aloe vera</i> gel 75%)	5.96	8.10	10.86
T ₃ (Sago 5%)	7.96	0.00	0.00
T ₄ (Acasia gum 5%)	7.46	9.74	0.00
T ₅ (Paste of tulsi leaves 20%)	8.48	0.00	0.00
T ₆ (<i>Aloe vera</i> gel + sago 5%)	6.87	8.68	11.56
T ₇ (<i>Aloe vera</i> gel 75% + acasia gum 5%)	6.08	8.33	11.19
T ₈ (<i>Aloe vera</i> gel 75% + paste of tulsi leaves 20%)	7.00	9.06	0.00
T ₉ (Sago 5% + acasia gum 5%)	7.63	10.00	0.00
T ₁₀ (Sago 5% + paste of tulsi leaves 20%)	8.00	0.00	0.00
T ₁₁ (Acasia gum 5% + paste of tulsi leaves 20%)	7.83	0.00	0.00
SE(m)	0.188	0.130	0.085
C. D.	0.554	0.385	0.250
C. V.	4.349	4.611	4.798

Table 8: Effect of edible coating treatments of sapota on non-reducing sugar (%)

Treatments	4 th (day)	6 th (day)	8 th (day)
T ₁ (Control)	9.24	0.00	0.00
T ₂ (<i>Aloe vera</i> gel 75%)	8.12	8.73	8.60
T ₃ (Sago 5%)	9.04	0.00	0.00
T ₄ (Acasia gum 5%)	8.50	8.09	0.00
T ₅ (Paste of tulsi leaves 20%)	9.60	0.00	0.00
T ₆ (<i>Aloe vera</i> gel + sago 5%)	8.02	8.41	8.25
T ₇ (<i>Aloe vera</i> gel 75% + acasia gum 5%)	8.48	8.67	8.27
T ₈ (<i>Aloe vera</i> gel 75% + paste of tulsi leaves 20%)	8.03	8.35	0.00
T ₉ (Sago 5% + acasia gum 5%)	8.73	8.01	0.00
T ₁₀ (Sago 5% + paste of tulsi leaves 20%)	9.83	0.00	0.00
T ₁₁ (Acasia gum 5% + paste of tulsi leaves 20%)	9.01	0.00	0.00
SE(m)	0.271	0.119	0.067
C. D.	0.800	0.352	0.199
C. V.	5.345	4.517	5.105

Table 9: Effect of edible coating treatments of sapota on total sugar (%)

Treatments	4 th (day)	6 th (day)	8 th (day)
T ₁ (Control)	18.23	0.00	0.00
T ₂ (<i>Aloe vera</i> gel 75%)	14.08	16.83	19.46
T ₃ (Sago 5%)	17.00	0.00	0.00
T ₄ (Acasia gum 5%)	15.96	17.83	0.00
T ₅ (Paste of tulsi leaves 20%)	18.08	0.00	0.00
T ₆ (<i>Aloe vera</i> gel + sago 5%)	14.89	17.09	19.81
T ₇ (<i>Aloe vera</i> gel 75% + acasia gum 5%)	14.56	17.00	19.86
T ₈ (<i>Aloe vera</i> gel 75% + paste of tulsi leaves 20%)	15.03	17.41	0.00
T ₉ (Sago 5% + acasia gum 5%)	16.36	18.01	0.00
T ₁₀ (Sago 5% + paste of tulsi leaves 20%)	17.83	0.00	0.00
T ₁₁ (Acasia gum 5% + paste of tulsi leaves 20%)	16.84	0.00	0.00
SE(m)	0.411	0.249	0.141
C. D.	1.214	0.736	0.418
C. V.	4.380	4.561	4.588

Conclusion

The findings under the different treatment influenced in which superiority of 75% *Aloe vera* gel as the minimum PLW (%) and Spoilage (%). Similarly, for bio-chemical parameter were significantly influenced where 75% *Aloe vera* gel has been lowest TSS, Total sugar and Reducing sugar and the maximum Ascorbic acid and Titrable acidity observed. While, the maximum pH observed in *Aloe vera* gel 75% + acacia gum 5% and non-reducing sugar in 8th day of storage was observed in *Aloe vera* gel 75%.

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