

Reduce

Arthuras, II
POND
former PARTNER

DIAGNOSTIC CASE REPORT

U. S. GEOLOGICAL SURVEY-BIOLOGICAL RESOURCES DIVISION
NATIONAL WILDLIFE HEALTH CENTER-HONOLULU FIELD STATION
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Case # 15297

Epizoo #

Submitter:

Mr. George Balazs
NOAA-NMFS-SWFC
2570 Dole Street
Honolulu, HI 96822-2396

Specimen description/identification:

1 green turtle carcass

Date Submitted: (04/03/2000)
(mm/dd/yy)

Date Collected: (02/11/2000)
(mm/dd/yy)

Date Examined: (04/03/2000)
(mm/dd/yy)

Location: Kapoho

County/Site: Hawaii

HISTORY: This animal was found dead in an isolated saltwater pond near Kapoho on Hawaii. The animal was fed papayas and other fruit due to the lack of opportunities to graze on algae. This is MTRP ID 02-11-00D.

SIGNIFICANT FINDINGS: This was a subadult male with massive deposits of fat in the coelomic cavity. Significant gross findings included a massively enlarged thyroid, severe shrinkage of the liver and papayas in the stomach and small intestines. Microscopic findings included severe goiter, fatty change, fibrosis, and atrophy of the liver, kidney testes, and spleen, and acute necrosis of kidney tissue associated with crystal deposition.

DIAGNOSIS: Goiter and hypothyroidism.

COMMENTS: The lesions in this animal pointed to a metabolic disease associated with inability to properly mobilize and metabolize fat. This was evident in the changes (fatty change) seen in multiple organs. The fibrosis accompanying these changes indicated the process was chronic (occurring over several months and perhaps years) and eventually impaired function of critical organs (spleen, liver, kidney) to the point where the animal died. It is likely that a major source of this metabolic disorder was severe hypothyroidism manifested morphologically as a massively enlarged thyroid (goiter). Goiter is typically associated with a diet deficient in iodine. Sea turtles in the wild typically graze on a variety of marine algae, which are rich sources of iodine, and probably other critical nutrients. The diet (papayas and other fruit and vegetables and absence of marine algae) of this animal may have lacked sufficient iodine. Alternatively, this animal may have been unable, for unknown reason, to properly assimilate iodine from its diet. The crystals in seen in the kidney were compatible with oxalate. Deposition of these crystals in animals typically occurs when they eat antifreeze (ethylene glycol) or plants rich in oxalates. These crystals, in sufficient amounts, damage kidney tissue and may lead to renal failure.

NATIONAL WILDLIFE HEALTH CENTER
NECROPSY REPORT

Submitter's Name, Affiliation Address

Mr. George Balazs
NOAA-NMFS-SWFC
2570 Dole Street
Honolulu, HI 96822-2396

Case: 15297
Accession: 001
Collected: 02/11/2000
Exam Date: 04/03/2000
Pathologist: T.M. Work
Prosector: T.M. Work

Species: Green turtle Specimen: Carcass
Bandtype: (E) Ref/Band No: (021100D) Euth: (N) Weight (Gm): (94545)
History Summary: This animal was found dead in an isolated saltwater pond near Kapoho on Hawaii. The animal was fed papayas and other fruit due to the lack of opportunities to graze on algae. Identification tags: RFL-Y153, LFL-Y152. Body measurements: SCL-80.2 cm, CCL-83.5 cm, TTL-38.5 cm.

EXTERNAL/INTERNAL OBSERVATIONS - LABORATORY RESULTS

External: The carcass was frozen prior to necropsy.

Internal: There are massive amounts of body fat. The liver is gray, cirrhotic, and appears shrunken. Pale foci ranging from pinpoint size to 1 mm appear on the liver surface. The heart is firm, smooth, homogenous red and otherwise unremarkable. The lungs are spongy and homogenous red-pink. The spleen is firm, smooth, and homogenous brown. The kidneys are firm, smooth, and homogenous brown. The adrenals appear enlarged. No bladder trematodes were seen. There is a huge amount of mesenteric fat. The thyroid is markedly hypertrophied and measures 11 cm in diameter. The brain is smooth, firm, and homogenous tan-pink. The esophagus contains the remains of 3-4 papayas. The gastrointestinal mucosa is smooth, homogenous tan and the lumen of the small intestines contains remains of papayas. No lesions are seen in the brain, musculoskeletal system, pericardial sac, heart valves, gall bladder, gastrointestinal mucosa and serosa, testes, pancreas and superficial and cut surface of heart, kidney, spleen, and lungs.

Preliminary Diagnosis: Goiter Exam Type: (GO)
Sex (M) Age (B)/() Body Cond. (E) Postmortem State (G) Giz. Lead ()/()
Laboratory Tests/Samples Saved:

1. Histo: Brain (A); Liver, spleen, testes (B); heart (C); lung (D); thyroid (E); liver (F); kidney (G-H).
2. Frozen: spleen, liver, thyroid.

HISTOPATHOLOGY:

Lung: In one section, the pleura appear somewhat thickened with nidi of eosinophilic homogenous material.

Liver: Diffusely, hepatic architecture is largely replaced by trabeculae of fibrous tissue surrounding pleomorphic clear spaces (probable fatty change) some of which are filled with masses of melanophages. Isolated foci of massively atrophied hepatocytes are occasionally noted within connective tissue trabeculae.

Heart: Myocardial fibers appear alternatively shrunken to hypertrophied and there are numerous small infiltrates of melanophages. In one section, myocardium is displaced by large numbers of lipocytes.

Brain: There is marked deposition of fibrillar eosinophilic material around meningeal blood vessels. Some vessels within the brain contain intramural depositions of granular brown pigment.

Histopathology (cont.)

Spleen: The spleen is virtually bereft of lymphoid tissue and red cells most of which are replaced by massive deposition of granular brown pigments and vacuolated cells. The latter are hard to positively identify as lipocytes due to freeze-thaw damage. The splenic capsule appears thickened and there are focal areas of necrosis and deposition of basophilic granular pigment (probable mineralization).

Kidney: There is marked fatty change and fibrosis of renal tubular interstitium that occupies most of the renal architecture. Remnant proximal tubular cells are either massively atrophied or exhibit acute necrosis characterized by cytoplasmic hypereosinophilia, fragmentation and nuclear pyknosis and karyolysis. Accumulations of birefringent crystals are noted within the lumen of scattered tubules. Epithelium of bowmans capsule of glomeruli appears hypertrophied and glomeruli are infiltrated by moderate numbers of melanophages.

Thyroid: Some follicles are massively distended with colloid and lined by flattened epithelium. Focally, there are marked infiltrates of melanophages within smaller follicles.

Testes: There is marked diffuse atrophy of spermatocytes and seminiferous tubule cells. Seminiferous tubules are surrounded by a markedly thickened connective tissue/fibroblasts layer and are separated by massive numbers of lipocytes.

Morphologic Diagnoses:

- 1) Severe goiter.
- 2) Severity, diffuse, chronic, fatty change, fibrosis, and atrophy, liver, kidney, testes.
- 3) Severe, multifocal, necrosis with crystals, proximal tubules, kidney
- 4) Severe, diffuse, lymphoid depletion and fatty change, spleen.

Comments: The lesions in this animal pointed to a metabolic disease associated with inability to properly mobilize and metabolize fat. This was evident in the changes (fatty change) seen in multiple organs. The fibrosis accompanying these changes indicated the process was chronic (occurring over several months and perhaps years) and eventually impaired function of critical organs (spleen, liver, kidney) to the point where the animal died. It is likely that a major source of this metabolic disorder was severe hypothyroidism manifested morphologically as a massively enlarged thyroid (goiter). Goiter is typically associated with a diet deficient in iodine. Sea turtles in the wild typically graze on a variety of marine algae, which are rich sources of iodine, and probably other critical nutrients. The diet (papayas and other fruit and vegetables and absence of marine algae) of this animal may have lacked sufficient iodine. Alternatively, this animal may have been unable, for unknown reason, to properly assimilate iodine from its diet. The crystals in seen in the kidney were compatible with oxalate. Deposition of these crystals in animals typically occurs when they eat antifreeze (ethylene glycol) or plants rich in oxalates. These crystals, in sufficient amounts, damage kidney tissue and may lead to renal failure.

Final Diagnosis (in order of importance)

	topog.	morph.	etiol.	funct.	disease	link
1. <u>Hypothyroidism</u>	(T96000)	(M71000)	()	()	()	()
2. _____	()	()	()	()	()	()
3. _____	()	()	()	()	()	()

Diagnostic findings may not be used for publication without the pathologist's knowledge and consent.