

Maternal care, calf-training and site fidelity in a wild harbour porpoise in the North Sea

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Direct, undisturbed observations of interactions of mother and offspring in harbour porpoises (*Phocoena phocoena*) in the wild are extremely rare. Because harbour porpoises are seldom held and hardly breed in captivity (Blanchet et al. 2008), even observations of mother-calf interactions of porpoises under human care are uncommon (Oleksenko & Lyamin 1996, Borowska 2009, Delgado & Wahlberg 2009). The second author, by chance, encountered a unique opportunity to observe wild porpoises (mother and calf as it turned out) associated with an offshore production platform during several weeks in September 2011. Interested in the animals as the second author was, but untrained as a biologist, the observations are only descriptive in nature. However, what could be seen repeatedly, were fully undisturbed interactions between a mother and a calf in the wild. This provided unique insight in the maternal care of porpoises and other aspects of the behaviour of this species, which would be extremely difficult to obtain in 'normal' (e.g., survey) conditions.

During at least three (possibly four) weeks in September 2011, a female and calf harbour porpoise were seen in close association with the offshore gas production platform Rijn Charlie (30 km west of Scheveningen, the Netherlands) in the southern North Sea. In

this area, the seafloor is sandy and the water depth is approximately 18 m. From photos provided, the calf could be estimated to be circa 70-75% of the total length of the female (hence, circa 100 cm if the female would have been 140 cm total length, which is about the minimum size for sexually mature females) (photo 1). Peak calving in the southern North Sea is centred around June/July, with a fairly large number of births occurring in May and August (Addink et al. 1995) and an estimated age of circa 3-4 months for the calf would be in accordance with that approximate body size. Even though there is no proof, the observers claim that there were no reasons to believe that more than this couple of porpoises were involved, visible as the animals were during virtually every watch and given the highly consistent behaviour and interactions of the animals during their stay near the platform.

The calf was seen suckling frequently (snout 'attached' to the vaginal region, mother more or less stationary and slightly turned to one side). Suckling was positively observed in the morning and the evening, but dedicated observations by the platform crew during mid-day were less frequent. There were very many sightings of the mother disappearing under water for a long dive, to return with a fish that was still alive and that was released just in front of the quickly approaching calf,



Photo 1. Harbour porpoise mother (left) and calf. *Photograph: A. Krop.*

apparently in an attempt to encourage the calf to capture the fish. Flatfish and roundfish were offered to the calf, all alive, but fish species were not recognised by the crew. During the deeper and more prolonged dives of the adult female, the calf was left alone near the surface (cf. Amundin & Amundin 1973). The calf would perform quick spurts (fast swimming) around the platform (interpreted by the crew as 'playful behaviour'), or remain stationary in one place. The crew remarked specifically that the calf would suddenly spurt towards a spot where the mother was later indeed seen to surface and where the fish was offered. No sounds were heard, but the observations strongly suggested that a vocal signal by the approaching adult from under water was released, in response to which the calf sprinted to the area where the adult would surface and offer her prey. Deliveries of live fish were frequent (up to 3x per half hour at times), and some fish were successfully captured and swallowed by the calf (no data were kept on frequencies and success rates). When the female was at the surface, mother and calf

were usually close together, even though short 'playful absences' by the calf occurred (e.g., making short spurts towards or around the superstructure of the platform).

A number of interesting aspects were provided by these observations. First, a mother-calf 'couple' of harbour porpoises were apparently 'residents' near an offshore platform for several weeks. Perhaps the platform provided shelter or safety for marine predators, perhaps the structure served as a beacon where mother and calf could easily rejoin in an otherwise more or less homogeneous sea area. Secondly, the calf was apparently trained to capture fish, even though the animal must have been very young and unlikely to be weaned for several more months. Instead of feeding the calf fish, she would release them to have the fish captured (or missed!) by her calf. This behaviour agrees with what is known of harbour porpoises: lactation lasts up to ten months with a marked reduction after 5-6 months, but calves start taking small fish when already 2-3 months old (Yasui & Gaskin 1986, Evans et al. 2008). Thirdly, there were

indications for playful behaviour of the young animal, but here lurks the risk of over-interpretation of the data. Some fish offered by the adult were not swallowed but played with and subsequently left to sink when the calf's interest faded. To the observers, the rapid spurts seemed playful behaviour, but it may simply have been excitement of the calf in anticipation of the return of the mother. Finally, there seemed to be vocal communication between the two animals, as a result of which the calf and the adult could rejoin exactly at the point where the mother would surface with her fish (North Sea waters near the Dutch coast are very turbid and the visibility under water is very low).

Strong social bonds, prolonged periods of maternal care (a long phase of immaturity), and even apparent training to hunt are all known for several species of cetaceans (Whitehead 1996, Addink & Smeenk 2001, Miles & Herzing 2003, Bender et al. 2008), but are less well known for elusive species such as the harbour porpoise. These small cetaceans are notoriously difficult to study in the wild, and the sightings reported here are unique as far as we could deduce. The temporary association of small cetaceans with offshore structures (platforms or buoys) has been observed in several species of dolphins (Camphuysen 2011), but no observations are known to us for harbour porpoises. Such associations may have implications for acoustic monitoring studies, where listening devices are attached to objects. Marine mammals may deliberately approach and investigate such structures (for example because the availability of food may be enhanced near offshore constructions or fixed objects), or stay close with them during certain periods of time. Both tendencies would result in overestimates of the presence of porpoises based on the recorded clicks with TPods or CPods.

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References

- Addink, M.J. & C. Smeenk 2001. Opportunistic feeding behaviour of rough-toothed dolphins *Stenobredanensis* off Mauritania. *Zoologische Verhandelingen Leiden* 334: 37-48.
- Addink, M.J., T.B. Sørensen & M. García Hartmann 1995. Aspects of reproduction and seasonality in the harbour porpoise from Dutch waters. In: A.S. Blix, L. Walløe & Ø. Ulltang (eds.). *Whales, seals, fish and man*: 459-464. Elsevier, Amsterdam, the Netherlands.
- Amundin, M. & B. Amundin, 1974. On the behaviour and study of the harbour porpoise, *Phocoena phocoena*, in the wild. *Investigations on Cetacea* 5: 317-328.
- Bender, C.E., D.L. Herzing & D.F. Björklund 2008. Evidence of teaching in Atlantic spotted dolphins (*Stenella frontalis*) by mother dolphins foraging in the presence of their calves. *Animal Cognition* 12: 43-53.
- Blanchet, M.-A., T. Nance, C. Ast, M. Wahlberg & M. Acquarone 2008. First case of a monitored pregnancy of a harbour porpoise (*Phocoena phocoena*) under human care. *Aquatic Mammals* 34: 9-20.
- Borowska, E. 2009. The relationships between mother and calf in harbour porpoise (*Phocoena phocoena*), at the basis of observations in Fjord & Baelt Centre in Denmark. M.Sc. thesis. Warsaw University of Life Sciences, Warsaw, Poland.
- Camphuysen C.J. 2011. Geboeide dolfijnen. *Tussen Duin en Dijk* 10 (1): 22.
- Delgado, L. & M. Wahlberg 2009. Behaviour of a harbour porpoise (*Phocoena phocoena*) mother-calf pair in captivity. M.Sc. thesis. Institute of Biology, University of Southern Denmark, Odense / Fjord & Baelt Centre, Kerteminde, Denmark.
- Evans, P.G.H., C.H. Lockyer, C.S. Smeenk, M. Addink & A.J. Read, 2008. Genus *Phocoena*. In: S. Harris & D.W. Yalden (eds.). *Mammals of the British Isles: Handbook*, 4th edition: 704-709. The Mammal Society, Southampton, UK.
- Miles, J.A. & D.L. Herzing 2003. Underwater analysis of the behavioural development of free-ranging Atlantic spotted dolphin (*Stenella frontalis*) calves (birth to 4 years of age). *Aquatic Mammals* 29: 363-377.

- Oleksenko, A.I. & O.I. Lyamin 1996. Rest and activity states in female and baby of harbor porpoise (*Phocoena phocoena*). *Journal of Sleep Research* 5 (supplement 1): 159.
- Whitehead, H. 1996. Babysitting, dive synchrony, and indications of alloparental care in sperm whales. *Behavioral Ecology and Sociobiology* 38: 237–244.
- Yasui, W.Y. & D.E. Gaskin 1986. Energy budget of a small cetacean, the harbour porpoise, *Phocoena phocoena* (L.). *Ophelia* 25: 183–197.

Samenvatting

Moederzorg, training van het kalf en plaatstrouw bij wilde bruinvissen in de Noordzee

Bij en onder het gasproductieplatform Rijn Charlie, 30 km westelijk van Scheveningen (zuidelijke Noordzee), werden gedurende ten minste drie weken in september 2011 twee bruinvissen (*Phocoena phocoena*) waargenomen. Het bleek om een volwassen wijfje met een kalf te gaan. De bemanning van het plat-

form was getuige van wat kennelijk trainingen van het jong door de moeder waren. Herhaaldelijk bracht het diep duikende, adulte dier nog levende vis naar de oppervlakte, die vlak voor het toesnellende jong werd losgelaten. Soms werd het jong ook nog gezoogd. De beschreven waarnemingen zijn uniek, omdat bruinvissen in het wild bijzonder moeilijk te bestuderen zijn. Behalve de training werd ook speels gedrag van het jong beschreven. Het toesnellen van het jong naar een plaats waar het volwassen dier pas later bovenkwam, suggereerde dat het jong een geluidssignaal kreeg van de opduikende moeder. Langdurig verblijf van bruinvissen in de buurt van offshore-installaties (zoals dat ook wel bij dolfijnen wordt gezien) heeft implicaties voor de interpretatie van gegevens die met akoestische monitoring worden vergaard, aangezien er dan overschatting van de presentie kan optreden waarvoor gecorrigeerd moet worden.

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