

Field Science Course and Genome Science Course in 2017

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 scientists from abroad and graduate students in Kyoto University attend the course together, using English as an official language.

“Genome Science Course” aims to train students in the molecular biology, 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 Science 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 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, 2017) 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 Science Course will be held in Yakushima Island. We hold the Genome Science 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 Genome Science Course, though we encourage you to take both of the courses.

Application form is available at the following site

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

1.3 Fee

Please pay about 17,000 yen for meals and insurance, on the first day. This will pay you back from the university about a month later. During the Field Science 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 on the way to and back from Yakushima), optional activities such as entrance fee of sightseeing sites (¥300-500 / site), public bath (¥200-500) and snacks.

2. Schedule

Field and Genome Science Courses in fall

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|-----------------------|--|
| September 15 | Deadline for application by students of Kyoto University (both for the Field Science Course and Genome Science Course) |
| September 22 | Fix the member and the courses |
| November 2, 4:00 p.m. | Guidance and lecture for the Field and Genome Science Courses at WRC in Yoshida Campus. PRI students can join it by teleconference. We will have a welcome party for participants from abroad. Please join us. |

Field Science Course (Yakushima Island, Kagoshima Prefecture)

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|-------|---|
| Nov 5 | Field Science Course starts (Move to Yakushima on this date) |
| | From Kyoto: 1015 Itamin – 1150 Yakushima (Flight schedule is not fixed) |
| | From Inuyama: 900 Chubu Centrair - 1025 Fukuoka |

1305 Fukuoka – 1405 Yakushima (Flight schedule is not fixed)

- Nov 6-9 Fieldwork in Yakushima
 Nov 10 Data analysis, presentation in the afternoon
 Nov 11 Leave Yakushima (if we have time, we will visit some places in Yakushima)
 To Kyoto: 1800 Yakushima – 1925 Itamin (Flight schedule is not fixed)
 To Inuyama: 1705 Yakushima – 1740 Kagoshima (Flight schedule is not fixed)
 2025 Kagoshima – 2140 Chubu Centrair

Genome Science Course at Kyoto University (Yoshida Campus and WRC, Kyoto City or PRI, Inuyama)

Nov 13–17 Molecular experiments and analyses, at WRC, Kyoto.

In the latter part, we will prepare for the presentation of the results (both for Field and Genome Science Courses) in the international seminar at Kyoto University, Yoshida campus, Kyoto. In the seminar, invited speakers will also talk. We will have banquet in the evening.

3. Field Science Course in fall

3.1 Participants

About 14 graduate students

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

3.2 Groups

We form three groups: deer, parasite, and drone. Each group will engage in different tasks. Choose your preference of the groups, from first to third. Please note that we cannot ensure your first preference, due to limited capacity of each group.

A) Deer group

Title

Relationship between mating behavior and sex steroid hormone concentrations in wild Yaku sika deer (*Cervus nippon yakushimae*)

Lecturers

Naoki AGETSUMA (Field Science Center for Northern Biosphere, Hokkaido University)

揚妻直樹(北海道大学 北方生物圏フィールド科学センター)

Yoshimi AGETSUMA- YANAGIHARA (Waku Doki Science Planning)

揚妻-柳原 芳美(Waku Doki サイエンス工房)

Abstract

The western coastal forest of Yakushima is one of the best study sites for behavioral

observation of wild Japanese sika deer (*Cervus nippon*). In this course, we focus on mating related behaviors between males and females, as well as between males, i.e. agonistic interactions. You will observe deer behaviors and record social interactions among them. During behavioral observation, you will collect their fecal samples to analyze their sex steroid hormones (testosterone, estradiol-17 β , and progesterone). After field work in Yakushima, you will analyze the levels of these hormones in the laboratory. We will examine the relationship between the hormone levels and activeness of mating behavior in wild situation.

Note that behavioral observation and fecal sampling of deer may demand endurance and we may walk in hilly mountain areas for long distances every day.

B) Monkey group

Title

Genetic variation of Japanese monkeys in the western low land in Yakushima Island.

Lecturers

Hideki SUGIURA (Wildlife Research Center, Kyoto Univ.) 杉浦秀樹 (京都大・野生動物)

Abstract

In the western lowland of Yakushima Island, about 10 groups of monkeys have been identified. Hayaishi and Kawamoto (2006) reported genetic variation of mtDNA on the whole island and suggested local-specific variations. We will try to collect DNA samples from feces of monkeys in multiple groups to explore genetic variation in the area. During the following the monkeys, we will identify individuals and observe their behavior.

Additionally, we will try to take photos of vegetation of study area by drone, if weather condition is good enough.

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>

CCTBio HP (in Japanese)

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

4. Genome Science Course in fall (Nov 13-16)

Following the Field Science Course will be the Genome Science Course. All courses will be held in Kyoto. 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. We recommend the following combinations.

Genome Science Course	Field Science Course
A) Deer sex hormones	A) Deer
B) Monkey population genetics	B) Monkey

A) Deer sex hormones

Lecturer

Kodzue KINOSHITA (Wildlife Research Center, Kyoto Univ.)

木下こづえ(京都大・野生動物)

Abstract

Participants will apply hormonal analysis to deer feces collected during Field Science Course and estimate the reproductive status of the deer. First, the participants will extract sex steroid hormones from the feces using the organic solvent. Secondly, the participants will measure the fecal sex steroid hormone (testosterone, estradiol-17 β , and progesterone) concentrations by using enzyme-immunoassay. November is the breeding season for deer, therefore we will obtain high sex steroid concentrations. We will discuss the relationship between behavioral observation results and their sex steroid hormone concentrations (reproductive status) in the wild deer.

B) Monkey population genetics

Lecturer

Takushi KISHIDA (Wildlife Research Center, Kyoto Univ.)

岸田拓士 (京都大・野生動物)

Abstract

DNA of monkeys will be extracted from the feces collected in Yakushima. After DNA extraction, we will conduct population genetics analyses and discuss about the population of Yakushima macaques.

Presentation at international seminar

Date: Nov 20 (Mon), 2017

Participants present of the results in the international seminar at Kyoto University, Yoshida campus, Kyoto. In the seminar, invited speakers will also talk. We will have banquet in the evening.

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 stronger on the road than in the forest, 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 2017 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

In 2017 fall course, all of us follow deer or monkeys in hilly mountain. Mountaineering shoes are highly recommended. If you do not have them, you can borrow them from a mountaineering shop in Yakushima and you do not have to pay the rental fee by yourself. If you have old mountaineering shoes, (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.

- Rainwear

Rainwear is necessary both for deer and monkey groups. Avoid using umbrellas, when you are observing deer, as they may be afraid of umbrellas. You can borrow it from a mountaineering 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 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.

5.3. Cell phone and Wi-Fi

In Nagata Village, you can use cell phones (mobile carriers of DoCoMo and au are usually good but Softbank may not. Please check the latest information by yourself). You cannot use mobile phone in the most field site.

In the field station, Wi-Fi is available. Accounts for “KUINS-Air” (Kyoto University members) or “Eduroam” (non Kyoto University members) is necessary. Temporal accounts of Eduroam are provided for non Kyoto University members. Note that the capacity of the Wi-Fi is small and it takes a time to download large files, especially when many people use it at the same time.

5.4. 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 liters 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 lend to participants at Yakushima or Kyoto)
- 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 equipments 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 (we do not provide towels)
- soap (for public bath)
- laptop computer (optional; a personal laptop computer is useful for data analysis and presentation of the results)