European Online Journal of Natural and Social Sciences 2022;
Vol.11, No 4 (s) Special Issue on Hybridity in the New Reality
ISSN 1805-3602

Sensory Evaluation of Developed Lolly Fruit *(Sandoricum Koetjape)* Sour Seasoning

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Abstract

In tropical areas, the santol tree is a fruit-bearing tree that can be seen growing everywhere. It spreads through pollination and seeds. This fruit is scrumptious and healthy. Additionally, many Filipinos may use it as a source of income. It is a big ornamental evergreen tree that is deciduous. It has a straight trunk, fissured bark that is greyish to pale pinkish-brown in color, and when wounded, it exudes milky latex. Acid sandy soil is suitable for growing it. Frost is utterly intolerable to the tree. The majority of the santol fruit tissues have a sub acid or sour taste. A sensory assessment of the dry, powdered lollipop fruit's acceptability as a souring additive on fish stew was done. There were some variations in the pieces' proximate makeup, physical and chemical characteristics, and nutritional composition. The fruit's largest component, the pulp, contained a high level of moisture and acidity that gradually decreased as the fruit ripened. The fresh and the dried, powdered lollipop fruits were comparable to one another in terms of color, scent, taste, and general acceptability as a souring ingredient for fish stew, according to the 9-point Hedonic sensory evaluation scale. The findings indicated that lollipop fruits have good physical-chemical characteristics and nutrient levels that are on par with or even greater than other conventional fruits used as souring agents. The powdered lollipop fruit has the potential to be used as a ready-to-use astringent in the home food supply.

Keywords: Seasoning, Sensory, Food, Industry, Acidity

Introduction

The Moluccas, Mauritius, Sri Lanka, India, Borneo, and erstwhile Indochina are thought to be the introduction sites for the santol plant. It has naturalized in the Philippines and Seychelles. Yamapi is another name for it. It is widely grown in these areas, and the local and global markets are stocked with an abundance of the fruit according to season. The severely tropical santol tree doesn't reach heights of more than 1000 meters. It is typically grown in Asian nations, and when it is in season, local marketplaces are brimming with its fruits. Santol is a fast-growing tree that can grow up to 50 meters tall and has a highly attractive appearance. With its huge, medium-to-dark green leaves and sporadic red leaves that contrast with the green, it also makes a good shade tree. It is a very inventive tree that yields 18,000 to 24,000 fruits annually. The ripe fruits are clamped to be harvested. Santol is a medium to large tree that matures into a buttressed structure after vigorously growing to a height of 15 to 25 cm. Trunks can have a diameter of at least 80 cm. On juvenile branches and leaves, soft hair is present. The tree is evergreen, but because it occasionally loses all of its leaves at once, it might be called partially deciduous.

There are numerous fruits, including bananas, mangoes, pineapples, durian, bilimbi, watermelon, etc., in the local markets in the Philippines. However, since santol is widely available, it is always for sale in regular quantities. It has several advantages including the ability to lower bad cholesterol, prevent diabetes, maintain good teeth, prevent anemia, and prevent Alzheimer's. It is also simple to grow no matter where you plant them. Additionally, some santol is used to make marmalade. The santol plant has anti-inflammatory effects in several of its components. Diarrhea and dysentery are both conditions they are used to treat. These can also be used as a carminative when

combined with vinegar and water. Fishing nets are also tanned with it. The caustic, fragrant root is an effective treatment for diarrhea in addition to being a tonic for stomach aches and an antispasmodic.

In tropical areas, the santol tree is a fruit-bearing tree that can be seen growing everywhere. It spreads through pollination and seeds. This fruit is scrumptious and healthy. Additionally, many Filipinos may use it as a source of income. Small to large ornamental evergreen trees that bear the santol fruit are deciduous, have a straight trunk, fissured, greyish to pale pinkish-brown bark, and when injured, release milky latex. Acid sandy soil is suitable for growing it. Frost is utterly intolerable to the tree. The majority of the santol fruit tissues have a subacid or sour taste. This tissue is even more acidic when the fruit is not fully ripe. Filipinos typically eat with salt and enjoy it even in a sour state.

People from the Philippines are renowned for their love of mouthwatering, sweet-sour fruits that send the taste buds into overdrive. Santol has been and continues to be a beloved fruit of people of all ages, especially in rural areas, due to its sweet and sour flavor. Santol is considered to be "for everyone's taking" and is produced in great abundance—santol trees can be found practically anywhere—but despite its popularity, it has always been overshadowed by more well-known fruits like banana and mango. The researchers intended to test the sour fruits used as a souring ingredient in sour broth meals because Filipino cuisine enjoys sweet and sour foods. Santol is a natural acidifier. Every Filipino loves the Filipino cuisine called *"sinigang"*. Santol is now a preferred astringent component. The researchers intended to dry and preserve the flesh fruit so that it would be as sour a condiment when it wasn't in season. It certainly delivers a nutritious, rich, salivating sour taste that is ideal for *"sinigang"* meals. Natural spices are used to flavor food, and studies have shown that they minimize cell damage and prevent inflammation. The primary distinction between a natural and artificial seasoning is whether it uses chemicals to flavor it. In contrast to artificially flavored spices that might spread infections if used regularly, natural tastes must be sourced from plant or animal material to be utilized in cuisine. As a result, when commercial sour seasoning is not in season, the santol fruit would be a suitable replacement.

Materials and Methods

Data Gathering Procedures

Immediately after collection, disease-free "santol" fruits were washed with water and air-dried. Composite samples representing the peel, and pulp of the mature fruits, the whole immature, mature, ripe fruits were prepared. The fruits were classified into three stages of maturities according to their firmness, skin/pulp color, aroma, and comparison on cross-section of the fruits.

Table 1. State of maturity of Santol fruit

Maturity	Fruit Color and Maturity
Young (Immature)	Light green, firm, thin skin, white and watery pulp, soft pericarp, watery and less than half-endosperm filled seeds
Mature	Green, firm, thin skin, creamy white and less watery pulp, thick, woody-hard pericarp, more than half-endosperm filled and fully developed endosperm
Ripe	Light yellow, soft skin and pulp, thick, woody-hard pericarp, fully developed endosperm, fruity aroma

Procedure in Making Powdered Lolly Fruit Seasoning

1. Collect samples of Lolly Fruit.

Young (Immature) Fruit

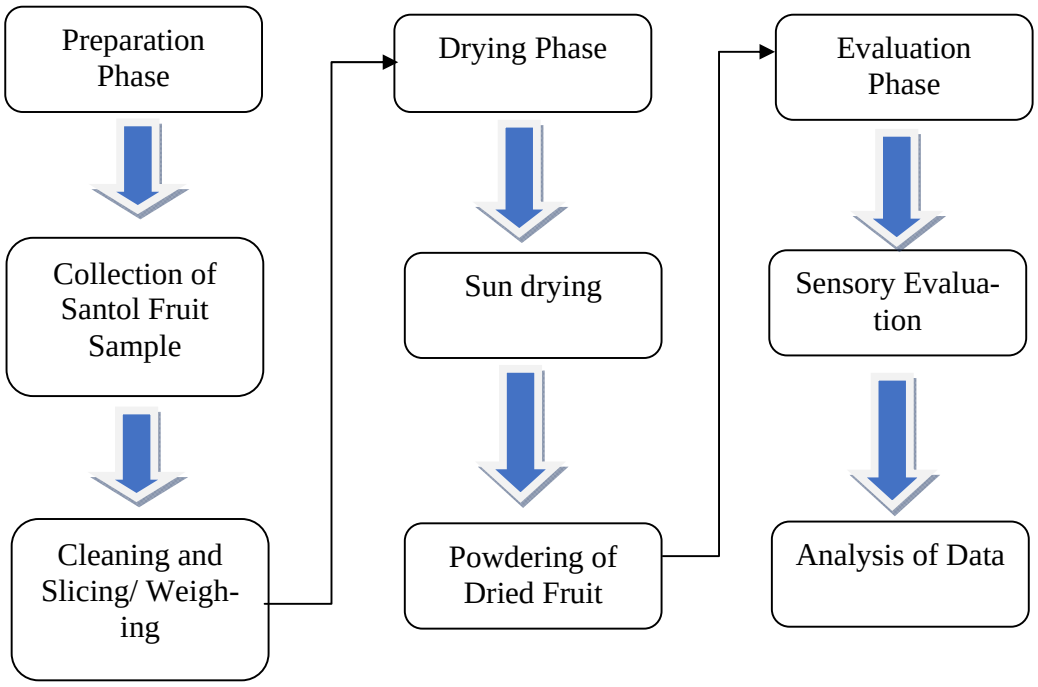
Mature Fruit

Ripe Fruit

2. Sun-dry samples for 16 hours.
3. Pulverize dried samples using food chopper and sift using a 60-mesh sieve.

4. Store in an air-tight plastic container or Ziplock and keep at room temperature.

Below is the flowchart of this study which illustrates the process under which the study was undertaken. The flowchart comes in three phases.



Results and Discussion

Table 2. Summary of Mean Sensory Characteristics of Powdered Lolly Fruit Seasoning

Descriptive Attributes	Color	Aroma	Taste	Flavor	Overall Acceptability
T1 (Control)	6.60	6.71a	6.11	6.56a	6.24
IMMATURE POWDERED FRUIT					
T2 150g	6.23	5.87ab	5.78	5.56ab	5.62
T3 200g	6.44	5.73ab	5.90	5.80ab	5.86
MATURE POWDERED FRUIT					
T2 150g	5.94	5.42b	5.56	5.42b	5.76
T3 200g	6.49	5.94ab	6.05	5.85ab	6.77
RIPE POWDERED FRUIT					
T2 150g	6.18	5.62ab	5.23	5.16	5.35
T3 200g	6.20	5.70	5.28	5.21	5.48

The above table shows that the highest overall acceptability of the powdered lolly fruit seasoning is “Like Moderately” with a mean score of 6.77 as reflected by the 200g of matured fruit while the lowest acceptability score is “Neither Like nor Dislike” with a mean score of 5.35 as seen in Treatment 2 of the riped lolly fruit. This means that Treatment 3 of the matured lolly fruit is extremely acceptable while Treatment 2 of the riped lolly fruit is neither acceptable nor not acceptable as described by the respondents. This is due to the titrable acidity content of the lolly fruit that

makes Treatment 3 of the matured fruit to be more acceptable than the other stages of maturity in the fruit. No significant difference existed in the aroma and flavor of the powdered lolly fruit except Treatment 2 with 150g of powdered lolly fruit. This is due to the amount of powdered fruit added to the fish stew when being evaluated.

Table 3. Summary of Mean Sensory Characteristics of Fresh Lolly Fruit Sour Seasoning

Descriptive Attributes	Color	Aroma	Taste	Flavor	Overall Acceptability
T1 Control (No Santol Fruit)	6.60	6.71a	6.11	6.56a	6.24
IMMATURE FRESH FRUIT					
T2 150g	6.29	6.22ab	5.10	5.51ab	5.01
T3 200g	6.54	5.66ab	5.60	5.54ab	5.86
MATURE FRESH FRUIT					
T2 150g	6.02	5.83ab	5.74	5.72ab	5.88
T3 200g	6.92	5.34b	5.44	5.41b	5.52
RIPE FRESH FRUIT					
T2 150g	5.89	5.63ab	5.18	5.18	5.33
T3 200g	5.93	5.82ab	5.26	5.20	5.47

The above shows the overall acceptability of the fresh lolly fruit when added to fish stew reflected the highest mean score in Treatment 2 on matured fresh lolly fruit while the lowest mean score of 5.33 is posited by treatment 2 of the fresh ripe lolly fruit. This means that fresh lolly fruit varies in terms of acid composition as it matures. This further implies that the acidity level (Ph) increases as it matures and decreases as it ripens.

In terms of flavor and aroma, a significant difference existed on treatment 3 of the fresh matured lolly fruit as an alternative seasoning in fish stew. Taste sensory characteristics of fresh lolly fruit did not show any significant differences in the stages of maturity of the fresh lolly fruit.

Further scrutiny of the table, the sensory characteristics of the fresh lolly fruit declined as it reaches maturity. This may be due to the decline in flesh tissue density that has attributed to the maturity of the fruit where a high degree of sweetness is attained thereby the titratable acidity is reversed and Ph level decreases. Lolly Fruit color retains its appearance as it matures.

The below table showed a significant difference on the sensory characteristic of the Powdered and fresh lolly fruit in terms of Flavor for Treatment 2 and Treatment 3 respectively. This implies that the evaluators were undecided on the flavor of both powdered and fresh matured lolly fruit as an alternative seasoning in fish stew. This further implies that degree of titrable acid content of the lolly fruit. Treatment 2 on the fresh lolly fruit is more preferred than treatment 3 while Treatment 3 on the powdered lolly fruit is more preferred than Treatment 2. This implies that the 150g of fresh lolly fruit is enough to season the fish stew while an additional amount (200g) of matured powdered lolly fruit is needed to meet the ideal sharp sour flavor. No significant difference existed between and among the other sensory characteristic of the powdered and fresh lolly fruit when used as an alternative fish stew seasoning.

Table 4. Sensory description of the Fish Stews with Fresh and Powdered Santol Sour Seasoning Agent

Treatment	Color	Aroma	Taste	Flavor	Overall Acceptability
T1 Control	6.60	6.71a	6.11	6.56a	6.24
POWDERED IMMATURE FRUIT					
T2 150g	6.23	5.87ab	5.78	5.56ab	5.62
T3 200g	6.44	5.73ab	5.90	5.80ab	5.82
POWDERED MATURE FRUIT					
T2 150g	5.94	5.42b	5.56	5.42b	5.76
T3 200g	6.49	5.94ab	6.05	5.85ab	6.77
POWDERED RIPE FRUIT					
T2 150g	6.18	5.62ab	5.23	5.16	5.35
T3 200g	6.20	5.70	5.28	5.21	5.48
FRESH IMMATURE FRUIT					
T2 150g	6.29	6.22ab	5.10	5.5ab	5.01
T3 200g	6.54	5.56ab	5.60	5.54ab	5.86
FRESH MATURE FRUIT					
T2 150g	6.02	5.83ab	5.74	5.72ab	5.88
T3 200g	6.92	5.34ab	5.44	5.41b	5.52
FRESH RIPE FRUIT					
T2 150g	5.89	5.63ab	5.18	5.18	5.33
T3 200g	5.93	5.82ab	5.26	5.20	5.47

Conclusion

Based on the results of the study, the proximate composition of the lolly fruit when powdered and compared, it is concluded that:

1. Physiochemical properties and nutrient composition of lolly fruits differ according to fruit parts and maturity. Nevertheless, the values obtained are comparable and even better than some conventional fruits used as souring agents reported in literatures.
2. Lolly fruits could be an inexpensive source of essential nutrients, vitamins, and minerals that are abundant in the peel, seeds, immature, mature, ripe fruits. Due to their high fiber and low total soluble solids, total sugar, carbohydrates contents, lolly fruits can be a potential raw material for the development of various low carbohydrate food products.
3. Because of their comparable acceptability, the dried, powdered immature and mature lolly fruits may be used as a souring agent for domestic consumption, and for food industry.

Acknowledgement

The authors would like to thank Dr. Gregorio T. Turqueza Jr., College President; Dr. Noel B. Begnalen, Vice President for Academic Affairs; Dr. Pablo B. Bose Jr., Director for Research and Development; Dr. Nero M. Paderes, Deputy Director for Research, for their endless support and encouragement towards the completion of this work.

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