The ecology study of Cubaris murina(*Oniscidea*)for organic balance in agricultural areas

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Abstract

Ecology study of Cubaris murina The soil properties were measured at the source of the found address. and no shrimp paste was found. It was found that soil temperature, pH and soil moisture have a similar average When compared with each other, there was no statistically significant difference at the .05 level. It was found that the locations where Cubaris murina were found contained nitrogen (N) 108.75±18.90 ppm, phosphorus (P) 7.92±1.26 ppm and potassium (K) 72.50±18.69 ppm, respectively. No Cubaris murina was found when the soil nutrient measurements were lower than average. It was found that nitrogen (N) 50.42±26.77 ppm, phosphorus (P) 3.53±1.37 ppm and potassium (K) 35.83±12.60 ppm, respectively. The comparative analysis showed a statistically significant difference at the .05 level.

When observing the behavior of Cubaris murina responding to environmental factors, it was found that Cubaris murina behavior was more towards the dark and wet side than the light side. Over time, Cubaris murina tended to choose dark and wet environment rather than bright and completely dry. Cassava is the best. The digestion rate was 65.41±4.44 percent, followed by the digestion rate of para rubber leaves with 53.92±2.96 percent and the digestion rate of sugarcane leaves with 37.42±2.76 percent, respectively. Cultivation of lettuce (***Lactuca*** sativa L.) found that lettuce grown using soil mixture in the ratio of soil to material obtained from cassava leaves of Cubaris murina 1:3 and 2:2 were the same. Height 4.67±0.58 cm, number of leaves 3.00±0.00 leaves, respectively, which is similar to planting by using seedlings in the market.

Keywords : ecology, Cubaris murina, insect behavior

Introduction

Agricultural land in the Northeast of Thailand Most of them come from invasion and destruction of natural forest areas for cultivation, such as farming, planting field crops such as sugarcane, cassava, para rubber, hemp, etc., which have been cultivated continuously for a long time. This puts them at a high risk of soil degradation and biodiversity loss. Due to plowing the soil in succession every year causing the soil structure to be destroyed (Sodsai Pimthong-ngam, 2004)

From local observations in the area where organic remains deposited, it was found that Cubaris murina was densely populated. The research team therefore hypothesized that Cubaris murina would have an effect on the degradation of those organic compounds. therefore searched further and found that the Cubaris murina Influence on chemical and physical factors of soil and areas in Ban Kae Pee community, Muang district, Kalasin province. which is a deciduous forest It consists of natural forest ecosystems and agricultural ecosystems. In the rainy season, there will be a large accumulation of leaves and plant remains, which the Cubaris murina plays an important role in the decomposition of these organic substances. The objective of this research is to study the ecology of Cubaris murina. find the relationship between living things and the environment and to study the physical factors affecting the organic degradation of Cubaris murina Because the biological information of Cubaris murina is useful for application in environmental assessment. It is an index of the impact of human activities on the environment and living organisms in the ecosystem, which guides the campaign for environmental conservation and proper and appropriate land management.

Objective

1. To study the ecology of Cubaris murina in the local ecosystem

2. To study the behavior of Cubaris murina on moisture and light intensity.

3 To study the effect of organic matter digestion of Cubaris murina for application

Experimental Method

Chapter 1 Studying the source and factors in the life of the Cubaris murina

equipment

Soil Property Measurement Equipment

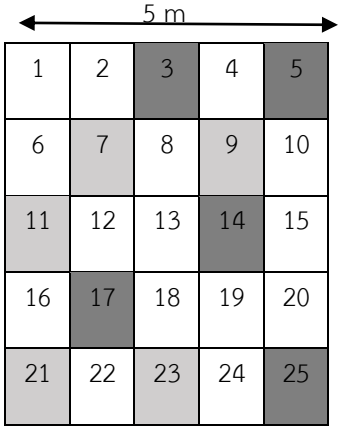
1. Soil test kit for testing soil pH and NPK elements, model HI3896.
2. Soil moisture meter model DM-15 from TAKEMURA
3. Smart brand soil thermometer, model 4in1 Soil Meter

experimental method

1. Determine the point to be studied at the coordinates of 16°22'51.4"N. 103°38'15.4"E Then collect the general soil data at 5 points by measuring the soil properties in the area found and not inhabited by Cubaris murina.

Design and sample collection

Study the diversity of shrimp paste. using random sampling of the area Representing the area with 5 repetitions of shrimp paste, given the size, the study was divided into 5 rows, each row was divided into 5 samples (5X5m), each plot was divided into 25 quadrats (1X1m). The study examined 9 points, totaling 45 data in the area where shrimp paste was found and no shrimp paste was found.



Sample plot (5 m X 5 m)

found the Cubaris murina

can't find Cubaris murina

- Soil temperature measurement
- Soil moisture measurement
- determination of macronutrients N P K
- Soil pH Measurement

2. Analyze the data to find the relationship between the habitat of the shrimp paste and the soil properties.
3. Fill out the information in https://www.globe.gov/globe-data/data-entry

Chapter 2 Study behavior that affects environmental factors. (light and humidity)
The present study uses chapter-based practice. http://www.biology.sc.chula.ac.th/
Materials and equipment used in the study of Cubaris murina
1. Cubaris murina
2. Plastic box with open-close door
3. Stopwatch, paintbrush, masking tape, loam
Methods of conducting research studies

A study of the behavior of Cubaris murina to light The research process is as follows.
1. Use dry loam to cover the plastic box floor. by covering it to attach to the floor of the box on both sides
2. Use a brush to push the Cubaris murina into the middle of the box about 20 pieces and leave it for about 2 minutes.
in order for the Cubaris murina to adapt to the condition of the box and observe the movement of the Cubaris murina
3. Pull out the baffles on both sides of the center compartment area. Count the number of Cubaris murina on the bright and dark sides.Immediately after 30 s, 1 min, 3 min, 5 min, the experiment was repeated 3 times and the results were recorded.
Note: Cubaris murina that is in the middle compartment is not counted.
The study of behavior of Cubaris murina on humidity The research process is as follows.
1. Use a paintbrush to drive about 20 Cubaris murina into the middle of the box and let the Cubaris murina stay there for about 2 minutes to adjust to the condition of the box. Notice the movement of the Cubaris murina.
2. Pour water on the loose soil on one side of the box until it is wet enough. Then pull out the baffles on both sides of the center compartment.
3. Count the number of Cubaris murina on the moist and dry side immediately after 30 seconds, 1 minute, 3 minutes, 5 minutes. Repeat the experiment 3 times and record the results.
Note: Cubaris murina that is in the middle compartment is not counted.

Chapter 3 Study on the decomposition of organic matter that is agricultural waste.
Materials and equipment used in the study of Cubaris murina
1. Cubaris murina
2. Plastic box with open-close door
3. Paintbrush, black cover
4. Agricultural waste material collected from the fall of 3 types of trees, namely cassava leaves, para rubber leaves and sugar cane leaves.

Methods of conducting research studies
The study of behavior of Cubaris murina on humidity The research process is as follows.

1. Use a paintbrush to drive about 20 Cubaris murina into the middle of the box and let the Cubaris murina stay there for about 2 minutes to adjust to the condition of the box. Notice the movement of the Cubaris murina.
2. Weigh 20 grams of agricultural waste before the experiment and put it in the prepared box. Add water by adjusting humidity to 50 percent (according to experimental Chapter 1).
3. After 1 week, separate the Cubaris murina from the box. After that, the agricultural waste materials are sifted through a 2 mm frequency sieve to prevent small pieces of agricultural waste from falling off. The agricultural waste was baked in a temperature controlled cabinet at 80 °C for 24 hours, and then weighed dry. and calculate the rate of degradation of organic matter as follows

$$\text{Organic matter degradation rate (\%)} = \frac{\text{weight of agricultural waste lost} \times 100}{\text{weight of agricultural waste at start}}$$

4. Repeat the experiment from 1-3, but change the agricultural waste until all 3 types are complete.
5. Compare the degradation rates of the three agricultural waste materials to find suitable materials for the decomposition of Cubaris murina.

Chapter 4 Study on application of materials obtained from cassava leaf digestion of Cubaris murina for use in plant cultivation.

materials used in the study

1. The material obtained from the cassava leaves of the Cubaris murina.
2. 105-hole seedling tray
3. Lettuce seeds (***Lactuca*** sativa L.)

experimental method

1. Take the material from the cassava leaves of the Cubaris murina. Mix with the soil from which the soil properties were initially measured in the ratio as follows.

ดิน	1	2	3	4	0
วัสดุที่ได้จากการย่อย	3	2	1	0	4

2. Put the soil mixture into the nursery tray and select the lettuce seedlings that have been prepared for breeding for 2 days, put in each well, 1 plant per hole, and then reduce the spray water.
3. Observe the seed changes, i.e. seedling growth for 15 days, and record the results.

Results

Chapter 1 Studying the source and factors in the life of the Cubaris murina.

From the data analysis to find the relationship between the habitat of the Cubaris murina and the soil properties. get the information as in the table

Table 1 shows the relationship between the habitat of Cubaris murina and soil properties.

สมบัติดิน ในแหล่งที่อยู่	อุณหภูมิ (°C)	ธาตุอาหารในดิน (PPM)			ค่า pH	ค่าความชื้น (%)
		N	P	K		
พบตัวกะปิ	23.17±2.20	108.75±18.90	7.92±1.26	72.50±18.69	7.02±0.65	52.33±6.26
ไม่พบตัวกะปิ	23.57±1.30	50.42±26.77	3.53±1.37	35.83±12.60	6.98±0.90	48.00±6.10
วิเคราะห์ข้อมูล	ns	*	*	*	ns	ns

* = significant difference at P < 0.05 ns = not significantly at P < 0.05

From the soil properties measurement table in the area of the habitat found and no Cubaris murina was found. It was found that soil temperature, pH and soil moisture have a similar average. When compared with each other, there was no statistically significant difference at the .05 level. It was found that the places where Cubaris murina were found contained nitrogen (N) 108.75±18.90 PPM, phosphorus (P) 7.92±1.26 PPM and potassium (K) at 72.50±18.69 PPM, respectively. No Cubaris murina was found when the soil nutrient measurements were lower mean values were found that Nitrogen (N) 50.42±26.77 PPM, Phosphorus (P) 3.53±1.37 PPM and Potassium (K) 35.83±12.60 PPM, respectively. The comparative analysis showed a statistically significant difference at the .05 level.

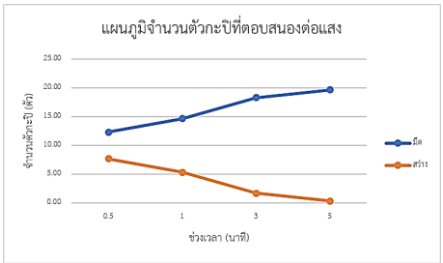
Chapter 2 Study behaviors that affect stimuli. (light and humidity)

The study of behavior of Cubaris murina on light and humidity results as shown in the table

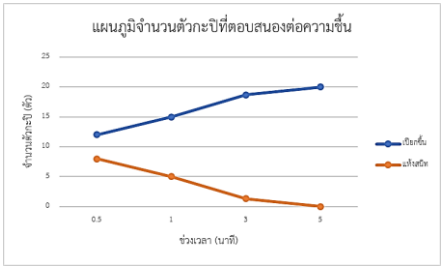
Table 2 Number of Cubaris murina behaviors on light and humidity

พฤติกรรมที่ตอบสนอง ปัจจัยแวดล้อม		ค่าเฉลี่ยจำนวนตัวกะปิที่ตอบสนองต่อปัจจัยแวดล้อม (ตัว) ในช่วงเวลาต่างกัน			
		30 วินาที	1 นาที	3 นาที	5 นาที
แสงสว่าง	สว่าง	7.67±1.53	5.33±0.58	1.67±0.58	0.33±0.58
	มืด	12.33±1.53	14.67±0.58	18.33±0.58	19.67±0.58
ความชื้น	เปียก	12.00±1.73	15.00±1.00	18.67±1.15	20.00±0.00
	แห้งสนิท	8.00±1.73	5.00±1.00	1.33±1.15	0.00±0.00

From the observation table of the behavior of the Cubaris murina responding to the environmental factors, it was found that on the light side, the Cubaris murina behavior was more towards the dark side than the light side. As time goes on, the Cubaris murina has a behavior to choose a darker than light source as shown in the chart.



From the observation table of the behavior of Cubaris murina responding to environmental factors, it was found that on the humidity side, Cubaris murina behavior was more toward the wet side than the completely dry side. As time goes on, the Cubaris murina will have a behavior to choose the wet environment as shown in the chart.

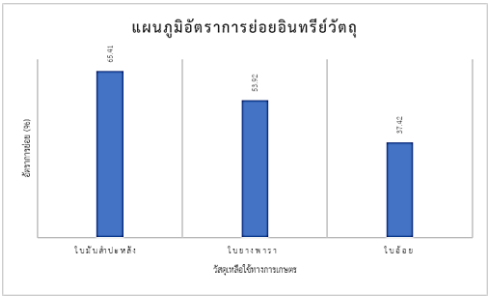


Chapter 3 Study on the degradation of organic matter that is agricultural waste of Cubaris murina.

Table 3 Rates of degradation of organic matter from agricultural waste

วัสดุเหลือใช้ทางการเกษตร	อัตราการย่อยสลายอินทรียวัตถุ(%)
ใบมันสำปะหลัง	65.41±4.44
ใบยางพารา	53.92±2.96
ใบอ้อย	37.42±2.76

From the table it was found that Cubaris murina was able to digest agricultural waste differently. It was found that Cubaris murina digested cassava leaves was the best. The digestion rate was 65.41±4.44 percent, followed by the digestion rate of para rubber leaves 53.92±2.96 percent, and sugar cane digestion rate 37.42±2.76 percent, respectively, as shown in the chart.



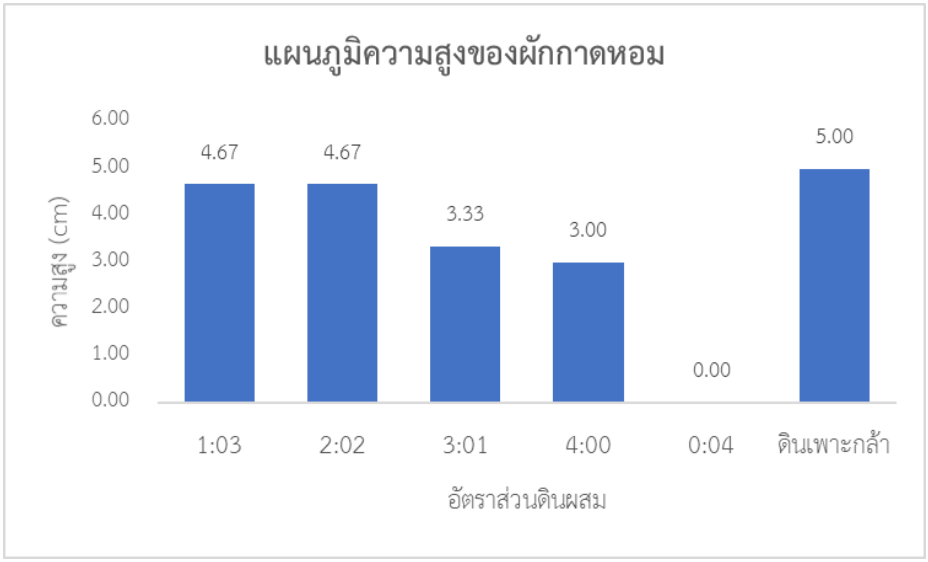
Chapter 4 Study on application of materials obtained from cassava leaf digestion of Cubaris murina for use in plant cultivation.

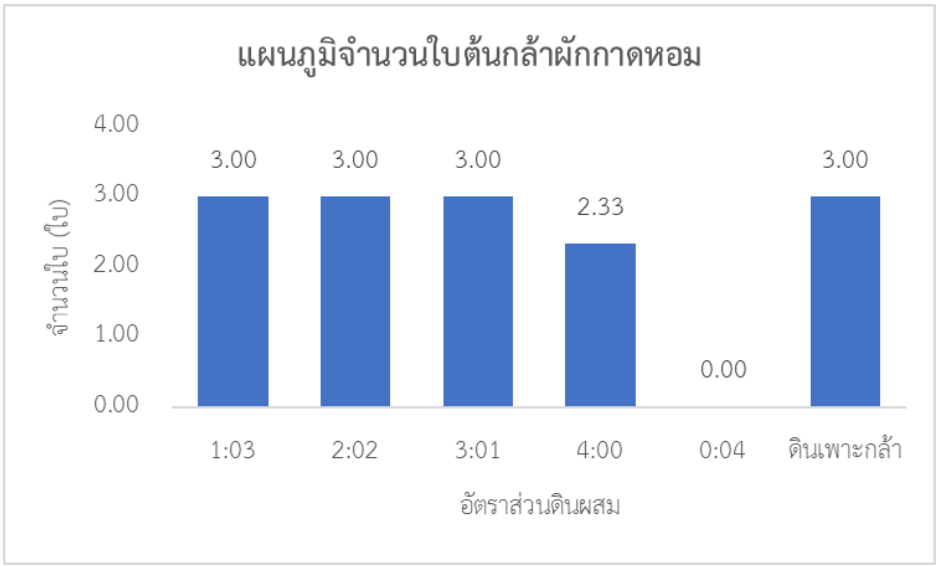
The study on the application of the material obtained from the cassava leaves of the Cubaris murina to be used in the cultivation of crops is shown in the table.

อัตราส่วนดินผสม	การเจริญเติบโต	
ดิน : วัสดุ	ความสูง (เซนติเมตร)	จำนวนใบ (ใบ)
1:3	4.67±0.58	3.00±0.00
2:2	4.67±0.58	3.00±0.00
3:1	3.33±0.58	3.00±0.00
4:0	3.00±0.00	2.33±0.58
0:4	0.00±0.00	0.00±0.00
ดินเพาะกล้าทั่วไป	5.00±0.00	3.00±0.00

Table 4. Growth of lettuce (***Lactuca*** sativa L.)

from the table showing the growth of lettuce (***Lactuca*** sativa L.) It was found that lettuce grown using soil mixture in the ratio of soil to material obtained from cassava leaves of Cubaris murina 1:3 and 2:2 had the same height of 4.67±. 0.58 cm, number of leaves 3.00±0.00 leaves, respectively, which is close to planting by using potting soil in the market as shown in the chart.





Discussion

Ecology study of Cubaris murina The soil properties were measured at the source of the found address. and no Cubaris murina was found. It was found that soil temperature, pH and soil moisture have a similar average In comparative analysis, there was no statistically significant difference at the .05 level, indicating that there was no difference in the Cubaris murina-free habitat in the soil ecosystem. But the soil in that area will gradually Lack of macronutrients, resulting in changes in the ecosystem in the area. As evidenced by the measurement of soil nutrients It was found that the source of Cubaris murina found nitrogen (N) 108.75±18.90 ppm, phosphorus (P) 7.92±1.26 ppm and potassium (K) 72.50±18.69 ppm. Statistics at the .05 level can be seen that these Cubaris murina can add nutrients to the soil and ecosystems in that area very well. Including, if wanting the Cubaris murina to be able to digest organic matter better, must not disturb the habitat with suitable environmental factors as the experimental results. Cubaris murina that responds to environmental factors They tend to be more towards the dark and wet side than the light side. Over time, Cubaris murina tends to choose dark and wet locations over bright and dry, thus providing a guideline for how to make good use of this information. It can be seen from the results of the experiment that Cubaris murina can digest many agricultural waste materials such as cassava leaves, para rubber leaves and sugar cane leaves. Turn these waste materials into benefits by adding organic matter to the soil and ecosystems. especially the local Kalasin province that has farmed resulting in a large number of these waste materials. and then create pollution by burning But if using the digestion of shrimp paste instead will make the ecosystem in that area more complete. This can be seen from the experimental application of the material obtained from the digestion of cassava leaves in lettuce cultivation. (*Lactuca* sativa L.) It was found that lettuce grown using a soil mixture in the ratio of soil to material obtained from cassava leaves of Cubaris murina 1:3 and 2:2 was close to that planted using seedlings according to cassava. market Therefore, activities that will destroy the Cubaris murina ecosystem, such as burning, as well as the excessive use of chemicals should be avoided as information from (Sodsai Pimthong-ngam: 2547) has indicated that the use of land for cultivation may affect Effects on the diversity of arthropods in soil The relationship of soil arthropods to the environment. and its influence on the degradation of organic matter. The impact of farming activities on the environment and ecosystem habitats Proper and appropriate land management will enable the agricultural ecosystem to have a sustainable natural balance forever.

Conclusion

Ecology study of Cubaris murina The soil properties were measured at the source at Cubaris murina was found and not found. Soil temperature, pH and soil moisture were found. have a similar average When compared with each other, there was no statistically significant difference at the .05 level. It was found that the locations where Cubaris murina were found contained nitrogen (N) 108.75±18.90 ppm, phosphorus (P) 7.92±1.26 ppm and potassium (K) 72.50±18.69 ppm, respectively. No Cubaris murina was found when the soil nutrient measurements were lower than average. It was found that nitrogen (N) 50.42±26.77 ppm, phosphorus (P) 3.53±1.37 ppm and potassium (K) 35.83±12.60 ppm, respectively. The comparative analysis showed a statistically significant difference at the .05 level.

When observing the behavior of Cubaris murina responding to environmental factors, it was found that Cubaris murina behavior. Approach the dark and wet rather than the bright side. Over time, the Cubaris murina has behavior to choose the dark and wet environment more than light and dry. Therefore, the Cubaris murina digested different agricultural waste materials. Cassava is the best. The second experiment was the digestion rate of para rubber leaves with 53.92±2.96 percent and the digestion rate of sugar cane leaves was 37.42±2.76 percent, respectively. lettuce (***Lactuca*** sativa L.) found that lettuce grown using soil mixture

in the ratio of soil to material obtained from cassava leaves of Cubaris murina 1:3 and 2:2 had the same height of 4.67±0.58. centimeter, number of leaves 3.00±0.00 leaves, respectively,which is similar to planting by using seedlings in the market.

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