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Unexpected incidents during reintroduction of Hatinh langurs (*Trachypithecus hatinhensis*)

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Summary

The Hatinh langur (*Trachypithecus hatinhensis*) is listed as an endangered species and occurs in a restricted area of central Vietnam and eastern Laos. The largest population in Vietnam lives in Phong Nha-Ke Bang National Park, Quang Binh Province. Several isolated smaller populations are dispersed along the border to Laos, but their long-term existence is precarious due to hunting pressure and habitat destruction.

The Endangered Primate Rescue Center (EPRC) maintains a very successful captive breeding program for the species and using this as a founder population it aims now to establish a larger second wild population in Vietnam. A number of surveys were carried out in areas, where smaller populations of Hatinh langurs were known to still exist, and in areas, where the species formerly occurred but has been eradicated. The aim was to locate an adequate area for the reintroduction of a new population. Finally Ke Go Nature Reserve in Hatinh Province was chosen.

In June 2015 a group of five captive born individuals from the EPRC – one adult male, two adult females each with a juvenile female offspring was transported to the nature reserve, where they were kept for one day in a temporary cage at the release site. The adult individuals were equipped with satellite radio collars. The monitoring of the animals started after release and coordinates were continuously downloaded.

During the first month after release, the group established a home range using an area of approximately 9 ha. Over the second month the langur group gradually extended the home range and the travel distances increased.

Three months after release – in August 2015 – the langur group had a confrontation with an unusually large and aggressive rhesus macaque troop (*Macaca mulatta*). The macaques harassed the langurs for several days and the conflict finally split the langur group. The critical situation started end of August with another attack of the large macaque band and soon proved critical for the released Hatinh langurs. One female died end of August soon after the attack, most probably due to stress caused by the continuous harassment which prevented normal foraging and rest time for digestion, a necessary sequence for this leaf eating primates. At the end of October the second adult female was found on the ground where she subsequently died. One of the juvenile females was found dead in the water of the lake with injuries in the face. We assume that the macaques caused the deaths of the animals. The second juvenile female was observed to travel alone but as she was without radio collar. Her movements could not be followed when she finally disappeared deeper into the forest. The decision was made to catch the remaining male and to return it to the EPRC.

Early in 2016 further surveys were conducted to locate another release site. A 35 ha peninsula at the Ke Go Lake was identified as potentially suitable. In July 2016 three captive born adult Hatinh langurs - one male and two females - were reintroduced at this site. Mid August, after one and a half months, all three individuals moved from the peninsula through a stretch of 100 m open grass land to the main area of the nature reserve. In October 2016 a century high flood in the area interrupted the monitoring for some time.

The tracking and monitoring of the last released three individuals had to end unfortunately by the end December 2016, which was the end of the planned project period.

From the moment of the release from the temporary cage the reintroduced Hatinh langurs showed

no difficulties in finding adequate food sources.

The confrontation of the langurs with the macaques was very surprising. The occurrence of macaques in the nature reserve is known and was also confirmed during the preliminary surveys. In Indochina most langur species occur sympatrically with macaque species. The macaques are on joint sleeping places dominant, but such aggressive behaviour during daytime has to date not been observed. Probably the captive bred langurs lacked the experience and behavioural norms of a canny wild group; they showed no adequate reaction but displayed symptoms of extreme stress.

The final goal is the establishment of a second viable population of this endangered species in Vietnam. To reach this goal reintroduction of several groups with more than one or two females is necessary and hopefully within this project reintroduction will continue.

It has to be considered how the released langurs can be better prepared for confrontations with macaques in the future. The release of a group not solely composed of captive bred individuals but with a wild born and experienced male is a possible solution.

The establishment of a new population is not only a logistic challenge it needs also long-term financial support. Reintroduction always requires a long-term financial and personal commitment.

Những sự cố không mong đợi trong quá trình tái thả loài Voọc Hà Tĩnh (*Trachypithecus hatinhensis*)

Tóm tắt

Voọc Hà Tĩnh (*Trachypithecus hatinhensis*) có tên trong danh sách loài nguy cấp và có vùng phân bố rất hẹp ở miền trung Trung bộ và phía đông Lào. Quần thể lớn nhất ở Vườn quốc gia Phong Nha – Kẻ Bàng, Tỉnh Quảng Bình. Một số quần thể nhỏ, tách biệt khác phân bố dọc biên giới với Lào. Tuy nhiên sự tồn tại lâu dài của các quần thể nhỏ này đang bị đe dọa do nạn săn bắn. Mục tiêu của dự án tái thả là tạo lập một quần thể bền vững thứ hai ở Việt nam. Tại trung tâm cứu hộ thú linh trưởng (EPRC), một quần thể Voọc Hà Tĩnh sinh sản trong nuôi nhốt có đủ điều kiện để thiết lập quần thể ban đầu phục vụ cho tái thả. Khu bảo tồn thiên nhiên Kê Gồ được lựa chọn làm nơi tái thả sau khi các nghiên cứu đánh giá thực trạng hệ sinh thái được tiến hành. Tháng 6 năm 2015, một quần thể 5 cá thể gồm một con đực trưởng thành, hai con cái trưởng thành, hai con nhỏ được đưa đến khu bảo tồn. Cá thể đực được gắn định vị vệ tinh trên vòng đeo cổ. Việc giám sát động vật được tiến hành ngay sau khi thả, các dữ liệu về vị trí, tọa độ được liên tục cập nhật. Trong 6 tháng đầu, quần thể Voọc đã thiết lập một vùng sống cho bầy với diện tích khoảng 9 ha. Ở tháng thứ hai sau khi thả, bầy bắt đầu mở rộng vùng sống và di chuyển xa hơn. Tháng thứ ba sau khi thả, bầy có sự đối đầu với một quần thể loài khỉ vàng rất lớn và hung dữ. Quần thể khỉ vàng luôn đe dọa bầy Voọc và tạo áp lực. Việc đối đầu dẫn đến sự chia cắt của bầy Voọc. Một cá thể cái trưởng thành được phát hiện chết, có thể do stress. Một cá thể con nhỏ khác cũng bị giết, có thể do loài khỉ vàng. Đợt tái thả lần thứ hai vào tháng 7 năm 2016 vẫn được tiến hành với 3 cá thể trưởng thành sinh tại trung tâm cứu hộ thú linh trưởng gồm 1 đực, 2 cái. Lần này các cá thể được thả vào một bán đảo rộng khoảng 35 hecta cạnh hồ Kê Gồ. Sau một tháng rưỡi tái thả, cả ba cá thể vượt khu vực bán đảo di chuyển vào bên trong núi. Tháng 10 năm 2016, trong khu vực diễn ra một đợt lũ lụt lớn nên hoạt động giám sát các cá thể này bị đình trệ và mất dấu. Sự đối đầu giữa các cá thể Voọc và loài khỉ vàng là một sự ngạc nhiên lớn mà chúng tôi đã ghi nhận. Một số loài Voọc khác ở Đông dương việc chia sẻ môi trường sống với các loài khỉ là rất phổ biến, và không có hành động gây hấn. Những nghiên cứu về tái thả sẽ được tiếp tục trong tương lai.

Introduction

The Hatinh langur is listed as an endangered species (IUCN Red List of Threatened Species) and occurs in a restricted area of central Vietnam and eastern Laos (Nadler & Brockman 2014). The largest population in Vietnam lives in Phong Nha-Ke Bang National Park, Quang Binh Province, but there is no reliable size estimation of this population. About 150 individuals are estimated to remain in the park as of 2013 (Nguyen Van Truong 2013). Former surveys estimated a population of 520-750 individuals (Le Xuan Canh et al. 1997), about 800 individuals (Pham Nhat 2002) and most probably

an over estimation with about 2000 individuals (Haus 2008). Several isolated smaller populations are dispersed along the border to Laos, but their long-term existence is precarious due to hunting pressure and habitat loss (DARD 2015; Nguyen Ai Tam 2012; Nguyen Manh Ha 2006).

The Endangered Primate Rescue Center maintains a successful captive breeding program for the species and using this as a founder population it aims now to establish a second wild population in a protected area in Vietnam.

To find a suitable habitat for the establishment of the new population a number of surveys were carried out in areas where smaller populations of Hatinh langurs were known to still exist and in areas where the species formerly occurred but has been eradicated (Forest Protection Department Quang Binh Province 2015; Nguyen Ai Tam 2012; Nguyen Hai Ha 2015; Nguyen Manh Ha 2006; Tran Huu Vy 2013; 2014a; 2014b) (Fig 1). Ke Go Nature Reserve in Hatinh Province was chosen as a reintroduction site based on the information on the occurrence of the species, the condition of the forest, the limited human disturbance in the area, the capability and activities of the nature reserve's Management Board and its forest rangers and the favorable logistics.



Fig.1. Distribution of Hatinh langurs (*Trachypithecus hatinhensis*) in Vietnam. (Nadler et al. (2003) and additional records).

The populations of Hatinh langurs in Ke Go Nature Reserve and in the adjacent Khe Net Nature Reserve in Quang Binh Province are eradicated or the number of remaining individuals is very small, if they still exist at all (Nguyen Manh Ha 2006; Tran Huu Vy 2013; 2014a; 2014b).

Preparation of the reintroduction

Reintroduction site

Once Ke Go Nature Reserve was chosen as reintroduction site a plant survey was carried out to confirm the occurrence of food trees for the langurs. Plant samples were collected in the surrounding of the location identified for release and were stored in a herbarium for identification. There are numerous water sources in this area like small forest streams feeding into Ke Go Lake, the largest freshwater lake in northern Vietnam, which partly belongs to the nature reserve (Fig. 2, 3).



Fig.2. Stream in the release area in Ke Go Nature Reserve. Photo: Tilo Nadler.



Fig.3. Ke Go Lake and forest of Ke Go Nature Reserve. Photo: Tilo Nadler.

Close to the designated release site a research hut was constructed (Fig. 4).



Fig.4. Research hut for the monitoring team in Ke Go Nature Reserve. Photo: Tilo Nadler.

Contact to stakeholders, information material

The reintroduction project was introduced to the Management Board of the nature reserve and all its aspects were discussed in detail, to ascertain the project had the necessary support at all stages. A meeting was organized for the surrounding communes to inform them about the project and to get them to commit to support the project (Fig. 5). The appeal to the honour to reintroduce the species which carries the name of the province was enthusiastic appreciated. Being the largest lake in northern Vietnam Ke Go Lake is a major tourist destination. To prevent tourist boats from landing at the reintroduction area, sign boards were installed, which indicated this area was closed for tourist activities. A sign board explaining the project was set up at the tourism center and information material on the project was distributed in the surrounding communes (Fig. 6).



Fig.5. Stakeholder meeting to introduce the reintroduction project for Hatinh langurs. Photo: Tilo Nadler.



Fig.6. Information board about the reintroduction project at the tourist area at Ke Go Nature Reserve. Photo: Tilo Nadler.

Animals for reintroduction

Five individuals from the EPRC were selected for the first reintroduction. These animals have been living together as a group at the Endangered Primate Rescue Center on a 5 ha semi-wild area with primary forest. The group consisted of one adult male (6 years old), two adult females (7 and 19 years old) with their female offspring (both 8 months old). All animals were born at the EPRC.

Prior the translocation to Ke Go Nature Reserve the langurs underwent a health check including a complete blood profile and tests for tuberculosis, Herpes, Hepatitis and were screened for ecto- and endo parasites.



Fig.7. Tracking equipment: 1- VHF Receiver, 2-Yagi antenna, 3-radio collars, 4-base station for coordinate downloads.

Radio collars

To allow post-release monitoring the three adult individuals were equipped with satellite radio collars (e-obs Company, Germany). The collars use GSM/GPRS technology. They consist of a GPS receiver for data storing and transfer, a UHF transmitter for field tracking and a cell battery as power source. The system works completely wireless to maximize field reliability. The collar takes GPS positions at preprogrammed intervals and stores the obtained position data. Up to 120.000 positions can be stored. The GPS positions recorded in the collar are downloaded remotely via the GSM/GPRS network and the GPRS modem of the base station. The UHF beacon generates radio waves at a certain frequency. These waves can be received with conventional radio receivers to locate a collared animal. The system works very similar to conventional VHF tracking but on a higher frequency (868 MHz or 916 MHz) compared to conventional VHF beacons (150 MHz).

The weight of a collar is 120 g. As the langurs weigh between six and eight kg this means they weigh about 1.5 to 2% of the body weight (Fig. 7).

First reintroduction of Hatinh langurs

Transportation and release

On 13th June 2015, the animals were anesthetized and loaded into transport boxes, which were loaded onto the transport vehicle. The transport by car started as soon as the animals were fully recovered in the late evening (Fig. 8). The distance to the release site was about 500 km and the drive took about eight hours. After arrival at Ke Go Nature Reserve in the early morning the transport boxes with the animals were transferred to a ranger boat and transported for another hour to the final release site (Fig. 9).



Fig.8. Hatinh langur transport from the Endangered Primate Rescue Center by car to Ke Go Nature Reserve. Photo: Tilo Nadler.



Fig.9. Transportation of the Hatinh langurs over the Ke Go lake to the release site. Photo: Hoang Quoc Huy.

At the release site a temporary enclosure was set up just prior to the arrival of the animals. Iron elements were assembled to a frame and covered with fishing net. The transportation of the construction elements was easy and the cage was erected in about one hour (Fig. 10, 11).



Fig.10. To set up a temporary cage iron frames covered with fishing net were used. Photo: Tilo Nadler.



Fig.11. Hatinh langur group was kept after arrival at the release site in a temporary cage for one day and one night to check the animals after transportation and to familiarize the animals with the natural surroundings. Photo: Tilo Nadler.

The animals were released from their transport boxes into this enclosure to let them settle down after the stress of transport, assess their condition and to allow them visual contact with the new environment. They were provided with food and water and were kept in the cage for the rest of the day of arrival and the following night.

In the morning of the second day – 15th June 2015 - the animals were released from the cage into the forest of the nature reserve.

Monitoring

The monitoring of the animals started immediately after release. The GPS coordinates were downloaded depending on the contact to the animals. The distance for downloading amounted 300 to 500 m. The animals were directly observed whenever possible, but care was taken not to disturb the animals and they were not approached at a close distance. When the animals were observed feeding samples from the food trees were collected for identification.

Results of the first reintroduction

During the first month after release, the group established a home range near the release site and the research station comprising an area of roughly 9 ha (Fig. 12). During this time the group travelled together through the home range area, feeding on selected tree species (Fig. 13). During the second month the langur group extended their home range and the travel distance increased. The group split up occasionally, so the travel distances are different for each individual (Fig. 14).

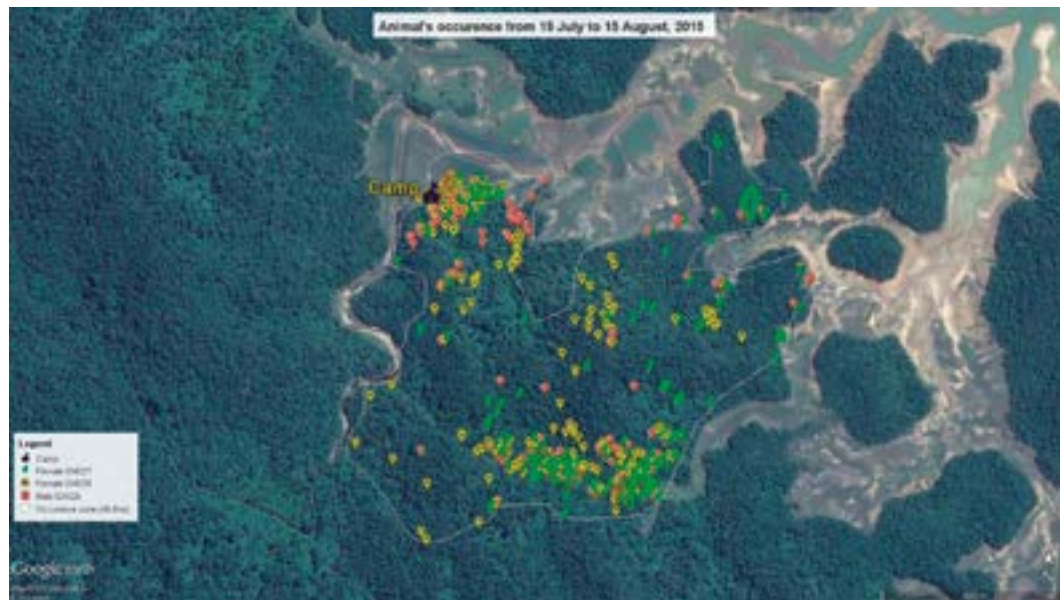


Fig.12. Coordinates of the locations of the three adult Hatinh langurs during the first month after release. The preferred area is close to the release site and the research hut.



Fig.13. Hatinh langur group after release. Photo: Tilo Nadler.

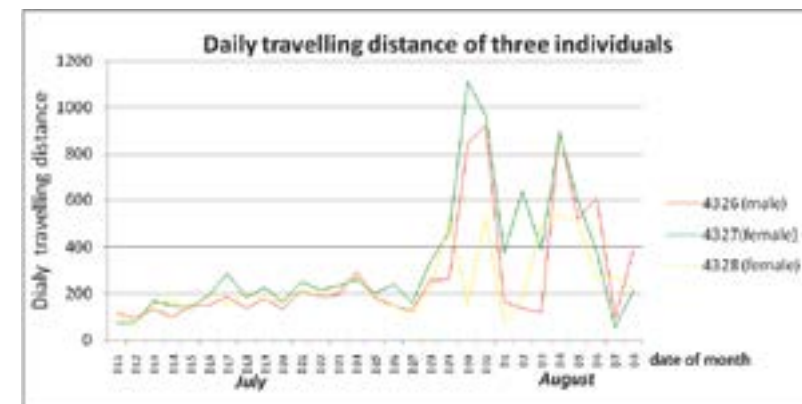


Fig.14. The daily travel distances show a high increase and a difference between the individuals during the conflict with the macaques.

Three months after release – in August 2015 – the langur group had a confrontation with an unusually large and unexpectedly aggressive troop of rhesus macaques (*Macaca mulatta*). The macaques harassed the langurs for several days, and finally the langur group split up. Direct physical attacks or fights were not observed, but as the langurs were continuously harassed through aggressive snarl and vocalization at close distance and from alternating individuals they covered much larger daily travel distances (Fig. 15).

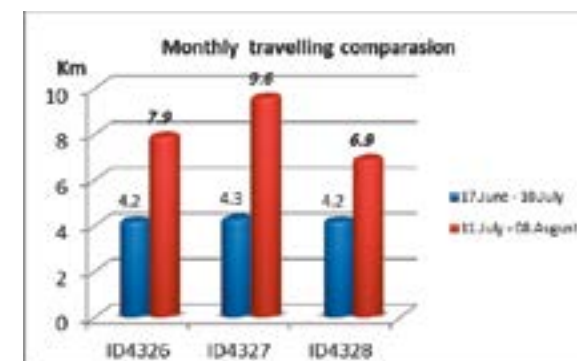


Fig.15. Travel distances of three released Hatinh langurs. The increase in the second period (11th July to 8th August) resulted most probably from the harassment of the rhesus macaques.

The situation became critical for the released Hatinh langurs by end of August, with another major attack of the large macaque band. One female died shortly after, most likely due to the harassment by the macaques and stress which prevented normal foraging and and rest time for digestion, a necessary sequence for this leaf eating primates. The daily travel distances of the male and the remaining female increased, probably to avoid confrontation with the macaques. The animals travelled also into different areas probably for the same reason (Fig. 16). By end of October the second adult female was found on the ground where she subsequently died. One of the juvenile females was found dead in the water of the lake with injuries in the face. There are no observations about an actual fight, but only days before both individuals were found active and in apparently good condition. We assume that the macaques caused the death of the animals, but the course of the events remains unclear. The second juvenile female was observed to travel alone but she was not equipped with a radio collar and her movements could not be monitored and finally this individual disappeared into the forest. However we obtained occasional reports from local people who entered the area by boat and observed the animal weeks later.



Fig.16. The Hatinh langur group splitted of, most probably resulted through the harassment of the Rhesus macaques. One female (radio collar 4328) with a subadult moved far from the research camp where the male (radio collar 4326) settled.

The decision was made to capture the remaining male, take it back to the EPRC and to carry out more surveys to identify another suitable release site hoping to avoid a similar confrontation with macaques. The male was caught in December 2015 and returned to the EPRC.

Second reintroduction of Hatinh langurs

Early in 2016 further surveys were conducted to locate another release site. A 35 ha peninsula at Ke Go Lake was identified as a suitable location. The research camp was moved to the isthmus of the peninsula. An about 100 m wide stretch of grassland separates the forest of the peninsula from the main contiguous forest of the nature reserve. If the water level is very high the peninsula becomes an island (Fig. 17).

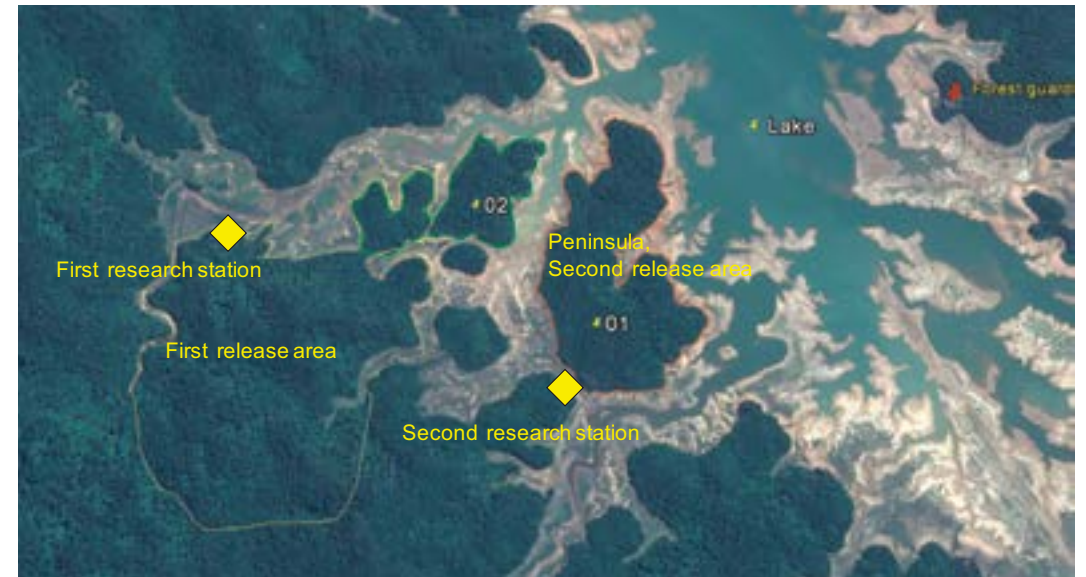


Fig.17. Overview about the areas for release and the localities for the monitoring camps.

Three captive born Hatinh langurs were chosen for reintroduction; one seven years old male, and two females, four and ten years old. The animals underwent the same obligatory health checks and were equipped with the same type of radio collars as described above. They were transported by car and boat to the release site and after one day in the temporary cage they were released on 2nd July 2016 into the forest of the peninsula.

After one and a half months, all three individuals moved away from the peninsula across the 100 m open grassland into the main forest area of the nature reserve. At this time the radio collar of the male didn't work properly anymore and the monitoring team lost the contact to this individual. The two females moved and foraged together. The male was occasionally observed alone but it was not possible to download the coordinates due to the malfunction of the radio collar (Fig. 18).

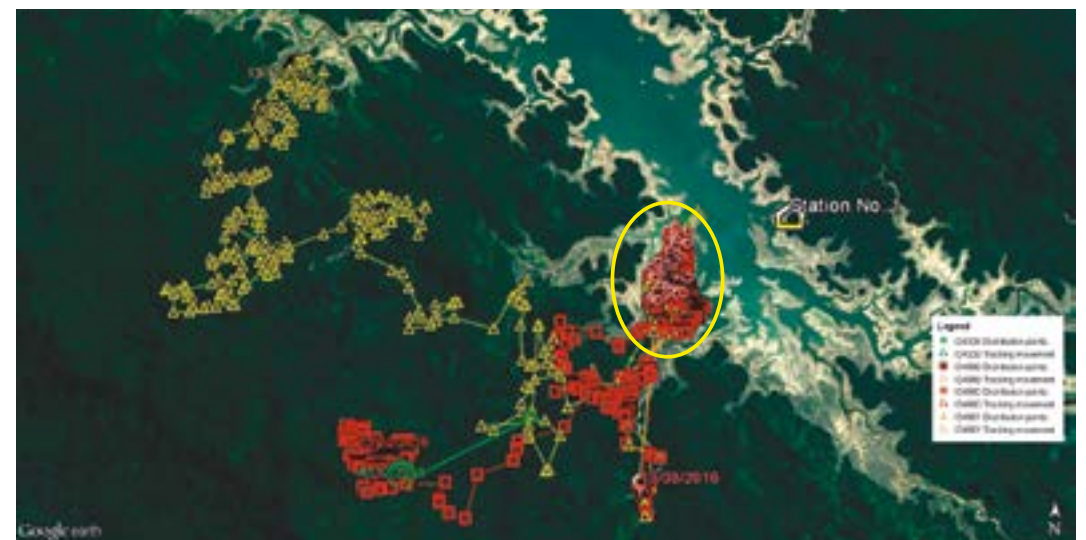


Fig.18. Movement of the four Hatinh langurs from the second release (male 4328 and females 4900 and 4901) until loss of contact and ending of the project phase. The oval marks the peninsula.

In October 2016 the highest flood of the century interrupted the monitoring for about three weeks. The monitoring team had to leave the research camp and a makeshift camp was established at a slightly higher and flood safe elevation to continue the monitoring (Fig. 19). After this interruption only one female could be located and her coordinates could be downloaded. The contact to the second female was lost. Probably the flood caused her to move out of range or her collar had become faulty as well.



Fig.19. For about two months after the flooding the monitoring team used a simple shelter to continue the monitoring and data download. Photo: Tilo Nadler.

After the forced interruption in monitoring the male was also no longer observed in the area and we assume he also moved away to escape the water.

In the attempt to establish at least one possible breeding couple at this site a second captive born Hatinh langur male from the EPRC was released close to the female which was still monitored on the 9th of December. This male was also equipped with a radio collar.

The tracking and monitoring of the last released individuals had to be unfortunately terminated by the end December 2016, which was the end of the project period and the available project budget.

Discussion

From the moment of the release from the temporary cage at the release site the reintroduced Hatinh langurs showed no difficulties to find adequate food sources. After a short inspection of the vicinity all individual started foraging about 30 min after release and in nearby food trees which had been identified prior release.

There were no natural water sources close to the release site and water bowls were provided and used by the langurs. After 15 days the first released langur group covered a distance of about 300 m and moved into an area with dense forest and a small stream, where the animals were observed drinking. The group remained in this area until the incident with the large and aggressive macaque band.

The occurrence of macaques in the nature reserve was known and was also confirmed during the preliminary surveys. Macaque species, especially the preferential arboreal species *M. mulatta* and *M. assamensis* occur sympatric with langur species like *T. hatinhensis*, *T. delacouri*, *T. francoisi* and *T. crepusculus*, in fact in all known areas, where langurs live (Duckworth et al. 1999; Nadler & Brockman 2014; Rowe & Myers 2016). Sympatric occurrence of langurs with macaques is also known for *T. leucocephalus* in China (Chengming Huang et al. 2002) and *T. laotum* in Laos (Phiapalath 2010; Nadler pers. obs.). In many limestone areas langurs and macaques use sleeping sites on cliffs (Nadler pers. obs.). If the species compete for such a sleeping site, the macaques mostly arrive earlier in the evening than the langurs, and they are always dominant, occupy the sleeping place on the cliff and chase the langurs away. But aside from this, aggressive behavior of macaques towards langurs during daytime has - according to our knowledge - not yet been observed. Langurs usually avoid confrontation with macaques and this conflict avoidance behavior is probably socially transmitted in areas where langurs and macaques live in sympatry. The extreme stress of the langurs and their failure to adequately react to the macaques was possibly caused by the lack of experience and a behavioral norm, which an experienced and canny wild group would both have.

Even though physical contact never occurred the continuing harassment caused the langurs to travel larger distances requiring more energy and at the same time reducing feeding time and consequently energy intake. The energy deficit and the stress probably were responsible for the rapid physical deterioration and eventual death of some individuals.

It could be considered to make sure that a released group of Hatinh langurs comprises at least one adult wild caught individual, which has experience tackling such situations.

During the second release an unexpected flood occurred in Hatinh Province which influenced the movement of the animals and prevented continuous radio telemetric monitoring. The high water level also prevented visual observation of the animal whose radio collar had failed and the contact to this animal was consequently lost after this period.

However the plan to establish a second population of this endangered species in Vietnam remains unchanged and reintroductions should continue within this project at this site. To achieve this it is necessary to introduce several groups with more than one female each. The normal social units of this species are one-male-groups with three to five females and the offspring from several years. A group with more females produces understandably over their life span a much higher number of individuals. The time of reproduction for a female is limited to the maximum of about 20 years (Nadler, pers. obs.). A group with one male and one female would within this time span grow to a population with about 20 females – not considered any limiting factors, like hunting, diseases or accidents. A group with four females therefore grows to a population with 80 females, supposed reproduction (Fig. 20). In order to establish the new population within an acceptable time frame it is necessary to release groups with several females. And even then it will be a very long process.

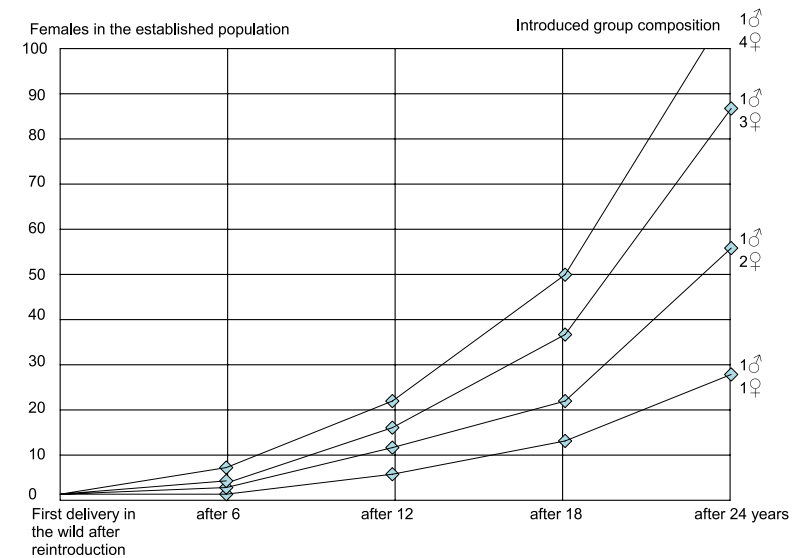


Fig.20. The diagram shows the theoretical maximal increase of the number of females in a langur population after reintroduction. The increase is depending from the number of females in a released group (one, two, three, four). The begin of reproduction for the females is supposed with six years, a sex ratio of born individuals 1:1 (males : females) and the involvement of all females in reproduction until the age of 18 years with a birth interval of 24 month.

To establish a population large enough to remain stable is not only an enormous logistic challenge, it also needs considerable reliable long-term financial support and organizational commitment.

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Natal-to-juvenile pelage change in free-living François' (*Trachypithecus francoisi*) and Cat Ba langurs (*T. poliocephalus*)

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Summary

This article discusses the timing, patterning, and implications of natal pelage loss for two species of limestone-dwelling Asian colobines – François' (*Trachypithecus francoisi*) and Cat Ba (*Trachypithecus poliocephalus*) langurs. It considers why some primate species, such as those in the *Trachypithecus* genus, are born with a flamboyant, orange natal coat and what purpose it may serve in promoting allocare and reducing the threat of infanticide. With 11-12 months of observation of each species, this study assesses the pattern of natal coat loss for three François' langur infants living in Mayanghe Nature Reserve (China) and three Cat Ba langur infants living on Cat Ba Island (Vietnam). There was conflicting evidence for our first hypothesis, as the pattern of natal coat loss is similar in both species, although the timing is sped up in François' langur infants. Using previous data on these species, and confirming our second hypothesis, there does appear to be an association between increased independence and decreased group member interest in infants that were progressively developing an adult coat colouration, suggesting that the coat does signal dependence and promote allocare. Finally, in analysing the pattern of where the natal coat is lost first, observations suggests that both species of langurs may be using a paternity cloaking approach to avoiding infanticide. Ultimately, it is unclear if François' and Cat Ba langurs are experiencing different degrees of infanticidal threat given the contradictory evidence, nor is it known how or if their divergent patterns of development are related to habitat quality.

Sự thay đổi màu lông từ lúc sinh ra đến tuổi bán trưởng thành ngoài tự nhiên của loài Voọc đen má trắng (*Trachypithecus francoisi*) và voọc Cát Bà (*T. poliocephalus*)

Tóm tắt

Bài báo này thảo luận về thời gian, mô hình, và ý nghĩa của việc thay đổi màu lông khi mới sinh của 2 loài Voọc thuộc nhóm Asian colobines gồm Voọc đen má trắng và Voọc cát bà. Giả thuyết là các con non mới sinh của các loài linh trưởng thuộc nhóm *Trachypithecus* có bộ lông với màu vàng cam sặc sỡ có mục đích tăng cường sự quan tâm chăm sóc từ các cá thể khác trong đàn và giảm thiểu nguy cơ bị giết chết. Qua 11-12 tháng thu dữ liệu với 3 con nhỡ của loài Voọc đen má trắng François' ở khu bảo tồn thiên nhiên Mayanghe (Trung Quốc) và 3 con nhỡ của loài Voọc cát bà ở Vườn quốc gia Cát bà (Việt Nam), nghiên cứu này kiểm nghiệm quá trình mất màu lông tự nhiên của cả 2 loài Voọc này. Có bằng chứng mâu thuẫn cho giả thuyết thứ nhất được ghi nhận ở cả 2 loài này về quá trình thay đổi bộ lông, mặc dù thời gian thay đổi màu lông ở loài Voọc François' nhanh hơn.

Cùng với các dữ liệu đã ghi nhận trước đây và xác nhận trên giả thuyết thứ hai cho thấy có mối liên hệ giữa sự tự lập tăng lên và sự quan tâm của các thành viên trong đàn giảm xuống với con non có bộ lông đang dần biến đổi sang bộ lông của con trưởng thành, điều này gợi ý bộ lông là dấu hiệu của sự tự lập và thúc đẩy sự quan tâm.

Cuối cùng, kết quả phân tích dữ liệu cũng chỉ ra rằng con non của cả 2 loài đều có phương thức