

Nature Watch

Thinking Like a Tahr: When Males and Females Go Their Separate Ways

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The reasons behind sexual segregation in animals are many. In this article, this complex behavioural aspect in Nilgiri Tahr is described.

By September, as the southwest monsoon prepares to withdraw, the stocky males of a cliff-dwelling goat of the Western Ghats - the Nilgiri tahr, *Hemitragus hylocrius* (see *Box 1*) — are making changes in their own annual calendar. For the preceding three months, they had converged at herds containing females and their young, searching for receptive females with whom to mate. Frenzied horn-flinging, resounding cracks, and dizzying thuds had characterised their grim contest over the females. But now, signalling the end of the mating season or rut, as there are no receptive females to be fought over – most of them would have conceived; those that had not are either immature, or already with a kid.

With the end of the rutting season then, one would expect males to abandon their procreative pursuits and return to the quiet grazing-and-resting routine alongside the female groups. But no! The males have different plans. Naturalists and biologists have long observed that, with the end of the rutting season, the male Nilgiri tahr move away from female herds to occupy different areas. Here, for the next six to eight months, they move about, feed, and rest in ‘bachelor’ herds consisting exclusively of the largest males, and scarcely mingle with female herds. Come monsoon, the males end their exile, and again dutifully reassemble at female herds, fighting each other madly to father the next instalment of kids. Why then, does this periodic segregation of the sexes occur? This was the question I sought an answer to when I went to Eravikulam, Kerala in late 1994 for a field-study of the Nilgiri tahr.

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Box 1. Tahr (Genus: Hemitragus)

Tahr belongs to the family Bovidae which also includes other even-toed, horned ungulates such as cattle and antelope. They are considered primitive cousins of true goats (*Capra* spp.) since they possess certain characters of primitive goat-antelopes (e.g., goral and serow, both *Nemorhaedus* spp.), such as a similarity of horn size in both males and females, and certain other features that characterise true goats, such as striking coat colour differences between the sexes, and the presence of odoriferous glands. Three species – all widely separated geographically – are known. The Himalayan tahr (*H. jemlahicus*) is distributed along the narrow interfaces of the temperate forests, meadows, and cliffs above 2500 m elevation in the Himalaya, east of river Indus into Sikkim. Males sport a prominent, shaggy ruff, while females are coloured an even brownish-grey. This species has been successfully introduced into New Zealand, South Africa and Canada. The Arabian tahr (*H. jayakari*), the smallest of the three tahr species (adult weight ~.30 kg), is found in the arid mountains of Oman. Very little is known about this species. The Nilgiri tahr (*H. hylocrius*) is perhaps the largest of the tahr species (adult males exceed 100 kg), and is found mostly at elevations over 1200m in the Western Ghat hill ranges within the states of Kerala and Tamil Nadu. Latest available estimates put its population at less than 2000. All tahr species are highly endangered owing mostly to extensive poaching, as also habitat fragmentation from developmental activities.

Eravikulam is a small national park (97 square kilometres) surrounded by plantations, mostly of tea. In the heart of the park is the gently undulating Eravikulam Plateau, some 2100 metres above sea level. This landscape is dominated by vast expanses of grassland, and small patches of stunted evergreen forest, locally called *shola*. On the fringes of the grassy plateau, sheer gneiss cliffs plunge into forested valleys. It is this narrow interface of grassland and cliffs which forms the habitat of the Nilgiri tahr.

Figure 1. After the rutting season, adult male tahr occur mostly in grasslands.



It was towards the close of the rutting season when I arrived in Eravikulam. The mature males and females already occurred separately. The bachelors favoured open, gently undulating, grassy plateaux (*Figure 1*), whereas females and their young kept to the steep and rocky terrain of the cliffs where forage was very patchy. Greater quantities of grassy vegetation—the tahr's choice forage—were available in the areas occupied by males. But, in these open areas the tahr were more vulnerable to nimble-footed predators, mostly the pack-hunting *dhole* (or the Indian wild



dog, *Cuon alpinus*). Cliffs, while being short on forage, afforded steep terrain which the tahr negotiated expertly to avoid predators. Interestingly, seldom did males visit the cliffs; and likewise, females almost never ventured into the open, rolling grasslands. Why was this happening? Was security from predation not an important consideration for males? And, were females less in need of better forage?

Males of the Nilgiri tahr are about 70% larger than females *Figure 2*. This difference in body size alone would dictate that males need greater amounts of forage – roughly 60–75% more than a female. But, the forage requirement of an animal is not determined merely by its body size; it is also determined by other energy-intensive processes relating to physiology and behaviour of the animals such as rut in males, pregnancy and lactation in females.

During the rutting season, males spend most of their time fighting other males, or tending receptive females – both physically exacting activities, and find very little time for feeding. Consequently, their physical condition deteriorates considerably by the end of the rutting season, leaving them with an energy deficit. It therefore becomes imperative for them to regain bodily reserves lost during the rutting season, and prepare adequately for the onset of the next rut. This, they ensure by occupying areas rich in choice grassy forage, where it is possible to maximise intake. This abundance of grassy forage also helps them minimise energy expenditure by requiring them to move less in order to feed, and affording them more time to rest than females. However, in order to access these attractive benefits of using open, grassy areas, males are forced to risk encounters with predators.

In contrast to the males, the females' participation in the rut is admittedly passive, and does not leave them in an energy-depleted state. But advancing pregnancy (and later on, lactation) begins to impose heavy demands on the energy reserves of females. Yet, they do not graze in the open, undulating, forage-

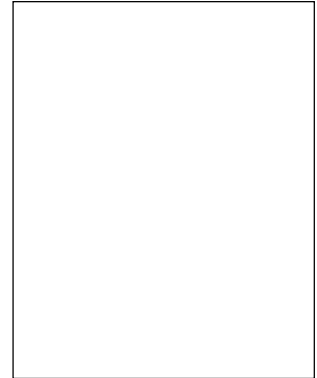


Figure 2. The male (left) is almost 70% larger than the female in size.

Suggested Reading

- ◆ V Geist. *The Mountain Sheep – A Study in Behaviour and Evolution*. University of Chicago Press, Chicago, 1971.
- ◆ G B Schaller. *The Mountain Monarchs: The Wild Sheep and Goats of the Himalaya*. University of Chicago, 1977.
- ◆ SH Prater. *The Book of Indian Animals*. Bombay Natural History Society, Bombay, 1980.
- ◆ C Rice. The Nilgiri Tahr. *The Indian Magazine*. March 8. 20–31, 1988.



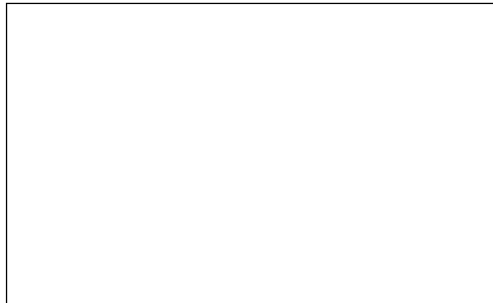


Figure 3 (left). An adult female tahr with a yearling. Figure 4(right). Females with young kids often use steep and broken areas for foraging.

rich areas. This perhaps results from the fact that females are encumbered with defenseless kids (including offspring from the previous year) that are completely dependent on them for safety (Figure 3). Clearly, females using open grassy areas would not only endanger themselves to predation, but also expose their kids to the same risk. Unlike the powerfully built males, who are, on occasion, known to defend themselves successfully against the *dhole*, the females and young practically stand no chance. The females are therefore forced to accommodate their forage needs on grassland patches closer to the security of the cliffs (Figures 4, 5).

For males, the equations change again during the rut, when accessing better foraging opportunities become secondary to efforts at maximising matings. They gather at female herds, while females, finding safety in inflated numbers, begin to graze in areas that are more open. Thus, the extraordinary rites of seasonal matrimony continue, as does the larger pattern of segregation between the sexes.

Figure 5. Anaimudi, west view. Steep, rocky areas (background) are usually used by females and the rolling grasslands (foreground) by the males after the rut.



Box 2. Sexual Segregation

In a wildlife ecologist's dictionary, sexual segregation refers collectively to a phenomenon where the sexes of a single species use resources in their environment differently. Segregation could occur because sexes use totally different areas (= spatial segregation), or because they use the same areas at different times (= temporal segregation). Segregation could exist even when the sexes occur together in a place at the same time, because they choose different kinds of food, or choose them in different amounts. Likewise, the sexes may also differ in their use of time as a resource. These are reflected as differences in behaviour: for instance, male Nilgiri tahr spent more time resting than did females.

Theories based on adaptive and mechanistic values have been formulated to explain sexual segregation in animals, which could apply to the tahrs as well. An *adaptationist* would argue that in the tahr, it is beneficial both for males in a poor body-condition, as well as for pregnant or lactating females that they do not compete for similar resources in the same area. Hence the sexual segregation is to minimise competition between the sexes at critical periods in the tahr's annual cycle. While a *mechanist* would insist that segregation occurs simply because males are clumsy on the cliffs owing to their large body size, which leaves only the small-bodied females and young animals to negotiate the steep areas.

With the tahr at Eravikulam, I asked why the sexes segregate after rut. I discovered that the male Nilgiri tahr move into the open, forage-rich, plateau seemingly to improve their poor physical condition after the rut. I also learnt that steep terrain, which promised maximum security to helpless offspring, appeared to dictate the distribution of females. These explanations are doubtless interesting, and perhaps, even convincing.

However, behavioural phenomena such as sexual segregation are exceedingly diverse, complex, and subtle. As topics of study, they are at once frustrating, humbling, and rewarding. Seldom is our understanding of these phenomena absolute. With the tahr itself, more valid explanations could exist for sexual segregation (see *Box 2*) besides the one I was able to examine. For instance, could segregation result because the large and bulky males are clumsy on steep terrain, whereas the slightly built females and their young negotiate them adeptly? (*Figure 5*). Entirely possible, but that one, I could best answer, if only I could think like a tahr!

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