

## Notas / Notes

### Finding of a dead rough-toothed dolphin *Steno bredanensis* (Cuvier and Lesson, 1828), stranded on the south Moroccan coast

A. G. de los Ríos<sup>1</sup> y O. Ocaña<sup>1,2</sup>

The rough-toothed dolphin *Steno bredanensis* (Cuvier and Lesson, 1828) inhabits tropical and warm-temperatures seas. However, in many of these places, the specie has not been recorded yet, so the distribution is based on scarce watching and stranding data. There are so few data of this species from around the world that the International Union for the Conservation of Nature (IUCN) catalogues this animal with Insufficiently Known status, which makes any observation of this species extraordinarily valuable.

Most of the encounters with the rough toothed dolphin have taken place offshore (Addink & Smeenk, 2001; Ritter, 2002). Though there are records of shallow water watching, often associated with feeding behavior (Delgado Estrella, 1994), individual OR SINGLE stranding is not very common (Smeenk, pers. com.) but often they strand in groups (massive stranding) (Cadenat, 1949; Stinnintz *et al.*, 2000; Manasijevic *et al.*, 2002).

Between the 4<sup>th</sup> and the 11<sup>th</sup> of September 2002 we took part in an expedition through the western coast of Morocco and the Western Sahara (De los Ríos y Ocaña, in prep.) searching for sea turtle nesting evidences and feeding ecology data. During this expedition, we found a rough-toothed dolphin *Steno bredanensis*, dead for several weeks. We would like to present here the results of our identification and study of the specimen.

The coast of Tarfaya consists of a large sandy beach, full of sediments and debris due to strong currents. Almost any inert material is, therefore, washed ashore. Much plastic debris such as bags, bottles, etc., and even three hulks, stranded in less than half a mile, were found in the littoral area. From our starting point (waypoint N 27° 55'163'' W 012° 53'048''), walking to either side of the beach for about 2 km, we found two Loggerhead turtle (*Caretta caretta*) carcasses, one Common dolphin (*Delphinus delphis*) corpse, and another corpse later identified as a Rough-toothed dolphin, *Steno bredanensis* (Fig. 1). So, according to our observations and also to local fishermen, this long and sandy coast is an area where cetaceans and turtles usually strand throughout the year.

Identification of a dolphin which is alive, recently stranded or dead for just a few days, is not very difficult, especially for experts. Unfortunately, most of the times, we find the animal many days after death, lying on the beach, burnt by the sun, and even with some showing. In these cases, we have to perform anatomical analysis in order to make a proper identification, and the best part to do that on the skull, where the most differential characteristics are concentrated.

The carcass in question presented a level of putrefaction 3, as the skin was totally dry and petrified. The identification of the specimen turned out

<sup>1</sup> Departamento de Medio Marino, Red de Varamiento Asociación Septem Nostra, Dependencias del Antiguo Tanatorio Municipal, 51001 Ceuta. [caretta@eresmas.net](mailto:caretta@eresmas.net); [lebruni@telefonica.net](mailto:lebruni@telefonica.net)

<sup>2</sup> Correspondence: O. Ocaña. Instituto de Estudios Ceutíes (CECEL-CSIC), Paseo del Revellín, 28, 51001 Ceuta. [lebruni@telefonica.net](mailto:lebruni@telefonica.net); [ieceuties1@retemail.es](mailto:ieceuties1@retemail.es)



Fig. 1.— *Steno bredanensis* stranded at Tarfaya beach.

Fig. 1.— *Steno bredanensis* varado en la playa de Tarfaya.

to be very complicated due to condition of the body, and the necropsy was discarded at all. As a consequence of this, the skeleton became crucial for identification.

The head and one flipper were removed, stored and taken out to the base in Ceuta, North Africa (Spain), about 1000 km distance. Once at Ceuta, the remains of the dolphin were placed in a special area, prepared for work with this type of biological material, and covered by a thin layer of sand and gravel waiting for its decomposition. After recovery, the skeleton was treated following the recommendations of the First World Congress on the Preservation and Conservation of Natural History Collections (Rose *et al.*, 1992). The skeleton was gently cleaned up using soaps and several types of paintbrushes and then dried in the sun. Finally, a layer of special varnish was applied, and it was stored well protected from light and humidity (see Ocaña & De los Ríos, 2002). The material was labeled for the collection of Septem Nostra, Departamento de Medio Marino: CET/SB-1. The dolphin seemed to have died several months ago, so this made the identification even harder, and determination of the cause of the death very difficult. The general morphology and anatomy of the skeleton were studied by means of a stereo dissecting microscope.

The head was the best preserved part of the body, which was good, since the skull reveals to be the key to distinguish the species properly. Some skin was still visible and the color was dark grey. The jaws were large, which explain one of the seve-

ral common names of this species: “Long beak dolphin”. The maxilla was bowed and did not seem to present a clear separation with the head, therefore it does not present an apparent melon. The teeth were apparent separated and not numerous (24) and the eyes were large. These characteristics gave the animal a strange appearance, different from the gentle morphology expected from delphinids.

The dental formula should serve as a start point, with about 24 teeth in each jaw. Teeth have many vertical ridges in the crown, well visible by means of a stereo dissecting microscope.

Apparently the skull looks similar to others members of the family, although some main differences were detected between the species studied by us in North Africa. According to Wilkie-Tinker (1988), *S. bredanensis* differs from the other species compared in having a more elongate and laterally compressed pointed skull (see Fig. 2). Other slight differences have been detected although they need a separate study (De los Ríos y Ocaña, in prep.). Nevertheless, the mandibles are the anatomic part of the skull offering a more significant and useful difference with the rest, as they are clearly bowed, thick and strong to hold the wide conical teeth, related to the type of habitat and feeding behavior developed by the species.

*Steno bredanensis* is a pan tropical species as it has been recorded in tropical areas of the Atlantic and the Indo pacific Oceans (see Evans, 1987), and it seems to be specially abundant on the Mexican coast (see Delgado-Estrella, 1994). It has also been recorded in the Mediterranean sea offshore Malta

Fig. 2.— Head skeleton of *S. bredanensis* specimen CET/SB-1 from West Sahara coast.

Fig. 2.— Cráneo de ejemplar de *S. bredanensis* CET/SB-1 hallado en la costa del Sahara Occidental.



(see Beaubrun *et al.*, 1995) and on the French coast (Fernández-Casado *et al.*, 1997), although the knowledge concerning this species in such areas is scarce. Generally, it should be considered an offshore species, being very uncommon to observe it near the shore. The species seems to be common off the Sahara coast and in the vicinity of the Cape Verde archipelago where, in summer 2002, a mass stranding were observed in Boavista Island (Pers. Obser.).

The sporadic presence of *S. bredanensis* in cold-temperate Sahara waters can be explained by the vicinity of the Canary Islands, where the species is often recorded (see Cañadas *et al.*, 1999; Ritter, 2002). According to this, populations of *S. bredanensis* from the Canary Islands may move to Saharan coast looking for food resources. As it is well known, all the continental shelf of the Sahara region from Cape Jubi (28°N) to Cape Blanco (21°N) is strongly influenced by seasonal upwelling, which produce important temperature falls, and increases in plankton production (see Longhurst, 1998). The common presence of *S. bredanensis* in deep waters, at least 175 meters deep, off Mauritania (see Addink & Smeenk, 2001) indicates its ability to change from temperate to cold waters temporarily. These data, along with the

abundance of cephalopods (one of the main prey for *S. bredanensis* —see Evans, 1987) along the Sahara coasts, support this idea.

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