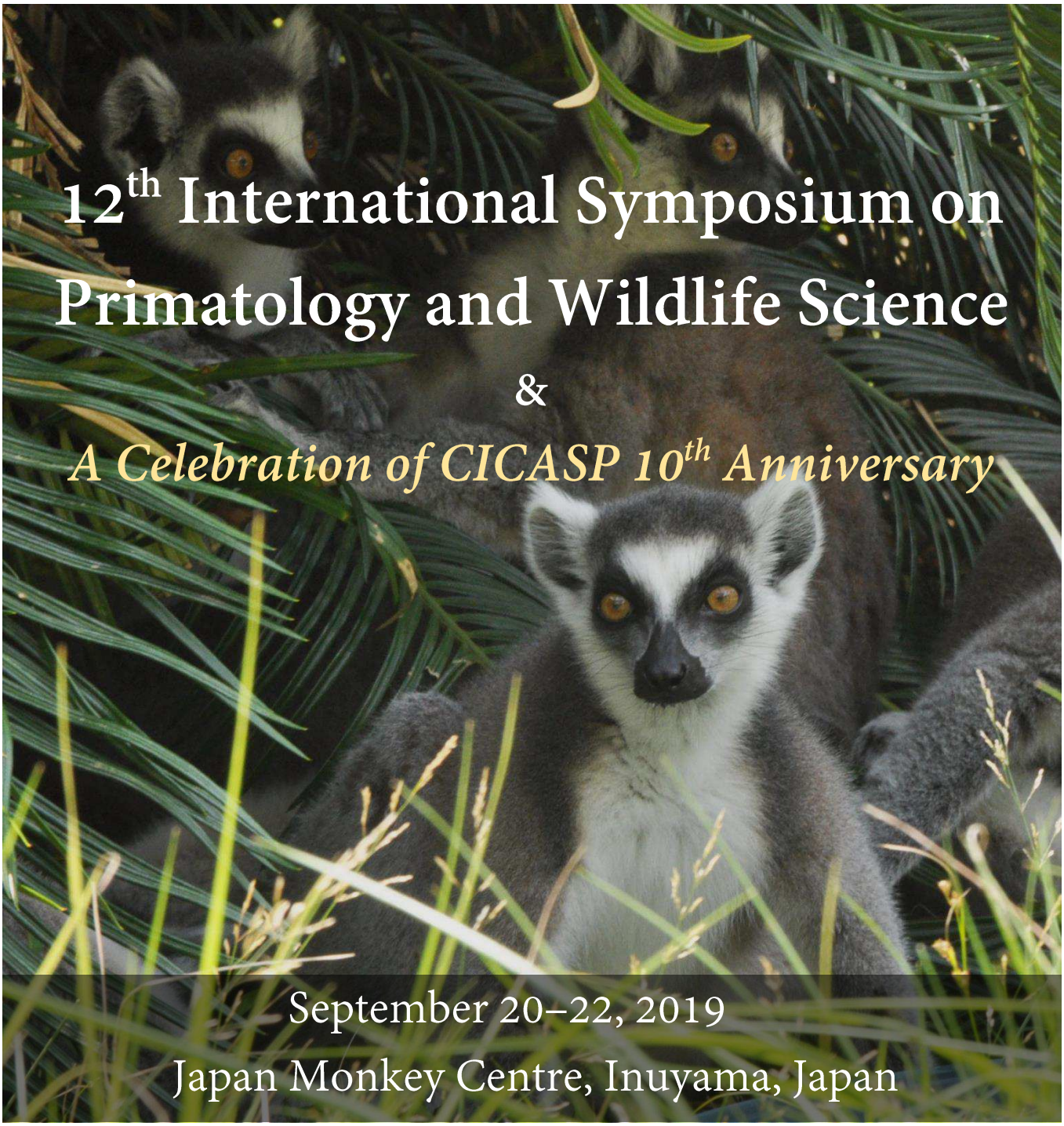

12th International Symposium on Primatology and Wildlife Science

&

A Celebration of CICASP 10th Anniversary

September 20–22, 2019

Japan Monkey Centre, Inuyama, Japan

Primate Research Institute founded 1967 Kyoto University

KYOTO UNIV. WRC

PRIMATOLOGY · WILDLIFE SCIENCE 京都大学

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JAPAN MONKEY CENTRE

CICASP center for international collaboration and advanced studies in primatology

an-SITE Laboratory

CETBIO Center of Excellence for Tropical Biodiversity

CICASP 10th Anniversary and PWS 12th International Symposium

Venue: Visitor Center at Japan Monkey Centre, Inuyama

	20th September (Fri)	21st September (Sat)	22nd September (Sun)
9:00		(5min) PWS faculty meeting	(10min) Presentation award ceremony
9:30		(90min) Wildlife Research in Uganda 25min x 3 + 15min x1 Eric Sande Charles Masembe	(120min) 10 years of CICASP: Making an Impact Within and Beyond Academia in a Global Community 25min x 3 + 20min x 1 + 15min x 1 + 10min x 1
10:00		Moses Chermourt Shintaro Ishizuka	Andrew MacIntosh, Cintia Garai, Ryu Heungjin, Hikaru Wakamori David Hill, Fred Bercovitch
10:30		(Session Chair: Chie Hashimoto) (10min) Coffee break	(Session Chair: Andrew MacIntosh)
11:00		(75min) Behavior & Ecology 15min x 5	(10 min) Coffee break
11:30	**Registration Open**	Nachiketha Sharma, Kim Mi Yeon, Mike Huffman Himani Nautiyal,Sota Inoue	(30 min) Onsite-Lab 15min x 2 (Chair: Satoshi Hirata) Makerere Univ., Sorbonne-Nouvelle Univ.
12:00		(Session Chair: Takushi Kishida) **Group photo & Lunch break** (light meals and soft drinks)	(10 min) Closing remarks (Testuro Matsuzawa)
12:30	(30min) MOU between PWS and Mont-bell		(60min) Lunch break
13:00	(10 min) Opening remarks (IDANI Gen'ichi)	(55min) Human-Animal Conflict	(60 min) Buddha Seminar (Ministry of the Environment)
13:30	(95min) Primates in the lab and field 25min x2+ 15min x3	25min x 1 + 15min x2 Helena Freitas,Raquel Costa, Otsuka Ryoma	[In Japanese] ブッダセミナー「環境省インターンシップ報告」
14:00	Simone Pika Yuri Kawaguchi, Shenwen Xu, Nelson Broche Alexander Weiss	(Session Chair: Satoshi Hirata) (10min) Coffee break	進行：福島誠子, 報告者：越智咲穂, 義村弘仁, 鳥井朋恵
14:30	(Session Chair: Yuko Hattori)	(95min) Evolution & Ecology I 25min x 2 + 15min x 3	
15:00	(15min) Coffee break (120min) Communicating Science: Expert Panel on Engaging the Media, the Public, and Policy Makers	Anthony Tosi, Richard Meindl Danielle Jones, Cody Ruiz, Xu Zhihong	
15:30	**Panelists**: David Kornhauser (Panel Moderator)	(Session Chair: Ikuma Adachi)	
16:00	Raymond Kunikane Terhune, Kei Kano, Ayumi Koso, Amanda Alvarez	(10min) Coffee break (70min) Evolution & Ecology II 25min x 1 + 15min x 3	
16:30	**Facilitators**: Andrew MacIntosh, Susumu Tomiya	Wilson Chung, Tianmen He, Wanyee Lee Take Makiko (Session Chair: Lira Yu)	
17:00	(Session Chair: Susumu Tomiya) (30min) Coffee break & preparing for poster session	(30min) Coffee break & preparing for poster session	
17:30	**Poster session**	**Poster session**	
18:00	(light meals and soft drinks)	**Get-together Party**	
18:30		(meals and drinks)	
19:00	**Nerd Nite "A journey through time"**		
19:30	**@ Rest Area, JMC** (meals and drinks)		
20:00			
20:30			
21:00			

JMC Monkeys in Chicago
We are delighted that our eight JMC Japanese monkeys are very happy in their new home in Chicago. For us, these monkeys are an expression of the friendship and collaboration between the United States and Japan. For more info, please visit snowmonkeys.org

▼Donate

Help us to help primates

Your donation will enable us to let our primates live a rich, interesting, and happy life. It further helps their fellow primates living in the wild.

Providing Quality Care for Our Primates

We are committed to optimising the welfare of our primates every day. We do so by asking ourselves every morning: “What can we do today to make their life even better?" There are new ideas and challenges every day, and for maintaining the physical and mental well-being of our primates, we need your help. Please support our primates and make a donation easily via the online donation form.
URL: https://fundexapp.jp/monkey/entry.php?lang=ENG

Conservation of Natural Habitats

The wild habitat of primates is vanishing at an alarming pace. That means, many of them will be extinct by the time our children have grownup. There are many ways to fight this development. Our approach is, together with the local governments and people, to support the conservation and sustainable development of these habitats. But we can achieve this goal only with your generous support.
Donor names will be posted in the JMC, on our website and printed in our newsletter (unless you wish to remain anonymous). Please let us know by specifying this on your application form.

Tax Breaks for Residents of Japan
The Japan Monkey Centre (JMC) is a 'Public Interest Incorporated Foundation', certified by the Japanese Government to be acting in the public interest. Therefore, all donations to the JMC are eligible for tax breaks: deductible from your taxable income for income tax.

▼Zoo Hours

10:00 – 17:00 (Nov. – Feb.: 10:00 – 16:00)
Closed on Tuesday and Wednesday; and some additional weekdays in January and February (open on public holidays and in high season). Please check the calendar in our website before your visit.

▼Admission Prices

One Day Ticket

Adults	Elementary and Junior High School Students	Preschool Children (Ages 3 - 6)
800 yen	**400 yen**	**300 yen**

Under 2, Free

▼JMC Membership

JMC membership provides great benefits and privileges throughout the whole year. You get free admission to the JMC, free parking, as well as special access to members-only events.

Adults	Elementary and Junior High School Students	Preschool Children (Ages 3 - 6)
3000 yen	**2000 yen**	**1500 yen**

Supporters: access to exclusive supporters’ website
5000 yen & Up

▼Access

The train station closest to the Japan Monkey Centre is the Meitetsu Inuyama Station; less than 30 min train-ride from Nagoya Station. From Meitetsu Inuyama Station (East exit) to the Japan Monkey Centre, it takes 5 min by bus or taxi, or 20 min walking.

JAPAN MONKEY CENTRE
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動物取扱業：公益財団法人日本モンキーセンター　愛知県犬山市大字犬山字官林 26 番地
業種:展示　動尾第 510 号　業種：貸出し　動尾第 509 号　登録:平成 19 年 5 月 31 日
有効:平成 34 年 5 月 30 日　取扱責任者:木村直人

2018.11.03

JAPAN MONKEY CENTRE

English

JAPAN MONKEY CENTRE

Museum and Zoo for Nonhuman Primates

Our Mission
“A Window to Nature”

The Japan Monkey Centre (JMC) was founded in 1956 for primate research and conservation. Its other main goal is to give all interested people a wealth of information on their closest relatives. JMC runs a unique zoo housing the world’s largest number of nonhuman primate species and attracts visitors from all over the world.






MAP① Visitor Centre, Museum Shop, Changing/ Nursing Facilities

At the Visitor Centre, we have regular exhibitions including taxidermist specimens, skeletons of nonhuman primates, and a touch screen monitor to perform a memory test for chimpanzees at the Primate Research Institute, Kyoto University. We also hold special exhibitions on a wide variety of different themes.

MAP② Madagascar House

This outdoor enclosure is in the form of an island ringed by a deep moat, allowing the inhabitants to roam freely. Living on the island-enclosure are three different species of lemurs found in the wild only in Madagascar: **brown lemurs**, **black lemurs**, and **ruffed lemurs**.

MAP③ South American House

Here you can see tiny monkeys such as marmosets and tamarins. They live in an indoor enclosure maintained at a temperature of about 25°C to simulate tropical jungle conditions. In the outdoor enclosure, you can meet **saki monkeys**, **woolly monkeys**, **spider monkeys**, and **capuchins** living in South America. In a special room where day and night light is reversed, nocturnal **owl monkeys** can be seen moving about during our daytime.

MAP④ Asian House

Japanese macaques, also known as snow monkeys, and living at the northern limit of the global range of all nonhuman primates, can be seen here, along with other Asian monkeys such as **rhesus macaques**, **toque macaques**, **bonnet macaques**, **lion-tailed macaques**, **pig-tailed macaques**, **Tibetan macaques**, and **Francois’s lutongs**.

MAP⑤ Wao Land

One of JMC’s must-see attractions are the free-ranging **ring-tailed lemurs**, offering a close encounter with them.

MAP⑥⑦ African Centre / Nocturnal Monkeys

Another star attraction is a **chimpanzee** family. You can also see a **gorilla** searching for his meals, parts of which the keepers hide earlier in various places within the enclosure. Here you can also watch **mandrills** and nocturnal monkeys including **pottos** and **lesser slow lorises**.

MAP⑧ African House

This house shows brightly-colored monkeys including **hamadryas baboons**. **Colobus monkeys** presents their strikingly beautiful black and white markings. You can also meet **Schmidt's guenons**, **moustached guenons**, **patas monkeys**, **savannah monkeys**, and **Barbary macaques** here.

MAP⑨ Baboon Castle

Over seventy **Anubis baboons** can be watched from this rooftop viewing deck.

MAP⑩ Monkey Valley

From this observation platform, you can see about 160 **Japanese Yaku-macaques**, showing the behavior of washing sweet potatoes and other food in a pond. They put the sweet potatoes inside the water and rub them against rocks. Sweet potato washing in Japanese macaques was first observed in a natural troop in Koshima Islet, Japan. Though rubbing behavior is quite common in macaques, the behavior of rubbing objects in water is rare. It can be easily observed during the monkeys' feeding time. You may also see other interesting behaviors like Saru-dango, tool use, and noise making with stones.
From the late December until the end of February, on weekends and holidays, our Japanese Yaku-macaques warm themselves by a real bonfire. The tradition of lighting bonfires for the monkeys began in 1957, after Japanese Yaku-macaques were observed to gather around the fires lit by staff to burn fallen trees following the Isewan Typhoon. This new 'bonfire-season' soon became established as a well-known and cherished attraction of JMC.

MAP⑪ Monkey Scramble

Here, you can enjoy **siamangs** brachiating (moving by swinging arm by arm) at a height of 15 meters (MAP11-1: **Big Loop**). Very impressing are also the **Geoffroy's spider monkeys** moving back and forth across a 100-meter-long suspension bridge (MAP11-3: **Monkey Skyway**). Don't forget to look up to see one of our greatest attractions — and keep an eye out for monkey excrements! (**Dangerous Zone**)

MAP ⑪-2 Squirrel Monkey Land

One of our highlights is a close encounter with **Bolivian squirrel monkeys**, moving freely within the dense undergrowth on a small island. Of all their food, Bolivian squirrel monkeys love to eat insects most. So, they spend a large amount of time foraging for insects. It is rare for any insects that have strayed into the Squirrel Monkey Land to ever reach the adult stage.

MAP⑫ Gibbons' House

Here you can see four different species of gibbons from Southeast Asia: **agile gibbons**, **pileated gibbons**, **white-handed gibbons**, and **Mueller's gibbons**.

MAP⑬ KIDSZOO/Tree House

In the 'KIDSZOO' there are many fluffy animals such as **degus**, **guinea pigs** and **rabbits**. You can meet exotic animals such as **Madagascar hissing cockroaches** and **leopard geckos**, and from our local wildlife beetles and other insects that are popular with children.

Our zookeepers added yet another attraction: a new **Tree House**. Looking down from the Tree House gives an impression of how monkeys see the world from the treetops.

MAP⑭ Restaurant Rakuen

MAP⑮ Monkey Bar

(Open on weekends and holidays)

The 12th International Symposium on Primatology and Wildlife Science

PROGRAM

All events (except Nerd Nite) will take place in the **Visitor Centre**.

Day 1 (Friday, September 20)

Time	Abstract	(min)	Title	Speaker	Affiliation
11:30–12:30	Registration				
12:30–13:00		(30)	MOU between PWS and Mont-bell		
13:00–13:10		(10)	Opening Remarks	IDANI Gen'ichi	Wildlife Research Center, Kyoto University
Primates in the Lab and in the Field					Chair: Yuko Hattori
13:10–13:35	O-1	(25)	The Loango Chimpanzee Project	Simone Pika	Institute for Cognitive Science, University of Osnabrück
13:35–13:50	O-2	(15)	The role of facial shape and color in chimpanzee's attention to infant	Yuri Kawaguchi	Primate Research Institute, Kyoto University
13:50–14:05	O-3	(15)	Video–real world matching in chimpanzees	Shenwen Xu	Primate Research Institute, Kyoto University
14:05–14:20	O-4	(15)	Creating a multicultural video resource for archiving the history of primatology in Japan	Nelson Broche	Primate Research Institute, Kyoto University
14:20–14:45	O-5	(25)	Personality variation in wild male chimpanzees is maintained by its changing association with rank	Alexander Weiss	Wildlife Research Center, Kyoto University; University of Edinburgh
14:45–15:00		(15)	<Coffee Break>		
Communicating Science: Expert Panel on Engaging the Media, the Public, and Policy Makers					Chair: Susumu Tomiya
15:00–17:00	S-1	(120)	**Panelists:** David Kornhauser (Panel Moderator), Raymond Kunikane Terhune, Kei Kano, Ayumi Koso, Amanda Alvarez **Facilitators:** Andrew MacIntosh, Susumu Tomiya		
17:00–17:30		(30)	<Coffee Break & Set up posters>		
Poster Session & Visual Storytelling Contest					
17:30–18:30	[All posters in Visitor Center; light meals & soft drinks provided]				
Nerd Nite Inuyama #4: *A Journey through Time*					
19:00–21:00 (doors open at 18:30)	[Rest Area next to restaurant *Rakuden*; meals & drinks provided]				

Day 2 (Saturday, September 21)

Time	Abstract	(min)	Title	Speaker	Affiliation
9:00–9:05			PWS Faculty Meeting		
Wildlife Research in Uganda					Chair: Chie Hashimoto
9:05–9:30	O-6	(25)	Progress on On-site Laboratory setting in Uganda	Eric Sande	Makerere University
9:30–9:55	O-7	(25)	Molecular Genetics and evolutionary research at Makerere University	Charles Masembe	Makerere University
9:55–10:20	O-8	(25)	Is habitat disturbance in Itwara and Matiri forests affecting primate populations? An analysis of threats	Moses Chermourt	Makerere University
10:20–10:35	O-9	(15)	Why are intergroup relationships non-antagonistic in bonobos?: Implications from recent genetic studies	Shintaro Ishizuka	Primate Research Institute, Kyoto University
10:35–10:45		(10)	<Coffee Break>		
Behavior & Ecology					Chair: Takushi Kishida
10:45–11:00	O-10	(15)	Testing Motivational structure hypothesis by using Asian elephant vocalizations	Nachiketha Sharma	Wildlife Research Center, Kyoto University
11:00–11:15	O-11	(15)	First vocalization study of wild Indo-Pacific Bottlenose dolphins (*Tursiops aduncus*) at Jeju Island, Republic of Korea: Whistle characteristics and its response to ambient noise.	Kim Mi Yeon	Wildlife Research Center, Kyoto University
11:15–11:30	O-26	(15)	Making Sri Lankan toque macaques' long tails short—the chilling details	Michael Huffman	Primate Research Institute, Kyoto University
11:30–11:45	O-13	(15)	Interaction between free-ranging dogs and Central Himalayan langur: An assessment of anti-predator behavioral strategy	Himani Nautiyal	Primate Research Institute, Kyoto University
11:45–12:00	O-14	(15)	Collective departure in feral horses	Sota Inoue	Wildlife Research Center, Kyoto University
12:00–13:00		(60)	<Group Photo & Lunch Break> [light meals & soft drinks provided]		
Human–Animal Conflict					Chair: Satoshi Hirata
13:00–13:25	O-15	(25)	Understanding the threats to wildlife in Africa	Helena Freitas	Centre for Functional Ecology, University of Coimbra
13:25–13:40	O-16	(15)	The impact of Ecotourism in the behaviour of mountain gorilla in Bwindi National Park, Uganda	Raquel Costa	Primate Research Institute, Kyoto University
13:40–13:55	O-17	(15)	Popularity of YouTube Contents that Violate the Tourism Regulations May Undermine Conservation of Mountain Gorillas	Ryoma Otsuka	ASAFAS, Kyoto University
13:55–14:05		(10)	<Coffee Break>		

Evolution & Ecology I					Chair: Ikuma Adachi
14:05–14:30	O-18	(25)	Evidence for multiple episodes of hybridization in the phylogenetic history of guenons (tribe Cercopithecini)	Anthony Tosi	Kent State University
14:30–14:55	O-19	(25)	Sampling the biodemographies of macaque lineages provides understanding of the success of early hominids	Richard Meindl	Kent State University
14:55–15:10	O-20	(15)	Investigating the neural basis of macaque social diversity: A comparison of cell density and serotonergic innervation of the amygdala among four species	Danielle Jones	Kent State University
15:10–15:25	O-21	(15)	Molecular Genetics of Macaque Reproductive Biology	Cody Ruiz	Kent State University
15:25–15:40	O-22	(15)	Impact of excluding age-sex classes of individuals from social network on the relationship between network centrality and parasite load	Zhihong Xu	Primate Research Institute, Kyoto University
15:40–15:50		(10)	<Coffee Break>		
Evolution & Ecology II					Chair: Lira Yu
15:50–16:15	O-23	(25)	Developmental Epigenetics of Mammalian Fertility: The Kallmann syndrome case	Wilson Chung	Kent State University
16:15–16:30	O-24	(15)	Effects of Food Toughness on Chewing Efficiency in Yakushima Japanese Macaques	Tianmeng He	Primate Research Institute, Kyoto University
16:30–16:45	O-25	(15)	Evaluating Japanese macaques' reliance on anthropogenic food by gut microbiome profile	Wanyee Lee	Primate Research Institute, Kyoto University
16:45–17:00	O-12	(15)	Fruit species choice by Golden-faced saki, an Amazonian "seed predator"	Makiko Take	Primate Research Institute, Kyoto University
17:00–17:30		(30)	<Coffee Break>		
Poster Session & Visual Storytelling Contest					
17:30–18:30	[All posters in Visitor Center]				
Get-together Party & Award Presentation					
18:30–20:30	[Visitor Center; light meals & drinks provided]				

Day 3 (Sunday, September 22)

Time	Abstract	(min)	Title	Speaker	Affiliation
9:00–9:10	Presentation award ceremony				
10 years of CICASP: Making an Impact Within and Beyond Academia in a Global Community					Chair: A. MacIntosh
9:10–9:20	S-2	(10)	10 Years and Counting: from CICASP to the World	Andrew MacIntosh	Primate Research Institute, Kyoto University
9:20–9:40	O-27	(20)	Applying Science and Filmmaking in Conservation in DRC	Cintia Garai	Wildlife Messengers; Ekolo ya Bonobo/Lola ya Bonobo/Amis des Bonobos du Congo
9:40–10:00	O-28	(20)	Working in a Governmental Institute: Balancing between our own Research Interests and Project Aims	Heungjin Ryu	Primate Research Institute, Kyoto University
10:00–10:20	O-29	(20)	Working at Tama Zoological Park	Hikaru Wakamori	Tama Zoological Park
10:20–10:45	O-30	(25)	Ecological consultancy and wildlife conservation in the U.K.	David Hill	Wildlife Research Center, Kyoto University
10:45–11:10	O-31	(25)	The Trail Connecting Sexual Selection in Baboons with Conservation Biology in Giraffes	Fred Bercovitch	Save The Giraffes
11:10–11:20		(10)	<Coffee Break>		
Uganda Onsite-Lab					Chair: Satoshi Hirata
11:20–11:35	O-32	(15)	Comparative Cognitive Science Laboratory	Satoshi Hirata	Wildlife Research Center, Kyoto University
11:35–11:50		(15)	TBD		
11:50–12:00		(10)	Closing Remarks	Tetsuro Matsuzawa	PWS Program Coordinator
Buddha Seminar					
13:00–14:00	環境省インターンシップ報告［in Japanese］				

Poster Sessions (5:30-6:30PM, September 20 & 21, JMC Visitor Center)

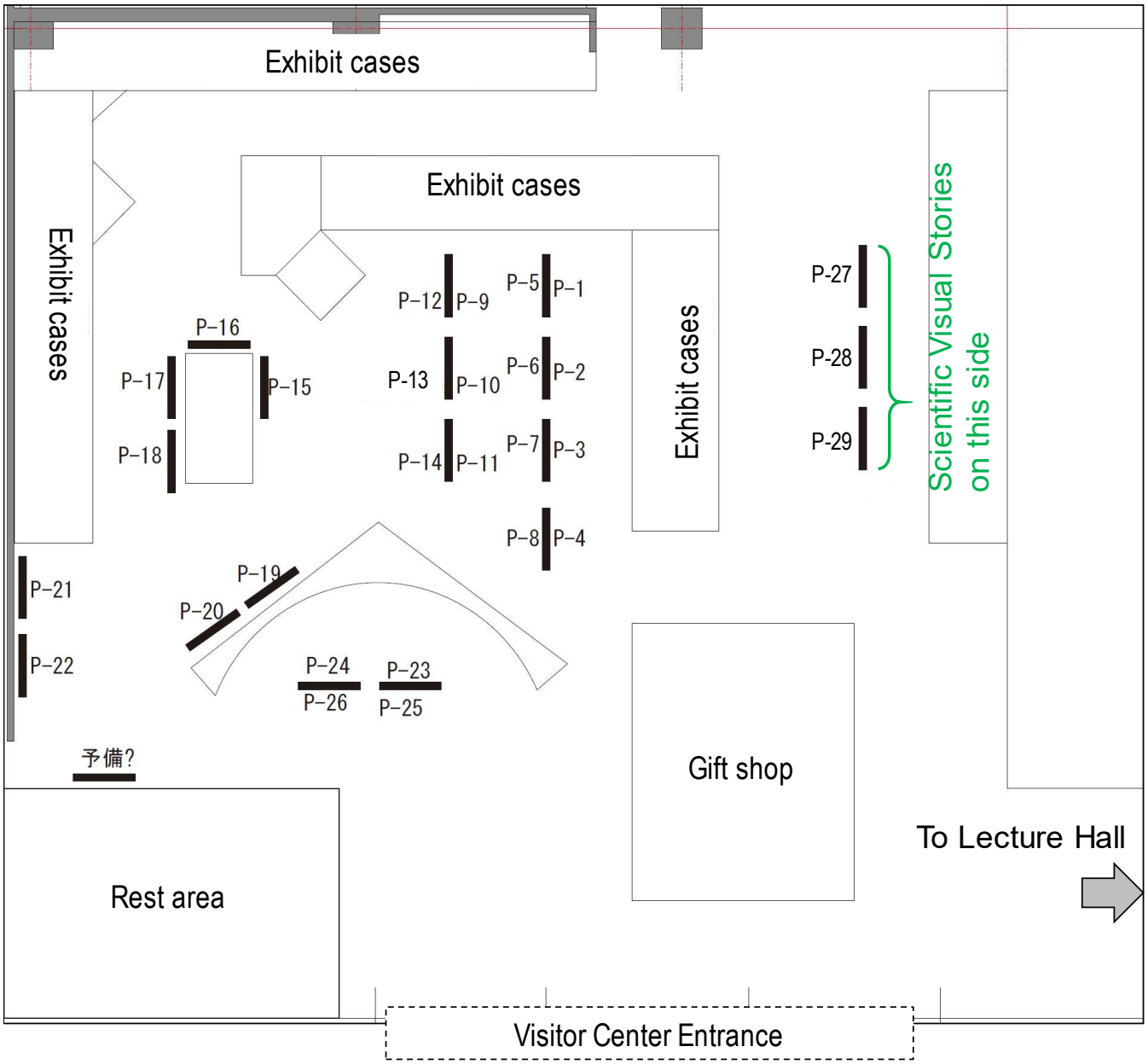
P-1	Lucie Rigaill	Sealed lips don't deceive: lips coloration informs about ovulation probability
P-2	James Brooks	Modulation of Great Ape Social Attention by Oxytocin
P-3	Hiroto Yoshimura	Does plant intake promote hair evacuation in captive snow leopards?
P-4	Xiaochan Yan	Characterization of bitter taste sensitivity of four species of Sulawesi macaques
P-5	Mayuko Nomoto	Relationships between diet and trails of forest elephant in and around Moukalaba-Doudou National Park, Gabon
P-6	Mao Asami	Does the tooth shape of macaque provide taxonomic character?
P-7	Tomoe Torii	Group Size Estimation of Finless porpoises by Aerial Videos
P-8	Jie Gao	Chimpanzees can detect strangeness in bodies: an eye-tracking study
P-9	Vanessa Gris	Boundaries between humans and captive chimpanzees: two cases of intensive care in Japan
P-10	Mikuho Yokoyama	Perception of object texture in chimpanzees and humans: A research plan
P-11	Pandora Pinto	Does size matter? Examining the possible mechanisms and adaptive significance of single and multi-male groups in horse societies
P-12	Morgane Allanic	Social influences on allogrooming behavior in wild bonobos at Wamba, DRC
P-13	Kristin Havercamp	Do chimpanzees' sleep patterns change with age? Looking back a decade
P-14	Ena Onishi	Preliminary behavioral survey of bonobos in Mbali, savanna-forest mosaic environment

P-15	Yutaro Sato	Great apes' understanding of biomechanically possible and impossible body movements
P-16	Huiyuan Qi	Preliminary DNA analysis using non-invasive samples from captive snow leopards in Japan's zoos
P-17	Takumasa Yokoyama	A bonobo at Wamba captured a duiker, but did not eat it – implication for their "prey image"
P-18	Annegret Moto Naito	Genetic diversity of the Japanese golden eagle at microsatellite and major histocompatibility complex loci
P-19	Scott Jenkins	Investigating Olfactory Receptors in Hystricomorpha, a Suborder of Rodentia
P-20	Diana Silva	Auditory enrichment in two primate species kept in the Maia Zoo: Common marmoset (*Callithrix jacchus*) and Green monkey (*Chlorocebus sabaeus*)
P-21	Josue Alejandro Pastrana	Effects of substrate change in bar-hanging behavior in the Takahama group at the Primate Research Institute
P-22	Sakiho Ochi	Investigation of Social Structure and The Function of Acoustic Communication to Maintain Social Relationship in Free-ranging Horses (*Equus caballus*)
P-23	Yuki Kinoshita	Coordination of trunk motion during bipedal walking in the frontal plane: a comparison between human, white-handed gibbon and Japanese macaque
P-24	Kazuya Toda	Antagonistic interactions and spatial relationships between immigrant and resident females in Wamba bonobos
P-25	Yuto Taki	mtDNA and microsatellite analyses of the Ryukyu flying fox
P-26	Tamao Maeda	Multilevel structure in feral horse society: Evidence from aerial observation using drones
P-27	Maegan Fitzgerald	What are the implications of tree cover loss for chimpanzees and humans across the greater Nimba landscape in Guinea
P-28	Halmi Insani	Mainland versus island adaptation: Impacts and consequences on body size and biodiversity of primates
P-29	Kenneth Keuk	Lack of confidence? Here are new tools to assess your network uncertainty

Poster board set-up

Note: You can: (A) leave your poster on the poster board overnight, from Friday evening until the end of the Get-together Party on Saturday; or (B) if you don't want to leave your poster unattended, take it down after the poster session on Friday ant put it up again on Saturday for the second poster session. Keep in mind that all JMC visitors, not just symposium attendees, will be able to see the posters that are on display during the day.

Please take down your poster after the Get-together Party on Saturday.



Special Sessions: **S-1**

Communicating Science

Expert Panel on Engaging the Media, the Public, and Policy Makers

Communicating Science has become a major focus in the information age, where access to new findings and critical developments has never been as easy - just a click away - as it is today. However, major challenges include getting your message out amidst an ever-increasing throng of information, while avoiding the spread of misinformation. This session showcases a panel of science communication experts who weigh in with their ideas and experiences to help all of us get a better handle on this phenomenon that is communicating science, and to provide us with some insights and some tools to get us started, or get us back on the right track. With topics ranging from the how's and why's of communicating science through engaging with media and the public, to navigating social media and intercultural perspectives in digesting and communicating science, this session is broad in scope and is designed to be encouraging of strong audience participation. Discussion of each topic will include plenty of time for and encouragement of audience participation, which can be through Q&A or simply relating our own relevant experiences. To be a difference-maker and a champion of wildlife and the environment - which is very much the hopes of the PWS program for all of you in attendance - we all need strong communication skills, so this session should make a strong contribution toward that end. In addition, this session marks one of two sessions at this PWS symposium to commemorate the 10th anniversary of CICASP, which has from its inception put strong emphasis on the communication abilities of our graduate students. Join us for an engaging and stimulating discussion of all things Science Communication!

Panelists:

- David Kornhauser (Panel Moderator)
- Raymond Terhune
- Kei Kano
- Ayumi Koso
- Amanda Alvarez

Facilitators:

- Andrew MacIntosh
- Susumu Tomiya (Session Chair)

Special Sessions: **S-2**

10 years of CICASP
Making an Impact Within and Beyond Academia in a Global Community

To celebrate this 10th Anniversary of CICASP, and to align our missions with those of the PWS program, this session introduces a number of past CICASP affiliates, from graduated students like Heungjin Ryu and Cintia Garai, to past faculty like Fred Bercovitch and David Hill, and even to a former TA and past graduate student in Hikaru Wakamori, all of whom are currently working or have recently worked outside of the academy, in wildlife conservation and outreach, development, management and curation. As a result, in addition to showcasing some of the current and recent work of past CICASP affiliates, this session also demonstrates how science practitioners can make a difference for wildlife outside of the academy, which is a major focus of the PWS program. All speakers have a background in biology and are PhD holders, but have found alternative ways to use their skill sets and contribute to wildlife and environmental issues outside of the university sphere, in some cases even after having lengthy and illustrious careers within it! Bringing back past CICASP affiliates allows us a retrospective and the ability to indulge in some good, old-fashioned nostalgia, but this session should also serve as encouragement to all students and young researchers, both inside and outside of the PWS system, that there are indeed many ways to make a difference, to be a champion for wildlife, in an increasingly global community that simply needs your passion for and stewardship of the natural world.

The Loango Chimpanzee Project

Simone Pika[1*], Tobias Deschner[2]
[1]*Institute for Cognitive Science, Comparative BioCognition, University of Osnabrück, Germany*
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We provide an overview on the research of the Loango Chimpanzee Project, Gabon. The site is ecologically very distinct from other long-term chimpanzee sites, consisting of a mosaic of different habitat types varying from marine, coastal lagoons, mangrove swamps, coastal forest, secondary and primary forest to open savannah. We will present data on home range and community size, as well as on ranging patterns and party composition. Furthermore, we report on distinct behavioral elements, which seem to differ from those reported for other populations. Finally, we will describe patterns of tool use and predation, including the predation on tortoises, and the newest PhD-project on cooperative turn-taking.

The role of facial shape and color in chimpanzee's attention to infant

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Infant faces have several features which distinguish them from adult ones. For example, infants have several morphological features such as relatively large eyes, and small nose and mouth. Besides, infants of some species such as chimpanzees, have unique skin coloration. Previous studies have found that chimpanzees have visual preference for infants, and their coloration plays an important role in guiding their attention. However, it remains unclear whether they also pay attention to the shape of infant faces. This study aimed to reveal the relative importance of facial color and shape on infant preference in chimpanzees. We first created the average faces of adult and infant chimpanzees. Then we morphed between them and created facial stimuli with adult, infant or neutral color and shape respectively, which results in following the stimulus pairs: congruent pair, incongruent pair, shape-controlled pairs, color-controlled pair. We presented the pairs of those morphed stimuli to 14 chimpanzees and measured their gazes. The results revealed that coloration, but not shape affected the looking behaviors. Thus, we found no evidence that chimpanzees, unlike human, have visual preference for shape features of infant faces. The results suggest that the facial cues characterizing infant appearance varies across species.

Video–real world matching in chimpanzees

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In many studies with nonhuman animals, video images were frequently used to present stimuli to them. However, whether animals recognize a video, which reflects reality, as an image of real world event remains still unclear. In this study, we aimed to investigate the extent of the ability to recognize actions/objects through the video in chimpanzees (*Pan troglodytes*). In particular, we examined if the aid of live video images of foraging-related events would have the same effect as live events to direct the chimpanzee's behavior to successfully obtain food. We conducted a two-choice task after demonstration of food baiting. Chimpanzees can get the reward if they choose the side which was baited. Three out of five chimpanzees successfully obtained the food, even though they could not observe the food-hiding directly but only from the live-video. They were equally accurate in "real world-real world matching" and "video-real world matching". Moreover, they used information including relative position, color and shape of the objects from the videos. Our results suggest that videos could be used as a valid referential tool for chimpanzees to guide their decisions in the real world.

Creating a multicultural video resource for archiving the history of primatology in Japan

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Where do we come from? In biology, this question may be asked from an evolutionary perspective, but here we ask this question in the immediate context of primatology in Japan. Stories of the past help us to better understand and appreciate the present but they also provide practical value because the past can be a learning tool of immense knowledge. Stories are often effectively told through visual aid since more information, such as non-verbal communication, can more accurately reflect a specific message to an audience. Furthermore, the current technology of video and the internet is allowing us to more easily share information to a broader audience. The history of primatology in Japan can be pieced together through various publications and television broadcasts. However, it is difficult to find an updated history that is easily accessible in one place for both Japanese and English speakers, particularly in an interview format. Here we describe a new project for documenting the stories of primatology in Japan through video interviews. Our aim is to first provide a supplementary resource for future research into the history of primatology. Simultaneously, we aim to provide insightful material about the history of primatology in Japan that can be easily accessed by the general public.

Personality variation in wild male chimpanzees is maintained by its changing association with rank

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The maintenance of variation in heritable fitness-related traits has been a topic of longstanding interest to biologists. Animal personality is a well-known example of such variation; studies in many species find evidence of stable and heritable interindividual differences in behavioral tendencies, and for associations between personality traits and fitness. Adaptive explanations have tended to focus on selection in heterogeneous environments or on frequency-dependent selection. Using 37 years of behavioral data on 28 male chimpanzees in Gombe National Park, Tanzania, we examined the associations between six well-established heritable, stable, chimpanzee personality traits and dominance rank, a trait tied to fitness in this species. We show that the magnitude and direction of associations between three personality traits—dominance, conscientiousness, and openness—and dominance rank vary across males' lifetimes. These results highlight another mechanism by which genetic variation can be maintained in fitness-related traits, namely that these traits are beneficial at different life stages and may thus represent alternative strategies maintained under negative frequency dependent selection.

On-site Laboratory for international collaborative research on primate ecology and evolution

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The Department of Zoology, Entomology and Fisheries Sciences (ZEFS) in Makerere University is all-encompassing vibrant, learner-centred and community-focused training facility. It offers BSc, MSc and PhD degrees in Fisheries, Aquaculture, Conservation Biology, Entomology, Parasitology, Wildlife Ecology and management. With the current enrolment of 150 undergraduate and 100 graduate students offering courses including: Basic Genetics, Introduction to Molecular Biology, Population genetics, Aquaculture Engineering, Evolution and Classification, Basic Bacteriology and Virology, Systematics & Diversity of Vertebrates, the need for laboratory facilities is critical. In line with the need to set up such facilities for quality training, ZEFS in collaboration with Kyoto University plans to establish an onsite lab which will be essential for processing and storing animal samples for molecular analyses. It is envisaged that the lab will boost both scientific research and innovation and play an important role in the training of both local and international students carrying out biological field studies in Uganda.

Molecular genetics for research and development: Challenges and opportunities for international collaboration

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Molecular genetics has seen a tremendous increase in tools, approaches and thus applicability. These tools are increasingly being used for wildlife population genetics, conservation of nature and disease transmission dynamics. Indeed, these tools are also applicable to fisheries and aquaculture, entomology and primatology. To set up and maintain this thrust in resource constrained settings requires concerted efforts with support from international collaborations. In this presentation, we show the evolution and population genetics of selected African large mammals in eastern Africa and the implication of these findings to conservation. With a molecular epidemiological approach, we show the evolution of foot-and-mouth disease and implications to vaccine strategies and shortcomings in other disease control approaches. We advance this approach when we apply it to African swine fever (ASF) transmission dynamics through the use of a host-genome depletion approach in the complete genome sequencing of ASF virus for deciphering evolution and spatial-temporal patterns of spread of the disease in Uganda.

Keywords: genetics, evolution, diversity, next generation sequencing, vaccines, conservation

Is habitat disturbance in Itwara and Matiri forests affecting primate populations? An analysis of threats.

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This study assessed the relative abundance among five previously recorded primate species in two forest reserves that are similar in protection status but contrast in levels of disturbance. Our objective was to compare the primate abundance in the heavily disturbed Matiri and less disturbed Itwara Central Forest Reserves. We measured anthropogenic activities and/or threats to primates in the two forest reserves. Our findings indicate differences in primate abundance between the two forests, with only one out of five primate species previously recorded found in the heavily disturbed Matiri forest. At this site (Matiri), primate numbers were significantly lower than in the previous census. We found no evidence of the endangered Red colobus (*Piliocolobus tephrosceles*), which was recorded 5-years ago in both forests. However, the Black-and-white colobus (*Colobus guereza*) showed slightly higher abundance in the heavily degraded forest and did not show a significant decline in either. We argue that escalating human activities in the two forests has specifically impacted the primate populations through reduction of food resources and exposing them to predators. However, Black-and-white colobus do not seem as affected by the current forest degradation. We suggest that their greater ecological adaptability may explain their resilience and relatively high abundance in the heavily degraded forest. We provide recommendations towards the long-term protection of the area.

Why are intergroup relationships non-antagonistic in bonobos?: Implications from recent genetic studies

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Intergroup relationships in bonobos (*Pan paniscus*) are usually non-antagonistic. Intergroup male aggressions are not severe; even physical contacts are rare in aggressive interactions between males of different groups. Intergroup female-female relationships are non-antagonistic and sometimes "peaceful"; affinitive interactions among females of different groups are often observed during intergroup encounters. Such affinity and antagonism among individuals of different groups may be affected by patterns of kinship among individuals of neighborhood groups. Since I became a PWS student, I and my colleagues have clarified kin structure among neighborhood groups for bonobos and the closest sister species, chimpanzees (*Pan troglodytes*). We found that male kin structure among neighboring groups is similar between the two species. We also found that approximate 60% of female bonobos migrate into neighboring groups. Based on our results, I discuss why intergroup relationships are non-antagonistic in bonobos.

Testing Motivational structure hypothesis by using Asian elephant vocalizations

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Mortan (1977) described that some birds and mammals use 'harsh' and relatively low-frequency sounds when disturbed or in a 'hostile' context, whereas they produce louder or higher frequency sounds during social interactions or in 'friendly' circumstances which can be outlined as "motivation-structural (MS) rules". We tested MS hypothesis by using Asian elephants' vocalizations which are produced during both disturbance and undisturbed contexts. We compared two call-types, namely 'rumbles' (low-frequency call) and 'trumpets' (high-frequency call), produced by elephants during disturbed (by humans or other animals) and undisturbed (normal social interactions) states. We analysed the acoustic characters, *i.e.,* absolute frequency parameters (fundamental frequency (F_0), minimum, mean, maximum, range and standard deviation), temporal (call duration, time to minimum F_0, time to maximum F_0, peak-point and minimum-point), and filter-related parameters (mean, minimum and maximum of first (F_1), second (F_2) formant locations) of these two call-types. Our results show that, under disturbed conditions, Asian elephants increased the call duration of rumbles, while decreasing the duration of trumpets. Similarly, the mean F_0 and mean positions of F_1 and F_2 of rumbles decreased, in contrast to the undisturbed condition. While in trumpets, no significant differences were observed in mean F_0 and formant positions of both F_1 and F_2 between two contexts. We also found that duration of rumbles was influenced by the interaction between group size and context, *i.e*., smaller groups produced longer duration rumbles when disturbed. Our results suggest that MS hypothesis holds true for Asian elephants' vocalizations. However, this can be further validated and tested with controlled experiments.

First vocalization study of wild Indo-Pacific Bottlenose dolphins (*Tursiops aduncus*) at Jeju Island, Republic of Korea: Whistle characteristics and its response to ambient noise.

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Dolphin vocalization mediates complex social behavior and navigation while obtaining environmental information. Indo-Pacific bottlenose dolphins, Tursiops aduncus, produce numerous types of acoustic emissions including clicks, pulsed signals, and tonal calls. Tonal calls are the diverse repertoire of whistles and signature whistles for communication which exhibits a variation between geographically separated populations of T. aduncus. Additionally, recent studies have shown the importance of both natural and anthropogenic ambient noise on the whistle production of dolphin in response to signal masking. First, the baseline study of whistle characteristic was conducted by measuring the following: whistle class, contour inflections, harmonics, beginning frequency, end frequency, maximum frequency, minimum frequency, and duration. Whistles occurred in the frequency range of 0.011-23.34 kHz (mean 6.75-11.7 kHz) with durations of 0.32 – 1.86 s. The whistle characteristics are significantly different from the closely located T. aduncus population in Japan and showed a less whistle contour complexity. To further investigate the whistle production, the effect of concurrent natural and anthropogenic ambient noise was examined (both the broadband signal (20 Hz–24 kHz) and one-third-octave band levels centered on frequencies from 20 Hz to 22.4 kHz). The linear regression analysis indicated that the minimum frequency had significant positive relationships with the ambient noise present at the time of the whistles. Also, an increase in anthropogenic noise mainly caused by dolphin-watching vessels below the dolphin's call bandwidth resulted in shifting up of the produced whistles on the minimum frequency, and reduction of whistle repetition. The noise induced change of dolphin acoustic behavior may reduce the overall effectiveness of communication. Additionally, the shift in whistle characteristic during a continuous disturbance by dolphin-watching vessels may result in group separation and significant loss of energy in efforts for group cohesion.

Fruit species choice by Golden-faced saki, an Amazonian "seed predator"

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Among neotropical primates, sakis and uakaris are generally described as "seed predators", because their specialized dentition allows them to access endosperm or cotyledon within tough seeds. But the fact that they also consume considerable amount of ripe fruit pulp has been overlooked. It is possible that their adaptive feeding strategy is to combine seeds and pulps, not simply to eat seeds. In order to understand their adaptation, as well as to explore the process of diet evolution in primates, it is necessary to reveal how they choose pulp and the role in their diet. We studied two groups of free ranging golden-faced saki (*Pithecia chrysocephala*) inhabiting a fragment forest in the campus of the Instituto Nacional de Pesquisas da Amazônia (INPA), Manaus, Brazil. We followed each group for 3-5 days respectively in a month, from January 2019 to July 2019. We recorded their feeding behavior by instantaneous scan sampling every 10 minutes. Total observation time was 511 hours (256 hours for Group A and 255 hours for Group B). Through the study period, the most used food item was categorized as "seeds" in both study groups (53% in the feeding time of Group A and 48% in that of Group B), and the secondly used food item was "pulps" (25% in Group A and 28% in Group B). Total number of fruit pulp species eaten by both groups was 44 species. We found that those fruit species can be classified into two types following saki's feeding behavior. As for a type of fruit species, sakis ate only pulp and never ate the seeds throughout the study period ("pulp-without-seed species"). On the other hand, for another type of fruit species, they ate seeds when it was unripe, and ate both seeds and pulp when it was ripe ("pulp-with-seed species"). Although the number of species classified into each type was similar ("pulp-without-seed": 21 species; "pulp-with-seed": 23 species), the consumption of "pulp-with-seed species" accounted for 64% in their pulp feeding time. These results suggest that the characteristic of fruit pulp mostly eaten by saki is that it is a pulp whose seeds are also edible. This may be a reasonable strategy to get high nutritional values with less foraging cost.

Interaction between free-ranging dogs and Central Himalayan langur: An assessment of anti-predator behavioral strategy

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Predation is an important factor in primate evolution and many factors of primate society have been explained as a response to predation. Predation has been discussed in broad theoretical terms, but little quantified data exists on the subject because of the difficulty of documenting its infrequent occurrence. Predation on wild nonhuman primates has rarely been studied and its effects on behaviour are poorly understood. We proposed dog-primate interaction as suitable model (dog predation mortality is 10-15% of the population annually) for understanding primate anti-predator behavioral strategies. We recorded 338 Himalayan langur and dog interactions over two years. Langurs mainly performed two types of anti-predator behavior; direct fighting with a predator and giving alarm calls. We analyzed the effect of dominance rank and status (immigrant/resident) on the anti-predator strategy through generalized mixed model (GLMM). Rank has no effect on fighting with predators but males living in the group for longer periods of time tend to take high risk behaviors i.e. fighting with dogs. Low rank individuals play a very important role in alarming the troop during the presence of predators compare to higher rank males. Resident adult males protect their troop by adopting a fighting with predator strategy, which might be associated with the presence of offspring/ kin in the group.

Collective departure in feral horses

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Group-living animals always need to make a decision and reach a consensus. When individuals move to another place for resources or decrease predation risks, each individual balances between benefit from staying there and cost for following others. In consequence, this collective departure proceeds in stages, not in a moment. The proceeding of the collective departure is composed of initiation and propagation. In a lot of previous studies, trends of social characteristics of initiators have been reported. However, mechanisms of propagation are still unclear. In the present study, we demonstrate how feral horses achieve collective departure by analyzing time lags among followers. We captured aerial videoclips of feral horses in collective departures in Serra D' Arga, Portugal. Movement of each individual was automatically detected using a deep learning method. We found that time lags between followers gradually became smaller as increasing the number of individuals who already departed. Considering this result, individuals seems to adopt majority- biased transmission in the collective departure.

Understanding the threats to wildlife in Africa

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There are few places on Earth where the impact of people has not been felt. As human population and needs grow, less and less room is available for wildlife. Unfortunately, in Africa, the effects of humans on wildlife are escalating, as wildlife and humans increasingly come into contact with one another. We will discuss these scenarios of human–wildlife conflict in many parts of Africa, as well as growing threats to species and habitats; from climate change effects that are being exacerbated by deforestation (water stress, droughts and an increase in arid lands), to resource extraction and ecosystem damaging, to bush meat hunting that provides a source of protein for rural communities, or population growth and land-use change.

What are the real chances to prevent some of these man-made threats and limit the loss of wildlife in Africa?

Assessment of the impact of mountain gorilla ecotourism in Bwindi National Park, Uganda

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Ecotourism plays a significant role in the conservation of mountain gorillas (*Gorilla beringei beringei*). Despite the growing number of tourists visiting mountain gorillas and an increasing number of habituated groups, very little behavioral data has been collected on the potential impacts of ecotourism on these wild populations. The present study examines how interactions with human tourists influence gorilla behaviour. We collected behavioural data (focal sampling) before, during and after tourist visits over a 11-month period (December 2017-February, 2019) one habituated group (15 individuals) in Bwindi Impenetrable National Park, Uganda. We used general linear mixed-effect models (GLMM) to analyze the differences between gorillas` behaviour regarding: 1) presence/absence of tourists, 2) distance to tourists and 3) tourist group size. Our data showed that animals' routine is influenced by the tourists. Group social dynamics and individual behaviour (including stress related behaviours) is affected by the presence of tourists, especially when in close proximity. Gorillas will charge, avoid humans or interact with humans, when visitors approach them, violating the 7 m rule. In addition, gorillas will react more to bigger groups of tourists. We strongly advice for the Enforcement of the current rules, in special of the 7-meter rule will decrease the physical interactions, minimize the influence on the animal`s behaviour.

Popularity of YouTube Contents that Violate the Tourism Regulations May Undermine Conservation of Mountain Gorillas

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Although ecotourism is expected to be compatible with conservation, it often imposes negative effects on wildlife. The ecotourism of endangered mountain gorillas has attracted many tourists and functioned as a key component of the conservation while the risk of disease transmission between humans and gorillas is a large concern. It is important to maintain a certain distance while observing gorillas to minimize risk. However, there might be conflicting expectations on the part of tourists who wish to observe or interact with the gorillas in close proximity and such expectations may have been engendered by the contents of social media in this Information Age.

We conducted a content analysis and described the general characteristics of 282 YouTube videos related to mountain gorilla tourism. In 70% of the videos, humans and gorillas were observed simultaneously, and physical contact or close proximity within arm's reach were identified in 40% of the videos. To explore the factors affecting the number of views and likes that these videos received, we ran generalized linear models and performed AIC model selections with 206 samples in which humans and gorillas were observed simultaneously. Videos obtained more views and likes when the thumbnail photos included both humans and gorillas together, while videos with thumbnail photos of only gorillas obtained fewer views and likes compared with those that included no gorillas. Moreover, videos obtained more views and likes in cases where physical contact or close proximity with gorillas were clearly observed, compared with those that did not clearly include any close human-gorilla interaction.

These results suggest that human-gorilla interaction and proximity with gorillas attract more public attention compared with when gorillas are simply shown by themselves. Our study highlights the importance of further investigation on the direct link between such contents that violate tourism regulations and the conflicting situation.

Evidence for multiple episodes of hybridization in the phylogenetic history of guenons (tribe Cercopithecini)

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The guenons (tribe Cercopithecini) number more than 20 species and range across most of sub-Saharan Africa. Multiple taxa are sympatric and often form polyspecific associations. Such close physical proximity leads to occasional interbreeding and the production of viable and fertile offspring which are then potential conduits for extraspecific alleles via subsequent backcrossing. The taxonomically widespread behavior of forming polyspecific groups indicates that episodes of introgression are likely to have occurred throughout the guenon radiation. Consistent with this idea, different components of the guenon genome (e.g. mitochondria, sex chromosomes, autosomes) have distinct evolutionary histories, yielding phylogenies that conflict in some areas. While some discordances are readily identified as evidence of earlier hybridization, others are difficult to separate from cases of differential lineage sorting. Obtaining trees from many unlinked loci can help distinguish between these two processes. We have collected double digest restriction site associated DNA sequence (ddRAD-Seq) data from more than 30,000 loci for representatives of each of the cercopithecin genera and "species groups" and subjected these data to phylogenetic analyses followed by calculation of D statistics to test for admixture between the species. Results indicate multiple likely episodes of introgressive hybridization in the guenon radiation, leading to the creation of mixed genomes. Interbreeding, even in low frequency, can thus be a significant force in primate evolution.

Sampling the biodemographies of macaque lineages provides understanding of the success of early hominids

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Hominids (*Australopithecus* and *Homo*) and *Macaca* proved successful in the Plio-Pleistocene. Current evidence suggests that these two clades expanded their geographic ranges beginning around 3.5 MYA (hominids) and 7 MYA (macaques). With two more recent radiations (*sinica* and *fascicularis* species complexes) there now exist more than 20 living macaque species.

Richard et al. (1989, *Inter. J. Primatology*, 10(6):569-594) have designated four macaques as "weed species," owing to their preference for riverine secondary forests that emerged across tropical Asia during thousands of years of human disturbances including swidden agriculture. Since secondary forests were likely niches for *Australopithecus* as well, we separate the mortality, fertility, and growth measures of the weed species and show how they can be instructive as models for other Pliocene primate radiations.

Female macaque fertilities are rather resistant to the environment; instead, the explosive growth potential of these monkeys is largely due to the occasional lessening of pre-reproductive mortality. By analogy, this mechanism offers a new understanding of the early demography of hominids, which progressively occupied increasingly less-forested habitats even as K-strategists. Hominid reduction in birth spacing would have been physiologically difficult and not as responsive. However, elevated female survival would have been a likely, more immediate, and selected outcome of the adoption of the most unusual mating structure ever to emerge in primates--social monogamy.

Investigating the neural basis of macaque social diversity: A comparison of cell density and serotonergic innervation of the amygdala among four species

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The genus *Macaca* is speciose and behaviorally diverse, making it an ideal model for investigating the biological basis of primate social behavior from an evolutionary perspective. To search for neural differences that may partially underlie their social style differences, this study compared cell density and serotonergic innervation of the amygdala among four macaque species using immunohistochemistry and stereological methods. The species examined have been considered to display different social styles from one another and included rhesus (*Macaca mulatta)*, Japanese (*M. fuscata)*, pigtailed (*M. nemestrina)*, and moor macaques (*M. maura)*. Significant species and amygdaloid nuclei differences were found. Specifically, pigtailed macaques possessed greater serotonergic innervation relative to rhesus and moor macaques. Additionally, Japanese macaques possessed significantly higher neuron and glia densities relative to the other three species. Differences among amygdaloid nuclei were also observed, revealing a relatively conserved cellular and serotonergic amygdala profile. The results of this study suggest that neural differences among closely related species may play a role in mediating observed behavioral differences. Additional neurochemical markers, brain regions, and primate species will be observed in future studies to further investigate the neural basis of primate sociality.

Molecular Genetics of Macaque Reproductive Biology

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Three closely related species of macaque – Japanese, rhesus, and long-tailed – are among the most extensively studied monkeys both in the wild and in captivity and provide valuable models for research into several areas of primate biology. The three species exhibit particularly interesting phenomena with respect to reproductive physiology and genetics. Japanese macaques (*Macaca fuscata*) and rhesus macaques (*M. mulatta*) are seasonal breeders. Testes swell to double their size during the mating season compared to the birthing season, yet the underlying mechanisms of genetic and molecular regulation remain poorly understood. In addition, rhesus macaques hybridize with long-tailed macaques (*M. fascicularis*) along the contact zone in northern Indochina, a situation which has led to the introgression of the Y-chromosome of the former species nearly 200km into the range of the latter. Considering that a number of spermatogenesis-related genes are located on the Y-chromosome, its widespread introgression is likely driven by an advantageous genic block that results in greater quality and/or quantity of sperm – qualities that would be considerably beneficial in the promiscuous multimale/multifemale mating system of macaques. At the Primate Research Institute, I studied the molecular mechanisms controlling seasonal breeding under the tutelage of Dr. Masanori Imamura. At Kent State University, I study the evolution of Y-chromosome genes with Dr. Anthony Tosi. Both projects offer new insights into primate reproductive biology and evolution.

Impact of excluding age-sex classes of individuals from social network on the relationship between network centrality and parasite load

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Group living is beneficial for individuals in a group, but also comes with costs. One such cost is the increased possibility of pathogen transmission. Yet, most research that focuses on social transmission in primates has done so with only subsets of the group (e.g. adults or even adult females), which will influence the results and their interpretation. With this in mind, we aimed to test (i) whether social interactions or proximity mediate the spread of intestinal parasites in primate groups, and (ii) whether work that includes only subsets of a group might produce biased results. To test these hypotheses, we investigated the relationship between social network centrality and intestinal parasite infection intensity in a group of Japanese macaques (*Macaca fuscata*), using both empirical and simulated data. We used social network analysis on data collected over two months on Koshima to relate indices of network centrality to an index of parasite infection intensity (fecal egg counts: FEC). We then ran a series of knock-out simulations to test the effect(s) of missing data on the observed relationship. General linear mixed models showed that social network centrality was positively associated with infection by nodular worm (*Oesophagostomum aculeatum*) in the complete observed data set but including only subsets of the group (e.g. adult females or random subsets of the group) can yield false negative results; though a juvenile only network retains the positive association between sociality and infection. Results suggest that social interactions or shared proximity can mediate the spread of some intestinal parasites, but researchers that only focus on subsets of their study groups, or where missing data may be an issue, must interpret their results with caution. This work introduces important methodological considerations for research into the dynamics of social transmission, and not just for infectious disease.

Developmental Epigenetics of Mammalian Fertility; The Kallmann syndrome case

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Genetic screenings uncovered a number of loss-of-function mutations that can cause congenital HH (CHH), a complex human reproductive disorder that results from the absence of normal pulsatile gonadotropin-releasing hormone (GnRH) release. One particular form of CHH called Kallmann syndrome (KS) is associated with anosmia. Of these, fibroblast growth factor (FGF) 8 mutations are of particular interest, because they disrupted embryonic GnRH neuron development and led to infertility in humans and rodents. Normally, GnRH neurons secrete the decapeptide GnRH into the portal vein system to cause the intermittent release of the gonadotropins: luteinizing hormone and follicle-stimulating hormone into the general circulation. These in turn activate steroidogenesis and gametogenesis. This major brain-body axis is responsible for the onset of puberty and fertility. Our molecular epigenetic studies showed that TET1 (ten-eleven translocation methylcytosine dioxygenase-1) recruitment and 5hmC-enrichment enhanced *Fgf8* transcription, while subsequent PRC-2 (polycomb repressive complex-2) recruitment promoted chromatin condensation and repressed *Fgf8* transcription. These data indicate that embryonic GnRH neurons require epigenetically controlled *Fgf8* transcription. This discovery will help in the development of novel approaches to alleviate infertility found in CHH patients, and improve our understanding of how intracellular and environmental signals affect epigenetic processes during health and disease.

Effects of Food Toughness On Chewing Efficiency in Yakushima Japanese Macaques

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Chewing, as an intermediate step between food handling and chemical digestion in the whole nutrition intake process, is one of the initial steps that deals with the mechanical defenses of food. It has been associated with the fitness of mammals by influencing digestive efficiency. The result of chewing, which is often quantified as chewing efficiency, is affected by many factors such as food properties and chewing ability of animals. Clarifying the relation between chewing efficiency and these factors can provide us knowledge about the influences of environmental variations and age-sex differences on animals' digestion. This study aims to clarify the effects of food mechanical properties and age-sex differences on chewing efficiency in Yakushima Japanese macaque (*Macaca fuscata yakui*). We collected feeding behavior data in Yakushima lowland. Food fracture toughness and fecal particle size were measured to show the variation in food mechanical properties and chewing efficiency respectively. We found seasonal variations in macaques' diet and the toughness of their food. Food fracture toughness was lower when fruit were important food while it was higher when mature leaves was important food. However, the chewing efficiency was relatively stable between different months and different age-sex classes. This unexpected result implied Japanese macaques in Yakushima lowland can reduce the size of most of their food items into similar level through digestion. And the effects of chewing behavior modification and food properties other than mechanical properties could be proper explanation of our results.

Evaluating Japanese macaques' reliance on anthropogenic food by gut microbiome profile

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As a result of human activities like agriculture, research and tourism, wildlife including Japanese macaques has learned to forage on easily digestible anthropogenic food like commercial feeds and agricultural crops. While for macaques' side, changed diet may lead to health issues like gastrointestinal disorder; for humans, close interaction with macaques may lead to crop damages and human injuries. For conservation and monitoring purposes, it is essential to determine the degree to which macaques' diet rely on anthropogenic food. Known for its close link with the host diet, gut microbiome makes detection of macaques' dietary change possible. This study set out to examine the gut microbiota of Japanese macaques (*Macaca fuscata*) with varying degree of reliance on anthropogenic food and the possibility of using gut microbiota as indicator for macaques' reliance on anthropogenic food. Using 16S rRNA gene sequencing, we described the microbial composition of Japanese macaques experiencing different types of human disturbance – captive, provisioned, crop-raiding and wild. In terms of alpha diversity, our results showed that observed richness of gut microbiota did not differ significantly between disturbance types but among collection sites, whereas Shannon diversity index differed by both disturbance types and sites. In terms of beta diversity, captive populations harbored the most distinctive gut microbial composition, and had the greatest difference compared to wild populations. Whereas for provisioned and crop-raiding groups, the macaques exhibited intermediate microbiota between wild and captive. We identified 35 potential bacterial taxa including five phyla, 8 classes, 10 order and 12 families. Our study revealed the flexibility of the macaques' gut microbiome and provided possible indices in assessing macaques' reliance on anthropogenic foods.

Making Sri Lankan toque macaques' long tails short- the chilling details

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Allen's rule first published in 1877 predicts ecogeographical anatomical variation in appendage proportions as a function of body temperature regulation. Since then this phenomenon has been tested in a variety of animal species. In macaques, relative tail length (RTL) is one of the most frequently measured appendages to test Allen's rule. To date, these studies have relied mostly on randomly collected museum specimens or the invasive and time consuming capturing of free-ranging individuals. To augment sample size, and lessen these logistical limitations, we designed and validated a novel non-invasive technique using digitalized photographs processed on LibreCAD, an open source 2D-CAD application. This was used to generate pixelated measurements to calculate an RTL equivalent, the Tail to Trunk Index (TTI) = tail (tail base to anterior tip) pixel count/trunk (neck to tail base) pixel count X 100). The TTI of 259 adult free-ranging toque macaques (Macaca sinica) from 36 locations between 7 and 2087 m above sea level (m. a. s. l.) were used in the analysis. Samples were collected from all three putative subspecies (M. s. sinica, aurifrons and opisthomelas), at locations representing all altitudinal climatic zones where they are naturally distributed. These data were used to test Allen's rule, predicting that RTL decreases with increasing altitude. Our results strongly supported this prediction. There was also a statistically significant, negative correlation between elevation and annual average temperature. The best predictor for the TTI index was elevation. Significant sub-species differences in relative tail length are linked in part to their ecological and altitudinal niche separation. The non-invasive method developed for the quick morphometric assessment of relative body proportions, applicable for use on unhabituated free-ranging animals, widens the range of materials available for research studying morphological characteristics and their evolution in primates.

Applying Science and Filmmaking in Conservation in DRC

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Scientists are trained to present their messages in an accurate, structured manner. Filmmakers and other communicators often choose to place entertainment above accuracy in their storytelling. However, to successfully convey a message, one should not need to choose between being entertaining and providing accurate information. Particularly, in the domain of conservation, we need to get messages, often complicated ones, out to the public, and to decision makers, without resorting to reductionism and in an engaging way. In this presentation I talk about how I use scientific and filmmaking backgrounds to applied conservation in the Democratic Republic of the Congo. The specific examples through which I introduce this approach of communication are the TL2 Project, operating in and around the Lomami National Park in Tshopo and Maniema Provinces, and the establishment of the Ekolo ya Bonobo Community Reserve in Equateur Province.

Working in a Governmental Institute: Balancing between our own Research Interests and Project Aims

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Upon obtaining a higher academic degree, one may agonize about future carriers. One-way to develop one's carrier will be getting a research position in a governmental institution, which aims to provide basic data, such as national level species distributions and population status, for policymaking. As the governmental institute is clearly goal-oriented, the transition from sole research-focused activities to policy dependent activities can be challenging. At the beginning, one can struggle to balance between his/her own research interests and the things that he/she had to do as a member of a project. In addition, the freedom we could have in the University can be limited in the government institute. Nonetheless, working in the government institution will give us chances to understand better about policy-making process, and how we can contribute to it with our research skill. There are plenty of other opportunities for extending our research networks and social contributions in the government institution as well. I will discuss the importance of the contribution of researchers by sharing my experience in a governmental institute that helped zoos with policymaking.

Working at Tama Zoological Park

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I belong to Tokyo Zoological Park Society (Tokyo Dobutsuen Kyokai), which is a non-profit organization that manages and operates the zoos and aquarium owned by Tokyo Metropolitan Government. The society operates Ueno Zoological Gardens, Tama Zoological Park, Tokyo Sea Life Park, and Inokashira Park Zoo, and I am working at Tama Zoological Park. I belong to the Educational department and working as an Animal Curator.

Tama Zoological Park locates at Hino City, suburbs of Tokyo. It was established in 1958, and its area is over 50 hectares. The zoo exhibit animals in different areas such as Asiatic Garden, African Garden, Australian Garden, and the Insectarium. The job of Animal Curator is to conduct guide tour, operate programs and workshops to students from kindergarten to university and teachers, wright newspaper about the zoo animals every month.

During the talk, I would like to introduce my job and some important skills that can be gained during graduate school.

Ecological consultancy and wildlife conservation in the U.K.

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Many species of animal and plant in the United Kingdom are protected under national and European laws which make it a legal requirement to obtain a license before starting any work or activity that might disturb them or damage their habitats. One of the roles of ecological consultants is to survey sites where development is proposed in order to determine whether protected species are present. If any protected species are likely to be negatively affected by the development, the developer may be required to alter their plans or take other action to mitigate for the potential impact.

All bats in the U.K. are European Protected Species and so they are a major focus for survey efforts by ecological consultancies. The main methods used include counts of bats emerging from and returning to known roosts, surveys of bat activity using bat detectors, and advanced techniques involving capture and radio-tracking to find roost sites and assess patterns of habitat-use.

Since 2015 I have been working in the U.K. as a self-employed ecological consultant specialising in surveying bats in woodland habitats. All of my work involves catching bats, and often attaching radio tags, and most of it is related to assessing the potential impact of planned development on local bat communities, or on specific rare species.

This work can only be done at times of year when the bats are active every night, which in the U.K. is from May to September. So each year I have 5 months of intensive work in late spring, summer and early autumn. I will give examples of some of the projects I have worked on and some of the advantages and drawbacks of doing this kind of work for a living. I will also consider the potential for this work by ecological consultancies to contribute to wildlife conservation in the U.K.

The Trail Connecting Sexual Selection in Baboons with Conservation Biology in Giraffes

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Baboons (*Papio* spp.) have a sexual skin that balloons in size during the follicular stage of the reproductive cycle, serving as a sexual advertisement to males of the probability of ovulation. In 1979, I began my PhD research in Kenya on the topic of sexual selection in baboons, focusing on the role of the sex skin in mediating mate choice and competition. In 2019, I was a delegate to the CITES Conference of the Parties 18th meeting in Geneva, Switzerland, where I provided evidence to the international community of the importance of listing giraffes (*Giraffa camelopardalis*) on CITES Appendix II. Although baboons are one of the most numerous primate species, occupying a wide range of habitats in Africa, and giraffes are an endangered species, occupying a limited number of discrete habitats, the 40-year path linking the evolution of baboon sex skins with the biology, ecology, and conservation of giraffes has a common foundation dating to 1859. In that year, *The Origin of Species*, by Charles Darwin, was published. He laid the foundations for understanding how natural selection regulates animal behavior. In 1872, he followed with *The Descent of Man and Selection in Relation to Sex*, where he explored human evolution and sexual selection. The Center for International Collaboration and Advanced Studies in Primatology (CICASP) was founded in 2009 with a Mission to "understand the evolutionary origins of human nature". The bedrock of human nature is built upon our shared heritage with other animals, and has involved the evolution of a propensity to protect Mother Nature.

Comparative Cognitive Science Laboratory

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We have established an on-site laboratory named "Comparative Cognitive Science Laboratory". The aim of this endeavor is to merge primatology, in which Japan has been an international leader, with horse related culture which is deeply rooted in Europe for a long time. A new window for wildlife science and its enlargement can be expected. We have been promoting comparative cognitive science by conducting research mainly targeted to chimpanzees both in the wild and in the laboratory. Using this framework of on-site laboratory, we will expand our research to wildlife science from a broader perspective. In doing so, such topics as ethology, ecology, and physiology of large-sized mammals, which have been done by limited number of researchers in this country, predator-prey interaction exemplified by horse-wolf relationship, and a more comprehensive view taking into account human activities that have influence on animal existence from different levels, could be dealt with. This takes the form of cross-bound laboratories. One of the two parties is Kyoto University, while the other is New Sorbonne University – Paris III; laboratories have been set up in both of these two universities, as well as the third one in Chantilly which is well-known for horse race, and we will exchange researchers between these laboratories to promote international collaboration. Under Kyoto University, cognitive study on non-human animals has been developed within the field of primatology, while New Sorbonne University has fostered outstanding research on communication between humans and horses, based on a long history of horse riding and training. These two universities have already started a collaborative project, and succeeded in establishing touch-screen studies on horses to investigate their cognition, and naturalistic observations on feral horses to investigate their social nature. This new endeavor of on-site laboratory will bloom, based on the long history of primatology and the new discipline of equinology – study on horses-, the next generation of comparative cognitive science on various taxa of nonhuman animals.

Intra-cycle variation in lips coloration in women and its implication on our understand of the evolution of primate sexual signaling

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Across human cultures, red is often associated with fertility. Men, from different populations, find women wearing or surrounded by red more attractive, and women are also more likely to wear red ornaments around ovulation. Studies of non-human primates showed that variation in female skin coloration (i.e., luminance: how dark or light the skin appears, redness: partially reflecting the color of the blood itself) is influenced by sex hormones and can contain information about the reproductive status. The link between red color and fertility could thus have roots in human biological heritage and have emerged in a shared primate ancestor. While few studies have tested whether woman cheeks coloration varies according to the probability of ovulation, no studies yet have investigated whether the most colorful part of the woman face, the lips, also contain such information. My study aimed at determining if lips coloration varies in relation to the probability of ovulation. I predicted that lips will become darker and/or redder (i.e., stronger signal) during the fertile phase (period with the highest probability of ovulation). I have analyzed 171 (mean per participant = 10.7 ± 1.5, range = 8-13) standardized lips photos of 16 cycling women along with saliva samples at the Kyoto University Primate Research Institute (Japan). Samples were collected every other day from the onset of menstruation until the next menstruation (1 menstrual cycle per participant) between September 2018 and June 2019. I measured lips redness (a*) and luminance (L*) as perceived by the human eye (ColourWorker software, CIELAB) and assessed ovulation period from salivary estrogens and progesterone profiles. I have also calculated intra-cycle perceptual differences in redness and luminance, i.e., difference between any point of the cycle against the highest value of luminance and redness reached during the cycle. I found that lips became significantly darker, but not redder, as the probability of ovulation increased. Intra-cycle differences in luminance varied through the cycle and seemed perceptible. There was notably a decrease in luminance starting 1-2 days before the beginning of the fertile phase and reaching its peak 1 day after it. All together this study highlights that human and non-human primates (such as Japanese and rhesus macaques) share some common mechanism and traits of sexual communication, but that their present function may differ across species likely as a result of the different evolutionary pressures that species may have faced. While lips coloration may not act at a sexual signal of ovulation in modern humans, I will discuss the implications of this study into the evolution of human sexuality.

Modulation of Great Ape Social Attention by Oxytocin

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The role of oxytocin has gained significant attention for its role in regulating social behaviour. An evolutionarily ancient neuropeptide, it was originally described primarily for its role in affiliative and prosocial behaviours, but recent studies in humans are beginning to demonstrate that it also plays an important part in outgroup aggression. New perspectives following these studies emphasize oxytocin's role in promoting "groupmindedness," increasing individuals' tendency to cooperate and support one's own group, while at the same time increasing antagonism towards and bias against those perceived as outgroup. Despite numerous studies in humans, monkeys, and dogs, there are very few studies on the effects of oxytocin in non-human great ape species. Here, we non-invasively administered intranasal oxytocin to 6 chimpanzees and 5 bonobos using a nebulized mist which the apes breathed while drinking juice. As a preliminary experiment, following administration of either oxytocin or saline placebo, chimpanzees were shown images of both ingroup and outgroup faces of all age/sex classes while their gaze was recorded with an eye tracker. We compared time looking at the eyes and mouth, in which there are existing species differences and demonstrated effects of oxytocin on human and monkey eye contact. To our knowledge this is the first study to combine oxytocin administration and eye-tracking in a non-human great ape species. Surprisingly, we found that oxytocin had opposite effects in bonobos and chimpanzees, enlarging existing species difference. Bonobos increased eye contact compared to mouth in oxytocin compared to saline condition, whereas chimpanzees looked more at mouth compared to eyes in oxytocin compared to saline condition. Interpretations and implications are briefly discussed.

Does plant intake promote hair evacuation in captive snow leopards?

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Snow leopard (*Panthera uncia*) is carnivorous big cat living in high mountains of Central Asia. Interestingly, plant materials are reported to be frequently contained in snow leopards' scat in the wild. There are also some reports about plant materials in scat of other felids. However, the reason why strict carnivores eat plants is still unclear. Some studies indicate that fermented products of dietary fibers have beneficial effects on gastrointestinal health or metabolism. Recently, plant derived fibers get to be included in commercially prepared feline foods expecting desirable effects on food intake, satiety, reducing calorie density, or evacuation of hair balls. Especially, in domestic cats, plant intake is believed to promote hair evacuation and edible grasses for cats are commercially available. Nevertheless, no scientific study exists which indicates the positive effect of plant intake on hair evacuation.

In this study, we focused on the relationship between plant and hair contained in scat of captive snow leopards. If plant intake promotes hair evacuation, the amount of hair and plant will have positive correlation. Total 56 scat are collected from 3 individuals (2 females and 1 male). One collection period was 10 days or 14 days, and scat were collected on a daily basis. Scat were freeze-dried and washed in tap water with 1 mm mesh to pick out plant materials, hair and other undigested matters.

Contrary to our expectation, there was no positive correlation in between hair and plant amounts contained in the same scat. This indicates that plant materials don't promote hair evacuation by catching hair. On the other hand, more hair tended to be included in the scat evacuated after plants were excreted, though it wasn't statistically significant. Although the internal movement of hair or plant was unclear, it might be possible that plant materials stimulated bowels and promoted evacuation of hair balls in their stomach. Further verification will be conducted by increasing the number of samples to reveal the relationship between plant intake and hair evacuation.

Characterization of bitter taste sensitivity of four species of Sulawesi macaques

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Sulawesi macaques have diverged into 7 species within a relatively short period and live allopatrically on Sulawesi Island, Indonesia. Thus, it will be interesting to study functional genes which might reveal species difference. Bitter taste plays a role in avoiding ingestion of toxins and resisting bacteria and parasites. We investigated a well-studied bitter taste gene, *TAS2R38*, receptor for the bitter glucosinolates in brassica vegetables and Phenylthiocarbamide (PTC). We studied PTC sensitivity and TAS2R38 polymorphism in *M. hecki* (N: 16), *M. tonkeana* (N: 12), *M. nigrescens* (N: 11) and *M. nigra* (N: 15). Initially, we found behavior response on PTC varies between four species. All individuals of *M. hecki* are sensitive to PTC while some individuals of *M. tonkeana, M. nigra* and *M. nigrescens* are low sensitive. Determining *TAS2R38* sequence, we found low sensitivity of PTC was mediated by specific TAS2R38 variants. In *M. tonkeana,* substitution on amino acid sites 117, 130 and 134 led to 'low sensitivity', whereas, in *M. nigrescens* and *M. nigra*, two base deletion and one base insertion respectively caused premature stop codon at site 85 and 178. Furthermore, we found these specific variations have independently arisen three times. Later we conducted cell-based functional analysis. We confirmed that the specific variants accurately predicted low PTC sensitivity in vitro. Interestingly, 'low sensitive' variants in *M. tonkeana* can express apparently intact TAS2R38 receptor, with low response to PTC. The intact 'low sensitive' variants may respond to other bitter compounds. Additionally, the frequency of low-sensitive variants is 0.08, 0.33 and 0.54 in *M. nigrescens, M. nigra and M. tonkeana,* separately. We suggested high frequency of 'low sensitive' variants in *M. tonkeana* appeared in the root of divergence of Sulawesi macaques. Our findings revealed species difference on bitter taste; however, whether these differences were resulted from local adaptation need to be studied.

Relationships between diet and trails of forest elephant in and around Moukalaba-Doudou National Park, Gabon

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Forest elephants (*Loxodonta cyclotis*) create trails, some of which are large and well maintained. It has been proposed that these large long trails connect fruit trees and/or forest clearings which called “bais”. However, few studies have focused on the dynamics of elephant paths in small scale. Thus, the objective of this study is to clarify the relationships between elephant trail density or width and elephant diet in small scale. I conducted trail survey from August to October 2017 and fecal analysis from September 2018 to February 2019 in and around Moukalaba-Doudou National Park, Gabon. Fifty-five quadrats (100 m x 100 m) were established to quantify elephant trails, and all the trails in the quadrats were followed and located using GPS. Path width was measured at 20 m intervals. During this period, location of elephant signs such as feces, food marks, footprints was recorded. I used the trail data with the elephant signs to analysis. I found 138 fresh intact piles of forest elephant feces. One bolus from each fecal pile was brought back to the research station to analyze feeding contents. From dung analysis, 26 fruit species were identified. And 46 tree species are debarked by elephants. The density of elephant trails was lower in savanna than in secondary and riverine forest. Trail density has relations with the number of the trees of which elephants feed fruit and/or bark. On the other hand, trail width has a positive relation with the number of the trees of which elephants feed not bark but fruit. These results suggest that elephant trails might be widen mainly in fruit season but non fruit trees also have an important role in dynamics of elephant trails.

Does the tooth shape of macaque provide taxonomic character?

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Macaque has the widest distribution among the extant non-human primates. Although macaque fossils have been abundantly reported from the Pleistocene sediments in East and Southeast Asia, most of the specimens consist of isolated teeth and/or fragmentary jaws. Therefore, their chronological change of the past distribution remains obscure, because of the difficulty of identification of isolated teeth. To identify such isolated teeth, we did Geometric Morphometric approach to explore the taxonomic character in extant macaque species and predict the taxonomic affinity of 28 isolated teeth fossils from 14 Pleistocene cave sites in Chongzuo, Guangxi Zhuang Autonomous Region, China. Occlusal crown surfaces of lower third molar (M3) was chosen because M3 shape is easily differentiated from and less worn than other teeth. We set 12 landmarks on M3 using a 3D laser scanner. Then, we conduct a discriminant analysis on the obtained 3D configurations of the landmarks. Results show there are species-group differences in Asian macaque. Among three species groups of macaques, *fascicularis* group showed relatively marginally positioned, lower cusps than other two, sinica and *silenus* groups. All Chongzuo specimens fall within the range of extant Asian macaque, suggesting that they belong to extant three species groups. Three species groups of macaques were sympatrically distributed in Chongzuo area since the early Pleistocene.

Group Size Estimation of Finless porpoises by Aerial Videos

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Neophocaena asiaeorientalis sunameri is distributed throughout the shallow (usually <50 m deep) coastal waters of Japan. Group size has been known as 1.92 individuals in the previous researches, while > 100 individuals show occasional aggregations. Finless porpoise is one of cetaceans with no dorsal fin, which reduces their visibility for surface observations. A recent study revealed that a bird-eye's observation technique using a drone may generate new considerations on finless porpoise behavior and sociality, while a drone flight last mostly < 20 minutes. So, we focused on observing them by taking aerial videos at the high bridge for estimating the group size through observation directly. At the Misumi West Port, Ariake Sound, Japan, settled finless porpoises are well known among the local people. We conducted a preliminary study for collecting a day-long behavioral data at Misumi West Port by put the video camera to a bridge at 42 m high.

Chimpanzees can detect strangeness in bodies: an eye-tracking study

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Humans have knowledge about how body parts look like and how they are aligned in bodies, which is important for us to compose the human figure, discriminate humans from other species, and to discriminate individuals within humans. However, it is not clear whether other animals have this ability or not. In this study, we tested whether they can detect strangeness in body images or not in seven chimpanzees to understand their body knowledge. We showed them pictures of chimpanzee bodies using an eye tracker. There were four types of manipulations for each body part, arm or leg. The first were normal bodies without any manipulations. The area of interest (AOI) was the arm or the leg. In the second type, we misplaced either one arm or one leg to another position in the body. The AOI in this condition was the arm or leg misplaced. In the third type, we replaced either one arm or one leg with a leg or an arm, respectively. The AOI in this condition was the body part replacing the original arm or leg. In the fourth type, we replaced either one arm or one leg with a human arm or a human leg, respectively. The AOI here was the human body part replacing the original arm or leg. For arm manipulations and leg manipulations respectively, we compared the time to first fixation and fixation duration in the AOIs across the four types of manipulation. In the preliminary analyses, we found that chimpanzees had the longest fixation duration to the human arms replacing chimpanzee arms, and shorter fixation duration to the legs replacing the original arms, shorter fixation duration to the misplaced arms than the previous one, and the shortest fixation duration to the arms in their original places and forms. They also showed a tendency to have longer fixation duration to the human legs replacing chimpanzee legs than the chimpanzee legs in their original forms. The results show that the chimpanzees paid more attention to the body parts with strange positions or looks in the body stimuli. It suggests that they have the knowledge of the arrangement and appearance of body parts, as humans do.

Boundaries between humans and captive chimpanzees: two cases of intensive care in Japan

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We describe two cases of intensive chimpanzee care at the Primate Research Institute, Kyoto University. Both cases presented poor prognosis that could lead to euthanasia. Not quite so in Japan. Reo was 24-year-old when he suffered of acute tetraparesis from inflammation around the C1 and C2 level. He developed decubitus ulcers and the body weight dropped from 57 kg to 35 kg in two months, despite being under constant intensive care. For 41 months, along with conventional medical protocol, daily session of physiotherapy and touch-screen cognitive tasks to motivate walking were part of his rehabilitation. His locomotion considerably improved: From immobilization to being able to reposition himself (8th month), then, to being able to lift himself up using ropes and bars, Reo could be in upright posture most of the time during the day. Secondly, Puchi, a previously healthy 51-year-old female chimpanzee was found unconscious and hypothermic in her facility. Her condition evolved to cardiopulmonary arrest. CPR was performed and she was kept under respiratory assistance for two days. Her prognosis was very poor once reflexes were absent and bispectral monitoring showed low brain activity. KUPRI followed the human policy for brain death, requiring repeated neurological confirmations before any further measure. After diagnosis of brain death, Puchi was anesthetized and ventilator was disconnected. Post-mortem exams showed she suffered a severe subarachnoid hemorrhage. In general, euthanasia can be an option on such cases due to poor prognosis, financial and personnel cost. However, Japanese are more reluctant towards euthanasia compared to westerners. Likewise, in Western societies, cruelty is associated with unnecessary suffering. In Japan, however, Buddhist-Shintoist traditions directly relate cruelty to killing and have been suggested to partially explain this phenomenon. Furthermore, in KUPRI, strong bonds are created between staff and chimpanzees and our evolutionary proximity is also emphasized. These beliefs fostered symbolic and practical innovations in care and rehabilitation that may serve as guide for the treatment of physical impairments in captive great apes.

Perception of object texture in chimpanzees and humans: A research plan

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Animals including humans live surrounded by a lot of objects. The surface of them includes various kinds of texture information, for example, glossiness, transparency, roughness, etc. They are indispensable for us to judge the quality of the objects and make a behavioral decision. In my graduation study, I examined how humans constantly perceive and memorize the texture of objects against the changes of illumination using CG images of plastic, glass, and metal objects under different illuminations. The results indicated that the perception and memory of texture were robust against illumination changes, but the degrees of constancy of texture were different between materials.

Non-human primates are also reported to use texture information for various kinds of decision making. They may select high quality foods or comfortable places by perceiving the texture information of objects from their surfaces. For chimpanzees, one of the important textures is water surface. Although water is indispensable for their life and they drink it every day, they always avoid being wet. Studying how they perceive water surface helps to understand how they perceive their ecological environments. To figure out it, two kinds of experiments are being proposed. One is whether they can correctly perceive the transparency of water under the different illuminations. The other is how they discriminate between wet and dry objects. We are planning to use touch panel and eye tracker to study them.

Does size matter? Examining the possible mechanisms and adaptive significance of single and multi-male groups in horse societies

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Horse groups with single and multiple stallions occur simultaneously throughout the world in different feral horses' populations. However, little is known on why such groups with more than one male exist, considering that stallions naturally fight to monopolize the females. Body size is often an important determinant of male fighting ability and reproductive success, thus it's possible that males in single-stallion groups are larger than males in multi-stallion or bachelor groups, making them better competitors or more dominant. We observed feral horses, more specifically the Garrano horses that live in Northern Portugal, and examined the relationship between body size, sex, group composition (single-stallion, multi-stallion or bachelor group) and number of females in the group, by measuring individual body length and height with a non-invasive laser distance meter. Preliminary results showed no significant differences in body length and height for all parameters assessed, suggesting that other factors may be more important to explain the existence of single and multi-stallion groups in horse societies. We tested the accuracy of remote body size measurements in the field, through comparison with known body size of domestic individuals, and found no statistical differences from the use of tape measures. Thus, we may assume the values obtained are reliable and stallions of single-male and multi-male groups don't differ in body length and height.

Social influences on allogrooming behavior in wild bonobos at Wamba, DRC

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In many species of nonhuman primates, social grooming is the most prominent social behavior, occupying up to 20% of the daily time budget. The amount of social grooming given and received, as well as the body site preferences can be related to social variables such as dominance rank, sex, kinship or age. Bonobos (*Pan paniscus*) are interesting models to study social grooming. Indeed, showing a male philopatry, the non-related females are unexpectedly highly gregarious and often form coalitions with one another. Moreover, in addition to be characterized as a tolerant species, wild bonobos regularly range and interact peacefully with neighboring groups, but their grooming interactions have not yet been studied. This study aimed to investigate the influence of six social parameters (sex, rank, grooming frequency, age, kinship, and group composition of the dyad) on the social grooming patterns of wild bonobos. Subjects were two groups of wild bonobos living in Wamba, DR Congo. PE group was composed of 27 individuals (immatures and matures) and PW group of 13 individuals (only matures). Grooming patterns were recorded from video clips. We found that sex, dominance rank, age and kinship influenced social grooming, whereas grooming frequency and group composition of the dyad did not. Male, submissive, and mature individuals significantly groomed female, dominant, and immature ones more than the reverse. Grooming sessions were longer when dyads were composed of mature individuals, of at least one male or when composed of related individuals. Finally, we found that body site preferences were influenced by dominance rank, age, and kinship. Low-ranking, immature, and non-related individuals groomed the head more than higher-ranking, mature and related ones, whereas the latter groomed the back more. Our study showed that social grooming in wild bonobos is influenced by several social variables, illustrating both the social and hygienic functions of social grooming.

Do chimpanzees' sleep patterns change with age? Looking back a decade

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Primates, like many other animals, spend around half of their lifetime sleeping, yet this behavior is rarely studied. In natural habitats it might be difficult or impossible to directly observe nocturnal activities, but in captivity the opportunity exists to record, study and thus better understand individual and/or group sleeping behavior and patterns. Human sleep patterns have been shown to change with increasing age, with sleep quality diminishing, and whether this also occurs in our close primate relatives is understandably unknown. Morimura et al. (2012) published one of the few studies describing captive chimpanzee sleep patterns non-invasively, utilizing video recorded from around 11 years ago at Kumamoto Sanctuary. We are replicating this study, which requires analyzing 72 13-hour night recordings made over the past year of 12 of the same individuals to investigate whether or not their sleep patterns change with age. I will present the most current results of our project.

Preliminary behavioral survey of bonobos in Mbali, savanna-forest mosaic environment

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Bonobos (*Pan paniscus*) are one of the only two living species closest to our last common ancestor. However, comprehensive study is largely lacking compared to chimpanzees (*Pan troglodytes*), and they are threatened with extinction due to several factors such as poaching and political instability of the only habit, Democratic Republic of Congo. Most of the past studies on bonobos have been conducted in rich tropical rainforests such as Wamba and LuiKotale. Uniquely, Mbali Malebo is a new field site pioneered by Kyoto University researchers which consists of savanna-forest environment, where no behavioral research has been conducted on bonobos yet. Studies in such environment may provide interesting insights to human evolution because this environment is thought to be the key for some major human evolution topics such as bipedalism. In here, preliminary report of the very first visit will be reported with some possible future research plans. Attempts for drone flights in Lola ya Bonobo, the bonobo sanctuary in DRC close to Kinshasa, as well as Mbali Malebo will be introduced with visual aid. Other basic information such as visibility, distance to bonobos and number of individuals will be discussed.

Great apes' understanding of biomechanically possible and impossible body movements

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For social living animals, understanding other individuals' behaviors is important to acquire information on physical and social environments. Behaviors are exerted under the biomechanical constraints. Understanding of the biomechanical rule is necessary to assess the efficiency of others' behaviors and to infer the intention behind the behaviors. Morita et al. (2012) conducted an eye-tracking study, in which human adults and infants were presented with the 3-D animation clips depicting an agent (human or robot) bending their elbows either in a biomechanically-possible or -impossible way. Both of the adult and infant participants looked at the elbow areas longer when they moved in a biomechanically-impossible way, indicating their fundamental understanding of the biomechanical rule. Additionally, adult participants exhibited increased pupil diameters in response to the impossible arm movement, suggesting their affective reactions to it. Following this previous study, I sought to examine whether chimpanzees (*Pan troglodytes*) and bonobos (*Pan paniscus*) distinguish biomechanically possible and impossible body movements, both behaviorally and physiologically. I presented the participants with the stimuli used in the previous study with slight modifications for apes. In addition, an ape model stimulus created for the current study was also presented. For the looking behaviors, they discriminated the human model's movement according to the biomechanical rule, but failed to do so for robot and ape models. This suggests that they do understand the violation of biomechanical rules. The ape model itself may have appeared uncanny for the participant, which made the impossible body movement less salient. With regard to the pupillometry, although the results seemed inconsistent with the previous study, it was difficult to draw firm conclusions because apes did not fixate on the monitor continuously, as is often the case with such experiments. Thus, their pupil diameters may have been largely affected by artifacts (e.g., the local luminance of the stimulus, or surrounding environments). Further studies are necessary to establish experimental protocols for the appropriate use of pupillometry as an indicator of emotions.

Preliminary DNA analysis using non-invasive samples from captive snow leopards in Japan's zoos

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The snow leopard (*Panthera uncia*) is an endangered and elusive apex predator inhabiting in vast high-altitude areas across Asia. Due to its limited population and ecological traits, non-invasive samples are widely applied in the snow leopard studies. Captive population is both valuable stock resource and nearby study material for the conservation of snow leopards. Here we conducted preliminary studies of 1. the genetic diversity of the captive population of snow leopards living in Japan's zoos, and 2. the epigenetic estimation of age with the use of fecal samples.

About the genetic diversity of the captive population, we genotyped 8 microsatellite markers of captive individuals in Japan's zoos and compared the result with the genetic diversity level of wild groups where founders were from.

Age is an essential information which is related with reproductive potential and is necessary for the estimation of the spatiotemporal change of population structure. Yet, it is difficult to assess age in elusive snow leopards and current methods for estimating snow leopards' age cannot be applied to all age stages. Age estimation based on age-induced epigenetic changes in DNA methylation has been studied on human beings, mice, dogs and several wild animal species. Here, we referred to the candidate marker genes of dogs and redesigned species-specific viably age-associated primers of snow leopards with the use of fecal samples of captive individuals in Japan's zoos.

A bonobo at Wamba captured a duiker, but did not eat it – implication for their "prey image".

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Bonobos hunt and consume the meat of medium-sized terrestrial mammals such as other primates (e.g. *Galago demidovii*), forest antelopes, squirrels, and rodents in wild conditions. However, at Wamba, Luo Scientific Reserve, hunting and meat eating by bonobos was relatively infrequent compared to other study sites, and bonobo have never been observed to hunt other mammals except for flying squirrels.

In addition, interspecific interactions between bonobos and other species have been reported at Wamba. For example, grooming behaviors between bonobos and red colobus monkeys (*Colobus badius*) have been reported, as well as a case study of bonobos carrying a dead red-tailed monkey (*Cercopithecus ascanius*) for over a month-long period. A case report at Lilungu, indicated that bonobos were interested in a captured monkey but handled the monkey in a manner that can be described as a play toy.

Here I report a new case of an adult female bonobo capturing a blue duiker (*Cephalophus monticola*) and carrying the duiker deer for approximately 30 minutes at Wamba. During the observations, the captured duiker deer continued to shrieks and was not eaten by bonobos. Five adult females, one adult male, two adolescent females, and one adolescent male bonobos were following such adult female who was carrying the duiker deer, but she seemed to escape from them. Unfortunately, we lost her for approximately two hours. When we found her again, she did not have the duiker deer.

My observations indicate that the female bonobo manipulated the duiker deer in a manner that can perhaps be described as play. Moreover, this reported case will help us to interpret differences and similarities of "prey image" among bonobo research sites.

Genetic diversity of the Japanese golden eagle at microsatellite and major histocompatibility complex loci

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The endangered Japanese golden eagle (*Aquila chrysaetos japonica*) has a shrinking population, with around 500 individuals in the wild. This decline is thought to be due to habitat loss and poor forestry practices. Surveying the genetic diversity of small populations is crucial for the conservation of this subspecies – low genetic diversity leads to inbreeding depression and its consequences (e.g. genetic abnormalities, higher risk of disease, reduced adaptability to changing environments). Previous studies of the Japanese golden eagle have found that genetic diversity measured at 16 neutral microsatellite markers is well maintained in both wild and captive populations. However, seven of these markers deviated from Hardy-Weinberg equilibrium (HWE), some loci were not highly polymorphic, and others experienced problems in PCR amplification. To improve the current panel of markers, we developed another 20 microsatellite markers. The new markers were more polymorphic and will serve as a valuable addition to the marker panel. Preliminary results from these new makers agreed with past studies – moderate levels of heterozygosity and low levels of inbreeding was observed in both wild (observed heterozygosity $Ho = 0.467$, inbreeding coefficient $F = -0.002$) and captive ($Ho = 0.463$, $F = 0.024$) populations. We chose the best markers out of the new and 16 preexisting markers, based on PCR success, HWE *p*-values, and ease of scoring, to analyze more samples. In addition to neutral loci, we expanded the survey of genetic diversity to functional genes as well. Currently, we are studying the major histocompatibility complex (MHC) class II *DRB* gene. This gene encodes for a constituent of the MHC class II protein, which presents antigens to initiate the immune response. Studies across vertebrate taxa show that this gene is responsible for immunological fitness as well as mate choice, so this is a relevant gene to be studying in an endangered species. Combining sequences available from online databases with bioinformatic data obtained from whole genome sequences of the Japanese and Scottish golden eagles, we found 39 single nucleotide polymorphisms (SNPs) in exon 2 of the target gene. In the future, we wish to apply next generation sequencing techniques to sequence more individuals of the Japanese golden eagle and survey the genetic diversity at this locus.

Investigating Olfactory Receptors in Hystricomorpha, a Suborder of Rodentia:

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The genes coding for olfactory receptors were first identified in rodents. The olfactory receptor families of humans and mice have been extensively studied, but less is known about the olfactory receptors of other species. Olfactory receptors are identified based on homology, making it more difficult to identify olfactory receptors that are less similar to those already identified. However, by adapting previous methods used to identify olfactory receptors, it is possible to develop a pipeline that can identify olfactory receptors in the genomes of similar species.

The phylogeny of rodents is controversial, but most classification schemes include *hystricomorpha* as a major clade. *Hystricomorph*s have a distinct jaw structure that distinguishes them from other rodents. Well known species include the porcupine, naked mole-rat, and capybara, as well as domesticated species like guinea pigs and chinchillas. Following in the latter's footsteps is the grasscutter, a large sub-Saharan rodent currently undergoing domestication. The recent release of several *hystricomorph* genome assemblies has made it possible to compare species in this clade at the genomic level. This presentation will look at the development of a pipeline to identify *hystricomorph* olfactory receptor genes and include some preliminary results.

Auditory enrichment in two primate species kept in the Maia Zoo: Common marmoset (*Callithrix jacchus*) and Green monkey (*Chlorocebus sabaeus*)

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In captivity, primates are usually deprived from important stimuli typically found in the wild. A way to provide a more stimulating and complex environment is through auditory enrichment. This has been a topic of interest due to the positive effects that music has on humans and some other animal species. The aim of this study is to explore the effect that music has in two primate species, *Callithrix jacchus* (N= 5) e *Chlorocebus sabaeus* (N=7), living in the Maia Zoo, Northern Portugal. Each individual under study was exposed to two stimuli (classic music and rainforest sounds), and to control sessions in which none of the stimulus was played. Focal sampling and continuous observation were used in 20 minutes sessions, in which affiliative and agnostic behaviours were registered. The obtained results revealed no evidences of any significant effect of music in the frequency of agnostic and affiliative behaviours in either species tested. However, some physiological effects, might have occurred has a response to the sound, and further studies should investigate that.

Effects of substrate change in bar-hanging behavior in the Takahama group at the Primate Research Institute, Kyoto University

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At the Primate Research Institute, one group of Japanese macaques housed in an outdoor enclosure, the Takahama group, engages in a unique behavior that we have termed "bar-hanging" which we have studied for some time now. This behavior is observed in all age-sex categories, it has increased over the years, leading us to propose that it is a socially transmitted, cultural behavior. Bar-hanging is observed the most when weather conditions are mild and external stressors are at a minimum. During the summer of 2019, we added different substrates (bamboo and plastic) to the enclosure in the locations on bars where they exhibited this behavior the most. We present our preliminary findings on the impact that substrate change had on this cultural behavior.

Investigation of Social Structure and The Function of Acoustic Communication to Maintain Social Relationship in Free-ranging Horses (*Equus caballus*)

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Horse (*Equus Caballus*) is thought to be social animal. Feral individuals make long-lasting harem groups. Also, throughout the long time after domesticated, horses have developed unique relationship with human. Nowadays, they are kept in human society mostly as a working animal such as riding horse or race horse. However, for those animals it is difficult to build proper social relationship with conspecifics because they spend much more time with human or by themselves (for example: in their stall). In this study, we aimed to reveal the social relationship among free-ranging individuals discuss the difference of social structure between free-ranging horses and feral horses. We set up 1) food sharing experiment and 2) vocal analysis. Thirty-five individuals separated in three groups (the numbers of individuals are; Group A: 11, Group B: 12, Group C: 12) were used for those two experiment/observation. For 1), we made 20m circle in horse grazing field where horses usually being kept, piled up hay at (the number of individuals in the group + two) points. We observed their aggression (aggressive behavior such as swinging their head, laying down their ears and approaching toward other individual), and food sharing (eating hay at the same point). In total 476 times of aggressions and 227 times of food sharing were observed. To investigate their social structure, we calculated their dominance order by using Average Dominance Index from aggression behavior, and closeness and centrality by using social network analysis (degree centrality) from food sharing behavior. For 2) we attached small microphones on each individual of horse groups and recorded horses' vocalizations throughout the day. In the result, we did not find strong relationship between the dominance order and the centrality. This indicates the different result from feral horses', which is reported in previous studies.

Coordination of trunk motion during bipedal walking in the frontal plane: a comparison between human, white-handed gibbon and Japanese macaque

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In human walking, the pelvis lists toward swing side during support phase, while the thorax lists toward stance side. Thus, the pelvis and thorax rotate oppositely to each other in the frontal plane. In chimpanzee's bipedal walking, however, the pelvis lists toward stance side during support phase on the contrary to human (O'Neill et al., 2015). Furthermore, since the thorax also lists toward stance side, the oscillation of body mass is larger than human (Thompson et al., 2018). However, except chimpanzees, there have been few reports about trunk movements during bipedal walking in non-human primates, and it is unclear whether human-like coordination between pelvis and thorax is unique strategy to humans or not. Here, we collected three-dimensional kinematic data in a white-handed gibbon and five Japanese macaques to investigate the frontal plane trunk kinematics during bipedal walking. Our results showed that both of two species listed their pelvis and thorax toward stance side as well as the chimpanzees, suggesting that the trunk movement pattern in human is unique among primates. Although overall trunk movement seems similar in the three non-human primates, the relative motions between the pelvis and thorax were different; chimpanzees list their thorax over the pelvis, while our gibbon and macaque subjects list their thorax back towards the midline. In other words, their thorax rotated oppositely relative to the pelvis during support phase. The observed difference may be related to narrower step width and smaller abduction of the thigh in the gibbon and macaques, rather than to differences in their entire trunk morphology.

Antagonistic interactions and spatial relationships between immigrant and resident females in Wamba bonobos

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In group-living animals, transfer from a familiar social unit to another unfamiliar social unit is one of the milestones of life history. Responses of resident conspecifics toward newcomers may vary among species depending on whether the social and ecological costs of intragroup competition outweigh the benefits of grouping. Intensive aggression of resident females against newly immigrant females has been reported in some primate species with female transfer, including chimpanzees (*Pan troglodytes*). On the other hand, female bonobos (*Pan paniscus*) exhibit high levels of social tolerance outside kinship, and female immigration into unfamiliar groups is likely a relatively mild and smooth process. This study examined how group tenure of female bonobos are reflected in spatial relationships and antagonistic interactions networked among them, in order to test an alternative hypothesis that resident females are hostile toward newly immigrant females. In our observations, female bonobos with a relatively short tenure received female aggression more frequently than those with longer tenure. However, we found that antagonistic interactions occurred more frequently between pairs with a shorter interval of group tenure. In addition, female bonobos with a shorter tenure were not peripheral in spatial relationships. This study suggests that resident females with a longer tenure may be tolerant with young immigrant females. Our findings imply that female bonobo immigration might provide possible benefits (e.g., intensified protection against predators, strengthened cooperative defense against male aggression, and enhanced reproductive rates for sons) outweighing the costs of food competition. Further research on generational relationships may be the key to a better understanding of the variety of social systems among primates.

mtDNA and microsatellite analyses of the Ryukyu flying fox

Yuto Taki[1*], Christian E. Vincenot[2], Yu Sato[1] and Miho Inoue-Murayama[1]
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There are 122 mammal species in Japan, and 37 of them are bats. The Ryukyu flying fox (*Pteropus dasymallus*) is one of the bat species in Japan, distributed in the Ryukyu archipelago, Taiwan, and possibly the Philippines, and is divided into 5 subspecies. They mainly eat fruits, nectar, and sometimes leaves, and has an important role in pollination and seed dispersal. Although they are listed as VU (vulnerable) in IUCN Red List, few genetic analyses have been conducted for their conservation. The purpose of this study is to evaluate genetic diversity and investigate the genetic structure of the Ryukyu flying fox between islands. At first, we conducted mtDNA haplotype analysis with the samples collected in 8 islands where one of the subspecies *P. d. yaeyamae* live. We identified 39 haplotypes in 526bp of the control region of 142 samples. 14 haplotypes were shared between some islands, and haplotype network for the 8 islands did not show any clear genetic structure. However, some haplotypes were only found in particular islands, so there might be some genetic structure which could not be revealed by mtDNA analysis. Therefore, we newly developed 34 microsatellite markers and tested them with 24 tissue samples. The average of the number of alleles, observed heterozygosity, and expected heterozygosity were 6.3, 0.625, 0.679, respectively. As a result of microsatellite analyses with samples from 3 islands (Miyako, Ishigaki, and Yonaguni), we found genetic differences between islands. Each island had a different level of genetic diversity, but populations in Miyako and Ishigaki were genetically similar while Yonaguni seemed to be more isolated.

Multilevel structure in feral horse society: Evidence from aerial observation using drones

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Most of the studies on polyadic social interactions are limited to the individual level whilst the inter-group social relationships have been mostly studied through the dyadic relationships. A multilevel society is a society with nested levels of social organization and is characterized by the intense polyadic interactions among the groups; thus, it is both important and interesting to study group-level relationships in a social system. Their functions and mechanisms are still poorly understood, especially for non-primate species, because of the lack of quantitative data. In this study, we aimed to apply spatial association data to verify the presence of a modular structure in feral horse society using the drone technique. Drones have recently been used for behavioral study, but individual identifications from the aerial photos have been rarely attempted in the previous studies. We took aerial photos of a feral horse herd in Serra D'Arga, Portugal in 30-minute intervals using drones, identified all the individuals, and collected their position data. We could observe 126 over-one-year-old horses in total which were present at the observation site. Their interindividual distance distribution showed two clear peaks, suggesting the presence of small social organizations, i.e., "units." We successfully defined 23 units (21 harems and 2 all-male-units; AMUs) and several solitary bachelors using the distance data. The units' home ranges largely overlapped and their inter-unit distances were significantly smaller than the randomized data, which suggest units aggregate to form a higher-level social organization, namely a "herd." Moreover, this herd had a structure where larger harems were more likely to be in the center, while all-male-units were in the peripheral zone. These three pieces of evidence regarding the existence of units, unit aggregation, and stable positioning among units strongly indicates that there is a multilevel structure in feral horse society. Our study has successfully provided an innovative method for the quantitative evaluation of this multilevel society. It may enable further understanding of its functions through comparison with other social indices, as well as cross-species and cross-population comparisons in future studies.

What are the implications of tree cover loss for chimpanzees and humans across the greater Nimba landscape in Guinea?

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Historically, the Upper Guinean Forest stretched across west Africa, but this once contiguous, dense canopy forest is now a highly fragmented ecosystem. The Forestière region of southeastern Guinea contains some of the last remaining patches of Upper Guinean Forest in the country. Within this region, the Nimba mountains are one such remnant patch of this forest ecosystem and are habitat for a variety of endemic and threatened flora and fauna, including the Critically Endangered Western chimpanzee (*Pan troglodytes verus*). The Nimba mountains are also rich in natural resources such as iron ore and provides essential ecosystem services for a rapidly growing human population. The ability to reconcile sustainable development with biodiversity conservation requires knowledge of not only the current situation in the region, but of its history and how this landscape has changed over time. This presentation will give an overview of historic (2001 to 2018) tree cover loss across the greater Nimba landscape and its implications for both chimpanzees and humans.

Mainland versus Island Adaptation: Impacts and Consequences on Body Size and Biodiversity of Primates

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Southeast Asian primates appears to be one of the most successful mammals in the dynamic palaeoclimatic changes since at least 1 mya. Human and non-human primates reflect the complex history of wide range of ecological and geographic variation, which presents to be the source of different systematics and biogeographic models. The past combinative effects of geographic factors (latitude, bathymetric barrier, and duration of island isolation), periodic sea level changes, and the contribution of human and/or non-human primate interaction are crucial subjects in studying their north-to-south dispersal events from continental to archipelago of Sunda Shelf and the phylogeographic analysis of human and non-human primates. Cranial size and shape difference between *Homo erectus* in mainland and island displays peculiarity on the effect of insularity. Data analyses on cranial landmarks of three non-human primates genera provides more clear resolution to reconstruct the complete scenario on how insular primates dispersed and adapted to their present biogeographical distribution.

Lack of confidence? Here are new tools to assess your network uncertainty

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Graph theory, or the use of network analysis to model, describe and infer from complex biological, ecological, or evolutionary systems, has become more and more widespread. With a rich toolkit borrowed from linear Algebra, Physics and Statistics, networks can model varied systems of connected elements – individuals in the case of a social network – and provide measures from local to global scales. But only few studies focused on how (un)reliable these measures could be in animal social networks, where data collection implies many challenges and constraints, often limiting sample size. We present here two readily applicable tools to assess and even mitigate parts of the uncertainty surrounding those measures, for people that could be interested in applying (social) network analysis in their research. The first address uncertainty from stochastic sampling in general, the second automate a dynamic data aggregation that assess uncertainty from sampling through time. We showcase their use in a field study on the Japanese macaques of Kōshima. There, while individual centrality in proximity networks is correlated to higher parasite loads, we show that ultimate inferences of a study can vary if you consider or not how uncertain your data are.

プログラム紹介

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（PWS）

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（PWS）では、京都大学の基本目標である地球社会の調和ある発展に向け、現場力、世界を相手に地球社会の未来をデザインする能力、ならびに我が国の海外展開に欠かせない俯瞰力と国際性に富むリーダーを養成します。

霊長類学は日本発の、そして日本が世界を牽引する稀有な学問であり、近年、霊長類学を基盤にし、大型の絶滅危惧種を対象にした**「ワイルドライフサイエンス」**という新興の学問分野が確立されつつあります。そこで必要とされているのは、**フィールドワークを基盤として、人間のこころ・からだ・くらし・ゲノムを包括的に理解しつつ、「地球社会の調和ある共存」を目指す実践活動**です。

学問としては最先端を担っていながら、欧米にあって日本に明確に欠けているものが3つあります。**(1)生物保全の専門家として国連や国際機関・国際NGO 等で働く若手人材、(2)博物館・動物園・水族館等におけるキュレーター、および、生息地で展開する博物館動物園としての「フィールドミュージアム」構想の具現者、(3)長い歳月をかけて一国を対象としたアウトリーチ活動を担う実践者。**これら日本が抱える3つの欠陥を逆に伸びしろと考えます。研究・教育・実践の新たな展開の場と捉え、学問と実践をつなぐグローバルリーダーの育成を目指します。

プログラムの詳細はHP（http://www.wildlife-science.org/）を参照してください。

1

絶滅危惧種保全の専門家として国連や国際機関・国際NGO等で働く若手人材

目に見える国際貢献：専門性・語学力・フィールドワーク経験を持つ人材を輩出

2

博物館・動物園・水族館等のキュレーター（博士学芸員）

専門的知識・経験を発揮し、社会に貢献するキャリアパス

3

長い歳月をかけて一国を対象としたアウトリーチ活動を担う実践者

京都大学のフィールドワークの伝統と蓄積：現地目線でニーズを発信、日本の具体的貢献を提言できるリーダー

同窓運営組織を作って相互交流・連携と次世代育成を図る

国際性を身につけた実践者の育成カリキュラム

プログラム運営委員

担当教員

- ◆フィールドワーク実習
  - 国内フィールドワーク実習
  - 海外フィールドワーク実習
- ◆野外研究の基礎となる学問の習得
- ◆国際連携機関との交流
- ◆国内実験施設での研修
- ◆語学

外部評価委員会

国際連携機関

グローバル30プログラムでの実績がある英語での入試・教育・学位授与

◆理学研究科生物科学専攻の8月試験（4月入学）の通常入試　◆平成21年から実施済の春秋入学の国際入試：外国籍の者だけ受験

海外フィールドワーク拠点と連携協定の締結先

フィールド実習のための国内拠点

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を履修するには

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（PWS）は、5年一貫教育プログラムです。大学院修士1年生（M1）から履修を認められた者をL1とし、L2、L3、L4、L5と進級し、5年間で修了します。**PWSは、従来の大学院課程と並行して進むプログラムであり、履修することによって現在の所属先を変更する必要はありません。**本プログラムを履修するためには、次の条件がどちらも必須です。

1. **京都大学の大学院生であること：**
   理学研究科生物科学専攻の大学院生になる必要があります。なお、他の研究科の大学院生はお問い合わせください。
2. **本プログラムの履修を申請し認められること：**
   日本人も外国人も同じ手続きです。なお履修対象者は、その時点での修士1年生（L1生と呼びます）か、いわゆる博士課程からの編入生（L3生と呼びます）を対象にします。例年1月中旬に次年度の履修生の募集要項を公開し、3月上旬に試験を実施します。秋入学者は日程が異なります。

カリキュラム

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（PWS）

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（PWS）が、生物科学専攻・霊長類研究所・野生動物研究センターとも協同して提供するカリキュラムの内容と日程を紹介します。必修科目の実習は、理学研究科の正式科目として登録されています。なお、実施日時は変更する場合があります。詳細はhttp://www.wildlife-science.org/ja/curriculum/を参照してください。
PWSの履修やカリキュラムの内容に関する問い合わせはinfo@wildlife-science.orgまでどうぞ。

必修科目　最初の2年間で必ず履修する「修士課程相当分」

◎インターラボ

京都市動物園・生態学研究センター・原子炉実験所・瀬戸臨海実験所・霊長類研究所・日本モンキーセンターを回り、生物科学専攻における広範囲な研究領域の概略を学びます。

2019/04/06-09

◎幸島実習

日本の霊長類学の発祥の地である宮崎県幸島において、天然記念物である幸島の野生ニホンザルを観察して、糞の採集から食物となった植物を同定するなど、各自がくふうしたテーマで研究を行い、野外研究の基礎を学びます。

霊長類研究所：2019/04/21-27
野生動物研究センター：
2019/05/07-13

◎屋久島実習

世界遺産の島・屋久島で、海外の学生との研究交流も兼ねて、タンザニア、インド、マレーシアの大学院生とともに英語を公用語としたフィールドワークを行います。採取した試料は、続いて行われるゲノム実習で使用します。

前期：2019/05/25-31
後期：2019/11/16-22

◎ゲノム実習

屋久島で採取した試料を使って、実験と解析を行います（初心者コース／次世代シーケンサーを駆使した高度なコース）。屋久島実習に引き続き参加する海外の大学院生を交えて、実習の公用語は英語です。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します。得られた成果をもとに、最終日には国際シンポジウムでポスター発表（英語）を行います。

前期：2019/06/03-07
後期：2019/11/25-29

◎動物園/博物館実習

PWSの学外連携施設日本モンキーセンターにおいて、キュレーター・飼育技術員を講師としたレクチャーを受け、現場で飼育実習を行い、教育普及活動にも参加します。PWSの3つの出口のうちのひとつである「博士学芸員」の仕事について学ぶとともに、霊長類及びワイルドライフサイエンスの環境教育の実践に触れます。

前期：2019/07/17-19

◎比較認知科学実習／動物福祉実習

比較認知科学研究の基礎を学ぶために、チンパンジー（霊長類研究所＝PRI：比較認知科学実習）とボノボ（熊本サンクチュアリ＝KS：動物福祉実習）を対象とした認知実験や行動観察の手技を習得します。PRIでは、霊長類とは異なる環境に適応してきた有蹄類であるウマについてもその行動観察を行います。

PRI：2019/09/17-19
KS：2019/10/21-24

◎笹ヶ峰実習（無雪期/積雪期）

京都大学笹ヶ峰ヒュッテ（新潟県妙高市：標高1300mの高原）において、生物観察や火打山（標高2462m）登山や夜間のビバーク体験（戸外での緊急露営）を通して、フィールドワークの基礎となるサバイバル技術を学びます。

無雪期：TBD
積雪期：TBD

◎自主フィールドワーク実習

自主企画の海外研修を行うことで、履修生の自発的なプランニング能力の向上を図り、出口となる保全の専門家や、キュレーターや、アウトリーチ活動の実践者の育成につなげます。

各自で企画

2018年度実施例：

2018/06/17-09/08（L2@ウガンダ）：
チンパンジーとボノボの攻撃性と生理学的状態の比較
2018/08/31-2019/02/26（L3@ガボン）：
マルミミゾウの利用環境と採食品目のフィールド調査
2018/05/03-07/16（L3@ポルトガル）：
ポルトガルにおける半野生ウマの行動研究
2018/05/24-08/23（L4@ブラジル）：
種子食に特化した霊長類サキの未成熟個体における採食行動の発達プロセス
2018/4/11-06/16（L5@インド）：
Vocal communication in Asian elephants

学生の自主企画の集団実習も多数実施しています
- 地獄谷・高崎山実習
- キッズジャンボリー@東京フォーラム
- 小豆島実習
- 知床シャチ実習
- サンフランシスコ実習

選択科目　最後の3年間で必ずこのうちの1つを履修する「博士課程相当分」

◎保全生物学研修

国連・国際機関・NGO等での研修

◎動物福祉学研修

博物館・動物園・水族館等での研修

◎アウトリーチ活動研修

一国を対象としたアウトリーチ活動の研修

教養科目

◎ブッダ・セミナー

WWF職員・大使・知事などの多様な講師陣によるセミナーを随時開催しています。公用語は定めていません。

◎アシュラ・セミナー

英国・コンゴ・ブラジル・ブータンなどからの研究者・政府関係者を講師として、公用語が英語のセミナーを随時開催しています。

語学　「自学自習」「現地習得」を支援

- 母語以外の多言語学習を推奨します。なお、英語は必修で英語が母語のばあいは最低ひとつの他言語が必修です。その他の言語習得についても強く推奨します。

国際シンポジウム

The International Symposiums on Primatology and Wildlife Science

- 第1回：2014/03/06-09
- 第2回：2014/08/29-30
- 第3回：2015/03/05-08
- 第4回：2015/07/21-22
- 第5回：2016/03/03-06
- 第6回：2016/09/12-15
- 第7回：2017/03/02-05
- 第8回：2017/09/26-28
- 第9回：2018/03/03-05
- 第10回：2018/09/22-24
- 第11回：2019/03/01-03
- 第12回：2019/09/20-22
- 第13回：2020/02/29-03/02

Introduction to the Program

Leading Graduate Program in Primatology and Wildlife Science (PWS)

The Leading Graduate Program in Primatology and Wildlife Science (PWS) strives to realize global well-being. The program aims to foster individuals with the ability to make quick judgements about environmental issues and to design a future global society, while at the same time nurturing leaders indispensable for global action.

Japanese primatology has played a leading role in this unique academic endeavor. During recent years, the field of **"Wildlife Science"**, which targets endangered species research, has begun to emerge. **With fieldwork as its foundation, the fundamental aims of this field are a comprehensive understanding of the human mind, body, life and genome, as well as hands-on activities that target the well-being of the world.**

While on the frontlines of academic research, wildlife science in Japan lacks three important careers that already exist in the West: **(1) Conservation specialists with international organization, such as the United Nations and other NGOs; (2) Curators of museums, zoos, aquariums, and similar institutions, particularly those that can develop and/or expand museums or zoos as a "field museums" in a specific habitat;** and **(3) Dedicated individuals that invest great lengths of time in outreach activities in specific countries and societies, the so-called "boots-on-the-ground" approach.**

While providing a foundation for new research, education and hands-on experience, this program aims to nurture global leaders whose accomplishments grow hand-in-hand with the larger academic field. For further details on the program, please refer to our HP.
(http://www.wildlife-science.org/)

1

Conservation specialists of international organization(s) such as the United Nations and NGO

Significant international contributions: Produce an individual that acquires expertise, high linguistic skills, and experience in fieldwork

2

Curator (Zoo, Museum, Aquarium, and the like) (Ph.D. level curator)

A career path in specialized knowledge, demonstrating one's experiences, and contributing to society

3

Outreach workers investing a great length of time in outreach activities in a specific country and society

Expanding Kyoto University's tradition: Identifying the needs through on-site field of view; a leader who can propose significant contributions to Japan

To enhance a connection with the next generation by creating an organization that facilitates a mutual relationship

PWS Core Staff Members / Collaborators

Supervisors / Mentors

The curriculum of a practitioner that acquired "internationality"

- ◆Hands-on fieldwork
  - Domestic fieldwork
  - International fieldwork
- ◆Acquiring the skills / Knowledge that becomes the foundation for fieldwork
- ◆Relationship with International Organizations
- ◆Training at domestic facilities
- ◆Language Learning

External Evaluation Committee

International Organizations

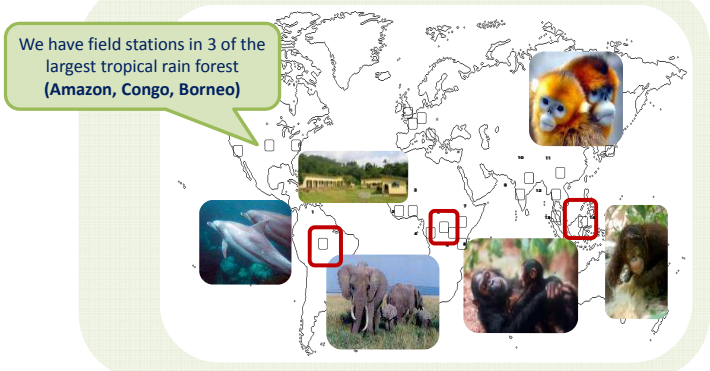
English achievements received by entrance exam, education, and degree through the "Global 30" Project

◆General admission to the Division of Biological Science, Graduate School of Science, Kyoto University (Entrance exam in August, Enrollment in April)

◆International enrollment from Spring and Fall of 2009: entrance exam for foreign students only

Facilities for International Collaborations

We have field stations in 3 of the largest tropical rain forest (Amazon, Congo, Borneo)



Domestic Facilities for Fieldwork Courses

The enrollment process of the Leading Graduate Program in Primatology and Wildlife Science

The Leading Graduate Program in Primatology and Wildlife Science (PWS) is a 5-year program. Students approved to join the PWS program from their first year of Master's program will progress from L1, L2, L3, L4, L5, and will complete the program in 5 years.
The PWS program is completed by students parallel to their existing Kyoto University master's and doctoral programs. Therefore, students do not need to change their supervisor or section/laboratory to join PWS. However, there are **two necessary** conditions for eligibility:

1. A graduate student of Kyoto University:
It is required to become a graduate student of the Division of Biological Science, Graduate School of Science (Kyoto University). However, we are in the process of adjustment for students of other graduate departments to enroll in our program, so please do not hesitate to inquire.
2. To apply and receive approval to enroll into our program:
The process is the same for both Japanese natives and foreign students. Eligible students: 1st year Master's students (will be called L1 student), or a doctoral students (will be called L3 student). Annually, we will disclose the guidelines for applicants in mid-January, and administer the entrance exam in the beginning of March. The schedule for October-enrolled students is different. (http://www.wildlife-science.org/index-en.html)

Curriculum

Leading Graduate Program in Primatology and Wildlife Science (PWS)

The following contents show the curriculum and schedule that the Leading Graduate Program in Primatology and Wildlife Science offer. Credits obtained through the mandatory courses can also be used as credit for Graduate School of Science, Kyoto University.

NOTE: Course schedules are subject to change. For more information, refer to the following site: **http://www.wildlife-science.org/en/curriculum/**

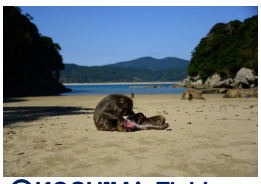
Please contact the following e-mail address for any questions about the curriculum of PWS: **info@wildlife-science.org**

MANDATORY COURSES (corresponds to Master course)

◎Interdepartmental Exchange "Inter-lab"

To obtain a general idea of the diverse areas of study in the Division of Biological Science, Kyoto University. Visit the following facilities in succession: Kyoto City Zoo, Center for Ecological Research (KU), Research Reactor Institute (KU), Seto Marine Biological Laboratory (KU), Primate Research Institute (KU), Japan Monkey Centre

Apr. 6th – 9th, 2019



◎KOSHIMA Field Science Course

To learn the basis of wildlife research. Conduct observation on wild Japanese macaques (protected species) in Koshima, the birthplace of Japanese primatology. Required to develop independent research topic (e.g., Identification of food items in feces)

PRI: Apr. 21st – 27th, 2019
WRC: May 7th – 13th, 2019

◎YAKUSHIMA Field Science Course

To learn the basis of wildlife research. Conduct fieldwork on animals/plants in Yakushima, a UNESCO World Heritage Site. English is the official language in this course to facilitate exchange of ideas with international participants, e.g. from Tanzania, India, Malaysia and elsewhere. Samples collected during the course will be used in the following Genome Science Course.

Spring: May 25th – 31st, 2019
Fall: Nov 16th – 22nd, 2019

◎Genome Science Course

Complementary to the Yakushima Field Science Course. Designed for participants who expect to engage in both laboratory work and fieldwork. Beginner (direct sequencing) and advanced (next generation sequencing) courses are available. English is the official language as in the previous course. The samples from Yakushima will be used to perform various experiments and analyses. Students give a poster presentation at the international symposium scheduled on the last day of this course.

Spring: June 3rd – 7th, 2019
Fall: Nov. 25th – 29th, 2019

◎Zoo/Museum Course

To obtain practical experience in environmental education in the field of primatology/wildlife science as well as to learn to work as a curator, one of the three exit points of the PWS program. This course provides lectures by zoo technicians and practical training as zookeepers.
Place: Japan Monkey Centre

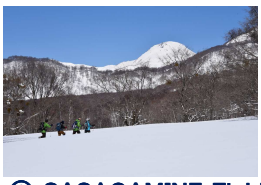
Spring: Jul. 17th – 19th, 2019

◎Comparative Cognitive Science Course / Animal Welfare Course

To learn the basis of comparative cognitive science. Understand the procedures in cognitive experimentation and behavioral observation. Work with:

- Chimpanzees & Horses (Primate Research Institute): Comparative Cognitive Science Course
- Bonobos (Kumamoto Sanctuary): Animal Welfare Course

Comparative Cognitive Course:
Sep. 17th – 19th, 2019
Animal Welfare Course:
Oct. 21st – 24th, 2019



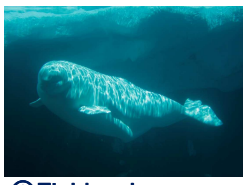
◎ SASAGAMINE Field Science Course

(Non-snow season / Snow Season)

To learn survival skills as the basis for future fieldwork. Activities include:
- Wildlife observation
- Climbing Hiuchi Mountain (2,420m)
- Night-time bivouac practicum (improvised encampment)

Place: Kyoto University Sasagamine Hütte (cabin) in Myoko-kogen (plateau at 1,300m elevation), Niigata Prefecture

Non-snow Season: TBD
Snow Season: TBD



◎Fieldwork (designed by each PWS student)

To develop skills in planning projects aimed at one or more of the three exit points (goals) of the PWS program (i.e., conservation specialization, curation, outreach). Required to design/conduct individual overseas training projects.

EXAMPLES (Academic Year 2018):

May 19th – August 27th, 2018 (L4@UGANDA):
How gorillas see the world: accessing the current impact of mountain gorilla ecotourism in Bwindi Impenetrable Park (Uganda)
May 7th – June 28th, 2018 (L4@KOREA):
Field Study in Jeju Island
April 11th - June 16th, 2018 (L5@INDIA):
Vocal communication in Asian elephants
May 19th - Dec. 29th, 2018 (L5@INDIA):
Observing the higher altitude langurs

Many group fieldworks are designed by Students.
- JIGOKUDANI/TAKASAKIYAMA
- Kids Jamboree@ TOKYO
- SHODOSHIMA
- SHIRETOKO (Killer Whale)
- San Francisco

LONG-TERM INTERNSHIP TRAININGS (corresponds to Doctoral course)

◎Conservation Biology Internship Training

UN-related organizations and NGOs

◎Animal Welfare Internship Training

Museums, Zoos and Aquariums

◎Social Outreach Internship Training

Outreach activities in specific countries and societies

LIBERAL ARTS SUBJECTS

◎Buddha Seminar

- Lectures from WWF officers, ambassadors, governors, etc.
- Official language: not specified

◎Asura International Seminar

- Lectures from researchers, government officials from the United Kingdom, Congo, Brazil, Bhutan, etc.
- Official language: English

LANGUAGE LEARNING

"Self-Study Paradigm"
"Hands-on Experience through Fieldwork"

Students are required to become proficient in at least one foreign language in addition to their native language. English is required for all students whose native language is not English. International students whose native language is English are required to master another language of their choice. Students are also strongly recommended to learn a second foreign language.

The International Symposiums on Primatology and Wildlife Science

- The 1st: Mar. 06-08, 2014
- The 2nd: Aug. 29-30, 2014
- The 3rd: Mar. 05-08, 2015
- The 4th: Jul. 21-22, 2015
- The 5th: Mar. 03-06, 2016
- The 6th: Sep. 12-15, 2016
- The 7th: Mar. 02-05, 2017
- The 8th: Sep. 26-28, 2017
- The 9th: Mar. 03-05, 2018
- The 10th: Sep. 22-24,2018
- The 11th : Mar. 01-03, 2019
- The 12th : Sep. 20-22, 2019
- The 13th: Feb. 29th – Mar. 2nd, 2020

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INUYAMA

A JOURNEY THROUGH TIME

Dance

Trivia quiz

Memories

Flashbacks

Silent auction**

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Tomiya Susumu

Alexander D. Hester

MC Raquel Costa

September 20th @ JMC*

Entrance: Free

Start: 19:00

(Doors open @ 18:30)

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*Rest area, next to the restaurant

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PWS Buddha Seminar

環境省インターンシップ報告

日時：**2019年９月22日（日）**
13:00～14:00

会場：**日本モンキーセンター**
ビジターセンター　ホール

言語：日本語（Language：JAPANESE）

－内容－

『白山レンジャー体験記！～自然と人を繋ぐ仕事～』
越智咲穂（京都大学野生動物研究センター・修士２年）

『大台ヶ原は蘇るのか』
義村弘仁（京都大学野生動物研究センター・修士１年）

『希少種保全の最前線@霞が関』
鳥井朋恵（京都大学野生動物研究センター・修士１年）



主催：京都大学　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