

Molluscan and crustacean items in the diet of the loggerhead turtle, *Caretta caretta* (Linnaeus, 1758) [Testudines: Cheloniidae] in the eastern Mediterranean

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The loggerhead turtle (*Caretta caretta*) has a circum-global distribution in temperate and subtropical areas including the whole of the Mediterranean.¹ However, little dietary information is available for those individuals foraging in this region.

After hatching on the natal beach, marine turtles undergo a poorly understood pelagic life history phase, where they are thought to feed upon planktonic items for a number of years.^{2,3} Following this, turtles migrate into a juvenile developmental habitat, usually demersal and neritic. It is thought that they remain in these areas until they reach adulthood, at which time they begin migrations to seasonal breeding grounds, which they may undertake every few years.³

For both post-pelagic juveniles and adults of this species, study of prey items in other regions of the world have found the diet to be dominated by benthic molluscs, crustaceans and coelenterates.¹ Loggerhead turtles off Australia have recently been observed 'mining' such prey items in soft sediments.⁴ Individuals sold in markets in Sfax, Tunisia in 1989, were observed to have previously ingested benthic molluscs and crustacea.⁵ Identification of gut contents from 31 individuals of varying sizes, caught by trawlers in Tunisian waters, showed the diet to consist largely of these two groups, but also of echinoderms and other items in relatively small proportions.⁶ These data suggest that certainly in this region, the loggerhead is a fairly non-selective predator upon sessile and slow moving prey.

Necropsy examinations of two loggerhead turtles were undertaken as part of an ongoing study of mortality patterns in Mediterranean marine turtles (B.G.). Lesions present strongly suggested that both individuals had been killed as the result of interactions with local artisanal fisheries in Famagusta Bay, off the coast of northern Cyprus. Both individuals showed signs of cranial trauma, were recently dead, in good general body condition and had digestive tracts relatively full of prey items when they were washed ashore. The first turtle, a subadult female (individual A), with a standard curved carapace length of 49 cm, was discovered on 6th September, 1994. This individual was likely to have been resident in the region. An adult male (individual B), with a standard curved carapace length of 76 cm, was discovered on the 7th June, 1995. The breeding season, in this region, is known to occur at the same time of year as the dis-

covery of this individual.⁷ Although this male may have been locally resident, it might also have been a breeding migrant from a distant feeding ground.

Guts were incised and all dietary items expected to be identifiable were collected and fixed for later taxonomic identification. Mollusc shell fragments were identified according to an established guide⁸ (S.S.) and opercula were identified by comparison with specimens in the Mollusca collections of the Natural History Museum, London (J.T.). Crustacea were identified according to existing publications for [Anomura: Paguridae] and [Brachyura: Majidae]^{9–13} and then compared with material in the reference collection of the Natural History Museum (P.C.).

The dietary items identified, substrate and depth where the species are normally found, and minimum numbers of each prey species recorded for each individual are shown in Table 1. Five of these genera (*Cerithium*, *Hexaplex*, *Fasciolaria*, *Pagurus* and *Paguristes*) have been previously recorded as prey items in this turtle species in the Mediterranean.⁶ Outside this region, at least six of these genera (*Astraea*, *Cerithium*, *Conus*, *Strombus*, *Pagurus*, *Paguristes*) have previously been recorded as prey items for the loggerhead turtle.¹

The occurrence of *Strombus decorus raybaudi* (identified from opercula) in the diet is noteworthy since this species has diversified morphologically since invading the eastern Mediterranean via the Suez canal from the Indian Ocean-Red Sea.¹⁴

It is difficult to generalise from such a limited sample size, however there was considerable overlap in prey items between both individuals. From general inspection of fragments, several other facts could be ascertained. Both individuals crushed, even the most robust, prey items before swallowing and there was no apparent difference in size of prey selected by different individuals, in that most mollusc fragments originated from shells of range 10–30 mm. Distribution data pertaining to the prey species suggest that loggerhead turtles in the eastern Mediterranean do indeed feed upon benthic molluscs and crustacea, at shallow to moderate depths, from both rocky and sedimentary habitats. It is strongly recommended that similar studies are carried out upon incidentally caught or stranded turtles within this region, to allow greater understanding of the synecology of this endangered population.

Table 1. Classification of prey items found, substrate and depths where they are normally found. Minimum numbers in both turtle individuals A and B are given. (Key: SH. = Identified by shell fragments, O. = Identified by opercula)

Phylum: Mollusca	Species	Substrate	Depth	Individual A	Individual B
Class: Gastropoda	<i>Astraea rugosa</i> (Linnaeus, 1767)	rock	8–59 m	6 (SH.)	–
	<i>Cerithium vulgatum</i> (Bruguière, 1792)	sand & mud	intertidal–20 m	6 (SH.)	
	<i>Strombus decorus raybaudi</i> (Nikolay & Manoja, 1983)	sand	0–20 m	–	100 (O.)
	<i>Naticarius stercusmuscarum</i> (Gmelin, 1791)	sand & mud	>25 m	1 (SH.)	–
	<i>Phalium undulatum</i> (Gmelin, 1791)	sand	8–80 m	40 (SH.)	39 (SH.)
	<i>Hexaplex trunculus</i> (Linnaeus, 1758)	sand & seagrass	1–100 m	30 (SH. & O.)	5 (SH. & O.)
	<i>Buccinulum corneum</i> (Linnaeus, 1758)	rock	intertidal–27 m	4 (O.)	–
	<i>Fusinus syracusanus</i> (Linnaeus, 1758)	sand & mud	1–50 m	4 (SH.)	6 (SH.)
	<i>Fasciolaria lignaria</i> (Linnaeus, 1758)	rock	0–20 m	20 (SH.)	8 (SH.)
	<i>Conus ventricosus</i> (Gmelin, 1791)	rock	0–20 m	1 (SH.)	20 (SH.)
Class: Bivalva	Anomiidae spp.	rock	0–20 m	1 (SH.)	–
Superclass: Crustacea					
Class: Malacostraca					
Infracorder: Anomura	<i>Pagurus anachoretus</i> (Risso, 1827)	rock	6–10 m	1	–
Family: Paguridae	<i>Pagurus cuanensis</i> (Bell, 1845)	rock	15–91 m	1	–
	<i>Paguristes eremita</i> (Linnaeus, 1767)	sand	10–80 m	1	1
Infraorder: Brachyura	<i>Maja goitziana</i> (d'Oliviera, 1888)	sandy-mud	15–200 m	2	–
Family: Majidae					

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