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Nurse Shark Pectoral Fins: An Unusual Use

ABSTRACT: *A young aquarium-held nurse shark, Ginglymostoma cirratum (Bonnaterre), was observed to hold its head and the anterior region of the trunk well above the substrate while resting on the bottom. This was accomplished by rolling the outer edges of the pectoral fins under the body.*

INTRODUCTION

Many sharks have broad, often triangular, pectoral fins which project from the body at right angles to the major axis. Unlike the pectoral fins of most teleosts they cannot be folded back against the body, and so give the appearance of being stiff and relatively immobile appendages. They are so sturdily braced in the anterior-posterior plane, in fact, that a blow from the pectoral fin of a speeding shark can be quite damaging (Coppleson, 1962). It is not unusual to find, therefore, that these fins are considered by many authors to function mainly as stabilizers and elevators, providing lift for the swimming shark (Budker, 1971; Marshall, 1971). The substantial bundles of elevator and depressor muscles which invest the basal and proximal radial skeletal elements of the pectoral fins (Daniel, 1934) indicate considerable muscular control of movement in the dorsoventral plane. Extreme depression of the pectoral fins of some sharks has been described in association with feeding behavior. For instance, lemon sharks (*Negaprion brevirostris*) depress the trailing edges of the pectoral fins when approaching large pieces of food, effectively braking their forward progress (Gilbert, 1962). This species has also been observed to use the greatly depressed trailing edges of the pectoral fins as a fulcrum on which to shake its head and body laterally when sawing chunks of meat from a food item too large to be swallowed whole (Moss, 1965). *Carcharhinus maculipinnus* probably uses its pectoral fins to achieve its remarkable "spin" when feeding (Springer, 1961). In other sharks, notably *Ginglymostoma cirratum* and *Heterodontus francisci*, the pectoral fin of the female is used as a convenient spot for the male to sink its teeth in order to steady itself during copulation (Gudger, 1912; Dempster and Herald, 1961).

DISCUSSION

Recently, while observing the feeding behavior of a small aquarium-held nurse shark, *Ginglymostoma cirratum*, a previously undescribed and possibly unique use of the pectoral fins was noted. This young shark (36 cm total length) repeatedly rested on the bottom of its tank with its pectoral fins rolled under its body, effectively propping its head and anterior body region a centimeter or so above the bottom (Fig. 1). This position was achieved in the following manner. The shark, swimming in midwater, would cease all locomotor movements and fall to the bottom. The pectoral fins were maximally depressed during this descent so that when their outer tips made contact with the substrate the fins rolled inward until the shark rested entirely on them. When food (chopped clams or fish) was placed directly in front of the animal, it quickly lurched forward and literally "pounced" upon it.

Although this behavior was never noted in approximately 30 other nurse sharks of all sizes which I observed in the field or in confined situations, it was

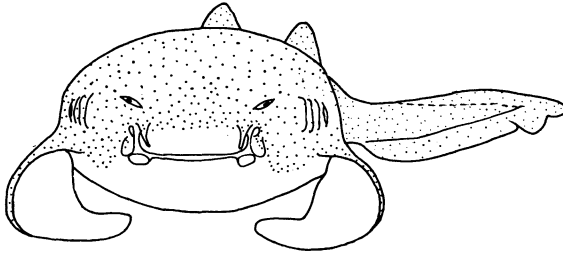


Fig. 1.—Anterior view of a young nurse shark, showing inward rolled position of the pectoral fins

a regular feature of this particular shark's behavioral repertoire. The possible function of this "head-up" resting posture is pure speculation, but it may have involved the facilitation of water flow across the olfactory epithelium. It is also tempting to think that this position created an apparent hole under the shark's head which could prove attractive to small fish, crabs or other invertebrates, thereby bringing potential food to within easy reach.

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Notes on the Occurrence of Endogone in Soils and Seeds from Cultivated Fields in Vigo County, Indiana

ABSTRACT: *Chlamydo*spores of the fungus, *Endogone*, were frequently found in soil samples and inside intact seeds gathered from cultivated fields in Vigo Co., Indiana, in 1970-71. Of 120 soil samples (50 g each) examined, 90.8% contained at least 50 spores. *Chlamydo*spores were discovered inside 27.1% of 1462 intact seeds examined.

INTRODUCTION

The fungus, *Endogone*, has been found in the stomachs of various rodents by Thaxter (1922), Diehl (1939), Dowding (1955), Bakerspigel (1956, 1958) and Whitaker (1962, 1966). Diehl (1939) and Whitaker (1962) reported that