

# Suckling attempts during winter by two non-filial Steller sea lion pups (*Eumetopias jubatus*)

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Porter B. T. & Trites A. W. 2004. -Suckling attempts during winter by two non-filial Steller sea lion pups (*Eumetopias jubatus*). *Mammalia* 68 (1) : 23-26.

Milk stealing and fostering care is rare among mammals (Packer *et al.* 1992). Such behaviour can benefit neonates and possibly the nursing foster mother (Roulin 2002, 2003). However, it also likely comes at a cost to the fostering mother and her dependent young. Neonates may increase their chances of survival by sneak-suckling unrelated females, or by obtaining milk with the consent of mothers of other neonates. However, chances are greater that females protective of their limited milk resources will aggressively prevent unrelated young from suckling. Risks of being bitten, attacked or killed by adult females presumably outweigh the potential benefits that might be achieved by sneak-suckling.

Among pinnipeds, the nursing of offspring that are not their own (allosuckling) has been noted for some species of seals, but rarely for sea lions or fur seals. Only one case has so far been reported of a nonfilial Steller sea lion pup (*Eumetopias jubatus*) successfully obtaining milk, and the duration was only 30 seconds (Higgins 1984). Since this observation, thousands of hours have been spent observing Steller sea lions in the wild (Trites & Porter 2002; Milette & Trites 2003; Trites, unpubl. data), but only two additional successful suckling attempts have been noted. These two observations are noteworthy because of their rarity and the interest in understanding allosuckling in mammals (e.g., Roulin 2002,

2003). They also have bearing on the poorly understood process of weaning in Steller sea lions.

Steller sea lions have a protracted nursing period that may last as long as a year in most cases, or may be extended for another year or longer (Pitcher & Calkins 1981). The process and exact timing of weaning in Steller sea lions is not known, but it has been speculated to occur sometime during winter or spring when pups are 6 months or older.

From January to March 1996, we observed two non-filial pups repeatedly suckling lactating females at a winter haulout site at Timbered Island in southeast Alaska. During over 560 hours of winter observations at this site, we observed an average of 101 pups per day (max. 266 pups) between the ages of 8-10 months. Some of the pups were branded, while others were recognized by their physical condition. During the course of this study we observed an average of 10-15 focal animals each day and used group scans to describe the behaviours of the remaining visible animals. Focal animals were identified from brands and natural markings (see Trites & Porter 2002 for study details).

The first case of milk stealing we observed (sneak-suckling) involved a female pup (brand no. F763). She was never seen with her own mother and was considered to be a starveling due to her poor and deteriorating condition (Trites & Jonker 2000). Most starvelings die slowly or disappear from the haulout, and are never seen with their mothers (pers. obs). We observed this pup for 15 continuous days during which time it made several successful attempts to steal milk from sleeping mother-pup pairs. By stretching its neck so as not to wake either of the sleepers, and keeping a low profile, she could often suckle for short periods before being discovered. Typically, when a mature female discovered the alien pup attempting to suckle, the mother immediately reacted aggressively, often nipping the stranger as it retreated. However, even after being rebuffed by a mature female, the starveling pup persisted in her repeated attempts to obtain milk. Lactating females became more and more vicious in their

attacks as this pup continued to approach several of the same pairs many times. As this animal became severely emaciated, the entire group became less tolerant of its presence and in the last days of starvation it was forced into isolation at the periphery of the haulout. After a severe storm lasting two days it was observed dead on the haulout.

The second case we observed was a mother providing care to an alien pup that was still with its own mother (allomaternal care). It involved a healthy looking pup identifiable by natural markings that regularly suckled its own mother. We observed this pup stealing milk from one resident mother-pup pair on several occasions, but the pair allowed suckling to continue without incident and with no sign of aggression. The non-filial pup was able to suckle while one or both of the pair was awake as well as during active periods. In several instances, both the resident and the non-filial pup were observed suckling together without incident. Both mother-pup pairs remained together and retained strong bonds with their filial mothers throughout the study, and both appeared to be healthy and fit when last observed at the end of observations in March.

Stealing milk is an indication that offspring might be under-fed, and strongly suggests that pups need more milk than their mothers are providing. Milk stealing is uncommon among pinnipeds and mothers are aggressive toward non-filial pups attempting to suckle. This is presumably due the high energetic cost of providing milk for a single pup. Mean daily food requirements of mature females nursing pups are about 70% greater than for females of the same age without pups (Winship *et al.* 2002). Captive feeding studies designed to determine the maximum amount of prey that can be ingested by a sea lion in one day (Rosen & Trites, unpubl. data) suggest that it is physically impossible for a mother to fully nourish two pups at the same time, although it would be feasible for her to provide some milk to a second pup.

Females returning to rookeries and haulouts must locate their own pup amongst many others. It is generally agreed that mother-pup recognition

among otariids is by auditory and olfactory cues (Bartholomew 1959, Stirling 1970, Trillmich 1981, Roux & Jouventin 1987). A mother initially finds the general location of her pup with an attraction call, and will touch noses when the two meet to recognize its unique odour. Mothers normally nurse only their pup and can inflict serious injuries on non-filial pups attempting to suckle.

Adult female Steller sea lions seldom allow strange pups near their teats, much less allow them to suckle. Both mothers and pups we observed were aggressive toward intruding conspecifics and were very protective of their mother's teats. However, there was a range of individual variation in the tolerance of both mature females and their offspring to the distance they would allow strange pups near the teats.

Of all pinniped species, the one most frequently observed stealing milk is the northern elephant seal (*Mirounga angustirostris*). Approximately 10% of weaned elephant seal pups obtain additional milk by surreptitiously suckling alien females. This occurs even though young animals caught stealing or entering the harem are severely bitten and chased from the area, often resulting in serious wounds (Reiter *et al.* 1978). Delayed dental eruption and moulting may facilitate this behaviour and give elephant seal pups an edge in avoiding detection (Reiter *et al.* 1978).

Among otariids, the incidence of milk stealing and fostering is rare and may occur more frequently during periods of nutritional stress. With Antarctic fur seals (*Arctocephalus gazella*) for example, milk stealing is occasionally seen and appears to be more prevalent when pups are nutritionally stressed (Lunn 1992). Macy (1982) found that northern fur seal pups (*Callorhinus ursinus*) sneak-suckled more during the early stages of dependence while their mothers were absent. Observations of California sea lions (*Zalophus californianus*) by Ono and Boness (1996) noted only 10 attempts by pups in 3 years of study at one site, while Higgins (1984) observed only a single case by a Steller sea lion, which lasted for 30 seconds before the pup was chased away.

During winter, lactating Steller sea lions spend approximately two days at sea and one day on

shore with their pup (Trites & Porter 2002). Pups (age 8–10 months) do not appear to accompany their mothers on these trips and presumably fast during their absence (Trites & Porter 2002). On several occasions we observed immature Steller sea lions swimming on the surface with live prey in their mouths, although it was unclear whether they had caught them, or if they had scavenged them. Most incidents involved thrashing at the surface and were similar to adult foraging behaviour in which large prey are brought to the surface and torn apart before being swallowed. The identifiable prey we observed included octopus (*Octopus* spp.), lingcod (*Ophiodon elongatus*), and rockfish (*Sebastes* spp.). There was only one occasion when we observed an immature sea lion swallow the prey it held and played with in its mouth. In this case, the pup thrashed and shredded an octopus into small pieces, and swallowed parts of several tentacles. In all other cases the prey were abandoned and not consumed by the pups.

It is undoubtedly advantageous for nutritionally stressed pups to attempt to steal milk, compared with the alternative — starvation. However the potential for injury likely out-weighs any gain in resources and probably deters most young from attempting to approach strange females. It is therefore curious to us that the pups we observed stealing milk did not supplement their intake with fish given the apparent ability of this age group to capture prey. The fact that they did not suggests that they may not have been behaviourally or physiologically capable of consuming fish. Compared with milk, they may also not be physically capable of consuming enough prey to meet their daily energy needs during this period of rapid growth and development (Winship *et al.* 2001, Winship *et al.* 2002). This further suggests that weaning of Steller sea lions pups may occur much later in spring or early summer than many have previously thought.

### Acknowledgement

We are grateful to the Alaska Department of Fish and Game for providing logistic and field

support. We would particularly like to acknowledge the assistance of Don Calkins, Dennis McAllister, Walt Cunningham, Dave Van Den Bosch, and Brad Ryon. Additional support was provided by the North Pacific Marine Science Foundation through the North Pacific Universities Marine Mammal Research Consortium. Comments on our manuscript were gratefully received from Pierre Jouventin. Our observations were made under the U.S. Marine Mammal Protection Act Permit 879 and a Special Use Wilderness Permit issued by the U.S. Forest Service.

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