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First Record of a Gravid Marine Turtle from Chile

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There are more than a hundred records of sea turtles on the Chilean coast. According Frazier and Salas (1982) the occurrence of marine turtles registered over the last two centuries in Chile is greater than any place in the Eastern Pacific, except the Galapagos Islands and the *arribada* areas in Mexico and Costa Rica. Of the four marine turtle species recorded on the coast of Chile, *Chelonia mydas* and *Lepidochelys olivacea* have been noted relatively frequently (Frazier and Salas, 1982; Ibarra-Vidal and Ortiz, 1990). Both are listed as Endangered by the IUCN Red List.

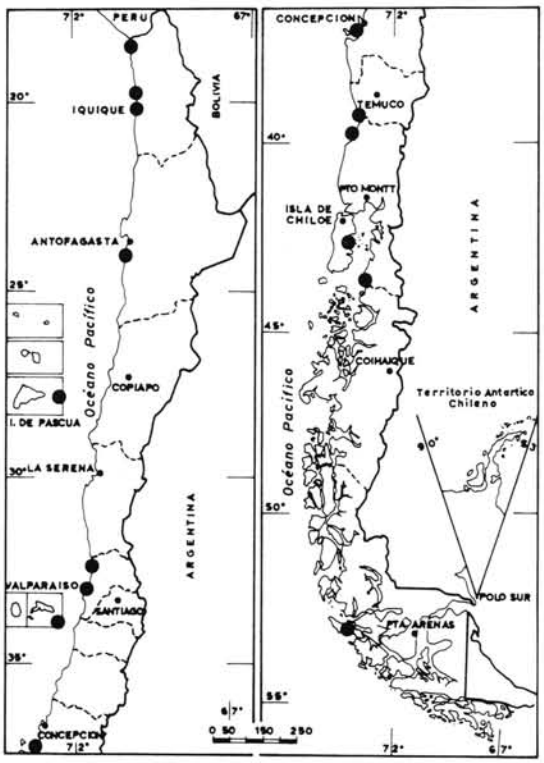

Figure 1. Map of Chile (left: northern half; right: southern half) showing localities mentioned in text. Solid dots represent records of marine turtles.

A population of *C. mydas* has been known since 1999 in Antofagasta (II Region), its presence possibly due to warming coastal waters produced by power generation plants in the area (Donoso and Dutton, 1999). The more numerous records of *L. olivacea* are from the Norte Grande coast, San Antonio (central Chile), and Arauco Gulf (VIII Region) (Frazier and Brito, 1990).

Despite the large number of records of marine turtles in Chilean waters, there has been little local work on the biology of these reptiles (Ibarra-Vidal and Ortiz, 1990). To date there is no clear evidence of breeding of any species of marine turtle on the Chilean coast. In this short communication, we report the first record of a gravid sea turtle from the coast of Chile, a female *L. olivacea*.

Results. — We found two stranded dead *L. olivacea* in July 2000, one at Laraquete (37°09'S; 73°11'W) and one at Caleta Lenga (36°47'S; 73°07'W), both near Concepción in central Chile (Fig. 1).

The first specimen was a female with a curved caparace length of 65 cm and carapace width of 57 cm. Necropsy revealed 96 eggs in the oviducts, in the final stage of development, with a mean diameter of 22.8 mm (± 4.1 mm SD). Stomach content analysis failed to identify any dietary items. The epibiotic fauna on its carapace included Hydrozoa, Cirripedia, and Bryozoa. This is the first time that members of Bryozoa have been noted to occur on marine turtles in Chile (H. Moyano, *pers. comm.*).

The second specimen was a male with a curved carapace length of 67.5 cm and carapace width of 69 cm. Stomach contents were primarily phaeophitas algae, which are abundant along the Chilean coast (Santelices, 1989). This may be a secondary dietary item because this species is thought to be carnivorous (Márquez, 1990). Epibiotic fauna on the flippers included Cirripedia and Hydrozoa. A fishhook was present in the esophagus, which was probably the cause of death.

Discussion. — This paper provides the first report of a gravid female marine turtle in Chile. Although this does not prove the occurrence of local breeding of *L. olivacea*, it does suggest that it may be possible. However, other sea turtles with eggs have stranded dead in non-nesting areas far from their normal nesting grounds; Rhodin and Schoelkopf (1982) recorded a leatherback turtle (*Dermochelys coriacea*) with eggs stranded dead in New Jersey, far north of the northernmost recorded nesting sites for the species.

It is not uncommon to find sea turtles with fishhooks in their digestive tracts, such as the specimen reported here and by Bjorndal et al. (1994). In Chile this occurs frequently on the Valparaíso coast (33°02'S), San Antonio (33°35'S), and in south-central Chile (VIII Region, 36°47'S; 73°04'W), associated with the artisanal fishery of *Xiphias gladius*, *Merluccius gayi*, and *Genypterus* sp. (Brito, 1998).

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Repetitive Data-Logger Attachments to Sea Turtles Using a New Quick-Release Method

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Classic studies involving visual observation of larger vertebrates are difficult when animals frequent obscuring environments, and observations of flying, nocturnal, or diving species become discontinuous or even impossible. However, attached transmitters and data-loggers which monitor animals continuously provide a solution to this, so that periods of monitoring may be greatly extended, even to years, if attachment systems are sufficiently robust and appropriate while minimally affecting the animal concerned.

Our specific aim was to develop an attachment method that fully meets the requirements of repeated deployments of replaceable data-loggers on sea turtles.

Methods. — Field work was carried out during the peak nesting season of hawksbill turtles (*Eretmochelys imbricata*) (July to September) 1998 and 1999 at Buck Island Reef National Monument (64°N, 17°W), St. Croix, U.S. Virgin Islands. Data-loggers were attached to the anterior of the carapace (2nd vertebral scute) of female hawksbill turtles during nesting, after the nest-hole was completed and the egg-laying process had already commenced. The general attachment method described below was used in both field seasons to attach different metal base plates to the carapaces of the turtles.

The carapace of nesting hawksbill turtles is usually relatively dry by the time the first eggs are laid (average time after emergence from water is ca. 40 min, Z. Hillis-Starr, *pers. comm.*). However, we scrubbed the carapace with a brush and freshwater to remove the film of algae and salt crystals, as well as loose sand and to prepare the surface of the scutes for the adhesive. All barnacles on, or near, the attachment area on the first and second vertebral scutes were removed using pliers. The attachment area was dried with a towel and roughened with sandpaper.

Following Mitchell (2000) we used a combination of a fast setting epoxy putty (Repair stick ST115 steel, Weicon® worldwide GmbH & Co. KG, Münster, Germany, info@weicon.de), which cures within ca. 5 min at 20°C, together with a slower-setting viscous epoxy from a cartridge (R-Kex®, synonym Foil-Fast®, Rawl, Glasgow, UK, info@rawlplug.co.uk), that cures within ca. 30 min. Like all epoxy resins, these materials consist of two components that react when mixed and cure within a temperature-dependent predictable time. Since under tropical conditions the fast-reacting epoxy cures too fast to be handled properly, we stored the putty in an insulated bag with ice-packs. Just prior to use, two pieces of the epoxy putty (ca. 25 g each) were taken from the bag and simultaneously kneaded to allow the two components of each piece to mix evenly and be warmed. We then rolled two pieces of the putty into a cylindrical shape and attached them beneath the edges of a metal plate, one being placed on each side (Fig. 1). While the ends of the pieces met in the tip, we left a gap (ca. 0.5 cm) in the middle of the trailing edge. The area between the rolls of putty was filled with R-Kex (ca. 85 g), that is readily mixed while being manually pumped from the cartridge through the nozzle onto

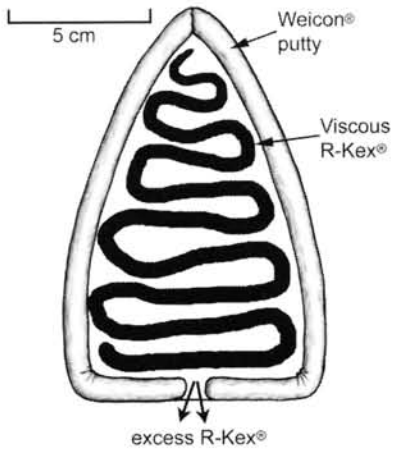

Figure 1. Epoxy adhesives applied to the base plate (see also Mitchell, 2000).