Macrorhabdus in Budgerigars
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*Macrorhabdus ornithogaster* is an important fungal disease in parrots, especially the smaller parrots (budgerigar, cockatiels and finches). *Macrorhabdus ornithogaster* is thought to be the etiologic agent of the “going light” syndrome in budgerigars. “Going light” in budgies is characterized by weight loss, diarrhea, regurgitation and death. *Macrorhabdus* has been reported in canaries, finches, cockatiels, lovebirds, chickens, ostriches and occasionally in larger parrots.

Believed initially to be a bacterium, for years it was called megabacteria. Recently it was determined that Megabacteria was actually a yeast and thus was renamed *Macrorhabdus ornithogaster*.

*Macrorhabdus* is a large, gram-positive rod-like structure measuring approximately 1 to 5 mcm in width by 20 to 90 mcm in length. *M. ornithogaster* stains positively by periodic acid-Schiff and silver staining techniques. Electron microscopy has revealed a three-layered wall with indentations in the inner wall and a translucent outer wall and the presence of eukaryotic nuclei within a nuclear membrane. Fungi by definition are eukaryotic heterotrophic organisms.

Clinical signs are often nonspecific. Progressive weight loss over months is seen in spite of a good appetite. Depression, regurgitation, diarrhea and maldigestion have also been noted. Melena may be seen in end-stage disease and death may occur due to hemorrhage. Occasionally acute *macrorhabdus* disease may be seen in budgerigars, where an apparently healthy bird suddenly becomes depressed and dies within 24 hours.

Differentials include: trichomoniasis, candidiasis, bacterial ventriculitis, heavy metal toxicity, neoplasia and proventricular dilatation disease.

Diagnosis in the live bird can be challenging. *M. ornithogaster* can be seen in wet mounts of feces or on proventricular scrapings with Grams or romanowsky stains, but shedding is intermittent so it may be difficult to detect. A complete blood count (CBC) and biochemical profile are typically nonspecific. Contrast radiographs with barium sulfate may reveal a “sandglass-like” appearance between the proventriculus and ventriculus. There is a PCR test available that can be done on feces that is more sensitive than wet mounts. Definitive diagnosis of *M. ornithogaster* is most often demonstrated at necropsy.

Necropsy often reveals an emaciated bird with major lesions at the junction between the proventriculus and ventriculus. Gross lesions include a proventriculitis with ulcers with or without hemorrhage, dilation of the gastric isthmus, thinning of the isthmus wall, and increased mucous secretion.

*M. ornithogaster* has also been found in clinically healthy birds.
and there is some evidence that *M. ornithogaster* may be a component of the normal gastrointestinal flora of budgerigars. Research has revealed that subclinical infections are present in a large number of budgerigars without any signs of disease. It has also been suggested that a bird’s innate susceptibility to infection may be more important than the duration of exposure. The mode of infection is fecal-oral, but there may be genetic factors involved because the prevalence of *macrornhabdus* is significantly higher in chicks from *M. ornithogaster*-positive parents than from *M. ornithogaster*-negative parents, even when raise by *M. ornithogaster*-negative parents.

Treatment has been challenging. Historically the only effective treatments have been amphotericin B and Nystatin; polyene macrolide antifungals which bind to ergosterols in the fungal cell membranes. Amphotericin B is most effective in birds if given orally, either in medicated water or by gavage. Nystatin has been reported to be effective in goldfinches. Although amphotericin B has proven to be effective it is quite expensive in a large flock making it often cost prohibitive.

A new drug regimen which has shown efficacy against *macrornhabdus* in budgerigars is Sodium Benzoate. Proposed by Dr. David Phalen in Australia as a treatment for *macrornhabdus*. Sodium Benzoate is a preservative that is used in jams, sodas, and makeups. It is bactericidal and fungicidal, water soluble and inexpensive. Studies done at the Schubot Exotic Bird Health Center confirmed that Sodium Benzoate was an effective treatment. Sodium Benzoate is quite bitter so treatment must begin slowly and be monitored closely. Overdosage can result in neurological signs and death. Birds that are reproductively active, feeding chicks or in hot environments tend to drink more, sometimes two to three times more water daily than normal. In these cases the dose must be ¼ to ½ the recommended treatment dose to be safe.

Begin with ¼ teaspoon of 100% sodium benzoate powder in one liter of water. Monitor water intake for a few days, and if the bird is drinking well increase water intake to ½ teaspoon per liter of water. If drinking normally over the next two days, increase to 1 teaspoon per liter and continue treatment for four to six weeks. Monitor feces directly for organisms or via PCR every two weeks.

This can be a very effective water treatment if the birds are not reproductively active, feeding chicks and if the birds are housed in moderate temperatures.

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Dr. Hoppes is an associate professor of Zoological Medicine at Texas A&M University’s College of Veterinary Medicine. She graduated from Oklahoma State University with her DVM degree in 1993 and worked in private practice for ten years. Dr. Hoppes is the president of the Association of Avian Veterinarians and has served as chair of their rescue and sanctuary committee and as a board member. She is also a member of the Association of Reptile and Amphibian Veterinarians. At PacVet, Dr. Hoppes leads eight sessions on Thursday and Friday, June 20-21, in Avian Medicine and Surgery.

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