

Feather Pigmentation Investigated

We have begun an investigation into the nature of the feather pigments in macaws and other large parrots. This will be the first contemporary, comprehensive investigation of the chemical structure of the pigmentary system and its relationship to the morphology of feathers. One goal is to explain the variety of brilliant colors in the plumage of these birds. A second goal is to use the information obtained to understand the nature of color production in various hybrids.

We are especially interested in macaws (genus *Ara*) and conures (genus *Aratinga*). These are large birds with

conspicuously colored feathers and which hybridize easily. Feathers from the various *Amazona*, lorikeets, cockatoos, and other, common cage birds are also welcome. Feathers from hybrids are of special interest.

Plucked or molted feathers should be labelled carefully (type of bird, date, and location). Feathers from hybrids should include information on breeding when available. Material can be sent to: Dr. Alan H. Brush, Department of Physiology and Neurobiology, University of Connecticut, Storrs, CT 06268. ●

Apparent Chlorhexidine Toxicity in Neonatal Psittacines

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Pediatric care in captive hatched psittacines is a fast developing field. It includes all facets of husbandry and medicine necessary to maintain and promote the growth and development of the altricial young. Special techniques are necessary to assure a success rate greater than one would achieve if the birds were to be left with their natural parents. An immaculate and methodical approach must be adopted if one is to hope for consistent positive results. This includes the way in which the food is formulated, prepared, stored and given to the chicks, as well as the manner of handling all the various implements used to feed and house the animals from the time of removal from the parents until they are on their own.

Like the young of any species, immature parrots are substantially more susceptible to infectious disease than their adult counterpart. Chick mortality from infection is significant and is one reason one might wish to place the animal in a more controlled environment. This paper is not designed to discuss how to raise baby parrots, but rather to hopefully warn others against one mistake made by the authors.

At our aviary, we routinely pull chicks for hand raising. Whenever possible, the baby is left with the parents for a minimum of two weeks. If the chick has problems hatching, or if the parents have a history of neglect or aggression, the egg or newly hatched chick is removed prior to feeding by the parents. At such a time, the bird is weighed, examined, and the "umbilicus" is treated with disinfectant. Excellent care in the past has rewarded us with a proven technique for rearing even the smallest of babies. It is because of this that the following saga is so disappointing.

In the summer of 1984, two blue and gold chicks were pulled for hand raising. They were pulled at hatching (and, in fact, needed assistance in hatching) because two previous chicks of the same clutch were neglected by the mother and died. The first chick, upon hatching, was treated with an



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iodophor disinfectant on its umbilicus. This was done only once and the bird was subsequently raised without problems. The second bird, hatching two days later, also had its umbilicus treated but due to the fact that we ran out of the first solution, an alternate, chlorhexidine, was used. This chick fell far behind the first in rate of gain, and a diagnostic workup was instituted to determine the cause. Without any definitive results, the bird was placed on antibiotics and antiyeast medication. Weeks later, the second bird was still smaller, but was catching up to the first. By five months of age, the two birds were virtually indistinguishable in size and behavior. The problem with the smaller bird was assumed to be due to an infection.

Their parents recycled and laid five more eggs. All these hatched and were pulled for hand raising due to continued maternal neglect. The same procedure was used on the chicks, including the chlorhexidine solution to the umbilicus. The birds hatched at two day intervals. By the hatching of the third chick, it was clearly evident that the first bird was having problems. The same protocol was used for treatment, antibiotics and antiyeast medication, but this time there was no success. By the time the fifth chick had hatched, the weight of the first was barely ten grams heavier. All the chicks continued to eat, and the food continued to go through the crop at an acceptable rate. However, they refused to grow. Numerous antibiotics and other medications were used without effect. At three weeks of age, the first chick died. It had scarcely doubled in size during this time. It was necropsied and grossly it was found to be relatively normal with the exception of a non-reabsorbed yolk sac. All the rest of the birds subsequently died and their necropsies were similar to the first. There wasn't any evidence of infection and, in fact, the tissues were unremarkable. Needless to say, we were about to give up the hand rearing business.

The spring of 1985 brought new hope with the beginning of the breeding season. The first birds to hatch were Mexican red heads. There were two clutches, one with four chicks and another with one. The clutch with four chicks was pulled because of parental neglect. We had hoped that the problem was only in the blue and gold macaws, but it became clearly evident that the problem was also in other species. All four of the Amazons were affected, and all had been treated with the chlorhexidine. The one bird (from a different

pair) that had escaped the problem was parent-raised to about the age of three weeks. We felt that this was indeed the same problem seen in the macaws. The entire husbandry of the birds was scrutinized and it was determined that the only thing constant with the failing chicks was the type of umbilical treatment. The first blue and gold had received a different solution, and the other Mexican red head hadn't been treated at all. Previous birds successfully raised had also been given a different umbilical wash. To test this hypothesis, all solutions of chlorhexidine were removed. Umbilical treatment (in these birds, more than one treatment was used) was discontinued. Food continued to go through the Amazons and with the exception of the smallest bird, they began to grow. The smallest Amazon died, but the rest of the birds progressed to normal size and stature. Subsequent birds have all been raised without problems.

The evidence, albeit circumstantial, points to the probability that chlorhexidine acts as a growth antagonist when used in young psittacines. The umbilicus, being open in the neonatal parrot, probably allows a disproportionate amount of the disinfectant to be absorbed. In these cases, there doesn't appear to be any evidence of infectious disease. Those birds not receiving treatment do not exhibit the signs of the syndrome, those continuing to get treated fail to grow and eventually die, and those getting treatment on a one shot or short-term basis become ill but recover. The problem seems to be one of degree; too strong of a chemical is given via an atypical means to a susceptible animal. In this case, it appears to be over-treatment, not failure to treat, that was responsible for the deaths. In order to verify that chlorhexidine was indeed the source of the problem, we would have to duplicate the circumstances in a controlled situation and produce the same results. Obviously we are not willing to sacrifice any more birds.

We wish that this story had a happy ending. Hopefully others can profit at our expense and not needlessly sacrifice their birds through good intentions. If there is a lesson to be learned, it might be that people should not be afraid to publicize their mistakes, especially if they are commonly followed and easily corrected. We still use chlorhexidine in its proper strength and as directed on the bottle for sanitizing bowls, feeding apparatus and cages. We feel that it remains a valuable tool when used properly. ●



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