On the whereabout of immature sea turtles (*Caretta caretta* and *Chelonia mydas*) in the eastern Mediterranean

by İbrahim Baran and Max Kasparek

Abstract: Numbers and spatial distribution of dead sea turtles washed ashore in Turkey indicate that immature Green Turtles *(Chelonia mydas)* stay more or less around their birth place and later reproduction grounds, whereas Loggerhead Turtles *(Caretta caretta)* apparently dismigrate to a much greater extent.

Kurzfassung: Die Anzahl und die räumliche Verteilung von Meeresschildkröten, die tot an der Meeresküste der Türkei angeschwemmt wurden, zeigt, daß Suppenschildkröten *(Chelonia mydas)* ihre Immaturphase mehr oder weniger an ihrem Geburts- und späteren Fortpflanzungsort verbringen, während die Unechte Karettschildkröte *(Caretta caretta)* offenbar in weit größerem Maße dismigriert.

Key words: *Caretta, Chelonia,* Cheloniidae, feeding grounds, conservation, migration

1. Introduction

The biology of sea turtles has mostly been studied on the nesting beaches. This implies the fact that only laying females and hatchlings have been intensively studied. Our knowledge of the life history of male sea turtles, of female sea turtles in the internesting period, as well as of immature sea turtles is still very poor and nothing is known on the situation in the Mediterranean. Being a more or less enclosed sea, the situation here might be different from other areas.

In the course of a study on the nesting beaches of Green Turtles *(Chelonia mydas)* and Loggerhead Turtles *(Caretta caretta)* along the Turkish coasts in 1988 (BARAN & KASPAREK 1989), some facts were obtained which might give a first idea on the whereabout of immature sea turtles.

2. Results

It is supposed that immature Green Turtles stay around their birth place and later nesting grounds, whereas Loggerhead Turtles seem to leave this area to a much greater extent. The place where they go is not known yet.

This assumption is based on the following facts.

Green Turtles washed ashore belong to all age classes. Fig. 1 shows the length of dead Green Turtles (curved carapace length) found along the Turkish coast in 1988. A total of 26 specimens were found (cf. Tab. 1), the smallest being somewhat less than 10 cm. This apparently was a first-year individual which had been dead for a rather long time. The carapace of the largest animal measured 92 cm, this being well in the upper range of laying females. All the dead Green Turtles were found between Mersin and the Syrian border, most of them along the Çukurova coast, with the exception of one

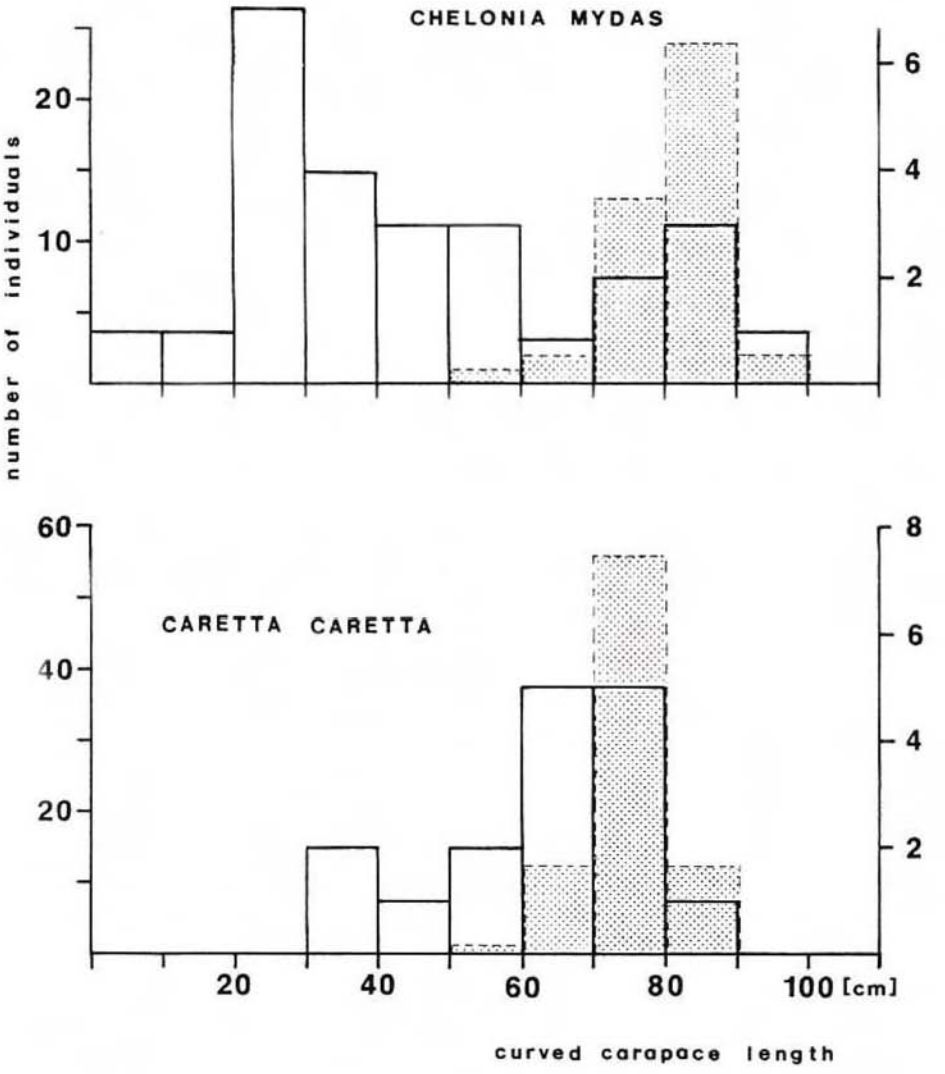

Fig. 1. Carapace length of Loggerhead Turtles, *Caretta caretta*, and Green Turtles, *Chelonia mydas*, washed dead ashore in comparison to adult individuals (mature females measured on the nesting beach). The right ordinate refers to stranded individuals, the left to adult individuals (shown as shaded columns).

specimen which was found in the Antalya province between Belek and Kumköy. The Çukurova is a major nesting ground for Green Turtles, where over 90% of the Turkish nesting population is concentrated (BARAN & KASPAREK 1989). Outside the

Fig. 2. A Loggerhead Turtle, *Caretta caretta*, returning to the sea after egg-laying. Photograph: YIGIT ERGIN.

Çukurova area, there are two more records of immature Green Turtles: One with a carapace length of 44 cm was washed ashore at Serik (Antalya prov.) in September 1976 and is now in the collection of the Aegean University İzmir (BAŞOGLU & BARAN 1982) and another stranded individual with a carapace length of about 40 cm was found in the Büyük Menderes delta in July 1987 (KASPAREK).

For comparison, Fig. 1 shows the length of adult females together with the data of the individuals washed ashore. All the laying females (n = 42) were studied along the Çukurova coast. The mean length was 90.1 cm (cf. Tab. 1).

The situation is different in Loggerhead Turtles. 85% of those found dead on the Turkish shores were larger (longer) than 50 cm. Thus most of them seem to be adults or subadults. The mean length of laying females tagged at various places along the Turkish Mediterranean coasts in 1988 was 75.6 cm. Further to the findings during the 1988 survey, there are two more records of immature Loggerheads: one with a carapace length of 47 and one with a length of 71 cm are found in the collection of the Aegean University İzmir and they also stem from the surroundings of İzmir (BAŞOGLU 1973).

Further indication that Green Turtles are more or less stationary whereas immature Loggerheads undertake some kind of migration is gained simply by the number of

Tab. 1. Size of Green Turtles, *Chelonia mydas*, and Loggerhead Turtles, *Caretta caretta*, in Turkey. The figures give the mean carapace length (curved length) and its standard deviation. For the calculations on laying females, the figures of GELDIAY & KORAY (1982) on Turkish animals have been added to own data.

species	type	n	mean carapace length	standard deviation
Ch. mydas	laying females	42	90.1	5.21
	stranded inds.	26	47.8	23.54
C. caretta	laying females	81	75.6	5.41
	stranded inds.	16	64.5	16.50

immature turtles stranded on the Turkish coasts: In the class below 50 cm, 15 Green Turtles were found, but only one Loggerhead. The latter species, however, is the more common one in Turkey, being several times more numerous than the Green Turtle (BARAN & KASPAREK 1989). The virtual absence of stranded immatures might indicate their absence in the region.

3. Discussion

Using data of stranded sea turtles, it is supposed that individuals washed ashore are found with the same degree of probability without respect to species and age. This might not be true for very young (1st year) animals. They are not only too small to be detected on the beach with the same probability as adults, but their decomposition also seems to be faster than that of adults. As a consequence, this age class might be underrepresented in the material.

The Green Turtle is a mainly herbivorous turtle. The Çukurova coastal waters seem to provide an excellent habitat for it: This alluvial land has a wide belt of shallow water which is essential for a rich plant life. The 10 m isobathe is 1.5 to 6.0 km in front of the shore line in the Çukurova and the straight length of the coast (i.e. without some bays) is approx. 120 km. Thus the Çukurova coast provides an extremely large area of shallow water. The Nile Delta is the only other similar large area of shallow water in the Mediterranean. However, due to the construction of the Assuan dam, the sea there has lost much of its productivity (cf. e.g. WITT 1984). From the point of nutrition, there seem to be no necessity for Green Turtles to leave the coastal waters of Çukurova.

In contrast to that, the Loggerhead Turtle is a carnivorous to omnivorous animal. Nutrition for this species is therefore much more complicated and more energy must be expended in finding food. A greater mobility and a better dispersal of the species is the result. Although this general pattern might be changed by local conditions, it

may apply to the Mediterranean Sea, which has an extremely low primary production. The productivity of the eastern Mediterranean is probably much lower still (cf. WITT 1984) and one can imagine that a high dismigration rate of the carnivorous Loggerhead is to the species' benefit.

The data are still too few to allow a final conclusion on the distribution and dispersal of immature sea turtles in the Mediterranean. The data presented here give hints for further research.

Further steps should be:

- The registration of turtle carcasses along the coasts should be continued. A coastal survey of nesting beaches as carried out in 1988 puts the necessary standards and framework and should be continued.
- Tracking of turtles should be done by mechanical means and/or by telemetry should be done. Satellite telemetry which has already been successfully applied in sea turtle tracing can provide the necessary long-term results.

Although protection of nesting beaches is of highest priority in the conservation of sea turtles, the protection of feeding grounds seems to be of similar importance. Without knowing even their geographic position, no assessment of threats and no protection is possible. This loophole in turtle conservation should be closed.

There is also very poor information on the whereabouts of adult sea turtles in the internesting season. Fishermens' observations indicate that Green Turtles stay around their nesting grounds, too, namely in the bay of Yumurtalık (Adana prov.), where they are often incidentally captured by shrimp trawlers. For the Loggerhead Turtle, the only recovery data of a tagged individual published so far shows considerable dismigration. A female which was tagged at Dalyan beach (Muğla province) on 8.6.1980 was captured by fishermen at Yeni Foça to the north of İzmir on 7.1.1983 (GELDIAY & KORAY 1982). The shortest distance between tagging and recovery site is 440 km.

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