AN OUTBREAK OF SARCOCYSTOSIS IN PSITTACINES AND A PIGEON IN A ZOOLOGICAL COLLECTION IN BRAZIL

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Study Results
This report describes an outbreak of acute pulmonary sarcocystosis in different species of captive psittacines and in a Luzon bleeding-heart pigeon in a zoological collection in Brazil. The probable source of Sarcocystis sp. in these birds was the wild opossum (Didelphis albiventris) that is a common inhabitant of a local forest that surrounds the Belo Horizonte Zoo (Fundação Zoo-Botânica). This is the first documentation of Sarcocystis infection in psittacines and in a pigeon from Brazil.

Significance of Study Results
This report demonstrates how easily Sarcocystis infection can spread to birds from opossums and it is an alert for veterinarians and zoo workers in order to prevent sources of infection. In addition, sarcocystosis should be considered in the differential diagnosis of sudden death and pneumonia in captive birds. More studies should be carried out in order to better understand the epidemiology of the disease and possible wild reservoirs in Brazil. Though Sarcocystis sp. has been documented in the feces of opossums from Brazil, this is the first documentation of disease associated with a Sarcocystis sp. in psittacines and a pigeon.

Additional Information
Sarcocystis sp. is an ubiquitous protozoan parasite that require two hosts to complete their life cycle. The sexual phase takes place in the definitive host, a carnivore, and results in the production of infective sporocysts that are shed in the feces. Asexual reproduction occurs in the intermediate host and is characterized by schizogony (merogony) and formation of sarcocysts in skeletal muscle (Figures 1–6). In general, Sarcocystis species have specific intermediate hosts.

In contrast, Sarcocystis falcatula (S. falcatula) can use a large variety of bird species as intermediate hosts, such as passeriformes, psittaciformes and columbiformes. In addition, S. falcatula has a prolonged schizogony (5 months or more) and is highly pathogenic to intermediate hosts, mainly due to the fatal pulmonary presentation especially in psittacines. The merogony phase in the intermediate hosts takes place primarily in the endothelial cells of arteries, capillaries, veins and venules of lungs, liver, kidney, brain, heart, and skeletal muscle. Mature sarcocysts can be observed in cardiac and skeletal muscles.

S. falcatula infections have been reported in North America and the North American opossum, Didelphis virginiana, which has been considered the definitive host for S. falcatula. It is known that the North America opossum is the intermediate host for at least 3 species of Sarcocystis: S. falcatula, S. neurona, S. speeri; however, S. neurona and S. speeri are not pathogenic to birds.

The opossum, Didelphis albiventris, in Argentina and the South American opossum, Didelphis marsupialis, in São Paulo, Brazil have also been identified as definitive hosts of S. falcatula and S. falcatula-like protozoa. The S. falcatula-like protozoan identified from one of the opossums (D. albiventris) was recognized as a new species based on structural difference and molecular characterization. It was named S. lindsayi, but its importance still has to be determined.

Outbreaks of acute fatal Sarcocystis infection have been reported in various species of birds especially in psittacines in the United States of America. Among psittacines, Old World psittacines such as budgerigars (Melopsittacus undulatus), cockatiels (Nymphicus hollandicus), African grey parrots (Psittacus erithacus erithacus), and various species of cockatoos (Cacatua sp.) are highly susceptible to S. falcatula. Psittacines from the New World are relatively resistant to S. falcatula but nestlings of certain species of psittacines are susceptible. Contaminated feed and water from the feces of opossum is one of the ways birds acquire S. falcatula. In one of the studies it was shown that cockroaches can also act as mechanical vectors of infectious forms of S. falcatula. Flies and fomites can also be mechanical carriers for S. falcatula.

Sarcocystosis outbreaks in various species of birds including psittacines, passerines and other birds from zoological collection and aviaries have been reported in USA. There are no such reports of S. falcatula infection in birds from outside the USA; however, there are reports of Sarcocystis in capercaillies (Tetrao urogallus) from Sweden and Finland but the species of Sarcocystis could not be determined. There is one report from Germany in which Sarcocystis kirshaei was identified in the brain of a hill mynah (Gracula religiosa), but no details were provided regarding its life cycle and definitive host. Also, the species of Sarcocystis that is infectious to birds and is found in the South American opossum, D. albiventris, in Brazil is not known.

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