



## A case study of artificial feeding of an unweaned giant otter (*Pteronura brasiliensis*) cub

Márcia M.M. Cabral<sup>†,\*</sup>, Carolina Ribas<sup>‡,§</sup> and Fernando C.W. Rosas<sup>¶</sup>

<sup>†</sup>Universidade de Aveiro (UA), Departamento de Biologia (DBio) – Doctoral Program in Biology and Ecology of Global Change (BEGC), Campus de Santiago, 3810-193 Aveiro, Portugal

<sup>‡</sup>Instituto Nacional de Pesquisas da Amazônia (INPA), PPG Ecologia, Manaus-AM, Brazil

<sup>§</sup>Embrapa-Pantanal, Rua 21 de Setembro 1881, 79320-900 Corumbá-MS, Brazil

<sup>¶</sup>Instituto Nacional de Pesquisas da Amazônia (INPA), Lab. Mamíferos Aquáticos (LMA), Caixa Postal 2223, 69080-971 Manaus-AM, Brazil

\*Corresponding author, e-mail: [marciamunick@gmail.com](mailto:marciamunick@gmail.com)

### ARTICLE INFO

Manuscript type	Note
<b>Article history</b>	
Received	31 March 2012
Received in revised form	04 March 2013
Accepted	08 May 2013
Available online	26 December 2015
<b>Responsible Editor:</b> Miriam Marmontel	
<b>Citation:</b> Cabral, M.M., Ribas, C. and Rosas, F.C.W. (2015) A case study of artificial feeding of an unweaned giant otter ( <i>Pteronura brasiliensis</i> ) cub. <i>Latin American Journal of Aquatic Mammals</i> 10(2): 159-162. <a href="http://dx.doi.org/10.5597/lajam00210">http://dx.doi.org/10.5597/lajam00210</a>	

The giant otter (*Pteronura brasiliensis*) is a gregarious and territorial semi-aquatic mammal endemic to South America. Essentially diurnal, the individuals of the groups spend most part of their day fishing, resting and marking their territory. The group has a specific scent that they spread around their territory with their anal glands (scent marking). Giant otters build dens along river banks to rest and to raise their cubs. They communicate over long distances with strong, complex vocalizations, which are also used to mark their territories (vocal marking). They appear to use all these mechanisms to avoid agonistic encounters with neighboring groups (Duplaix, 1980; Schweizer, 1992; Carter and Rosas, 1997; Ribas and Mourão, 2004). Predominantly piscivorous, an adult individual can eat up to 10% of its body weight per day (Carter *et al.*, 1999; Cabral *et al.*, 2010) to maintain its activities due to its high metabolic rate.

Although the species is classified as endangered by the IUCN<sup>1</sup>, there are no current population estimates for giant otters in Brazil, where they are known to commonly occur along river and lake systems of the Amazon and Pantanal biomes. The main historical factor responsible for the species decline was the intense hunting for its pelt in the 1960s and 1970s (Best, 1984; Carter and Rosas, 1997; Rosas, 2004; Rosas *et al.*, 2007). The species is currently protected by law, which reduced considerably the slaughter for its pelt, but habitat destruction, the theft of cubs to be used or sold as pets and conflicts with fishermen constitute the current threats to giant otters, especially in the Amazon (Rosas, 2004; Rosas *et al.*, 2007; Rosas-Ribeiro *et al.*, 2012).

According to Oftedal (1984) the milk composition and yield vary greatly among diverse mammalian species and the knowledge of the nutritional content of milk is essential to guarantee the survival of orphan cubs. It is well known that giant otter cubs tend to stay inside the dens in the early months of life, probably feeding only on their mother's milk (Duplaix, 1980; Carter and Rosas, 1997). However, there is no information available on the nutritional content of giant otter milk, nor about the amount of milk consumed by the cubs. The information presented here is intended to help *ex-situ* institutions to raise and rehabilitate giant otter orphan cubs with an artificial milk formula and provide hand-rearing information for their management in captivity.

In this study we describe the procedures attempted to rehabilitate an orphan giant otter cub, which arrived at the Laboratory of Aquatic Mammals of INPA (Manaus, Brazil) on 15 June 2007, from the lower Negro River (Amazonas, Brazil). The cub, a female called *Nyryny* (meaning 'alive' in the indigenous language of Waimiri-Atroari), weighed 1.9kg and measured 65cm of total length at the time. Her eyes had just opened and the animal was crawling with little coordination. Only the tips of the canines (yellowish in color) and of two lower molar teeth were visible. The weight and length of this giant otter cub fit well on the body weight/length relationship described by Rosas *et al.* (2009).

At the beginning we offered approximately 40ml of lactose-free milk (*NAN*<sup>TM</sup>) every 40 minutes. After the fourth day we added 2g of an amino acid supplement (*Aminomix*<sup>TM</sup>). On the fifth day 2ml of canola oil were added. On the following days, instead of using boiled/filtered water, the milk formula was prepared with either coconut water or an electrolyte solution

<sup>1</sup> The IUCN Red List of Threatened Species. Version 2015-4. <[www.iucnredlist.org](http://www.iucnredlist.org)>. Consulted on 09 December 2015.



**Figure 1.** Orphaned giant otter cub in a severely dehydrated state. Note the cracks on its tail (encircled).

(*Babydrax*<sup>TM</sup>) on alternating days. According to the *Stuobook of Giant Otter*, solutions of electrolytes are only to be used as complements and depending on the situation may be administered alone or added to the milk formula (Sykes-Gatz, 2005). Additionally, one egg and 0.15ml of a multivitamin supplement (*Poliplex*<sup>TM</sup>) were mixed with the milk formula in every other bottle. Although McTurk and Spelman (2005) were successful adding chicken eggs with an electrolyte solution to the milk, we did not have good results with this formula probably because we were using lactose-free milk. Using McTurk and Spelman's (2005) formula the cub did not gain weight, sometimes would not even accept the milk bottle, and within ten days became severely dehydrated (Figure 1). According to Sykes-Gatz (2005), some electrolyte solutions can also be administered subcutaneously. Following this, we administered a total of 20ml of subcutaneous injections of physiological saline solution to rehydrate the cub.

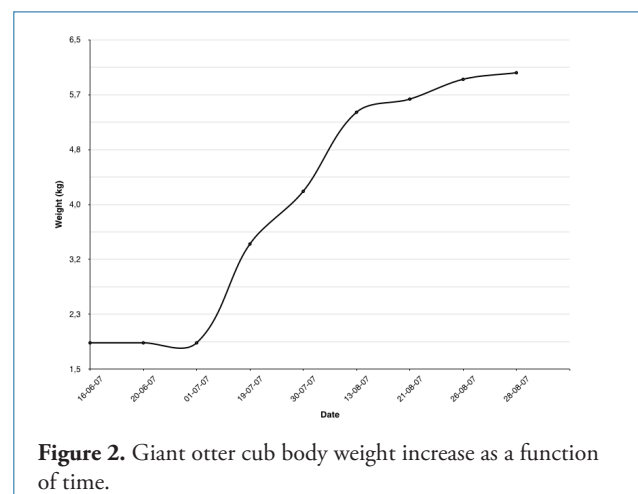
Although the composition of giant otter milk is unknown, it is probably very high in fat and relatively high in protein, as in most otter species (McTurk and Spelman, 2005). Therefore, on 1 July 2007 the *NAN*<sup>TM</sup> milk, which has low protein, carbohydrates and fat content, was replaced with UHT cow's milk combined with two teaspoons of *Farinha Láctea*<sup>TM</sup> (wheat flour enriched with iron and folic acid, sugar, powdered milk, vitamins and minerals) together with 0.3ml of *Poliplex*<sup>TM</sup> to each 120ml of milk. The mix was offered every two hours to the cub. At this time the cub also had caught a cold, which was diagnosed by the presence of a nasal secretion and loss of voice. To address this we enriched the diet by adding in alternating order honey, propolis, *Glicopan*<sup>TM</sup> (a nutritional solution combining 22 readily absorbable amino acids, vitamin B and glucose) and *Scott's Emulsion*<sup>TM</sup> (cod-liver oil) to the milk formula (see Table 1 for details). Simultaneously, we bathed the cub in *andiroba* oil to treat the cracks in its skin caused by dehydration. In 18 days the cub gained 1.5kg and all dehydration signs disappeared (Figure 2). At that time, the cub was consuming about 130ml at each feeding, totaling

approximately 1 litre/day of the milk formula. Eventually, pieces of fish mixed in a blender were provided. After the 30<sup>th</sup> day using the latter formula, we started offering small pieces of catfish (Figure 3), which were held by *Nyryny* with her forepaws.

At the end of July the animal weighed 4.2kg and the average milk consumed was about 200ml per feeding session. Fish was offered more frequently until the animal reached 6kg, which happened two months and 12 days after its arrival.

On 28 August 2007 the Brazilian Institute of the Environment (IBAMA) sent *Nyryny* by plane to a zoo in southern Brazil. The trip from Manaus to the destination was of approximately 10 hours. It is important to mention that IBAMA has extensive experience with handling and transporting wild animals and followed all the protocols for this kind of transportation. However, the animal arrived dead at its destination. According to the veterinarians who received the animal in southern Brazil the box was filled with vomit and there was evidence that the animal struggled during transport, indicating a high degree of stress.

Our results indicate that the solution prepared with cow's



**Figure 2.** Giant otter cub body weight increase as a function of time.



**Figure 3.** Nyryny eating small pieces of catfish.

**Table 1.** Milk formula successfully used to rehabilitate the giant otter cub. The amounts were mixed with 130ml milk. UHT = Ultra High Temperature as a method to sterilize cow's milk.

Milk	Amount	Supplement	Frequency
UHT	2 tea spoons	<i>Farinha Láctea</i>	Always
	0.3ml	<i>Poliplex</i>	Always
	0.2ml	<i>Glicopan</i>	Alternating bottles
	1 drop	<i>Propolis</i>	Alternating bottles
	1 tea spoon	Honey	Alternating bottles
	1 drop	<i>Scott emulsion</i>	Alternating bottles

milk was effective for rearing the orphan giant otter cub. Although the *International Giant Otter Studbook* (Sykes-Gatz, 2005) recommends to use *Esbilac*<sup>TM</sup> to raise giant otter cubs, the same document also mentions that cow's milk can be useful for hand rearing giant otters. Additionally, *Esbilac*<sup>TM</sup> is not easily found in the Brazilian Amazon, making its use almost impossible in this region. Considering the limited information about raising giant otter cubs with artificial milk, every orphan cub successfully raised contributes significantly to the knowledge of this endangered species.

#### Acknowledgments

We thank Fundação O Boticário de Proteção a Natureza and Philadelphia Zoo for financial support. We acknowledge

the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) by a doctoral fellowship awarded to Marcia Munik Mendes Cabral (Process 6082-13-0). We also thank Bruno Santos and Kesä Kannikah Lehti (deceased) for helping us to look after *Nyryny*. Amanda Lehti Rosas reviewed the English version of the first draft of manuscript. We also thank the valuable contribution of the reviewers of this manuscript.

#### References

- Best, R.C. (1984) The aquatic mammals and reptiles of the Amazon. Pages 371-412 in Sioli H. (Ed.) *The Amazon. Limnology and Landscape Ecology of a Mighty Tropical River and its Basin*. Dr W. Junk Publishers, Dordrecht, The Netherlands.
- Cabral, M.M.M., Zuanon, J., De Mattos, G.E. and Rosas, F.C.W. (2010) Feeding habits of giant otters *Pteronura brasiliensis* (Carnivora: Mustelidae) in the Balbina hydroelectric reservoir, Central Brazilian Amazon. *Zoologia* 27(1): 47-53. <http://dx.doi.org/10.1590/S1984-46702010000100008>
- Carter, S.K. and Rosas, F.C.W. (1997) Biology and conservation of the giant otter *Pteronura brasiliensis*. *Mammal Review* 27: 1-26. <http://dx.doi.org/10.1111/j.1365-2907.1997.tb00370.x>
- Carter, S.K., Rosas, F.C.W., Cooper, A.B. and Cordeiro-Duarte, A.C. (1999) Consumption rate, food preferences and transit time of captive giant otters *Pteronura brasiliensis*: Implications for the study of wild populations. *Aquatic Mammals* 25(2): 79-90.

- Duplaix, N. (1980) Observations on the ecology and behavior of the giant river otter *Pteronura brasiliensis* in Suriname. *Revue Écologique (Terre et Vie)* 34: 495-620.
- McTurk, D. and Spelman, L. (2005) Hand-rearing and rehabilitation of orphaned wild giant otters, *Pteronura brasiliensis*, on the Rupununi River, Guyana, South America. *Zoo Biology* 24: 153-167. <http://dx.doi.org/10.1002/zoo.20042>
- Oftedal, O.T. (1984) Lactation in the dog: milk composition and intake by puppies. *The Journal of Nutrition* 114(5): 803-812.
- Ribas, C. and Mourão, G. (2004) Intraspecific agonism between giant otter groups. *IUCN Otter Specialist Group Bulletin* 21(2): 89-93.
- Rosas, F.C.W. (2004) Ariranha, *Pteronura brasiliensis* (Carnivora: Mustelidae). Pages 265-269 in Cintra, R. (Ed.) *História natural, ecologia e conservação de algumas espécies de plantas e animais da Amazônia*. EDUA/INPA, Manaus, Brazil.
- Rosas, F.C.W., De Mattos, G.E. and Cabral, M.M.M. (2007) The use of hydroelectric lakes by giant otters (*Pteronura brasiliensis*): The case of Balbina dam in Central Amazonia, Brazil. *Oryx* 41(4): 520-524. <http://dx.doi.org/10.1017/S0030605307005121>
- Rosas, F.C.W., Da Rocha, C.S., De Mattos, G.E. and Lazzarini, S.M. (2009) Body weight-length relationships in giant otters (*Pteronura brasiliensis*) (Carnivora, Mustelidae). *Brazilian Archives of Biology and Technology* 52(3): 587-591. <http://dx.doi.org/10.1590/S1516-89132009000300010>
- Rosas-Ribeiro, P.F., Rosas, F.C.W. and Zuanon, J. (2012) Conflict between fishermen and giant otters *Pteronura brasiliensis* in western Brazilian Amazon. *Biotropica* 44(3): 437-444. <http://dx.doi.org/10.1111/j.1744-7429.2011.00828.x>
- Sykes-Gatz, S. (2005) *International Giant Otter Studbook*. Zoologischer Garten Dortmund, Germany.
- Schweizer, J. (1992) *Ariranhas no Pantanal: Ecologia e Comportamento da Pteronura brasiliensis*. Edibran-Editora Brasil Natureza Ltda, Curitiba, PR, Brazil. 202 pp.