Pseudoestrus in pregnant Hanuman langur females: Functional explanations

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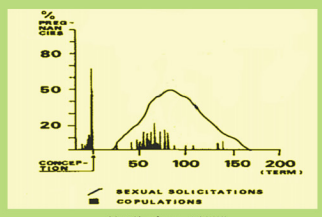
Introduction

Females of Hanuman langurs *(Semnopithecus entellus)* show frequently behavioural estrus (pseudoestrus) during their pregnancy. The pseudoestrus is not likely to be a mere tailing of pre-conception cycles, because of its specific form clearly differing from proper, ovulatory estrus.

Estrus has a cyclic pattern, proceptive periods are separated by anestrus with menstruations, frequency of solicitations is high.

Pseudoestrus in pregnancy lacks the cyclic pattern, it persists continuously for several week's period, no vaginal bleeding occurs, frequency of solicitations is lower than during the proper estrus.



Adapted from Sommer *et al.* (1992)

Question: How to explain the function of pseudoestrus in pregnancy?

H1: Prevention of infanticide by new troop males

According to the classical functional explanation by Hrdy (1977), **mating with a potentially infanticidal male during female's pregnancy may lead to paternity confusion.** Such male is expected to behave as the female's infant sire and not to harm the infant after it is born.
However, the field data strongly suggest that mating with pregnant female does not subsequently affect infanticidal behaviour of the new troop male(Sommer et al. 1992, Borries et al. 1999, our unpublished data). This is in contrast with the data that have shown such effect after mating with non-pregnant females.

H2: Prevention of infanticide by extratroop males

The question arises, how can the male distinguish pregnant from non-pregnant females. It seems likely that he responds to the temporal pattern of solicitations, described above. This would be possible only in case of regular contact with the female. The data showing no effect of copulations on infaticidal behaviour concerned only established troop member ma es, who do have such regular contact. However, there is a number of other, extratroop males, who may pose a potential infanticidal threat, too. **Supposing it is the temporal pattern of soliciticationsgiving the clue to uncover pregnancy, we suggest that the extratroop males still can get confused.**
Specific pattern of pseudoestrus, hard to be explained at the first glance, can be seen in this light to optimize the chance of such "adulterous" matings. Contact with extratroop males is limited for the female and the continuous receptivity can be beneficial for her in such situation.

H3: Reducing risk of abortion

We are suggesting yet another alternative. The pseudoestrus may serve to reduce male's aggresion toward the females. Because the incidence of abortions is higher during the periods of social instability, the pregnant females may have extra benefit from reducing the tensions. This view is supported by observations that pseudoestrus is more likely to occur following male membership changes in troops, which is not consistent with the explanation of pseudoestrus as infanticidal counterstrategy directed to extratroop males.

	Predictions of hypotheses			Field data
	H1 Prevention of infanticide by new troop males	H2 Prevention of infanticide by extratroop males	H3 reducing risk of abortion	
temporary pattern	cyclic (imitating proper estrus)	continuous (maximizing chance of copulation)	continuous (maximizing frequency of copulations)	**continuous**
social situation dependancy	following male immigration	each pregnancy	following male immigration	**data inconsistent:** each pregnancy or only following male immigration
effect of copulations with new troop males on infanticide	reduced risk	no effect	no effect	**no demonstrable effect**
effect of copulations with extratroop male on infanticide	no effect	reduced risk	no effect	**no data**
effect of copulations on rate of abortions	no effect	no effect	reduced rate	**no data**
	rejected	**inconclusive**	**inconclusive**	

Conclusions

- **There are at least three possible explanations concerning the function of the pseudoestrus in pregnant Hanuman langur females.**
- **At present, the data concerning the functional explanation of pseudoestrus remains inconclusive.**
- **There is a strong need for data concerning (1) the effect of copulations, in particular with the extratroop males, on the infanticidal behaviour and (2) the social situation dependence of the pseudoestrus.**

References

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