

A REVIEW: POSSIBILITIES OF ALLOSUCKLING OCCURRENCE IN CAMELS (*CAMELUS BACTRIANUS*)

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Abstract

Allosuckling (non-offspring nursing) occurs in many mammal species. This paper discusses five main hypotheses of allonursing (why do mothers nurse an alien offspring) and also reasons of allosuckling (why do allosucklers suck from alien mother). Allosuckling was observed in many ungulates, both in pigs and in ruminants, e.g. in fallow deer, red deer, water buffalo and others. Allosuckling occurrence is increased by captivity but it was also observed in wild animals. Some cases of allosuckling were also seen in camels but it was not studied yet, so allosuckling research in camels is a challenge for future.

Key words: allosuckling; ungulates; camels

INTRODUCTION

Allosuckling (allosucking, allonursing or communal nursing, communal suckling, non-offspring nursing, fostering, mis-mothering) in mammals means the situation when lactating female allows the offspring of another animal to suck her milk (e.g. PACKER et al., 1992). This situation can appear intentionally (when a female knows that the suckling young is not her own and despite of this fact she allows him access to her udder) or by mistake (when a female does not know she is suckling alien offspring - she does not recognize the young or she does not notice it while suckling together with her own offspring).

Why Do Females Suckle Alien Offspring

When the latter case occurs, this "milk-theft" is advantageous only for the suckling youngster, but not for the female. Lactation is a great energetically cost and when allosuckler steals milk, there would be not enough for her own young. It seems that females will reject all the solicitations of alien offspring. However, it is not always right.

As mentioned above, female sometimes suckles an alien offspring knowingly. It implies that this behaviour is to her benefit. Five main hypotheses have been put forward to explain why females nurse alien offspring and what type of benefit they get from it. These five hypotheses were reviewed by ROULIN, 2002. All these hypotheses are not mutually exclusive and that is why it is very difficult to decide what the reason of allosuckling is and all the occurrences should be assessed by many points of view.

The Kin Selection Hypothesis

The kin selection hypothesis proposes that mother nurses alien offspring only if they share genes by common descent allowing her to spread those genes in her population (PACKER et al., 1992).

The Reciprocity Hypothesis

The reciprocity hypothesis proposes that two females achieve a higher fitness when nursing each other's offspring to a similar extent than when they do not share milk (ROULIN, 2002).

The Parenting Hypothesis

Under the parenting hypothesis, females nurse alien offspring to improve their maternal skills, and hence allosuckling should be performed mainly by inexperienced females (ROULIN, 2002).

The Milk Evacuation Hypothesis

The milk evacuation hypothesis advocates that mothers nurse allosucklers to evacuate surplus milk that their own offspring did not consume, e.g. for descending her body weight before hunting (ROULIN, 2002).

The Misdirected Parental Care Hypothesis

This hypothesis proposes that female doesn't know that she suckles an alien offspring (she didn't notice that it is not her own or allosuckler steals her milk). This implies that the loss of milk and risk of contracting pathogens from allosucklers entails fewer costs than being vigilant to detect, recognize and reject alien offspring (ROULIN, 2002).

Why Do Allosucklers Suck from Alien Mother

The reason why allosucklers suck from alien females seems to be easier to find. Also in this case many hypotheses exist. The decision why allosuckler uses the alternative source of milk can be evident, when its mother e.g. doesn't have enough milk to cover its energetic requirements. Allosuckling observed in water buffalos (*Bubalus bubalis*) (MURPHEY et al. 1995) was associated with a lack of maternal experience in young cows and apparent milk theft by hungry calves whose mothers were not providing them with sufficient milk. Investigation in Iberian red deer (*Cervus elaphus hispanicus*) showed an inverse relationship between milk production and percentage of allosuckling attempts. Allosuckling attempts were more frequent after the milk overproduction period. Both findings

suggest that allosuckling is a response to compensate for a reduced maternal milk supply (LANDETE-CASTILLEJOS et al., 2000). Negative correlation between milk supply and allosuckling attempts was found also by RÉALE et al., 1999.

There are also less evident reasons of allosuckling, like those proposed in the “immunological function of allosuckling hypothesis” which postulates that by suckling several lactating mothers, allosucklers obtain more diverse specific immune compounds and thereby improve resistance against pathogens and parasites (ROULIN & HEEB, 1999).

Allosuckling in Ungulates

In 1992 PACKER assessed the occurrence of allosuckling in 100 mammalian species (PACKER, 1992). Ungulates were represented by 30 species. From the assembled records 15 species demonstrated allosuckling.

Most of the allosuckling records were observed in *Suidae* (3 species assessed), the only taxon belonging to ungulates where females routinely give birth to multiple young. The rest of species where allosuckling was recorded is formed mainly by taxons where females typically give birth to a single young (except goats). The extent of allosuckling in these taxons was maximally 10 % of total nursing time by young (PACKER et al., 1992).

However, Packer’s list doesn’t contain other ungulate in which allosuckling also occurs. And besides, the extent of allosuckling (number of allosuckling events / number of total suckling events ratio) is higher in recent studies. Here are some examples of studies that support more allosuckling occurrence in wild animals than PACKER (1992) pretends:

EKVALL, 1998 investigated incidence of allosuckling in wild population of fallow deer (*Dama dama*). Allosuckling occurrences formed 43 % of all observed suckling occurrences. Great appearance of allosuckling was also recorded in wild mouflons (*Ovis musimon*) (RÉALE et al., 1999).

Following results confirm the finding of PACKER (1992) that the incidence of allosuckling is increased by captivity. The incidence of allosuckling could be indeed increased by this factor; on the other hand we have to take into account the fact that allosuckling observation is connected with much more technical difficulties in wild animals in their natural environment.

Frequent example of allosuckling in captivity is the case of domestic water buffaloes. Both major types of the species, river buffalo and swamp buffalo, exhibit allosuckling. MURPHEY et al. (1995) investigated allosuckling in 30 lactating river buffalo cows and their calves. The extent of observed allosuckling was more than 50 % of all suckling events. PARANHOS DA COSTA et al. (2000) found out the correlation between social interactions (among others allosuckling), birth order and sex of calves, which may affect the weight gain of calves, and that is why it has to be taken into consideration in animal husbandry.

LANDETE-CASTILLEJOS et al. (2000) compared milk intake of captive Iberian red deer in group-suckling experiment and in isolation-suckling experiment. In group-suckling experiment allosuckling occurred in 37,80 % of all suckling events.

Despite of the fact that the occurrence of allosuckling tend to be much greater in captive ungulates, there are also situations when allosuckling was observed in wild animals.

Allosuckling in Camels

Although the dromedary camel (*Camelus dromedarius*) is mentioned in the PACKER’s list (1992) the occurrence of allosuckling wasn’t confirmed there. The Bactrian (two-humped) camel (*Camelus bactrianus*) is missing at all. According to my latter observations Bactrian camels exhibit allosuckling at least in captivity (nonpublished data).

Bactrian camel lives in social groups, these groups are formed mostly by females and calves. And besides, there are bachelor groups and single males. Bactrian camel is a seasonal breeder, breeding season starts in January – March and ends in June – July in Northern Hemisphere. This time males form harem groups, fight with each other and take care of the females in wildness. In captivity camel groups are similar – females and youngsters, bachelor and male groups, during the rutting season males are allowed to mate females. In some cases male is kept together with female group all over the year.

Ovulation is induced 36-48 h after mating or insemination (HAFEZ & HAFEZ, 2001). Camel female is pregnant more or less 400 days and she give always birth to single young. Mother usually leaves the herd for parturition. Camel female is a passive type of mother - she never licks her calf and doesn’t help it to rise. Newborn calves can walk after 2 hours and can follow their mothers after 24 hours. Female can suckle her calf 1 to 2 years; weaning time depends on the time of following parturition. Camel female normally has one calf every two years. Camels mature in 3 – 5 years and expected live length is 35 – 40 years (MASSICOT, 2004).

CONCLUSION

Allosuckling occurs in many mammal species. It is quite a lot spread in ungulates and its occurrence tends to be increased by captivity. However, it was seen in wild animals, too. Allosuckling in camels was not studied yet, so allosuckling research in camels is a great challenge for future.

REFERENCES

- EKVALL K. (1998): Effects of social organization, age and aggressive behaviour on allosuckling in wild fallow deer. *Animal Behaviour*, vol. 56, p. 695–703

- HAFEZ E.S.E., HAFEZ B. (2001): Reproductive parameters of male dromedary and bactrian camels. *Archive of andrology*, vol. 46 (2), p. 85-98
- LANDETE-CASTILLEJOS T., GARCIA A., GARDE J., GALLEGRO L. (2000) : Milk intake and production curves and allosuckling in captive Iberian red deer, *Cervus elaphus hispanicus*. *Animal Behaviour*, vol. 60, p. 679–687
- MASSICOT P. (2004): Animal Info - Wild Bactrian Camel. [<http://www.animalinfo.org/species/artiperi/comebact.htm>], last modified April 21, 2004.
- MURPHEY M. R., PARANHOS DA COSTA M. J. R., DA SILVA, R. G., DE SOUZA, R. C. (1995): Allonursing in river buffalo, *Bubalus bubalis*: nepotism, incompetence, or thievery? *Animal Behaviour*, vol. 49, p. 1611-1616
- PACKER C., LEWIS S., PUSEY A. (1992): A Comparative Analysis of Non-offspring Nursing. *Animal Behaviour*, vol.43, p.265-281
- PARANHOS DA COSTA, M. J. R., ANDRIOLA, A., SIMPLICIO DE OLIVEIRA, J. F., SCHMIDEK, W. R. (2000): Suckling and allosuckling in river buffalo calves and its relation with weight gain. *Applied Animal Behaviour Science*, vol. 66, p. 1–10
- REALE D., BOUSSEES P., CHAPUIS J.-L. (1999): Nursing behaviour and mother–lamb relationships in mouflon under fluctuating population densities. *Behavioural Processes*, vol. 47, p. 81–94
- ROULIN A, HEEB P. (1999): The immunological function of allosuckling. *Ecology Letters*, vol. 2, p. 319–324.
- ROULIN, A. (2002): Why do lactating females nurse alien offspring? A review of hypotheses and empirical evidence. *Animal Behaviour*, vol.63, p.201-208

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