

Research title : A study of soil quality in herb gardens in Thung Khai Botanical Garden
Yan Ta Khao District, Trang Province Thailand

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Abstract

The purpose of this research was to study the quality of herb garden soil. by studying soil quality at Thung Khai Botanical Garden Yan Ta Khao District, Trang Province Thailand. Three study points were identified, namely zone 1 under the Resak tembaga, zone 2 under the White meranti and zone 3 under the Knema globularia (Lam.) Warb By studying the pH, temperature and nutrients in the soil such as nitrogen, phosphorus and potassium. These characteristics will indicate the quality of the soil. The study found that pH, temperature, soil nutrients are suitable for plant growth. On average, the 3 areas were different and the results of this experiment could be used to further improve the soil quality for further planting.

Keywords : soil quality, herb garden, soil nutrients

Acknowledgments

This research study of soil quality in herb gardens in Thung Khai Botanical Garden Yan Ta Khao District, Trang Province Thailand that success due to the great favor from who gave good advice.

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Introduction

Medicinal plants are natural products extracted from plants, animals and minerals, which are used as drugs or mixed with other substances in drug formulations to treat diseases and nourish the body. There are about 200 kinds of medicinal plants in the world that play a huge role in people's lives. For example, it is a medicine for curing diseases, a food, a nutritional supplement, an antidote, a drink, an insect repellent or an insect repellent. Therefore, researchers are interested in studying the diversity and benefits of medicinal plants. Trang Province is the site of Thung Khai Botanical Garden, Yan Ta Khao District, Trang Province Thailand, covering an area of 2600 farm, including rainforest, swamp and low hills. The Thung Khai Botanical Garden was 175 meters long and 18 meters high, has a rich ecosystem and has conducted close research on nature. The meters are located above the forest at the same level as the tree crown. Tourists can see various plants in the Thung Camp. Rich, including animals living in trees, such as birds, squirrels, monkeys, bats, etc. There is also a 1200-meter-long marsh natural trail, which takes 30-45 minutes to walk.

Thung Khai Botanical Garden Yan Ta Khao District, Trang Province Thailand, is a source of natural knowledge worth exploring. It is popular with tourists of all ages. Another lovely charm is the little guide. Which are youths from schools in nearby communities to help guide and educate about various plants.

Research Objectives

To study soil quality in herb gardens Thung Khai Botanical Garden Yan Ta Khao District, Trang Province Thailand.

Research Questions

pH value, temperature, soil nutrients of soils from herb garden 3 zone in Thung Khai Botanic Garden Yan Ta Khao District, Trang Province Thailand are there any difference.

Research Hypothesis

pH value, temperature, soil nutrients of soils from herb garden 3 zone in Thung Khai Botanic Garden Yan Ta Khao District, Trang Province Thailand are there different.

Materials and equipment and methods of conducting research

- | | |
|-----------------------------|---------------------|
| 1) Thermometer | 2) Pipett |
| 3) Erlenmeyer flask | 4) Filter paper |
| 5) Stirring rod | 6) Reagent Bottle |
| 7) Notebooks and stationery | 8) Beaker |
| 9) Test tube | 10) Filter funnel |
| 11) pH Meter | 12) Test Tube Stand |
| 13) Soil nutrient teste | |

GLOBE Protocols

Principles of Soil Measurement Pedosphere (Soil)

Study point determination

In the herb garden in the area of in the area of Thung Khai Botanical Garden, Thung Khai Sub-district, Yan Ta Khao District, Trang Province Thailand for sampling.

Research Method

1. Research preparation stage

- 1) Set up a study issue and select the topic that you want to study.

- 2) Study research gather knowledge and theories related to research.
- 3) Determine the purpose of the study.
- 4) Determine the sampling point in the study area.

2. Procedure

- 1) Make a research action plan.
- 2) Conduct a survey of the area to be researched.
- 3) Measure the soil quality according to the GLOBE method by measuring the temperature, pH and nutrients in the soil as follows:
 - 1) Specify the sampling point, divided into 3 study points, namely under the Resak tembaga, under the White meranti and under the Knema globularia (Lam.) Warb.
 - 2) Measure the soil temperature at every point by bringing a thermometer to measure the temperature and reading the soil temperature, collecting data 3 times.
 - 3) Collect soil samples, 80 g per area.
 - 4) Take 50 g of soil, dissolve with 100 mL of distilled water, then filter with filter paper. Bring soil water that has been put in a reagent bottles.
 - 5) Measure out 5 mL of each soil water, put it in a beaker, test it with a pH Meter, find the pH value, collect the data 3 times.
 - 6) Pipet 5 mL of each soil water into a test tube. Soil nutrient testers such as Nitrogen, Phosphorus and Potassium were added to test the nutrients in the soil. Shake the test tube to mix, wait and collect data 3 times each.
 - 7) Send data to GLOBE Data Entry.

Analysis and conclusions of the study

1) The data obtained were analyzed and compared the relationship. The statistics used in the data analysis were soil temperature, soil pH average, average nitrogen, phosphorus and potassium in the soil.

2) Make chart and tables to show the values of the comparison data.

3) Experiment summary.

Research result

1.Geographical coordinates.

Table 1 shows the geographic coordinates of the bryophytes studied.

Area found	geographic coordinates	
	Latitude (N)	Longitude (E)
Herb garden in Thung Khai Botanical Garden, Yan Ta Khao District, Trang Province Thailand	7.4648799	99.6402206

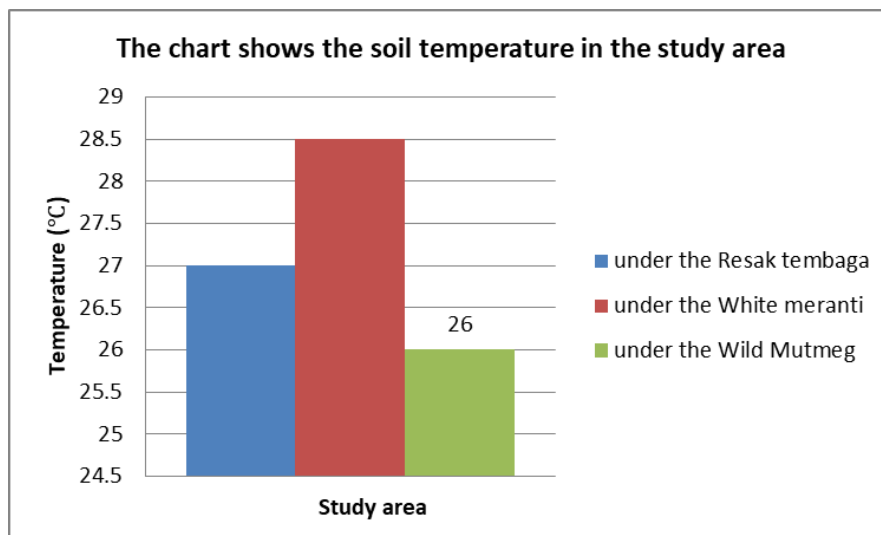
From Table 1, the geographic coordinates of the study of the area around the herb gardens in Thung Khai Botanical Garden Yan Ta Khao District, Trang Province Thailand, which are moist evergreen forests studied for soil quality, consisted of 3 areas, each with Latitude (N) at 7.4648799 and Longitude (E) at 99.6402206.

2. Soil temperature

Table 2 shows the soil temperature in the study area.

Study area	Temperature (°C)			
	1 st time	2 nd time	1 rd time	Average
under the Resak tembaga	27	27.5	26.5	27
under the White meranti	28.5	28.4	28.7	28.5
Under the Knema globularia (Lam.) Warb	26	26.1	25.9	26

Chart 1 shows the soil temperature in the study area



From Table 2 and Chart 1 , The study of soil temperature in the herb garden of Thung Khai Botanical Garden Trang Thailand. All 3 areas, It was found that the average temperature under the Resak tembaga was 27°C , The average temperature under the

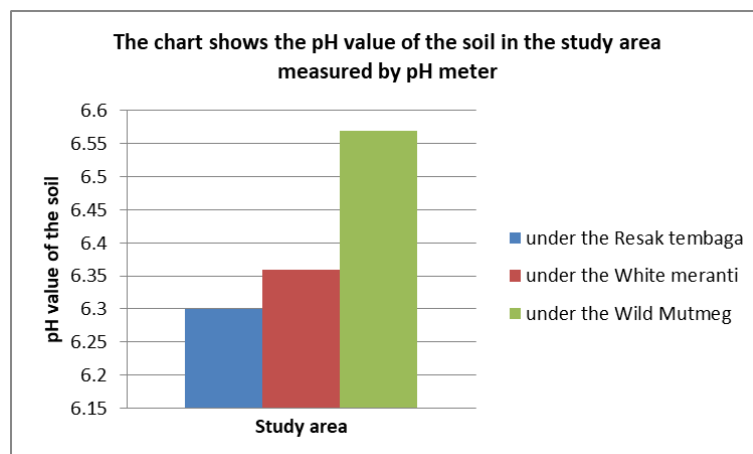
White meranti was 28.5 °C. And the average temperature under the Knema globularia (Lam.) Warb was 26°C. So the temperature in the herb garden was between 26-28.5°C

3. pH value of the soil

Table 3 shows the pH value of the soil in the study area measured by pH meter.

Study area	pH value of the soil			
	1 st time	2 nd time	1 rd time	Average
under the Resak tembaga	6.32	6.29	6.29	6.30
under the White meranti	6.35	6.35	6.38	6.36
under the Knema globularia (Lam.) Warb	6.58	6.56	6.57	6.57

Chart 2 shows the pH value of the soil in the study area measured by pH meter



From Table 3 and Chart 2 , The study of the pH value of the soil measured by pH meter in the herb garden of Thung Khai Botanical Garden Trang Thailand. All 3 areas,

It was found that the average pH value of the soil under the Resak tembaga was 6.30 , The average pH value of the soil under the White meranti was 6.36. And the average pH value of the soil under the Knema globularia (Lam.) Warb was 6.57. So the pH value of the soil in the herb garden was between 6.30-6.57

4. Soil nutrients

1) Nitrogen (N)

Table 4 shows the nitrogen values in the study area measured with the nitrogen test.

Study area	Nitrogen content			
	1 st time	2 nd time	1 rd time	Average
under the Resak tembaga	less	less	less	less
under the White meranti	medium	medium	medium	medium
under the Knema globularia (Lam.) Warb.	high	high	high	high

From Table 4, The study of the Nitrogen content of the soil with the nitrogen test in the herb garden of Thung Khai Botanical Garden Trang Thailand. All 3 areas, It was found that the average Nitrogen content of the soil under the Resak tembaga was less , The average Nitrogen content of the soil under the White meranti was medium. And the average Nitrogen content of the soil under the Knema globularia (Lam.) Warb was high. ,So the nitrogen content in the soil in herb gardens are different.

2) Phosphorus (P)

Table 5 shows the phosphorus values in the study area measured with the phosphorus test.

Study area	Phosphorus content			
	1 st time	2 nd time	1 rd time	Average
under the Resak tembaga	high	high	high	high
under the White meranti	less	less	less	less
under the Knema globularia (Lam.) Warb	medium	medium	medium	medium

From Table 5, The study of the Phosphorus content of the soil with the phosphorus test in the herb garden of Thung Khai Botanical Garden Trang Thailand. All 3 areas, It was found that the average Phosphorus content of the soil under the Resak tembaga was high , The average Phosphorus content of the soil under the White meranti was less. And the average Phosphorus content of the soil under the Knema globularia (Lam.) Warb was medium. ,So the phosphorus content in the soil in herb gardens are different.

3) Potassium (K)

Table 6 shows the potassium values in the study area measured with the potassium test.

Study area	Potassium content			
	1 st time	2 nd time	1 rd time	Average
under the Resak tembaga	very less	very less	very less	very less
under the White meranti	less	less	less	less
under the Knema globularia (Lam.) Warb	very less	very less	very less	very less

From Table 6, The study of the Potassium content of the soil with the potassium test in the herb garden of Thung Khai Botanical Garden Trang Thailand. All 3 areas, It was found that the average Potassium content of the soil under the Resak tembaga was very less , The average Potassium content of the soil under the White meranti was less. And the average Potassium content of the soil under the Knema globularia (Lam.) Warb was very less. ,So the potassium content in the soil in herb gardens are different.

Summary of research results

From the study of soil quality at 3 points in the herb garden in the Thung Khai Botanical Garden. Yan Ta Khao District, Trang Province Thailand. Including under the Resak tembaga, under the White meranti, and under the Knema globularia (Lam.) Warb. It was found that the pH, temperature, and nutrient elements in the soil were different. On average, the 3 areas had different nutrients in the soil depending on the type of soil. Zone 1 under Resak tembaga has a pH value was 6.30, a soil temperature was 27 °C, low nitrogen content, high phosphorus content and very less potassium content. Zone 2 under the White meranti is the pH value was 6.36, the soil temperature was 28.5 °C, the medium nitrogen content, less phosphorus content and less potassium content. Zone 3 under the Knema globularia (Lam.) Warb is the pH value was 6.36, the soil temperature was 28.5 °C, the less nitrogen content, high phosphorus content and very less potassium content. Concluded that the soil around the herb garden of Thung Khai Botanical Garden in Yan Ta Khao District. Trang Province is different contains a lot of nitrogen, medium phosphorus and little potassium. It can be concluded that the soil around the herb garden of Thung Khai Botanical Garden in Yan Ta Khao District. Trang Province, Thailand are different.

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