

PDD Update

An International Aviculturists Society Publication

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Brief History of PDD

An infectious agent is killing companion, aviary, and free-ranging birds throughout the world. At present, no birds or aviaries are known to be protected. This dreaded affliction is called Proventricular Dilatation Disease (PDD).

PDD has been reported in over fifty species of the Parrot family and pathology suggests the disease is also present in other families of captive and free-ranging birds. In contrast to the polyomavirus and PBFD virus which primarily cause disease in young birds, PDD is more prominent in adults. We know of no parrots safe from the devastation of PDD. At this time, there is no protection we can afford our companion birds, aviaries or free ranging parrots.

This disease was reported some twenty years ago and has been referred to by many names, the most commonly used being "macaw wasting disease".

IAS ACTIONS

The International Aviculturists Society (IAS) recognized this disease to be extremely dangerous, if not the most dangerous, disease of parrots. In 1994, IAS targeted eradication of this threat as its primary research goal and began a directed donation program with the Psittacine Research Group (PRG) at the University of Georgia to do the research necessary to develop a means of protecting birds from this disease process (vaccine). Concurrently, an Educational program was launched.

The Psittacine Disease Research Group

Through our support, The Psittacine Disease Research Group at the University of Georgia College of Veterinary Medicine including Branson Ritchie, Chris Gregory, Kenneth Latimer, Buddy Stefens, Steve Poet, Denise Pesti, Ray Campagnoli, Vicki Burnley and Phil Lukert have made substantial progress in our understanding of PDD.

The IAS board of directors choose to support this group in their quest to stop PDD because the PRG had a proven track record on behalf of Aviculture. With the support of Aviculture, the PRG developed an assay for testing and effectively eliminating Psittacine Beak and Feather Disease (PBFD) from our aviaries and breeding stock.

The PRG developed an assay and ultimately a commercially available vaccine for the prevention of polyomavirus in parrots, a leading cause of death in young companion birds.

The PRG in cooperation with researchers at LSU have been conducting research on a DNA probe based assay to diagnosis psittacosis and on a vaccine to prevent infections.

The PRG has developed and has performed preliminary safety, immunogenicity and efficacy trials with a herpesvirus vaccine in a safe adjuvant which hopefully will one day be available as a combination vaccine along with the polyomavirus vaccine. (Indeed we are optimistic and expect in some future year to have a combination vaccine protecting parrots against polyomavirus, PBFD, PDD, and herpesvirus).

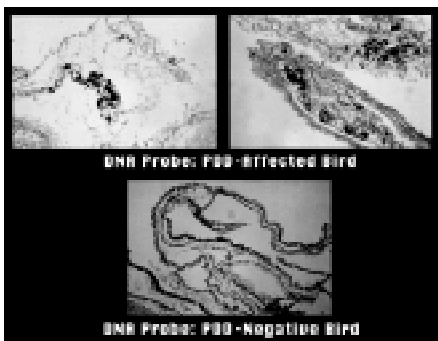


African Grey with PDD

Funding

IAS pledged to lead efforts to educate the avicultural community and raise funds to support these research efforts. The PRG investigators at the University of Georgia are on salary from the University. Laboratory space and overhead expenses are supplied by state funds as well as occasional grants. Unfortunately for exotic and companion birds, there is no government funding for the basic laboratory supplies and technician time needed for avian research. Although the dog and cat pet industry funds veterinary and vaccine research, there is no "avian industry" supplying significant research dollars. Avian Research is in fact supported and purchased by the avian community.

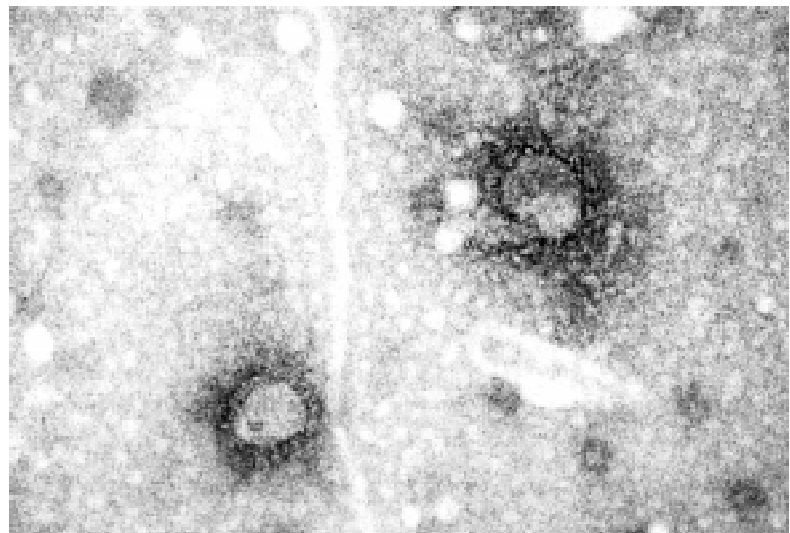
We are fortunate in that IAS funds raised for research on PDD, with the capable help of Terry Clyne of the International Avian Research Foundation, have often been matched or supplemented by university or state funds or additional private grants. Loro Parque Foundation has made significant contributions to the fight against this deadly disease.



Educational Efforts

Our 1995 and 1996 IAS Conventions were educational for all of us. Dr. Greg Rich, Dr. Keven Flammer, Dr. Mathew Bond, Dr. Michael Taylor and Dr. Fern Van Sant warned us of the infectious nature and heart-wrenching devastation caused by this deadly disease. Case presentations and the discussion forums illustrated the variable neurologic and physiologic disease course. Dr. Michael Taylor shared video projections of gastrointestinal radiographs showing the poorly functioning intestinal tract with decreased motility in diseased birds. Dr. Branson Ritchie has translated much of the histology and necropsy information into terms we as aviculturists can understand.

Several thousands of brochures have been distributed and additional information has been made available worldwide through the Internet (<http://www.funnyfarmexotics.com/IAS>). The World Parrot Trust has donated financial support and aided in publicizing the critical nature of this disease. The monthly avian periodicals have supported our efforts.



80 nm diameter enveloped virus

Diagnosis and Treatment

Although the group has developed a DNA probe which can detect a portion of the virus in stool and tissues, more testing is necessary before this test would be of value in a clinical setting. To put this in perspective, the research group tested the PBFV virus and polyomavirus DNA probes for three years before they were made widely available for clinical testing purposes.

Crop biopsies and motility studies may suggest the disease but are not diagnostic. One study suggests a 24 % false negative rate of crop biopsy. However if the crop biopsy is positive, it is very suggestive of the disease.

There is no specific treatment. Dr. Ritchie recommends a stress-free environment, an easily digested high energy formulated diet, and treatment of secondary infections.

Research Findings

Due to funding from the avicultural community, the PRG has now been able to work with this disease. Considerable progress has been made in determining the cause of this disease, and we know a lot more about the behavior and characteristics of this disease agent than previously.

With apologies to the researchers, some of the findings to date are summarized in an oversimplified manner:

The responsible agent of this disease appears to be a virus. This virus does not appear to be Eastern Equine Encephalitis virus (EEE) which has been associated with avian viral serositis. Likewise it does not appear to be a paramyxovirus, a herpesvirus, Western Equine Encephalitis (WEE), or an autoimmune phenomena.

An enveloped virus (80 nm diameter) has been recovered from affected birds. This virus is present in tissue which has been used to transmit disease to experimental birds. A test has been developed to demonstrate this virus in tissue of birds affected with PDD. The test consists of a DNA probe which was made from the RNA of the virus. This virus appears to be the culprit (EM photo opposite page).

For those who can remember back to their high school biology, this virus fulfills Koch's postulates.

Robert Koch was a German scientist and the discoverer of the agent causing tuberculosis. He won the Nobel Prize for medicine in 1905. He established four criteria, all of which must be fulfilled to establish a particular microorganism as the etiologic agent of a given disease.

- (1) *The organism is observed in all cases of the disease;*
- (2) *It can be isolated in pure culture or artificial media.*
- (3) *Inoculation of this culture produces a similar disease in animals used experimentally.*
- (4) *The organism can be recovered from lesions in these animals.*

(Note: Not all etiologic agents known to cause disease meet these criteria.)

Experimentally, this virus has been demonstrated in tissues of all of the infected birds. Inoculations of solutions containing this virus have been shown to experimentally cause the disease. In turn, virus containing tissue solutions from the experimentally infected birds has been shown to cause the disease in other birds through three generations. The virus is present in the tissue of experimentally infected birds and is frequently shed in the excrement.

Now that research has shown that PDD is transmissible, much is to be done. The research team will work further, tearing this virus apart, and confirming that indeed this is the causative organism rather than a coincidental opportunistic organism (unlikely).

The research team is currently working to further characterize this virus and improve the quantity of virus they are able to obtain in cell culture.

References for further information include:

Proceedings of the International Aviculturists Society Annual Convention, 1995, 1996, 1997 (some papers available from <http://www.funnyfarmexotics.com/IAS>).

Gregory CR, Ritchie BW, et al. Proventricular Dilatation Disease: A Viral Epornitic. Proc. Assoc AvianVet, 1997

Ritchie BW, Avian Viruses: Function and Control Lake Worth, Wingers Publishing, 1995

Respectfully submitted,

Richard Porter, Gopher

In summary, we know a lot more than we did a year ago. The dedicated PRG has done much to determine the etiology of this disease. A viral agent has been identified. With continued study the virus should be characterized and grown in tissue culture. Ultimately we should have a diagnostic test to identify infected birds, and ideally a vaccine to combat this disease by preventing infection.

Funding

Your continued support is needed to fund this vital research. IAS is recognized as a 501(c)(3) nonprofit organization. All donations directed to PDD research are deductible and go directly to the research.

To raise these funds, the International Aviculturists Society appeals to the entire avicultural community as well as individual companion bird owners. IAS is a non-profit 501(c)(3) corporation with **NO SALARIED POSITIONS**. All donations to the PDD project are directed donations for PDD Research., and IAS will absorb any overhead expense in administering this project.

Additionally, your IAS PDD donations are frequently matched with funds from other government or private sources to multiply the effect of your donation.

PDD Avian Research Donations

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Thank you. Your contribution is appreciated!



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