

REPORT FOR HOPE-GM, PRIMATE ORIGINS OF HUMAN EVOLUTION: FROM GENES TO MIND

**Japan Society for the Promotion of Science (JSPS)
Research Activities from February 2010 to May 2010**



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Arrival to Japan (Osaka KIX): 20 February 2010.
Departure from Japan (Osaka KIX): 19 May 2010.

The author of this report was selected to be part of a group of 8 foreign scholars, invited under the sign of the new Japanese research project named HOPE GM, Primate Origins of Human Evolution: From Genes to Mind, funded by the JSPS program. This is part of the International Training Opportunities for Young Researchers, and aimed to promote the multi-disciplinary studies on primate origins of human evolution. It covered evolutionary genomics, animal behavior, and cultural primatology. Equally, these programs were designed to encourage internationalization of research environments for the Japanese world-leading advanced research institutes/centers. In our particular case, one group of 8 young researchers and 3 senior researchers started the dynamics with the newly created CICASP (Centre for International Collaboration of Advanced Studies in Primatology), in the Primate Research Centre, University of Kyoto, Japan. The Director of the general programs and our senior host was Prof. Tetsuro Matsuzawa, director of the Primate Research Institute, in Japan. I am deeply grateful to him for this opportunity. Further closest hosts were Prof. Ikuma Adachi and Prof. Misato Hayashi, also from the PRI (Primate Research Institute). One of the main goals of this program, fully achieved, was to promote the exchange among researchers, with different scientific experiences and knowledge, to facilitate sharing common perspectives and interests within Primatology: Field and captive research, captive enrichment and environmental conservation, cognitive studies within a variety of primate species, etc.

This was a three month fellowship period, during which the author had the opportunity to develop a variety of research tasks, in direct collaboration with Japanese students/colleagues, and expand the knowledge and skills about Japanese primatological research, historic and gastronomic culture, and environment, educational and administrative systems. This work, of course, could not be successful without the close help of many colleagues at the PRI Institute that played with excellence the role of younger hosts: Mari Hirose, Tomoko Imura, Takaaki Kaneko, Fumihiko Kano, Andrew Macintosh, Chris Martin, Takahisa Matsusaka, Gaku Ohashi, Yoshiaki Sato, Reiko Sawada, Makiko Uchikoshi, Yumi Yamanashi. To Profs. Masaki Tomonaga and Michael Huffman the author would like to thank for the introduction to Japanese Sumo and for the help and friendship during the visit. In Koshima we could never have seen the amazing monkeys doing the sweet potato washing without the help of Mr. Takafumi Suzumura and of Mr. Fujio Kanchi (the nephew of Mrs. Mito Satsue, the discoverer of the cultural potato-washing behavior). Additionally, on the administrative front, the author would like to thank especially all the administration office of PRI and particularly to Mrs. Michiko Sakai and Ms. Mami Shikuwa for their

endless patience and efficiency to solve all the necessary requirements. Finally, I am grateful to all my HOPE GM junior colleagues: Anna Albiach Serrano (Max Planck Institute), Paco Bertolani (Cambridge University), Kim Hockings (New University of Lisbon), Kat Koops (Cambridge University), Sonja Koski (Cambridge University), Malini Suchak (Emory University), and also much indebted to the senior HOPE GM invitees: William McGrew (Cambridge University), Svante Paabo (Max Planck Institute) and Frans De Waal (Emory University), with whom we learned very much.

Additionally, and since 2006, the author of this report is also part of the KUPRI International Team for Bossou and Nimba (long-term research site of wild chimpanzees in Guinea Conakry), and has been collaborating directly in field research directed by Prof. Tetsuro Matsuzawa for the past 4 years. The current research is a continuing collaboration between the University of Cambridge (U.K.), and the Primate Research Institute of Kyoto University (Japan).

The author of this report was in the following location during these periods:

Primate Research Institute (Inuyama): 20-Feb-2010 ~ 26-Feb-10; 01-Mar-10 ~ 21-Mar-10; 24-Mar-10 ~ 28-Mar-10; 02-Apr-10 ~ 07-Apr-10; 11-Apr-10 ~ 02-May-10.

Accommodation: PRI dormitory.

Kyoto: 27-Feb-10 ~ 28-Feb-10; 21-Mar-10 ~ 24-Mar-10; 02-May-10 ~ 07-May-10; 15-May-10 ~ 19-May-10.

Accommodation: Seifu-Kaikan, University residence.

Osaka: 24-Mar-10.

Primate Research Institute (Koshima and Yakushima field stations): 29-Mar-10 ~ 02-Apr-10.

Accommodation: Koshima Field Station; Soyo tei Hotel (Yakushima).

Tokyo: 07-Apr-10 ~ 11-Apr-10; 07-May ~ 14-May-10.

Accommodation: Private and Budget Hotel (Comfort Hotel).

A) CONFERENCE ORGANIZATION

22-23 March 2010: HOPE-GM Lectures on Primate Mind and Society, University of Kyoto, Primate Research Institute, 2010 (with Misato Hayashi, Kim Hockings, Tetsuro Matsuzawa and Masaki Tomonaga).

This international meeting gave all JSPS-HOPE invitees and Japanese scholars the opportunity to present their current research and promoted the exchange of new scientific findings and perspectives (see timetable and speakers below).

Monday 22 nd March		
09:00-10:00	Registration	
10:00-10:10	Opening remarks	
SESSION 1		Chaired by M Tomonaga
10:10-10:30	Satoshi Hirata	Auditory and visual event-related potentials in an awake chimpanzee
10:30-10:50	Takahisa Matsusaka	Vocal communication of captive chimpanzees
10:50-11:10	Yumi Yamanashi	Assessing the effects of cognitive experiments on the welfare of captive chimpanzees by direct comparisons of the activity budget between wild and captivity
11:10-11:30	Misato Hayashi	Cognitive development in chimpanzees assessed by object manipulation
11:30-12:00	Susana Carvalho	From pounding to knapping: how chimpanzee archaeology can help us model lithic technology
12:00-13:00	Lunch	
13:00-14:30	Poster session	
SESSION 2		Chaired by I Adachi
14:30-15:00	Kathelijne Koops	The effect of ecology on the use of elementary technology in foraging and nest-building in the chimpanzees of the Nimba mountains, Guinea
15:00-15:30	Kimberley Hockings	Fission-fusion dynamics in chimpanzees at Bossou, Republic of Guinea: ecological constraints in an anthropogenic environment
15:30-15:50	Yamato Tsuji	An effect of yearly difference in nut fruiting on foraging success of female Japanese macaques (<i>Macaca fuscata</i>) through within-troop contest-type competition
15:50-16:20	Paco Bertolani	Adoption of an infant chimpanzee by an unrelated lactating mother in Tai National Park, Côte d'Ivoire
16:20-16:40	Chie Hashimoto	Male philopatry and possible fusion of wild bonobo unit-groups at Wamba, D.R. Congo
16:40-17:40	William McGrew	Fifty years of wild chimpanzee tool use: where do we stand?
18:00-20:00	Party	

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Tuesday 23rd March		
SESSION 3		Chaired by M Hayashi & T Imura
09:00-09:20	Shiro Kohshima	Face and eye morphology of the human and nonhuman primates: implications in visual communication
09:20-09:40	Fumihiko Kano	A comparative eye-tracking study in chimpanzees and humans
09:40-10:00	Tomoko Imura	Differences in visual temporal integration on object recognition between chimpanzees and humans
10:00-10:20	Ikuma Adachi	Direct comparison between humans and chimpanzees for their pitch-luminance mapping
10:20-10:40	Takaaki Kaneko	A comparative study in the perception of self-agency between human and chimpanzee
10:40-11:10	Anna Albiach Serrano	They bring the food, but do they know how? Causal knowledge of strip-pulling tasks in great apes and corvids
11:10-11:30	Masaki Tomonaga	Going ahead: Perceptual bias for forward-facing motion in chimpanzees
11:30-12:00	Sonja Koski	Chimpanzee personality assessed by observational quantification of behaviour
12:00-13:00	Lunch	
SESSION 4		Chaired by S Carvalho & K Hockings
13:00-13:20	Chris Martin	Shared matching-to-sample tasks in Chimpanzees
13:20-13:40	Yuko Hattori	Extracting and expressing referential information by chimpanzees (<i>Pan troglodytes</i>)
13:40-14:00	Masayuki Tanaka	Acquisition of numerical sequences in three primate species, <i>Pan troglodytes</i> , <i>Hylobates lar</i> , and <i>Mandrillus sphinx</i>
14:00-14:20	Jae Choe	"From so simple a beginning" Animal cognition in Korea: primates and magpies
14:20-14:40	Sanha Kim	Korea's first field study of primates: the behavior and ecology of wild Javan gibbons (<i>Hylobates moloch</i>)
14:40-15:00	Coffee break	
15:00-15:30	Malini Suchak	Capuchin monkeys cooperate with strangers: learning the benefits of reciprocity with in-group and out-group members
15:30-15:50	Shinya Yamamoto	Chimpanzees' ability for cumulative culture: invention, modification, and social learning of tool-use technique
15:50-16:50	Frans de Waal	Prosocial primates: the altruism question
16:50-17:00	Closing remarks	

B) PRESENTATIONS AND SEMINARS

The author of this report was invited to give two oral presentations and one seminar during this period:

1. Carvalho S., Matsuzawa T, McGrew W. (2010). From pounding to knapping: How chimpanzee archaeology can help us model lithic technology. Invited paper, *Primate Mind and Society - HOPE Genes to Mind*, Kyoto, Japan.



- Carvalho S., Matsuzawa T., McGrew W. (2010). Weaving different trends of research in Guinea: From field experiments to environmental education. Invited paper, *The intersection of comparative cognitive science and field science*, Nagoya, Japan.

**Weaving different trends of research in Guinea:
From field experiments to environmental education**

scr50@cam.ac.uk Susana Carvalho, Tetsuro Matsuzawa and William McGrew

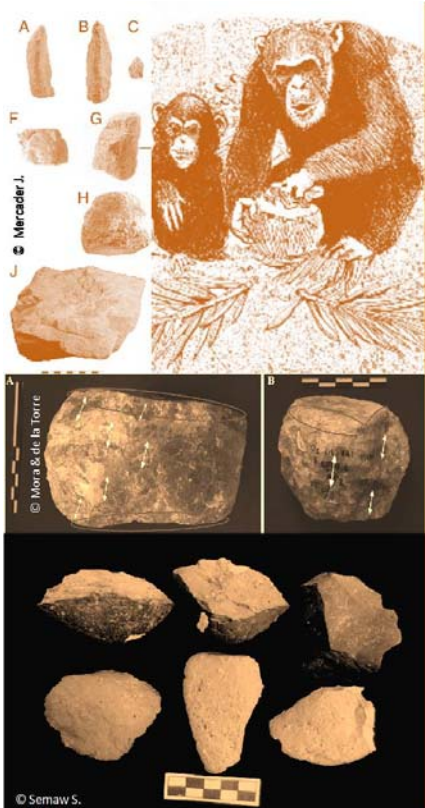


The composite image consists of three panels. The left panel shows a child's drawing of a monkey with a pink face and green body, sitting on the ground with several small red and green objects. Above the drawing is handwritten text in French: 'ROSE Kpaje', 'Samedi 6 Juin 2009', and 'Le bébé de 5^e année d'école'. The middle panel is a photograph of a chimpanzee sitting on the ground, holding a stick in its mouth. The right panel is a painting of a chimpanzee sitting on a branch, holding a baby chimpanzee.



Nagoya, Japan
03 April 2010

3. Carvalho S. (2010). The origins of the Oldowan: Why are chimpanzees still good models for the technological evolution in Africa? *Invited seminar at the Primate Research Institute, Japan.*



UNIVERSITY OF CAMBRIDGE

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The origins of the Oldowan:

WHY ARE CHIMPANZEES STILL GOOD MODELS FOR THE TECHNOLOGICAL EVOLUTION IN AFRICA?

SUSANA CARVALHO | APRIL 2010
SCR50@CAM.AC.UK

C) WORKING ON VIDEOS FROM FIELD RESEARCH

About 200 hr of video records from field experiments and follows of wild chimpanzees, from the forests of Bossou and Diecké, in Guinea Conakry, were converted into DVD`s with the help of a Sony Multi Function DVD Recorder (**MODEL:** VRD-MC10). Videos were also edited and short clips were prepared to be used for research and educational purposes.

D) WRITING WORK (papers, etc)

The author of this report wrote and submitted one book review, and started two new manuscripts (part of my PhD), during the period of the fellowship:

1. Carvalho S. (2010). Book Review: Beautiful Minds, the Parallel Lives of Great Apes and Dolphins. *Antropologia Portuguesa*. In press.
2. Carvalho S. (in prep.). Chimpanzees as Referential Models for Early Pleistocene Technology and Site Formation. In: Domínguez-Rodrigo (ed.) *Theoretical Debates in Early Pleistocene Archaeology*, Cambridge University Press.
3. Carvalho S., Matsuzawa T., McGrew W.C. (in prep.). From Pounding to Knapping: How Living Apes Can Help Us Model Hominin Lithics. In: Boesch C., Call J., Sanz C. (eds), *Understanding Tool Use*, Cambridge University Press.

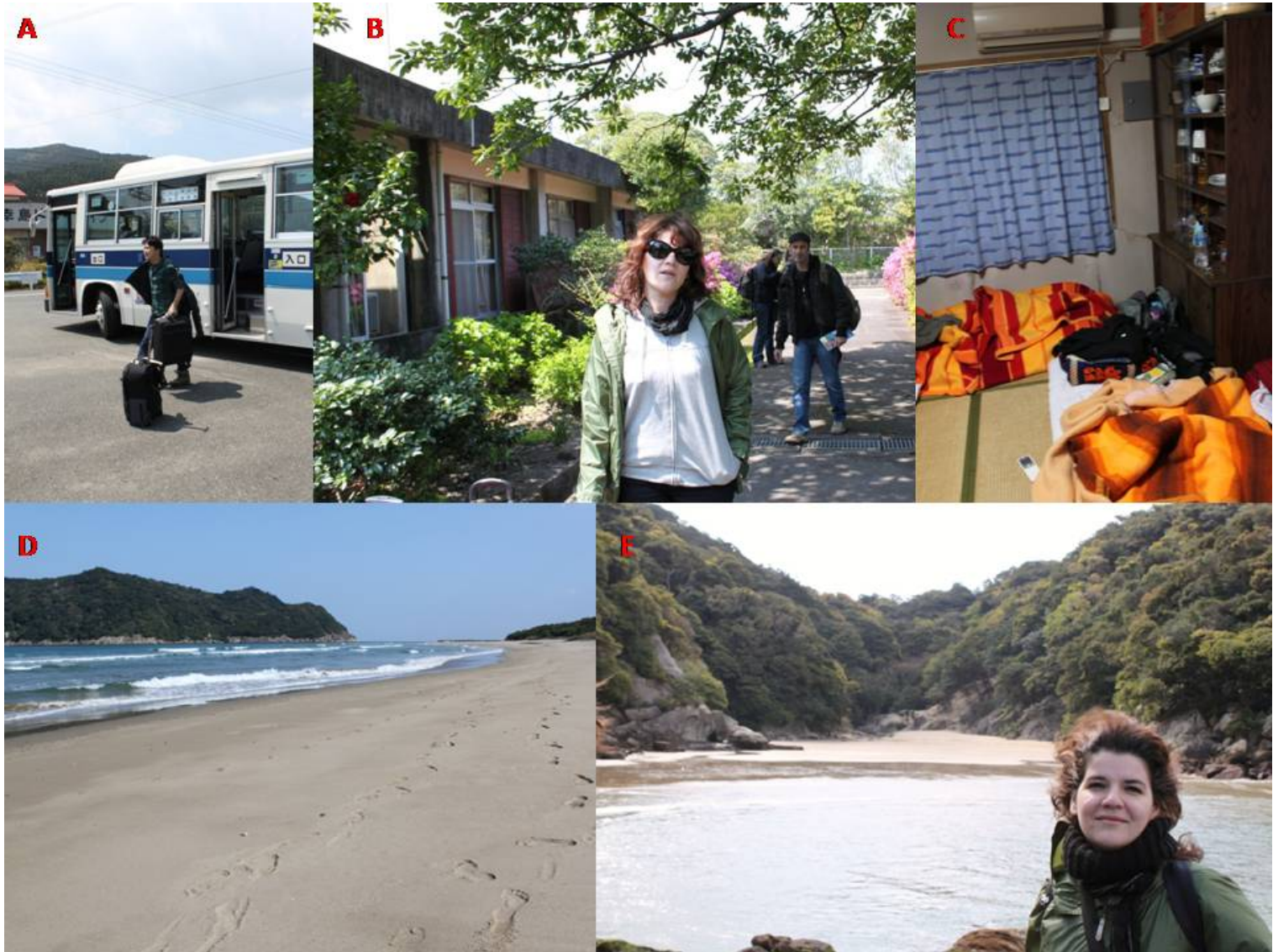
E) VISITS TO KOSHIMA AND YAKUSHIMA (29 March to 02 April 2010)

Accordingly with the detailed program (below), all HOPE-GM junior students (with Profs. McGrew and Linda Marchant) visited Koshima and Yakushima islands. This was a memorable experience. Our hosts-guides during the travel were our junior colleagues Yoshiaki Sato and Fumihiko Kano, and they prepared this travel with great detail and efficiency.

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Date	Time	OUR PLAN FOR KOSHIMA-YAKUSHIMA TRIP	Via
29-Mar	5:43	Leave Inuyama Station	Meitetsu for Centrair Station
	7:00	Arrive at Centrair Station	
	7:00	Breakfast at Centrair (little time to eat)	
	8:00	Leave Centrair	ANA 341
	9:20	Arrive at Miyazaki Airport	
	9:20	Rent a car (one person has to take a car to the station)	Rent-a-car
	10:05	Leave Miyazaki Airport Bus Stop	Miyazaki Kotsu Bus for Obi
	11:26	Arrive at Aburatsu Bus Stop (ask the driver which bus to transfer to)	
	11:40	Leave Aburatsu Bus Stop	Miyazaki Kotsu Bus for Koshima-iriguchi
	12:30	Arrive at Koshima-iriguchi Bus Stop	
	?	Leave for buying food ingredients	Rent-a-car
		Buy food ingredients for 2 dinners and 2 breakfasts and 1 lunch	
	?	Dinner	
	?	Bring 4 persons to the hotel (remaining 7 stay at the station) Hotel (for those 4 persons)	Rent-a-car
30-Mar	?	Breakfast and prepare lunch	
	?	Pick up at the hotel	Rent-a-car
	?	Visit Koshima Island Sweet potatoes for monkeys (10,000 yen)	Motorboat of the station
	?	Lunch	
	?	Back to the station	Motorboat of the station
	?	Dinner	
	?	Bring 4 persons to the hotel	Rent-a-car
	?	Breakfast	
31-Mar	?	Leave Koshima Field Station	Rent-a-car and Suzumura's car
	?	(Pick up the 4 persons at the hotel)	Rent-a-car
	-	Arrive at Miyazaki Station	
	-	Lunch around the station	
	12:19	Leave Miyazaki Station Bus Stop	Miyazaki K Exp Bus Hamayu fro Kagoshima
	14:32	Arrive at Kagoshima Airport Bus Stop	
	17:00	Leave Kagoshima Airport	JAC 3759
	17:35	Arrive at Yakushima Airport	
	17:50	Leave Yakushima Airport Bus Stop	Bus for Nagata Bus Stop (last bus)
	18:46	Arrive at Nagata Bus stop	
1-Apr	18:46	Hotel	
	?	Dinner at the hotel	
	7:30	Breakfast at the hotel	
	8:00	Kano, Otani (at Yakushima then), and Sato go to Miya-no-ura	Taxi
	-	Rent 3 cars	
	-	Back to the hotel	Rent-a-cars
	-	Sightseeing in Yakushima Island	Rent-a-cars
	-	Lunch somewhere <i>[How about Chaya Hirano?]</i>	
	16:30	Visit Yakushima Field Station	Rent-a-cars
	17:00	Back to the hotel	Rent-a-cars
	17:00	Kano, Otani, and Sato go to Miya-no-ura to return cars	Rent-a-cars
	18:50	Kano, Otani, and Sato get back to the hotel	Taxi
	?	Dinner at the hotel	
2-Apr	?	Breakfast at the hotel	
	9:05	Leave Nagata Bus Stop	Bus for Iwasaki Hotel Bus Stop
	9:42	Arrive at Miya-no-ura Bus Stop	
	9:42	Sightseeing in Miya-no-ura	
	?	Lunch somewhere	
	12:48	Leave Miya-no-ura Bus Stop	Bus for Oko-no-taki Bus Stop
	13:07	Arrive at Yakushima Airport Bus Stop	
	15:15	Leave Yakushima Airport	JAC 3750
	15:45	Arrive at Kagoshima Airport	
	16:30	Leave Kagoshima Airport	ANA 858
	17:45	Arrive at Centrair	
	18:06	Leave Centrair Station	Meitetsu, Myu Sky Express for Gifu
3-Apr	18:35	Arrive at Nagoya Station	
	13:00	Meeting of JSAP at Hotel Shimmei near Nagoya Station	

I slept in the Koshima Field Station facilities on the 29 and 30th March, located in the mainland, around 300 m from the island of Koshima, very close by. These facilities are very good; I was very impressed by the quality of the field station and by the beauty of the location. Research started there in 1947, but it was from 1952 that individuals were identified and their life stories continuously recorded. It was also by this time, that sweet potatoes were provided to the monkeys and that, for the first time Imo, a female, started to wash the potatoes to get rid of the sand (and maybe to improve their taste). This was the beginning of a behavior named cultural and, in the course of time, the sweet potato washing spread (horizontally and vertically) among the individuals. So, even today, in 2010, it is still possible to observe this amazing behavior well established among the Japanese macaques of Koshima. Of course, currently, it is very rare to provision the monkeys with sweet potatoes, so this is done only in special circumstances. In the morning of the 30 March we finally went to Koshima in the boat of the field station, with Mr. Suzumura. It was very windy, so we were very lucky that it was still possible to reach Koshima. Currently there are 113 monkeys living in Koshima, and it was very impressive to approach the beach and to see so many individuals running towards the boat! It was my first time to observe the wild Japanese macaques! This was an extraordinary experience, after the discovery of this cultural behavior (by Mrs. Mito Satsue) so much was written about these astonishing primates and now I was able to experience this by myself. Follow and enjoy my photo report:



A) Arrival to Koshima Field Station by bus. B) The Koshima Field Station. C) Our room at the Field Station. D) Koshima Island and mainland, viewed from the beach. E) Arrival to Koshima Island, on the morning of the 30 March 2010.



F) Arrival, by boat to Koshima Island, with Mr. Suzumura guiding the trip. G) Waiting for the arrival of the boat...H) Mr. Suzumura, taking field notes, recording the Japanese macaques. I) The bags of sweet potatoes are taken to the beach. J) And...the sweet potato washing behavior!!



L) I observe the sweet potato washing. M) Prof. McGrew and the Japanese Macaques in Koshima. N) We could observe in detail this cultural behavior.

On the 31st March I travelled to the island of Yakushima, until the 2nd April. In this island, we experienced the traditional Japanese accommodation, traditional gastronomy, and we could observe the unique subspecies of Japanese macaques of this island: *Macaca fuscata yakui*, living side by side with deer's! Yakushima belongs to the world heritage of UNESCO, especially due to the existence of the extraordinary ancient forest of Cedars, the Yakusugi Cedar Land. This island is the southern limit where we can find these exclusive Japanese macaques along with an exceptional nature, and innumerable hot springs. The annual rainfall in Yakushima is 8000~10000 mm, so we were not surprised to have some rain during our second day of travel. During two days in Yakushima I was so lucky to see

several troops of monkeys, and many deer's, old cedars, waterfalls. The atmosphere of Yakushima is excellent, I will be back!

A) The young HOPE GM scholars experience the Japanese style accommodation in Yakushima. B) I enjoyed especially this forest of old cedars (this is Yayoisugi Cedar). C) The delicacy of the local food. D) Monkeys and deer together...E) Several monkeys were feeding so close to us.



F) EXTRA VISITS (Osaka, Kyoto, Tokyo)

During this period, I also had the opportunity of doing several extra visits, to Osaka, Kyoto and Tokyo. In Osaka we attended a Sumo tournament, a unique event that teaches us so much about the story and tradition of Japan.

In Kyoto, I experienced two scientific meetings but I also visited so many historical and cultural sites: Nijo Castle (Nijo-jo), Kyoto Gyoen National garden and Murin-an garden, Byodoin Temple and Phoenix Hall, Rokuon-ji Temple, Ryonji Temple, Ginkakuji Temple, Sanjusangen-do Temple, Kiyomizu Temple, are only a few examples. Finally in Tokyo I enjoyed for the first time the gigantic urban modern life.

Susana Carvalho, 2010