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REPRODUCTIVE TRACT ANOMALY IN A BOX TURTLE

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Abstract: A box turtle, *Terrapene carolina*, was found to have 3 coelomic, extra-oviducal shelled eggs. Two of these were attached to the liver by overgrowth of its connective tissue, presumably in response to inflammation induced by the eggs. Yolk material from the third (unattached) egg yielded pure cultures of the bacterium, *Micrococcus tetragenus*. Cultures of albumen and yolk were sterile from one of the four shelled oviducal eggs present.

An adult female (carapace length: 126 mm) box turtle, *Terrapene carolina*, collected in the gallery forest area bordering the Tombigbee River in Lowndes County, Mississippi, on June 11, 1970, was found to have an unusual pathological condition associated with its reproductive system. On the day following capture, the turtle was anesthetized and dissected for routine visceral examination. Upon removal of the plastron, we noted the presence of two distorted shelled eggs, attached to the posterior margin of the liver (Fig. 1) by overgrowth of the liver connective tissue. An additional shriveled shelled egg was free in the abdominal cavity. The oviducts appeared normal, and each contained two normal shelled eggs. With aseptic precautions, the free anomalous egg was opened and two portions of the inspissated yolk contained within the egg shell were transferred to brain-heart infusion for incubation. Subsequent transfers from broth to nutrient agar plates yielded only pure cultures of white colonies approximately 1.0 mm in diameter. Biochemical screening tests showed the isolate to be a gram-positive, H₂S negative coccus, with an acid reaction to dextrose and lactose and producing a slightly acid reaction in litmus milk. Microscopic examination revealed that the coccus occurred in tetrads

with occasional pairs and singles. Established identification criteria and procedures¹ verified that the organism was *Micrococcus tetragenus* (*Gaffkya tetragenus*), a bacterium of varying pathogenicity that has been found in pure culture in animal abscesses.² Using the same aseptic precautions, one of the normal-appearing oviducal eggs was opened, and separate portions of albumen and yolk were removed and transferred to brain-heart infusion. The egg was apparently bacteriologically sterile since no growth resulted from the inoculations.

Few data are available concerning the pathology of the reproductive tract in turtles. Risley⁷ observed a musk turtle, *Sternotherus odoratus*, which was held captive during the laying season and released in the fall. The same individual captured the following spring had three shelled oviducal eggs and three shelled eggs free in the abdominal cavity. This condition he interpreted as due to a reversal of the normal direction of egg passage through the oviducts. Cagle and Tihen⁸ observed a female chicken turtle, *Deirochelys reticularia*, retained in the laboratory from March until the following January had three shelled eggs free in the abdominal cavity, while four shelled oviducal eggs protruded slightly

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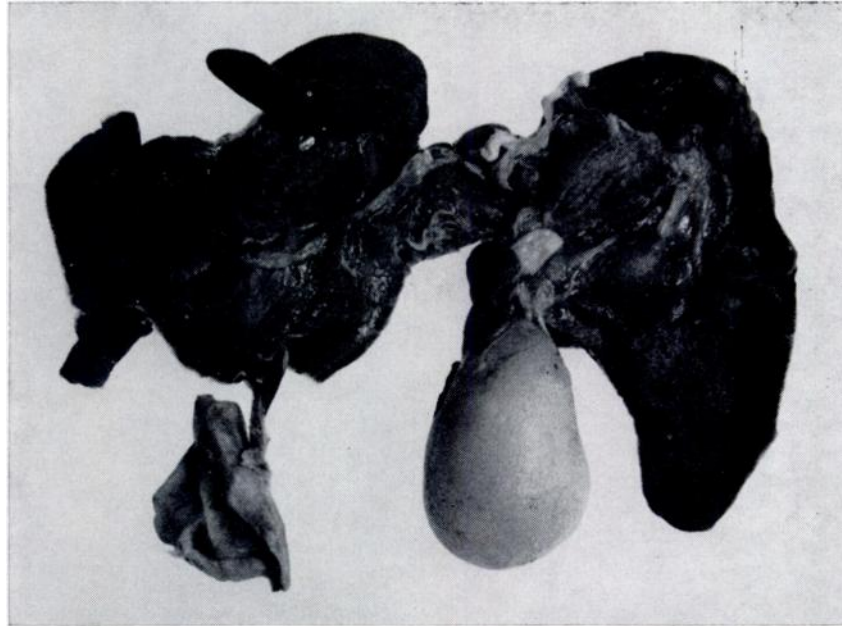


Figure 1. Liver of *Terrapene carolina* with two encapsulated eggs. Mr. Joe Renteria, San Diego State College Photographic Laboratory, kindly photographed the specimen.

through holes eroded through the walls of the oviduct. It was apparent that the three free eggs had entered the abdominal cavity via three large, eroded holes in the upper part of the oviducts rather than by means of reverse passage. Dobie⁴ found two shelled eggs in the urinary bladder of an alligator snapping turtle, *Macrolemys temmincki*, which had a deformed carapace, posteriorly. He presumed the condition resulted from the simultaneous movement of two eggs from opposite oviducts into the cloaca, forcing one egg through the urethral opening and into the bladder. Kaufmann⁵ during necropsy of a series of adult red-eared turtles, *Chrysemys scripta elegans*, observed a specimen with several misshapen follicles on each ovary. The diseased yolk-containing follicles were cultured, and pure growth of the enteric bacterium, *Citrobacter*, was obtained.

In our specimen, the ovaries appeared quite normal, and no eroded opening in the oviducts could be seen. Accordingly, it appears that the three distorted eggs were forced into the coelom by reverse peristalsis. Such "internal laying" in fowls results in the free eggs acting as foreign bodies which may become surrounded by inflammatory tissue.⁶ The significance of the finding of *Micrococcus tetragenus* in the cultured free egg is not clear.

Feeley and Treger⁵ demonstrated experimentally that shelled turtle eggs exposed to *Salmonella braenderup* for as little as one hour were penetrated by the bacterium. In our individual, perhaps infection of the free eggs enhanced their ability to provoke the inflammatory reaction, as indicated by overgrowth and walling-off of the eggs. No signs of other concomitant pathological changes were observed.

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