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Diagnostic Exercise
From the Latin Comparative Pathology Group and the Davis-Thompson Foundation

Bursal cryptosporidiosis in a kelp gull (*Larus dominicanus*)

Diego A. Yañez[1]*
Laboratorio AnimaLab Diagnóstico, Quilpué, Chile.

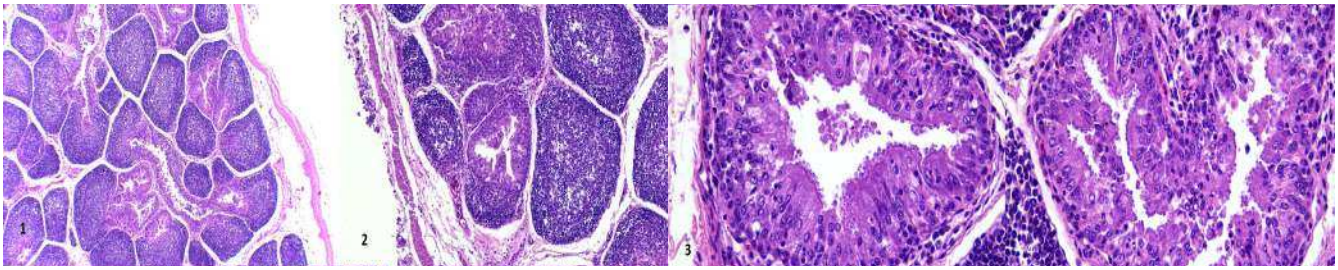
Corresponding author: animalabdiagnostico@gmail.com

History:

A juvenile kelp gull (*Larus dominicanus*) was found dead.

Necropsy findings:

The bird was in good body condition. Gross lesions were restricted to the head, with extensive skull fractures, severe intracranial and subcutaneous hemorrhage (*in vivo* trauma). Samples were collected for histopathology (Figs.1-4).



Figures: 1-4. Cloacal bursa. There is moderate bursal epithelial hyperplasia. Abundant, small, round basophilic protozoa morphologically consistent with *Cryptosporidium* spp. are lining the apical portion of the epithelium. Minimal intraepithelial heterophils are seen. Lumina are distended by a small amount of sloughed epithelial cells, heterophils, and cell debris. No changes in lymphoid tissue are noted.

**The Diagnosti Exercises are an initiative of the Latin Comparative Pathology Group (LCPG), the Latin American subdivision of The Davis-Thompson Foundation (DTF). These exercises are contributed by members and non-members from any country of residence. Consider submitting an exercise! A final document containing this material with answers and a brief discussion will be posted on the DTF website: https://davisthompsonfoundation.org/diagnostic-exercise/*

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Follow-up questions:

- *Morphologic diagnosis*
- *Etiology*
- *Name other organs that can be affected by this agent, in avian species*

ANSWERS

Histologic description:

Cloacal bursa (Figs. 1-4): There is moderate bursal epithelial hyperplasia. Abundant, small, round basophilic protozoa morphologically consistent with *Cryptosporidium* spp. are lining the apical portion of the epithelium. Minimal intraepithelial heterophils are seen. Lumina are distended by a small amount of sloughed epithelial cells, heterophils, and cell debris. No lymphoid tissue changes are noted.

Morphologic diagnosis:

Cloacal bursa: Minimal, acute heterophilic bursitis with epithelial hyperplasia and surface-associated protozoa.

Etiology:

Cryptosporidium spp. (most commonly *C. baileyi*).

Comments:

Cryptosporidium is an apicomplexan protozoan that infects birds, mammals, fish, reptiles, amphibians, and humans, with 19 known zoonotic and potentially zoonotic species (4,5,8). Cryptosporidiosis can be defined as a secondary and no host-specific parasitism, more often producing clinical disease in immunocompromised individuals (4,5,8).

The most described species of *Cryptosporidium* infecting birds are *C. baileyi*, also being the most reported in laridae (3), *C. meleagridis*, mostly reported in turkeys, and *C. galli* in chickens (4,5), although different parasite species can infect different hosts, including anatidae, accipitridae, falconidae, passeridae, phasianidae, psittacidae and tytonidae (8).

Cryptosporidium can infect nasal the cavity, trachea, bronchi, and lungs, producing epiphora, conjunctival redness, swollen eyes, cough, and abundant mucous secretion accumulation in the airways (4,5). Gastrointestinal infections are reported in the proventriculus, intestine, colon, cloaca (1,5,6), and bursa (1,5,7) of chickens and turkeys, leading to diarrhea and weight loss (6). The urinary tract can also be infected, producing weight loss and systemic gout (2). The most common pathologic features of *Cryptosporidium* infection are the presence of 2 to 8 µm round protozoan parasites located in the apical portion of the epithelium, epithelial hyperplasia and sloughing of cell debris are mixed with mucous exudate. Mixed heterophilic and lymphoplasmacytic infiltrates can be detected in the lamina propria of the affected organs (1). *C. baileyi* is the most reported agent in laridae, producing respiratory cryptosporidiosis in *Chroicocephalus rubicundus* and *Larus argentatus* young gulls, but subclinical infections of the cloacal bursa and cloaca are most commonly reported (3).

The definitive diagnosis of cryptosporidiosis can be achieved by immunohistochemistry, polymerase chain reaction (PCR), and electron microscopy showing the characteristic intracellular and epicytoplasmic distribution of the protozoa (5).

There is limited information about cryptosporidiosis in *Larus dominicanus* and its role in the dissemination of this agent in the environment is unknown.

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