

## フィールド科学実習・ゲノム科学実習 参加者募集

2017年2月1日

世界遺産の島・屋久島で、フィールドワークを経験しませんか？豊かな自然の中で、自らの手足を動かして、観察や試料採取をします。何ごとも、見聞きするのと、実際にやってみるのは大違いですが、特にフィールド調査は、実際に現場にいて初めて実感できることが多いものです。野外調査の経験や、大学院での研究分野は問いません。野外調査をしたことがない方や、大学院ではミクロの研究を志している方も歓迎します。

フィールド科学実習（以下、屋久島実習）には、海外からの留学生も参加します。そのため屋久島実習は、英語を公式言語としますが、参加者の英語能力は問いません。英語で話した経験の少ない方や、英会話に自信がない方の参加も歓迎します。海外からの同世代の参加者と積極的にコミュニケーションを取ってみてください（留学生も英語を母国語とする人は多くありません）。

これに続くゲノム科学実習（以下、ゲノム実習）では、屋久島で採取した試料を使って、様々な実験と解析を行います。フィールドでのサンプリングと、それに続くゲノム分析を通して経験することで、フィールドワークもラボワークも行える研究者を養成することを目指しています。なお、フィールド実習とゲノム実習の両方を受講することをお勧めしますが、必須ではありません。皆さんの興味や経験に応じて、片方だけを受講していただいても結構です。

なお、本実習は、また、京都大学理学研究科 生物科学専攻の正式な単位として認められます。単位の取得を希望される方は、KULASIS で履修登録をしてください。また霊長類学・ワイルドライフサイエンス・リーディング大学院の実習でもあります。

**予約の都合で、申込締切がたいへん早くなっていますので、ご注意ください。**

### 募集対象者

2017年4月の時点で、京都大学理学研究科 生物科学専攻に所属する大学院生、および、霊長類・ワイルドライフサイエンス・リーディング大学院の履修生（修士課程、博士課程）であること。学年は問いません。

### 締め切り

申込み期間： 4月1日（土）～4月9日（日）・ 締め切り4月9日

### 問合せ先

いつでもお問い合わせ下さい。入学前でも結構です。

霊長類・ワイルドライフサイエンス・リーディング大学院 事務まで

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電話：075-771-4388

## 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 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 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 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 10,000-15,000 yen for meals and insurance, on the first day. This will pay you back from the university 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), optional activities such as entrance fee of sightseeing sites, public bath and snacks.

## 2. Schedule

### **Field and Genome Science Courses in spring**

- April 9      Deadline for application by students of Kyoto University (both for the Field Science Course and Genome Science Course)
- May 11, 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.

### Field Science Course (Yakushima Island, Kagoshima Prefecture)

- May 13      Field Science Course starts (Move to Yakushima on this date)
- May 14-17      Fieldwork in Yakushima
- May 18      Data analysis, presentation in the afternoon
- May 19      Leave Yakushima

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

- May 22 – 26           Molecular experiments and analyses, at several laboratories.  
 May 29     Preparation for presentation (both for Field and Genome Science Courses)  
 May 30     Presentation of the results of the courses at international symposium (held at  
 Yoshida Campus)

### **Field and Genome Science Courses in fall**

The contents and schedule of the courses in fall is not fixed. We will announce them at the following web site, in late March, 2017.

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

## **3. Field Science Course in Spring (May 13-19)**

### **3.1 Participants**

About 20 graduate students

About 10 teaching staff, including professors, post-doc and graduate students who study in Yakushima and/or subject species.

### **3.2 Groups**

We form three groups: monkey and deer distribution, parasite, and plant. 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) Monkey and deer distribution group**

##### Title

Island-wide distribution of Japanese macaques and sika deer  
 ニホンザルとシカの全島分布

##### Lecturers

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

Shun HONGO (Primate Research Institute, Kyoto Univ.) 本郷峻(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 and sika deer. 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. Sika deer is another large mammal in Yakushima, and their numbers are reported to have increased rapidly recently. However, heterogeneity in deer density is reported to exist over an island-wide scale according to the census conducted in early 2000s.

We will conduct census of Japanese macaques and sika deer 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) Parasite group**

### Title

Gastrointestinal parasites of mammals in Yakushima.

屋久島に生息する哺乳類の消化管内寄生虫

### Lecturers

Munehiro OKAMOTO (Primate Research Institute, Kyoto Univ.) 岡本宗裕 (京都大・霊長研)

Akiko SAWADA (Primate Research Institute, Kyoto Univ.) 澤田晶子 (京都大・霊長研)

### Abstract

Although several species of mammals inhabit in Yakushima, there are very few reports about gastrointestinal parasites of them. In parasite group, we will investigate gastrointestinal parasites of deer and wild rodents. In Yakushima, the deer abattoir was established recently. The viscera of deer slaughtered in the abattoir will be kindly provided, and parasites in gastrointestinal tract will be collected. We can probably find the adults of nematode or trematode. In the case of the parasites of rodent, we will trap wild rodent by "Sheman Trap" in the field first. After measurement of body size etc., we will try to collect eggs of Syphacia (rodent pinworm) from perianal region by transparent tape test. After that rodent will be released (don't kill). We will collect the feces left inside of the "Sheman Trap". In the feces, we can find the eggs of several species of parasite. Adult worms and eggs will be used for the Genome Science Course.

## **C) Plant Group**

### Title

Species composition in fern gametophyte

シダ植物の配偶体における種構成

### 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

Ferns that we usually observe in forests are in their sporophyte stages. Compared with sporophyte, fern gametophyte is very small and about 1 cm at most in size and has no sufficient morphological character using for species identification so far, as well as other tiny characterless kind of organisms. However, recently, developing molecular analysis shed right on the species identification for these small organisms. This year, plant team focuses on studying phenology of fern gametophytes in Yakushima. We plan to collect gametophytes from several places and compare the species constitution 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 and 2016 spring are available)

CCTBio HP (in Japanese)

[http://www.wrc.kyoto-u.ac.jp/core-to-core/training\\_old.html](http://www.wrc.kyoto-u.ac.jp/core-to-core/training_old.html)

#### 4. Genome Science Course in spring (May 22- 26)

Following the Field Science Course will be the Genome Science Course. If you are planning to take both the Field Science and Genome Science Courses, we will be using the samples collected during the Field Science Course in Yakushima Island for the Genome Science Course. Therefore, we recommend that you join in a group in Genome Science Course that corresponds to the one in the Field Science course you took. Courses A and C will be held in Kyoto, while course B will be held in Inuyama.

##### Recommended combinations

Genome Science Course	Field Science Course
A) Monkey	A) Monkey and deer distribution
B) Parasite	B) Parasite
C) Plant	C) Plant

#### A) Monkey

##### Lecturer

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

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

##### Abstract

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

#### B) Parasite

##### Lecturer

Takashi HAYAKAWA (Primate Research Institute, Kyoto Univ.) 早川卓志 (京都大・霊長研)

Munehiro OKAMOTO (Primate Research Institute, Kyoto Univ.) 岡本宗裕 (京都大・霊長研)

##### Abstract

Genomic DNA of parasites isolated from Yakushima animals during the Field Science Course will be extracted. Using PCR, Sanger sequencing and phylogenetic analysis, we will determine the species information of these parasites and discuss their geographical distribution and ecological background.

#### C) Plant

##### Lecturer

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 gametophyte samples collected from Yakushima, we will try to identify the species or the genera to which they belong using molecular analysis. We will extract DNA from the samples and determine rbcL gene sequences from them. Subsequently, we will compare these sequences with registered DNA sequences in the gene bank.

### **International Seminar**

Date: May 30 (Tue), 2017

## 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 and deer distribution 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 and deer distribution 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 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.

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