Study water, soil and air quality that effects density of Caulerpa corynephora in mangrove forest Ban Khok Ok, Trang

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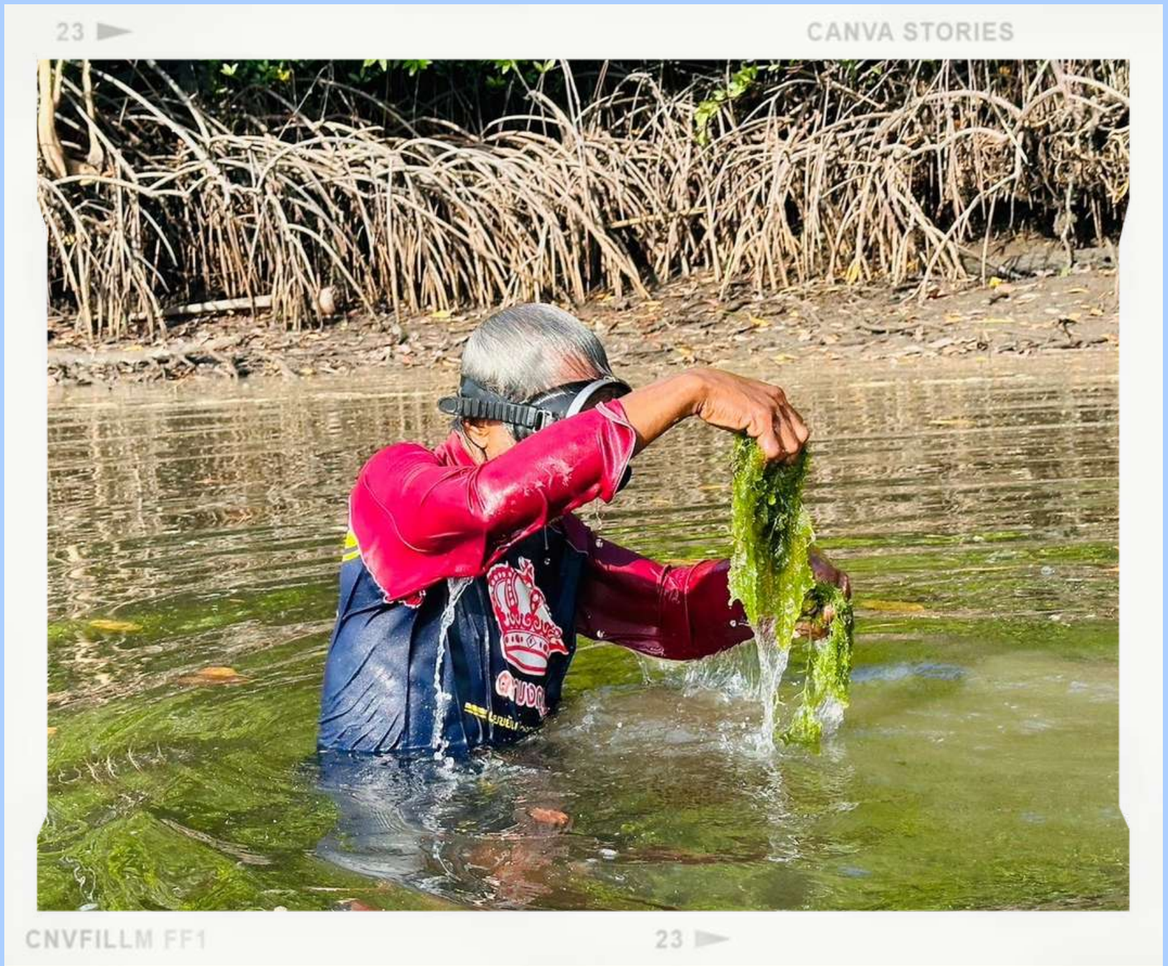
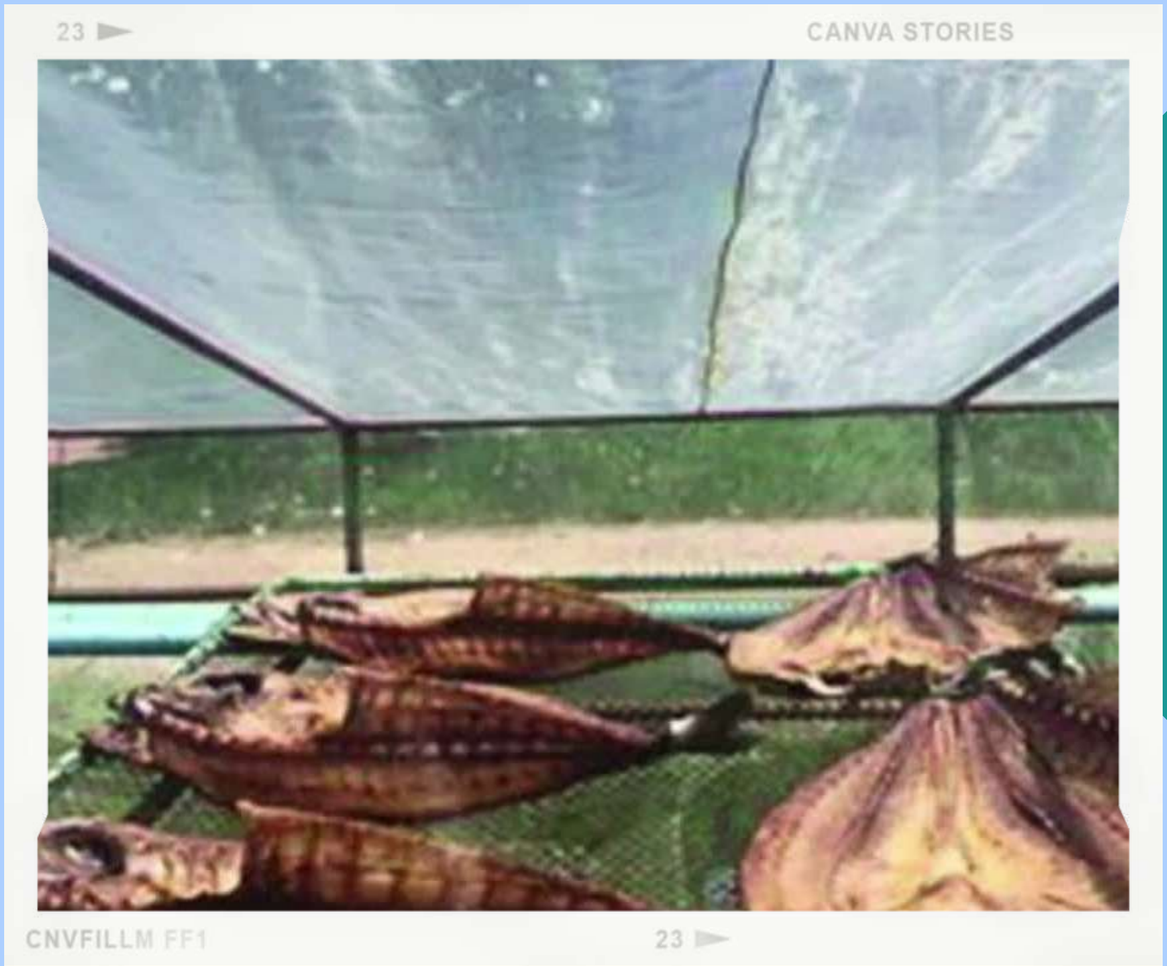
Introduction

Introduction





Introduction

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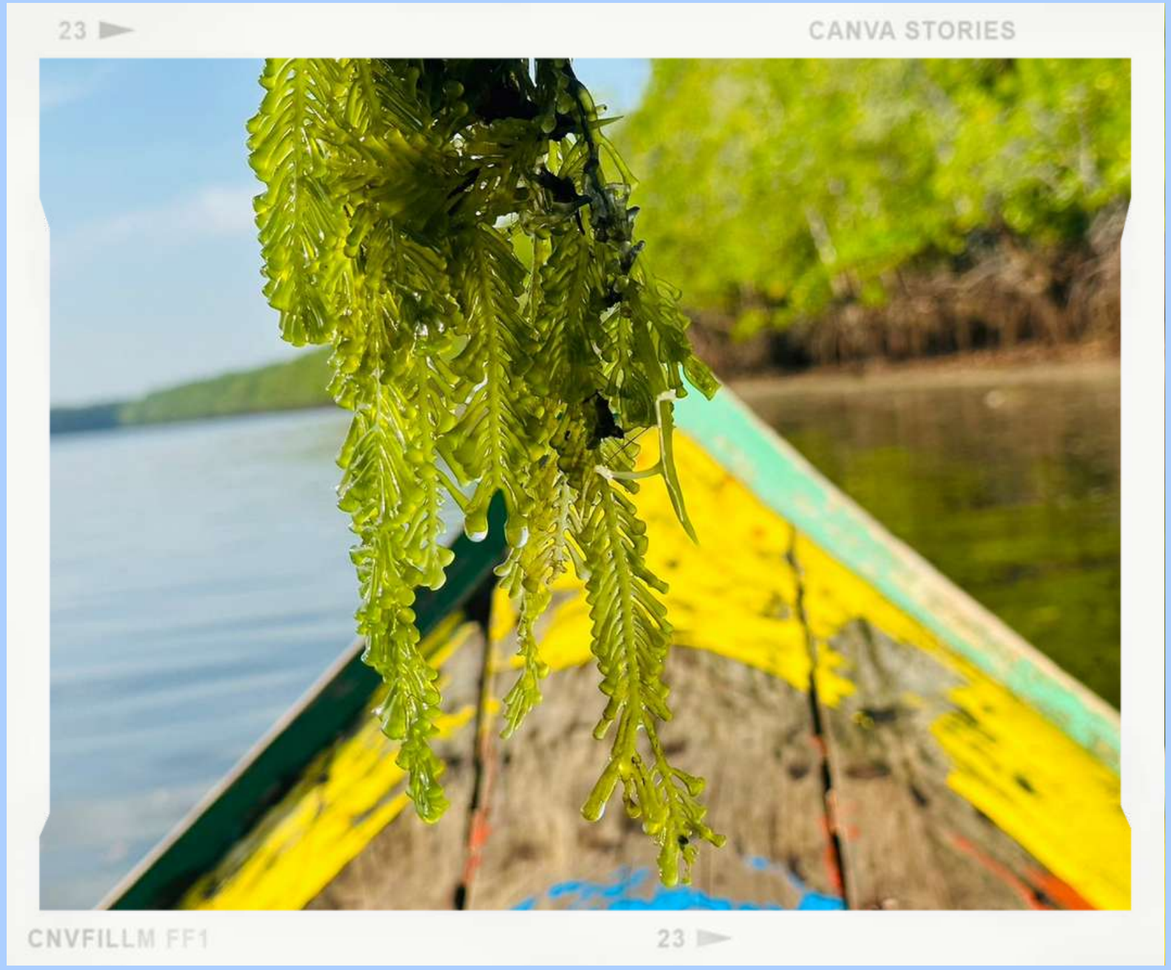


Research Objectives

1. To study the water quality affects the density of Caulerpa corynephora in the Khok Ok Mangrove forest area, Hat Samran District, Trang Province.

2. To study the soil quality affects the density of Caulerpa corynephora in the Khok Ok Mangrove forest area, Hat Samran District, Trang Province.

3. To study the air quality affects the density of Caulerpa corynephora in the Khok Ok Mangrove forest area, Hat Samran District, Trang Province.

4. To study the growth of Caulerpa corynephora cultivated under controlled water quality conditions close to natural water in the Khok Ok area.

Research Question

1. Does water quality affect the density of Caulerpa corynephora in the Khok Ok mangrove forest area, Hat Samran District, Trang Province?

2. Does soil quality affect the density of Caulerpa corynephora in the Khok Ok mangrove forest area, Hat Samran District, Trang Province?

3. Does air quality affect the density of Caulerpa corynephora in the Khok Ok mangrove forest area, Hat Samran District, Trang Province?

4. Will Caulerpa corynephora thrive when cultivated with controlled water quality similar to natural water in the Khok Ok area?

Research Hypothesis

1. Water quality affects the density of Caulerpa corynephora in the Khok Ok mangrove forest. Hat Samran District, Trang Province.

2. Soil quality affects the density of Caulerpa corynephora in the Khok Ok mangrove forest. Hat Samran District, Trang Province.

3. Air quality affects the density of Caulerpa corynephora in the Khok Ok mangrove forest. Hat Samran District, Trang Province.

4. Caulerpa corynephora grown by controlling the water quality to be similar to the natural water of Ban Khok Ok will grow well.

Related variables

Hypothesis 1. Water quality affects the density of Caulerpa corynephora in the Khok Ok mangrove forest. Hat Samran District, Trang Province.

Independent variable : Quality of water in the mangrove forest area.
Dependent variable : Density of Caulerpa corynephora.
Control variables : size of the study area, date of survey, instruments used in the survey.

Related variables

Hypothesis 2. Soil quality affects the density of Caulerpa corynephora in the Khok Ok mangrove forest. Hat Samran District, Trang Province.

Independent variable : Quality of soil in the mangrove forest area.
Dependent variable : Density of Caulerpa corynephora.
Control variables : size of the study area, date of survey, instruments used in the survey.

Related variables

Hypothesis 3. Air quality affects the density of Caulerpa corynephora in the Khok Ok mangrove forest. Hat Samran District, Trang Province.

Independent variable : Quality of air in the mangrove forest area.
Dependent variable : Density of Caulerpa corynephora.
Control variables : size of the study area, date of survey, instruments used in the survey.

Related variables

Hypothesis 4. Caulerpa corynephora grown by controlling the water quality to be similar to the natural water of Ban Khok Ok will grow well.

Independent variable : Water quality for Caulerpa corynephora cultivation.
Dependent variable : weight of Caulerpa corynephora.
Control variables : size of the study area, date of survey, instruments used in the survey.

GLOBE Protocols

Pedosphere (soil) soil measurement methods

Hydrosphere water measurement methods

Atmosphere atmospheric measurement methods

Materials

Thermometer

Water quality measurement set

Secchi Disk

Plankton net

Salinity Refractometer

Conductivity Meter

Plant Color Guide

Quick Soil Test

Universal Indicator

Beaker, Erlenmeyer flask

Filter paper

CU Smart Lens

Google Maps

Weighing Scale

Wire mesh grid

Methods

Study area 1

Determine the study location

The mixed mangrove forests

Methods

Study area 2

Determine the study location

The majority of the mangrove forests are mangroves

Methods

Part 1: To study water quality affects the density of Caulerpa corynephora in the Khok Ok mangrove forest area, Hat Samran District, Trang Province.

1.Measure the acidity and base values of the water.

Methods

2. Measure the temperature of the water.

Methods

3. Measure the amount of dissolved oxygen in the water.

Methods

4. Measure the transparency of the water.

Methods

5. Measure the salinity of water.

Methods

6. Measure the electrical conductivity and Nitrate of water.

Methods

Part 2: To study soil quality affects the density of Caulerpa corynephora in the Khok Ok mangrove forest area, Hat Samran District, Trang Province.

1. Study the physical characteristics of the soil by studying soil structure, soil texture and color by comparing with soil charts.

The mixed mangrove forests.

The majority of the mangrove forests are mangroves.

Methods

Part 2

2. Measure soil temperature and moisture.

Methods

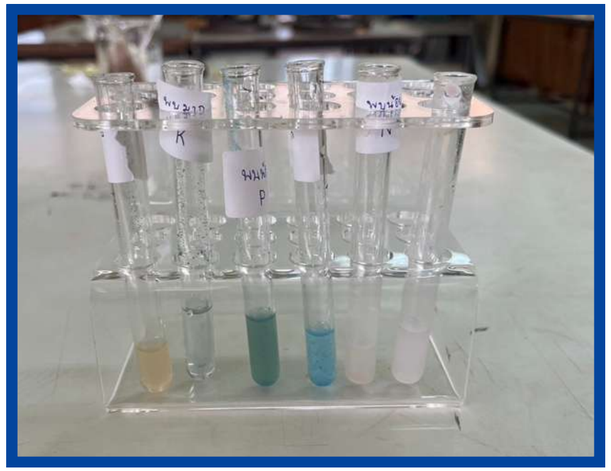
Part 2

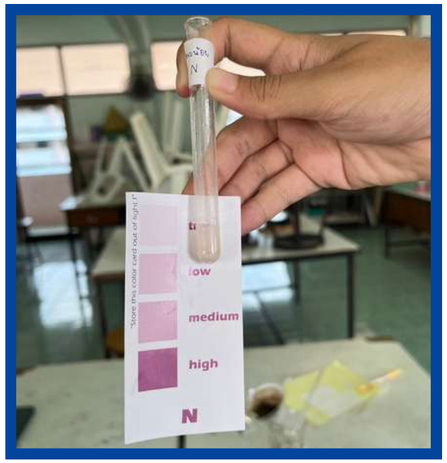
3. Measure the pH of the soil.

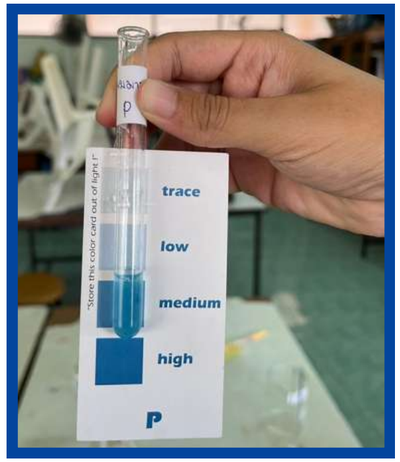
Methods

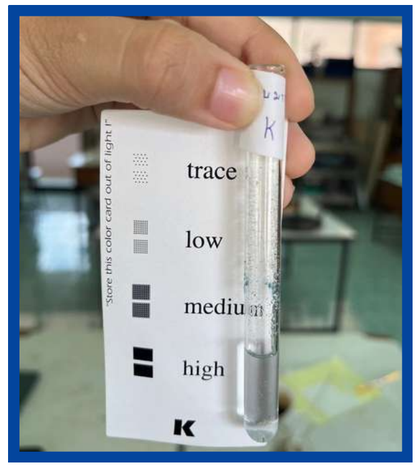
Part 2

4. Measure the amount of Nitrogen, Phosphorus, and Potassium in the soil.









Methods

Part 3: To study air quality affects the density of Caulerpa corynephora in the Khok Ok mangrove forest area, Hat Samran District, Trang Province.

Measure the relative temperature, humidity and light intensity in the air.

Methods

Part 4: Measures the density of Caulerpa corynephora.

Designate a study area around the mangrove forest area.

Methods

Part 5: To study the growth of Caulerpa corynephora that is cultivated by controlling the water quality to be similar to the natural water of Ban Khok Ok. Hat Samran District, Trang Province.

1. Prepare 3 experimental of 100 centimeters diameter basins, add seawater from the Khok Ok mangrove forest for the cultivation of Caulerpa corynephora.

Methods

Part 5

2. Measure the acidity, base, temperature, oxygen, salinity and electrical conductivity of the seawater within the 3 experimental basins to be similar to natural seawater.

Methods

Part 5

3. Weigh 100 grams of Caulerpa corynephora and place it in 3 experimental cultivation basins. Observe and weigh the Caulerpa corynephora every 1 week until 4 weeks. Record the Caulerpa corynephora growth results.

Results and Discussion

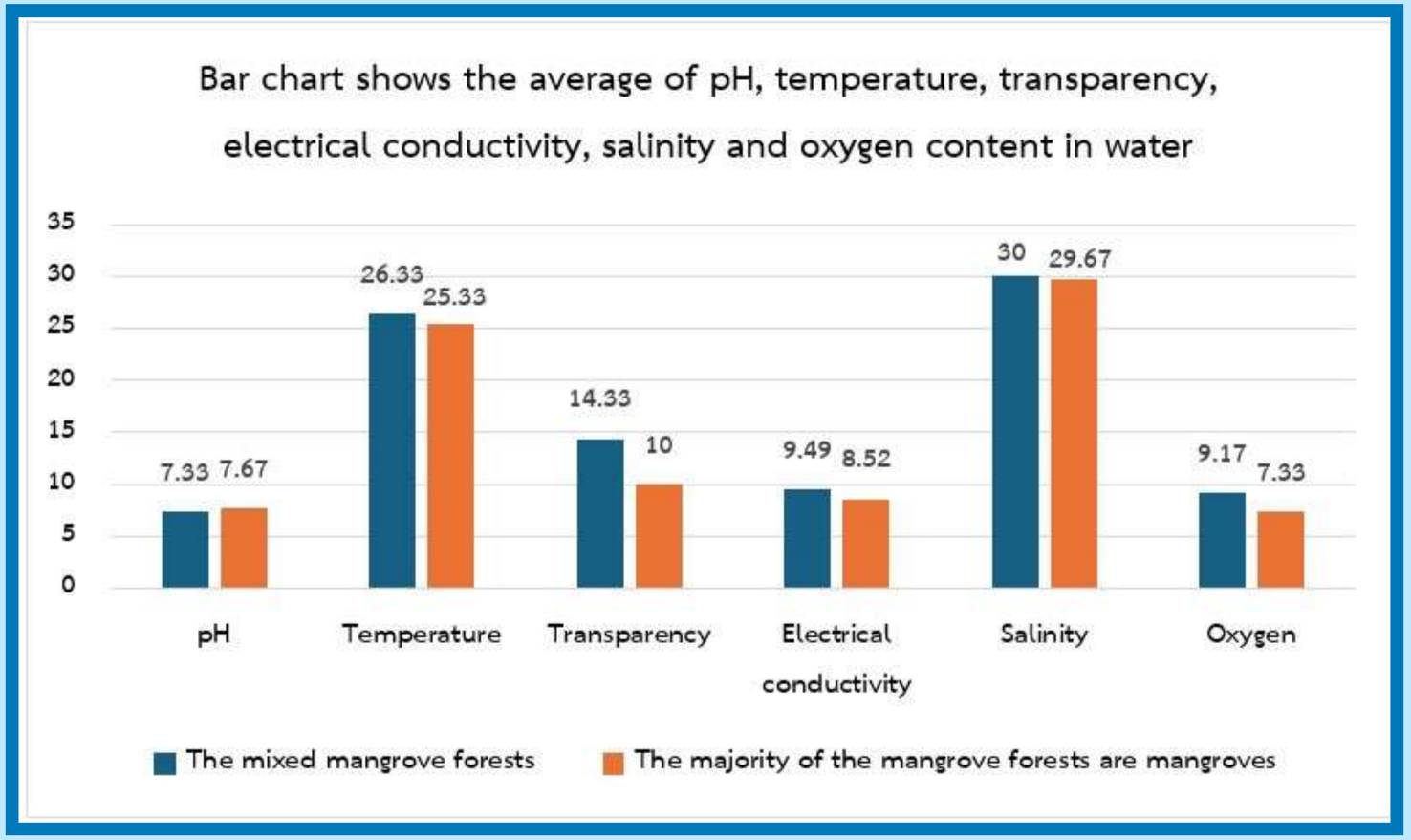
Geographic coordinates

Area	Geographic coordinates	
	Latitude(N)	Longitude(E)
The mixed mangrove forests	7.2198430	99.5940921
The majority of the mangrove forests are mangroves	7.2120181	99.6009873

Table 1 shows the geographic coordinates.

Results and Discussion

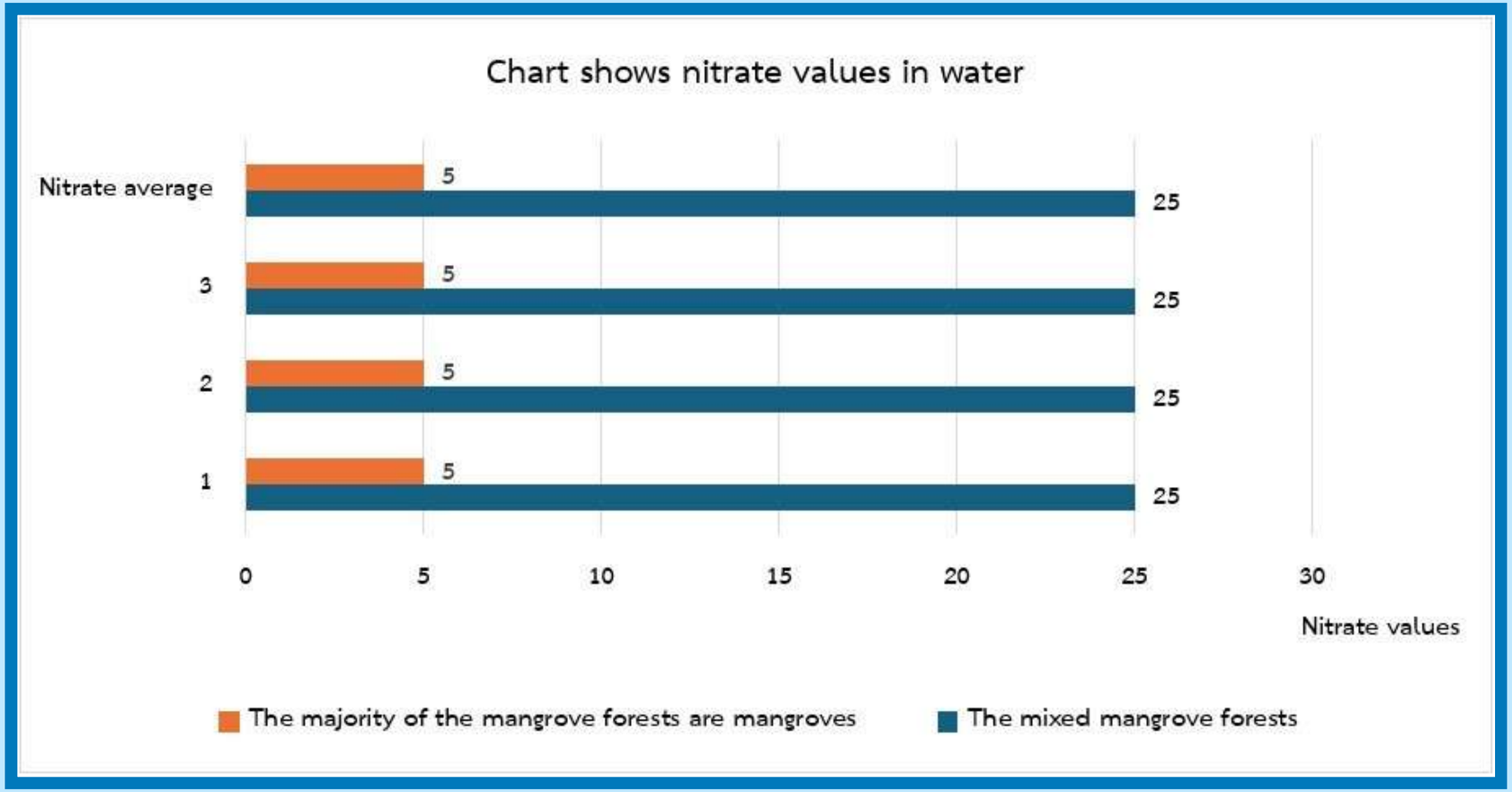
water quality



Bar chart 1 shows the average of pH, temperature, transparency, electrical conductivity, salinity and oxygen content in water.

Results and Discussion

water quality



Bar chart 2 shows nitrate values in water.

Results and Discussion

soil quality

Mangrove forest area	Picture of soil structure	Soil color	Soil cohesion	soil texture
The mixed mangrove forests		7.5YR 2.5/1 Black	Tight soil adhesion	Clay loam
The majority of the mangrove forests are mangroves		7.5YR 2.5/2 V. Dark Brown	Tight soil adhesion	Silty clay

Table 2 shows soil structure, soil cohesion, soil color and soil texture in the Khok Ok mangrove forest area.

Results and Discussion

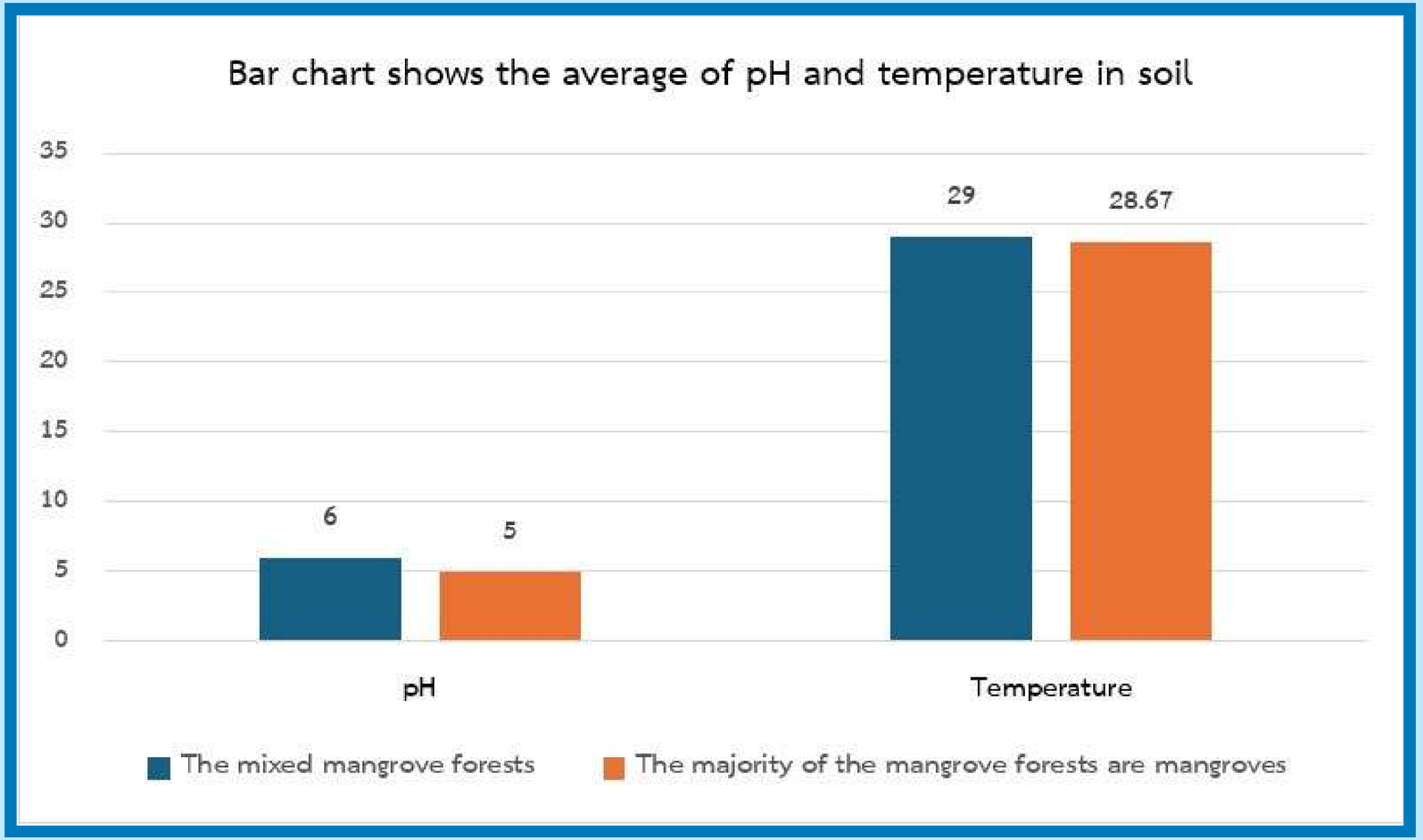
soil quality

Mangrove forest area	Soil fertility		
	Nitrogen	Phosphorus	Potassium
The mixed mangrove forests	Little	Medium	Medium
The majority of the mangrove forests are mangroves	Little	Little	Little

Table 3 shows the soil fertility of each zone in the Khok Ok mangrove forest area.

Results and Discussion

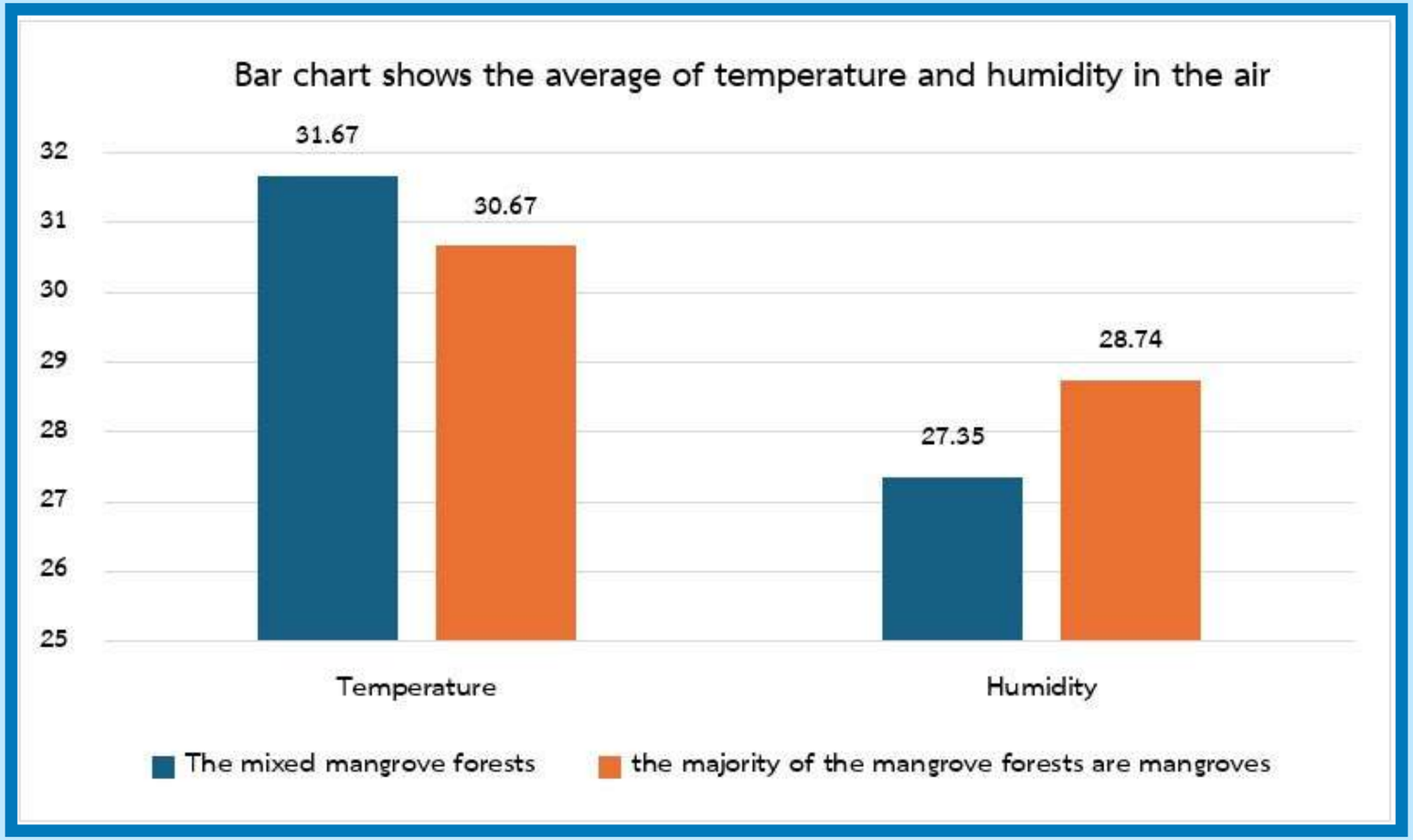
soil quality



Bar chart 3 shows the average of pH and temperature in soil.

Results and Discussion

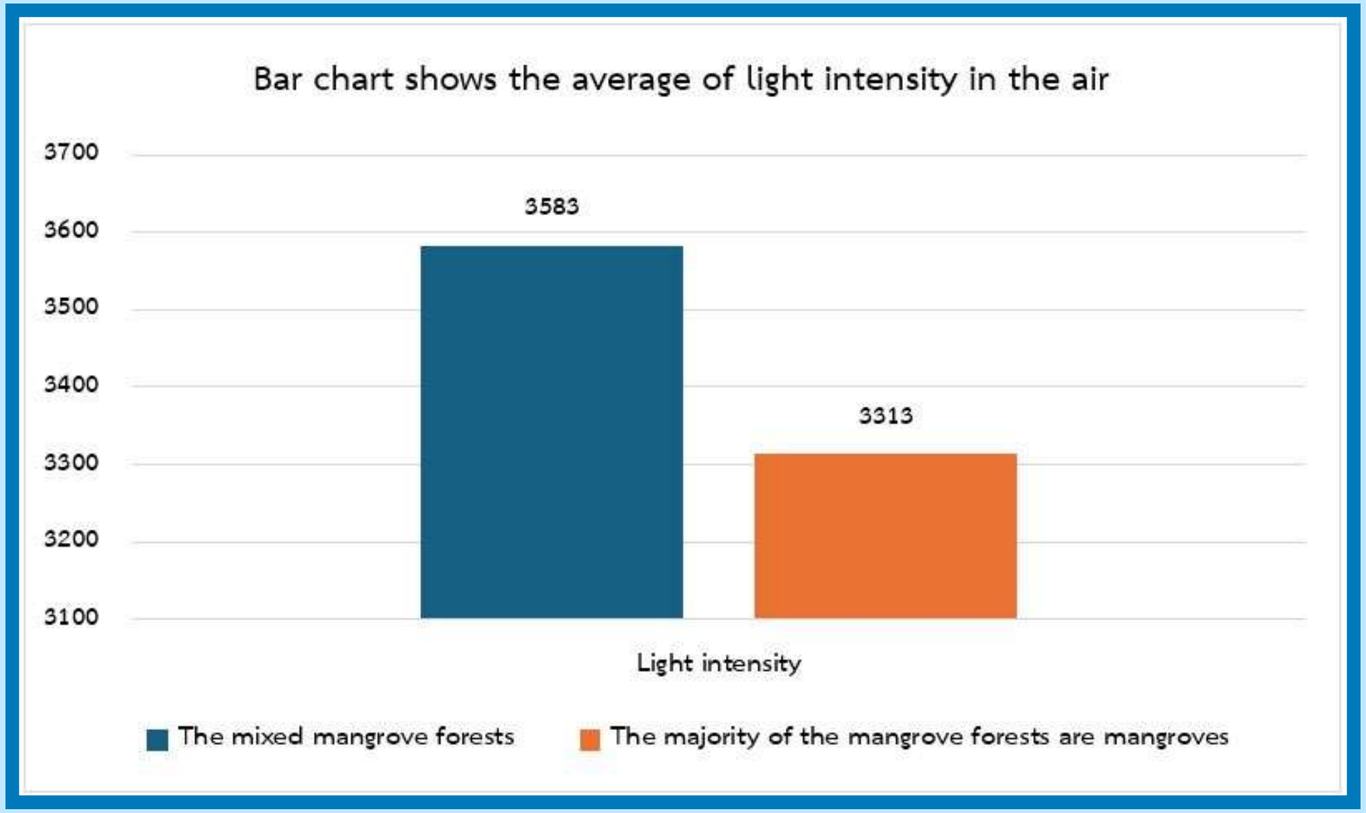
air quality



Bar chart 4 shows the average of temperature and humidity in the air.

Results and Discussion

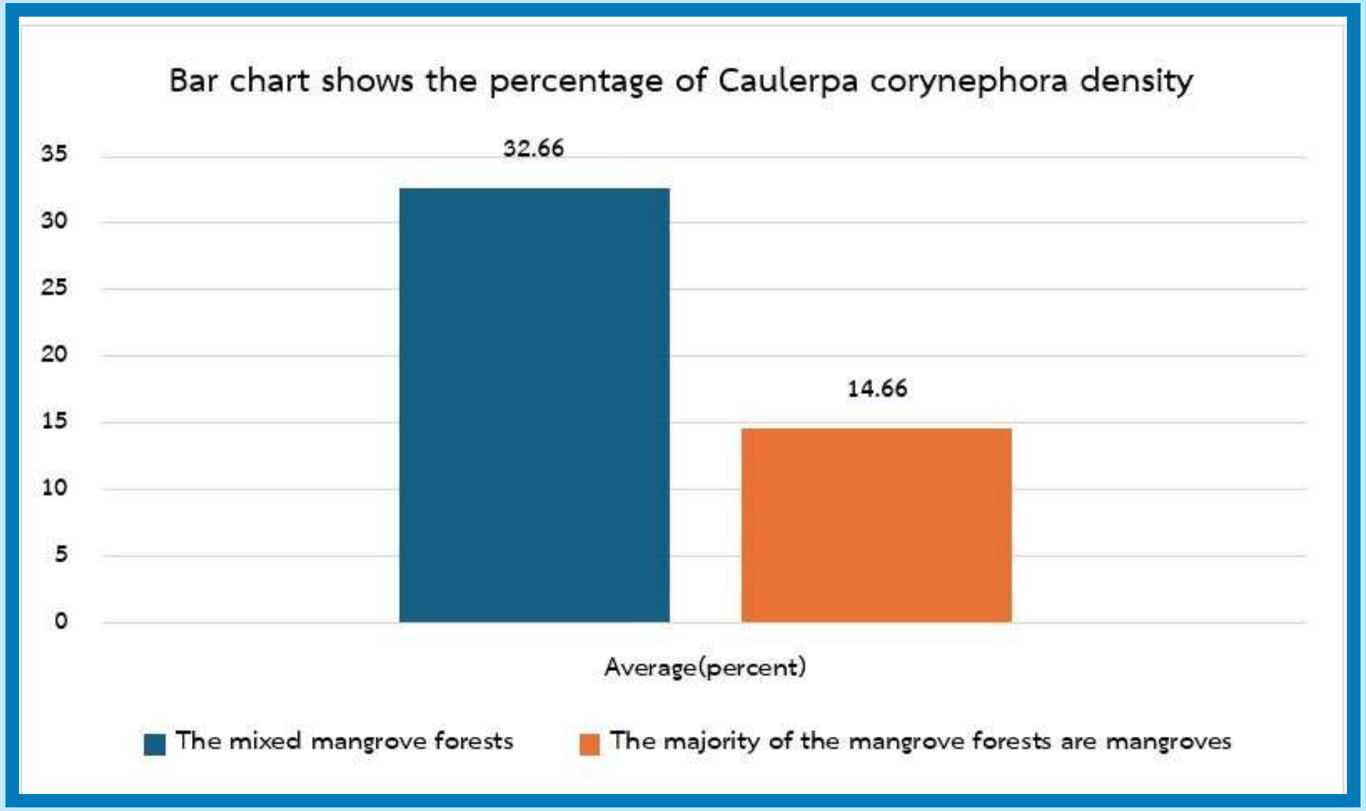
air quality



Bar chart 5 shows the average of light Intensity in the air.

Results and Discussion

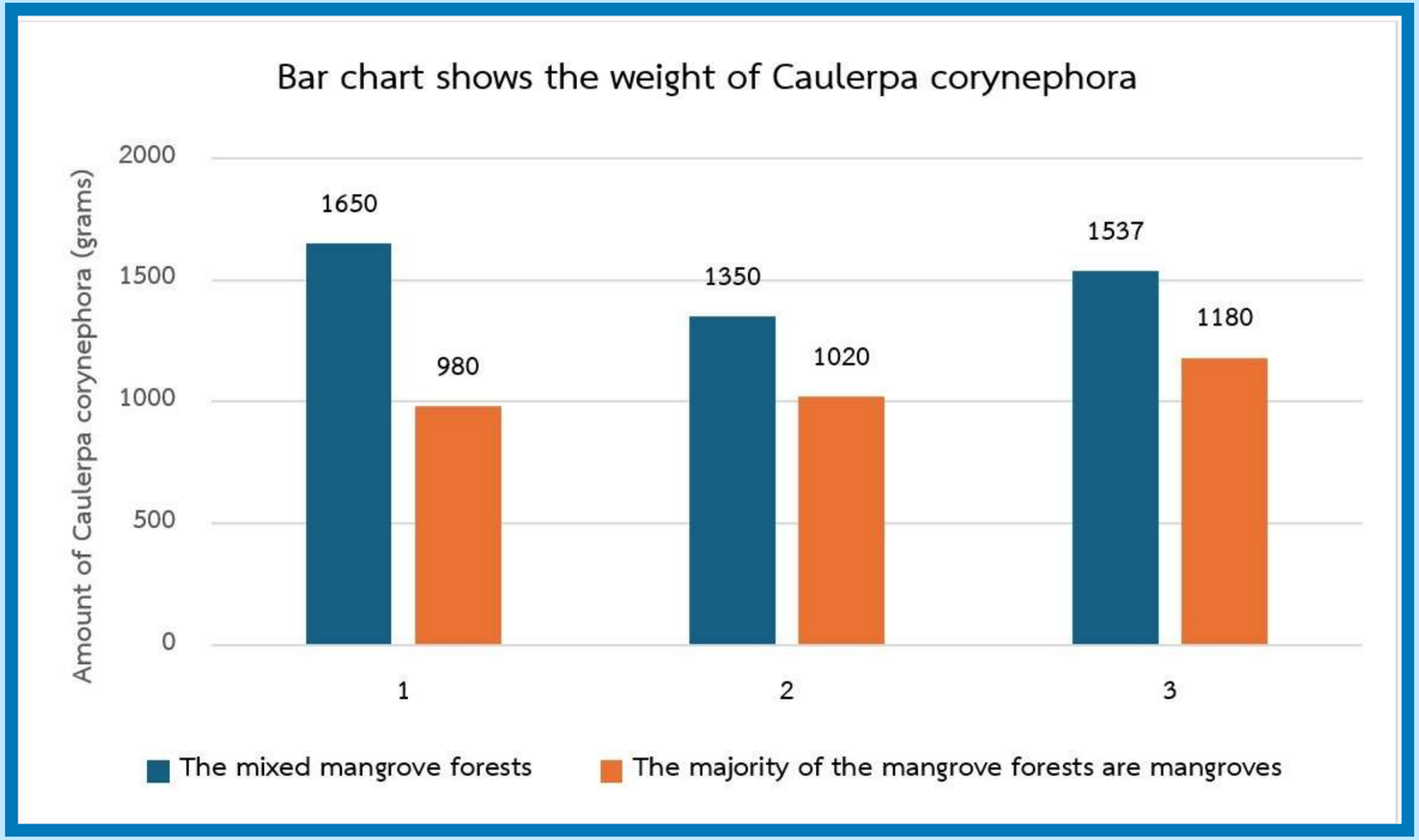
Caulerpa corynephora



Bar chart 6 shows the percentage of Caulerpa corynephora density.

Results and Discussion

Caulerpa corynephora



Bar chart 7 shows the weight of Caulerpa corynephora.

Results and Discussion

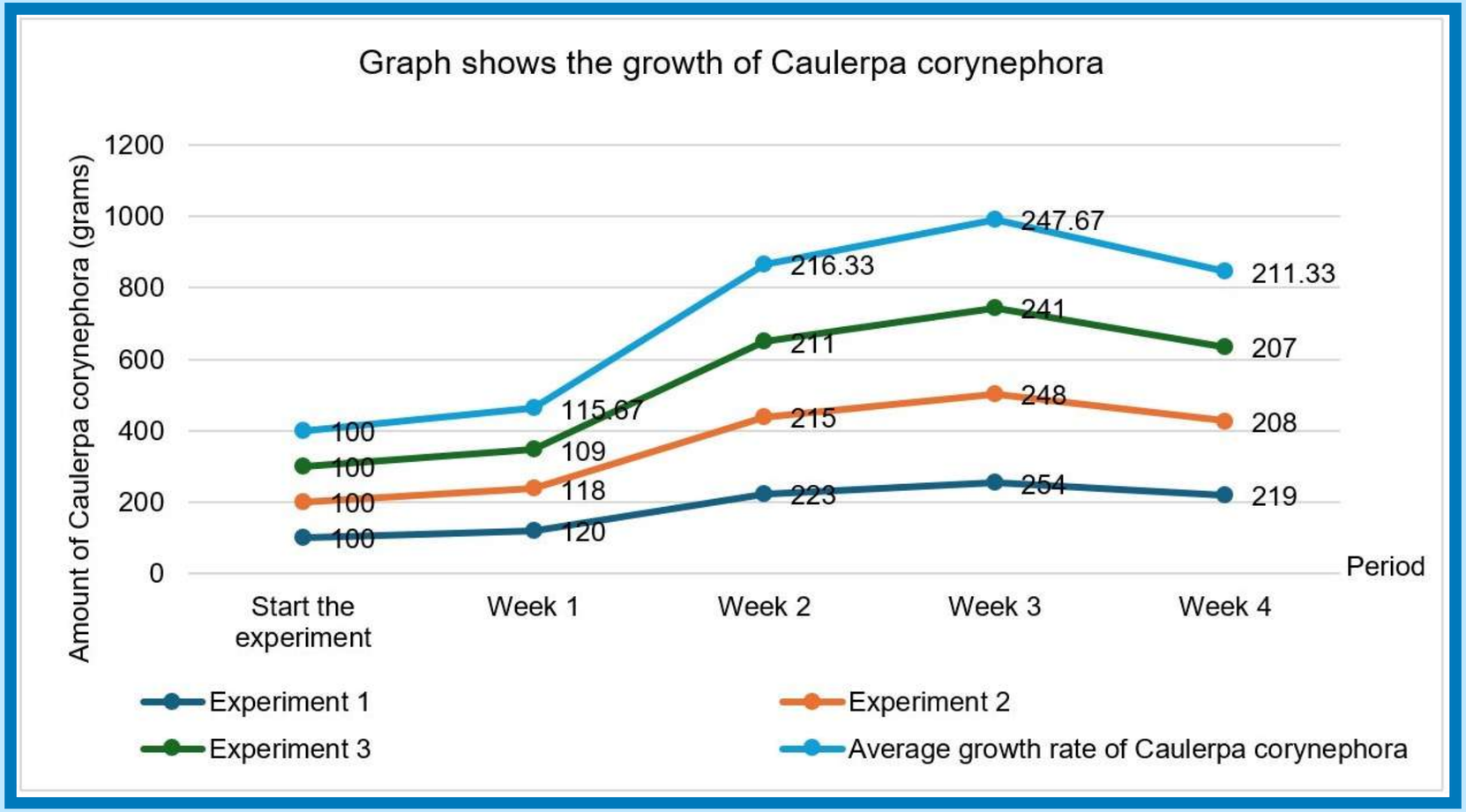
Caulerpa corynephora

Mangrove forest area	Color of Caulerpa corynephora		
	1	2	3
The mixed mangrove forests	5GY5/10 Green	5GY5/10 Green	5GY5/10 Green
The majority of the mangrove forests are mangroves	5GY6/10 Light green	5GY6/10 Light green	5GY6/10 Light green

Tables 4 shows color of Caulerpa corynephora.

Results and Discussion

Caulerpa corynephora



Graph shows the growth of Caulerpa corynephora.

Conclusion

From the study of soil quality, water quality and air quality in both areas is based on the hypothesis that the quality of water, soil and air affect the density of Caulerpa corynephora in the Khok Ok mangrove forest, Hat Samran District, Trang Province and Caulerpa corynephora grown by controlling the water quality to be close to nature will grow well. It was found that the area with the mixed mangrove forests had more minerals in the soil. The transparency value, the nitrate content and the oxygen content in the water are higher. And the higher light intensity of the air results in a higher density of Caulerpa corynephora. And from an experiment in raising Caulerpa corynephora using seawater from the Khok Ok mangrove forest, areas where more Caulerpa corynephora were found to grow most rapidly in the second week of cultivation.

Thank You