

STUDY OF SOCIAL INTERACTIONS AMONG ADULT TIGERS (*Panthera tigris tigris* Linn.) AND CUBS IN CAPTIVITY

S.K. Palita¹, A.K. Patra² and S.K. Patnaik³

INTRODUCTION

The tiger is usually pictured as an unsociable animal leading a solitary life. The well-known Chinese proverb "one hill cannot shelter two tigers" appears to have been taken literally (Schaller, 1967). Tigers are sociable only during the amatory season and when that is over the male betakes himself again to his solitary, predatory life (Inglis, 1892). Male and female tigers do not live together, even though they may have overlapping territories. Only when a tigress comes into heat she is joined by a male. They may stay together so long as the female's estrus period lasts (Mc. Dougal, 1977). The rearing of the cub is the sole responsibility of the female. The tiger appears to desert its male shortly before or after the cubs are born (Prater, 1948). The father plays no part in the up-bringing of the cubs, and it has often been suggested that he may be a danger to them. However, recent observations show that a close relationship can endure (Jackson, 1990). Schaller (1967) cites many examples from old literatures to contradict the idea that the tiger is always unsociable. Observations of Baker (1886) and Thapar (1886, 1989) ascertain that an association among father and cubs is possible.

This paper presents our findings on the social relationships among adult male and female tigers during the females' anestrus period as well as among the adult male tiger and its cubs in captive conditions.

MATERIALS AND METHODS

The Nandankanan Biological Park is situated inside the lush green forests of the Jujhagarh Forest of Chandaka Forest Division. The park is flanked in the outskirts by extensive swamps and marshes and many wild animals and birds move in and around park area.

Three different pairs of tigers and their cubs kept in three open enclosures (0.6 acres each) at the Nandankanan Biological Park formed the subjects of the present study. White male *Sangram* and normal female *Janhavi* formed the first pair, normal male *Debashis* and white



Fig. 1. Normal coloured male tiger *Debashis* and its white coloured cub sharing a close moment at Nandankanan Zoo.

female *Jamuna* formed the second pair and white male *Biswamitra* and normal female *Rohini* the third pair. The first pair produced two litters and the cubs were kept with the parents for 4 months and 1 year 8 months and 15 days respectively. Similarly the second pair produced two litters and the cubs stayed up to 1 year 1 month and 7 months respectively. In case of the third pair the cubs were kept for 1 year and 3 months.

Behavioural observations on social interactions was carried out from November 1992 to February 1996 through direct observations and with the aid of a binocular (Zenth 7 x 50 Field 7.1^o) whenever necessary. The usual practice in this zoo is to keep tigers in pairs and separate the expectant mothers a fortnight before the expected date of parturition till the cubs are about 9 months old (Acharjyo and Mohapatra, 1980). In an earlier experience in this biological park on 4 August 1988, tigress *Janhavi*

delivered in the presence of its male *Sangram* and two other tigresses before being shifted to a separate enclosure. Father *Sangram* fiddled with the cubs like a perfect father (ZP, 1988). During the present experimental study, the pairs of tigers were allowed to live together along with the cubs till the cubs were about one year old.

OBSERVATIONS AND RESULTS

The cubs born to three pairs of tigers were reared in the same enclosure with their father. Male tigers neither disliked nor showed any agonistic behaviour towards the cubs, and posed no problem

¹ Dept. of Zoology, Kendrapara College, Kendrapara 754 211.

² Environmental Biology Lab., P. G. Dept. of Zoology, Utkal University, Bhubaneswar 751 004

³ Nandankanan Biological Park, Mayur Bhawan, Bhubaneswar 751 007

or the safety and security of the blind and helpless cubs in the first fifteen days of their birth. Gradually the weaned cubs approached the father, nuzzled him, crawled over his body and very often were found to lie closely with him without any fear (Fig.1). Even the cubs shared food with the father peacefully. Very often the male and female tigers lay closely with their cubs just like a pride of lions (Fig.2).

During the period of this study tigress *Jamuna* and *Janhavi* came into estrous, even though growing cubs stayed with them (Table-1). The most remarkable event was that the cubs of the first and second pair witnessed the act of mating curiously without posing any problem. However, during the second mating period, the cubs disturbed their mating parents, particularly the male cub mounting over the father during the act. Male parent, *Debashis*, of the second pair growled at the cub and this act of intolerance continued further even after the completion of the mating period. After this incident the cub was separated to a different enclosure. Though the two cubs of the first pair disturbed their parents in the second mating period, father *Sangram* did not show any sort of intolerant behaviour. During the third mating period of the first pair (Table 1) two cubs posed no problem for the parents and tigress *Janhavi* conceived and pregnancy continued even though her grown-up cubs and the male stayed with her.

During feeding time, the three grown-up cubs of the third pair entered the feeding chamber first and shared a large chunk of food, consequently health of the father deteriorated. In one feeding session, when father *Biswamitra* was injured by one of its cubs, it was separated from cubs.

During anestrus period, both male and female came face to face, brushed the body, smelled the scent marks and produced the characteristic 'flehmen' (Leyhausen 1950)

These activities were of regular occurrence. However during the feeding time this association between them breaks a little with the male tiger first entering the feeding chamber to have the best part of the beef (heart, liver and lung-mass), keeping a strict vigil on the feeding chamber. However, on many occasions (n =12) the tigresses with small cubs (3 to 4 months old) entered the feeding chamber first and the male had to wait outside.

DISCUSSION

Schaller (1967) cites many examples to contradict the idea that the tiger is always unsociable. Forsyth (1889) reports that he has seen five, and once seven tigers to be driven out of one cover. A male and a female have often been seen together (Brander, 1923) and Sanderson (1912) once observed two females and a male on a kill brought down by the latter animal. Hewett (1938) notes that "a family will be met of father, mother and two or three cubs, some times as large as the mother before they leave her". The largest party ever seen by Brander (1927) consisted of six animals, one large male and two fully grown female accompanied by three young animals almost as big as the parents.

Schaller (1967) saw a male together with a tigress and her four cubs on two occasions, the first when the cubs were only four months old, and the second when they were eleven months. Citing this above example Mc.Dougal (1977) says

that "probably prior relationship do have a bearing on the situation, as do different temperament of individuals. Generally speaking the tigress keeps small cubs out of the males way". Observations of Thapar (1986) in Ranthambhore Tiger Reserve India suggest that a close relationship can exist between the male tiger and cubs. Thapar (1989) also describes the incident of male tiger Kublai visiting tigress Nalaghatti and Noon and their cubs separately. Similar reports of wild tigers living in groups have also come from Siberia. In eastern Siberia researchers have found tracks of parties of five to seven repeatedly moving together (Jackson, 1990).

Such assemblies do not, however, disprove the solitary nature of the tiger when compared with the lion. The different habitats in which they evolved has encouraged their divergent life-styles. Lions live mainly in open habitats where there is abundant prey and social units based on mother-daughter relationship and survive through co-operative hunting. But co-operation is no advantage for tiger hunting in the dense cover where prey is dispersed and rare. Even lions tend to become more solitary in areas where there is no large concentration of prey (Jackson, 1990).

The main points that emerge from the description of the tiger's social organisation is that although the cat is essentially solitary, it is not unsociable (Schaller, 1967). Solitary mammals have a communal organisation, just as those that normally live in groups (Leyhausen, 1965). It may be conjectured that the solitary habits of the tiger are an adaptation to the average size and availability of its prey. Much of the tiger's food consists of relatively small mammals such as pigs and deer which if shared with several other adults would not provide enough meat for them all. The prey is usually scattered and time-consuming to find and stalk in the forests. Under such conditions, a solitary search for prey is probably more efficient than a communal hunt (Schaller, 1967)

In captive conditions such as Nandankanan Biological Park, where searching for food is not a problem as it is provided to each of them, there is no competition among themselves over food. Over the years as these pairs of tigers are allowed to remain together it is obvious that they have developed mutual acceptance for each other. Enough space is available, abundance of plant provide shade and objects for marking and pawing.

Estrous in most instances is held in abeyance while the tigress has her cubs (Schaller, 1967). However, findings of the present study negates this view as five estrous periods were observed in two tigresses in the presence of about one year old cubs (Table-1). Tigresses may on rare occasions be accompanied by cubs of different ages (Brander, 1923). Stewart (1928) shot a pregnant tigress which was followed by a cub of about ten months old. Captive lions have been known to go into estrous while nursing young (Cooper, 1942). Occurrence of estrous and continuation of pregnancy in the presence of grown-up cubs in tigress *Janhavi* in the present study supports the findings of Brander (1923), Stewart (1928) and Cooper (1942). In captivity there is also no demand on the part of the mother to forage for the offspring to teach the young about hunting and to enable them secure a place of their own as in the wild. Absence of these responsibilities may be conducive for nursing tigresses to come into estrous in captivity.

Table 1. Occurrence of estrous in tigers in the presence of one year old cubs in captivity at Nandankanan Biological Park.

Name of tigress	Date and duration of estrous	Age of cubs during the estrous of the mother
Jamuna (white)	23.08.94 - 27.08.94 (5 days) 27.09.94 - 04.08.95 (5 days)	11 months 26 days 1 yr. and 1 month
Janhavi (normal)	31.07.95 - 04.08.95 (5 days) 08.09.95 - 15.09.95 (8 days) 15.11.95 - 21.11.95 (7 days)	10 months 25 days 1 yr. and 2 days 1 yr. 5 months and 9 days

The agonistic behaviour shown by one male tiger against its male cub in the present study is clearly an indication that the adult male can't tolerate the presence of grown-up cubs for long. The deteriorated health condition of the male tiger *Biswamitra* due to scarcity of food caused by three grown-up cubs and it being injured by one of its cubs is another indication that harmonious relation among father and grown-up cubs can't continue for long. So as long as cubs do not pose any problem over food, territory and mating rights, the male tiger accepts them. The tiger *Sangram* did not show any agonistic behaviour against its two one-year and six-months old cubs as they did not pose problems for the parents.

The present observation is limited to only five litters of three pairs of tigers over a period of three years. But to reach a definite conclusion, it is necessary to study more pairs of tigers with cubs over long periods of time.

ACKNOWLEDGEMENT

We are thankful to the Wildlife Wing of the Forest Dept. Govt. of Orissa for facilities provided and to Mr. K. L. Purohil, Range Officer, Sanctuary Management, Nandankanan Biological Park for photography. S K P is grateful to U G C, New Delhi for a

minor research project.

REFERENCES

- Acharjyo, L.N. and Mohapatra, S. 1980. Litter size of some captive wild mammals. *J. Bombay nat. Hist. Soc.* 77(2): 321-325.
- Baker, E.B. 1886. *Sport in Bengal*, Ledger Smith & Co. London
- Brander, A. 1923. *Wild animals of Central India*. Edward Arnold, London.
- Cooper, J. 1942. An exploratory study of African lions *Comp. Psychol. Monogr.*, 17(1): 1-18.
- Forsyth, J. 1889. *The highlands of Central India*. London (Cited by Schaller, G. B. 1967).
- Hewett, J. 1938. *The highlands of Central India*. London (Cited by Schaller, G. B. 1967).
- Inglis, J. 1892. *Tent life in Tigerland and sport and work on the Nepal frontier*. London.
- Jackson, P. 1990. *Endangered species. Tigers*. Chartwell Book. 110 Enterprise Avenue. New Jersey.
- Leyhausen, P. 1950. Beobachtungen an Lowen-Tiger-Bastarden mit einigen Bemerkungen zur Systematik der Gross Katzen *Z.f. Tier psych.* 7(1): 48-83.
- Leyhausen, P. 1965. The communal organisation of solitary mammals. *Simp. Zool. Soc. London* 14: 249-263.
- Mc. Dugai, C. 1977. *The face of the Tiger*. Clarion Book.

Rivington Books and Andre Deusch.

Prater, S. H. 1948. *The book of Indian Animals (Third Edition)*. Bombay Nat. Hist. Soc. Oxford University Press. Bombay

Sanderson, G. 1912. *Thirteen years among the wild beast of India*. Edinburgh.

Schaller, G. B. 1967. *The Deer and the Tiger*. the University of Chicago Press. Chicago and London.

Stewart, A. 1928. *Tiger and other game*. London (Cited by Schaller, G. B. 1967).

Thapar, V. 1986. *Tiger. Portrait of a Predator*. Collins & Grafton Street. London

Thapar, V. 1989. *Tiger. The secret life*. Elm tree Books Penguin Group. 27 Wrighter's Lane. London.

Baby sitting father tiger ZP 1988 3(12): 10



Fig. 2. A tiger family at Nandankanan (normal tiger Debashis, white tigress Jamuna and their white cub).