



MIGRATIONS OF LOGGERHEAD TURTLES NESTING IN KYPARISSIA BAY, GREECE, DERIVED FROM FLIPPER TAG RETURNS

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The Bay of Kyparissia in western Peloponnese, Greece, contains the second largest nesting aggregation of loggerhead turtles in the Mediterranean. The Bay's coastline includes a 44km long beach from the river Alfios in the north to the river Arcadikos in the south. Although turtles nest along the entire beach, the majority of nesting (about 84%) occurs within the southernmost 9.5km which is considered the core area. Since the early 80s, ARCHELON has undertaken a long-term monitoring and conservation project in Kyparissia Bay. Tagging of nesting turtles started in 1982 and was performed in the core nesting area. Two types of tags were used: metal Monel 681-style tags on front flippers and plastic Jumbo Rototags usually on hind flippers. In total 1,358 loggerheads were tagged during the period 1982-2012. Of the tagged turtles, 69 individuals (5.1%) were recovered from 1 September 1985 until 5 June 2013, at various localities in the Mediterranean; specifically 27 in the Ionian Sea (incl. 3 in the Gulf of Taranto), 20 in northern/central Adriatic, 9 in the Gulf of Gabes, 8 in the Aegean Sea, 3 in the eastern Mediterranean and 2 in southern Adriatic. Excluding the turtles that were recovered relatively close to the nesting area in the Ionian Sea, the greatest concentrations of tag returns were observed in the northern/central Adriatic Sea (47.6%), in the Gulf of Gabes (21.4%) and in the Aegean Sea (19%). Although the first two areas are known foraging grounds of loggerhead turtles in the Mediterranean, the Aegean Sea has not previously been identified as important for turtles nesting in Kyparissia Bay. The longest migrations (about 1,400 km) were directed to the Gulf of Trieste, Slovenia, and to Sinai Peninsula, Egypt. The elapsed time (in days) between last observation at the nesting area and first recovery averages 901 days for turtles recovered in the Ionian Sea (range: 11-5,493 days), 795 days (range: 77-2,015) in the Gulf of Gabes, 760 days (range: 101-2,641 days) in northern/central Adriatic and 525 days (range: 33-1,154) in the Aegean Sea. It is worth to note that one turtle was observed alive in the Ionian Sea after 5,493 days, which was about 15 years from its last observed nesting in Kyparissia Bay. Elapsed times in relation to the distance of the recovery location can provide an idea of the average travelling speeds of migrating turtles; the maximum of these speeds reached about 12km/day for five turtles (3 migrating to northern Adriatic, 1 to Gulf of Gabes and 1 to the Aegean Sea); this speed concurs with similar research elsewhere. The present study highlights three important regions for loggerhead turtles in the Mediterranean with one of them identified for first time as a preferred site for loggerheads nesting in Kyparissia Bay. Many thanks to fishermen, coast guard and fisheries officers, concerned citizens and colleagues in several countries that provided information on recovered turtles. Also, many thanks to the hundreds of ARCHELON volunteers and field assistants for tagging turtles in Kyparissia Bay over the decades.

SURFACE CIRCULATION PATTERNS DRIVE THE GENETIC STRUCTURING OF JUVENILE LOGGERHEAD TURTLE POPULATIONS IN THE MEDITERRANEAN SEA

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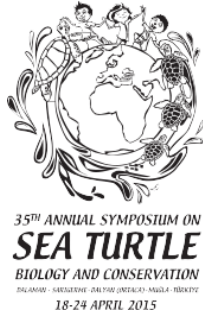
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Turtles of both Atlantic and Mediterranean origin share common foraging grounds in the Mediterranean Sea. However, the detailed structuring and distribution at sea of specific loggerhead turtle populations in the basin is still unclear. We analyse the origin of 275 stranded or bycaught juvenile loggerhead turtles (30-69 cm CCL) from six distinct foraging grounds within the Mediterranean Sea through a Bayesian mixed-stock analysis with longer fragments of mtDNA. We aimed to describe the distribution of juveniles of Atlantic origin within the Mediterranean Sea, unveil the use of Mediterranean foraging grounds by juveniles from the Mediterranean populations and understand the mechanisms of such distributions. Differences were found in the relative contribution of juvenile turtles of Atlantic and Mediterranean origin to each foraging ground. A decreasing proportion of Atlantic juveniles was detected along the main surface current entering the Mediterranean Sea, with a high prevalence in the Algerian basin and lower numbers elsewhere. In regards to the turtles from Mediterranean populations, juveniles from Libya prevailed in central and western Mediterranean foraging grounds other than the Algerian basin. Conversely, the Adriatic Sea was characterised by a large presence of individuals from western Greece, whilst the southern Levantine Sea was inhabited by a heterogeneous mix of turtles from the eastern Mediterranean rookeries (Turkey, Lebanon and Israel). Overall, the distribution of juveniles could be directly related to the surface circulation patterns observed, revealing that the contribution of different nesting beaches to any particular juvenile foraging ground strongly depends on the pattern of surface currents connecting these beaches with the foraging ground used. These results have deep implications for the assessment of bycatch impacts on the populations using Mediterranean foraging grounds.



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