

LEADERSHIP AND FORAGING STRATEGY OF GREY LANGUR *SEMNOPIITHECUS ENTELLUS* IN WEST BENGAL WITH REFERENCE TO SUPER CYCLONE AMPHAN

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Grey Langur, *Semnopithecus entellus* (Dufresne, 1797), also called Hanuman Langur, is a primate species native to the Indian subcontinent (https://en.wikipedia.org/wiki/Gray_langur). Meena *et al.* (2015) recently studied a multimale bisexual troop of Hanuman Langur, *Semnopithecus entellus* and observed their parental care in Jodhpur, Rajasthan, India. Herein, foraging behaviour of a multiple male troop (https://en.wikipedia.org/wiki/Multi-male_group) of this species was observed in suburban Kolkata for about one year, especially in post Amphan months, and reported hereunder.

The super cyclone Amphan was struck in southern West Bengal on 20th May, 2020 and reportedly blown over Kolkata and its suburban areas with a speed of about 120 kmph. The troop on 21st May and 23rd May, 2020, was found to repeat same area foraging, leaving only one day gap. They were earlier found to visit the locality to forage in the morning hours with an interval of 10-15 days, while after Amphan they were observed resorting to the third route through the roadside shop sheds. On 23rd May 2020 relatively visible sighting of the troop through the third route over the roadside shop sheds, it was revealed that this multi-male group consisted of 20 individuals, representing 14 adults/ subadults and 6 juveniles clinging to their mother. The troop initiated foraging activities through the third route, visibly from a banyan tree, then a peepal tree, and then getting down over to four small shop sheds, and then jumping on to the desired shed in line covering a wide gap. They were quite easy going and with an elapsing a time of around 25 minutes. They displayed amazing social organization led by a stout adult male, followed by other males / sub adults and eventually by the mother monkeys, and finally by the two adult males as hind guards of the monkey troop. As such, leadership by a stout male herein recognized as the process of facilitating collective troop efforts to accomplish shared goals (Yukl, 2006).

This troop was again noted foraging here on 2nd June 2020, *i.e.*, on 12th day, leaving a gap of 11 days, taking the 1st route through the boundary wall (Fig. 1). The troop was also found chased by dogs (Figs. 2-5), while trying to follow the 2nd route of a concrete road keeping a watch on the leader from the adjacent apartment top by the 3rd monkey in the row. Being disturbed and late for actively foraging a mother monkey with kid was found the last to negotiate the road on guard by the two dogs. In general, the mother monkeys were always found quite carefully holding their babies on to the chest, apt in brachiating on branches of trees and jumping over a distance of 10 feet or more. In one occasion (23rd May, 2020), the mother monkeys were found to jump over 12 feet distance from one roadside shop shed to another shop shed with amazing articulation. In this case, each mother monkey had her own trick in negotiating the shop gap, having a tree in between. The help of this tree was not taken by all mother monkeys, some showed quickly jumping over directly on motion, while others sprang perpendicularly to a branch or even jumping at ease to the tree trunk 8 feet away or sometime strategically seated for a while, took 3-4 back steps to finally took a smooth flying leap forward onto the next shop shed made of asbestos.

On 2nd June, 2020, close watch revealed actively chasing by two dogs from the 2nd monkey in line of progression and the troop compelled to manage along the adjacent 2nd route of concrete rural road. The next visit after 21 days on 23rd June, 2020, same interaction with dogs occurred and managed to follow the 2nd route through boundary wall, building and the concrete road. On 1st July, 2020, the troop followed the 2nd route. Next day, i.e., on 2nd July 2020, leaving no gap, the troop followed the same 2nd route and found chased by two dogs. On 6th July 2020 morning during rain, the troop came again with a gap of 3 days and followed the 1st route of boundary wall with no chase of dogs. On 12th July at 6.10 pm in the evening, the monkeys only were on return journey to the roost observed on a fourth route on the other roadside shop sheds, also seen foraging in late hours. Next day on 13th July 2020, the entire troop had a tough time at early morning hours of 6.00 am, faced an encounter with three super excited dogs which chased, even jumping on to the other wall, but the troop with time managed to follow the 2nd route.

On 27th July 2020, without any gap, the troop came at 7.00 am in the morning about an hour late and took much time to follow the 2nd route though there was one dog not so excited. It was observed that the mother monkeys were on training mode to their kids took 45 minutes to cover the area in sight, and the leadership by strong male was not so marked and also the last one was a mother monkey. Apparently, hind guard by male monkeys was absent. On 20 August 2020, the troop came at 6 am followed 2nd route taking minimum time. This is presumably monkey kids are somewhat trained up and confident, even though found clinging onto the mother when in movement on road. Sugiyama (1965) observed that in infants after six months old, locomotion is predominantly independent and carrying by the mother is rare. Foraging the same area again, on 1st and 2nd July 2020 leaving no gap, was presumably be attributed to super cyclone Amphan adversity impact, while on 27th July 2020 could not be explained. It seems that foraging gap varied highly and also their time schedule with situation.

Extensive and intensive fixed site observations suggest that this multiple male troop may shift their night roost site, entire or in part, if any exigency arises. In general, abnormality and non-synchronic foraging activities apparently appear unexplained. It is found that this troop is flexible in their approach to life activities, including leadership, forage strategy, time schedule and feeding time, based on availability of food, local situation and environmental condition. Baby monkeys are taken care of for about six months including carry clinging onto the tummy and socialization to brachiating, jumping and climbing up a building wall outside. In the locality there have been more canine-simian conflicts than man-monkey conflicts. Bursting of five crackers one day and one cracker on some other day was noted. It is also worth mentioning that a local person was found trying his best to keep the dogs restrained to canine-simian conflicts.

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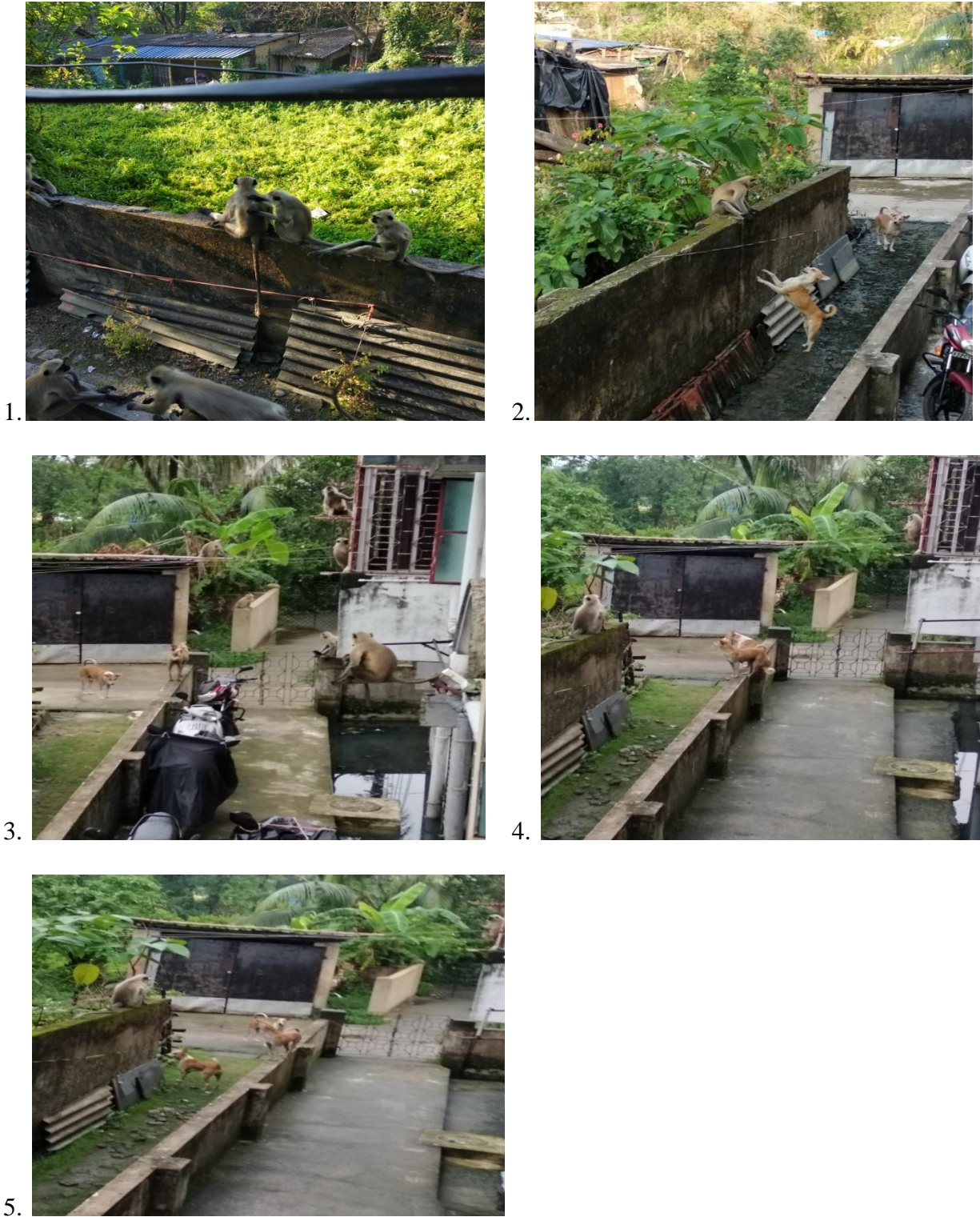
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Figs. 1- 5 : Gray Langur foraging troop observed in 2020. Fig. 1. Troop found on way to the 1st route. Figs. 2-5. Dogs-Langur troop conflicts showing simian watch from adjacent apartment (Fig. 3), and also actively chasing and excitedly jumping on to the boundary wall by dogs (Figs. 4 and 5).