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Stomach Contents of an Olive Ridley Turtle (*Lepidochelys olivacea*) from the Gulf of Papua, Papua New Guinea

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There is little documentation on the diet and feeding habits of the olive ridley turtle, *Lepidochelys olivacea*, with much of the information anecdotal (NMFS and USFWS, 1996). In this paper we analyze the contents of the digestive tract of an olive ridley from the Gulf of Papua in Papua New Guinea.

The olive ridley is not well known from Papua New Guinea. Spring (1982) summarized the known nesting sites for the olive ridley in Papua New Guinea, which include the north coast of West New Britain, Ataliklikun Bay in East New Britain, and along the East Sepik coastline near Turubu village. The species is identified with a vernacular name in a number of coastal Provinces in both northern and southern Papua New Guinea (Rhodin and Spring, 1979; Rhodin et al., 1980; Spring, 1982).

While no nesting has been recorded from the southern coastline of Papua New Guinea, olive ridleys do occur in nearshore waters as evidenced by records of olive ridleys incidentally captured in shrimp trawlers operating in the Gulf of Papua (Spring, 1982). Little is known about olive ridleys in neighboring Australian waters. They are incidentally captured in shrimp trawls in northern Australian waters (Poiner et al., 1990), and in trawls off the coast of Queensland (Robins, 1995). Low level nesting has been recorded from a few sites across Northern Australia, including the islands off Arnhem Land (Guinea, 1990), the Coburg Peninsula (Cogger and Lindner, 1969), and on Bare Sand Island, west of Darwin (Whiting, 1999).

There are no records of the stomach contents or feeding habits of olive ridleys from Papua New Guinea or Australia.

Methods. — The senior author examined and identified an olive ridley incidentally captured by a shrimp trawler operating in the Gulf of Papua (8°00'S, 145°45'E) on 24 November 1977. The turtle was caught and drowned in a Florida Flyer trawl net operating at a depth of 24 m, one meter above the sea bed. The turtle was frozen on board the trawler after capture and delivered to the Papua New Guinea Wildlife Division where the senior author performed a necropsy at the Papua New Guinea Museum. The shell and wet specimens from the turtle were lodged in the PNG Museum (PNGM 14016).

Results and Discussion. — The adult turtle had a curved carapace length of 70 cm and a curved carapace width of 50

cm. It weighed 31 kg and was in good condition, with no signs of injury or disease. There were no barnacles on the turtle. There was one thick curved claw on the front of each forelimb. The carapace was short and wide, smoothly domed but flattened along the upper vertebrals, and flared slightly upwards towards the marginals.

The surface of the carapace was comprised of very thin greasy olive-gray scutes. The scute arrangement was: nuchal 1, postpygals 2, costals 7/7, vertebrals 6, and marginals 12/12. Head scales included: prefrontals 2 pairs, postoculars 3/3, and postparietals 2. The plastron was pale yellow in color.

The sex of the turtle was not determined; eggs were absent but there was no tail elongation (tail length from vent to tail tip: 40 mm; from base to tail tip: 120 mm).

The stomach and intestines, which contained a large amount of shell material and muddy silt, were removed and provided to the second author for analysis of their contents.

The wet weight of the total digestive tract contents was 1.20 kg of which 1.14 kg (95%) consisted of shell material. The remaining 5% of the total weight consisted of partially digested hermit crab parts, and soft unrecognizable amorphous material.

Most of the shell material (80% of the shell weight or 0.91 kg) had been broken into coarse pieces. The fragments were sorted into groups based on aperture shape and dentition, and body whorl ornamentation, shape, size, and color. All fragments were identified as far as possible using the University of Papua New Guinea Museum reference collection of invertebrates. A low power microscope was used to discern shell features where necessary. The remaining 20% of the shell material (0.23 kg) consisted of complete shells (0.11 kg), crustacean fragments (0.01 kg), fine, unidentifiable fragments of shell-grit (0.05 kg), and 0.06 kg of muddy silt. Analysis of the shell material is shown in Table 1.

The digestive tract contained mainly shell material of which more than 98% was gastropod shells and less than 2% was crustacean shell fragments.

Of the gastropods, three species made up 96% of the shell material in the digestive tract: *Nassarius crematus*, *Nassarius vitiensis*, and *Turris crispa*. The two *Nassarius*

Table 1. Analysis of shell material found in the digestive tract of an olive ridley turtle from the Gulf of Papua.

Class	Family	Genus/Species	% wet weight	kg
Class Gastropoda				
Nassariidae		<i>Nassarius (Zeuxis) crematus</i>	20	0.23
		<i>Nassarius vitiensis</i>	30	0.34
Turridae		<i>Turris crispa</i>	46	0.52
		<i>Terebra</i> spp. (juveniles)	<1	
Terebridae		<i>Terebra</i> spp. (fragments)	<1	
Turbinidae		<i>Turbo</i> spp. (fragments)	<1	
Turritellidae		<i>Turritella terebra</i>	<1	
Mitridae		<i>Cancilla</i> spp.	<1	
Architectonicidae		<i>Architectonica</i> spp. (fragments)	<1	
Bursidae		<i>Bursa rana</i>	<1	
Naticidae		<i>Notocochlis lineatus</i>	<1	
Fascioliariidae		<i>Pleuroploca</i> spp.	<1	
Class Crustacea				
Portunidae		4 broken chelipeds	<1	
		<i>Diogenes pallescens</i>	<1	
Paguridae				
Total Weight				1.14

species are small shells up to 30 mm in size, while *Turris crispata* is a moderately large shell up to 150 mm in length (Cernhorsky, 1972). Many of the intact gastropod shells (10% of shell weight), and in particular those of *Nassarius* spp. contained the hermit crab *Diogenes pallescens*.

Mortimer (1982) reviewed published and anecdotal records of the feeding habits and diet of olive ridleys and concluded that little is known about their feeding habits. Published accounts of the stomach contents of olive ridleys from other regions have not shown gastropods to be an important diet item.

Deraniyagala (1939) recorded that the olive ridley is usually vegetarian, its stomach often full of algae but that it also ate the flat sea urchin and young pearl oysters when available. Caldwell et al. (1969) observed the stomach contents of an olive ridley accidentally drowned in a bottom fish trawl off the coast of Surinam contained 2 fresh catfish, 10 small broken snail shells, and 3 crab carapaces. Falanruw et al. (1973) recorded a few small crabs and strips of plastic in the stomach and intestinal tract of a female olive ridley caught while mating near Yap in the Western Caroline Islands. Honma and Yoshi (1975) recorded a liquefied substance in the stomach of an olive ridley taken off the coast of Japan, with a gelatinous substance like a jelly fish or a salp in the intestine. Biswas (1982) concluded that adult olive ridleys are mainly herbivorous after observing digestive tracts full of algae in dissected animals from the Bay of Bengal.

A number of authors have reviewed published and anecdotal accounts of the diet and feeding habits of olive ridleys, including Pritchard and Trebbau (1984) who concluded that the olive ridley appears to be a rather generalized and opportunistic feeder.

This conclusion is supported by the findings of Marquez (1990) who stated that the olive ridley is a facultative carnivore capable of eating a single kind of food for long periods, or a variety of foods, as was shown by Montenegro et al. (1986). This study, carried out from July to December in Oaxaca, southern Mexico, recorded the diet of male olive ridleys ($n = 24$) consisted of fish (57%), salps (38%), crustaceans (2%), and molluscs (2%), and that of female turtles ($n = 115$) consisted of salps (58%), fish (13%), molluscs (11%), algae (6%), crustaceans (6%), bryozoans (0.6%), sea squirts (0.1%), sipunculid worms (0.5%), and fish eggs (0.04%).

In the Recovery Plan for US Pacific Populations of the Olive Ridley turtle (NMFS and USFWS, 1996), information on the food and foraging habits of olive ridleys was reviewed. It concluded that early accounts of olive ridleys having a primarily herbivorous diet had not been substantiated and that available information suggested a catholic diet with crustaceans a major food item.

Our results indicate that this olive ridley from the Gulf of Papua was a benthic feeder with a diet consisting mainly of gastropods.

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