Short Research Article

AN EXPERIMENTAL STUDY TO KNOW THE EFFECT OF NAT MUR 30C IN PROLONGING SHELF LIFE OF SAPOTA (Manilkara Zapota L)

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 [(1)].

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 [2]. Ancient times, Salt was used for preservation of foods, later refrigerators and other methods took the place for improvising shelf life of food materials. A number of other sodium-containing compounds are also used for increasing the safety and shelf life of foods or creating physical properties [3].

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. Character of Natrum Murianticum said in according to Materia Medica is like there is a wonderful prostration of peculiar kind, Like emaciation, weakness, nervous prostration, nervous irritability and often Chlorotic[4].

This research is conducted with help of previous studies done to improve the shelf life with Natrum Murianticum.

1. A study is conducted on Natrum mur 200c which helped in promoting seed germination and increases total protein, chlorophyll, rubisco and sugar in early seedlings of cowpea under salt stress [5].
2. A study in Safety and quality preservation of starfruit (Averrhoa carambola) at ambient shelf life using synergistic pectin-maltodextrin-sodium chloride edible coating. This research was conducted to determine the effectiveness of synergistic edible coatings (pectin [Pe] and maltodextrin [M] and 100, 200, and 300 ppm of sodium chloride [SC]) on the quality and safety criterion of starfruits throughout a shelf-life analysis of 14 days at ambient temperature [6].
3. Post Harvest Application of Calcium and Sodium Chloride formulations on Ripening, Shelf Life and Quality of Banana Under Jimma Condition. In this study CaCl2 treated banana fruit had a prolonged shelf life compared with NaCl treated, which was not reflected on the fruit firmness. Significantly increased WL and P/ P ratio in calcium treated fruit didn't negatively affect fruit firmness [7].
4. Effect of calcium chloride & sodium chloride on storage life of vegetables, here shelf life of the Calcium chloride treated vegetables with a steeping time of 5 minutes, 10 minutes and Sodium chloride treated vegetables with a steeping time of 10 minutes is more compared to control [8].

Overall, the literature suggests that the shelf life of fruits and vegetables 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.

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.

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 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 [9].

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.

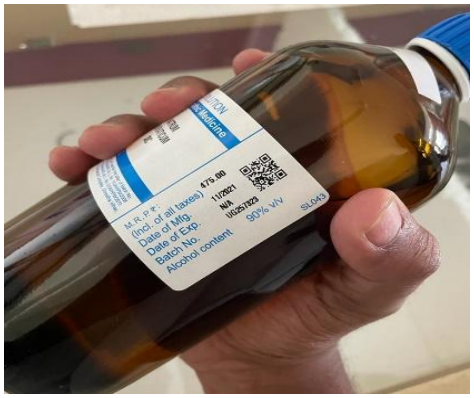

Fig 3, 4: Natrum Mur 30 CH

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 %[10].

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

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**

RESULTS AND DISCUSSION

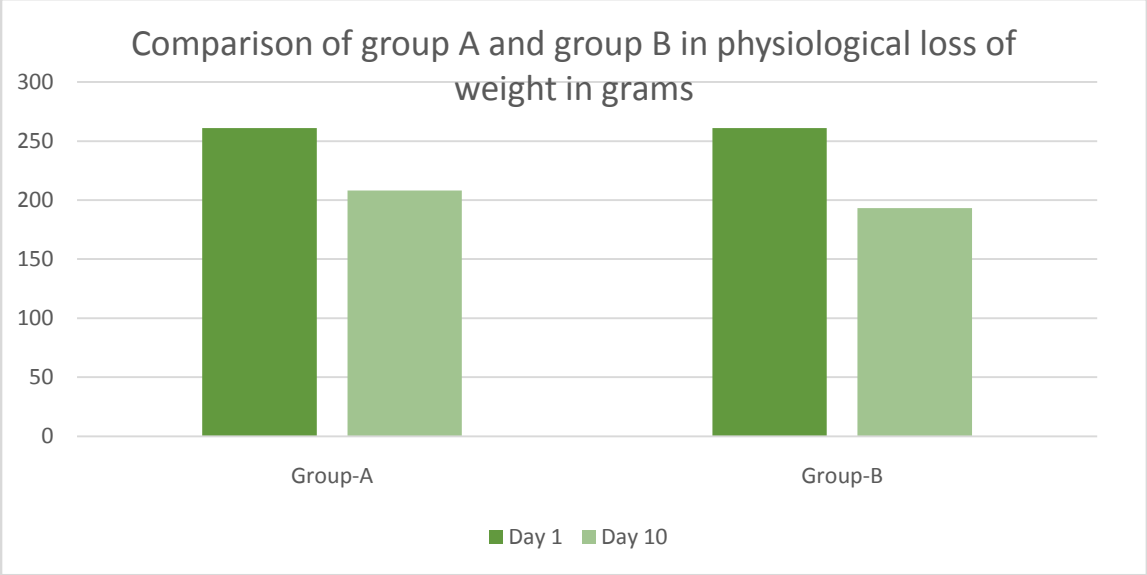

Fig 5: Comparison of group A and B in physiological loss of weight in grams

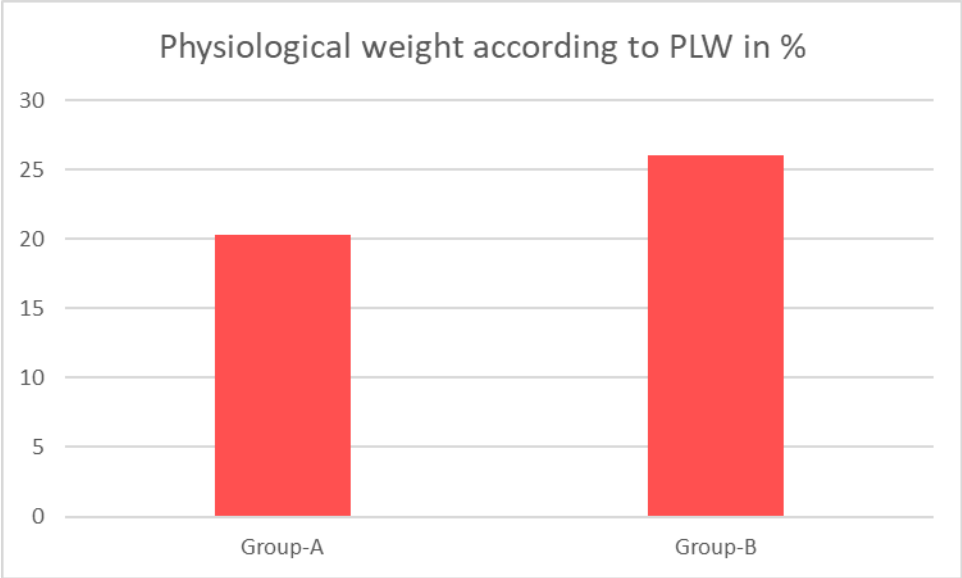

Fig 6: Physiological weight according to PLW (%)

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

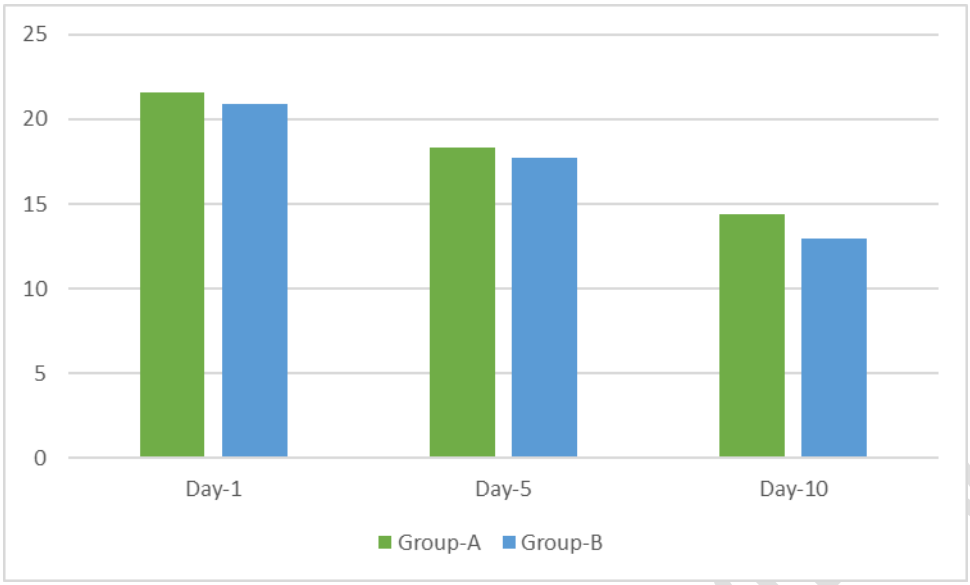

Fig 7: Bar graph showing Diameter of The Fruit

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.

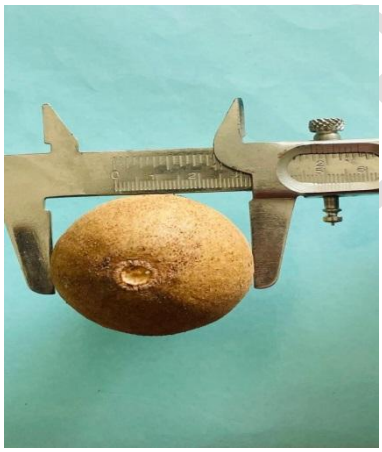

Fig 8 :Measurement of Diameter

Fig 9:Pre-cooling stage

Weight of the fruit

261 gms 261 gms

Fig 10: **Weight of the fruit**

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-A) 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. Previous studies showed sodium chloride is helpful in using as a preservative to improve shelf life for different fruits and vegetables.

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.

REFERENCES:

1. Pooja singh, Mamata Rathore, H.G Prakash, International journal of science and research (IJSR), Volume -10, Issue -3, March 2021, Studies on nutritional, pharmacological and Health importance of “chikoo”, Available from: https://www.ijsr.net/archive/v10i3/SR21319173103.pdf.
2. Joseph K. Beikhosia* and Vijaya Rawat, To Study the Effects of Different Packaging Materials on Shelf Life of Sapota – A Review, Available from: https://www.ijcmas.com/9-11-2020/Joseph%20K.%20Beikhosia%20and%20Vijaya%20Rawat.pdf

3. Available from: https://www.ncbi.nlm.nih.gov/books/NBK50952/.
4. Lectures of Homoeopathic Materia Medica, J.T. Kent, 2009, 2nd Re-edition, Pg.no-766
5. International journal of High Dilution Research, Natrum Mur 200c promotes seed germination and increases total protein, chlorophyll, rubisco and sugar in early seedlings of cowpea under salt stress, Available from: https://www.highdilution.org/index.php/ijhdr/article/view/570.
6. Available from: https://pubmed.ncbi.nlm.nih.gov/33681497/.
7. Nigeria journal of Horticultural science, Post Harvest Application of Calcium and Sodium Chloride formulations on Ripening, Shelf Life and Quality of Banana Under Jimma Condition, Available from: https://www.ajol.info/index.php/njhs/article/view/62162.
8. B Naveena and Genitha Immanuel , Journal of Pharmacognacy and Phytochemistry, Available from: www.phytojournal.com/archives/2019/vol8issue5/PartAK/8-4-803-284.pdf.
9. Food Preservation, Safety, and Shelf-Life Extension, Food Processing for Entrepreneurs Series, Available from: https://extensionpublications.unl.edu/assets/html/g1816/build/g1816.htm.