

Color variation in black-shanked douc langurs (*Pygathrix nigripes*), and some behavioural observations

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Summary

Black-shanked douc langurs on Hon Heo Peninsula, Khanh Hoa Province, Vietnam show remarkable color variations. Individuals with different white extensions on the forearms and partly red coloration on the lower legs have been observed. This is a typical feature of red-shanked douc langurs (*Pygathrix nemaeus*).

Molecular genetic investigations have shown that douc langurs from Hon Heo Peninsula cluster together with other black-shanked douc langurs from southern Vietnam. Moreover, no genetic signs of red-shanked douc langurs were observed in the population, so that the Hon Heo population indeed represents black-shanked douc langurs.

Observations show that black-shanked douc langurs spend about 20% of the daily time budget on the ground, mostly on large granite blocks. These observations contradict the assumption of the entirely arboreal way of life of the species. Water consumption of doucs on the ground has been observed.

Sự đa dạng màu sắc lông ở loài chà vá chân đen (*Pygathrix nigripes*), và một số quan sát tập tính

Tóm tắt

Quần thể vọc chà vá chân đen trên bán đảo Hòn Hèo, tỉnh Khánh Hòa, Việt Nam có sự thay đổi đáng kể về màu sắc lông. Nhiều cá thể có mảng lông trắng rộng ở chi trước và một phần lông màu đỏ ở cẳng dưới của chi sau đã được quan sát. Những đặc điểm về màu sắc lông nêu trên là đặc trưng của loài chà vá chân nâu (*Pygathrix nemaeus*).

Phân tích di truyền học phân tử cho thấy quần thể vọc chà vá ở bán đảo Hòn Hèo cùng nhóm với các quần thể chà vá chân đen miền Nam, Việt Nam. Hơn nữa, không có dấu hiệu nào về mặt di truyền học của chà vá chân nâu trong quần thể này, có thể khẳng định quần thể chà vá ở Hòn Hèo là loài chà vá chân đen. Quan sát quần thể chà vá chân đen ở đây còn cho thấy 20% tổng thời gian hoạt động trong ngày động vật di chuyển dưới đất, thường là các tảng đá lớn. Kết quả trên ngược với giả định về cách sống hoàn toàn trên cây của loài này. Những hành vi động vật uống nước trên nền đất cũng đã được quan sát.

Introduction

Ongoing studies have recently been initiated on the black-shanked douc langur (*Pygathrix nigripes*), yet, compared to other Indochinese primates, the species is poorly studied. Such a dearth of knowledge about *Pygathrix nigripes* has contributed to its provisional systematic placement as a subspecies within the red-shanked douc langur *Pygathrix nemaeus* (Chaplin & Jablonski, 1998; Lippold, 1998) and its incorrect assignment of “already extinct” (Warhol & Benirschke, 1986).

The coloration of the black-shanked douc langur was initially described based on a few museum specimens and it is this description that has appeared in several publications (Jablonski, 1995; Lippold, 1998; Napier, 1985; Napier & Napier, 1997). With the intensified field work on primates in Vietnam and with the information from poached, confiscated and kept animals there is more detailed knowledge about this species which provides new insights.

Material

In May 2007 a survey was carried out on Hon Heo Peninsula, Khanh Hoa Province, south Vietnam (Ha Thang Long & Nadler, 2007) to gather an overview about a recently discovered population of black-shanked douc langurs (S. Lamarche, pers. comm.). During several additional visits to Hon Heo Peninsula douc langurs were observed with binoculars and documented with photographs and video.

Fecal samples of 16 individuals were collected and used for molecular genetic analyses.

Results

Coloration

Detailed observations of the douc langurs were made on several occasions. A maximum of 32 different individuals was observed belonging to three groups. Twelve animals were identified as having coloration that didn't match the typical “standard description” of the black-shanked douc langur body coloration: dark grey forearms, and black lower legs (Groves, 1970; Chaplin & Jablonski, 1998; Fig. 1).

Two typical features of different coloration could be recognized:

1. White coloration of varying length on the forearms. White coloration can extend from small patches, like a wristwatch, to a complete white forearm (Fig. 4-6).
2. Red coloration on the lower leg. The red can be differ from a red shine, resulted in a number off red colored hairs to dark red coloration to at least the half lower leg (Fig. 7).

Both features are typical coloration for the red-shanked douc langur (*Pygathrix nemaeus*) (Groves, 1970, Chaplin & Jablonski, 1998).

Pygathrix nigripes populations in Cambodia (B. Rawson, pers. comm.), and the Vietnamese National Parks Nam Cat Tien (G. Polet, pers. comm.; Nadler, pers. obs.) and Nui Chua (Hoang Minh



Fig. 1. A group of black-shanked douc langurs in Nui Chua National Park with typical “standard coloration”. Photo: Le Khac Quyet.

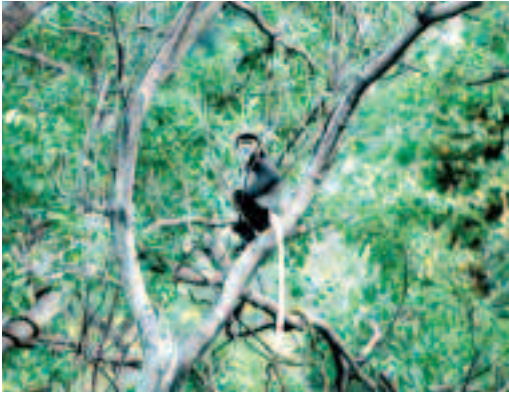


Fig. 2, 3. Black-shanked douc langur with typical "standard coloration"; Hon Heo Peninsula, Khanh Hoa Province. Photo: T. Nadler.



Fig. 4. Black-shanked douc male with small white patch on the wrist and black lower legs; Hon Heo Peninsula, Khanh Hoa Province. Photo: T. Nadler.



Fig. 5. Black-shanked douc male (middle) with more extended white patch on the wrist and black lower legs; Hon Heo Peninsula, Khanh Hoa Province. Photo: T. Nadler.



Fig. 6. Black-shanked douc male with complete white fore arms and black lower legs; Hon Heo Peninsula, Khanh Hoa Province. Photo: T. Nadler.



Fig. 7. Black-shanked douc male with complete white fore arms and dark red on lower legs; Hon Heo Peninsula, Khanh Hoa Province. Photo: T. Nadler.

Duc, pers. comm.) show the typical black-shanked coloration. Also poached animals from neighbouring Khanh Hoa Province (only 30 to 40 km from the Hon Heo Peninsula) show no different coloration (Fig. 8).

Molecular genetics

From all 16 fecal samples collected, the hypervariable region I of the mitochondrial D-loop was successfully amplified and sequenced. Based on phylogenetic tree reconstructions, all obtained sequences cluster significantly together with black-shanked douc langurs and not with red- or grey-shanked douc langurs. Haplotypes from the latter two were not observed in the population (Roos, unpubl.). Although only maternally inherited markers were analyzed, it seems highly unlikely that paternal-inherited markers would provide a different relationship, which might be explained by hybridization. However, to definitively exclude hybridization further markers should be analyzed.

Behavioural observations

Contrary to the assumption that doucs are entirely arboreal (Lippold, 1998; Napier & Napier, 1997) the black-shanked douc langurs on Hon Heo Peninsula spend about two hours per day (20% of the daily time budget) on the ground, seeming to prefer granite blocks for resting and social contact, like grooming and mating (Fig. 9-13).

One reason to move to the ground is the need to drink water. A group of douc langurs was observed drinking extensively from a water source every morning (Fig. 14-15). Little is known about the water consumption of colobines and it is often overlooked that water is an essential nutrient (Committee of Animal Nutrition, 2003). Douc langurs have a relatively high water demand (Ruempler, 1998). This high demand exists not only for animals fed compressed food or pellets under captive conditions (Lippold, 1977). Observations on doucs at the EPRC, kept in cages and



Fig. 8. Poached black-shanked douc langurs from Khanh Hoa Province. Photo: FPD.

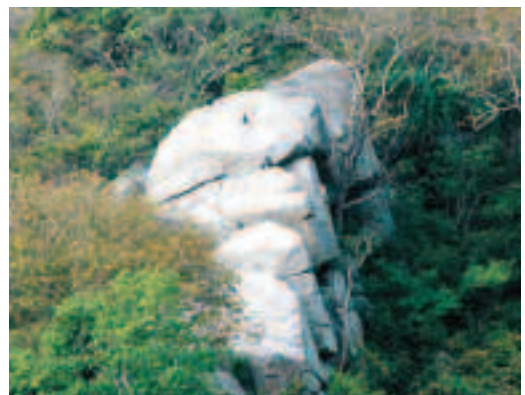


Fig. 9, 10. Black-shanked douc langurs resting on a granite block. Photo: T. Nadler.



Fig. 11, 12, 13. Female offered mating, laying down for mating, and mating. The male has a white wrist patch. Photo: T. Nadler.

on a semi-wild area, show that doucs also drink extensive water when natural food is available (Nadler, unpubl.). In the wild doucs probably also use arboreal cisterns (such as depressions at junctures of tree limbs and trunks) as has been documented for mantled howlers (*Alouatta palliata*) (Glander, 1978), but doucs often form relatively large groups and therefore arboreal water sources are likely insufficient, necessitating animals to move to the ground to use terrestrial water sources.



Fig. 14. Black-shanked douc langur group moved to a water hole on the top of a granite block. One male with an extended white patch on the wrist. Photo: T. Nadler.



Fig. 15. Black-shanked douc langurs drinking from a water hole on the top of a granite block. Photo: T. Nadler.

The reason that field investigators previously had not seen douc langurs on the ground and drinking directly from water sources (Lippold, 1977; 1998) can be attributed to unhabituated animals exercising caution in the presence of observers.

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