

RESUSCITATION OF A COMATOSE GREEN TURTLE

Fewer sea turtles would drown from incidental capture in shrimp trawls and other fishing gear if better resuscitation procedures were used. The current recommended practice is to hold a comatose turtle out of water in either a prone or supine position, and see if it revives over a period of 1 to 24 h. The turtle's posterior should be elevated if held prone. If placed on its back, the plastron should be periodically compressed ("pumped") by hand or foot (Hopkins and Richardson 1984). The actual manner in which these manipulations may foster resuscitation has not been described. Presumably they are aimed at ventilating the lungs, draining water from the res-

piratory passages and lungs, and promoting cardiovascular function. It is unknown what percentage of comatose turtles are revived, or what the survival rate of revived turtles is following release. From the high frequency of beach strandings adjacent to certain shrimp trawling areas, considerable mortality apparently takes place (Shoop and Ruckdeschel 1982), although it is not known whether attempts were made to resuscitate these turtles.

The resuscitation of a comatose green turtle, *Chelonia mydas*, at Johnston Atoll (lat. 16°45'N, long. 169°31'W) in November of 1983 provided a new perspective on the problem, and suggested the use of additional therapy. During a tagging study employing large mesh nets in algal foraging pastures, an

entangled subadult green turtle (68 kg, 76 cm carapace length) became snagged on coral 2 m deep making it unable to surface. The seawater temperature was 27.5°C. The turtle was submerged for at least 30 min before emergency retrieval could be carried out from a small boat. When it was brought to the surface there were no signs of life except for contraction of the tail when extended manually. The turtle was placed on its back and the plastron pumped every 2-3 min for 1 h following rescue, but no resuscitation was evident. Upon close examination, it was determined that the movement of air caused by pressing on the plastron was only taking place into and out of the esophagus, and not the trachea. At all times the glottis, a longitudinal slit posterior to the tongue, remained tightly shut and

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could only be opened by forcing a finger into it. When the finger was withdrawn, the glottis immediately returned to the closed position. To hold the glottis open and permit the passage of air, a 40-cm piece of 10 mm outside diameter, 7 mm inside diameter, plastic tube was inserted 2 cm. With the turtle prone, the lungs were then ventilated by gently blowing into the tube at irregular intervals over the next hour. No water drained out through the tube, although fluid apparently from the stomach came out of the mouth. After being seemingly lifeless for over 2 h, the turtle suddenly raised its head well into the air and took a deep breath. For the next 30 min distinct breaths gradually became more frequent and the tube was finally removed. Movement of the flippers also gradually resumed. The turtle was left prone for the next 11 h in a confined area. In the morning it was found active and appeared fully recovered. A large quantity (1.5 kg) of voided feces was present. When released, the turtle swam a short distance near the surface, took a breath, and dove out of sight in a normal manner.

Dead green turtles of various sizes which I have examined have all shown a closed glottis, like the comatose specimen reported here. This appears to be the normal state, serving to prevent the inhalation of seawater. The glottis appears to open only with the outward movement of the hyoid apparatus

and gaping of the mouth to take a breath. Closure of the glottis in the green turtle, or any other sea turtle species, has not been previously mentioned in connection with resuscitation efforts. If the goal is to ventilate the lungs, then an open air passage must be established. The insertion of a small plastic tube is a simple and convenient way to meet this objective. In addition, since the lungs are located dorsally, under the carapace, the prone position for resuscitation would seem best to avoid compression from the heavy food-laden digestive tract and other organs.

LITERATURE CITED

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