

REPORT FOR HOPE-GM, COMPARATIVE STUDY OF PRIMATE SOCIAL SYSTEM AND COMSERVATION

Japan Society for the Promotion of Science (JSPS)

Research Activites from November 2009 to February 2010



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Arrival to Japan (Nagoya): 27 November 2009.

Departure from Japan (Nagoya): 24 February 2010.

A) Research Activities

*The author of this report is associate professor of the College of Life Sciences, Northwest University. The general interests of the author are behavioral ecology, sociobiology and conservation of Golden snub-nosed monkey (*Rhinopithecus roxellana*), and spend more than 9 years in the field of Qinling Mountains, Central China. Research topics covers individual dispersal, social unit formation, reproductive parameters, sexual interference related female competition, sex-biased maternal investment, individual spacing within the group, and adaptation to the habitats of this species. This study was conducted under long term close cooperation with the researcher from Primate Research Institute, Kyoto University. Prof. Watanabe, Prof. Wada, Dr. Zhangpeng and Dr. Murai have the same interesting with the author on the social organization of the polygamous social system.*

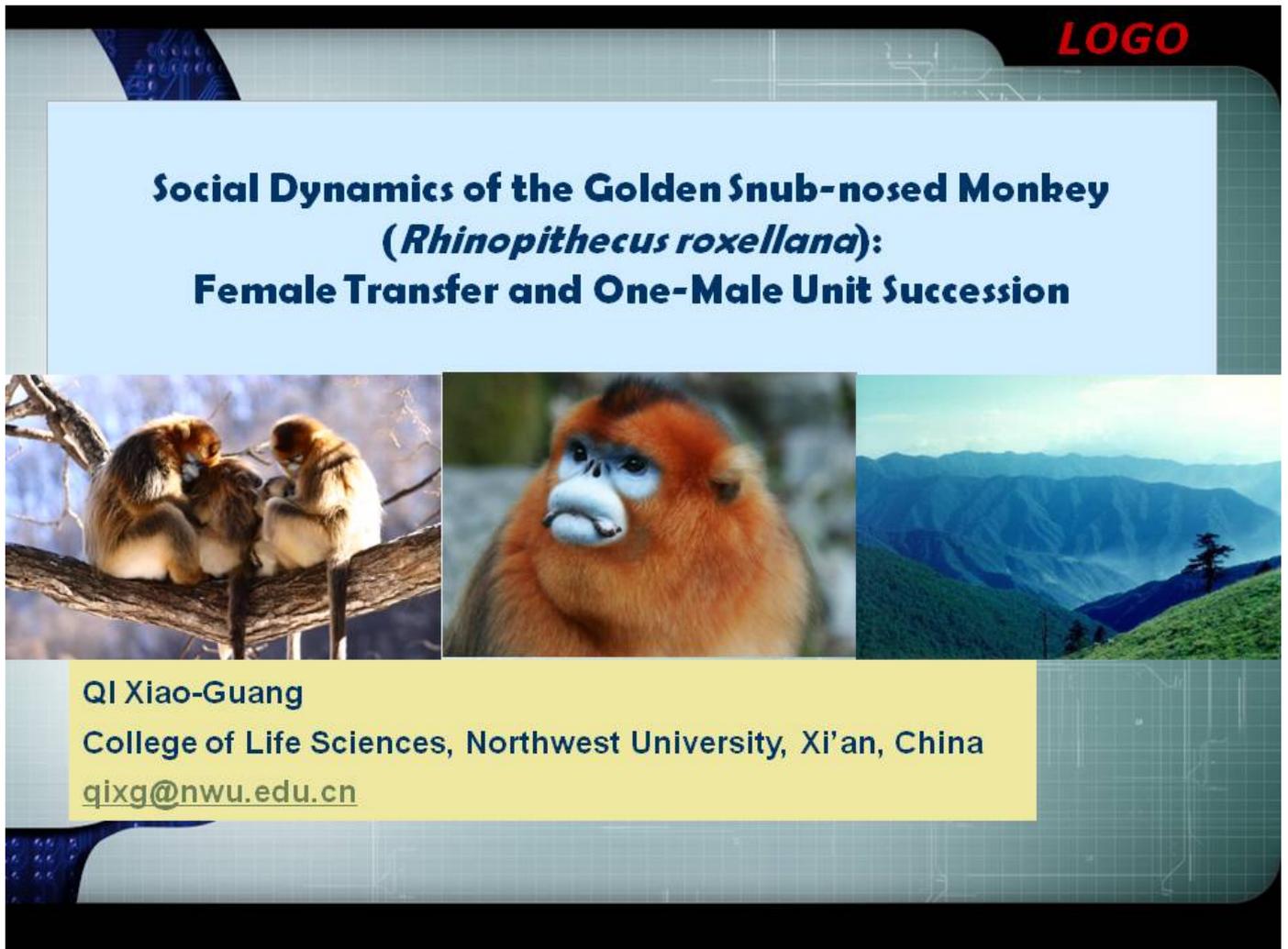
In this case, the author of this report has the opportunity to get the found of the new Japanese research project named HOPE GM. Benefit by the project, the author been invited and came to Social Systems Evolution Section, Department of Ecology and Social Behavior, Primate research institute of Kyoto University. This is exciting opportunities for Young Researchers, and aimed to promote the comparative study on primate social system, especially on multi-level societies.

Multi-level societies comprise social systems in which individual relationships are implemented at two or more levels within the community. These societies are the most complicated social structures in non-human primates. Only Hamadryas and Gelada baboons, as well as snub-nosed monkeys possess these characteristics. The fundamental social unit for all these species is the one-male unit (OMU). The basic social structure shows similarities with other colobine monkeys, however, each unit is not independent, but rather these OMUs aggregate to form troops composed of hundreds of animals. The mechanism behind the stable formation of such organizations has been widely discussed. Studies of hamadryas and gelada baboons have shown that they clearly differ in terms of individual social relationships and dynamics. Understanding the diversity of polygynous social systems within multi-level societies could greatly help us clarify the relationship between primate social evolution and environmental adaptation. To date, information regarding the social organization of snub-nosed monkeys living in multi-level societies remains insufficient to draw any strong conclusions.

Prof. Watanabe, Prof. Mori, Prof. Sugiyama from PRI are the most excellent primatologist whom studied on social system of Gelada baboon, hamadryas and Asian Colobinea. This opportunity enable author to communicated with them and compare matrilineal and non-matrilineal polygynous systems, focusing on differences in individual dispersal, patterns of residential male replacement, OMU succession, female kin-bonds, and reproductive strategies among species living in multi-level societies. Furthermore, Proboscis monkey was argued as fourth species who formed with multi-level society. Dr. Matsuda and Prof. Hanya also interested and specialized on the social affiliation of the species. Beside, Prof Furuichi, Prof. Huffman, Dr. Rizuldi, Dr. Tsuji, Dr. Sakamaki from Social Systems Evolution Section also helped me very much, which I really appreciate.

B) PRESENTATIONS AND SEMINARS

The author of this report was invited to give oral presentation during this period:



The slide features a dark blue background with a grid pattern. In the top right corner, the word "LOGO" is written in red. The main title is centered in a light blue box. Below the title are three images: two monkeys on a branch, a close-up of a monkey's face, and a mountain landscape. At the bottom, a yellow box contains the author's name and contact information.

LOGO

**Social Dynamics of the Golden Snub-nosed Monkey
(*Rhinopithecus roxellana*):
Female Transfer and One-Male Unit Succession**

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Among primates that form multilevel societies, understanding factors and mechanisms associated with the movement of individuals between groups, clans, and one-male social units offers important insight into primate reproductive and social strategies. In this research we present data based on an 8-year field study of a multilevel troop of Sichuan snub-nosed monkeys (*Rhinopithecus roxellana*) in the Qinling Mountains of China. Our study troop contained 78-126 individuals, and was usually organized into 6-8 one male units (OMU). The majority of OMUs were composed of networks of unrelated females and their offspring. We found that 59.7% (43/72) of sub-adult and adult females in our study troop transferred between OMUs (n=66) or disappeared (n=7) from the troop. In the

majority of cases, two or more females transferred together into new OMUs or troops. In *R. roxellana*, new OMUs formed in several ways. During 2001 to 2008, 16 adult males appeared in the study troop. Over this period, we observed 13 different males who became harem leaders either by taking over an existing harem or by attracting females from other OMUs into their harem. We also observed 4 OMUs from a neighboring troop to successfully immigrate into the study troop. The number of individuals in these newly immigrated OMUs was significantly smaller than that number of individuals in resident OMUs. During harem formation, fighting between adult males was rarely observed, and female mate choice appeared to play a crucial role in harem male recruitment and replacement. These results suggest that Golden snub-nosed monkeys are organized in a non-matrilineal social system. Female mate choice, and possibly incest avoidance appear to play important roles in female transfer, male tenure, and OMU stability.

C) WRITING WORK (papers, etc)

The author of this report wrote and submitted three new manuscripts during the period of the fellowship:

Xiao-Guang Qi, Ming Wang, Bao-Guo Li Kunio Watanabe. Pattern and Influencing Factors of Huddling Behavior in Golden Snub-nosed Monkey (*Rhinopithecus roxellana*) in the Qinling Mountains, China. *Acta Theriologica Sinica*. in press.

Xiao-Guang Qi, Peng Zhang, Bao-Guo Li, Kunio Watanabe. The Diversity of Polygynous System in Multi-level Society of Non-human Primates. *Acta Theriologica Sinica*. in press.

Xiao-Guang Qi, Bin Yang, Wei-Hong Ji, Bao-Guo Li, Kunio Watanabe. Sexual Interference in Golden Snub-Nosed Monkey (*Rhinopithecus roxellana*): A test of sexual competition hypotheses on polygynous species. *American Journal of Primatology*. Under Review (AJP-10-0054.).

D) Culture and Private communication

This project also let the author have the opportunity to meet many new friends and the approach to Japanese culture. Beside the mention above, they are Dr. Macintoshi, Dr. Jaman, Dr. Hashimoto, Dr. Matsubara, Dr. Go, Dr. Otani, from Department of Ecology and Social Behavior; Dr. Adachi, Dr Martin, and all the football team member. Especially, I appreciate Prof. Mastuzawa and Miss Shikuwa helped me during all around the periods.

