Research Activity Report
Supported by "Leading Graduate Program in Primatology and Wildlife Science"
(Please be sure to submit this report after the trip that supported by PWS.)

	2018. 06. 08
Affiliation/Position	Graduate School of Science/ M1
Name	Kenta Moriya

1. Country/location of visit

Japan/ Yakushima Island

2. Research project

Yakushima Field Science Course (Plant)

3. Date (departing from/returning to Japan)

2018. 05. 19 – 2018. 05. 25 (7 days)

4. Main host researcher and affiliation

Dr. Wataru Shinohara, Professor at Kagawa University; Dr. Hiroshi Kudoh, Professor at Kyoto University

5. Progress and results of your research/activity (You can attach extra pages if needed)

Please insert one or more pictures (to be publicly released). Below each picture, please provide a brief description.

During seven days from 19 to 25 May of 2018, I joined Yakushima Field Science Course. In this course, I belonged to a plant team and investigated the distribution of fern sporophytes and gametophytes on Yakushima.

Activity Schedule
May 19: Arrival at Yakushima
May 20: Sample Collection at Onoaida Trail (161-350 m altitude)
May 21: Sample Collection at Yodogo Trail (1300 m altitude)
May 22: Sample Collection at Menko (185 m altitude, along the river)
May 23: Data Analysis & Preparation for Presentation
May 24: Presentation
May 25: Arrival at Kyoto

<Introduction>
Ferns are only land plants whose sporophytes and gametophyte live independently. It is previously reported that in some ferns the geographical distribution of their sporophytes and gametophytes does not coincide and the difference of the distribution between sporophytes and gametophytes are not understood well. In this course, we collected fern samples as many as possible at 4 sites for identification of their species. However, because it is difficult to identify gametophyte species morphologically, we planned to carry out DNA barcoding analysis (using chloroplast *rbcL* sequence) in following genome course.
In addition, we investigated mosses living mainly on living leaves, called epiphyllous liverworts. Because they prefer the humid environment all year round, like Yakushima Island, we rarely find them in the main land of Japan, especially on flat land. It is suitable for investigating these kinds of liverworts on Yakushima.

May 19: After we arrived at Yakushima Island, lecturers took us to the area registered in the World Heritage Sites and this time I saw the vegetation of Yakushima in detail for the first time. It looked reflecting the eating habitats of deers. We tried to find gametophytes, but we could not find them at all.

May 20–22: We collected ferns at 4 sites. We participants collected gametophytes and Prof. Shinohara and Prof. Kudoh gathered sporophytes. Finally, 185 gametophytes (50 at site1; 71 at site2; 16 at site3; 48 at site4) and 53 sporophytes were collected. Speaking about gametophytes, gametophytes collected were mainly cordate and a few potentially filamentous gametophytes were included. 53 sporophytes corresponded to 35 species. We also collected *Arachniodes sporadosora* and *Hymenophyllum polyanthos* whose leaves were covered with epiphyllous liverworts.

May 23: We analyzed the distribution of sporophytes and identified some epiphyllous liverworts. It was revealed that the number of species was highest at site4 (n=18) and lowest at site3 (n=6). Probably, this is because the difference of precipitation and average temperature at that site. Because a lot of fern species prefer relatively high temperature, a

few number of species could adapt in the low temperature. These hypotheses are consistent with low species diversity at site3.

May 24: We gave a presentation. I am poor at English and I was greatly helped by members. I appreciate them. The main analysis of plant group was planned to be performed in genome training course, so the presentation was limited to the analysis of sporophyte distribution. Due to the small number of samples and sampling sites, detailed analysis was difficult. In this day, we could get to know the investigation of monkey group. At night, we had BBQ. I could talk with monkey group members and talked about the difficulty of field work.

It was hard but enjoyable seven days for me because I have never experienced field works. Since it was difficult for me communicate in English, it might have caused inconveniences to foreign participants, but they listened to the conversation, so I think we got a good discussion. Participants who did not study plants also worked ambitiously, so we were able to enjoy collecting and analyzing. Finally, I appreciate Prof. Shinohara and Prof. Kudoh who gave us plenty of knowledge about plants, Prof. Hanya and other members of the monkey team who supported meals and other aspects.

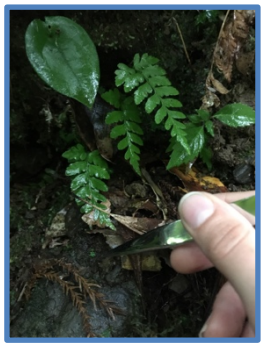

Fig1| Collecting Gametophytes

Fig2| Sampling Site

Fig3| Cordate Gametophyte

Fig4| Epiphyllous Liverworts

*Obtain approval from your mentor before submitting this to report@wildlife-science.org.

6. Others