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SHORT COMMUNICATIONS

Mother-infant Relationship in the Slender Loris (*Loris tardigradus lydekkerianus*)

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ABSTRACT. Close observations under caged conditions were made on the behaviour of four mother lorises towards their own and alien infants. There appears to be no mutual recognition between the mother and her infant, and the relationship appears to be less specific. The infants are accepted by and get settled with any lactating female. In the first few weeks after birth, there is an intense attachment exhibited by the mother towards her baby. When the baby is separated, it exhibits a series of "fixed action patterns." As the infant grows older, maternal interest declines and is lost after about 15–20 weeks post partum.

Vocalization of the separated juveniles evokes greater maternal response than the visual cue.

INTRODUCTION

The mother-infant relationship is the chief agent facilitating learning and modifying the behaviour of the young. In some species, this relationship is close and enduring. In others, it is less specific. In these forms adoption of infants may be either optional as in many rodents (KAHMANN & FRISCH, 1952) or a rule as in bats (DAVIS, HERREID, & SHORT, 1962). The specificity of mother-infant relationship involves the recognition of one by the other and raises interesting questions about the stimuli involved in such a mutual recognition specially when the infant is to be recognized by its mother (BEACH & JAYNES, 1956).

Our knowledge on the mother-infant relationship in the prosimian group is too scanty. Most of the prosimians are small in size and nocturnal in habit and thus pose a problem for their eco-behavioural study in nature. It is equally difficult to maintain them under laboratory conditions and breed them. The report on the mother-infant relationship in the lemurs under laboratory conditions (KLOPPER, 1974) is interesting and reflects on their habit and habitat. In such social organizations with infant precocity, the acceptance of substitute mothers and infants has a great survival value (KLOPPER, 1974). An attempt at understanding the mother-infant relationship in freshly captured wild slender lorises has been made under caged conditions in the present study.

MATERIALS AND METHODS

Slender lorises were caught from the forest areas around Bangalore and maintained under laboratory conditions for a fortnight before observations were made. Their staple food was bananas and cockroaches, occasionally supplemented with milk and eggs. Four mother animals selected for the observations were: *Loris A*: a mother of about 1-week-old (judged by the fur color and weight) twins weighing 15.5 g—the twins died on the day of capture and the

mother had ceased to lactate at the time when the observations were made 15 days later; *Loris B*: a mother of a male infant weighing 38.5 g (about 6-8 weeks old); *Loris C*: a mother of heterosexual twins weighing 24 and 25 g, respectively (about 3 weeks old); and *Loris D*: a female who had just given birth to 1-day-old twins.

These females were caged separately and placed adjacent to one another. An adult male was introduced into the cage of *Loris A* and another into the cage of *Loris C*; however, the male caged with *Loris A* was withdrawn as the female was very aggressive towards him during the course of observations.

The infants were temporarily separated from their mothers and the reactions of the mother and the young towards mutual separation were observed on successive days for two weeks. The ability of the mother to recognize its own infant from others was also tested by presenting it the infants of other animals simultaneously or separately.

Squeaking infants after separation from their mothers were placed out of sight of the mothers within an audible distance to study whether it was the visual cue or the auditory cue that was responsible for evoking maternal response. An infant which was weak even to vocalize was also used to compare the efficiency of the visual and auditory cues in evoking the maternal response.

These observations were made over a two-week period—daily for 1 hr and the response showed very little variance over the period.

OBSERVATIONS AND RESULTS

Although learning modifies the behaviour of an organism to a considerable extent, the innate, fixed action patterns themselves do not change. This is very true of the slender loris mother-infant relationship which changed very little over the two-week period of observation under laboratory conditions.

The immediate reaction of the mother towards infant separated was an angry growl followed by the mother's trying to bite the observer. No sooner was/were the infant(s) taken out and the door of the cage closed, the mother who was confined in it began to show a series of "fixed action patterns" such as biting the twigs, rushing repeatedly towards the cage door, pulling the bars of the cage, retreating to a corner, foot-scratching, urine-washing, licking its palms, and vocalizing ("cawing"). When the infant was held close to the cage, the mother frantically tried to snatch it through the bars of the cage.

The infant(s), on the other hand, began to screech and "caw" in a high pitch with an occasional whistle. When left free, the infant(s) began to move about and tried to climb up any support that it/they came across in the way. Its/their vocalization increased the aggressiveness of the mother.

These responses of the mother and the infant were stereotyped and varied very little between individuals. However, there was a slight variation in the degree of eagerness in the mother to get at the infant when given an opportunity. *Loris A*, whose young were dead a fortnight before the observations were made, when given an access to the separated young, immediately rushed to it (Fig. 1) and picked up the infant (Fig. 2), and licked it holding in both the hands. She then helped the baby to cling to her and sat in a corner grooming and licking the infant (Fig. 3) and also her own finger and toe tips.

A similar response was obtained from *Loris C* and *Loris D* when given access to their own/other infant(s) after temporary separation from their own young. However, *Loris B* with an

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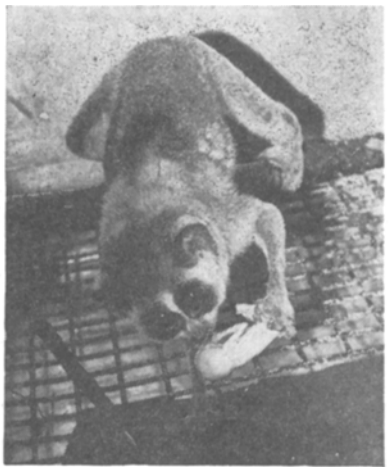

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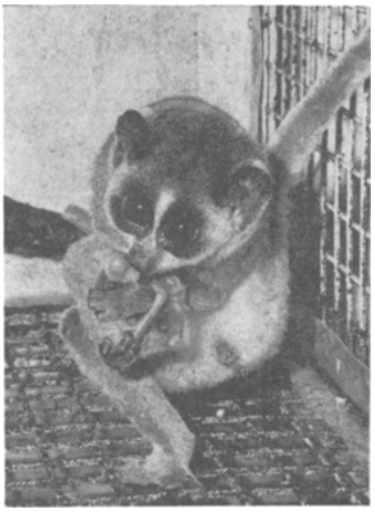

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Fig. 1. Mother approaching the baby.
Fig. 2. Mother picking up the baby.
Fig. 3. Mother licking the baby.

older infant (6–8 weeks old) showed a lesser degree of response and eagerness to get at the infant presented to her.

There was no mutual recognition between the mother and her infant. The mother would pick up any infant as readily as its own young. When the three different infants were offered together or singly, all of them were picked up with the same eagerness and fondness and were carried back to the corner of the cage.

Loris A was caged along with a male, and the two were quite compatible. When the infants of *Loris B* were offered to *Loris A* and subsequently separated from her, the female became very aggressive towards her cagemate and finally the two were separated. However, *Loris C* which had her twins showed no such dominance and aggressiveness towards another male caged with her even when the infants were separated. In fact, this male would sit next to the female and groom her. This type of behaviour is true of gregarious forms. However, nothing is known about the social life of the slender loris in the wild.

Any infant would settle with any lactating female. The infants would not react in anyway between themselves. The three babies would cling to the mother, and the infant that failed

to apply itself to the teat became restless, started squeaking and screeching, and climbed onto the mother's back. The mother was not reactive to such an infant. None of the infants was comfortable with *Loris A* which, having lost her young, had ceased to lactate.

Unless there was vocalization on the part of the infant, it was not picked up by the mother. When the separated infant was placed out of sight of the mother, the mother would look in the direction of the sound. If the infant stopped squeaking or screeching either due to fatigue or otherwise, the mother looked round anxiously for sometime and then settled quietly in the corner of the cage accepting the absence of the young.

One of the infants in the collection was too weak to move about or to vocalize loudly. This young was deserted by its mother when it had lost the strength to cling to her. When this infant was presented to *Loris B* and *Loris C*, it was not picked up by either of them. However, when placed in the cage of *Loris A*, which had lost its young, this animal sat next to the infant, bent over and licked it and started making shrill "cawing" sounds. When an active young was simultaneously presented, *Loris A* picked it up and licked it for sometime. However, when the weak infant was disturbed by the observer to remove it from the cage, it suddenly gave a loud shrill call which brought *Loris A* to it.

No such responses were observed from the mothers of older infants (i.e., infants weighing above 50–60 g). Except for an angry growl at the time of separation, the mother would not try to retrieve her young. The young also would soon accept the separation and try to position itself in a comfortable manner and sleep after one or two squeaks. Thus, a decline in the maternal aggressiveness towards infant-separation is seen with the increasing age of the infant.

When a number of lactating females with their young ones were caged together, the infants freely moved about from one to another and settled with any mother without any resistance from any angle.

DISCUSSION

Of the five main affectional systems identified in primates (HARLOW & HARLOW, 1965), the "mother-infant" affectional system is responsible for the better survival and easy acceptance of the young into the social organization of the group (RAHMAN & PARTHASARATHY, 1971). This minimizes the innumerable psycho-social problems that the juvenile has to successfully overcome in order to emerge as a fully fledged adult.

The slender loris bears either a single infant or twins once a year. The twins may be isosexual or heterosexual (RAMASWAMI & ANAND KUMAR, 1965). It has two pairs of functional mammae and develops the characteristic "lacteal tract" (SETH, 1960; RAMASWAMI & ANAND KUMAR, 1965) during the "heavy lactation" period.

The maternal attachment and protection in the slender loris begin at the time of parturition. An intense attachment is exhibited by the mother towards her newborn. Any separation at this stage evokes a series of "fixed action patterns" both in the mother and the infant. The vocalization of the separated infant evokes a greater response than a mere visual cue. This probably has a selective value in the natural habitat of thick foliage for the mother to locate her lost infant.

The mutual recognition of the infant and the mother persists even three weeks after separation in a 210-day-old rhesus monkey (SEAY, HANSEN, & HARLOW, 1962). The same is true of 2-week-old langur infants (JAY, 1963) and 4–6-week-old squirrel monkey infants (ROSENBLUM,

1968). Such a recognition is totally lacking in the slender loris. In the squirrel monkey, however, older infants showed a variable choice between the mother and the aunt (ROSENBLUM, 1968). The mother-infant recognition is needed in gregarious forms where a clear social hierarchy exists. In the slender loris, however, the social organization appears to be rather loose, and if at all it exists, it is limited to a small group of four to five animals. If they live in small groups, there is very little chance of mothers' being mixed up and hence a need for mutual recognition is not felt in the loris.

In lemurs which live in larger groups, the acceptance of substitute mothers by precocious infants and snatching of more independent infants by nearest adults at the approach of a predator reflect on the high rate of activity and widely ranging movements, and in short, promote infant precocity which has a greater requirement for surrogate mothers for protection than do less precocious babies (KLOPPER, 1974). In the slender loris where the infant at birth is completely dependent on its mother, the lack of mutual recognition between the mother and her infant and the easy acceptance of one by the other are of selective value, for the slender loris which moves very actively among treetops under the cover of thick foliage faces a greater risk of infant loss than many other primates. The slender loris mother picks up any screeching infant irrespective of the number of its own young and their age. The infant is comfortable too with any lactating female.

By about the time the loris infant is 4 months old (about 80–100 g body weight), it is capable of taking solid food. Under caged conditions, such infants are seen moving away from the mother and exploring the corners of the cage for considerable length of time and even eat bananas and cockroaches provided for the mother. Any separation at this stage evokes no response except an angry growl from the mother and a squeak or two from the infant. Even the mother fails, when allowed, to retrieve the young. However, in the wild, the infants appear to be dependent on the mother for a longer period.

One of the basic affectional variables in the primate order is not just contact but "clinging contact" (BOWLBY, 1958) which could be responsible for the infant dependence on the mother even beyond the nutritional stage in the slender loris. This persistence of infant dependence is seen in some of the primates with a strong social organization like the bonnet macaque (RAHMAN & PARTHASARATHY, 1971) and the rhesus macaque (HARLOW, HARLOW, & HANSEN, 1963).

The decline in the nutritional support and affection from the mother probably drives the older infant to spend more time away from the mother exploring the surrounding environment and thus seek new avenues to emerge as a fully fledged "individual."

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