

Research Activity Report
Supported by “Leading Graduate Program in Primatology and Wildlife Science”

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Affiliation/Position	Primate Research Institute/M2
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1. Country/location of visit
Yakushima, Kagoshima Prefecture, Japan
2. Research project
Yakushima Field Course and Genome Science Course (Deer population using fecal-size pellet as a tool)
3. Date (departing from/returning to Japan)
2015. 10. 18 – 2015. 10. 24 (7 days), 2015. 10. 26 – 2015. 10. 26 (5 days)
4. Main host researcher and affiliation
Dr. Hanya, Dr. Yumoto, Dr. Kudoh, (Kyoto University) Dr. Shinohara (Kagawa University)
5. Progress and results of your research/activity

Yakushima Field and Genome Science Course, October 2015

In the past, I had asked various professors which field site in Japan was their favorite for ecological studies or just for a visit, and most of them told me, it was undoubtedly Yakushima due to its unique beauty and ecological diversity. One Japanese professor even told me that if he did not get to visit Yakushima regularly, he would become very sad and cry. Therefore, it was with high expectations that I headed towards my first visit ever to Yakushima Island in the Kagoshima Prefecture of Japan for my field work course. In short, it was a great experience, not just for the great learning experience in the field and subsequently the lab work, but also for the warm and kind people of Yakushima.

Fieldwork at Yakushima

For our first part of the course, we headed to Yakushima for a week to conduct our own experiment and collect samples in either the plant team or the deer team. I was in the deer team and our main goal was to try to determine the demographics of the deer population in Yakushima, by collecting samples at the Seibu Rindo field site. In addition to that, we wanted to see if we could also determine sex by using the DNA left in the feces and by hormonal analysis.

In recent decades there has been a notable change with the floor vegetation in Yakushima, it is slowly disappearing and hardly re-growing, leaving big patches of barren soil under the canopy of trees. The actual reason for this change is not quite clear, however; one of the main theories is that the deer population has grown exponentially and it is eating most of the floor vegetation. As part of our experiment, we set out to see if we could estimate the deer population demographic using deer fecal-pellet sizes

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as a reliable measure to estimate age, size, or sex. We woke up early every day we set out to collect our samples, and we were already hiking in the mountains and taking samples by 7:30am, until the afternoon. When we returned to from the forest, we headed straight to the lab to measure our pellets, sort them and store some in the freezer to use for our genome science course in the following week. After a few days of collecting data, we spent a few days analyzing our findings and getting ready for our presentation on the last day. It was a lot of work, but a really interesting learning experience. In the end, our findings did suggest that fecal-pellet size is a good way of determining the age of the animal. This might be a useful tool in the future to try to see how the population is changing over time and if it needs to be managed differently. It would be one step closer to determining if the ever increasing deer population is the only or main reason for the loss of the floor vegetation.

Genome Science Course

For the second part of our course, we wanted to see how efficiently we could do DNA analysis using the fecal samples and to also determine the sex of the animals using hormonal analysis. For our first part of the course we used the frozen samples we had taken in the field to prepare for the hormonal analysis part. After drying our samples, weighing, crushing, among other many steps, we were prepare our samples for hormonal and DNA analysis. We stored our samples for the hormonal part, and worked on doing the DNA first. It was really interesting as we did all of the steps needed to DNA studies, from preparing our own agarose gels, to running the finalized samples and viewing our results in the computer. For the other half of the week, we spent most of our times preparing the dilutions required for the hormonal analysis and finally obtaining our results on the last day. This especially interesting for me since I am collecting samples to do hormonal analysis next year and it was a great way to see what is in store for me in the near future. It takes a lot of time and much more steps than I initially thought, but nonetheless very interesting learning experience. For both DNA and hormonal analysis we were successful at determining the sex of the animals seen the previous week and then presented it to our professors and colleagues. For our DNA part, out of the samples that were viable, we were successful at determining sex by PCR by over a 95%! For our hormonal part of the course, we did not find sex-steroid hormone difference between sexes (testosterone, estrogen, and estradiol) but we did notice a significant difference in seasons compared to the samples that were collected for us by a previous group earlier in the year. For the final stage of our course, we prepared and gave a presentation of both the field and lab work and shared comments on how to improve the process in the future and the possibility of continuing the study.

The Yakushima Field Course and Genome Science Course was an incredible experience to learn all the steps involved in an interdisciplinary scientific experience and it

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also gave us the opportunity to go to one of the field sites that have pioneered primatology. The lab work and fieldwork were not an easy task to handle, but the more we worked on it the more excited we were on getting our results. Moreover, the opportunity to go to Yakushima which is a very special place for its fauna and flora was an amazing experience. The people are very warm and friendly, the food is superb, the accommodations are also fantastic, and it has been one of the most beautiful starlight nights I have ever seen in Japan.

I am very grateful for all the professors that helped us during the course for both the fieldwork and the laboratory work, my colleagues for their help and cooperation, and for everyone else that made this great experience possible. I strongly recommend this course for anyone who has a desire to learn about the wonderful ecological wonders of Yakushima, as well as learning all the various steps that are needed in research project out in the field. Thank you!

6. Others



Deer team getting ready!



Great mountain view from our site.

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Great food!



Future scientists and new friends!



Deer.



DNA work in the lab.



Presenting our findings in Yakushima!



Mountains in Yakushima.