

## Records of the barnacle *Xenobalanus globicipitis* (Steenstrup, 1851) on small cetaceans of Brazil

Ana Paula Madeira Di Benedetto  
Renata Maria Arruda Ramos

Universidade Estadual do Norte Fluminense, Centro de Biociências e Biotecnologia, Laboratório de Ciências Ambientais, Av. Alberto Lamego, 2000, Campos, RJ, 28015-620, BRASIL.  
e-mail: dibeneditto@rol.com.br

Aceito para publicação em 07/06/2000

### Resumo

A craca *Xenobalanus globicipitis* é um epizóico encontrado aderido à borda das nadadeiras de cetáceos. O objetivo deste estudo foi ampliar as informações sobre *X. globicipitis* em pequenos cetáceos no litoral do Brasil, com especial referência as espécies capturadas acidentalmente em operações de pesca no Norte do Estado do Rio de Janeiro (21°35' - 22°25'S), entre 1989 e 1998. Ao longo da costa brasileira, a presença de *X. globicipitis* foi registrada em *Pontoporia blainvillei*, *Sotalia fluviatilis* e *Tursiops truncatus*. No Norte do Rio de Janeiro, a prevalência de infestação foi de 1,04% para *P. blainvillei*, 10,13% para *S. fluviatilis* e 20,00% for *T. truncatus*. Os indivíduos de *X. globicipitis* aderidos às nadadeiras destes pequenos cetáceos eram todos adultos. A diferença na prevalência de infestação entre *P. blainvillei* e *S. fluviatilis* pode estar relacionada com a velocidade de natação e/ou com o habitat preferencial. Os epizóicos podem ser usados como marcadores

biológicos, discriminando as áreas de utilização e os padrões de movimentação das espécies e populações de cetáceos.

**Unitermos:** *Xenobalanus globicipitis*, pequenos cetáceos, *Pontoporia blainvillei*, *Sotalia fluviatilis*, Brasil.

## Summary

The barnacle *Xenobalanus globicipitis* is an epizoic found on the edge of the fins of cetaceans. The purpose of this study was to improve information about *X. globicipitis* on small cetaceans of Brazil, with special reference to incidentally-caught species on the northern coast of Rio de Janeiro State (21°35' - 22°25'S), from 1989 to 1998. Along the Brazilian coast, the presence of *X. globicipitis* was recorded on *Pontoporia blainvillei*, *Sotalia fluviatilis* and *Tursiops truncatus*. On the northern coast of Rio de Janeiro, the prevalence of infestation was 1.04% for *P. blainvillei*, 10.13% for *S. fluviatilis* and 20.00% for *T. truncatus*. The individuals of *X. globicipitis* attached to the fins of these small cetaceans were all adults. The difference in infestation between *P. blainvillei* and *S. fluviatilis* may be related to differences in swimming velocity and/or preferential habitat. The epizoics can be used as biological tags, discriminating home range and movement patterns of the cetacean species and populations.

**Key words:** *Xenobalanus globicipitis*, small cetaceans, *Pontoporia blainvillei*, *Sotalia fluviatilis*, Brazil.

The barnacle *Xenobalanus globicipitis* (Steenstrup, 1851) is an epizoic found on the edge of the fins of cetaceans. It has been recorded in tropical and temperate waters world-wide, occurring on about 20 species of cetaceans, from the small *Pontoporia blainvillei* (Gervais and d'Orbigny, 1844) to the large *Balaenoptera musculus* (Linnaeus, 1758) (Pinedo et al., 1989; Rajaguru and Shantha, 1992). However, as yet, little is known about the epizoic

fauna of Brazilian cetaceans (Siciliano et al., 1988; Azevedo et al., 1996). The purpose of this study was to improve information on the occurrence of *X. globicipitis* on small cetaceans along the Brazilian coast, with special reference to incidentally-caught species on the northern coast of Rio de Janeiro State (21°35' - 22°25'S).

From our review of the literature, we established that the presence of the barnacle on small cetaceans of Brazil had been previously recorded only for *S. fluviatilis* and *T. truncatus* (Table 1). The body epizoics of small cetaceans specimens, accidentally-caught in fisheries on the northern coast of Rio de Janeiro from 1989 to 1998, were analysed. We sampled 190 specimens: 96 *P. blainvillei* (Gervais and d'Orbigny, 1844), 79 *Sotalia fluviatilis* (Gervais, 1853), 6 *Stenella frontalis* (Cuvier, 1829), 5 *Tursiops truncatus* (Montagu, 1821), 2 *Steno bredanensis* (Lesson, 1829), 1 *Delphinus capensis* (Heying and Perrin, 1994) and 1 *Pseudorca crassidens* (Owen, 1846).

The small cetaceans were brought to the laboratory 24-48h after death and the external surfaces of their bodies were macroscopically examined. The intact epizoics were measured from the basal plate to highest point of the hood (total length), as described by Rajaguru and Shantha (1992). The intact epizoic shells were counted only. The average intensity and the prevalence of infestation were calculated according to Bush et al., (1997). The hosts were characterized by total length, sex and age (Table 1).

From the seven species analysed, only three had the barnacle *X. globicipitis* attached to their fins: *P. blainvillei*, *T. truncatus* and *S. fluviatilis*. The present study provides the first record of *P. blainvillei* infested by *X. globicipitis* in Brazilian waters.

TABLE 1: Biological data on small cetaceans infested by *Xenobalanus globicipitis* of Brazil.

Species	Date	Area / Latitude	Length (cm)	Sex	Year (GLGs)	N° of epizootics	Reference
<i>Pontoporia blainvilliei</i>	Dec/92	Flecheira, RJ (22°15'S)	110.0	M	2	1	Present study
<i>Sotalia fluviatilis</i>	Mar/87	Guanabara Bay, RJ (-22°48'S)	141.0	F	4	7	Siciliano et al., 1988
	Feb/91	Quissamã, RJ (22°20'S)	193.0	M	10	4	Present study
	May/91	Farol de São Tomé, RJ (22°05'S)	193.0	F	11	3	Present study
	Oct/91	Quissamã, RJ (22°20'S)	184.0	F	-	10	Present study
	Oct/91	Quissamã, RJ (22°20'S)	176.0	M	-	3	Present study
	Nov/91	Flecheira, RJ (22°15'S)	187.0	M	10	16	Present study
	Jul/92	Guanabara Bay, RJ (-22°48'S)	178.0	F	30	1	Azevedo et al., 1996
	Sep/92	Northern RJ (21°35'-22°25'S)	191.0	M	7	5	Present study
	Oct/92	Quissamã, RJ (22°20'S)	187.0	M	8	1	Present study
	Jan/93	Northern RJ (21°35'-22°25'S)	186.5	M	6	6	Present study
<i>Tursiops truncatus</i>	Sep/91	Farol de São Tomé, RJ (22°05'S)	162.0	-	0	1	Present study
	May/95	Cabo Frio, RJ (23°00'S)	287.0	M	15	1	Azevedo et al., 1996

(RJ = Rio de Janeiro State; M = male; F = female; GLGs = growth layer groups)

The presence of *X. globicipitis* was recorded in only one specimen of *P. blainvillei* (intensity = 1, prevalence = 1.04%, total length of the epizoic = 48.3 mm) and one of *T. truncatus* (intensity = 1, prevalence = 20.00%) (Table 1). In relation to *T. truncatus*, only the barnacle shell was found attached to the specimen's caudal fin. The presence of *X. globicipitis* was verified on 8 specimens of *S. fluviatilis*. The average infestation intensity was 6 (range = 1-16, SD = 4.8, prevalence = 10.13%) and the epizoics' total length varied from 27.5 to 58.5 mm (mean = 43.0, SD = 0.76) (Table 1). All the specimens of *X. globicipitis* attached to the small cetaceans caught on the northern coast of Rio de Janeiro were adults (over 25.0 mm, as described by Spivey, 1980).

The species *P. blainvillei* and *S. fluviatilis* were sympatric in the area studied and the sample size examined was rather similar between these species. However, the prevalence of infestation of *X. globicipitis* on *S. fluviatilis* was around ten times greater than it was on *P. blainvillei*. Two hypotheses are suggested to explain this difference. First, the swimming velocity. The water flow has an inverse relation with the success in settlement of the cirriped larvae (Wetthey et al., 1988). Thus, differences in swimming velocity between small cetacean species might result in different infestation rates. Aznar et al. (1994) reported an increase in the number of epizoics on the slower cetaceans in the Mediterranean Sea. Second, the preferential habitat. *P. blainvillei* and *S. fluviatilis* have a marine coastal distribution (Jefferson et al., 1993) and the feeding patterns of these species on the northern coast of Rio de Janeiro suggest that the former has a stronger association with estuarine areas than the latter (Di Benedetto, in preparation). Rittmaster et al. (1999) recorded the presence of *X. globicipitis* on *T. truncatus* that inhabits marine and estuarine areas, on the western North Atlantic coast. The authors verified that the percentage of dolphins found in the ocean with the barnacle was approximately four times that encountered in the estuary. *S. fluviatilis* has a wider marine distribution than *P. blainvillei* and this might favour the epizoic infestation.

The epizoics can be considered as biological tags (Aznar et al., 1994; Rittmaster et al., 1999). Long term research on the epizoic fauna of cetaceans may yield information that can help to discriminate home range and movement patterns of the species and their populations. It will also improve our knowledge about the life history of epizoic species.

### Acknowledgements

We wish to thank Carlos Ruiz-Miranda, Salvatore Siciliano and Ilana Rosental Zalmon for their critical review of this manuscript and, the fishermen of Atafona village who provided us with the accidentally-caught specimens on the northern coast of Rio de Janeiro.

### References

- Azevedo, A.; Soares, M.P.; de Castro, M.C.T.; Lailson-Brito Jr., J.; Gurgel, M.I. 1996. Ocorrência de epizoítos em cetáceos na costa do Estado do Rio de Janeiro, Brasil. **Resumos do XXI Congresso Brasileiro de Zoologia**, Porto Alegre, Brasil, p. 254.
- Aznar, J.; Balbuena, J.A.; Raga, J.A. 1994. Are epizoits biological indicators of a Western Mediterranean striped dolphin die-off? **Dis. aquat. Org.**, **18**: 159-163.
- Bush, A.O.; Lafferty, K.D.; Lotz, J.M.; Shostak, A.W. 1997. Parasitology meets ecology on its own terms. **J. Parasit.**, **83**: 575-583.
- Jefferson, T.A.; Leatherwood, S.; Webber, M.A. 1993. **Marine mammals of the world**, Ed. FAO, Rome, 320 pp.
- Pinedo, M.C.; Praderi, R.; Brownell Jr., R. 1989. Review of the biology and status of the franciscana, *Pontoporia blainvillei*. In:

- Perrin, W.F.; Brownell Jr., R.; Kaiya, Z.; Jiankang, L. (eds.). **Biology and conservation of the river dolphins**. IUCN Occasional Papers nº 3, Hong Kong, p.46-51.
- Rajaguru, A.; Shantha, G. 1992. Association between sessile barnacle *Xenobalanus globicipitis* (Coronulidae) and the bottlenose dolphin *Tursiops truncatus* (Delphinidae) from the Bay of Bengal, India, with summary of previous records from cetaceans. **Fish. Bull.**, **90**: 197-202.
- Rittmaster, K.; Bowles, N.; Lynn, B.; Thayer, V.; Odell, D. 1999. *Xenobalanus* barnacle on *Tursiops* dorsal fins in Beaufort, NC, USA. **Abstracts of 13<sup>th</sup> Biennial Conference on the Biology of Marine Mammals**, Maui, USA, p. 158.
- Siciliano, S.; Capistrano, L.; Lodi, L. 1988. *Xenobalanus globicipitis* registrado em *Sotalia* sp. na baía de Guanabara, Rio de Janeiro, Brasil. **Resúmenes de la III Reunión de Trabajo de Especialistas en Mamíferos Acuáticos de América del Sur**, Montevideo, Uruguay, p.18.
- Spivey, H.R. 1980. Occurrence of the balanomorph barnacle *Xenobalanus globicipitis* Steenstrup, 1851 (Coronulidae) on the Atlantic bottlenose dolphin, *Tursiops truncatus* in the Gulf of Mexico. **Florida Sci.**, **43** (4): 292-293.
- Wethey, D.S.; Luckenbach, M.W.; Kelly, C.A. 1988. Larval settlement in barnacles: influence of water flow. *In*: Thompson, M.F.; Sarojoni, R.; Nagabhushanam, R. (eds) **Marine Biodeterioration**. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi, p. 499-511.