Field Science Course and Advanced Laboratory Course in 2019 Fall

1.1 Outline

"Field Science Course" aims to train students to do fieldwork on the UNESCO World Natural Heritage Site on Yakushima Island, Japan. Young students and scientists from abroad and graduate students in Kyoto University attend the course together, using English as an official language.

"Advanced Laboratory Course" aims to train students to do laboratory works, which is useful for field biology. In this course, samples collected in the preceding "Field Science Course" will be analyzed, as much as possible. Students can choose a topic which is suitable for their interest and prior experience in laboratory works. Through the two courses, students will experience the process of scientific field 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 had few chances to communicate in English. Please communicate with foreign students of the same generation.

In the Field Science Course, students will learn the fundamental methods to study the ecology of wildlife. 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 October 1, 2019) can apply for the courses. 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 Science Course will be held in Yakushima Island. We hold the Advanced Laboratory Course either 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 Field Science Course or Advanced Laboratory Course, though we encourage you to take both courses.

Applicants must send the form before the deadline. If we have more applicants than our capacity, we will select participants in a week. The application form is available at the following site:

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

1.3 Fee

Students of Kyoto University must pay about 17,000 yen for meals and insurance in Field Science Course in Yaskushima on the first day (no fee is required for the Advanced Laboratory Course). This will pay you back from the university about a month later. Invited students do not need to pay the fee by yourself.

During the Field Science Course in Yakushima, 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 on the way to and back from Yakushima), and optional activities such as entrance fee of sightseeing sites (¥300-500 / site), public bath (¥200-500) and so on.

2. Schedule

Field and Genome Science Courses in fall

September 6 Deadline for application by students of Kyoto University (both for the Field Science Course and Genome Science Course)

September 13 Fix the member and the courses

Nov 14 Introduction of the course, lectures on safety during fieldwork in Yakushima, self-introduction by participants and ice-breaking party

Place: Seminar room on B1 floor of Wildlife Research Center, Kyoto Uiversity, Kyoto City

Field Science Course

Place: Yakushima Island, Kagoshima Prefecture

Nov 16 Field Science Course starts (Move to Yakushima on this date)
From Kyoto: 09：35 Kobe - 10：45 Kagoshima
12：55 Kagoshima - 13：35 Yakushima
(Flight schedule is not fixed)
From Inuyama: 900 Chubu Centrair - 1025 Fukuoka
1305 Fukuoka – 1405 Yakushima (Flight schedule is not fixed)
Meeting in the evening: introduction of the lecturers and courses, etc.

Nov 17-20 Fieldwork in Yakushima
Nov 21 Data analysis, presentation in the afternoon
Nov 22 Leave Yakushima (if we have time, we will visit some places in Yakushima)
To Kyoto: 18：00 Yakushima - 18：35 Kagoshima
19：55 Kagoshima - 21：00 Kobe
(Flight schedule is not fixed)
To Inuyama: 1705 Yakushima – 1740 Kagoshima
2025 Kagoshima – 2140 Chubu Centrair
(Flight schedule is not fixed)
(Nov 23 Outreach event for local people: some lecturers stay in Yakushima and hold the event.)

Advanced Laboratory Course

Nov 25–29 Laboratory experiments and analyses, at WRC, Kyoto. In the latter part, we will prepare for the presentation of the results (both for Field and Laboratory Courses) in the international seminar on Dec 2

Place: Wildlife Research Center, Kyoto University, Kyoto City

International Seminar

Dec 2. We will present the results of the Advanced Laboratory Course and Field Science Course. Invited students will also present their own current research. We will have a banquet in the evening

Place: Science Seminar House, in Yoshida north campus, Kyoto Uiversity, Kyoto City

3. Field Science Course in Fall

3.1 Participants and staff

14 graduate students (6 invited students from abroad and max. 8 graduate students of Biological Science, Kyoto University)

About 5 teaching staff, including professors, post-doc and graduate students who study in Yakushima and/or subject species.

3.2 Groups

We form two groups: parasite and deer groups in the field course, and DNA variation and hormone in the laboratory course. Each group will engage in different tasks. Choose your preference of the groups, from first to second. Please note that we cannot ensure your first preference, due to limited capacity of each group.

A) Parasite group

Title

Environmental assessment of parasites infecting mammals in Yakushima

Lecturers

Andrew MacIntosh (Primate Research Institute, Kyoto Univ.) アンドリュー　マッキントッシュ

Abstract

Japanese macaques and virtually all other animals are infected with intestinal helminth parasites. Many of these parasites are acquired through contact with contaminated environments via fecal-oral transmission. Since most intestinal helminths shed propagules (usually eggs) into the environment via host feces, the soil and low-lying vegetation becomes a home for developing infective stages (embryonated eggs or infective L3 larvae), and a source of infection for host animals. This project aims to collect environmental samples, including soil and ground vegetation, for evidence of parasites that infect Yakushima macaques and sika deer, among other vertebrate hosts such as weasels and raccoon dogs. Parasite stages will be detected using microscopy following concentration methods. We will attempt also to sample from multiple sites to explore geo-physical and micro-climatic factors that might influence deposition and survival of parasites, thereby identifying 'hotspots' of infection for hosts.

B) Deer group

Title

Is sex hormone level of deer fecal pellet affected by that of monkey feces they eat?

Lecturers

Yoshimi AGETSUMA- YANAGIHARA (Waku Doki Science Planning) 揚妻-柳原 芳美
Hideki SUGIURA (Wildlife Research Center, Kyoto Univ.)　杉浦秀樹
Takafumi SUZUMURA (Wildlife Research Center, Kyoto Univ.)　鈴村崇史

Abstract

We observed deer often eat monkey feces in our study area in the western lowland on Yakushima Island. Monkey feces probably be nutritious to them, but little is known about meaning of feeding of the feces.

We also measured sex hormones in deer feces and found that even male deer have high

progesterone level in autumn. This hormone is typically known to increase in pregnant female and our result is curious. A possible explanation is that male deer feed on feces of pregnant monkeys, which contain much progesterone.

To test this hypothesis, we will

- Collect monkey feces from various age-sex classes and measure progesterone level
- Present the monkey feces to wild deer and observe whether deer select monkey feces or not. If deer prefers feces of adult monkey females, this may support our hypothesis.
- Find deer staying close to a monkey group and observe deer's eating of monkey feces in natural situation
- Follow adult male and adult female deer and collect their fecal pellet.

Progesterone level of collected feces of deer and monkeys are measured in the following laboratory course (B). We will also take DNA of monkeys from the feces and analyze their variation in the following laboratory course (A).

4. Advanced Laboratory Course in fall (Nov 12-16)

Following the Field Science Course will be the Advanced Laboratory Course. We will analyze the sample collected in the Field Science Course and present the results together with the field observation in the Field Science Course.

A) DNA (monkey phylogeography) group

Lecturer

Takushi KISHIDA (Wildlife Research Center, Kyoto Univ.) 岸田拓士

Place

Higashi Ichijokan (south of Wildlife Research Center), Yoshida campus, Kyoto City.

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.

B) Hormone (field endocrinology) group

Lecturer

Kodzue KINOSHITA (Wildlife Research Center, Kyoto Univ.) 木下こづえ

Place

B1 floor of Wildlife Research Center, Yoshida campus, Kyoto Citty

Abstract

Participants will apply hormonal analysis to deer and monkey feces collected during Field Science Course and estimate whether deer select to eat monkey feces with high progesterone concentration or not, i.e. feces of pregnant females. Since pregnant monkeys need higher nourishment, it is assumed that deer eat feces of pregnant individuals as a nutritious food. Actually, in the previous study, male deer also showed high progesterone levels in their scat during breeding season as same as pregnant deer (Kinoshita et al., The 23rd Annual meeting of Japanese Society of Zoo and Wildlife Medicine, 2017).

First, the participants will extract hormones from feces of monkeys and deer collected in Yakushima using the organic solvent. Secondly, the participants will measure the fecal progesterone concentrations by using enzyme-immunoassay. November is the breeding season in both monkey and deer, therefore, we will obtain high progesterone concentrations if females get pregnant. We will discuss the relationship between behavioral observation results of deer in Field Science Course, especially eating monkey feces, and the fecal progesterone concentrations in monkeys and deer.

4.2 Reports on the past program and reports

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

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

CCTBio HP (in Japanese)

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

5. Information on fieldwork and life in Yakushima Island

5.1. Fieldwork

Research in Yakushima

In the lowland 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. In the highland, undergrowth is bushy and 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 November, you may get bug bites (mostly mosquitoes) and hornets are still active and aggressive. 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 may have 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 15-22 °C in early November in lowland. Note that air temperature is much lower in high-altitude mountainous areas. The temperature around the summit is 10°C lower than around the coast. (we do not go to the summit area, in 2018 fall)

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. 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

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 a resident in Yakushima. Please help her 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 5 bedrooms with other students (4 people / room). Each bedroom has two bunk beds with mattresses. Please bring your own sleeping bag or blanket and/or warm clothes, as the temperature may drop to 15 degrees at night and we do not have enough blanket in the station. Expensive, high-quality sleeping bag is not necessary but inexpensive one is good enough 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.

□ backpack (20-30 litters is enough)
□ 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)
□ whistle (we can lend some whistles. Please let us know if you do not have it)
□ 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)

□ 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 things for stay at the field station

□ sleeping bag or blanket (must).

□ underwear

□ clothes (which you can wear in the house)

□ sandals (optional)

□ towel

□ toilet kit

□ laptop (optional; a personal laptop computer is useful for data analysis and presentation of the results)