The Potential of Katmon Fruit (DelleniaPhilippinensis) Extract as a Natural Food Preservative

Abstract.
Food preservation is one of the important strategies to maintain the shelf life of our foods. We have a lot of ways to preserve foods by putting them in the fridge and buying chemical content about preservation in our food. Katmon fruit is a more acidic and can be used as a natural food preservative. All wild fruits have an acidic type, but Katmon fruit has more antioxidant properties. KatmonFruit,orDelleniaPhilippinensis,can be seen in some areas worldwide, including India, Malaysia, and the Philippines. We see it in the wild areas in the Philippines. Katmon or DelleniaPhilippinensis is a green applefruit; we can eat it raw. It has a sour taste that others can't appreciate. This study aims to create a natural food preservative from the extract of Katmon fruit or DelleniaPhilippinensis, which is a main base ingredient in preserving food without any chemicals added.

Keywords: Food preservation, antioxidant, katmon fruit, and DelleniaPhillipinensis

INTRODUCTION

Katmon fruit, also known as Dilleniaphilippinensis, is a wild fruit tree that we commonly see in areas in the Philippines,especially in Mindanao. We can eat Katmon raw, and it is juicy and refreshing. It has a sour taste that I mostly can't appreciate. But if you love the sour taste, you can love this fruit. In Mindanao, especially the wild area of Bacuag,plenty of Katmon fruit is wasted because they don't desire it. The researcher got interested in the potential of katmon fruit (DelleniaPhilippinensis) as a natural food preservative.Because in some areas here in Bacuag,everybody does not notice this fruit. The extract of Katmon Fruit or DilleniaPhilippinensishas high antioxidant content. It can be used as a natural food preservation,which means it is a primary ingredient in food preservation. The antioxidant effect of the fruit is due to the sour taste and the presence of another mineral that can help protect and fight the microbacteria in the food. There are also health benefits from this fruit extract of Katmon;itsignificantly contributes to the prevention of long-term conditions such as cancer and heart disease and can treat additional ailments like fever, dysentery, and diarrhea. It is rich in vitamin A for vision and vitamin C for immunity. It supports both systems well. This study aims to create instant food preservatives from the extract of katmon fruit (DelleniaPhilippinensis). This study aims to determine the shelf life of food after we apply the Katmon extract to the foods.

MATERIALSANDMETHODS

1.1 Materials

The overall need to create a natural food preservative extract is to procure in the wild Katmon fruits. Fresh water and sugar.

1.2 Production of fruit extract

Fresh pick and not freshKatmonFruitorDelleniaPhilippinensis fruit that in the grounds can be used. It would be washed and cleaned. The seed is already pinched and put in the 1L jar, and it can be soaked with 500 grams of warm water. Then add 75g of sugar. Gradually mix it in 2 minutes. Then, store it at room temperature for 3-7 weeks. Every day until the extract is fermented, you can mix it in 2 minutes.

Pic 1. Steps in making Acetic Acid Solution from the Fruit extract:
1. put the pinched seed of the fruit in 1L jar.
2. add 500 grams of warm water
3. add 75 grams of sugar
4. mixed for around 2 minutes
5. cover a clean white cloth and store in room temperature for 3-7 weeks.
6. see the result after 7 weeks.


3 4


5 6


1.3 Measurement

The extract we get after the process of extract production has a presence of acetic acid that can be present in the extract andused in food preservation. Around 25% to 80% of an aqueous solution ofacetic acid. There are also chemical constituents and vitamins from the extract in the katmon fruit (DelleniaPhilippinensis), such as vitamins C, A, and E, Potassium, Fiber, and minerals. In 100g of an extract, there are 52 to 72 milligrams of vitamin C. Per 100g of an extract, there are 20 to 30 of Vitamin A. Per 100g, there are expected around 0.11 to 0.15 milligrams of vitamin E. It contains the following nutritive values:moisture,protein, fat, minerals, fiber,carbohydrates, calcium, and phosphorus.

2. Result and discussion

Adding the natural extract from said fruit to the food can generate a chemical process. Acetic acid is a chemical that regulates the microbacteria in food that can cause changes in color, texture, and odor from the original food. This acid would fight this problem.

2.1 Sensory Evaluation

The acetic acid from the extract of said fruit can kill the micro bacteria that can cause food spoilage after 30 minutes of soaking in the extract with an Acetic acid solution. This equation could determine the capacity of extract or solution in food preservation.

A. We can do a ratio proportion;
a:b=b:a
which is a time
which is b, which is the percentage of acetic acid.
60:12=x:12
12x/12=720\12
X= 60

In 12% acetic acid, the bacteria would kill in just 60 minutes.By this equation, we can predict how many days acetic acid would be consumed in food preservation. Acetic acid concentrations of 5% or higher can

effectively reduce bacterial numbers in food.

See Table 1. (Acetic Acid Solution in Minutes)

Minutes	Acetic Acid %
10	2.2%
20	4%
30	6%
40	8%
50	10%
60	12%

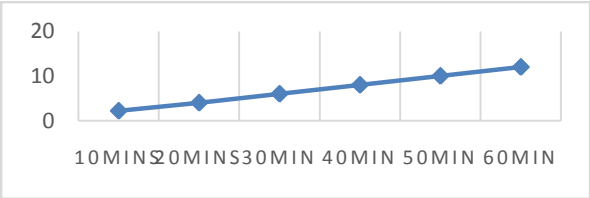

Fig 1. Sensory Evaluation curve

Whereas:
Y axes is representthe percentage of Acetic Acid
X axes is represent the minutes

In this solution and graph, in every minutes have a correspond acetic acid. For example;
You want to extend your food shelf life in 10 minutes you need to apply the 2.2% of acetic acid on your food, by this it can add more 10 minutes shelf life of the food.

B. Fruit extract from the said fruit has an antimicrobial capacity and it can generate through the amount of Acetic Acid to fight the microbacteria. There are around 4000 microbacteria in food in 30 minutes and can double in an hour. The 0.04% acetic acid can kill 200 ppm (Parts per Million) This means that in every 1 million bacteria if you apply 0.04% Acetic acid there's only 200 bacteria would killed. (see the the table below)

Table 2. Micro bacteria killed in the acetic percentage

Acetic acid %	Micro bacteria Killed(PPM)
0.01%	50 ppm
0.02%	100 ppm
0.03%	150 ppm
0.04%	200 ppm
0.05%	250 ppm

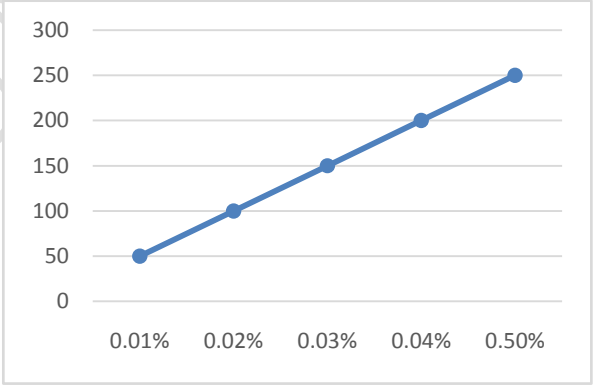

Fig 2.antimicrobial capacity

Whereas:
Y axes represent the number of bacteria
X axes represent the acetic need to kill the bacteria.
In this solution and graph, in every percentage of acetic acid have a correspond microbacteriaare killed. In 0.01% of acetic acid there are around 50 ppm (parts per million) bacteria can killed.

C. In every minute of applying the extract of the said fruit, there are 2.2% or 0.22 Acetic content and 66.7 ppm of bacteria. (see the table below)

Table 3. bacteria count in minutes with correspond acetic acid

Minutes	Acetic Acid %	Bactria Count
10min	2.2%	667
20min	4%	1340
30min	6%	2,010
40min	8%	2680
50min	10%	3350

The corresponding bacteria count has a corresponding acetic acid in a given time.
Whereas; in every 10 minutes there are 667 counts of bacteria present in the food and can killed it with the 2.2% of acetic acid. By this if you can add more 10 minutes shelf life of your food.

3. Conclusion

Based on the research results, microorganisms like microbacteria can be killed in acetic acid. It depends on the corresponding amount of corresponds the percentage of acid in the food that can last for more days or it can add more shelf life of the food.

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