Thailand Diary

~From Day 5th to Day 8th~

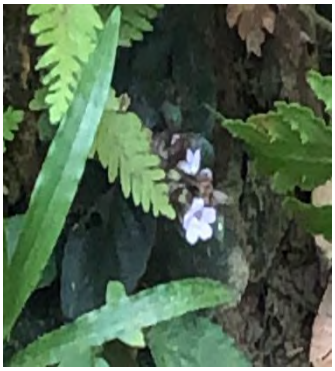
Yokohama National University
Collage of Urban Science
Department of Risk Management and
Environmental Science
Second grades
Kaito Horiuchi

横浜国立大学
都市科学部
環境リスク共生学科
第 2 学年
氏名 堀内凱斗

Day 5th

Current status of natural parks

In the Sa Nang Manora Forest Park we visited, alien species threaten the ecosystem of the native species. Foreign species are not eaten by native species and grow faster than modern species (image.1). In addition, land conversion for agricultural use puts an end to this situation. Rivers play an important role in the ecosystems of tropical forests where indigenous species live. However, the river flow is reduced because nature is converted to palm and rubber forests upstream of the river. As a result, in the lower reaches, the water level has dropped significantly, spring drainage has occurred, and ecosystems of wild species have been destroyed.(Image.1 this flower is one of alien species.) Therefore, conservation of the entire basin and appropriate response to alien species are required.



Mangrove

Before going to the mangrove forest, I thought that there are many living things in the mangrove forest. But in fact it was different. The place where mangrove forests can be made is a place like Japan's tidal flat where plants can not grow. However, in tropical areas such as Thailand, plants adapt and evolve under harsh environmental conditions, resulting in mangrove forests. Therefore, only species that have evolved to withstand adverse environments are inhabited.

The mangrove I went to survey was planted artificially. Therefore, the mangroves were regularly placed, grew in the same height, and increased too much. The number of trees is large but thin because they neglect natural disturbance. This influence is not limited to one generation. With the rapid increase of mangroves, there is no root for children to grow, and this mangrove forest has already collapsed as vegetation although it has form. This trend of planting is considered to be the result of planting where Thais only promote greening and neglected the ecosystem. (Image.2 Too much mangrove)

Mangrove is also a plant, so water is required for growth, but the main supply is seawater,

so the discharge of salinity is essential for growth. There are species that drain salt on the surface of the leaf and species that store salt in the leaf and release salt outside the body by defoliation. In the former case, it was salty. The evolution for growth is interesting.

Day 6th

Ton Phrai waterfall

Mountains in Thailand are often formed of limestone. However, this time I visited the waterfall and river where the water of the mountain without limestone flows. Because it does not pass through limestone, there is little calcium and it is close to the Japanese river. Although many plants inhabit tropical forests, rich ecosystems are realized by changing their heights. The existence of plants at many levels indicates that they have evolved appropriately for their habitat. Species in lower need to perform primary production more efficiently with less light. Therefore, the color of leaves is darker in the lower layer (image3), and it is realized that photosynthesis is efficiently performed with less light. In this waterfall, it is said that it is properly maintained because it is protected by the law but it is protected by people.

(Image3 Difference of leaves' color)

Heath forests

The soil of the Heath forest is the soil of the sand where the moisture on the surface is evaporated by sun heat. Because this survey site is near the coast, freshwater is maintained near sea level due to the difference in density between freshwater and seawater, and plants can secure water necessary for survival and growth. The source of water in the Heath forest is mostly rainwater, and the fields change in the dry and rainy seasons. When changing from the dry season to the rainy season, the grassland becomes a wetland and the convex topography becomes an island. Therefore, plant habitat is determined by adapting to the change of the topography.

The exotic species is characteristic in the Heath forest investigated, acacia mangium,. This species is (Image.4 Acacia mangium) native to Australia and has excellent growth in a dry and poor nutritious environment like

Heath forest. It was probably planted by human as a species suitable for climate. When planting, we used chemical fertilizer to promote growth, so no vegetation is growing around Acacia mangium. Because this species is rich in pollen and honey, insects such as butterflies and bees carrying pollen gather in this tree, and the ecosystem of other entomophilous flower is threatened. Still, since this alien species Acacia mangium has just entered, its change is small, but there is a possibility that it can become irreparable when it leaves it.

Day 7th

Forest of coast

Vegetation along the coast can be divided into areas where the alien species, Casuarina, are prioritized, and areas where native species remain. The climate on the coast is changing rapidly, and the native species grows while changing the shape of the trunk. On the other hand, the alien species Casuarina just extended its trunk, and the trunk fell, and it immediately repeated stretching a new trunk. As a result of natural competition, the latter won. Therefore native vegetation has become habitat restricted. Since Casuarina needs a large amount of nutrition to immediately grow its trunk, flowers do not flourish under Casuarina trees. In addition, vines that occur near the coast will be blocked by sunlight by the Casuarina and threaten their habitat. As the mature Casuarina is large and it will be difficult to reduce its habitat, it may be important to save the vegetation at a small stage during growth. (Image5 Casuarina)

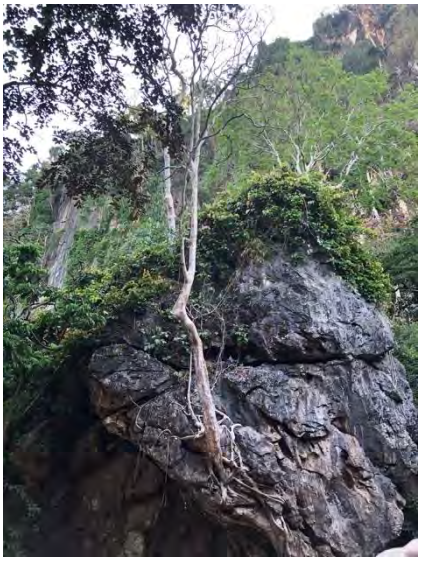
Melaleuca

I also went to a different heath forest the other day. Here, the species Melaleuca was an important part of the ecosystem in this heath forest. Melaleuca is a pre-historic alien species that is different from the native, but it is one of the species that became wild in Thailand after many years. I was examining Melaleuca as a preliminary survey in Thailand, but at that time I only knew that Melaleuca could be used for cosmetics. Although Melaleuca is characterized by this white resin, Melaleuca covers the entire field. It seems not good to have a single vegetation in order to foster biodiversity. However, whether it is good or not is necessary to judge how the present ecosystem has

been created. Before Melaleuca came, the native species was alive under the environment of Heath Forest. However, the heather forest is easy to change its environment, and its habitat is severe. There, Melaleuca came. Melaleuca is more resistant to dryness and salinity and has adapted more to the environment and flourished than native species. And as a result of that situation lasting for a long time, a new ecosystem centered on Melaleuca was built. Rather, Melaleuca survives more than wild species against environmental changes, reducing the disturbance of the entire ecosystem and making it easier for species to survive. Therefore, even with single vegetation, biological diversity is secured, and it functions properly as an ecosystem today. (Image.6 Melaleuca)

Day 8th

Vegetation on the rock



I visited a temple in Thailand and I saw a strange scene there. Trees and plants cover the rocks (Image.7). What we can see from this is that some species have evolved so that their habitat can be rock, as competition in the tropical environment is intense. But how are they getting the water and nutrition they need to grow? It uses the water remaining in the small caves of the rock to absorb and dissolve the minerals remaining in the rock. It was me who breathed in a rare sight. (Image.7 A tree on the rock)

Peat swamp forest

A peat swamp forest is a forest where swamps are formed on top of peat and trees grow there. Peat swamp forests are closely linked to global warming, and the conservation of peat swamp forests is urgent. The reason peat swamp forests are related to global warming is peat, which is the soil of peat swamp forests. This peat includes what is called "woody peat", which remains undigested of plant remains. This occurs because microorganisms can not function enough to break down plant remains from the water environment of wetlands, and peat takes them in. This woody beet will eventually be

broken down into carbon dioxide when it comes in contact with air. Conservation is urgently needed because peat swamp forests are not properly maintained and they emit greenhouse gases that are the cause of global warming. However, it was found from the actual investigation that it is difficult how to protect the peat swamp forest. In the peat swamp forest that I conducted, most of the soil appeared on the surface and the wetlands were few. In other words, the peat swamp forest that I went to was already in danger. Although peat barely remained black and oxidation did not proceed, it was also a time problem that the woody peat was decomposed. All this is due to the reduction in the amount of water entering peat swamp forests. The decrease in water volume, which has been reported in previous studies, is due to the agricultural use of palm and rubber forests. Therefore, the conservation of peat swamp forests is expected to be difficult because of the need for water conservation. (Image8. Peat)

タイ野外実習　レポート
片山滉平

This is *Selaginella uncinate*. It has glossy.

The edge of this pond is made of lamestone. In Thailand, you can see the similar view like this.

6 March

It is primitive fern. It is rare species. The branch of it is separate to two.

This ant behaves in a group. When you touch it, they attack you. The pain of the bites of one ant is a little pain but they attack you in a group so it is great pain.

7 March

It is Casuarina. It has breakwater effect. It is alien species in Thailand but it is spreading there now.

You can get fiber in it. It is family of *Crinum*. You can see it in coast area.

8 March

Sorry I don’t know the name of this lizard. I see it in national park. The body length is about 10cm.

This green snake is very dangerous. It is difficult to recognize it because the body is similar to the tree. However its face is so cute.

Marth 4th

I went national park.

Fresh water and sea water mixed. Below the picture is fresh water, the upper side of the picture is sea water. The quality of water is different. Fresh water is clear, but sea water is dirty. There are different kind of fish in each water.

March 5th

I went to Phang-nga from Krabi. I saw various tropical plants.

This plant is one of fern plant. Some of fern plant is big one, and the others is such small one. This plant looks like blue in this picture, but the color changes depending on how the sun light hits. It is due to interference of sun light.

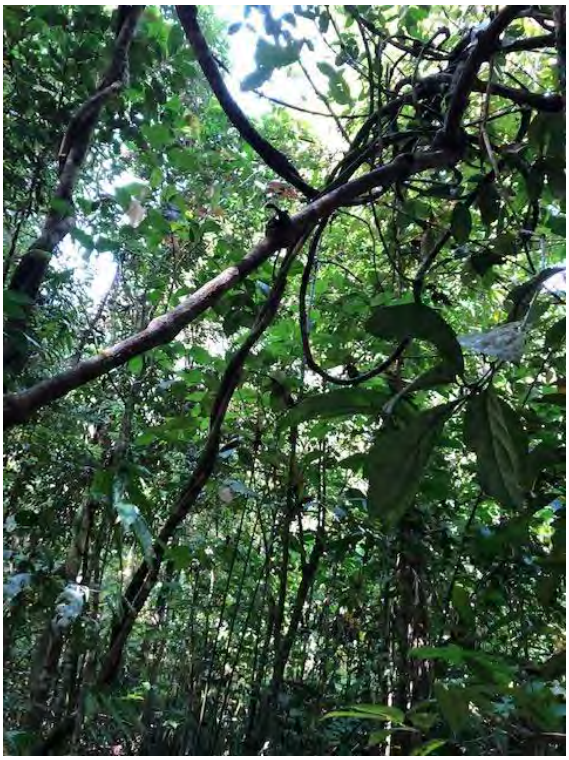
There flows clean mineral water in this river. The limestone melts and it became table like structure which is saw in Chine.

In the river, we can see several fish. Today, I saw a snake which has poison.In the way,

there was a big snake. So, we came back.

March 6th

Today, I went Nature trail. There is national park.



This tree is a kind of gymnosperm. Almost all gymnosperms are coniferous forests, but this is broad leaved tree. This plant has fruits, but it is not angiosperm.

Also, I went near the sea. The low sea level place became wetland, and the place became dry land.in this way, the land without nutrition was created. Here, each plant lives dependently each other and they can not live individually.

This tree has poison, and it is sprinkling chemical substances. So, there are no plants around this tree. this tree came from Australia. Many tree which can live little fertilizer came from Australia. It should be cut.

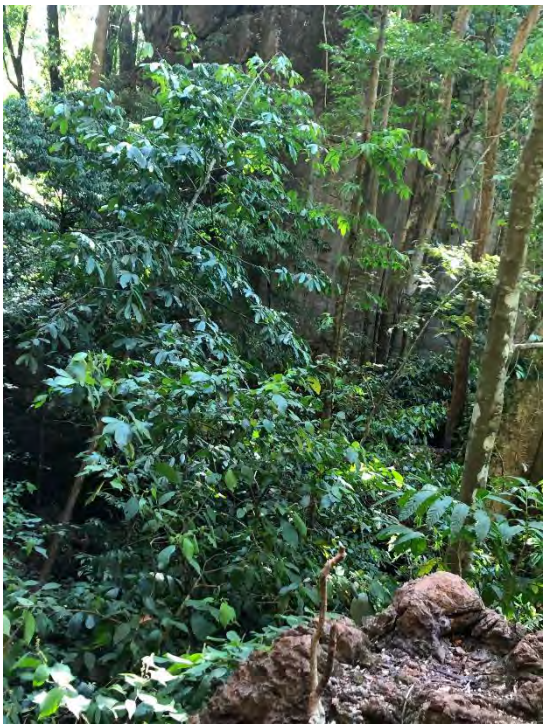
March 7th

I went coast and observed coast plant. The seawater sinks downward, freshwater moves upwards. This is due to the difference in density.

left picture is plants which live on a sand away from the sea. Few plants grow near the beach now, but in the dry season, many plants live near the sea. the right picture is the example. However, as waves come to the place plants live, the plants will decrease. Such cycle is repeated.

This tall tree is introduced species. The name is Casuarena. While native species grow slowing and thinking, Casuarena grows without thinking and quickly. Though it dies quickly too, it is strong in competition with native species.

March 8th

This is limestone. There are some plants on the limestone. Some plants grow on only limestone. Because limestone is made of calcium, and the plants uses calcium ions as a nutrient source. These plants in the picture are the example. There is more grass than trees. Many plants on limestone have small and hard leaves.

When we clap our hands, creatures come out and the surface of the water moves. There are many such creatures in Thailand, and I saw them several times in this trip.

Report of the field trip in Thailand

Name Hiromichi Koizumi

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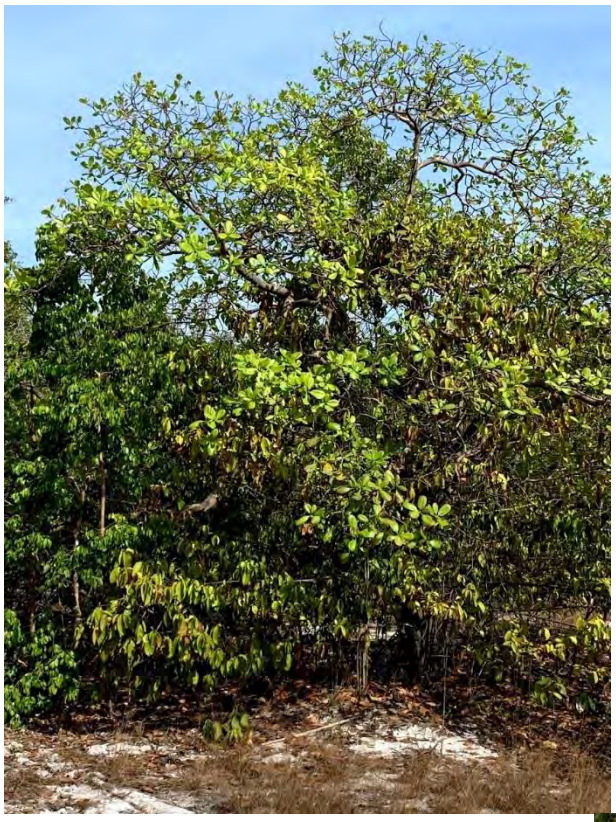
This picture is a floating island where Muslims live.
There were people doing business and fishing equipment.

→

It is a burrow of crab and giant clam.



←

It is a land of poor nutrition called heath.

It is very dry because of the dry season.

A deep and strong plant grows.

→

It is an epiphyte of the vines

Epiphytes such as orchids are found in places with low nutrient content.

This picture is the sea of a national park.
The color of the sea is beautiful because household drainage is not mixed.

→

The picture on the right is coral that was on the beach.

There are places where tourists are prohibited from entering the area to protect coral reefs.

↑

This photo is an artificially maintained promenade and mangroves.

→

It is a lizard mimicking a tree. I could see various kinds of mimicry.

Filing date: May 15, 2019

Report of the field trip in Thailand

Student name: Kaho Maehara

March 5, 2019

The photo on the left shows Mangrove. Mangrove is the forest which form at brackish water area. I saw that white things were on Mangrove's leaves (the photo on the right). There are salt contained in water absorbed by Mangrove trees. This proves that these Mangrove trees are growing in place with saltwater or soil. Occasionally," Mangrove" mean species of Mangrove trees. Mangrove trees especially grow at the tropical zone.

Mangrove in the left photo were planted artificially. This can be understood by observing this forest. All of Mangrove trees in this forest have thin and same thick trunk. And the height of the trees is almost the same. There must be planted at same period.

The density of forests is increasing due to artificially planted. It prevents other species from invading. The proof is the photo on the left. There is the walking path that built it for humans for walk. Along the walking path, the other species are slightly invaded. This is because the density of forests here is a little lower.

In Thailand, Mangrove trees are often cut intentionally. Cut down and secure a place for shrimp farming. So, it is important to plant Mangrove trees artificially. But planting only mangroves leads to a decrease in species diversity like this forest.

March 6, 2019

This picture shows wasteland which called Heath. Heath soil is mainly formed of sand. This sand is like sponge. It absorbs and stores water. The soil here is low in nitrogen. Heath has grasses or shrubs which can adapt to these environments. Although this place is near from the sea, the plants inhabiting here aren't strong for salt water. We can see similar environment at Europe or Okinawa.

Here is basically a dry climate. However, the rainy season, rain water gathers in the depression. Around the depression, for example Moliniopsis japonica, there are plants that grow on wetlands.

In this place, a lot of shrubs and grass grow. For instance, Cymbidium which is native species grow here. And Epiphytes are growing on the ground.

On the other hand, many alien species also inhabit. This is the picture of Periwinks, on of the alien species on here.

March 7, 2019

This photo shows Casuarina which are growing along the coast.
Casuarina came from Australia originally. These are distributed throughout especially the tropical zone. Seeds are carried by the ocean waves and expand their habitat.

Casuarina in this photo aren't grow in place here originally. There were planted artificially after tsunami made a raid on this coast. There are two reasons that these trees were positively planted. First, Casuarina grow very fast. If a trunk got taller and withered, it would grow easily. Second, Casuarina is resistant to dry and salt. This property let Casuarina grow at the sand beach or the coast.

Planting Casuarina, we can see recovery from the tsunami disease. But Casuarina had some bad effect on the coast environment. Look at photo on under this sentence. There are native species of plants which like the coast environment to live. For example, Pandanus which has tall trunk and live in mainly tropical region. Casuarina is the alien species in Thailand. It has strong ability to survive. The native species are robbed their habitat by Casuarina.

In this photo, a lot of native species are growing. But I think that Casuarina must be take their habitat before long.

March 8, 2019

These photos show the plants Melaleuca. Melaleuca mainly inhabit tropical swamps. It is characterized by the whitish stem. It grows in a wetland just behind a mangrove forest. It is an evergreen tree that crowds.

It is commonly known as Tea tree. Tea tree oil extracted from leaves is used for skin care products. Melaleuca have a lot of species.

This photo shows the plant Rattan. It is characterized by thorns on branches. It isn't a tree but creeper.　It is growing while being entangled with other trees. Rattan is mainly native to tropical rain forests in Southeast Asia.

Because it is strong and hard to break, it is processed into a goods, for example chair or basket.

Coastal botany

1663145 Matsubara Natsuki

3/5

Sa Nang Manora Waterfall

These are elian species. This one destroys vegetation in the area growing.

This is epiphytic orchard. It is characteristic of tropical forest that there are many orchids of epiphytic.

This is *Selaginella uncinate.* The color of the leaves of this plant is a structural color, and the appearance of the color changes depending on the angle.

This is *Diospyros sp..*

Mangrove

In the open space like the picture, different species from the whole area will establish in natural.

In this area, different individuals cannot grow because of the carrying capacity is full.

Although mangrove species absorb seawater, they adjust their body's salt content by dropping leaves and discharging saltiness to the surface of the leaves.

KHAO LAMPI-HAT THAI MUENG NATIONAL PARK

The water flowing through this river is not from limestone, but from damp mountainous areas. This place is a corridor between Himalayan plants and tropical rainforest plants.

The plants in these three pictures are all the same plants.

Tropical heath

There is a layer of freshwater at a level about the sea level below the sand.

In Japan, it is universally seen as a horticultural species. This is elian species.

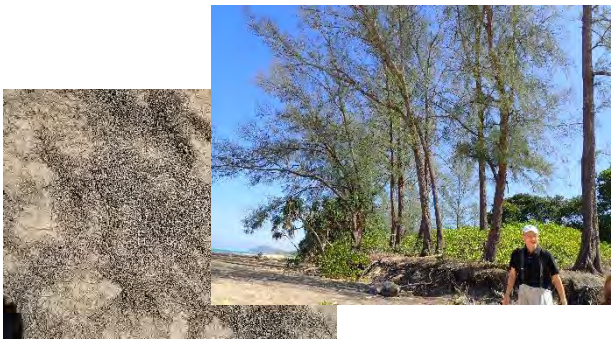
This tree is also depicted in the paintings of ancient people. It is characteristic species of tropical heath.

The leaves of this tree have allelopathy, so other plants cannot grow where there are fallen leaves.

KHAO LAMPI-HAT THAI MUENG NATIONAL PARK

Fresh water

This is Casuarina. The fallen leaves of Casuarina are accumulated on the beach.



This is *Pandanus boninensis.* In place Casuarina grow, they lose the competition.

Casuarina was planted artificially after the tsunami at this location. However, Casuarina is an alien species and adversely affects native plants.

Tropical heath

Moss grows in such poor nutrition places.

Spring water from freshwater formations (dune spring).

Melaleuca (elian species)

3/8

There are *Dipterocarpaceae.* Since dipterocarp can grow in poor nutrition areas, there is a forest on limestone.

Plants in the tropical seasonal forest drop leaves in the dry season. Vegetation here is tropical rain forest, but species of tropical seasonal forest can be seen in a dry place like the top of limestone.

A typical forest with many species typical to limestone vegetation.

It looks like a peat swamp because there is not much water flow. In the water, the decomposition of fallen leaves is delayed.

This is litter rather than peat. Decomposition is slower due to high water content and less bacteria compared to normal soil.

Report of the field trip in Thailand

Yokohama National University B3 Nakagawa Mayu

2017.03.05 (TUE)

Flowers and Fruits That Bloom On Tree Trunks.
This is a family of *Diospyros kaki*.
There is many it in the tropical zone.
They facilitate pollination and due to the animal not to be able to reach to the point of the branch and can scatter the efficient seed to the ground.

Selaginella uncinata
The color of the leaf changes by light and is shiny.

Report of the field trip in Thailand

Yokohama National University B3 Nakagawa Mayu

2017.03.06 (WED)

This is a family of Melastomataceae
It is the big course of 4,400 kinds of approximately 180 genus, but most are distributed over only the tropical zone, the subtropical zone.
The designs of the leaf are different, but three photographs are plants of the same melastome.

Jasmine
The tropical zone of Africa or subtropics are autochthonism from Asia.
Leaf is so smelly.

Report of the field trip in Thailand

Yokohama National University B3 Nakagawa Mayu

2017.03.07 (THU)

Casuarina
After a big tidal wave, Casuarina planted it with trees a lot.
I grow up rapidly.

Maybe, this dead tree died at the time of tsunami.

This is a family of *Crinum asiaticum*.
A thread such as the fiber appears when I cut a leaf.

Report of the field trip in Thailand

Yokohama National University B3 Nakagawa Mayu

2017.03.08 (FRI)

We went to Chinese temple.

A large tree grew in the limestone.

They supply nourishment from limestone, and this grows up.

Bats inhabited the cave, but it was driven to a person and crowded in the small space.

This temple is very famous. So great person comes there.

A report of Coastal Botany

環境リスク共生学科　2年　繁村周

2019/3/5(Tuesday)

This picture was taken in Sa Nangmanora Waterfall(Phang Nga, Thailand).

This plant(Selaginella willdenowii) is a species of spikemoss known by the common names “Willdenow's spikemoss”. The shape of plants resembles fern but it is not a fern. Most of Selaginella willdenowii grow in the shade. The leaves of the plant change color depending on the viewing angle. The color changes blue-green. This is due to light interference.

A mangrove forest and mud lobster's burrows

This is a mangrove forest where human hands have been added. The planting time is near, the height of each tree is almost the same. To take in oxygen, many roots come to the surface (cypress knee). Mud lobsters, clubs, horseshoe crabs, gobies are live in ground surface. Mud lobsters lives in their nest. Its shape likes hill and burrows.

2019/3/6(Wednesday)

Ton Prai Waterfall(Phang Nga)

There are a lot of waterfalls around Phang Nga. We went to the dry season, but the waterfall was full of water. Unlike the mechanism in which forests hold water in Japan, water is supplied even in the dry season by the topography centered on limestone. To my surprise, several small fish lived

under the waterfall. Trees around the waterfall were very tall. I cannot see well to the top even if I look up. Like these, the rainforest trees are very tall.



Vegetation and soil near the coast

Near the coast, short trees and grasses were growing. The soil contains little clay and is poor in nutrients (Heath). Soil color is white. The particle size of the soil was small and like sand. The plants were deeply rooted because the soil was very dry in the dry season.

2019/3/7(Thursday)


Lam Kaen Beach(Phang Nga) and Casuarinaceae

A lot of Casuarinaceae was seen along the beach. These are significantly taller than other plants. They were standing upright, with many plants growing diagonally under the influence of the wind. It is strong against the wind blowing from the sea. The sea was very transparent.


Plants along the beach

There were plants that stretched runners to crawl on the beach. Even on the same beach, the

tendency of growing plants changed depending on the location. It seems that diversity is seen in how to grow plants where there is no Casuarinaceae.

2019/3/8(Friday)


Wat Suwan Khula (Cave Temple)

In temple, there are many monkeys. The cliff behind the temple is very steep, but the monkey lived there. There were tall trees on the cliff. They seemed to live on eating corn and bananas given by tourists. At the cliff, tall trees grew from the crack of the rocks. It seemed to be growing towards the sun, probably because the sun blocked by the cliff. A lot of bats lived in the cave.


The poisonous snake and plants at the cliff

In the forest I visited in the afternoon, I was able to observe the poisonous snake. At first glance, it looks like a green tendril. They mimicked and appeared to ambush the prey. Most of the Thailand snakes are highly toxic, so we must be careful enough.

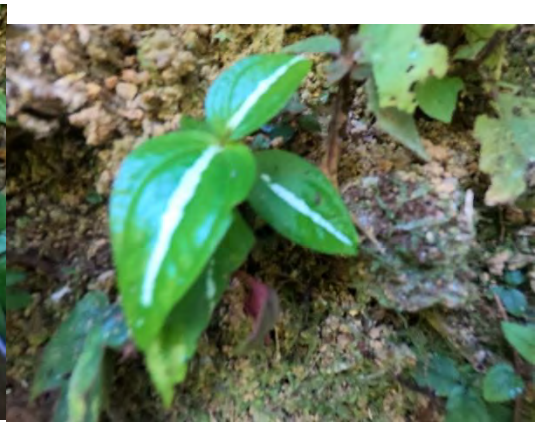
タイ実習レポート　　Tomoki Shima

Mar.5

I went to the National Park in Ko Panyi, where limestones play a significant role as making different level of water table as well as making mineral.

Melastomataceae

This is one of the departments which belongs to dicotyledon and blooms red flower.These two Melastomataceae plants below are the same species.

In the afternoon, we went to mangrove area near the fishing village. There were two mangrove species overwhelming others, Xylocarpus genus and Rizofora. The former species dominated outside of this area, while the latter one was dominant to inside. That is because the outside was faced with river, that is, Rizofora could not stand the strong flow of river.

Mar.6

Ecology VS Forestry

You can see the isolated tree in the middle. This is because it was planted by people. In Thailand, There are some people who are engaged in forestry and they misunderstand plantation is eco-friendly. However, planted tree disturb surrounding young native trees ironically, so ecologists are critical to plantation.

Mar.7 Thai Mueang national park
casuarina

casuarina dominated near the coast. It grows fast and is high enough to reach 20 meters.

Scaevola is dominated coast area except for casuarina area.

We can see the frontier between casuarina and scaevola. There is a trend to increase green area among Thai people, so they plant a lot of trees like casuarina. However, Kitichate said planting led negative effect on ecosystem and lost biological diversity.

May 8

We went to Krasom on the way to Krabi. This picture represents trees which are on the hill.

Thai practice report

Department of Risk Management and Environmental Science
Takeuchi Ryunosuke

March 5


It has a comb-like structure like a Morpho butterfly on its leaves, which is called "Selaginella uncinata" and shows a structural color by light interference.


This is a group of moths that grow on leaves, and such species are only found in tropical rainforest areas.



The picture on the left is a kind of Ricaniidae, which is large and beautiful compared to the species that live in Japan. In addition, there was a big horn-like protrusion and I felt a unique evolution.

The middle and right pictures are the watering butterflies . However, I considered this species locally as a member of the poisonous Danainae. The mottles are very similar too, but they were deceived because their way of flying was Danainae's way of flying. In fact, this butterfly is a kind of Papilionoidea, and it can be distinguished from the difference in the atmosphere of the abdomen and head, which are clearly thicker than those of Danainae, when looking at the torso in the right picture. I realized that this was a mimicry in the tropics. Also, as a fine point, the Danainae mates rarely come to the water supply. I regret that I should have doubt there.

March 6

All three photographs show the same plant. However, from the left, there are three types of changes, a type with plain leaves, a type with white mottled leaves, and a type with white streaked leaves.

All three photographs are members of Papilionoidea and are watering. The butterfly on the left is Papilio palinurus, which is closely related to Papilio dahaanii and Papilio maackii in Japan. According to my teacher, Mr. Nakamura, it was a rare butterfly in Thailand. The picture in the middle is Graphium antiphates, which is a common species. In the image, the green color stands out, but it looks whitish when it is flying. The photo on the right is a kind

of Graphium, but it closely resembles Graphium doson subsp that inhabits the southwestern islands of Japan. It is also known that all butterflies that feed water in this way are male.

March 7

These plants sprout near the coast, and are expected to wither due to salt damage if high waves come. Such a scene was seen because the time of our training was dry season.

These insects have an ecology specific to sand dunes. The grasshopper on the left is very similar in ecological appearance to Epacromius japonicus in Japan. The insect on the right is a kind of Cicindela, which is thought to be similar to Cicindela anchoralis in Japan.

March 8

This is a group of bats found in a cave in one of the three major temples in Thailand. In Thailand, in addition to the bats checked here, it was also possible to see flying above the city of Krabi. It is a pity that I could not confirm the fellows of Pteropodidae.

This is a nest of swallows that could be confirmed at the same temple. Currently, because the human hands are too busy, it seems that Swallow does not form a nest, but it has been able to confirm many of the past nests. I was impressed to see the swallow nest, which is known as a high-grade food, for the first time.

Thailand's flora and fauna were wonderfully ashamed of the tropical rain forest name. The variety of species and survival strategies was high, and many creatures of different nature from Japan were seen. However, animals and plants that have similarities with Japan to the same extent were also seen and were interesting.