

# Heavy metals in marine turtle eggs and hatchlings in the Mediterranean

by Yakup Kaska and Robert W. Furness

**Abstract.** The concentrations of cadmium, lead, iron, copper and zinc were analysed in Loggerhead Turtle (*Caretta caretta*) hatchling samples (eggshells, remaining yolk, and liver) from beaches of southwest Turkey. Cd, Pb, Fe, and Cu concentrations were higher in embryo liver than in yolk. Zn concentration was higher in yolk. Hg concentrations in all yolk samples were below the detection limit, but levels could be measured in some embryo livers.

**Kurzfassung.** Eischalen, Dotterreste und Leberproben von Schlüpflingen der Unechten Karettschildkröte (*Caretta caretta*) aus Südwestanatolien wurden auf Rückstände von Kadmium, Blei, Kupfer und Zink untersucht. Die Konzentrationen von Cd, Pb, Fe und Cu waren in der embryonalen Leber höher als im Dotter. Die Blei-Konzentrationen lagen in allen Dotterproben unterhalb der Nachweisgrenze, doch konnte in einigen embryonalen Lebern Hg nachgewiesen werden.

**Key words.** Marine turtles, heavy metals, Turkey, Mediterranean, *Caretta caretta*, Loggerhead Turtle.

## Introduction

The carnivorous Loggerhead Turtle, *Caretta caretta*, occurs in the Mediterranean Sea, Atlantic, Indian and Pacific Oceans (DODD 1988). Recent reports showed that sea turtles are considerably affected by marine pollutants, such as debris, tar balls and toxic chemicals (CARR 1987, GRAMENTZ 1988, SAKAI et al. 1995, 2000a, 2000b) and suggested the need to monitor chemical pollutants in an effort to preserve their populations. All species of sea turtles are regarded as endangered. Contaminants can be measured in turtles found dead or in carapaces sampled from living turtles (GODLEY et al. 1999, SAKAI et al. 2000b). Alternatively, eggs can be used as indicators for monitoring heavy metal levels in turtles (SAKAI et al. 1995).

There are two possible sources of heavy metals for the eggs; from the substratum or from the mother. The loggerhead is long lived, taking at least 25–30 years to reach maturity, and during its life time it may built up concentrations of trace metals in its tissues. Sea turtles and their eggs have been analysed for heavy metals and organochlorine compounds (STONEBURNER et al. 1980, WITKOWSKI & FRAZIER 1982, DAVENPORT & WRENCH 1990, RYBITSKI et al. 1995, BISHOP et al. 1995, SAKAI et al. 1995, 2000a, 2000b). Heavy metal concentrations of loggerhead eggshells differ for example significantly between Florida and Georgia/South Carolina rookeries (STONEBURNER et al. 1980), and heavy metals are found at higher concentrations in liver than in eggs of Loggerhead Turtles (SAKAI et al. 1995).