

Frenzy and Postfrenzy Swimming Activity in Loggerhead, Green, and Leatherback Hatchling Sea Turtles

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Sea turtle hatchlings emerge from subsurface nests on oceanic beaches, crawl to the ocean, and swim out to sea. Once in the water, hatchlings at first swim almost continuously (a period called the frenzy). In this laboratory study, we compared the duration and diel pattern of frenzy and postfrenzy swimming activity among loggerhead, green turtle, and leatherback hatchlings from beaches in southeastern Florida. The frenzy of all species lasted one day (24 h). After the frenzy, hatchlings continued to swim during the day. Green and loggerhead hatchlings eventually became inactive at night, but leatherback hatchlings typically swam between 15-45% of the dark period. Because the frenzy is temporally similar in all species, its function may also be the same: escape from shallow waters near shore. Postfrenzy differences in diel activity may reflect contrasts among species in foraging, predator avoidance, and energy conservation strategies.

SEA turtle hatchlings emerge from underground nests, crawl down to the ocean, and swim rapidly away from shore (Carr and Ogren, 1960; Bustard, 1972). After entering water, hatchlings undergo a period of hyperactive swimming (termed the "frenzy," Carr, 1962) during which they swim continuously (Deraniyagala, 1930, 1939).

Little is known about the species-specific length of the frenzy or how it compares across populations of a species. In Florida loggerhead sea turtles (*Caretta caretta* Linnaeus), the frenzy is characterized by nearly continuous swimming for the first 24 h (Salmon and Wyneken, 1987). After the frenzy (the "postfrenzy" period), loggerhead hatchlings swim only during the day and are inactive at night.

Bennett (1978) found that Florida green turtle (*Chelonia mydas* Linnaeus) hatchlings swam vigorously when they were first immersed in water. Activity levels declined within 10 h and showed no further change through 24 h. Dalton (1979) reported that green turtle hatchlings from Tortuguero, Costa Rica, had a three-day swimming frenzy whereas 66% of turtles from Ascension Island, South Atlantic Ocean, showed no frenzy period.

Variation in frenzy behavior might reflect species-specific and/or population-specific differences in frenzy function. Alternatively, differences could be an artifact of experimental design or handling. In this study, we compared frenzy and postfrenzy swimming activity in loggerhead, green, and leatherback (*Dermochelys coriacea* Vandelli) sea turtle hatchlings. All tur-

tles were treated identically and came from the same geographic location (southeastern Florida). Two primary questions were addressed: (1) How long does the frenzy period last in each species? (2) Are there differences in frenzy or postfrenzy swimming activity? We also discuss the biological implications of species-specific differences in postfrenzy swimming activity.

METHODS

Animals.—Hatchling leatherbacks were obtained from natural nests. Loggerhead and green turtles were captured from natural nests or from nests reburied within 24 h of deposition at safer locations on a nearby nesting beach. All nests were located on Hutchinson or North Hutchinson Island, Florida. Experiments with green turtles and leatherbacks were carried out in the summers of 1988 and 1989; loggerheads were studied in the summer of 1986.

Hatchlings were captured either as they emerged from nests or just prior to natural emergence. To capture turtles before they emerged, nests deposited on known dates were monitored for several days prior to expected emergence. When a depression appeared in the sand surface above the egg chamber, we dug down and removed four hatchlings. Only turtles at the top of the clutch and presumably in the process of digging to the surface were collected. Remaining hatchlings were covered with sand and left to emerge naturally. Captured subjects were placed in Styrofoam boxes, taken to our laboratory within 30 min, and held in a