Unique copulatory postures in douc langurs (*Pygathrix* sp.)

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Summary

Observations on all three douc langur species, red-shanked, grey-shanked and black-shanked douc langurs (*Pygathrix nemaeus*, *P. cinerea*, *P. nigripes*) at the Endangered Primate Rescue Center, Vietnam and in the wild show a similarity in an unique copulatory posture among the Cercopithecidae. While in the most common dorsoventral copulation the male grab the calves or ankles of the standing female with his hind feet or stands with its feet on the ground in species with a larger gender difference in size. Copulation in douc langurs takes place with the female lying down and the male kneeling behind her. The copulatory postures of proboscis monkeys (*Nasalis larvatus*) correspond to the known scheme of the Cercopithecidae. Little detailed information is available for two other two genera of the odd-nosed group *Rhinopithecus* and *Simias*.

Các tư thế giao phối độc đáo ở chi Voọc chà vá (*Pygathrix* sp.)

Tóm tắt

Điểm tương đồng trong những quan sát trên cả ba loài voọc chà vá chân nâu, chân xám và chân đen (*Pygathrix nemaeus*, *P. cinerea*, *P. nigripes*) tại Trung tâm Cứu hộ Linh trưởng Nguy cấp, Việt Nam và trong tự nhiên cho thấy chi Chà vá có tư thế giao phối độc đáo so với các loài thuộc họ Cercopithecidae. Ở quá trình giao phối lưng-bụng phổ biến nhất, cá thể đực dùng bàn chân sau để tóm phần bắp chân hoặc cổ chân của cá thể cái đang đứng. Ở những loài có sự khác biệt lớn về kích cỡ giữa cá thể đực và cái, cá thể đực sẽ đứng bằng chân trên mặt đất. Còn quá trình giao phối ở các loài voọc chà vá diễn ra khi cá thể cái ở tư thế nằm và cá thể đực quỳ xuống ở đằng sau. Tư thế giao phối ở loài Khỉ mũi dài (*Nasalis larvatus*) tương đồng với mẫu chung ghi nhận được ở họ Cercopithecidae. Có rất ít thông tin chi tiết về tư thế giao phối ở hai chi *Rhinopithecus* và *Simias* thuộc nhóm khỉ mũi lạ.

Introduction

Compare to a rather considerable overview about primate mating systems (Dixon 1991; 2012; Dunbar 2000; Strier 2000; Pereira et al. 2000; Sterck & van Hooff 2000; Kappeler & van Schaik 2002; Barelli et al. 2008; Shultz et al. 2011; Opie et al. 2012; Roberts & Roberts 2015) information about copulatory postures with a detailed description are limited and focuses on a higher number on studies on apes and gibbons, including also some photo documetations (Brandes 1939: Ford & Beach 1952; Hutzelsieder 1937; Tutin 1979a; 1979b; Tutin & McGinnis 1981; Hashimoto 1997; Barelli et al. 2008; Balcombe 2011; Dixon 2012; Roberts & Roberts 2015). Detailed information about copulatory postures in Old World Monkeys (Cercopithecidae) is scare (Harms 1956; Napier & Napier 1997; Reagan 2017) and this is especially true for the genera of the odd-nosed group. Only one report (Kavanagh 1978) described in more detail the copulatory posture from captive red-shanked doucs langurs (*Pygathrix nemaeus*) in San Diego Zoo.

Material

Observations on copulatory postures on red-, grey- and black-shanked douc langurs (*Pygathrix nemaeus*, *P. cinerea* and *P. nigripes*) were made at the Endangered Primate Rescue Center (EPRC),

Vietnam and in the wild. The EPRC keeps a large captive breeding population of red-shanked douc langurs and is also the only facility which keeps a captive breeding population of the grey-shanked douc langurs. Since establishment of the EPRC in 1993, in total 110 red-shanked and 112 grey-shanked and 7 black-shanked douc langurs were kept in several breeding groups. A high number of douc langurs were born at the EPRC - 55 red-shanked and 49 grey-shanked douc langurs. Observations of copulations at the EPRC were made in nine cases by red-shanked douc langurs and on in six cases by grey-shanked douc langurs.

Additional observations on red-shanked douc langurs were made at the Zoological Gardens Singapore and as well in the wild on Son Tra Nature Reserve, Danang, Vietnam. Observations on black-shanked douc langurs were made only in the wild on Hon Heo Peninsula, Khanh Hoa Province, Vietnam.

Copulatory postures in langurs and douc langurs

Most common copulatory posture in Cercopithecidae is the dorsoventral copulation. For species with less gender difference in size, like macaques and langurs, the double-foot clasp is common in which the male grab the calves or ankles of the female with his hind feet to copulate (Fig. 1, 2). In species where the male is much larger as the female, the male will keep both feet on the ground. For Southeast Asian species is it the case for the proboscis monkey (*Nasalis larvatus*) (Boonratana 2011) (Fig. 3) and probably also for the snub-nosed monkeys (Liang-Wei Cui & Wen Xiao 2004; Baoguo Li & Dapeng Zhao 2007; Thanh Hai Dong et al. 2011).

Fig.1. Rhesus macaques (*Macaca mulatta*) show the common copulatory postures in Cercopithecidae for species with less gender difference in size; Myanmar. Photo: Tilo Nadler.

Fig.2. Copulatory postures of Cat Ba langurs (*Trachypithecus poliocephalus*); Cat Ba Island. Photo: Andy Nguyen.

Fig.3. Copulatory postures of proboscis monkeys (*Nasalis larvatus*); Chimelong Park, China. Photo: Tilo Nadler.

If in langurs a female offer mating by presenting her hindquarter to the male in a quadrupedal position with stiff legs, the tail lifted and the head moving rhythmic sidewards. For copulation the male mounts from behind and grabs the calves or ankles with his hind feet (Figs. 4, 5, 6, 7, 8).

Fig.4. Cat Ba langur female (right) invites copulation with stiff extended legs and lateral head movements. Photos: Tilo Nadler.

Fig.5. The female presents her hind quarter directly to the male, but the male seems uninterested.

Fig.6. The female jumpts closer to the male….

Fig.7. …and presents directly in front of the male.

Fig.8. The male rides up to copulate.

The copulatory initiation, the offer for copulation and posture for douc langurs is different. The female lie down on the ground or also on a more or less horinzontal thicker branch, to tuck up one's legs and lift the tail up or sidewards. The mail crouches or kneels behind the female to execute the intromission (Fig. 9, 10, 11, 12, 13, 14, 15, 16, 17).

Fig.9. A red-shanked douc langur female lying on a bamboo structure inside a cage and offers for copulation; Endangered Primate Rescue Center, Vietnam. Photos: Jochen Menner.

Fig.10. During copulation the female actively hangs her head downwards.

Fig.10. A grey-shanked douc langur female lies down on a thick, nearly horizontal branch to invite copulation; semi-wild area at the Endangered Primate Rescue Center, Vietnam. Photo: Tilo Nadler.

Fig.12. Black-shanked douc langur female invites copulation with stiff extended legs close to the mail on the tree; Hon Heo Peninsula, Kien Giang Province, Vietnam. Photos: Tilo Nadler.

Fig.13. The female lays down on a platform and invites copulation.

Fig.14. The male move from the tree to copulate.

Fig.15. During mating the female move down from the platform.

Fig.16. After ejaculation the female move her body from the platform….

Fig.17. …and moves away.

Fig.18. Douc langurs also show the typical copulation posture on thinner branches - here a couple black-shanked douc langurs. Photo: Marc Gölkel.

Discussion

For an overview and comparison of the copulatory postures of the four odd-nosed monkeys genera *Pygathrix*, *Rhinopithecus*, *Nasalis* and *Simias*, sufficient information is lacking.

The copulatory postures of the three *Pygathrix* species are apparently the same and clearly different from the Asian langurs and macaques. The proboscis monkeys (*Nasalis larvatus*) show a copulatory posture similar to the macaques, but the male stands with its hind feet on the ground due to the considerable difference in size to the female.

There is little detailed information on the genera *Rhinopithecus* and *Simias*. From very brief descriptions of copulation in *Rhinopithecus bieti* (Liang-Wei Cui & Wen Xiao 2004) *Rhinopithecus roxellana* (Baoguo Li & Dapeng Zhao 2007), *Rhinopithecus avunculus* (Thanh Hai Dong et al. 2011) it might be assumed that it is similar to langurs and macaques. However, the photo of a copulation of *R. bieti* in an enclosure shows more similarity to the copulatory postures of *Pygathrix* (Fig. 19). It seems that the genus *Pygathrix* has a unique copulation posture within the Cercopithecidae.

Fig.19. Copulation posture in Yunnan snub-nosed monkeys (*Rhinopithecus bieti*) in an enclosure show similarity with *Pygathrix*; Kunming Institute of Zoology Photo: Cyril Grüter.

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