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Observation of a leatherback sea turtle, *Dermochelys coriacea*, in the Gulf of Corinth, Greece

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Published records of the leatherback sea turtle, *Dermochelys coriacea* (Vandelli 1761) in the Mediterranean are few, particularly in comparison to those of the loggerhead sea turtle *Caretta caretta* (Casale & Margaritoulis 2010). However, these records indicate that leatherbacks occur throughout the basin, from the Gibraltar Strait to the easternmost part, and enter the basin at a relatively large size (large juveniles/adults), with no evidence of breeding in the Mediterranean (Casale *et al.* 2003). The species is classified globally as Vulnerable by the International Union for Conservation of Nature (Wallace *et al.* 2013). Mediterranean leatherbacks are considered part of the north-Atlantic regional management unit of this species, categorized as Low risk–Low threat (Wallace *et al.* 2011).

Leatherbacks have been reported from the Ionian and the Aegean Seas, including coastal areas. In Greece, all published records have concerned dead animals, usually stranded on beaches (Margaritoulis 1986). Information on the diving behavior of leatherbacks at non-breeding grounds is limited, derived from satellite tracking or animal-borne cameras, and most of the information is from post-nesting females (Fossette *et al.* 2010; Heaslip *et al.* 2012; Shillinger *et al.* 2011). Here, we report an encounter with a leatherback in the semi-enclosed Gulf of Corinth, Greece, contributing one of the few detailed observations of a live individual of this species in the entire Mediterranean region.

The Gulf of Corinth (surface area of approximately 2,400 km^2) is a deep semi-enclosed basin separating the Peloponnese from mainland Greece (Fig. 1). The 1.9-km-wide Rion-Antirion strait, crossed by a four-pylon bridge, separates the Gulf from open Mediterranean waters. The waters of the Gulf of Corinth are oligotrophic and transparent, with no significant river runoff. While the western part of the Gulf is relatively shallow (the maximum depth under the Rion-Antirion bridge is about 70 m), its central portion has waters 500 – 900 m deep, offering a suitable albeit restricted habitat to marine fauna that is normally pelagic (*e.g.*, striped dolphins *Stenella coeruleoalba*; Bearzi *et al.* 2011).

On 7 August 2012, while conducting a boat survey in the Gulf of Corinth in the context of a study of dolphin abundance that was initiated in 2009 (Bearzi *et al.* 2011), we spotted a leatherback breathing at the surface on a completely flat sea (38°11'174N, 22°44'851E; sea floor about 700-800 m deep). Starting 7 min after the beginning of the observation, we timed a total of 29 consecutive surfacings, until the animal was lost from view due to deteriorating weather conditions. While the animal was close to the boat, we took 1 min of underwater footage with a Canon Powershot S100 digital camera (12 Megapixel) in a waterproof casing, deployed manually while we stayed on board our 5.80-m inflatable boat. In addition, a number of photos were taken with a Canon 7D digital

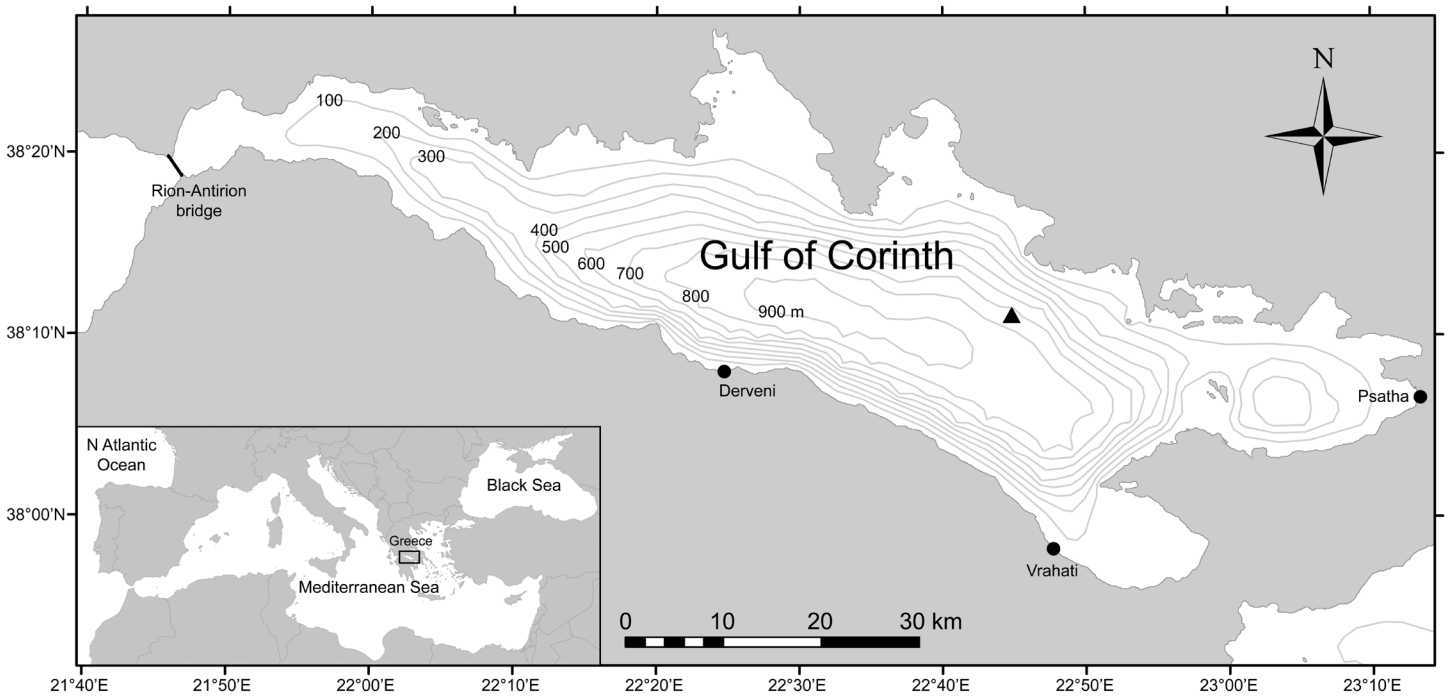

Figure 1. Map of the Gulf of Corinth showing bathymetry as well as the position of the leatherback sea turtle observed on 7 August 2012 (triangle), together with the approximate location of animals found stranded in the past (dots).

camera (18 Megapixel) equipped with a Canon EF 70–200 mm f 2.8 IS USM zoom.

Estimated body size was approximately 1.5-2 m (total length), based on the relative size of boat and leatherback when the animal swam close by. Dive durations recorded continuously during a 36 min sampling interval ranged between 8 and 601 s (mean = 75 s, SD = 145.5, *n* = 29). The diving pattern of the leatherback is shown in Fig. 2. Observed dive durations were much shorter than those observed at nesting grounds (Reina *et al.* 2005; Shillinger *et al.* 2010, 2011; Wallace *et al.* 2005) and also shorter than those recorded during migration or at foraging grounds (Fossette *et al.* 2010; Heaslip *et al.* 2012; Shillinger *et al.* 2011).

About 21 min after the beginning of the observation, the animal surfaced close to our boat (the low-noise four-stroke engine of 100 HP was operated either on idle or at minimum speed). There was no clear avoidance behavior. The underwater video shows that the turtle suddenly changed direction when the distance from the boat was about 5 m (surfacing no. 21 in Figure 2). The animal did not

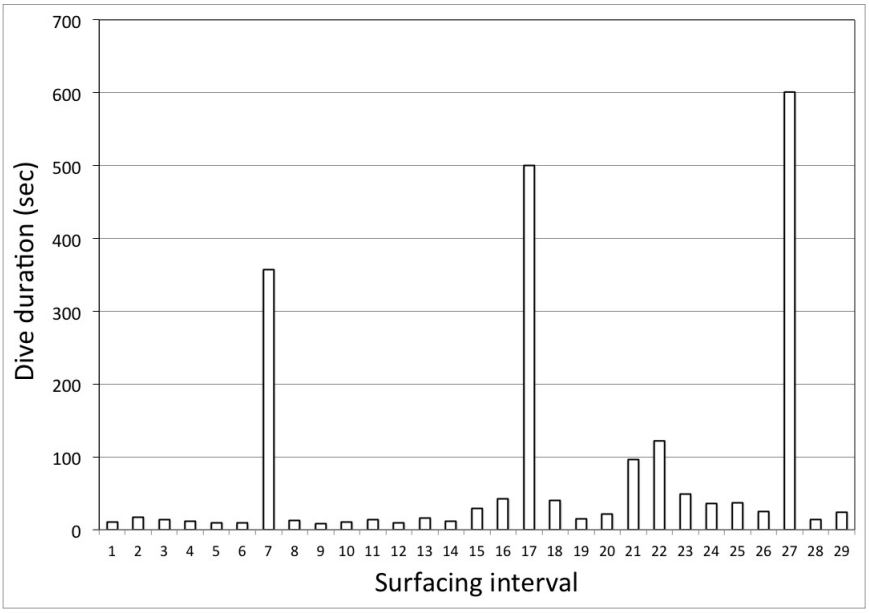

Figure 2. Dive durations recorded between 16:37 and 17:13. Interval no. 21 is when the animal came close to the boat and passed under the keel.

Figure 3. Underwater image from video, showing several of the accompanying pilot fish as well as a Mediterranean jelly on the upper left (photo by G. Bearzi).

Figure 4. The "pink spot" on top of the leatherback's head, the contour of which may be used for individual identification (photo by S. Bonizzoni).

attempt to avoid the boat but swam directly toward it, passing under the keel and to the opposite side, at about 1 m depth. Subsequent surfacing intervals were likely affected by this close approach, although the animal soon resumed its original dive pattern (Fig. 2).

The underwater video shows a total of 12 pilot fish *Naucrates ductor* swimming in close proximity to the leatherback (Fig. 3). Additionally, a bloom of Mediterranean jelly *Cotylorhiza tuberculata* was ongoing at the time of the observation, and several of these invertebrates (diameter ~ 20 cm) may be seen in the video near the swimming leatherback; the turtle ignored these. While no feeding behavior was observed, the animal defecated (a large yellowish cloud) while swimming about 10 m from the boat and parallel to it. The "pink spot" on the top of the head - a characteristic of adult leatherbacks - was photographed during surfacings (Fig. 4) and its contour may be used for individual identification in case this individual is re-sighted.

The only other published record of a leatherback sea turtle in the Gulf of Corinth refers to an animal caught in fishing gear and then killed by a fisherman near Psatha in November 1982 (Margaritoulis 1986; Fig. 1). More recent unpublished data from the ARCHELON Sea Turtle Rescue Network include two incidents in the Gulf of Corinth, both concerning dead-stranded leatherbacks with severe injuries on the neck and front flippers, attributed to incidental capture in fishing nets: one near Vrahati (28 September 1997; in advanced decay) and one near Derveni (26 June 2004; in decay). Both stranding locations are on the Gulf's southern shores (Fig. 1). Our observation contributes to documenting the occurrence of charismatic and vulnerable fauna in the Gulf of Corinth, where efforts to preserve marine biodiversity have been modest.

Acknowledgements. We express our gratitude to OceanCare for having funded this study. Research was conducted under permit #201986/3101 issued by the Hellenic Ministry of Environment, Energy and Climate Change.

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Natural Death of a Hawksbill Turtle Due to Feeding Behavior

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The Abrolhos Archipelago (17.93°S, 38.94°W), located within the Abrolhos National Marine Park, is an important feeding area for immature hawksbill turtles *Eretmochelys imbricata* (Proietti *et al.* 2012). This species is generally carnivorous and has been reported to feed on a wide range of prey, with preference for ingesting sessile benthic organisms such as sponges and zoanthids (León & Bjorndal 2002; Proietti *et al.* 2012; Stampar *et al.* 2007). At the archipelago, hawksbill turtles are commonly seen at shallow reef areas, where they feed in a distinctive manner on the green sea mat *Zoanthus sociatus* (Fig. 1).

On 18 March 2015, at 3:50 PM local time, while snorkeling at a protected bay (Mato Verde) of Santa Barbara Island, we observed an

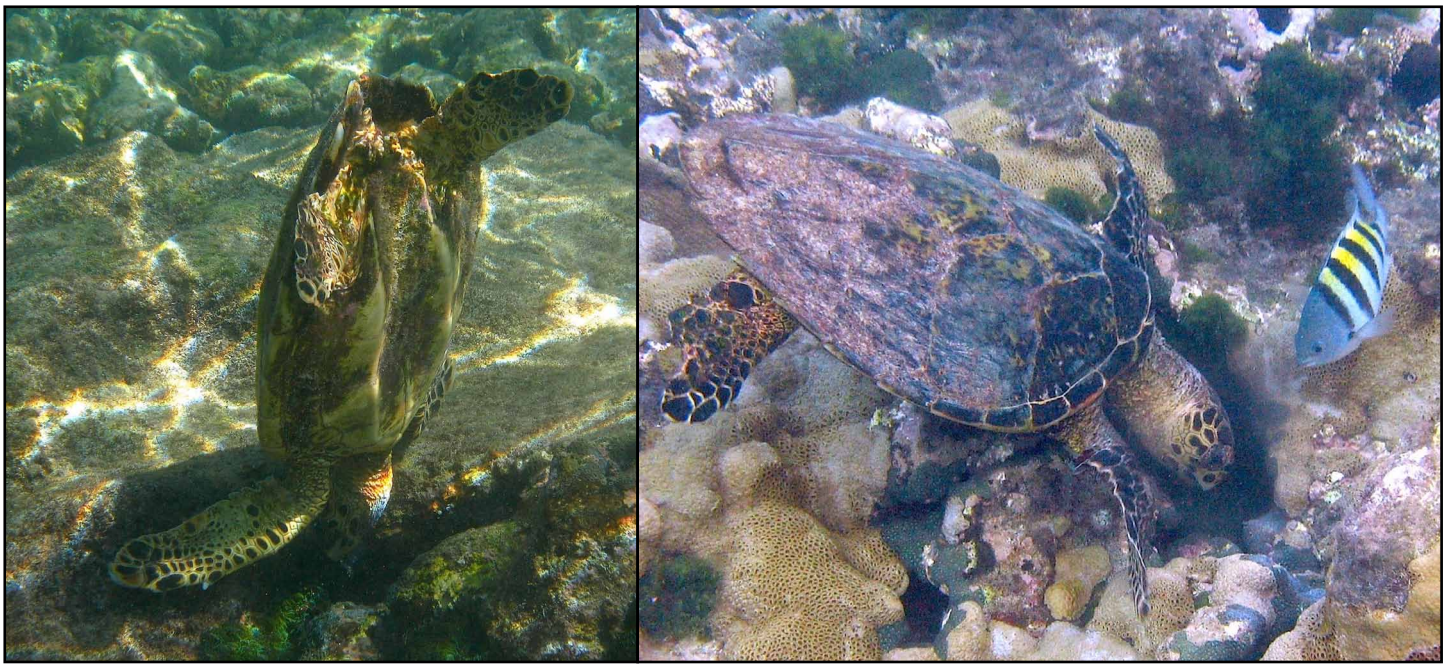

Figure 1. Live immature hawksbill turtles feeding on Zoanthus sociatus at the Abrolhos Archipelago.