Megabacteria by Cerise Duran

Megabacteria

Virtually unheard of as recently as 5-6 years ago, Megabacteria is being increasingly found in more and more species of birds. Although very easy to diagnose and treat, many avian veterinary exams do not include a wet mount of a fresh fecal, generally the ONLY way it can be seen. Like it or not, this is something ALL aviculturists may be facing in ALL species in the very near future.

The following article as well as the links to the left contain a tremendous amount of info regarding this organism, its origin, diagnosis, and treatments. Get familiar with it, it is likely you will seeing it or hearing about it again soon!

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by Cerise Duran

Part I - My Experience

My beautiful 6 month old Pacific blue mutation parrotlet was found on the floor of his cage, puffed up and with his head tucked under his wing His appetite was good, but he was very lethargic. I put him into isolation, weighed him (he had a 10% weight loss), provided heat, seeds, soft foods and water.

My veterinarian was out of town, so he was taken to a non-avian doctor the next day. At my request, a CBC and blood chemistry panel were taken, as well as cultures. Blood results came in with a very low white count, apparently an indication of a bacterial infection, and culture results were negative. He was put on antibiotics, but there were no signs of improvement.

Aggressive "nursing care" pulled this bird through the next 4 days, until my veterinarian's return. Heat and hand feeding saved his life. When my avian veterinarian returned, he gave me a call, and asked to see the bird since there had been no improvement from the antibiotics treatment.

This bird had arrived with a second bird, and the two had been sharing the same cage. The cage mate showed no signs of ever slowing down. He was highly energetic, and never skipped a beat. One morning, I was surprised to see the cage mate spitting up undigested beets! Well, he made the trip, along with the blue, to my veterinarian's office.

Luckily for me, my avian veterinarian is well informed, well read, and stays up on all the new "things" going on in the world of avian medicine. He checked the bird's droppings under the microscope. I took a look at the microscope, and there it was - Megabacteria! Both birds had the bacteria, but only one of them showed noticeable symptoms!

Medication was prescribed for the two birds, and viola! In 48 hours, the blue made a complete turn around! His energy returned, and he began to regain the weight he had lost. The two birds went on to make an unremarkable recovery, and the blue has since produced several clutches of babies.

Once the emergency was under control, I needed to deal with the "flock". So, I collected "sample" birds from every cage I had and made the trip back to my veterinarian. These birds were individually checked for Mega. Guess what! It was found in 25% of my cages.

The original two affected birds were the only ones to come from that particular source, and they came from a line of imported European birds. A European import fallow hen from a second source tested positive for Mega. One cage-full of babies, from parents that tested negative, had positive tests for the organism, while another group of babies from the same parents tested negative. The one oddity in the cage of babies that tested positive was a single bird from a third source that shared the cage with them. That bird came from an aviary with birds that had been imported from Europe. I notified all three aviary owners of the problem.

The imported fallow hen had been "looking suspicious" ever since laying her first clutch, and had become rather inactive. I decided to have my veterinarian give her a second exam. He found that this hen had "fat rolls" above her legs. She sat on her perch all day and did nothing while her mate fed her. She laid no more eggs that year, and looked scruffy most of the time. She was chosen as one of the "sample birds" that went in for testing for Megabacteria, and this would be her third trip in. Yes, she had Megabacteria! She was treated, became active once again, lost the fat rolls, and laid and raised 3 successful clutches in 1997. She is active to this day, and has never developed those fat rolls again.

the fallow hen that was infected but only looked "suspicious", and C) all the rest of the birds that were infected and displayed absolutely no symptoms! Other than these described symptoms, no others showed up with my birds.

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Part II - What is Megabacteria?

Megabacteria is a recognized problem in both Europe and Australia. It's been seen primarily in canaries and budgies, and in particular "show" budgies, although other species have been affected. For the Europeans and Australians, Megabacteria is recognized as a common pathogen. For aviculturists and pet owners in the US, this is viewed by many as an exotic pathogen, and as such should be eliminated from our aviaries and pet birds.

In a publication by Lucio J. Filippich of The University of Queensland, Queensland, Australia, he states that: "Megabacteria are large, gram positive, rod-shaped organisms that are being increasingly found worldwide in the proventriculus or droppings of several pet bird species, especially budgerigars and canaries."

He goes on to say that Megabacteria has been reported to have been found in wild-caught European goldfinches as well as in wild-caught Australian sulfur-crested cockatoos. He states that budgerigar breeding colonies in Australia show a 64% infestation rate.

He describes symptoms of budgerigars in the acute stage to include severe drowsiness, lethargy, fluffed feathers - ending with death within 12 - 24 hours. Regurgitated blood can stain the feathers around the beak and neck. This same bleeding may result in droppings that are black or reddish-black. The chronic stage is more common, and is usually seen in budgerigars over one year of age, or just after the first breeding season. These birds become depressed, lose condition, fluff up and lose weight in spite of their apparent good appetites. Although the birds are often at the food dish, they only grind or mouth their foods, swallowing very little. Birds may regurgitate blood tinged food. They may "mouth gag" or "neck stretch" in an attempt to regurgitate. Their droppings may contain undigested seed particles, or even undigested whole seeds. These budgies will continue to lose weight over weeks or even months, then they either die or slowly recover. He cautions that what may appear to be a recovered bird will usually relapse later when stressed, naming molting or breeding as examples of stress. He also advises that these birds are of no value in a breeding program.

Dr. Speer says that the birds exhibit all the classic signs of having a severe stomach ache. Their fluffed appearance, tucked heads, sitting on the bottom of the cage, closed eyes and pained expressions all look like "us" when we have a stomach ache.

Diagnosis and treatment are relatively reliable and safe. Your avian veterinarian will have to test, diagnose, and prescribe the medication for you. The test in live birds is a simple direct fecal (a fresh dropping) wet-mount slide checked at 400 power or higher. Staining (including Gram's staining) is not necessary. Dr. Speer takes a great deal of time examining the slide, and he has found as few as one or two organisms in the last field checked. In less careful hands, these could have been missed.

Culturing for this bacteria, using conventional culture medium, is not effective. This bacteria can be cultured with great difficulty, but it has special medium requirements, which are not commonly available.

In necropsy examination, the lining of the proventriculus and ventriculus are swabbed for direct examination under a microscope. The organism produces a slimy coating on the mucosal surface of the proventriculus and ventriculus. This slimy coating will be thick with the organism, and diagnosis should be eminent. On some occasions, the bacteria can cause perforation of the proventriculus, which will lead to internal bleeding and death. This swab of the mucosal surface must be done on fresh tissues, not on tissues that have been subjected to preservatives such as formalin. Therefore, it will usually be the veterinarian or pathologist who originally opens the carcass that will have to run this test. It is not uncommon for the organisms, and hence the diagnosis, to be washed off in formalin-fixed tissues, unless fresh wet mounts have been prepared prior to tissue fixation.

Megabacteria is resistant to antibacterial antibiotics. One recognized effective treatment is with the antifungal drug, Amphotericin B. Filippich states that Amphotericin B works on certain components of the cell membranes of fungi. This same action does not apply to Megabacteria, since Megabacteria is lacking in that particular component based on electron microscopy studies. Just how it affects Mega is not known at this time. Mega is, at this time, assumed to be a bacterial organism, although there has been no absolute conclusion.

Treatment prescribed for my birds was the antifungal, Amphotericin B (Fungizone).

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Part III - Management

I decided to treat the entire flock of about 50 birds ..... which is when I discovered that it would cost me well over $700.00! The pharmacist at the local hospital conducted a search and found that there was an oral suspension form. Well, you might know how I reacted when she told me that I could buy enough oral medication to treat the entire flock twice for around $30!

The oral form of this medication still is not commonly available in drugstores. Many pharmacists don't even know about it yet. If you ask for their help, they can do a search on their computers and will find that the medication is available.

The oral form was well tolerated by all the birds, they even seemed to like its taste. Every bird had to be caught and treated individually every morning and every night for 10 days. As part of the recommended treatment, about halfway through the ten day period, every cage was thoroughly cleaned and disinfected. Perches and nest boxes, toys and barrier sheets, everything was either discarded or disinfected.

For prevention and containment, test the birds that you currently own (sample birds will probably be adequate for breeders with larger aviaries), then treat accordingly. If you find Mega in even one bird, you should treat your entire flock. Follow your avian veterinarian's advice for treatment, then retest your birds. For breeders, the use of a microscope for screening will be your best tool in elimination efforts.

Use Dr. Speer's "closed aviary concept". Have all new birds examined by your avian veterinarian, including appropriate tests, and maintain quarantine for a minimum of 60 days. Every new bird purchased should be considered a potential carrier. There are many types of birds that are regularly being imported from Europe, resulting in multiple opportunities for cross contamination. Over the course of 2 years, I acquired birds from 5 different breeders and had the organism found in birds from each and every one of them. I now have all new birds tested. The test is noninvasive, inexpensive, and accurate in the hands of a careful diagnostician. If even one bacterial rod is found, the bird should be considered to be infected and subsequently treated. If even one bird tests positive in an aviary, the entire aviary should be considered suspect, and efforts should be made to treat the entire flock. Retesting should confirm the presence or absence of the organism.
I have described: A) the acute symptoms that appeared in my blue - a bird that looked very much like it would not live to see the 'morrow,
Keep your cages clean and use closed water bottles (the hamster style bottles, which may help to reduce the spread of many diseases within an aviary). Clean your cage thoroughly before housing a new bird in it. Do not cross contaminate by sharing used dishes or water bottles between cages. Always thoroughly clean and disinfect all feeding equipment.

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Part IV - Afterthoughts

I feel very strongly that birds should not be dying from Megabacteria, were it not for the fact that too few of us are aware of the problem. The same goes for our avian vets. This is quite simply because the organism has not been recognized as a problem in this country until recently, although there have been a number of reported cases for several years now. Have your birds properly screened for this organism, and make the effort to eradicate it. If it is identified in single birds or in your flock, avoid water-based treatments. The probability of only a reduction, not an elimination, of this organism is greater with water-based treatment approaches. This will result in infected or carrier status birds still being sold from your flock, which will potentially go on to infect others, develop disease or damage your reputation in the future.

Although my experience has been with parrotlets, this problem is not limited to parrotlets. Birds of several kinds are still being imported from Europe, and you can bet that infected birds are still coming in. Be sure to check your birds. You may have this "unseen killer" in your aviary.

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Questions and Answers

(1) How would using water bottles instead of bowls help? Does it have to do with the problem of "parrot soup" and pooping in water dishes?

Answer: For the single bird owner, it may not be much of an issue. In an aviary, however, it's a different story. This bacteria may be spread via particles of fecal debris floating in the air from flapping wings and vacuum cleaners, or being directly dropped from cage to cage. Although there has been no specific research done pertaining to how Megabacteria is spread, this mode has been proven in the spread of other diseases. It makes sense that contaminated debris (such as dried or even fresh droppings) falling into the water dish of another bird will cause the spread of this bacteria, because the water dish is an ideal medium for the growth of many bacteria.

(2) I know someone who had a case of Megabacteria in their birds which was diagnosed by a reliable avian vet. The birds were put on a treatment of a very diluted solution of hydrochloric acid for several weeks and that seemed to do the trick. By the way, that is the same treatment given in Avian Medicine: Principles and Applications by Ritchie, Harrison & Harrison.

Answer: I understand that this treatment has been used in the past. I also understand that this particular treatment has not been found to be consistently effective, according to Filippich, Dr. Speer and other vets in this country. Perhaps the Avian Medicine text is out dated as regards this particular bacteria and its treatment. That's not a slam, it's just that research changes things. What is accepted as good medicine today is often proven wrong or improved upon tomorrow! I would suggest that any veterinarians who are faced with treating this bacteria for the first time, those who are using the method of changing the pH level, and those who are considering using the water-based treatment from Australia should first consult with Dr. Brian Speer. His consultation number is 925-625-1878 and e-mail address for consultation is AVNVET@aol.com. Consultation costs are very reasonable, considering the potential loss of birds, production and reputations that are at stake.

Also, I caught a note from Dr. Branson Ritchie on another list stating that the only recognized effective treatment for this bacteria is Amphotericin B. You might recall that he co-authored Avian Medicine: Principles and Applications with the Harrison's.

(3) Not knowing that much about Megabacteria, is this an organism that can lay dormant in a bird and for some unknown reason at any time it could start shedding it? If that is the case how would we test for it? If the bird is not shedding at the time the test would be inconclusive, just like for polyoma.

Answer: At this time, no real understanding of the nature of this beast is in hand. There are verified cases of false negative results. The current recommendation is that the bird is considered clean after three consecutive tests are performed, with negative results in all three tests.

The following are answers from Dr. Brian Speer:

(4) How long after a bird is dead can Megabacteria still be isolated from the mucosal linings?

Answer: We have been able to identify Mega on fresh wet mount of intestinal or proventricular mucosal scrapings in post mortems - even some fairly old carcasses - 2-3 days since death.

As I believe you know, histopathology usually will not demonstrate the organisms reliably, as they tend to wash off in the formalin during fixation, and gram stains (in my opinion) are fraught with the same problems.

(Since that time, Mega was found in a 5 day old carcass.)

(5) If Mega is a bacteria why are we treating it with an anti fungal antibiotic?

Answer: Technically, we do not know WHAT Mega is. It morphologically resembles a bacterium, but therapeutically responds to an antifungal which should have no effect on bacteria. We know that it is a beta-hemolytic organism that can be grown (with great difficulty) on blood agar media.

(6) For human purposes, Amphotericin B is a last resort drug and must be used for 30 days to be effective. Why only 10 days for a bird?

Answer: Ten days has been shown to be clinically effective. Human treatments are based on IV use for severe systemic fungal disease - which Megabacteriosis is not.

(7) After a 10 day treatment can it be considered cured? Since there are false negatives, and lack of expertise in the department of detecting low numbers of rods, how can we ever be sure it is gone.

Answer: By monitoring for confirmation of it's absence over time, we may be able to claim a cure. In general, I feel much better when there have been no organisms seen on a series of three independent checks in birds, as long as the environment and traffic flow are secure.

(8) If we can never be sure it is gone and since no one can say what the incubation period is then would it be practical to treat on a regular basis, say annually.

Answer: This is the approach adopted by the Australian train of thought - with the concurrent statement that there is an incidence of up to 60% subclinically infected birds there. Routine treatment will reduce numbers, but still allow subclinical infection and spread of the agent. The Australian data has clearly shown that.

(9) What harm or good would it be to treat all of the for sale birds again just two weeks prior to shipping.

Answer: There is no harm known with Amphotericin B treatment other than the cost and labor involved. But, a collection that is free of the organism (a fair but longer term goal) will not necessitate this approach. Also realize that this may make detection of the presence of the organism in your birds leaving (the true sentinels for your management program) much more challenging, therefore, may lead you to more of a false sense of security as to your standing pertinent to this organism's presence in your flock.

(10) Can a sun lamp or UV lighting protect or clean in an indoor aviary situation?

Answer: We have no factual data to support or deny this thought. UV light should not hurt, but we do not know if it will help.

(11) Would you recommend new cages considering all the little welds and wired together spots on cages being able to harbor the Mega?

Answer: No. In general, good quality cleanliness is the key. A "Germ free" environment is both impractical as well as technically impossible.

(12) Someone said feeding citrus fruit could help prevent Mega. Is there any truth to that statement?

Answer: Not much. Some canaries tend to have less disease when eating or drinking acidified food / water. Parrotlets are not canaries, and this approach is not an acceptable TREATMENT, it only reduces numbers of organisms present.

(13) How about other species being affected with Mega?

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URL: https://faq.budgiebreeders.asn.au/content/4/329/en/megabacteria-by-cerise-duran.html

Budgerigar Health And Related

Off of the top of my head, Mega has been seen in many psittaciformes -- but predominately in the smaller species; it has been seen in several small passeriformes (particularly canaries, finches, etc.). It has been reported in the ostrich and a few other ground feeding species.

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