

Advanced training and Advanced laboratory skills in field biology in 2018

1.1 Outline

“Advanced training in field biology” (field course) aims to train students to do fieldwork on the UNESCO World Natural Heritage Site on Yakushima Island, Japan. Young scientists from abroad and graduate students in Kyoto University attend the course together, using English as an official language.

“Advanced laboratory skills in field biology” (laboratory course) aims to train students various laboratory skills to study wildlife, including hormonal and genetic analysis, from rudimentary DNA sequencing techniques to the analyses of high-throughput next-generation sequencer data. In this course, various samples collected in the preceding field course will be analyzed. Students can choose a topic which is suitable for their interest and prior experience in molecular biological experiments. Through the two courses, students will experience the whole process of scientific research, sampling in the field, analyzing in the laboratory, conducting data analysis and presentation of the results.

No previous experience is required to take these courses and we welcome both students who engage in fieldwork and those who engage in laboratory work. We also welcome students who have few chances to communicate in English. Please communicate with foreign students of the same generation.

In the field course, students will learn the fundamental methods to study the ecology and behavior of various wild animals. We stay in a small village, having local food. We hope you enjoy the nature and culture of Yakushima Island.



1.2 Application

A graduate student of Biological Science, Graduate School of Science, Kyoto University (as of April 2018) can apply for the courses. Please note that we accept a limited number of participants due to safety for fieldwork and limited capacity of accommodation and transportation.

We will hold the course twice this year, in spring and fall. The contents of spring and fall courses are different, and students may take only one of them. If an applicant was unaccepted for the spring course, he/she may apply again for the fall course.

In both seasons, the field course will be held in Yakushima Island. We hold the laboratory course at Yoshida Campus of Kyoto University in Kyoto City or at the Primate Research Institute in Inuyama City (depends on the group).

Students may apply to either the two courses, though we encourage to take both of them.

Application form is available at the following site

<http://www.wildlife-science.org/ja/curriculum/yakushima-field-science-course.html>

<http://www.wildlife-science.org/en/curriculum/yakushima-field-science-course.html>

1.3 Fee

Please pay 15,000-20,000 yen for meals and insurance, on the first day in Yakushima. This will pay you back from the university later. During the field course in Yakushima, please pay by yourself the cost of meals other than those provided in our field station (usually, lunch on the first day, lunch and dinner on the last day), optional activities such as entrance fee of sightseeing sites, public bath and snacks.

2. Schedule

Advanced training and Advanced laboratory skills in field biology in spring

April 11 Deadline for application by students of Kyoto University (both courses)

May 17, 3:00 p.m. Guidance and lecture at WRC in Yoshida Campus. PRI students can join it by teleconference. We will have a welcome party for participants from abroad.

Field course (Yakushima Island, Kagoshima Prefecture)

May 19 Field course_starts (Move to Yakushima on this date)

May 20-23 Fieldwork in Yakushima

May 24 Data analysis, presentation in the afternoon

May 25 Leave Yakushima

Laboratory course at Kyoto University (Yoshida Campus, Kyoto City)

May 28 – 31 Experiments and analyses, at several laboratories.

June 1 Preparation for presentation (both for “Advanced training in field biology”)

June 5 Presentation of the results of the courses at international symposium (held at Yoshida Campus)

Advanced training and Advanced laboratory skills in field biology in fall

The contents and schedule of the courses in fall is not fixed. We will announce them at the following web site, in July, 2018.

September 17 Deadline for application by students of Kyoto University (both courses)

Field course (Yakushima Island, Kagoshima Prefecture)

Nov. 3 or 4 Field course_starts (Move to Yakushima on this date)
 Nov. 4-8 or 5-9 Fieldwork in Yakushima
 Nov. 8 or 9 Data analysis, presentation in the afternoon
 Nov. 9 or 10 Leave Yakushima

Laboratory course at Kyoto University (Yoshida Campus, Kyoto City)

Nov 12-16 Experiments and analyses, at several laboratories.
 Nov. 19 or 20 Presentation of the results of the courses at international symposium (held at Yoshida Campus)

<http://www.wildlife-science.org/ja/curriculum/>

3. Field course (Advanced training in field biology) in Spring (May 19-25)

3.1 Participants

About 18 graduate students

About 7 teaching staff, including professors, post-doc and graduate students who study in Yakushima and/or subject species.

3.2 Groups

We form two groups: monkey and plant. Each group will engage in different tasks. Choose your preference of the groups. Please note that we cannot ensure your first preference, due to limited capacity of each group.

A) Monkey group

Title

Island-wide distribution of Japanese macaques
 ニホンザルの全島分布

Lecturers

Goro HANYA (Primate Research Institute, Kyoto Univ.) 半谷吾郎(京都大・霊長研)

Yosuke KURIHARA (Primate Research Institute, Kyoto Univ.) 栗原洋介(京都大・霊長研)

Takeaki HONDA (Primate Research Institute, Kyoto Univ.) 本田剛章(京都大・霊長研)

Abstract

We will study the island-wide distribution of Japanese macaques. According to the island-wide census conducted in the 1990, density of Japanese macaques are high only around in the lowland and did not differ among the altitudinal zones higher than 400 m above sea level. However, census was conducted only in the western area where habitat disturbance was minimal and the distribution in disturbed habitats (mainly due to logging and conifer plantation) is not well known. As a follow-up study of the census of the previous year, we will conduct census of Japanese macaques by walking logging road and trails of Yakushima, including the summit areas of more than 1800 m above sea level. Students are required to walk a long distance each day. We collect fecal samples that are used in population genetic analysis conducted during the Genome Science Course.

B) Plant GroupTitle

Species composition of fern prothallia in Yakushima

屋久島のシダ植物の前葉体における種構成

Lecturers

Wataru SHINOHARA (Kagawa Univ.) 篠原渉 (香川大学)

Hiroshi KUDOH (Center for Ecological Research, Kyoto Univ.) 工藤洋 (京都大・生態研)

Abstract

When you are in a dark wet forest, you can find many ferns growing on the ground. Ferns never have flower. Instead, they produce spores to propagate themselves. Spores are very tiny and easy to fly by wind. When a spore drop down on the ground, and after some conditions are ready, the spore germinates and turns into a prothallium. Compared to the sporophyte stage of ferns, the prothallium stage is very small (about 1 cm in size) and has not enough morphological character for species identification. So, there is no clue to know what is happening in the prothallium world so far. For example, are there any unknown species being able to live only on the prothallium stage distributed in Yakushima? Are there any distributional differences between sporophyte and prothallium stage of ferns? This year, plant team focuses on prothallium of ferns. We will collect prothallia and identify the species of each prothallium by using DNA analysis. After that, we will compare their species composition with that of sporophytes and across the collection sites.

3.2 Reports on the past program

Leading Graduate Program of Primatology and Wildlife Sciences (in English)

<http://www.wildlife-science.org/en/curriculum/yakushima-field-science-course.html>

(reports for the 2014 fall, 2015 fall, 2016 spring, 2017 spring are available)

CCTBio HP (in Japanese)

http://www.wrc.kyoto-u.ac.jp/core-to-core/training_old.html

4. Advanced laboratory skills in field biology in spring (May 28- June 1)

Following the field course”, laboratory course of will be held. If you are planning to take both the courses, we will be using the samples collected during the field course in Yakushima Island for the laboratory course. Therefore, we recommend that you join in a group in laboratory course that corresponds to the one in the field course you took. In spring, both courses will be held in Kyoto.

Recommended combinations

Genome Science Course	Field Science Course
A) Monkey	A) Monkey 1 or B) Monkey 2
B) Plant	C) Plant

A) Monkey 1

Lecturer

Miho MURAYAMA (Wildlife Research Center, Kyoto Univ.) 村山美穂 (京都大・野生動物)

Abstract

Using feces collected in the Field Science Course we extract DNA and conduct sex identification. Then we genotype behavior-related candidate genes such as COMT (Pfluger *et al.* 2016) and compare with the other Japanese macaque groups. The result may reflect behavior trait of Yakushima macaques.

B) Monkey 2

Lecturer

Takushi KISHIDA (Wildlife Research Center, Kyoto Univ.) 岸田拓士 (京都大・野生動物)

Abstract

Using feces collected during the Field Science Course, the phylogeography of Yakushima macaques will be investigated based on the mitochondrial DNA (mtDNA). The mtDNA-based phylogeography of the Yakushima macaques was primarily reported by Hayaishi and Kawamoto in 2006. They found 6 haplotypes of the mtDNA among Yakushima macaques and reported the distribution of these haplotypes. We will investigate the current distribution of these haplotypes. This may reflect the movement of Yakushima macaque population during the last decade.

C) Plant

Lecturer

Koji TAKAYAMA (Faculty of Science, Kyoto Univ.) 高山浩司 (京都大・理学研究科)

Shizuka FUSE (Faculty of Science, Kyoto Univ.) 布施静香 (京都大・理学研究科)

Wataru SHINOHARA (Kagawa Univ.) 篠原渉 (香川大学)

Hiroshi KUDOH (Center for Ecological Research, Kyoto Univ.) 工藤洋 (京都大・生態研)

Abstract

For the prothallium samples collected from Yakushima, we will try to identify the species or the genera to which they belong using DNA barcoding analysis. We will extract DNA from the tiny prothallium samples and determine *rbcL* gene sequences from them. Subsequently, we will compare these nucleotide sequences with registered DNA sequences in the DNA databases. Finally, we will examine the species composition of ferns in the distinct phases of life cycle (gametophyte and sporophyte).

International Seminar

Date: June 5 (Tue), 2018

5. Information on fieldwork and life in Yakushima Island

5.1. Fieldwork

Research in Yakushima

In the forest, the canopy is closed and the forest floor is dark. Undergrowth is sparse in the western lowland where you can observe habituated Japanese macaques and deer, but bushy in the highland. Summit area is densely covered with bamboo grasslands. There are no trails in the western lowland forest, but we can walk through most parts easily. We sometimes walk on steep slope and cross streams. In other parts of Yakushima, we walk only along logging roads or existing trails for hikers. Please wear long trousers and shoes to protect your legs and feet in case you lose your balance.

During the month of May, you may get bug bites (mostly mosquitoes). A long-sleeved shirt is good for protection from insect bites. Wear a long-sleeved shirt, if you have sensitive skin. We also walk on the road to search for animals and their feces. Sunlight is strong on the road so you will need a hat.

In the forest, visibility is poor and you need to confirm your location using a map and compass.

Weather

Air temperature is about 18-26 °C in May and 19-25 °C in October in lowland. Note that air temperature is much lower in high-altitude mountainous areas. The temperature around the summit is 10°C than around the coast.

Yakushima Island is famous for rainy climate. Early June is the beginning of rainy season and it is likely to rain in late May.

What to wear on the field

- Long-sleeved shirt, long trousers, hat or cap

In general, it is better to wear a long-sleeved shirt and long trousers to cover your skin on the field. They will protect you from insect bites, scratches and strong sunlight. Sunlight is very strong in May. Long trousers should be soft and loose enough to walk on steep slopes. Avoid tight jeans, because they become heavy and hard when they are wet.

- Shoes

Avoid slippery shoes or those that do not cover your foot, such as sandals.

Mountaineering shoes are the best, if you have. We recommend them, if you do not have enough experience in walking in hilly forests.

Jogging shoes or sneakers are good in lowland forest, though they are not water proof. They should be tough enough to walk on the rocky slope. If you are joining the monkey group, we advise you to borrow a trekking shoes, as you walk a long distance each day. You can borrow from a sport shop in Yakushima and you do not have to pay the rental fee by yourself.

If you have old mountaineering shoes, jogging shoes or sneakers (more than 3 years), check their soles. Old bond may become weak and the soles can fall apart. Almost every year, one or two participants have had their soles fall apart.

Long boots are also good, if you are experienced in walking in the mountain with them.

- Rainwear

Good rainwear is essential for those joining in the monkey group. Waterproof and breathable one (Gore-Tex) is highly recommended. You can borrow from a sport shop in Yakushima and you do not have to pay the rental fee by yourself.

- Gloves

You may wear gloves if you like. Thin gloves are good for manipulation, such as taking notes.

5.2. Accommodation and meals

In Yakushima, we stay in the field station (PWS House Yakushima) of Kyoto University in Nagata Village. All meals are provided during our stay in the field station. For dinner, you can enjoy local foods cooked by local people. Students and staffs will not cook except for the BBQ on the last night. We wash dishes and clothes and clean the rooms by ourselves.

Do it yourself in the field station

We have no housekeeper in the station. You will be responsible for maintaining the station and doing daily chores such as cleaning, washing clothes, packing lunch, washing dishes, taking out the garbage, etc. Please do these things actively and cooperatively.

Meals

Meals are cooked by residents in Yakushima. Please help them cook when necessary. If you have food allergy or food(s) to avoid (e.g., meat for vegetarian), please let us know.

We pack lunch by ourselves. Bring a lunchbox of your preference and utensils necessary (spoon, fork, chopsticks, etc.).

Room and bedding

In the Field Station, there is a dining hall, kitchen, 3 shower rooms and 3 restrooms. You will share one of the 5 bedrooms with other students (4 people/room). Each bedroom has two bunk beds with mattresses. Please bring your own sleeping bag and/or warm clothes, as the temperature may drop to 15 degrees at night. Expensive, high-quality sleeping bag is not necessary as we stay inside the house at night.

Bath

There are three shower rooms. We prepare shampoo and soap, which you can use freely for bathing. If you prefer your own shampoo or soap, please bring them. Have your own towel for bathing.

As it takes a long time for everyone to take a shower, some of us may go to public bath. You can try Japanese public bath, if you like. When you go to a public bath, have soap and a towel with you.

Washing clothes

Two washing machines are available. We will provide the laundry detergent. Please wash your clothes together with those of other station members, to save time. We prepare mesh bags for washing, for which you can put your clothes in. Do not start washing after 10 p.m., to avoid making noise and inconveniencing others.

Others

You may bring sandals, which may be useful for walking around the station.

Shopping

In Nagata Village, you can buy snacks, drinks and daily necessities at a small shop. There are no supermarkets or convenience stores in the village. There is a supermarket in Miyanoura (20 km from the field station), the largest town in Yakushima Island, but you may not have time to go shopping there, except on the first and last day. You will have some time for shopping, on the last day.

5.2. List of personal equipment

Equipment for field research (common to all groups)

In addition to below, some other equipment will be necessary depending on your activity.

Special equipment in each group will be announced later.

- small backpack
- notebook (pocket size is good)
- pen / pencil
- marker (with which you can write on plastic sample bags and plastic tubes)
- canteen (you may use a PET bottle)
- lunch box and spoon, fork, chopstick (bring a plastic container to pack your lunch to Yakushima)
- flashlight (and batteries)
- sampling bag, tube, etc. (they are given to participants at Yakushima)
- maps (they are given to participants at Yakushima or Kyoto)
- poison remover (they are given to participants at Yakushima)
- backpack cover, or plastic bag inside the backpack (optional, when it is rainy)

- long trousers (and a belt, must)
- socks (must)
- rainwear / umbrella (when it is rainy)

- whistle (optional)
- insect repellent (optional)
- antipruritic (optional)
- sunscreen (optional)
- snack, candy, etc. (optional)
- adhesive tape (optional, each lecturer has a first-aid kit)
- towel (optional)
- tissue (optional)

- vest (optional)
- waist pouch (optional)
- spats (optional)
- gloves (optional)
- camera (optional)

Other equipment for stay at the field station

- sleeping bag (must). We have five sleeping bags to lend. Please ask PWS Leading Graduate Program Office
- underwear
- clothes (which you can wear in the house)
- sandals

- towel
- soap (for public bath)
- toilet kit
- laptop (optional; a personal laptop computer is useful for data analysis and presentation of the results)