

Five years of the "Indochinese Primate Conservation Genetics Project"

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Summary

After a five year period of the "Indochinese Primate Conservation Genetics Project" some important results have widened the knowledge of some primate taxa and provide also background information for conservation measures. Highlighted results are: (1) Two species of silvered langurs (*Trachypithecus germaini* and *T. margarita*) are confirmed for the Indochinese bioregion. (2) The Indochinese grey langur (*T. crepusculus*) is present in Pu Long Nature Reserve. Although no specimen was observed since the 1960s, genetic analyses of fecal material collected in the Nature Reserve confirmed its occurrence there. (3) *Nomascus hainanus* represents a distinct species. The genus *Nomascus* comprises now the five species *N. nasutus*, *N. hainanus*, *N. concolor*, *N. leucogenys* and *N. gabriellae*. (4) *Nomascus siki* represents a subspecies of *N. leucogenys*. However, the exact distribution zones of *N. gabriellae*, *N. l. siki* and *N. l. leucogenys* are not clarified yet, and maybe another subspecies is present in the region. (5) The sympatry of *Pygathrix cinerea* and *P. nemaus* is confirmed for Chu Mom Ray National Park. Hybridization among them is highly likely, but not genetically confirmed yet.

Sample collection is requested for the continuation of the work.

Năm năm thực hiện chương trình "Nghiên cứu bảo tồn gen của các loài linh trưởng Đông Dương"

Tóm tắt

Sau 5 năm thực hiện chương trình "Nghiên cứu bảo tồn gen của các loài linh trưởng Đông Dương" một số kết quả quan trọng đã được phát hiện. Đặc biệt là những kiến thức mới về phân loại học và ý nghĩa của nó đối với các chương trình bảo tồn loài. Kết quả như sau: (1) Có hai loài vọc bạc gồm *Trachypithecus germaini* và *T. margarita* được khẳng định tại vùng Đông Dương. (2) Loài vọc xám Đông Dương (*T. crepusculus*) hiện diện ở khu bảo tồn thiên nhiên Pu Luông, Việt Nam. Mặc dù không có mẫu vật nào được quan sát từ những năm 1960, nhưng phân tích di truyền học dựa trên mẫu phân thu thập ngoài tự nhiên đã khẳng định sự hiện diện của chúng. (3) Loài vượn *N. hainanus* là một loài riêng biệt. Giống *Nomascus* gồm có năm loài khác nhau: *N. nasutus*, *N. hainanus*, *N. concolor*, *N. leucogenys* và *N. gabriellae*. (4) Vượn *N. siki* là một loài phụ của *N. leucogenys*. Tuy nhiên vùng phân bố của ba loài và phân loài *N. gabriellae*, *N. l. siki*, và *N. l. leucogenys* chưa rõ. Có thể tồn tại một loài phụ khác trong vùng phân bố trên. (5) Vùng phân bố trùng nhau của hai loài *Pygathrix cinerea* và *P. nemaus* được khẳng định tại Vườn Quốc gia Chu Mom Rây. Con lai của hai loài này nhiều khả năng

tồn tại nhưng chưa được kiểm chứng về thông tin di truyền.

Để chương trình được tiếp tục nhiều mẫu vật cần được thu thập thêm trong thời gian tới.

Introduction

November 2008 will mark the 5th anniversary of the "Indochinese Primate Conservation Genetics Project." The idea for such a project came up at the symposium "Conservation of Primates in Vietnam" at Cuc Phuong National Park in November 2003. The project aimed to improve exchange of information between scientists involved in primate science and conservation in the Indochinese bioregion in order to straighten conservation efforts as well as studies in different fields of biological research.

In fact, in the last five years, knowledge on several biological aspects of Indochinese primates was deepened, and the distribution of taxa was improved in many ways as such as by publishing a new journal, the *Vietnamese Journal of Primatology*. Although comprehensive collaborations with many organisations in Vietnam, Cambodia, Laos and China have existed for several years, further cooperations with e.g. Fanjingshan National Nature Reserve and the University of Beijing, Guizhou Provice, China were established.

In recent years, trans-boundary actions became increasingly important. With the exception of *Nomascus hainanus*, *Trachypithecus delacouri*, *T. poliocephalus poliocephalus*, *T. poliocephalus leucocephalus* and the four *Rhinopithecus* species, all other primate species are distributed in at least two countries. Of special conservation relevance are *Nomascus nasutus*, *T. laotum hatinhensis* and *Pygathrix cinerea*, which occur in restricted areas in trans-boundary regions of Vietnam-China, Vietnam-Laos and Vietnam-Laos-Cambodia, respectively. Accordingly, collaborations between governments and other conservation organisations are urgently required to improve conservation efforts across borders.

Results

Besides research on behaviour, socioecology and distribution conducted in the field or on captive populations, genetic studies based on non-invasively collected material provide further insights into the biology of species. Accordingly, based on the collection of different material types by various scientists and field workers of the consortium, comprehensive genetic analysis were conducted, which have led to important results. Highlighted results include:

1. Two species of silvered langurs (*Trachypithecus germaini* and *T. margarita*) are confirmed for the Indochinese bioregion (Groves, 2007; Nadler et al., 2005; Roos et al., 2007)
2. The Indochinese grey langur (*Trachypithecus crepusculus*) is present in Pu Long Nature Reserve. Although no specimen was observed since the 1960s, genetic analyses of fecal material collected in the Nature Reserve confirm its occurrence there (Nadler et al., 2004).
3. *Nomascus hainanus* represents a distinct species. The genus *Nomascus* comprises now the five species *N. nasutus*, *N. hainanus*, *N. concolor*, *N. leucogenys* and *N. gabriellae* (Roos, 2004; Roos et al., 2007).
4. *Nomascus siki* represents a subspecies of *N. leucogenys*. However, the exact distribution zones of *N. gabriellae*, *N. l. siki* and *N. l. leucogenys* are not clarified yet, and maybe another subspecies is present in the region (Roos, 2004; Roos et al., 2007).
5. The sympatry of *Pygathrix cinerea* and *P. nemaus* is confirmed for Chu Mom Ray National Park. Hybridization among them is highly likely, but not genetically confirmed yet (Roos, unpubl.).

The population genetic studies focus on gibbons, douc langurs and "limestone langurs". Using different genetic marker systems, we have established a rough distribution map of genetic haplotypes for these three primate lineages. Preliminary data provide insights into taxonomy, recent and historic dispersal events, the influence of climate zones, rivers and mountains on the distribution, and gene flow between populations.

Genetic studies revealed new information on taxonomy, evolution, dispersal mechanisms, behaviour and ecology of Indochinese primates. Accordingly, these and other data deepen our knowledge about the biology of these species, which in practise help to protect primate populations and species. For example genetic methods allow the geographic origin of confiscated primates to be traced with a relative high accuracy. Moreover, population sizes can easily be estimated and the occurrence of a species in an area can be confirmed without seeing any specimen. Accordingly, genetic analyses are useful tools to reduce wildlife trade and to improve survey work. Furthermore, basic information for establishing migration corridors between protected areas and for reintroduction or resettlement programs can be provided.

Call for contribution and cooperation

Although many issues were settled in recent years, others are still unresolved and further investigations are needed. The utility of a reference collection to identify confiscated animals depends on the amount of existing sample material. Therefore, further samples from many individuals and locations all over the distribution areas are required. I would like to thank all the field workers who provided samples in last years and encourage them to further collection of samples to expand the database. In principal, all types of material are useful. Detailed information (species, sex, location, coordinates) for all collected samples should be provided. Sample materials should be handled and preserved in the following way:

1. Hairs: pluck out the hairs, don't cut them, so that root cells are still present. Preserve hairs dried in small plastic or paper bags.
2. Dry tissue/skin (also smoked material): cut off a piece and preserve it dry in a small plastic or paper bag.
3. Fresh tissue/skin: cut off a piece and preserve it in a tube with 70-90% ethanol.
4. Fecal sample: put sample (about 1cm³) with a stick into a tube with 70-90% ethanol.

The shipment of samples, especially across the border, should be in accordance with national and international laws and regulations. For some species samples CITES permits are required. Information and support can be requested at the Endangered Primate Center at Cuc Phuong National Park, Vietnam (s.a. www.primatecenter.org).

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