Int.J.Curr.Res.Aca.Rev.2025; 13(6): 8-21

EXCELLENT PUBLISHERS

International Journal of Current Research and Academic Review

ISSN: 2347-3215 (Online) Volume 13 Number 6 (June-2025)

Journal homepage: http://www.ijcrar.com

doi: https://doi.org/10.20546/ijcrar.2025.1306.002

Effect of Cultivation Practices on Physicochemical Properties of Eggplant *Solanum aethiopicum* L. var F1 Djamba in Côte d'Ivoire

Adjouman Yao Désiré[1, 2]*, Komenan Ayemene Cedrick Ardin[1, 2], Gbraguhe Désirée Victoire[1], Dembele Tita[1], Kouame Kohi Alfred[1, 2] and Nindjin Charlemagne[1, 2]

[1]*Laboratory of Food Biochemistry and Technologies of Tropical Products-STA, UFR Food Sciences and Technologies, NANGUI ABROGOUA University, Abidjan, 02 BP 801 Abidjan 02, Côte d'Ivoire*
[2]*Centre Suisse de Recherches Scientifiques in Côte d'Ivoire, CSRS-CI, 01 BP 1303 Abidjan 01, Côte d'Ivoire*

**Corresponding author*

Abstract

The quality of eggplants depends on both storage and cultivation methods. While the impact of storage methods is well documented, the influence of the production system on physico-chemical properties remains little studied. The general objective of this study was to compare the storage properties of *Solanum aethiopicum* L. var F1 Djamba eggplant from agroecological and conventional farming in Côte d'Ivoire. For this purpose, the vegetables from the two different crops were stored at room temperature and at 18°C. Properties such as firmness, loss rate and mass loss were determined over a 24-day period. Furthermore, the results showed that the firmness of conventional eggplants (5.56±0.385 N) decreased more significantly ($p \leq 0.05$) than those from agroecology (10.33±0.577 N). Also, loss rates increased significantly for both conventional and agroecological vegetables. The shelf life for conventional eggplants was 15 days, while for agro-ecological ones it extended to 24 days at room temperature. These results could characterize the impact of cultural type on eggplant characteristics.

Article Info

Received: 20 April 2025
Accepted: 24 May 2025
Available Online: 20 June 2025

Keywords

Vegetable, *Solanum aethiopicum* L. var F1 Djamba, agroecology, conventional, storage.

Introduction

Eggplant *Solanum aethiopicum* Linnaeus, 1756, is a vegetable valued for its nutritional quality and is an important source of income for small-scale farmers on the African continent (Han *et al.,* 2021). Indeed, its fruits are sources of protein, carbohydrates, calcium, potassium, iron, vitamins (A, B and C), phosphorus, sodium, magnesium, fiber and antioxidants (El-Nemr *et al.,* 2012). Well adapted to tropical climates, eggplant can be grown anywhere in Côte d'Ivoire, but prefers light, well-drained soils rich in organic matter. Eggplant can be grown all year round, provided water is supplied during drought periods (Djidji and Fondio 2013). According to the national statistics agency, eggplant production in Côte d'Ivoire was 118,305 tons in 2023 (ANStat, 2023). Due to the high demand for fruit and vegetables, the need for large-scale production and the high sensitivity of fruit and vegetables to be attacked by pests, diseases and weeds, conventional production based on the use of synthetic chemicals (pesticides, herbicides, fertilizers) is giving way to agroecological production (Mazzei *et al.,* 2013). Studies have also shown that eggplant composition is influenced by several factors, such as growing conditions or the cultivar used. Previous studies have shown that environmental conditions and cultivation techniques can influence eggplant composition (Singh *et al.,* 2009). Indeed, Aminifard *et* *al.,* (2010) found that conventionally grown eggplants had higher nitrogen content, which can lead to larger, faster-ripening fruit, but with a sometimes-reduced concentration of certain beneficial nutrients, such as antioxidants and vitamins. Zhao *et al.,* (2014) have also shown that conventionally grown eggplants tend to contain lower concentrations of solanine, a natural antioxidant, due to the use of intensive chemical treatments. This can make eggplants more susceptible to rapid post-harvest spoilage. On the other hand, Altieri (2004) and Gliessman (2007) have shown that agroecological systems increase ecosystem resilience by enabling crops to better resist climatic hazards and diseases. In addition, these practices appear to have a positive effect on the nutritional quality of eggplants. Some studies have shown that the quantity and quality of phenolic compounds present in fruit and vegetables are strongly influenced by cultivar, environment, soil type, growing and storage conditions (Luthria, 2006). The composition of phenolic phytochemicals in fruit and vegetables can also be influenced by the cultivation method, i.e. conventional, organic (Luthria *et al.,* 2010) or agroecological. Moreover, the preservation of eggplants, whether by traditional methods such as storage at room temperature or by more advanced techniques such as refrigeration or freezing, can also have a significant impact on their physico-chemical characteristics. Factors such as temperature, humidity and shelf life can affect texture, moisture content, nutrient content and sensory perception (Barrett *et al.,* 2010). The aim of this study is therefore to evaluate and compare the physico-chemical characteristics of *Solanum aethiopicum* L. cv. F1 Djamba eggplant from agroecological and conventional agriculture in Côte d'Ivoire.

Materials and Methods

Eggplants (*Solanum aethiopicum* L. var F1 Djamba) of uniform size were harvested at similar maturity stages from agroecological and conventional crops in two different fields located in SONGON (Dabou), a commune west of Yopougon, Côte d'Ivoire in the autonomous district of Abidjan. In addition, conventional cultivation in this study refers to the 100% use of synthetic chemicals in the entire vegetable production process by the grower. The term agroecology, on the other hand, refers to the producer's use of 70% organic materials during production, such as natural plant decoctions, composts rich in organic matter and crop rotation. Immediately after picking, the eggplants were sorted into separate boxes according to crop type on the same day. Then, they were transported to the Laboratory of Food Biochemistry and Tropical Products Technology at NANGUI ABROGOUA University.

Preservation

After collection, pre-treatment consisted in carefully washing the eggplants in water containing sodium hypochlorite (1%) and draining them in a colander. They were then sorted to reject those with mold or local damage and those that were not ripe enough. In addition, after pre-treatment, two large batches of vegetables were formed according to type of cultivation (agroecological and conventional). Each batch was divided in two and stored at 18°C and room temperature (approx. 25.60°C) respectively, i.e. 20 kg of eggplant per culture. Ambient temperature was recorded using a hygrometer (Extech Instruments, SD700, Taiwan) throughout storage. The bench was disinfected beforehand to avoid contamination.

Determination of the physico-chemical properties of eggplants

pH, total soluble solids and acidity

For these properties, batches of 10 eggplants were cut up and blended. The resulting mixtures were ground using a juice extractor (Kuvings C7000, France). The juices obtained were used to measure pH, Total Soluble Solids and acidity.

pH

The pH of the samples was determined according to the method of Karangan *et al.,* (2019). To do this, 10 g of tomato and eggplant juice were each added with distilled water until 50 g was reached. Calibration was performed on a pH meter (HANNA® HI6221-02, APH4220) with pH 4 and 7 buffers. The pH meter was then cleaned with distilled water with a tissue. The tip of the pH meter was dipped into the sample for data collection. Measurement took place over 5 minutes.

Total soluble solids and acidity

Acidity and total soluble solids content (°Brix) were determined using a dual-scale digital refractometer (PAL-Easy ACIDF5 Master Kit) in accordance with the manufacturer's recommendations. To measure °Brix, a drop of pure juice was placed directly on the instrument's prism. For acidity, 1g of juice was mixed with distilled water to a total volume of 50g, then homogenized. A drop of this mixture was then used for analysis. Results are expressed as a percentage (%) (Akpo, 2022).

Firmness

Firmness was measured using a digital penetrometer (PCE-PTR 200) with a diameter of 3 mm. The breaking force required for a 3 mm diameter tip to penetrate the pulp was measured. Measurements were taken in three sections: the top, middle and bottom of the eggplant. For this test, 10 vegetables were used. The numbers inscribed on the vegetable hand penetrometer were read and recorded (Naibaho *et al.,* 2013).

Colorimetric analysis

Color coordinates were measured using a portable colorimeter (Chromameter CR-400, Konica Minolta), previously calibrated with a standard white tile, in accordance with standard illuminant CIA D65. The Cartesian values of the CIELAB colorimeter space were recorded: L*, a* and b*. Five repetitions were performed. Results were reported according to the equation described by Guiné and Barroca (2014).

Evaluation of storage losses

These properties were evaluated using the method described by Akpo (2022).

Mass loss

A 5 kg batch of eggplants was used for each type of crop. The vegetables were weighed every three days. The average mass was taken as the loss value. Results were expressed as percentage mass loss. The formula used is as follows:

$$P_m(\%) = (\frac{M}{M_i}) \times 100$$

Pm: percentage mass loss; M: average of day n tomato masses, MI: average of initial tomato masses

Loss rate

The loss rate, expressed as a percentage, was calculated by grouping different batches of 20 vegetables. Infected vegetables were removed every three days throughout the storage period. The loss rate was calculated based on the percentage of vegetables remaining after storage.

Statistical analysis

Statistical analysis was carried out using John Macintosh Project software (JPM version 18). Data were subjected to analysis of variance (ANOVA) and Student's t-test to determine any differences. Significant difference was assessed using Turkey's adjustment for multiple comparisons at $P \leq 0.05$. Experiments were performed in triplicate to establish a mean.

Results and Discussion

Firmness of conventional and agroecological eggplants

Figure 1 shows the evolution of the firmness of conventional and agroecological F1 Djamba eggplants stored at room temperature and 18°C for 24 days. Firmness decreases significantly from D0 to D24, whatever the type of crop (conventional and agroecological) and the storage time (ambient and 18°C). The room-temperature (67.89±1.262 N) and 18°C (51.89±1.503 N) firmness's of agroecological eggplants were significantly higher than those of conventional F1 Djamba eggplants at room temperature (63.11±0.839 N) and 18°C (45.77±2.658 N) at D0. Starting firmness (D0) rose to 17.1±1.559 N and 35.78±1.018 N respectively for conventional and agroecological F1 Djamba eggplants at 18°C. Initial firmness (D0) also increased to 16.44±1.711 N and 40.89±1.262 N for conventional and agroecological F1 Djamba eggplants at room temperature. The decrease was more pronounced in conventional eggplants than in agro-ecological ones. On the other hand, conventional eggplants stored at ambient temperatures were completely rotted after the 15th day. However, those (conventional and agroecological) stored at 18°C were preserved throughout the 24-day experiment. To date, the firmness of agroecological eggplants (10.33±0.577 N) was higher than that of conventional eggplants (5.56±0.385 N).

Loss rates for conventional and agroecological eggplants

Figure 2 shows the loss rates for F1 Djamba eggplants from conventional and agroecological crops stored at room temperature and at 18°C. At room temperature, the rate of loss began on the 6th day of storage (26.19%), rising to 69.64% on the 15th day of storage. On day 18, the loss rate was 100%. The loss rate for eggplants grown using agroecological methods begins on day 12 with 15.08% loss. The rate of loss increased to 45.24%

on day 24. At 18°C, losses are observed from day 12 onwards, with 13.10% for conventionally grown eggplants and 13.10% for agroecologically grown eggplants. The rate of loss increases significantly, reaching 65.47% for conventionally grown eggplants and 39.30% for agroecologically grown eggplants.

Mass loss of conventional and agroecological eggplants

Figure 3 shows the mass losses of conventional and agroecological F1 Djamba eggplants stored at room temperature and 18°C for 24 days. Mass losses start on day 3 and increase significantly up to day 24, irrespective of the type of crop (conventional and agroecological) and storage time (ambient and 18°C). However, the loss of mass at room temperature of F1 Djamba eggplants in conventional culture after the 15th day of storage was not determined, as they had completely deteriorated. Mass loss on the 3rd day of storage at room temperature was 20.4±0.468% and 15.05±3.097% respectively for conventional and agroecological eggplants. At 18°C, mass loss was 10.02±0.589% and 5.48±0.377% for conventional and agroecological eggplants respectively. Mass losses were significantly higher for F1 Djamba eggplants grown conventionally than for F1 Djamba eggplants grown agroecologically. On the 15th day of storage, mass losses were 63.54±1.274% and 51.26±2.755% at room temperature, and 37.34±0.905% and 33.45±0.511% at 18°C for conventional and agroecological eggplants respectively. The increase in mass loss observed was more pronounced in conventional eggplants than in agroecological ones. In addition, F1 Djamba eggplants (conventional and agroecological) stored at 18°C were kept for the 24 days of the experiment. To date, the mass loss (55.11±2.009%) of conventional-grown eggplants was higher than that of agroecological-grown eggplants (48.98±0.601%).

Acidity of conventional and agro-ecological eggplants

Figure 4 shows the evolution of acidity in F1 Djamba eggplants from conventional and agro-ecological crops stored at room temperature and 18°C for 24 days. Acidity increased significantly from D0 to D24, irrespective of the type of crop (conventional and agroecological) and storage time (ambient and 18°C). The acidities at room temperature (0.87±0.010) and at 18°C (0.98±0.006) of agroecological eggplants were significantly higher than those of conventional F1 Djamba eggplants at room temperature (0.77±0.026) and at 18°C (0.65±0.025) at start-up (D0). Starting acidities (D0) rise to 0.85±0.026 and 1.48±0.078 for conventional and agroecological F1 Djamba eggplants at 18°C on day 15. On the same day of storage, acidities rose to 1.65±0.025 and 1.53±0.021 for conventional and agroecological F1 Djamba eggplants at room temperature. The increase is more pronounced for agroecological eggplants than for conventional eggplants. On the other hand, conventional eggplants stored at ambient temperatures were completely rotted after the 15th day. However, those (conventional and agroecological) stored at 18°C were preserved throughout the 24-day experiment. To date, the acidity of agroecological eggplants (1.82±0.006) was higher than that of conventional eggplants (1.09±0.017).

pH of conventional and agroecological eggplants

Figure 5 shows the evolution of the pH of conventional and agroecological F1 Djamba eggplants kept at room temperature and at 18°C for 24 days. The pH decreases significantly from D0 to D24, irrespective of the type of cultivation (conventional and agroecological) and storage time (ambient and 18°C). At room temperature, the starting pH, i.e. on day 0 (7.84±0.110) and day 3 (7.30±0.081), of F1 Djamba eggplants from conventional cultivation was significantly higher than the starting pH (7.14±0.053) and day 3 (5.75±0.040) of eggplants from agroecological cultivation. On day 15, the pH was 5.24±0.135 and 5.12±0.082 respectively for F1 Djamba eggplants grown in conventional and agroecological conditions. On the other hand, at 18°C, the pH was significantly different at start-up (D0) and on days 3, 6, 12, 21 and 24, depending on the cropping method. The start-up pH (D0) was 8.06±0.035 and 7.14±0.053 respectively for F1 Djamba eggplants from conventional and agroecological cropping. On day 24, the pH was 4.97±0.078 and 4.72±0.030 respectively for F1 Djamba eggplants from conventional and agroecological cultivation.

Total soluble solids (°Brix) of conventional and agroecological eggplants

Table 1 shows the Brix evolution of conventional and agroecological F1 Djamba eggplants stored at room temperature and 18°C for 24 days. At room temperature, Brix increases from day one (4.03±0.153) to day 6 (4.8±0.00) and decreases from day 9 (4.2±0.173) to day 12 (4.16±0.058), finally increasing on day 15 (4.5±0.00) for F1 Djamba eggplants grown conventionally. In the case of F1 Djamba eggplants growing using agroecological methods, Brix levels increased from day one to day 9 (4.50±0.001) and then decreased from this point to day 15 (3.90±0.001). On day 18, Brix increases (4.50±0.002) and decreases to reach a value of 3.70 on day 24. At 18°C, Brix increases significantly from day one (4.03±0.153) of the tests to day 18 (4.90±0.006) and decreases until day 24 (4.22±0.015) for F1 Djamba eggplants grow conventionally. In the case of F1 Djamba eggplants growing using agroecological methods, Brix levels increase from day one (3.93±0.025) to day 9 (5.23±0.025) and decrease to day 12 (4.63±0.115). Brix increases again on day 15 (4.91±0.015) and decreases until day 24 (4.22±0.021). A fluctuation in Brix degree was observed on F1 Djamba eggplants grown using both cultivation techniques at different storage temperatures (ambient and 18°C). A variation is also observed when comparing data obtained on F1 Djamba eggplants from the two cultivation techniques. Indeed, at room temperature and on day 3, the Brix value (4.66±0.058) obtained with conventionally grown eggplants was significantly higher than that (4.13±0.058) obtained with agroecologically grown eggplants. However, on day 6, the Brix value (4.50±0.001) obtained with agroecological eggplants was significantly higher than that (4.2±0.173) obtained with conventional eggplants. The same variations were observed at 18°C.

Color parameters of conventional and agroecological eggplants

Table 2 shows the evolution of color parameters (L*, a*, b*) of F1 Djamba eggplants from conventional and agroecological cultivation kept at room temperature and 18°C for 24 days. Concerning L*, at room temperature a significant increase was observed in both conventionally and agroecologically grown eggplants. L* was significantly higher in conventionally grown eggplants than in agroecologically grown eggplants. At 18°C, L* decreased significantly in both conventionally and agroecologically grown eggplants. Values at D0 were the highest.

In addition, at D24, L* in agroecologically-grown eggplants was significantly higher than L* in conventionally grown eggplants. As for the a* parameter, a significant increase was observed from D0 to D24, both at room temperature and at 18°C. At room temperature on day 15, the a* parameter in conventionally grown eggplants was significantly higher than a* in agroecologically grown eggplants. Similarly, at 18°C, on day 15, a* in conventionally grown eggplants was significantly higher than a* in agroecologically grown eggplants. The b* parameter increases significantly from D6 to D9 for conventionally grown eggplants but decreases significantly from D0 to D3 and from D18 to D21 for agroecologically grown eggplants at ambient temperature. Parameter b* decreased significantly from D0 to D3 and from D12 to D24 for conventionally grown eggplants at 18°C but decreased significantly from D0 to D9 and from D9 to D15 for agroecologically-grown eggplants.

Firmness decreases significantly from D0 to D24, irrespective of the type of crop (conventional and agroecological) and storage time (ambient and 18°C). Firmness is an indicator of importance in determining the degree of ripeness. Therefore, greater ripeness translates into lower firmness when force is applied (Jimenez *et al.,* 2015). The fact that firmness decreases regardless of storage time (Ambient and 18°C) may translate into eggplant softening as storage time increases. Indeed, fruit softening is due to deterioration in cell structure, cell wall composition and intracellular materials (Seymour *et al.,* 1993). It is also due to the conversion of starch to sugars (Khurnpoon *et al.,* 2008). Softening is a biochemical process also involving the hydrolysis of pectin and starch by enzymes such as wall hydrolases (Ali *et al.,* 2010). The decrease in firmness can also be explained by the fact that the cell walls of fruit tissues are rich in proto-pectin on the day of harvest; the insoluble proto-pectin content of tissue cell walls progressively decreases with increasing storage time while the soluble pectin content increases, fruit tissues become progressively soft during storage (Li *et al.,* 2012). A decrease during storage in the mechanical and textural properties (firmness) of eggplant was also observed by Miraei Ashtiani *et al.,* (2015) in the study on effect of loading position and storage duration on textural properties of eggplant and by Kappel and Mozafarian (2022) who examined the effect of storage temperature on the post-harvest quality of eggplant cv. Madonna.

The firmness at room temperature and 18°C of eggplants from agroecological cultivation was significantly higher than that of F1 Djamba eggplants from conventional cultivation at room temperature and 18°C. The decrease was more pronounced for conventional eggplants than for agroecological ones. The fact that the firmness of F1 Djamba eggplants in conventional cultivation is lower than in agroecological cultivation could be due to a reduction in the enzymatic activities of pectinesterase and polygalacturonase. These enzymes are responsible for depolymerizing or shortening the chain length of pectin substances in the cell wall, and thus for degrading insoluble proto-pectins to more pectic pectins (Seymour *et al.,* 1993). As the fruit ripening process progresses, depolymerization or shortening of the chain length of pectin substances occurs with an increase in enzyme activities (pectinesterase and polygalacturonase) (Yaman and Bayindirli, 2002). Faster ripening due to a higher respiration rate in F1 Djamba eggplants from conventional cultivation could also be at the root of the observed difference in firmness. Indeed, low levels of O2 and high levels of CO2 limit enzyme activities and allow retention of firmness during storage (Salunkhe *et al.,* 1991). Dias *et al.,* (2016), in their study of the growth, yield and post-harvest quality of eggplants produced under different foliar fertilizer treatments (*Spirulina platensis*), observed a variation in firmness when the fertilizer concentration was high. Differences in the variation of physicochemical parameters of conventionally and organically grown eggplants were also observed in the study on the effects of organic and conventional growing methods on eggplant fruit composition (Raigon *et al.,* 2010). Mass losses increase significantly whatever the type of crop (conventional and agroecological) and storage time (ambient and 18°C). An increase in mass loss of eggplants during storage has been observed in some studies other than ours (Adhamatika *et al.,* 2022). After harvest, fruits and vegetables continue to lose water by evaporation (transpiration) through the skin, especially if the skin is thin. Water escapes via the stomata (microscopic pores) or through the cuticle (thin waxy layer) (Lufu *et al.,* 2020). High temperatures also accelerate evaporation. Low relative humidity increases the vapor pressure gradient, leading to water loss. Also, after harvest, fruit and vegetable cells breathe. This entails, the degradation of sugars and other reserves leading to the release of CO_2 and water vapor (mass loss) (Mahajan *et al.,* 2014). The basic mechanism of mass loss in fresh fruit and vegetables is linked to vapor diffusion, driven by water vapor pressure at various points (Yaman and Bayindirli, 2002). It is also linked to respiration, which also causes weight loss (Pan and Bhowmilk, 1992). Eggplant catabolism breaks down macronutrients into micronutrients for energy. This energy is used for respiration, which produces CO2 and water. The rate of product respiration is an indicator of tissue metabolic activity (Adhamatika *et al.,* 2022). Mass losses were significantly higher in F1 Djamba eggplants grown conventionally than in F1 Djamba eggplants grown agroecologically. The study on the effects of organic and conventional cultivation methods on eggplant fruit composition showed that organically grown eggplants had higher levels of minerals and total phenolics than conventionally grown ones (Raigon *et al.,* 2010). However, the study did not specifically address mass loss during storage. One study found that the use of certain pesticides increased fruit magnesium content, which could influence their stress resistance and mass loss during storage (Gaikwad *et al.,* 2018). This could justify the fact that the mass loss of eggplants from conventional cultivation is higher than that of F1 Djamba eggplants from agroecological cultivation. It is possible that agro-ecological practices have resulted in eggplants with a thicker skin structure that does not promote easy respiration. In addition, previous studies have shown that water exchange in eggplants takes place mainly through the calyx (Ashtiani *et al.,* 2016). It is possible to associate the reduction in mass loss and dehydration with the maintenance of calyx integrity in agroecologically grown eggplants (Massolo *et al.,* 2011). The rate of loss increased significantly for both conventionally and agroecologically grown eggplants, at both room temperature and 18°C. However, at room temperature the rate of loss was more significant. Rotting (post-harvest loss) of eggplants (*Solanum melongena*) during storage is mainly caused by fungal infection and pathophysiological injury. Fungi such as *Alternaria solani* and *Alternaria alternata* are responsible for dry rot and flesh decay in eggplants. They penetrate fruit through mechanical wounds or skin defects, favored by inadequate storage conditions. Temperature has a direct influence on pathogen growth rates after harvest (Coates and Johnson 1997). High eggplant storage temperatures may contribute to disease development rather than prevent it, which could be attributed to the presence of surface moisture on the product. Eggplant rot losses were associated with high (ambient) temperature and relative humidity conditions in the study by Ledesma *et al.,* (2022). Further research into the quality of eggplants (*Solanum melongena*) at two storage temperatures (21-25°C and 7-10°C), showed that storage at 21-25°C resulted in faster softening and more pronounced rotting compared with storage at 7-10°C (Salabao *et al.,* 2014). The high loss rate could also be linked to eggplant softening due to high temperatures and insufficient relative humidity. Softening is mainly due to enzymatic processes involving cell wall degradation. Enzymes such as polygalacturonase (PG), pectin methyl esterase (PME) and cellulase are responsible for the degradation of pectin and cellulose, resulting in a loss of cell rigidity. Losses during storage were more significant for F1 Djamba eggplants grown under conventional methods than for those grown under agroecological methods. This finding could be linked to differences in cultivation practices. Excessive fertilization, particularly of nitrogen, can promote vegetative growth to the detriment of disease resistance. One study showed that high doses of nitrogen can increase eggplant susceptibility to pathogens such as Phytophthora infestans, responsible for eggplant and tomato rot (Alberto and Sanogo 2012). Also, the use of compost and organic amendments can improve soil structure and moisture retention, promoting healthy eggplant growth. The same Alberto and Sanogo (2012) study revealed that the incorporation of rice straw and pig manure reduced the incidence and severity of fruit rot caused by Phytophthora, with an 85% reduction in incidence in eggplants.

Acidity increased significantly regardless of crop type (conventional and agroecological) and storage time (ambient and 18°C) during storage. Such an observation was made by Massolo *et al.,* (2011) who worked 1-Methylcyclopropene (1-MCP) delays senescence, maintains quality and reduces browning in non-climacteric eggplants (*Solanum melongena* L.). During storage, even after harvest, eggplants continue to breathe. This metabolic process generates energy, but it also produces organic acids such as citric acid, malic acid and oxalic acid, which accumulate in the tissues. The increase in these acids leads to a rise in titratable acidity. In addition, sugars stored in cells (such as glucose and fructose) can be broken down into acids by the action of enzymes, particularly under conditions of oxidative stress (lack of oxygen, humidity, non-optimal temperature). This transformation favors an accumulation of acids in plant tissues, resulting in increased acidity. Also, enzymes such as oxidases or pectin methyl esterases (PME) can catalyze reactions that produce or release acids. These enzymatic processes certainly contributed to tissue acidification.

A study which analyzed the impact of storage temperature and type of packaging on the physico-chemical characteristics of eggplants, showed that the titratable acidity of eggplants increased with each day of storage, reaching maximum values on day 9^{e}, irrespective of the type of packaging (kraft paper, PE plastic or no packaging) (Adhamatika *et al.,* 2022). The increase in titratable acidity could be linked to internal metabolic processes, such as the degradation of organic acids or microbial activity. It could also be linked to storage conditions. Indeed, Barragán *et al.,* (2019) in their study on the effect of storage conditions on the physicochemical characteristics and phenolic compounds of eggplant (*Solanum melongena* L.) showed that acidity increased, under certain conditions throughout the storage period. In this study, the acidities at room temperature and 18°C of F1 Djamba eggplants from agroecological cultivation were significantly higher than those of F1 Djamba eggplants from conventional cultivation at room temperature and 18°C. Specific studies comparing the titratable acidity of eggplants from agroecological and conventional systems are rare. However, agroecological systems, favoring biodiversity and minimal use of chemicals, can influence the chemical composition of eggplants, potentially affecting their postharvest metabolism. The study by Thierry *et al.,* (2019), which examined the effects of different types of fertilizer and irrigation regimes on eggplant growth in Côte d'Ivoire, showed that irrigation with brackish water could affect eggplant growth, although the study did not focus specifically on titratable acidity. Differences in the variation of physicochemical parameters of conventionally and organically grown eggplants were also observed in the study on the effects of organic and conventional growing methods on eggplant fruit composition (Raigon *et al.,* 2010).

The pH decreases significantly from D0 to D24, whatever the type of crop (conventional and agroecological) and the storage time (ambient and 18°C). The drop in pH during storage may be linked to microbial activity due to naturally present or introduced lactic acid bacteria, which transform sugars into lactic acid. The increase in acidity therefore induces a drop in pH. In addition to this, vegetables continue to breathe after harvest inducing carbohydrate breakdown to produce CO_2 and organic acid. Organic acids (malic, citric acid) can accumulate, which would favor a pH decrease. The decrease in pH may also be linked to the loss of firmness of eggplants during storage. Indeed, the study by Kappel and Mozafarian (2022), which examined the effect of storage temperature on the post-harvest quality of eggplants cv. Madonna, showed that the pH of fruit stored at 0°C decreased significantly after 3 days, reaching lower values than those stored at 10°C. They linked this decrease to a reduction in eggplant firmness during storage. Another study analyzed the impact of storage temperature and type of packaging on the physico-chemical characteristics of eggplants. The results also showed that the pH of eggplants stored at 8°C decreased (Adhamatika *et al.,* 2022). However, an increase in pH values during eggplant storage at temperatures between 0 and 30°C was reported by Concellón *et al.,* (2007) and Amanullah *et al.,* (2016). According to these results, the pH value of eggplant fruit increases with storage temperature (Amanullah *et al.,* 2016; Concellón *et al.,* 2007).

Table.1 Total soluble solids (°Brix) as a function of storage temperature and crop type

Property	Day	Temperature			
		Ambient		18°C	
		Conventional	Agroecology	Conventional	Agroecology
Total soluble solids (°Brix)	0	4,03±0,153^{c*}	3,90±0,000^{d*}	4,03±0,153^{f*}	3,93±0,025^{e*}
	3	4,66±0,058^{ab*}	4,13±0,058^{c**}	4,23±0,058^{e*}	4,17±0,115^{d*}
	6	4,8±0,000^{a*}	4,30±0,000^{b*}	4,40±0,000^{d*}	4,67±0,058^{c**}
	9	4,2±0,173^{c**}	4,50±0,001^{a*}	4,77±0,058^{abc*}	5,23±0,025^{a**}
	12	4,16±0,058^{c*}	4,10±0,003^{c*}	4,83±0,057^{ab*}	4,63±0,115^{c*}
	15	4,5±0,000^{b*}	3,90±0,001^{d*}	4,71±0,023^{bc*}	4,91±0,015^{b**}
	18	NA	4,50±0,002^{a}	4,90±0,006^{a*}	4,63±0,058^{c**}
	21	NA	4,30±0,031^{b}	4,61±0,012^{c*}	4,67±0,025^{c**}
	24	NA	3,70±0,001^{e}	4,22±0,015^{e*}	4,22±0,021^{d*}

Data presented are mean ± standard deviation. Statistically significant values ($p < 0.05$) in columns and rows are denoted by letters (a, b and c) and symbols (*, **) respectively. Turkey's ANOVA/post-hoc test and Student's t-test were used respectively for differentiation of means between each crop and for comparison between crops. Tests were performed using John's Macintosh Project Software (JMP 18).

Table.2 Color parameters as a function of storage temperature and crop type

Properties	Day	Temperature			
		Ambient		18°C	
		Conventional	Agroecology	Conventional	Agroecology
L*	0	58,8±1,670^{c*}	58,93±0,603^{e*}	76,00±0,265^{a*}	76,13±1,102^{a*}
	3	60,53±2,641^{c*}	58,17±1,358^{e*}	75,33±0,153^{a*}	67,47±0,907^{b**}
	6	60,1±1,253^{c*}	58,87±1,021^{e*}	69,03±0,306^{b*}	67,37±1,069^{b*}
	9	62,96±0,252^{bc*}	59,83±1,856^{de*}	67,67±0,666^{c*}	64,53±0,321^{c**}
	12	68,9±4,493^{b*}	64,67±2,040^{cd*}	64,60±0,361^{d*}	63,17±0,764^{cd**}
	15	76,53±1,137^{a*}	66,30±4,687^{bc**}	59,77±0,351^{e*}	61,06±0,723^{de**}
	18	NA	71,70±1,153^{ab}	59,33±0,643^{e*}	58,40±1,200^{f*}
	21	NA	71,97±0,252^{a}	57,63±0,351^{f*}	59,23±0,503^{ef**}
	24	NA	71,93±0,473^{a}	56,80±0,436^{f*}	58,93±0,603^{ef**}
a*	0	-13,43±0,929^{e*}	-14,60±1,345^{d*}	-11,50±0,608^{f*}	-11,13±0,115^{f*}
	3	-6,03±0,764^{d*}	-12,13±0,929^{cd**}	-5,57±0,404^{e*}	-7,03±0,651^{e**}
	6	4,23±0,462^{c*}	-12,20±0,600^{cd**}	-3,07±0,404^{d*}	-1,27±0,209^{d**}
	9	8,7±0,755^{b**}	-6,80±4,751^{c*}	-4,20±0,265^{d*}	0,17±0,153^{c**}
	12	12,43±0,723^{*a}	-0,83±0,379^{b*}	4,90±0,200^{c*}	3,17±0,503^{b**}
	15	13,43±0,513^{a*}	4,20±2,066^{b**}	11,83±0,351^{b*}	4,43±0,416^{b**}
	18	NA	10,70±1,300^{a}	12,93±0,850^{ab*}	12,97±0,737^{a*}
	21	NA	11,63±0,757^{a}	12,43±0,153^{ab*}	13,07±0,493^{a*}
	24	NA	13,27±0,379^{a}	13,43±0,513^{a*}	13,27±0,379^{a*}
b*	0	8,5±1,153^{b**}	26,97±0,643^{a*}	35,70±1,039^{a*}	35,33±0,833^{a*}
	3	9,16±1,457^{b**}	24,07±0,987^{ab*}	32,70±1,229^{b*}	32,57±1,557^{a*}
	6	14,73±3,907^{ab**}	22,70±1,153^{ab*}	26,23±0,551^{c*}	32,57±1,739^{a**}
	9	20,56±3,350^{a*}	20,80±0,458^{ab*}	27,83±0,551^{c*}	29,37±0,666^{b**}
	12	19,93±1,159^{a*}	21,17±0,462^{ab*}	26,50±1,212^{c*}	27,73±0,404^{bc**}
	15	17,66±1,893^{a*}	20,27±0,376^{b*}	22,03±1,401^{d*}	25,70±1,493^{d**}
	18	NA	19,17±6,285^{b}	19,80±0,265^{de*}	21,27±0,231^{d**}
	21	NA	11,30±0,700^{c}	17,13±0,513^{ef*}	20,10±0,700^{d**}
	24	NA	8,47±0,907^{c}	16,53±1,234^{f*}	19,80±0,361^{d**}

Data presented are mean ± standard deviation. Statistically significant values ($p < 0.05$) in columns and rows are denoted by letters (a, b and c) and symbols (*, **) respectively. Turkey's ANOVA/post-hoc test and Student's t-test were used respectively for differentiation of means between each crop and for comparison between crops. Tests were performed using John's Macintosh Project Software (JMP 18).

Figure.1 Comparison of eggplant (*Solanum aethiopicum* L.) var F1 Djamba firmness by growing method (at 18°C and room temperature)

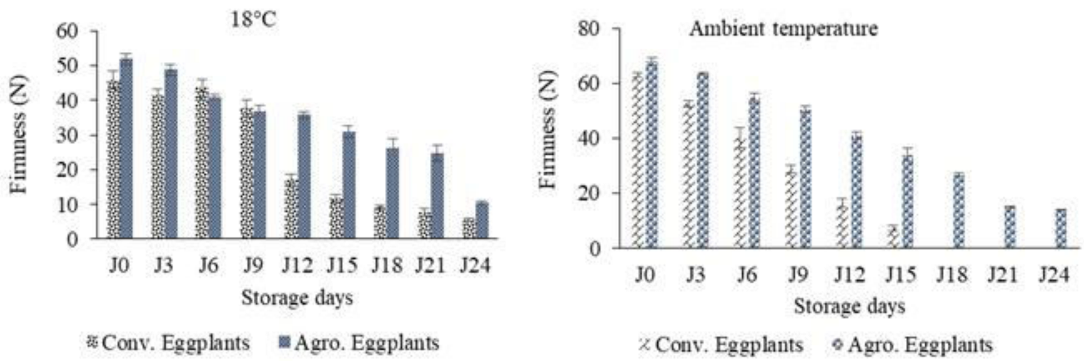


Figure.2 Comparison of loss rate of eggplants (*Solanum aethiopicum* L.) var F1 Djamba by growing method (at 18°C and at room temperature).

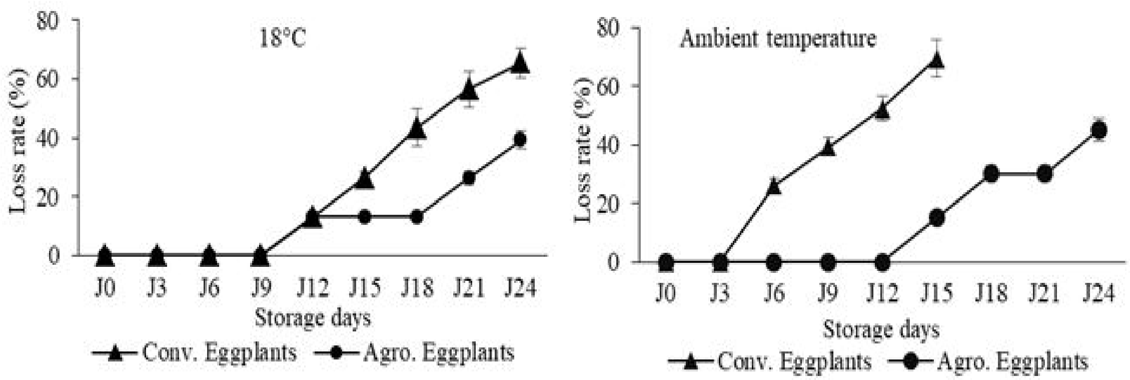


Figure.3 Comparison of mass loss of eggplants (*Solanum aethiopicum* L.) var F1 Djamba by growing method (at 18°C and at room temperature).

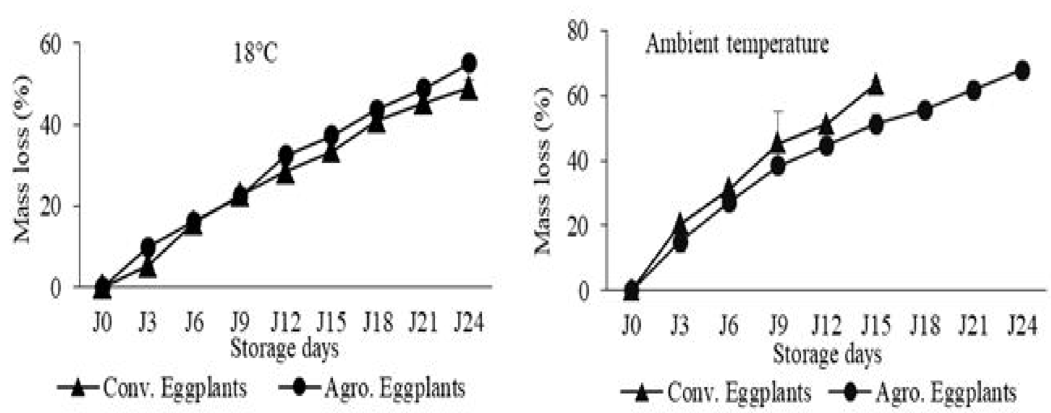


Figure.4 Comparison of the acidity of eggplants (*Solanum aethiopicum* L.) var F1 Djamba by cultivation method (at 18°C and room temperature)

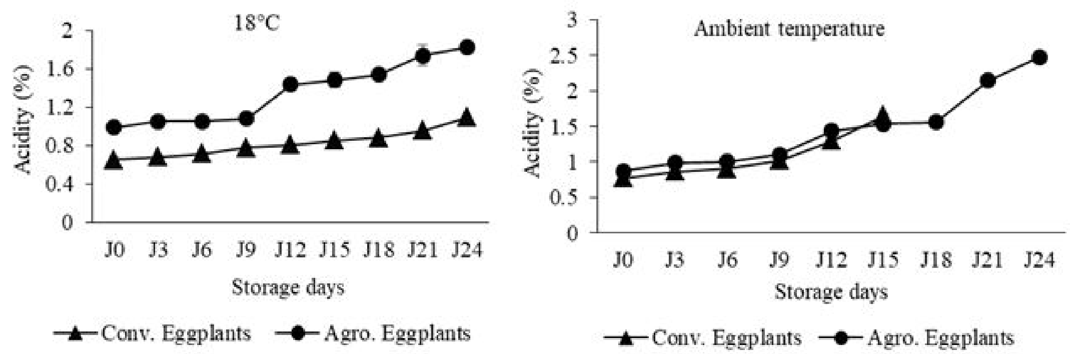
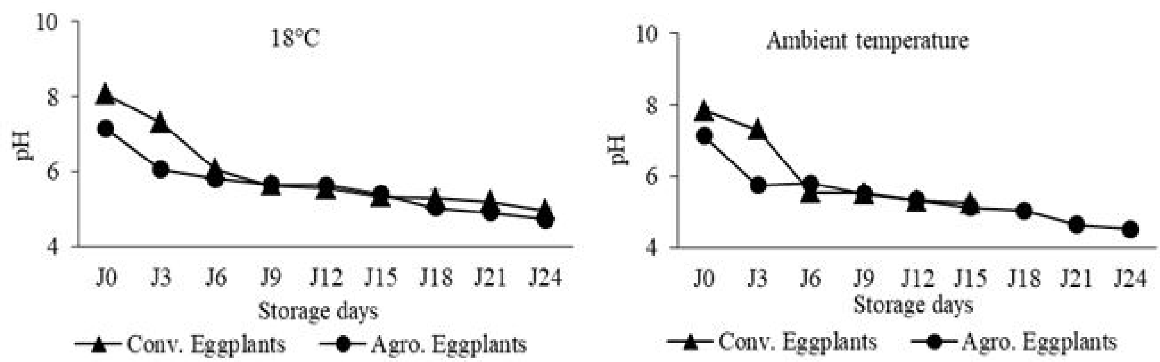


Figure.5 Comparison of pH of eggplants (*Solanum aethiopicum* L.) var F1 Djamba by cultivation method (at 18°C and room temperature)



These results are contrary to those found in this study. The pH values at room temperature and 18°C of F1 Djamba eggplants from conventional cultivation were significantly higher than those from agroecological cultivation at room temperature and 18°C. The decrease in eggplant pH during storage is the result of ongoing metabolic processes, influenced by factors such as cell respiration, enzyme activity and storage conditions. The fact that the pH of conventionally grown eggplants is higher than that of agro-ecologically grown eggplants could be linked to lower metabolic activity, cell respiration and enzyme activity in agro-ecologically grown eggplants. Yengkokpam and Mazumder (2021) in their study on antioxidant enzyme activities and gene expression profiling associated with tolerance to organophosphorus stress in *Solanum melongena* L.cv. Longai, showed that the activities of the antioxidant enzymes superoxide dismutase (SOD), catalase (CAT) and ascorbate peroxidase (APX) increased with pesticide application. In addition, lower pesticide concentrations (50-100 ppm) showed positive effects on eggplant growth and metabolism, while higher concentrations (150-200 ppm) resulted in negative effects, including cell damage. In our study, conventional cultivation refers to the grower's 100% use of synthetic chemicals throughout the vegetable production process. Agroecology, on the other hand, refers to the grower's use of 70% organic materials in the production process, such as natural plant decoctions and composts rich in organic matter. This difference could justify the results of this study. A significant increase and decrease in total soluble solids (Brix degree) was observed in F1 Djamba eggplants grown using both cultivation techniques at different storage temperatures (ambient and 18°C). Similar results have been reported by several authors who have observed an increase and decrease in total soluble solids content in eggplants during storage (Kappel and Mozafarian 2022; Ledesma *et al.,* 2022). This variation could be due to factors such as dehydration or enzymatic changes. The increase in total soluble solids in eggplants during storage is mainly due to the concentration of solutes resulting from dehydration and biochemical changes. Storage conditions, such as temperature and humidity, as well as the genetic characteristics of the varieties, play a crucial role in managing these dynamics. Variation in total soluble solids was also observed when comparing data obtained on F1 Djamba eggplants grown using the two cultivation techniques. Differences in cultivation practices (conventional and agroecological) certainly influenced the total soluble solids content of eggplants in this study. A study of the impact of different insecticides on eggplant quality and nutritional parameters showed that the application of Triazophos led to a reduction in total soluble sugar content. In contrast, treatments with Azadirachtin and Cypermethrin showed no variation in this parameter (Goswami *et al.,* 2018). Another study conducted in Ethiopia that evaluated the effect of different rates of NPSB (nitrogen, phosphorus, sulfur and boron) fertilizers on eggplant quality showed that the highest rates of fertilizers led to a significant increase in SST, indicating an improvement in fruit quality (Abrham and Shumbulo, 2024). This increase could be linked to improved plant mineral nutrition, promoting the synthesis of soluble sugars in the fruit. Concerning L*, at room temperature a significant increase was observed in both conventional and agroecological eggplants. However, at 18°C, L* decreases significantly in both conventionally and agroecologically grown eggplants. The luminosity (L*) of fresh eggplants is generally low, indicating a dark color. During storage, this value may increase, suggesting a lightning of the skin. The skin of F1 Djamba eggplant is naturally light and may become lighter during storage, indicating a loss of pigments. However, low storage temperatures can lead to a decrease in brightness, indicating a darkening of the skin (Concellon *et al.,* 2007). Concellon *et al.,* (2007) showed that storage at 0°C led to a decrease in brightness (L*) and an increase in anthocyanin degradation, thus affecting skin color. L* was significantly higher in conventionally grown eggplants than in agroecologically grown ones. Furthermore, at D24, L* of eggplants from agroecological cultivation was significantly higher than L* of eggplants from conventional cultivation. Regarding the a* parameter, a significant increase from D0 to D24 was observed at room temperature as well as at 18°C. The F1 Djamba eggplants, white to cream in color, had an a* value close to zero at harvest, indicating an absence of a pronounced red or green tint. During storage, several phenomena can influence this value. A slight increase in the a* value may occur, indicating the development of a red tint. This phenomenon may be associated with enzymatic reactions, such as the degradation of anthocyanins, the pigments responsible for the purple color. A decrease in the a* value may indicate a loss of red tint, often observed during the degradation of anthocyanins. At room temperature as at 18 °C, on day 15 the parameter a* in eggplants from conventional cultivation was significantly higher than a* in eggplants from agroecological cultivation. The parameter b* increased significantly from day 6 to day 9 for eggplants from conventional cultivation but decreased significantly from day 0 to day 3 and from day 18 to day 21 for eggplants from agroecological cultivation at room temperature. The parameter b* decreased significantly from day 0 to day 3 and from day 12 to day 24 for eggplants from conventional cultivation at 18°C, on the other hand, for eggplants from agroecological cultivation it decreased significantly from D0 to D9 and from D9 to D15. During storage, several phenomena can influence the b* value of F1 Djamba eggplants. A slight increase in the b* value may occur, indicating the development of a yellow tint. This phenomenon is often associated with the degradation of anthocyanins and increased synthesis of carotenoids, such as beta-carotene, which impart a yellow hue to the fruits. A decrease in the b* value may indicate a loss of yellow hue, often observed during the degradation of yellow pigments (Jarerat *et al.,* 2022). The observed differences in the color parameters of eggplants grown using conventional and agroecological methods can be attributed to several factors such as fertilizer use, irrigation management, and environmental conditions. Chemical fertilizers used in conventional agriculture can affect the chemical composition of fruits, thus influencing their color. Also, irrigation practices differ between the two systems, which can affect the fruit's water content and visual appearance. Additionally, growing conditions, such as light, temperature, and humidity, vary depending on farming practices and can influence color parameters.

Conclusion

Vegetable produce is very important in people's daily consumption. It is produced in several ways, including conventional farming, characterized by intensive use of synthetic chemical fertilizers, and agroecological farming. The latter prioritizes the use of methods that respect the environment and the health of producers. This research was conducted to evaluate the physicochemical properties of African eggplants, *Solanum aethiopicum* L. cv., F1 Djamba, from these two crops during storage. It showed that the firmness of African eggplants from agroecological cultivation was significantly higher than that from conventional cultivation, both at room temperature and at 18°C. Furthermore, mass loss and loss rate increased significantly over time, regardless of cultivation method and storage conditions. However, these losses were more pronounced in conventional eggplants than in those grown using agroecological methods, whether at room temperature or at 18°C. These results could contribute to the promotion of more responsible agriculture and allow consumers to benefit from better quality products.

Competing interests

The authors declare that they have no competing interests.

Acknowledgments

The authors would like to thank the agroecological and conventional eggplant growers who gave them the opportunity to carry out this work.

References

Abrham Y & Shumbulo A. (2024). Growth, yield and quality response of Eggplant (*Solanum melongena* L.) to blended NPSB fertilizer rates and intra-row spacing in Boloso Bombe district, Wolaita zone, South Ethiopia. *Heliyon* 10(15): 12p. http://dx.doi.org/10.1016/j.heliyon.2024.e35671

Adhamatika A, Meidayanti K. & Indraloka A B (2022). Analysis of storage and packaging conditions on physicochemical characteristics of Eggplant (*Solanum melongena* L.). *Industria : Jurnal Teknologi dan Manajemen Agroindustri* 11(1) : 40–50. http://dx.doi.org/10.21776/ub.industria.2022.011.01.5

Akpo A F (2022). Mise en place d'une méthode de conservation de la tomate (*Solanum lycopersicum*) par l'application du froid et d'extraits végétaux aux effets anti-mûrissement et antifongique (Doctorat). Université d'Avignon, Université Nangui Abrogoua, Montpelier et Abidjan. p168.

Alberto R T & Sanogo S (2012). Reducing phytophthora fruit rot in eggplant and tomato fruits using rice straw and swine manure. *Plant Pathology & Quarantine* 2(2): 153–160 http://dx.doi.org/10.5943/ppq/2/2/8

Ali A, Maqbool M, Ramachandran S & Alderson P G (2010). Gum arabic as a novel edible coating for enhancing shelf-life and improving postharvest quality of tomato (*Solanum lycopersicum* L.) fruit. *Postharvest Biology and Technology* 58: 42– 47 https://doi.org/10.1016/j.postharvbio.2010.05.005

Altieri M A (2004). Agroecology: *The Science of Sustainable Agriculture*. CRC Press.

Amanullah S, Jahangir M M, Ikram R M, Sajid M, Abbas F & Mallano A I (2016). Aloe vera coating efficiency on shelf life of eggplants at differential storage temperatures. *Journal of Northeast Agricultural University (English Edition)*, 23(4), 15-25. http://dx.doi.org/10.1016/S1006-8104(17)30003-X

Aminifard M H, Aroiee H, Fatemi H, Ameri A & Karimpour S (2010). Responses of eggplant (*Solanum melongena* L.) to different rates of nitrogen under field conditions. *Journal of Central European Agriculture* 11(4): 453– 458. http://dx.doi.org/10.5513/JCEA01/11.4.863

ANStats, Agence Nationale de la Statistique. (2023). https://www.anstat.ci/indicateur-details/0f9de8437968cfc600759735cb5f766b54f2df13c7077cfd383b6cd494922233b37fd1b777c10029120229f6fd4d9b41d0b957183f02e6798d26cadfb9a22be2N1yzM4s_c6yPiPVcAXelJnGTN71RNo3qLxh5vuUBy-c, View in April 2025.

Ashtiani Miraei S H, Golzarian M R, Baradaran Motie J, Emadi B, Nikoo Jamal N & Mohammadinezhad, H (2016). Effect of loading position and storage duration on the textural properties of eggplant. *International Journal of Food Properties* 19(4): 814– 825. https://doi.org/10.1080/10942912.2015.1045515

Barragán J, Franco A, López J & Perez-Cervera C (2019). Effect of storage conditions on physicochemical characteristics and phenolic compounds of eggplant (*Solanum melongena* L.). *Revista de Ciencias Agrícolas* 36(2): 5–16.

Barrett D M, Beaulieu J C & Shewfelt R (2010). Color, flavor, texture, and nutritional quality of fresh-cut fruits and vegetables: desirable levels, instrumental and sensory measurement, and the effects of processing. *Critical reviews in food science and nutrition* 50(5): 369– 389. https://doi.org/10.1080/10408391003626322

Coates L M & Johnson G I (1997). Postharvest disease of fruit and vegetables, in Brown, J. and Ogle, H.

(Eds.): *Plant Pathogens and Plant Disease*. p.533–547

Concellón A, Añón M C & Chaves A R (2007). Effect of low temperature storage on physical and physiological characteristics of eggplant fruit (*Solanum melongena* L.). *LWT-Food Science and Technology* 40(3): 389–396. http://dx.doi.org/10.1016/j.lwt.2006.02.004

Dias G A, Rocha R H C, Araújo J L, Lima J F, & Guedes W A (2016). Growth, yield, and postharvest quality in eggplant produced under different foliar fertilizer (*Spirulina platensis*) treatments. *Semina: Ciências Agrárias*, 37(6), 3893-3902. http://dx.doi.org/10.5433/1679-0359.2016v37n6p3893

Djidji AH & Fondio L 2013. Bien cultiver l'aubergine en Côte d'Ivoire. Protocole d'expérimentation. Fiche technique, Centre National de Recherche Agronomique. p4.

El-Nemr M A, EL-Desuki M, Fawzy Z F & El-Bassiony A M (2012). Yield and fruit quality of eggplant as affected by NPK-sources and micronutrient application. *Journal of Applied Sciences Research* 8 (3): 1351–1357

Gaikwad S B, Chetti M B & Jirali D I (2018). Influence of different pesticides on chemical, biochemical and yield parameters of brinjal (*Solanum melongena* L.). *Journal of Plant Biochemistry & Physiology*, 5(4): p9. http://dx.doi.org/10.4172/2329-9029.1000201

Gleissman S R (2007). Agroecology: *The Ecology of Sustainable Food Systems*. 2nd Edition. https://doi.org/10.1201/b17420. CRC Press.

Goswami M R, Pati U K, Maity P & Mukhopadhyay A (2018). Studies on the effect of different insecticidal applications on quality, nutritional parameters and total antioxidant capacity of brinjal (*Solanum melongena* L.). *International Letters of Natural Sciences* 69:34–42. http://dx.doi.org/10.18052/www.scipress.com/ILNS.69.34

Guiné R P F & Barroca M J (2014). Quantification of browning kinetics and colour change for quince (*Cydonia oblonga* Mill.) exposed to atmospheric conditions. *Agricultural Engineering International: CIGR Journal* 16: 285–98.

Han M, Opoku K N, Bissah N A & Su T (2021). *Solanum aethiopicum*: The nutrient-rich vegetable crop with great economic, genetic biodiversity and pharmaceutical potential. *Horticulturae* 7: 1–17.

Jarerat A, Techavuthiporn C, Chanchomsuek C & Nimitkeatkai H (2022). Enhancement of antioxidant activity and bioactive compounds in eggplants using postharvest leds irradiation. *Horticulturae*, 8(2): 134. https://doi.org/10.3390/horticulturae8020134

Jimenez D A S, Salazar L N P, Sánchez S A M, Concha J L H & Castillo H S V (2015). Coating effect of modified cassava starch in hass avocado. *Producción + Limpia* 10: 31–37

Kappel N & Mozafarian M (2022). Effects of different rootstocks and storage temperatures on postharvest quality of eggplant (*Solanum melongena* L. cv. Madonna). *Horticulturae*, 8(10): 862. https://doi.org/10.3390/horticulturae8100862

Karangan J, Sugeng B & Sulardi S (2019). Uji keasaman air dengan alat sensor pH di STT Migas Balikpapan. *Jurnal Kacapuri: Jurnal Keilmuan Teknik Sipil* 2(1): 65–72. http://dx.doi.org/10.31602/jk.v2i1.2065

Khurnpoon L, Siriphanic J & Labavitch J (2008). Cell wall metabolism during fruit dehiscence. *Postharvest Biology and Technology*, 48: 391-401. http://dx.doi.org/10.1016/j.postharvbio.2007.08.012

Ledesma C L U, Secretaria L B & Bayogan E R V (2022). Postharvest quality of two eggplant (*Solanum melongena* L.) cultivars as influenced by storage in ambient and evaporative cooling conditions. *International Journal of Postharvest Technology and Innovation* 8(2/3): pp.257–270. http://dx.doi.org/10.1504/IJPTI.2022.121962

Li Z, Li P, Yang H, Liu J & Xu Y (2012). Propriétés mécaniques des tissus d'exocarpe, de mésocarpe et de gel loculaire de tomate. *Journal d'ingénierie alimentaire* 111, 82–91. http://dx.doi.org/10.1016/j.jfoodeng.2012.01.023

Lufu R, Ambaw A & Opara U L (2020). Water loss of fresh fruit: Influencing pre-harvest, harvest and postharvest factors. *Scientia Horticulturae* 272: 109– 519. http://dx.doi.org/10.1016/j.scienta.2020.109519

Luthria D L (2006). Significance of sample preparation in developing analytical methodologies for accurate estimation of bioactive compounds in functional foods. *Journal of the Science of Food and Agriculture* 86: 2266–2272. http://dx.doi.org/10.1002/jsfa.2666

Luthria D, Singh A P, Wilson T, Vorsa N, Banuelos G S & Vinyard B T (2010). Influence of conventional and organic agricultural practices on the phenolic content in eggplant pulp: Plant-to-plant variation. *Food Chemistry*, 121(2): 406– 411. http://dx.doi.org/10.1016/j.foodchem.2009.12.055

Mahajan P V, Caleb O J, Singh Z, Watkins C B & Geyer M (2014). Postharvest treatments of fresh produce. *Philosophical Transactions of the Royal Society A-Journals*. 5: 372. https://doi.org/10.1098/rsta.2013.0309

Massolo J F, Concellón A, Chaves A R & Vicente A R (2011). 1-Methylcyclopropene (1-MCP) delays senescence, maintains quality and reduces browning of non-climacteric Eggplant *(Solanum melongena* L.) Fruit. *Postharvest Biology and Technology* 59: 10–15. http://dx.doi.org/10.1016/j.postharvbio.2010.08.007

Mazzei J R F, Freire E, Serra E G, Macedo R, Oliveira A C, Bastos L H P & Cardoso M H W M (2013). Recherche sur le terrain: Une analyse comparative entre les méthodes conventionnelles, biologiques et durables de production de tomates. *Revista Científica Multidisciplinar Núcleo do Conhecimento*. 2(5) : p125–146.

Naibaho J, Julianti E, & Yusrain E (2013). Penyimpanan buah terung belanda dengan kemasan aktif menggunakan bahan penyerap oksigen, karbondioksida, uap air dan etilen. *Jurnal Rekayasa Pangan Dan Pertanian*, 1(3), 41–51.

Pan, R. S., & Bhowmik, P. C. (1992). Respiration rate and its impact on biomass and weight reduction in plants. Journal of Plant Physiology, 140(3), 245–250. https://doi.org/10.1016/S0176-1617(11)80559-4

Raigon M D, Rodriguez-Burruezo A & Prohens J (2010). Effects of organic and conventional cultivation methods on composition of eggplant fruits. *Journal of agricultural and food chemistry* 58(11): 6833–6840. https://doi.org/10.1021/jf904438n

Salabao A, Benitez M, Sudaria E, Acedo A, Ekman J, Valida A & Rivera F R (2014). Eggplant (*Solanum melongena*) quality grading at two storage temperatures. In *III Asia Pacific Symposium on Postharvest Research, Education and Extension:* APS2014 1213. pp. 297–302. https://doi.org/10.17660/ActaHortic.2018.1213.43

Salunkhe D K, Boun H R & Reddy N R (1991). *Storage processing and nutritional quality of fruits and vegetables*. CRC Press Inc., Boston, USA. p156–161.

Seymour G B, Taylor J E & Tucker G A (1993). *Biochemistry of Fruit Ripening*. Chapman and Hall, London, New York. p461.

Singh A P, Luthria D, Wilson T, Vorsa N, Singh V, Banuelos G S & Pasakdee S (2009). Polyphenols content and antioxidant capacity of eggplant pulp. *Food Chem* 114: 955–961.

Thierry L T, Coffi P-M J, Yao S D M & Ama T J (2019). Vegetative growth response of Eggplant (*Solanum Aethiopicum* L.) to combined effects of fertilizer types and irrigation regimes applied on littoral tertiary soil in Côte d'Ivoire. *International Journal of Plant & Soil Science* 30 (5):1–11.

Yaman O & Bayindirli L (2002). Effects of an edible coating and cold storage on shelf-life and quality of cherries. *LWT- Food Science and Technology* 35:146–150. https://doi.org/10.1006/fstl.2001.0827

Yengkokpam P & Mazumder P B (2021). Antioxidant enzymatic activities and profiling of gene expression associated with organophosphate stress tolerance in *Solanum melongena* L.cv. Longai. *3 Biotech. Dec* 11(12): 510. https://doi.org/10.1007/s13205-021-03061-7

Zhao Y, Gu M, Bi G, Evans B & Harkess R (2014). Planting date effect on yield of tomato, eggplant, pepper, zinnia, and snapdragon in high tunnel in Mississippi. *Journal of Crop Improvement* 28(1): 27–37. http://dx.doi.org/10.1080/15427528.2013.858283

How to cite this article:

Adjouman Yao Désiré, Komenan Ayemene Cedrick Ardin, Gbraguhe Désirée Victoire, Dembele Tita, Kouame Kohi Alfred and Nindjin Charlemagne. 2025. Effect of Cultivation Practices on Physicochemical Properties of Eggplant *Solanum aethiopicum* L. var F1 Djamba in Côte d'Ivoire. *Int.J.Curr.Res.Aca.Rev.* 13(06), 8-21.
doi: https://doi.org/10.20546/ijcrar.2025.1306.002