A Study of Soil Quality Affecting the Amount of Cyanide in *Tacca leontopetaloides* in the Rajamangala Beach, Trang.

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Abstract

The purpose of this project was to study the soil quality that affects the size of the tuber and the soil quality that affects the cyanide content in the *Tacca leontopetaloides*. Soil samples and tuber were collected from 2 areas: the area away from the beach and the area near to the beach. To analyze soil properties, including pH, Nitrogen value, phosphorus value, Potassium value, humidity, organic matter, soil texture and soil color, as well as analysis of cyanide content in tuber and flour obtained from processing. Soil samples were collected by digging the soil at a depth of 10 centimeters from the soil surface, randomly collecting 600 grams of soil samples of each sample, and randomly collecting samples of about 5 kilograms of tuber that the area near to the beach had sandy loam with brown and yellow soil, and the area away from the beach had a sticky loam with brown and yellow soil. The soil quality of the two regions did not differ statistically significantly in pH and nutrients, but they differed in soil moisture and organic matter content. The soil near to the beach area has less organic matter and moisture than the area away from the beach. Meanwhile, the results of the analysis of cyanide content in *Tacca leontopetaloides and in Tacca leontopetaloides's* flour were not different. No cyanide accumulation was detected in the two areas. The results of the study show that soil quality affects the size and weight of the plantain. Sandy loam soil is the right soil for planting Polynesian arrowroot. The information obtained can be used to increase the efficiency of cultivation and strengthen the safety of consumption of tuber products.

Keywords: *Tacca leontopetaloides*, Cyanide, Soil Quality

Introduction

Tacca leontopetaloides

tuber

Yarrow root's flour

Cyanide

Dizziness

Vomit

Research Questions

1. Is there a difference in soil quality between the beach and the remote areas? How?
2. Does soil quality affect the size and weight of the yarrow root?
3. Does soil quality affect the cyanide content in yarrow root and in yarrow root's flour?

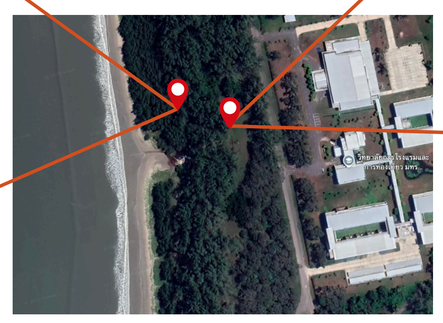
Hypothesis

1. Soil quality in the beach and far from the beach is different. Soil in the far from the beach is better than soil in the beach.
2. Soil quality affects the size and weight of the yarrow root.
3. Soil quality affects the cyanide content in yarrow root and in yarrow root's flour?

Procedure

Study sites

Ratchamongkol beach, Sikao District, Trang Province Area near the beach (Latitude 7°31'33" N, Longitude 99°18'30" E)



Ratchamongkol beach, Sikao District, Trang Province Area away from the beach (Latitude 7°31'30" N, Longitude 99°18'29" E)

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Visit the area to collect soil samples and the tuber of *Tacca leontopetaloides.*

1

2

Record data into the GLOBE database

Weighing and measuring the size of the tuber of the Polynesian arrowroot

3

4

Soil quality analysis

Process the Polymesian anrrowroot into flour.

5

6

Statistical data analysis

7

Analysis of cyanide content in cassia flour and cassia root

Results

Table 1: Shows the soil quality.

Study area	Soil quality (%)		pH	Soil nutrients		
	humidity	organic matter		Nitrogen	Phosphorus	Potassium
Beach front area	8.21 ± 2.15[a]	1.12 ± 0.62[a]	7.5 ± 1.30[a]	trace	trace	trace
Far from the beach area	14.21 ± 1.76[b]	2.20 ± 0.56[b]	7.2 ± 1.21[a]	trace	low	trace

Table 2: Shows soil texture and soil color.

Study area	soil texture	soil color
Beachfront area	Sandy loam	brown mixed with yellow (2.5Y 5/3)
Far from the beach area	Clay loam	brown mixed with yellow (2.5Y 7/4)

Table 3: Shows the size and weight of the head of *Tacca leontopetaloides*.

Study area	Average data of *Tacca leontopetaloides* (per capita)		
	Horizontal circumference (cm)	Vertical circumference (cm)	Head weight (grams)
Beachfront area	37.3 ± 5.27[a]	15.8 ± 3.94[a]	633.92 ± 221.68[a]
Far from the beach area	26.6 ± 4.22[b]	15.2 ± 4.73[a]	256.23 ± 81.6[b]

Table 4: Shows the amount of cyanide in cassia tuber and cassia flour.

Study area	Cyanide content (mg/L CN-)	
	Tacca leontopetaloides	flour
Beachfront area	N/A	N/A
Far from the beach area	N/A	N/A

Note: N/A means no cyanide was detected.

Conclusion

1. Soil quality, soil texture and soil color of both areas are different, but pH, nitrogen and potassium values are not different. The area near the beach has lower soil moisture, soil organic matter and soil phosphorus than the area far from the beach. The soil near the beach is sandy loam soil, while the area far from the beach is clay loam soil. Soil quality also affects soil color. The soil near the beach has lower organic matter, making the soil lighter in color than the area far from the beach.
2. The size of the tuber is different between the two study areas. The tuber near the beach have higher average size and weight than the area far from the beach because Polynesian arrowroot grow well in soils that can drain well, have low soil moisture and can grow in soils with less organic matter.
3. No cyanide accumulation was found in Polynesian arrowroot and flour in both areas because the soil quality and texture of both areas are suitable for the growth of Polynesian arrowroot. As a result, linamarin or cyanide precursors in yarrow bulbs are not produced under unsuitable conditions.

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