## Care Cards

## Coccidiosis

Protozoa are commonly found on routine fecal examinations in reptiles. The majority of species found in the reptile gastrointestinal tract are nonpathogenic. Normal gastrointestinal protozoa and bacteria are necessary for proper degradation and digestion of food items.

Coccidia are a group of pathogenic protozoa that can infect many animal species. In general, coccidia are usually host specific. In reptiles, the coccidia genera most frequently isolated are *Caryospora, Cryptosporidium, Eimeria* and *Isospora. Caryospora* are not considered a common problem. Lizards have the most distinct coccidian species although the organisms have been isolated from all reptile species. Coccidia usually invade the epithelial lining of the intestinal tract or bile duct. There are a few reports of coccidia infecting the kidneys.

Coccidia are transmitted via the fecal-oral route. Infected animals shed oocytes in their stool which mature into sporozoites outside the host. Following their ingestion, the sporozoites are released into the intestinal lumen where they colonize and mature within the epithelial cells. The mature colony is called a schizont. The schizont ruptures into the lumen of the intestine causing local damage to the epithelial lining and releasing merozoites.

Oocyte

Figure 1 Isospora sp. Normal and Sporulated

The merozoites either infect other epithelial cells continuing the life cycle or remain in the lumen and become oocytes which are shed in the stool.

Animal Veterinary Hospital

Coccidiosis can lead to sloughing of the intestinal lining, hyperplasia of the epithelium and enterocytes, and the movement of inflammatory cells into the mucosa. Clinical signs of affected reptiles include: restlessness, anorexia, weight loss, intestinal intussusception, enteritis, regurgitation, stunted growth, diarrhea, and death. Diagnosis is made by demonstrating the oocytes microscopically in feces.

Isospora amphiboluri is the coccidian parasite of bearded dragons and is endemic in captive dragons in the United States. The lack of an effective quarantine system has allowed coccidia to become well disseminated within the reptile population. Most coccidial infections are selflimiting in higher vertebrates; these infections often persist in bearded dragon colonies. The organism can lead to morbidity and mortality in juvenile bearded dragons. Affected animals can be anorectic, and have weight loss and diarrhea. If untreated dehydration, electrolyte imbalance, and secondary bacterial infections can occur.



Figure 2 Eimeria sp Sporulated

Coccidiosis is a major disease in captive crocodilians resulting in stunted growth and mortality. Unlike in most reptiles, oocytes are rarely found in fecal samples. The disease is often diagnosed by histopathology of gastrointestinal tissues. Inflammation and ulceration of the intestinal mucosa along with identification of any stages of the life cycle is diagnostic.

Eliminating coccidia from infected reptiles is difficult. Most therapeutic agents used to eliminate coccidia are coccidiostatic and produce inconsistent results. Currently Ponazuril is the best product available to treat this condition. No evidence exists to show zoonotic possibility or cross infection to humans from infected reptiles. Control and prevention of coccidiosis in reptiles requires good hygiene and quarantine procedures. Routine fecal exams should always be preformed.

 Barnard, Susan and Upton, Steve: A Veterinary Guide to the Parasites of Reptiles, Volume 1 Protozoa, Krieger Publishing Company, Malabar, 1994, pp. 43.



Questions? Please contact Dr. Bruce Bogoslavsky • Animal Veterinary Hospital of Orlando • 1320 West Oak Ridge Road • Orlando, FL 32809 • Phone: 407.855.7387

References:

Mader, Douglas: Reptile Medicine and Surgery, W.B. Saunders Company, Philadelphia, 1996, pp. 191-192.

Mitchell, Mark and Diaz-Figueroa, Orlando: Clinical Reptile Gastroenterology in Vet Clin of Exot Anim (8), W.B. Saunders Company, Philadelphia, 2005, pp 292.