MALE-MALE AGGRESSION IN ASIAN ELEPHANT OBSERVED IN SIMILIPAL TIGER RESERVE, ORISSA

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Introduction

During 27 February to 01 March 1994 two well grown tuskers were found killed with injuries sustained due to goring-in of tusks (of a victor). An inquiry was conducted into the incidents to obtain answers to two question (1) if the victor was still alive, and (2) what may have led to such male-male aggression leading to the deaths.

This paper is a presentation of the above report in the light of field observations and an analysis of various aspects of aggression in elephants - the reason, duration, targets and types of expressions

The incidents

Incident I : In the night of 27.2.94 trumpeting sounds suggesting fight between two elephants were heard by the Range staff at Upper Barha Kamuda (UBK) in southern Similipal. Almost continuous sounds were heard until around 0700 hrs next morning. Later it was all silent. The Forest Guard, Tankadhar, went out with a search party looking for indications to what might have happened. Blood trails from the main forest road across River West Deo led them to the carcass of a tusker lying on the bed of Sambardhara nallah 1.5 km south of the UBK Range Office. A circular area of about 5 m radius was clear on the bank of the nallah. Apparently, before death and during the fight the tusker had locked its tusks with those of the victor and moved over this area in a circular fashion. Evidences also suggested that one of the animals was cornered to the high bank nallah. Damages to the ground vegetation were also extensive.

The dead tusker had clear and deep insertion marks of gored-in tusk of the victor. The insertions were through the lower abdomen and anal region. From the front foot circumference the shoulder height of the animal was estimated to be 3.6 m. The measurements of the right tusk were - outer length : 124 cm, inner length : 110 cm, mid-girth : 27.5 cm and weight : 7.85 kg. The left tusk had outer length : 133 cm, inner length : 116 cm, mid-girth : 25 cm and weight : 8.0 kg.

Incident II : At about 2200 hrs in the night of 01.03.94 the staff and Khadias at UBK heard trumpets from the distant forest. The sound approached nearer and then water splashes were heard. It was surmised that two elephants engaged in fight came nearer into River West Deo. Trumpets and water

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splashes were heard in very quick succession until about 2300 hrs. Then the silence of the night prevailed.

The next morning two search parties went around. The carcass was lying across the river, within 500m of the UBK Range Office, 30 m away from the main forest road. The injuries were of similar pattern as were on the carcass of Incident-I. There were very clear gored-in holes on the lower abdomen, behind the ear and the anal region. These holes were due to goring-in of the tusks of the victor, attacking from the left and behind. Since the carcass was lying on its right it was not possible to ascertain the type and extents of injuries sustained on the right side of the body. There was only one tusk on the left. The right tusk might have fallen off early in its life because there were no injuries or healed up tissues to indicate a recent happening.

The shoulder height of the animal was 2.4 m. The only intact tusk, the left tusk, measured 195 cm along the outer edge, 166 cm along the inner edge, 30 cm girth at the mid-length and 18.0 kg in weight.

There were extensive signs of chasing, trampling and cornering to the high bank of the river. There were also a few tusk-pierces along the river bank.

The victor survives

Suggestions by some that the dead tusker of 01.03.94 was the victor of the first incident were dismissed on several grounds. (1) Trumpets and water splashes in the night of 01.3.94 were the outcomes of a fresh fight. It was obviously between the victor of the first incident and the single-tusked bull of this date. (2) The single-tusked bull which died on 01.3.94 was not the victor of the first incident, because the tusk-pierces of this night on the river bank showed drawn-out parallel-lines. The two parallel lines indicated that the victor of the second fight had two tusks. The locking-up of tusks leading to gyration or circular movement, noticed in the first incident was also most possible when both the fighting partners had two tusks, each. Therefore, the same tusker was victor in both the incidents. (3) From the river bank measurements were taken of the pierces made by the tusks of the victor. These suggest that the tips of the tusks of the surviving victor are separated by a minimum distance of 71 cm. The girth of the left tusk is 18 cm and that of the right is 38 cm. The measurements were taken 40 cm away from the tip. (4) An examination of the dimensions of the tusks leads to believe that the victor was much older than both the victims. The victim-I had 25 cm tusk girths around the middle i.e., beyond 50 cm point. Victim-II with only the left tusk intact, presumably from calf-hood, is expected to have a larger and heavier tusk for its age because of a changed pattern of growth that would have set to favour the left tusk after the right tusk was uprooted. Victim-II had 25 cm girth at the 40 cm point of the tusk from its tip.

The above discussion leads to conclude that while the victor was a full-grown adult, the victims were younger bulls but had passed their sub-adult stage (about 20 years of age).

Discussion

Reasons for aggression : Aggression is an outcome of stress (Barua, 1993). The reasons for development of stress conditions in sub-adults may be due to (1) problems in social adjustment (Lahiri-Choudhury, 1988) leading to the expulsion of the individual

from its group; (2) unsatisfied mating urges leading to 'redirected sexual activity' (Eisenberg *et al.*, 1971) towards younger males (Ramachandran, 1984) or other expressions of stress (Lahiri-Choudhury, 1988), and (3) injuries and pain which may lead to death (Rajgopal, 1965; Sukumar, 1989). In adults too, injuries and pain may lead to stress, but in the context of the present report 'musth' appears to be a more plausible source of stress for an adult, enhanced by the presence of younger competitors for breeding.

During musth the animals are highly aggressive and dangerous (Patridge, 1993) and restless and sexually active (Katugaha, 1993). In Sri Lanka the largest numbers of males come in musth during February-March (Katugaha, 1993). Yet, bulls tend to show non-overlapping musth periods so that it is rare for two males to be in musth at the sametime in the same area. Mature bulls in musth, range over larger areas, displacing equally large bulls that are not in musth (Santiapillai, 1993). Therefore, the normal concepts of range-areas (Desai, 1991) become a looser concept for a bull in musth which may also be seeking a mating partner.

Male-male battles may also start for herd-leadership (Stracey, 1963). Such a situation will arise only at the onset of the breeding season when males appear close to the female-led herds (Singh, 1990; Santiapillai and Jackson, 1990). Data from the years 1979 through 1987 from Similipal have indicated that males are sighted more often in the family herds during March-April (Singh, 1990). In the same study it has also been reported that males appear during certain other months too, which supported by field observations, has led to conclude that the breeding season may extend through other months, as well.

On 05 February 1994 a lone tusker and a lone female were seen within 200 m distance apart near Brundaban in North Similipal. It was then surmised that the appearances were prior to the beginning of the courtship behaviour.

From the above discussion it appears that during the time the killing incidents occurred in UBK the breeding season for elephants was around. Breeding urge among the males may have brought the males closer to the female groups. Hence the probability for the contact among the competing males had increased. Besides, a musth condition with the older bull, the victor, cannot be ruled out because its intention to displace 'all' large bulls around him appear very clear. February-March may be the common musth-season in Sri Lanka as well as Similipal.

The three tuskers which created this report cannot be considered as totally strangers to each other because, Similipal presents no definitely known scope for immigration or migration under the present conditions of the degraded migration corridors. Therefore, in the case of the Elephant population of Similipal a natural order of social dominancy must have set-in long since

In animal world, at the concentrated resources, individuals could always be ranked in a dominance hierarchy although spatial separation between more dominant individuals do occur (for example see Craig and Douglas, 1986 for birds, and Singh, 1990 for Crocodilians). When individuals do not respect this dominance ranking or the dominant individual expresses certain other uncommon biological stress, the conflicts can be expected to take stronger forms.

Thus, a probable musth condition of the older bull and the mating urge of the growing-up younger bulls are expected to have cumulatively created the series of aggressive expressions leading to the killing of the two younger bulls.

There is yet another aspect of examination of the above subject: how many females were receptive at the time the bulls were fighting to satiate their mating urge? A female with calves is not receptive to males, and only where there are a fewer number of adult tuskers, the sub-adult tuskers get opportunities for mating (Ramachandran, 1984). A wild tusker was known to have had "managed to cover, brooking no competition, almost all the departmental cow elephants..." maintained at Jaldapada (Lahiri-Choudhury, 1988).

In Similipal Tiger Reserve the Elephant population was estimated to have 143 adults and 113 sub-adults with a sex-ratio of 1 male : 2.3 females (Anon., 1990). Thus, the aggressiveness of the victor in musth have been due to an additional reason, i.e., the availability of less number of receptive mating partners around UBK.

Duration : The exact duration over which a stress condition may last is uncertain. Yet, it is normal to expect that the duration of aggressiveness will continue until the causes for stress are overcome. For example, a situation arising out of a problem in social adjustment will conclude in the ultimate expulsion of the individual, the sub-adult male Elephant in these cases. Such a problem may arise at different age among the males but they are known to establish their own territories by the age of ten years (Desai and Johnsingh, 1993). Problems arising out of injuries and pain will culminate either at the stage of healing-up of the injuries or the death of the animal (Rajgopal, 1965; Sukumar, 1989) which also may take different durations.

Similarly, aggressiveness due to mating urge will continue till mating takes place as many times as the biological state of the male may demand. With respect to musth, it is known that bulls of 15-25 years age come to musth sporadically for short durations, those above 25 years have annual musths and those above 35 years have extended periods (Desai and Johnsingh, 1993). Thus musth may last from a few days to a few months (Patridge, 1993).

In the incidents of UBK it was not known for how long each battle had already been fought before coming to the notice of the staff and people at UBK. The people heard the fighting-trumpets only when the elephants were within about a kilometer of UBK. Ten to twelve hours and one hour, respectively, had taken for the death of animals in incidents I and II after the fights were taken notice of. The gap between the first and second kills was less than full two days. This is the period the victor, after killing the first bull, took to encounter the second bull. Yet, the duration is expected to be short and that the victims were, as stated earlier, not matching in age and strength for the victor.

Rajgopal (1965) has cited about a male-male fight that lasted for 3-4 days. Stracey (1963) mentioned of the days of Kheda operation in 1935-36 when two tuskers battled for "two whole days" until the victim was killed. Stracey comments that elephants are 'very vindictive in combat and fight to the death, the victor leaving the scene only when his opponent has been killed'.

In the wild it is not always possible to

detect a male-male fight when it is on. For example, in the instances described by Rajgopal (1965) and Lahiri-Choudhury (1988) there is no mention if second elephants were killed in a row.

Finally, aggressive expressions can also be directed towards people (HGHM, 1945; Lahiri-Choudhury, 1988; Sukumar, 1989; Barua and Bist, 1993; DTE, 1993), towards animals like bullocks (HGHM, 1945) or objects and constructions (Stracey, 1963; Lahiri-Choudhury, 1988).

Fight implications : Male-male fights involved the use of tusks, the strength to chase and corner, and the determination to see the death of the opponent. All these traits in the victor contribute to better qualities in the offsprings. Therefore, such killings cause no alarm for the biological principles involved in Elephant management, instead these ensure the natural selection leading to the survival of the fittest. Such natural orders, however, are upset due to unthoughtful removal of tuskers through capture or killing for human use.

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SUMMARY

Near Upper Barha Kamuda Range Office in South Similipal two elephants were killed in male-male fights, one in the morning of 28 Feb, 1994 and the other in the night of 01 March, 1994. Evidences from the sites of fights and the noises heard have enabled to construct the scenes of fight and offer reasons to such aggression in Elephant. The fights involved chasing, circular movements due to locked-in tusks, and goring into the body of the victim in the anal region, lower abdomen and behind the ear. Noises included trumpets and water splashes. A probable musth condition of the victor - the older bull, and the enhancing mating urge of the growing-up tuskers are expected to have led to aggressions. It was perhaps worsened by the availability of a less number of receptive mating partners. It was not known for how long each battle had already been fought before coming to the notice. The victor took about two days to locate, fight and kill the second bull after killing the first. In the wild it is always not possible to detect a male-male fight. Such male-male fights and kills are viewed as natural mechanisms allowing the best bull to enter into reproduction for continuance of the race.

सिमिलीपाल संरक्षित क्षेत्र उडीसा में देखा गया एशियाई हाथियों का नर-नर संघर्ष

बी०सी० प्रुश्ती व एल०ए०के० सिंह

सारांश

दक्षिण सिमिलीपाल में ऊपरी बरहा परिक्षेत्र कार्यालय के निकट नर-नर की आपसी भिड़न्त में दो हाथी, एक 28 फरवरी 1994 को सवेरे के समय तथा दूसरा 1 मार्च 1994 की रात में, मारे गए । भिड़न्त स्थली और वहाँ से सुने गए कोलाहल के साक्ष्य के आधार पर इस भिड़न्त के दृश्यों को प्रस्तुत किया और हाथियों के परस्पर संघर्ष के कारणों को

बताया जा सकता है । इस लड़ाई में पीछा करना, दांतों के उलझने के कारण गोल-गोल घूमना, शिकार बने हाथी के गुदा भाग, पेट के निचले भाग और कान के पीछे शरीर से रक्त बहना आते हैं । कोलाहल में चिंघाड़ और पानी फेंकने की आवाजें थी । विजेता-बड़ा नर हाथी संभवतः मस्त हो गया था और बढ़ रहे दंतेल की बढ़ती मैथुन इच्छा ही इस संघर्ष का कारण रही होगी । मैथुन उत्सुक संगिनियों की संख्या कम रहने से यह स्थिति कदाचित् और बिगड़ गई होगी । पता नहीं कि ध्यान में आने से पूर्व यह लड़ाई कितने समय तक लड़ी जा चुकी होगी । पहले को मार डालने के बाद दूसरे नर को खोजने, उससे लड़ने और मारने में विजेता को दो दिन लगे । जंगली अवस्था में नर-नर की लड़ाई देख पाना संभव नहीं होता । नर-नर की ऐसी लड़ाई और हत्याएँ प्राकृतिक तन्त्र के रूप में समझी जाती हैं । जिससे अपनी जाति को आगे चलाते रहने के लिए पुनरूत्पादन कार्य में सबसे अच्छा नर ही आगे जाता है ।

References

Anon. (1990). Elephant population estimation during 1989 monsoon. *Tech.* Report-3. ORI/N/SIM. Similipal Tiger Reserve, Orissa. 17 pp.

Barua, P. (1993) Managing an unmanageable population of elephants. *Abstracts. Intl. Sem. on the Cons. of the Asian Elephant.* Mudumalai Wildlife Sanctuary, 13-18 June. p. 9.

Barua, P. and S.S. Bist (1993). Changing patterns of distribution and movement of Wild Elephants in North Bengal. *Abstracts. Intl. Sem. on the Cons. of the Asian Elephant.* Mudumalai Wildlife Sanctuary, 13-18 June. p 9.

Craig, J.L. and M.E. Douglas (1986). Resource distribution, aggressive asymmetries and variable access to resources in the nectar feeding bellbird. *Behav. Ecol. Sociobiol.* **18** (3) : 231-240.

Desai, A.A. (1991). The home range of elephants and its implications for management of the Mudumulai Wildlife Sanctuary, Tamil Nadu. *J. Bombay Nat. Hist. Soc.*, **88** (2) : 145-156.

Desai, A.A. and A.J.T. Johnsingh (1993). Social organisation and reproductive strategy of the male Asian Elephant (*Elephas maximus*). *Abstracts. Intl. Semi. on Cons. of the Asian Elephant.* Mudumalai Wildlife Sanctuary, 13-18 June. p. 26.

DTE. (1993). Elephants: attacking in defence. *Down to Earth.* **2** (15) : 19.

Eisenberg. J.F., G.M. Mckay and M.R. Jainudeen (1971). Reproductive behaviour of the Asiatic Elephant (*Elephas maximus maximus* L.). *Behaviour* **38** : 193-225.

HGHM. (1945). Some reminiscences of sport in Assam. *J. Bombay Nat. Hist. Soc.*, **45** reproduced in *Hornbill*, 1983(2), July-August : 9-13 and 17.

Katugaha, H.I.E. (1993). Some observations on elephants in the Ruhuna National Park, Sri Lanka. *Gajah.* **10** : 26-30.

Lahiri-Choudhury, D.K. (1988). Aggression in young elephants. *Hornbill.* April-June, (2) 28-39.

Patridge, J. (1993). The complex lifestyles of a gentle giant. *Animals*, 13-18.

Rajagopal, K. (1965). Strange find in elephant's tusk socket. *J. Bombay Nat. Hist. Soc.* **62** (3) : 549.

Ramachandran, K.K. (1984). Observations on unusual sexual behaviour in elephants. *J. Bombay Nat. Hist. Soc.* **81** (3) : 687-688.

Santiapillai, C. and P. Jackson (1990). *The Asian Elephant : An Action Plan for its Conservation*. IUCN, Gland, Switzerland.

Santiapillai, C. (1993). Book Review : *The illustrated encyclopedia of elephants*. (Ed.) Eltringham, S.K. (1991). Salamander Books, London *Gajah*. **10** : 34-39.

Singh, L.A.K. (1990). Indian mugger, *Crocodylus palustris* Lesson (Reptilia, Crocodilia). Territorial Resource Partitioning and its implications in sanctuary management : A zoo project under Animal Management Course, National Extension College, Cambridge, UK. pp. 49.

Stracey, P.D. (1963). *Elephant Gold*. Natraj Publishers, Dehradun.

Sukumar, R. (1989). *The Asian Elephant. Ecology and Management*. Cambridge University Press, Cambridge, New York.