Records of *Xenobalanus globicipitis* on *Balenoptera physalus* and *Stenella coeruleoalba* in Tunisian and Sicilian waters

Sami Karaa[1,2], Gianni Insacco[3], Mohammed Nejmeddinne Bradai[2] & Dino Scaravelli[4]

[1] National Institute of the Sciences and Technology of the Sea - Route de Madagascar - 3000 Sfax, Tunisia
[2] Sfax Faculty of Sciences - P.O. Box 1171 - 3000 Sfax, Tunisia
[3] Museo Civico di Storia Naturale - Piazza delle Erbe, 13 - 97013 Comiso (RG), Italy; *g.insacco@comune.comiso.rg.it*
[4] Great Pelagic Vertebrate Group, Dipartimento di Scienze Mediche Veterinarie, University of Bologna - Viale Vespucci, 2 - 47042 Cesenatico (FC), Italy

Abstract. *Xenobalanus globicipitis* (Steenstrup, 1851) is a monotypic and cosmopolitan pseudostalked barnacles associated with 34 cetacean species. It shows particular morphological features and adaptation to location on the host body surface, the trailing edges of fins. Two cases of barnacles collection are reported herein, one in a *Balenoptera physalus* found stranded in Gabés gulf in 2008 (Tunisia) and another one in a *Stenella coeruleoalba* found stranded in Letojanni (ME, Sicily, Italy) in 1998.

Keywords: *Xenobalanus globicipitis*, Barnacle, *Balenoptera*, *Stenella*, Cirripedia.

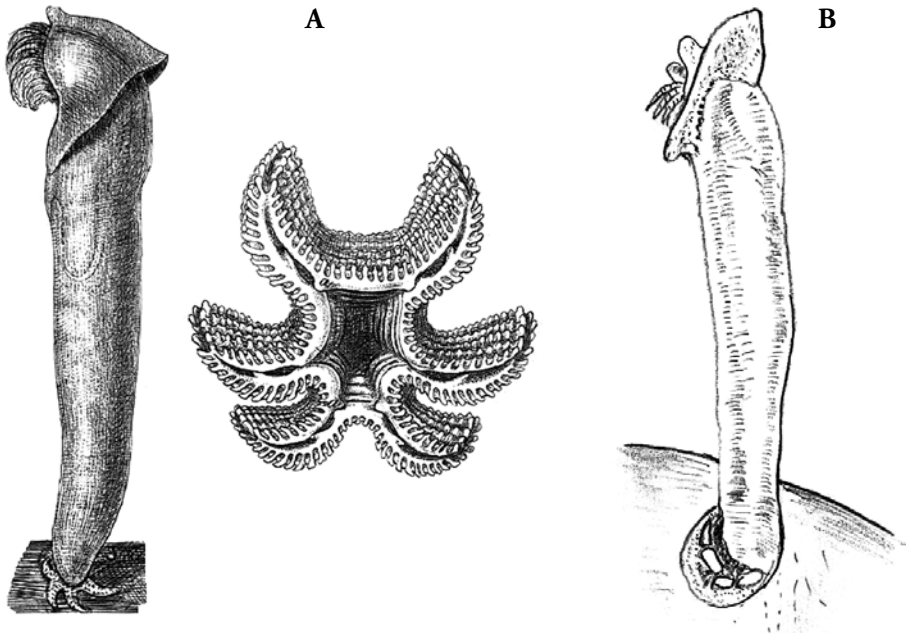
INTRODUCTION

Barnacles of the superfamily Coronuloidea are obligate commensals of sea turtles and cetaceans and, among others, the pseudostalked barnacle *Xenobalanus globicipitis* Steenstrup, 1851 lives on dolphins and whales (Fig. 1).

Xenobalanus globicipitis is a cosmopolitan species that seems to be associated with 34 cetacean species (Spivey, 1981; Rajaguru & Shantha, 1992; Kane et al., 2008). Pseudostalked barnacles are generally found on trailing edges of cetaceans as on dorsal fins, pectoral flippers and tail flukes (Dhermain et al., 2002; Seilacher, 2005; Toth-Brown & Hohn, 2007).

Although this species should be regarded as an obligate commensal, it has been sometimes reported as being able to cause skin irritation to its hosts (Dhermain et al., 2002; Fertl & Newman, 2008). Number and location of barnacles on the animal are largely variable and, in debilitated specimens, it is possible to detect over 100 barnacles (Aznar et al., 2005; Toth-Brown & Hohn, 2007). The presence of this commensal is widely connected to the health of the host (Aznar et al., 1994; Aznar et al., 2005) and is also commonly found on stranded cetaceans (Dailey & Walker, 1978; Dhermain et al., 2002; Karuppiah et al., 2004). Variations of prevalence are also related to the population's health, as also reported during the 1990-1992 *Morbillivirus* epidemic in Mediterrranean striped dolphins (Aznar et al., 2005).

We report herein two cases of *Xenobalanus globicipitis* occurrence in cetaceans from Tunisian and Sicilian waters.



Figg. 1A, B – *Xenobalanus globicipitis*. On the left redraw from Darwin 1884 and on the right drawing from the studied specimen. Note the particular morphology of the whole animal as well as of the walls inserted in the skin of the host.

MATERIALS AND METHODS

The first group of barnacles was found on an immature *Balenoptera physalus* 13.5 long stranded on the coast of the Kerkennah Islands (Gulf of Gabès - Tunisia) on February 22, 2008 (Fig. 2). The second case was observed on a stranded 2 m long female *Stenella coeruleoalba* found on the shore close to Leto Creek estuary in Letojanni (ME) on March 23, 1998 (Fig. 2). The specimens were identified and measured by comparison with collection materials and literature (Darwin, 1884; Cornwall, 1927; Pilleri, 1970; Karuppiah et al., 2004).

RESULTS

Xenobalanus globicipitis is monotypic and is very particular in shape and morphology, since its walls are reduced to a sort of anchor, while the arthrodial membrane supporting the operculum has been lengthened into a slender stalk up to some centimeters. Distally, the stalk expands to a capitulum-like structure, albeit without plates, since the *terga* and the *scuta* have both been lost. In this part is housed most of the organs of the barnacle. Part of the hood is modelled as a sort of "fins" which probably help the barnacle to get stabilized in turbulent waters at the tip of the fins were it is normally attached.

The pseudostalked barnacles were found on the tails of the whale, with 11 specimens, and striped dolphin, with 2 specimen (Fig. 3).

In both cetaceans under study, *Xenobalanus globicipitis* adult specimens of approximately 3 cm were found. The insertion into the skin had an average diameter of 6 mm (Fig. 4).

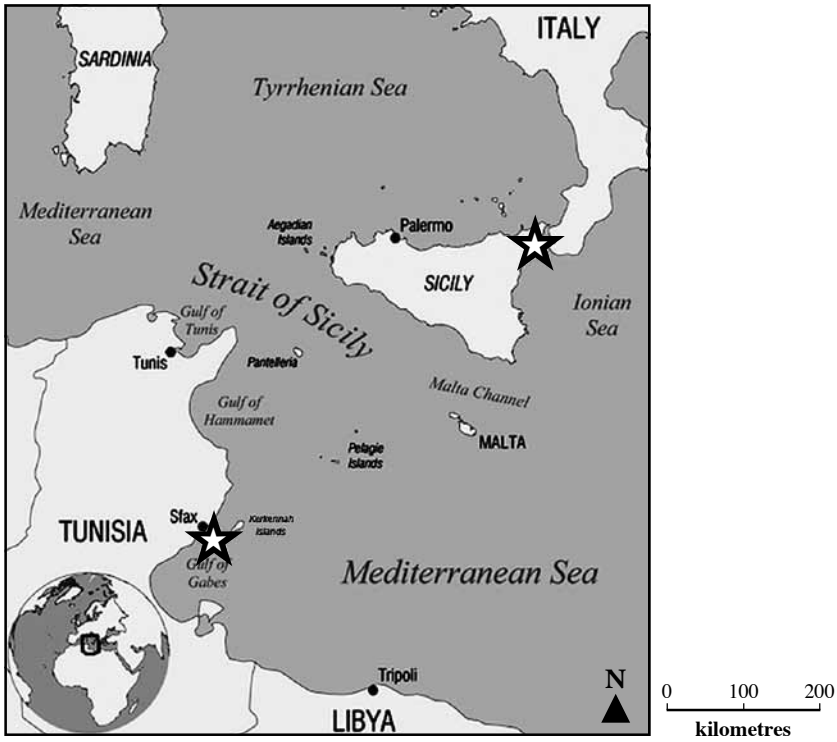


Fig. 2 – Record location of strandings with the *Xenobalanus globicipitis* barnacles.

Fig. 3 – Specimens on the tail of *Stenella coeruleoalba*.

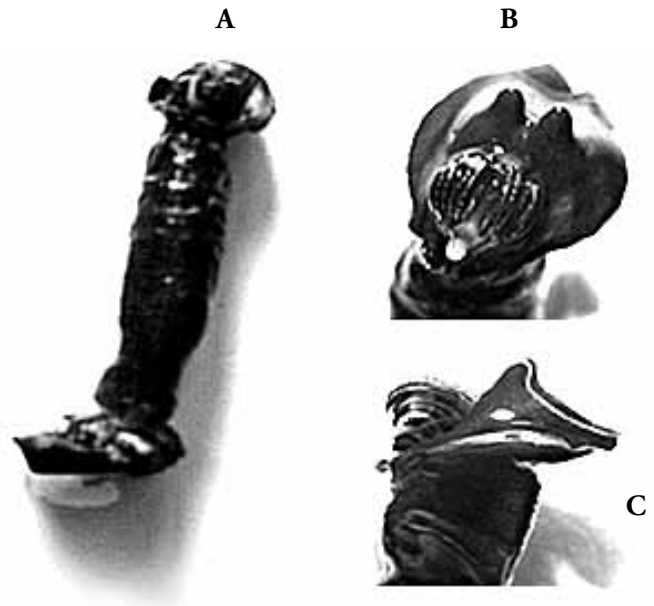


Fig. 4 – *Xenobalanus globicipitis* found on the *Balenoptera physalus*. A: general view, B: opening of the hood, C: lateral view

As far as Tunisian waters are concerned, there is a previous record of *X. globicipitis* on the same host (Heldt, 1950), with the species being also recorded in Italy (Relini, 2010).

The observations made and the records collected increase our knowledge on the distribution and occurrence of barnacles in free-living cetaceans, thus underscoring the need for scientific collaboration among Countries facing the Mediterranean Sea, as well as the crucial necessity of collecting information on marine biodiversity and its conservation.

RIASSUNTO

Nota su *Xenobalanus globicipitis* su *Balenoptera physalus* e *Stenella coeruleoalba* spiaggiate in acque della Tunisia e della Sicilia

Xenobalanus globicipitis (Steenstrup, 1851) è specie monotipica e particolarmente modificata di Cirripede. Presenta una distribuzione cosmopolita ed è stato ritrovato come commensale obbligatorio in 34 specie di cetacei, sebbene a volte produca lesioni consistenti sulla pelle. Presenta una morfologia particolare e mentre le pareti sono ridotte e costituiscono una specie di ancora nella pelle dell'ospite, il corpo è allungato e vi sono piccole alette laterali che probabilmente aiutano nella stabilizzazione dato che la specie si localizza soprattutto al margine delle pinne e della coda delle diverse specie di cetacei. Qui si riportano due casi di ritrovamento in acque contigue: su *Balenoptera physalus* spiaggiatesi nel 2008 nel Golfo di Gabés (Tunisia) e su una *Stenella coeruleoalba* spiaggiata presso la foce del torrente Leto a Letojanni (ME, Sicilia, Italia) in 1998. I dati raccolti saranno utili a incrementare la conoscenza sulla distribuzione e ospiti della e sottolineano l'importanza dello scambia di informazioni tra le diverse sponde per una migliore conoscenza e conservazione del Mediterraneo.

REFERENCES

Aznar, F. J., Perdiguero, D., Perez del Olmo, A., Repulles, A., Agusti, C. & Raga, J. A. (2005). Changes in epizoic crustacean infestations during cetacean die-offs: the mass mortality of Mediterranean striped dolphins *Stenella coeruleoalba* revisited. Dis. Aquat. Org. **67**: 239-247.

Aznar, F.J., Balbuena, J.A. & Raga, J.A.. (1994). Are epizoites biological indicators of a western Mediterranean striped dolphin die-off? Dis. Aquat. Org., **18**: 159-163.

Cornwall, I.E. (1927). Some North Pacific whale barnacle. Contrib. Canad. Biol. Fish. n.s. **3** (23): 1-17.

Dailey, M.D. & Walker, W.A. (1978). Parasitism as a factor (?) in single strandings of Southern California cetaceans. J. Parasitol., **64**: 593-596.

Darwin, C.R. (1854). A monograph on the sub-class Cirripedia. The Balanidae, the Verrucidae, etc. Ray Society, London.

Dhermain, F., Soulier, L., &. Bompar, J.M. (2002). Natural mortality factors affecting cetaceans in the Mediterranean Sea. In Notarbartolo di Sciara G. (ed.), Cetaceans of the Mediterranean and Black Seas: State of Knowledge and Conservation Strategies. A report to the ACCOBAMS Secretariat, Monaco, pp. 1-14.

Fertl, D. & Newman, W.A. (2008). Barnacles. in Perrin W.F., Wursig, B., & Thewissen, J.G.M. (eds.), Encyclopedia of Marine Mammals. Academic Press, San Diego: pp. 89-91.

Heldt, J.H. (1950). Note au sujet de *Xenobalanus globicipitis* Steenstrup sur *Balaenoptera borealis* Lesson en Mediterranee. Bull. Soc. Hist. Nat. Tunis **3** (1): 25-28.

Kane, E.A., Olson, P.A., Gerrodette, T. & Fiedler, P.C. (2008). Prevalence of the commensal barnacle *Xenobalanus globicipitis* on cetacean species in the eastern tropical Pacific Ocean, and a review of global occurrence. Fish. Bull **106**: 395-404.

Karuppiah, S., Subramanian, A. & Obbard, J.P. (2004). The barnacle, *Xenobalanus globicipitis* (Cirripedia, Coronulidae), attached to the bottle-nosed dolphin, *Tursiops truncatus* (Mammalia, Cetacea) on the southeastern coast of India. Crustaceana, **77** (7): 879-882.

Pilleri, G. (1970). *Xenobalanus globicipits* Steenstrup on *Delphinus delphis*, *Stenella styx* and *Tursiops truncatus* of the Western Mediterranean. Invest. Cetacea **2**: 247-249

Rajaguru, A. & Shantha, G. (1992). Association between the sessile barnacle *Xenobalanus globicipitis* (Coronulidae) and the bottlenose *dolphin Tursiops truncatus* (Delphinidae) from the Bay of Bengal, India, with a summary of previous records from cetaceans. Fish. Bull., **90** (1): 197-202.

Relini, G. (2010). Cirripeda. Biol. Mar. Mediterr. **17** (suppl. 1): 466-470.

Seilacher, A. (2005). Whale barnacles: exaptational access to a forbidden paradise. Paleobiology, **31** (2): 27-35.

Spivey, H.R. (1981). Origins, distribution, and zoogeographic affinities of the Cirripedia (Crustacea) of the Gulf of Mexico. J. Biogeogr., **8**: 153-176.

Toth-Brown, J. & Hohn, A.A. (2007). Occurrence of the barnacle, *Xenobalanus globicipitis*, on coastal bottlenose dolphins (*Tursiops truncatus*) in New Jersey. Crustaceana, **80** (10): 1271-1279.