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# Interaction between a leopard and a tiger at a kill site in India

**Documenting interspecific interactions between sympatric large carnivores, such as leopards *Panthera pardus* and tigers *Panthera tigris*, are important for understanding ecosystem dynamics. In India, these interspecific interactions between the large carnivores shape ecological communities by determining the distribution, abundance, and co-existence of each other and also the prey community. Here, we present an incident where a tiger and a leopard were captured in the same frame by a camera trap deployed at a leopard kill of domestic cattle. The tiger was photographed again on the next day moving the remnants of the prey. While it is impossible to conclude what happened in between or afterward due to the lack of successive images, this rare event of capturing these two elusive predators at a kill simultaneously suggests that they interact at a much finer scale than often presumed.**

In densely populated countries like India (where the human population is the highest in the world; UN Report 2022), the conflict between humans and large carnivores may increase over time. With a high density of people living in the country, the need for land has increased, leading to increased encroachment into the habitat of large carnivores. Due to the shrinking habitat and increasing habitat fragmentation, large carnivores like leopards and tigers are being increasingly forced to live in human-dominated landscapes (Kshetty et al. 2017, Warriery et al. 2020). In such areas, livestock is an important source of prey (Muhammad et al. 2017), leading to increased human-carnivore conflict (Athreya et al. 2007), based on rising attacks on humans by the large carnivores and inevitable retal-

latory killing of large carnivores (Dhanwatey et al. 2011). These pressing issues, along with the illegal hunting for their body parts, threaten the country's large carnivore population (Nittu et al. 2023).

Leopards are common outside of protected areas (Gubbi et al. 2020). The shrinking habitat (as the forested areas around the villages are being converted into agricultural fields) may lead to increased niche overlap between leopards and tigers in human-dominated landscapes (Lamichhane et al. 2019). Leopards are opportunistic predators, and they adjust their spatiotemporal behaviour in areas where they share space with tigers in such a way that they don't have to directly compete for the same resource because tigers are generally competitively dominant to leopards (Harihar

et al. 2011, Carter et al. 2015). But in a landscape with human disturbance, both of the species often modify their behavior and response to maximize their resource utilisation and to avoid competition (Karanth et al. 2017). Here, we present an incident of a direct interaction between a leopard and a sub-adult tigress at a kill site in Bramhapuri forest division, Chandrapur, Maharashtra, India. In Bramhapuri, a domestic cattle killed by a leopard was located on 29 January 2020. We deployed a camera trap (Cuddeback C1, Green Bay, Wisconsin, USA) at the kill site as soon as it was discovered. The camera trap had a white flash and the "delay" was set to be five seconds between two consecutive detections. The tigress and leopard were both captured at 23:48 h on the same day (Fig 1). In the photograph, the crouched posture of the leopard may indicate an aggressive posture, and it does not seem to be backing down from the tigress. On the next day (30 January 2020), the tigress, ID N1 (or possibly her sister ID N2), was again photographed moving the remnants of the prey to a new location (Fig 2). It is impossible to conclude what happened in between or afterward due to the lack of successive images, but carrion acquisition can have a significant impact on the fitness of individuals and species (Allen et al. 2015, Panda et al. 2023). The body size of the predator often plays a key role in carrion acquisition (Choudhary et al. 2020). Tigers being the bigger and dominant predator (weighing 100–260kg, although subadult females can weigh as little as 80 kg), can limit the carrion consumption rate thus reducing the nutritional gain of the leopard (weighing 30–90 kg), by asserting dominance over the carcass (Panda et al. 2023). However, in this direct interaction, the leopard seemed to compete for its kill. An adult male leopard can be of similar size as a sub-adult female tiger, but in this encounter, the leopard seems to be a female which is much smaller in size (weighing 20–43kg). Kleptoparasitism is well documented in opportunistic, generalist predators like leopards (Hayward et al. 2006, Mandal et al. 2018), but it is rarely documented in tigers. However, the forest department staff of Bramhapuri Forest Division do claim to see tigers in the act of kleptoparasitism. While there is much unknown about this observation, it is significant in showing the interaction of tigers and leopards at the kill site and also documenting tigers scavenging. Usually, subordinate predators like leopards avoid conflict with dominant species like tigers, but in this case, the leopard was competing with the tiger



**Fig. 1.** Tiger and leopard both present at the same kill site on 29 January 2020, aggressively staring at each other (Photo: Maharashtra Forest Department).

for the kill which suggests that they interact at much finer scales, such as when acquiring carrion, than often presumed.

Bramhapuri Forest division in the Indian State of Maharashtra has a robust population of tigers and leopards (Habib et al. 2023). However, the forest division does not have the protection status of a tiger reserve and there are several villages situated inside the forest which makes the habitat highly fragmented. Prey abundance is thought to be much less (Habib et al. 2023) compared to any adjacent protected areas. Hence, when the wild prey is short both of these apex predators will resort to killing cattle (Bhattarai et al. 2012). Further studies at a much finer scale will decode the intricate, complex, dynamic relationship of two apex predators in a human-dominated landscape and how it changes when there are anthropogenic disturbances involved as a governing factor.

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**Fig. 2.** Tiger was again photographed on the next day (30 January 2020), taking the remnants of the prey away (Photo: Maharashtra Forest Department).

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