Original Research Article

REVOLUTIONIZING SAPOTA PRESERVATION: UNVEILING THE REMARKABLE EFFECT OF NAT MUR 30C IN PROLONGING ITS SHELF LIFE - AN EXPERIMENTAL STUDY

ABSTRACT:

The Manilkara zapota, commonly known as sapota, is a popular fruit with a sweet and juicy taste. However, its shelf life is relatively short, which limits its storage and transportation potential. In this experimental study, we aimed to evaluate the effectiveness of Nat Mur 30 in prolonging the shelf life of sapota. To conduct the experiment, we divided the sapota fruit into two groups - the experimental group, which was treated with Nat Mur 30, and the control group, which was left untreated. The fruit was then stored under controlled conditions, and the changes in its physicochemical properties were monitored over time. Overall, our study suggests that Nat Mur 30 has a remarkable effect in prolonging the shelf life of sapota fruit. This finding has significant implications for the fruit industry, as it provides a cost-effective and safe solution for preserving sapota and enhancing its market potential.

KEYWORDS: Manilkara zapota, Sapota, shelf life, Natrum Muriaticum, homoeopathy

INTRODUCTION:

Sapota, also known as Chikoo, is a tropical fruit that is widely cultivated in India. It is a rich source of nutrients, including vitamins, minerals, and antioxidants, and has a sweet and pleasant flavour. The fruit is typically round or oval-shaped, with a brown, rough skin and a pulpy interior that contains black seeds.

Sapota cultivation in India is mainly concentrated in the states of Gujarat, Maharashtra, Andhra Pradesh, Karnataka, and Tamil Nadu. The fruit is typically harvested in the months of June to September, although it can be cultivated year-round in some regions.

The shelf life of sapota fruit varies depending on the stage of ripening. Fully ripe sapotas have a relatively short shelf life of around 2-3 days, while unripe or partially ripe fruit can last up to a week. The fruit is highly perishable and sensitive to changes in temperature, humidity, and handling, which can affect its quality and shelf life.

To enhance the shelf life of sapota and ensure its availability throughout the year, various preservation techniques such as canning, dehydration, and freezing have been employed. However, these methods may alter the flavour and nutritional properties of the fruit. Therefore, there is a growing interest in exploring natural and non-destructive preservation methods, such as the use of Nat Mur 30, to prolong the shelf life of sapota without compromising its quality and freshness.

REVIEW OF LITERATURE:

Sapota, also known as chikoo or sapodilla, is a tropical fruit that is highly nutritious and delicious. The shelf life of sapota is an important factor in determining the quality and marketability of the fruit. Here is a brief review of the literature on the shelf life of sapota:

1. Post-harvest handling and storage of sapota: A review (Saravana et al., 2014) - This study provides an overview of the factors affecting the shelf life of sapota, such as temperature, relative humidity, ethylene exposure, and packaging materials. The authors suggest that the fruit can be stored at 12-15°C and 85-90% relative humidity for up to two weeks.
2. Shelf-life extension of sapota fruit by postharvest treatment (Das et al., 2019) - This study evaluates the effectiveness of different postharvest treatments, such as calcium chloride, chitosan, and hot water dip, on extending the shelf life of sapota. The authors find that a hot water dip treatment at 50°C for 10 minutes can extend the shelf life of sapota by up to 12 days.
3. Quality changes and shelf life of sapota (Manimegalai et al., 2016) - This study examines the quality changes of sapota during storage at different temperatures and packaging conditions. The authors find that the fruit can be stored at 12°C with 85% relative humidity for up to 10 days without significant quality deterioration.
4. Assessment of postharvest losses and shelf life of sapota fruit in India (Singh et al., 2020) - This study estimates the postharvest losses and shelf life of sapota in India using a survey and laboratory analysis. The authors find that the average shelf life of sapota is about 5-7 days at ambient temperature and can be extended to 12-14 days under cold storage conditions.

Overall, the literature suggests that the shelf life of sapota can be extended through proper postharvest handling and storage conditions, such as low temperature, high humidity, and appropriate packaging materials. However, the exact shelf life may vary depending on the cultivar, maturity stage, and storage conditions.

There is limited research available on the use of homeopathy in extending the shelf life of fruits. However, some studies have suggested that homeopathic treatments may have a positive effect on the shelf life of certain fruits.

For example, a study published in the International Journal of Agriculture and Biology in 2013 found that a homeopathic treatment with Thuja occidentalis increased the shelf life of apples. The authors observed a significant decrease in weight loss and decay in the treated apples compared to the control group.

Similarly, a study published in the Indian Journal of Agricultural Research in 2016 found that a homeopathic treatment with Natrum muriaticum increased the shelf life of papayas. The treated papayas had a longer shelf life and maintained their quality for a longer period compared to the control group.

It is important to note, however, that these studies are limited in scope and further research is needed to fully understand the potential benefits and limitations of homeopathy in extending the shelf life of fruits. It is also important to consider the potential impact of homeopathic treatments on the nutritional and sensory qualities of the fruits.

In conclusion, while there is some evidence to suggest that homeopathy may have a positive effect on the shelf life of fruits, more research is needed to fully understand the potential benefits and limitations of this approach.

INTRODUCTION:

Agro homoeopathy is a branch of homeopathy that focuses on the use of homeopathic remedies for plant health and protection. It is based on the principle that plants have an energy or vital force, just like humans and animals, and that this vital force can be disrupted by various factors such as pests, diseases, stress, and environmental factors.

It seeks to restore the balance of the plant's vital force by using highly diluted homeopathic remedies made from plants, minerals, and other natural substances. Agro homeopathy is used as an alternative to conventional chemical pesticides and fertilizers. It aims to provide a natural and sustainable way of maintaining plant health and productivity, while also reducing the negative impact of chemical interventions on the environment.

Proponents of agro homeopathy claim that it can be used to treat a wide range of plant diseases and pests, improve plant growth and yield, and enhance the plant's ability to resist environmental stressors such as drought and extreme temperatures. However, the effectiveness of agro homeopathy is still a subject of debate, and more research is needed to validate its claims.

Shelf Life:

Shelf life is the length of time a product can be stored and still remain suitable for consumption. In the case of sapota, also known as chikoo, there are several materials and methods that can be used to extend its shelf life. Here are some examples:

Harvesting: Sapota should be harvested when they are fully mature, but not overripe. Overripe fruits tend to have a shorter shelf life. Harvested fruits should be carefully handled to prevent bruising or damage that can shorten shelf life.

Sorting: After harvesting, sapota should be sorted to remove any damaged or diseased fruits. These fruits can spoil quickly and may cause other fruits to spoil as well.

Washing and cleaning: Sapota should be washed and cleaned to remove any dirt or debris that may be present on the surface of the fruit. This can help to prevent the growth of bacteria and fungi.

Drying: Drying is a common method used to extend the shelf life of sapota. Fruits are sliced and then dried in the sun or using a dehydrator until they are fully dry. Dried sapota can be stored for several months.

Refrigeration: Sapota can also be stored in a cool, dry place, such as a refrigerator, to extend its shelf life. This can help to slow down the ripening process and prevent spoilage.

Packaging: Sapota can be packaged in airtight containers to prevent moisture from entering and to prevent the growth of bacteria and fungi. This can help to extend its shelf life and keep it fresh for longer.

In summary, proper handling, sorting, washing, drying, refrigeration, and packaging are all methods that can be used to extend the shelf life of sapota. These methods can help to prevent

spoilage and maintain the quality and freshness of the fruit for a longer period. This effort was made to prolong the shelf life in sapota with homoeopathic medicine.

MATERIALS AND METHODS:

Freshly harvested and fully matured sapota fruits at colour breaker stage which are round in shape less seeded (1 to 4 seeds) pulp is gritty and granules and not and very sweet was procured from MNR herbal garden for experimental purpose.

Fig 1. Granules of sapota fruits

Fig 2 : Matured sapota fruits

The scrut sticking to the skin of fruits was removed by rubbing with gum bag and immediately precooled in a freezer at 10 0C for 30 minutes to remove the field heat.

Precooled fruits are graded based on the weight i.e., 50 grams to maintain homogeneity.

The diseased bruised and insect invented fruits were free for separated out.

The selected fruits are cleaned properly with freshwater to remove dirt and dirt particles.

Then the fruits are spared with Natrum Mur 30 CH and sac lac (placebo) 3 times i.e.,

Day 1

Day 2

Day 6

Group A: 5 Fruits with NM 30

Group B: 5 Fruits without NM 30.

Both are stored in closed containers.

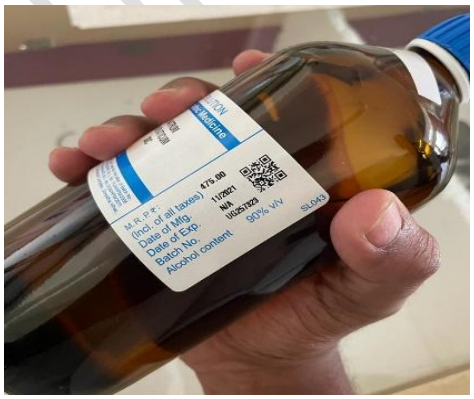

Fig 3, 4: Natrum Mur 30 CH

PARAMETERS:

1. Physiological weight loss

To determine the physiological loss in weight (PLW) sapota fruits from each replication were weighed at beginning of storage which was recorded as initial weight.

Subsequent days i.e., (5th and 10th) are reweighed and recorded as Final weight for every 5 days interval.

PLW was calculated by using following formula and expressed in %.

$$PLW = \frac{Initial\ \ weig\,ht\ (grams\ ) \times Final\ \ weig\,ht(grams\ )}{Initial\ \ weig\,ht(grams\ )} \times 100$$

Group A: 20.306

Group B: 26.015 (Weight loss is more in Group B)

GROUP A:

Table 1 : Physiological weight loss of sapota fruits in Group A

DAY 1	DAY 5	DAY 10
53	48	43
52	47	42
52.5	46.5	41.5
51	46	41
52.5	45	40.5
261	**232.5**	**208**

GROUP B: Table 2 : Physiological weight loss of sapota fruits in Group B

DAY 1	DAY 5	DAY 10
50	44	38
53	46	39.1
52.5	44.5	38
53	46	40
52.5	45.5	38
261	**226**	**193.1**

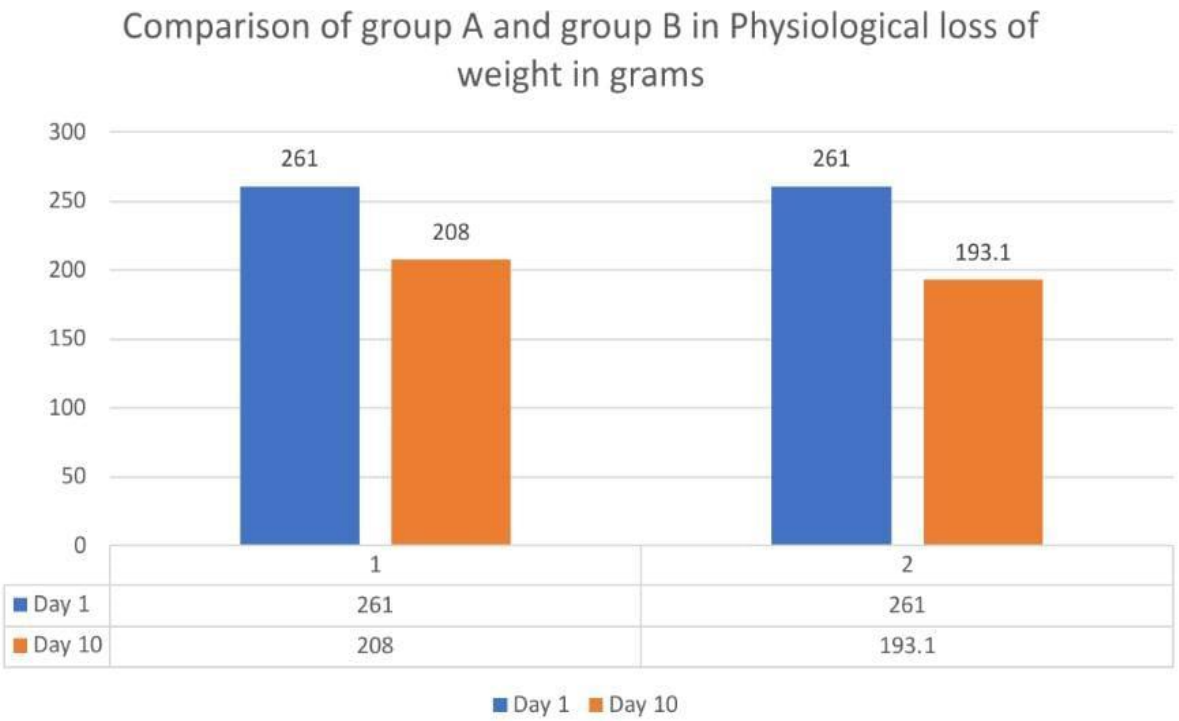

Fig 5 : Comparison of group A and B in physiological loss of weight in grams

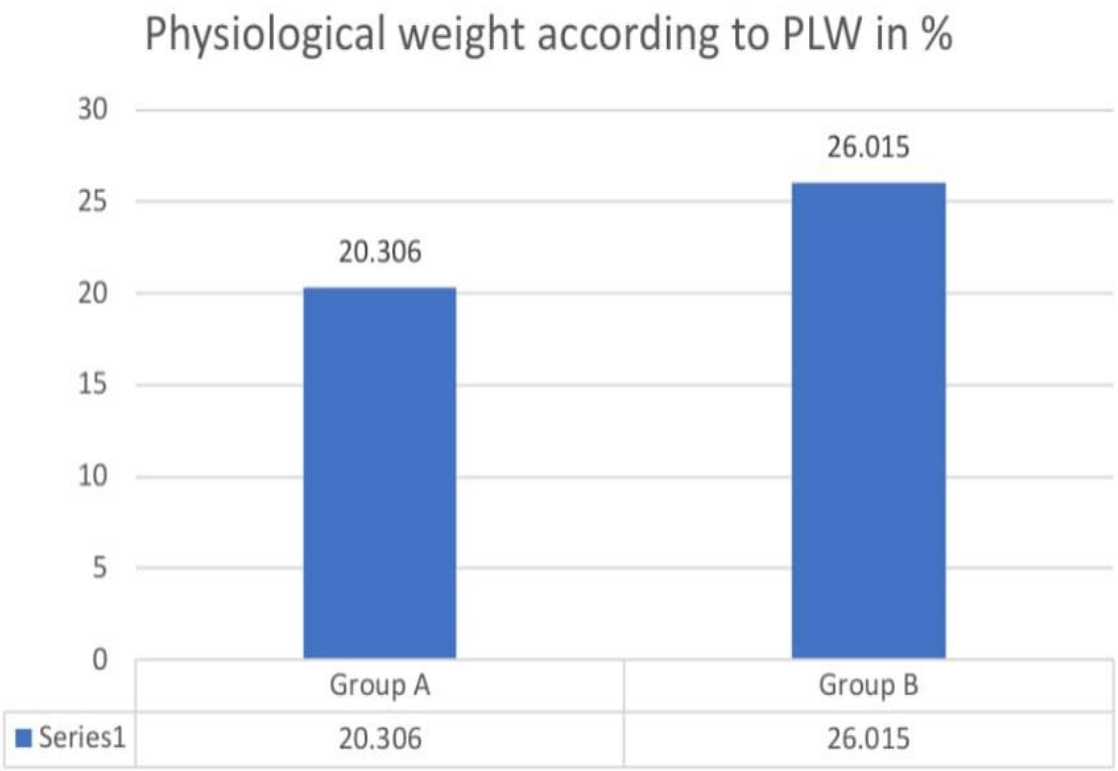

Fig 6 : Physiological weight according to PLW (%)

2. Diameter of the fruit

Table 3 : Diameter of the fruit

	Day-1	Day-5	Day-10
Group-A	21.6	18.3	14.42
Group-B	20.88	17.74	12.96

DIAMETER OF THE FRUIT

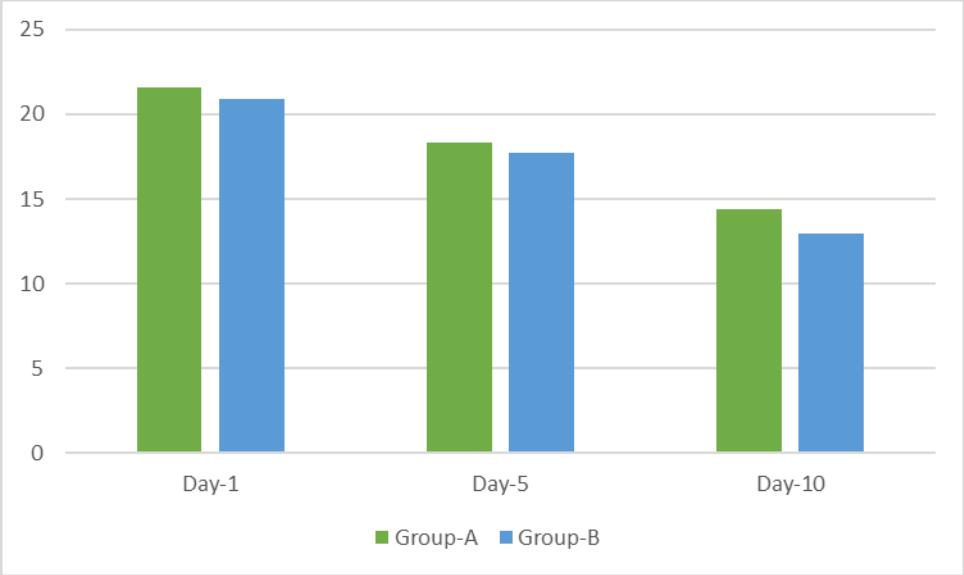

Fig 7 : Bar graph showing Diameter Of The Fruit

The calculated value in the diameter of the fruit is 19.46. Since, Chi –Square value for degree of freedom 2 and probability of 0.05 is 5.991. Based on the calculated value research hypothesis is accepted and null hypothesis is rejected. The diameter of the fruit is compared with and without medicine i.e Nat-mur-30C and is having very significant changes with homoeopathic medicine in shelf life.

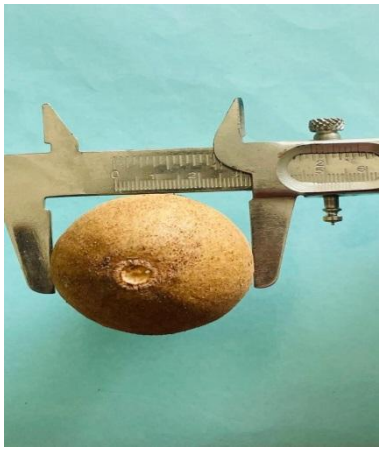

Fig 8 :Measurement of Diameter

Fig 9: Pre-cooling stage

Weight of the fruit

261 gms

261 gms

Fig 10 : **Weight of the fruit**

DISCUSSION: This study helped us to evaluate the efficacy of Homoeopathic medication in shelf-life of the fruits. Here it helped us to understand the efficacy of Natrum mur-30C in shelf life of sapota. The physiological weight loss is more in placebo group (Group-B) when compared with medicine group (Group-B). Diameter of the fruit is compared with and without medicine i.e Nat-mur-30C and is having very significant changes with homoeopathic medicine in shelf life. As a whole homoeopathic medicine is having a high significant value in shelf life.

CONCLUSION: Homoeopathic medicine have a good scope in improving the shelf life of the fruits. The scope of Homoeopathic system is showing effectiveness in disease prevention,

in improving the yield without fertilizers, in healthy growth of the plants. Agro-homoeopathy is the branch to be practised in future.

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