

Breeding the Red-browed Amazon Parrot: Chronicles of a Paradise Lost?

(*Amazona dufresniana rhodocorytha*)

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As tropical avifaunas have become increasingly imperiled through human activities, the imperative for conservation practices in aviculture has become increasingly clear. First-breedings and subsequent propagation of rare species are important first steps toward maintaining captive populations, from which natural populations may ultimately be restored. Recent limited conservation successes with psittacines like the Puerto Rican Amazon (Snyder, et al., 1987) and the Thick-billed Parrot (Beissinger and Snyder, 1991) are testimony to the efficacy of aviculture in preserving certain taxa. Sadly, for others the hope of rescue is fleeting, and the prospect for recovery of natural populations even in the distant future is essentially nil. For these desperate species, captive culture has taken on a sobering new light — occasional breeding successes may be all that stem the inevitable tide of extinction. It is with this perspective that we report the first successful North American breeding of the Red-browed Amazon Parrot (*Amazona dufresniana rhodocorytha*) in eight years.

Description

The Red-browed (a.k.a. Red-topped or Red-crowned) Amazon is a large Amazon, 35 to 40 cm in length and 450 to 650 g in adult weight. The obvious feature of the species is the red forehead and crown, which fades toward the nape to a reddish-purple tinged with blue. As with its nominate species, the Blue-cheeked Amazon (*A.d. dufresniana*), the lores are yellow-orange with cheeks and neck blue. Other distinguishing features include a horn-colored upper mandible that becomes pink at the base, an orange-brown iris and grey legs. Further details of plumage can be

found in Forshaw (1989) and Stoodley and Stoodley (1990).

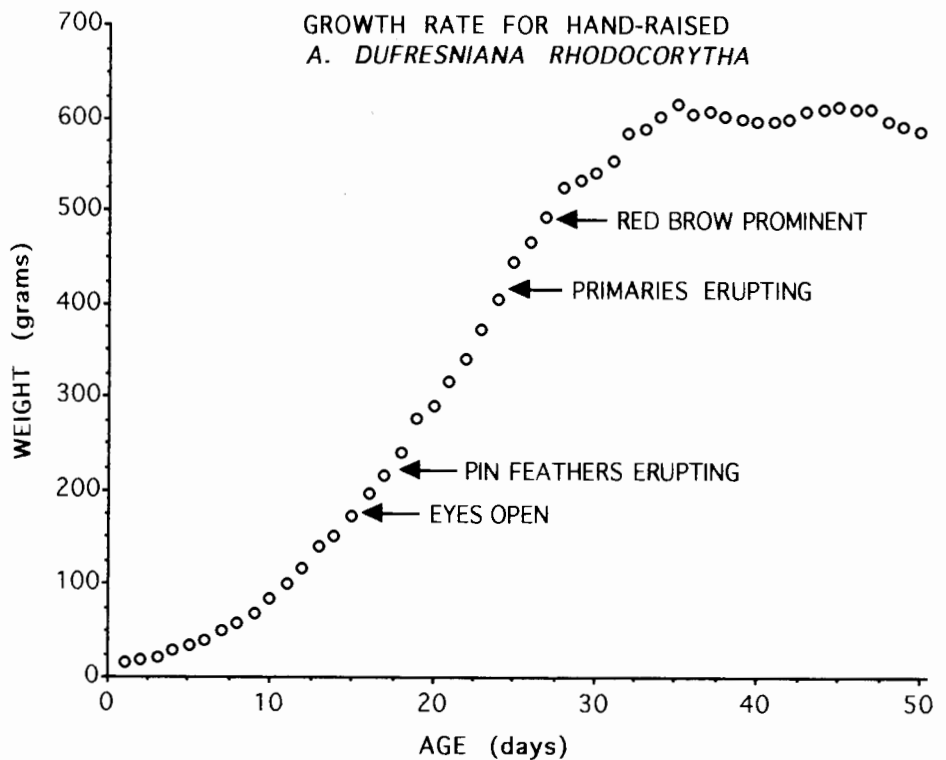
Natural History

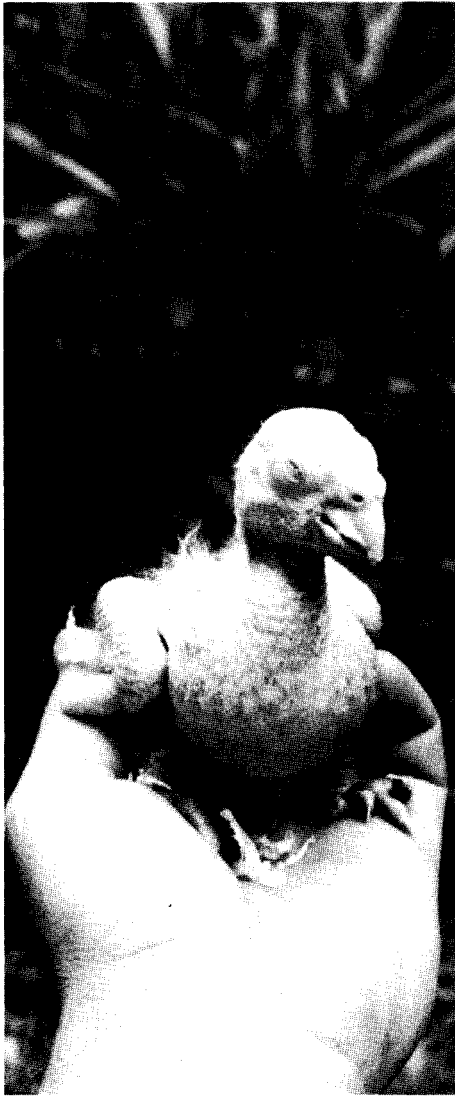
Once a common parrot in southeastern Brazil (Pinto, 1935), the Red-brow is now altogether extinct across most of its original range due to deforestation and human encroachment (Forshaw, 1989). Remnant populations are very locally distributed in fragmented forests between Alagoas and Rio de Janeiro, although it is doubtful that any birds survive in the latter state (Low, 1984; 1986). Within Espirito Santo it is known only from the Sooretama Reserve and Monte Pascoal National Park and adjacent areas (Ridgely, 1981). Habitat preferences vary seasonally, and extend

from humid lowland forests to montane forests to estuarine mangroves, where they may be associated with Orange-wing Amazons (*A. amazónica*) during winter foraging trips. Red-brows prefer to roost and feed in the tops of primary forest trees, and at one time were found in large flocks in the forest canopy. Pinto (1935) described raucous congregations along the banks of the Gongogy River near Boa Nova, Bahia where birds could be heard each morning; these populations have been extinct for at least 12 years (Ridgely, 1981) and probably much longer.

Aviculture

The first captive breeding of *A.d. rhodocorytha* occurred in Peterbor-





Hand-reared chick at 13 days, weight 152.6 grams.

ough, England in 1980 (Mann, 1982). The first — and prior to this writing — only documented, captive breeding success in the USA was by Ramon Noegel in 1984 (Noegel, 1984). The entire collection, including offspring and adult birds compiled from various sources prior to the 1984 breeding, was purchased jointly by Dr. John Vaughn (Rare Species Conservatory, Florida) and Mr. Charles Osterbrink (Night Flight Farms, Mississippi) in 1988. To our knowledge, this represents the only significant collection of Red-brows in the United States (ISIS Bird Abstract, 30 June 1992), comprising three adult males and seven adult females, plus the progeny described here. An additional adult pair that was confiscated by the U.S. Fish and Wildlife Service in 1982 and maintained at Miami Metrozoo has been loaned to The Rare Species Conservatory to be included in our breeding program.

Other birds have been rumored to be in private collections for years, although only a single male, currently outside our collection, has been verified. Hence, as of this writing, there exist 12 adult birds in our program, four of which are males. As a founder population for genetic diversity, this is certainly a bare minimum. Ironically, the last bird to be fledged in the U.S. in 1984 is the mother of the babies described here, which, maternally, represent second-generation domestics.

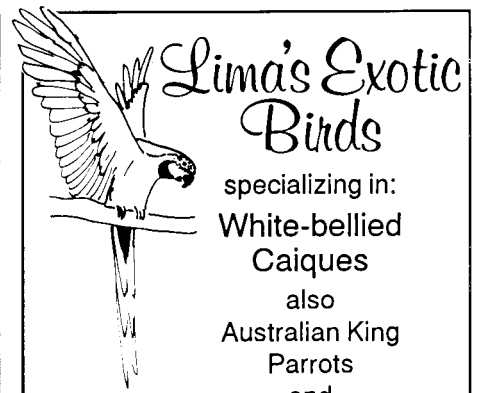
Husbandry

The breeding pair is housed in a 4' x 5' x 12' suspended cage made from 1"x 1", 14-gauge galvanized wire mesh. The nest box measures 1' x 1' x 2' and is made from 3/4" plywood lined with galvanized flashing through. The box is hung from the top center rear of the flight, with the longest dimension in a vertical aspect, the entrance hole near the top of the box. The only access to the box is from a hinged flap-style door at the back near the bottom. Since Red-brows at our aviary have never used the box except for sitting eggs, the box is inspected only weekly during the non-breeding months and is left on the cage year-round. Soft pine shavings are changed monthly (minimum) during the breeding season and as required during the fall and winter months.

Diet consists of a mixture of various types of sunflower seeds, parrot mix, Zupreem monkey biscuits and fresh fruits and vegetables offered once a day, with seeds constituting roughly 30% of the daily ration by volume. Spray millet is offered weekly. Nekton-S vitamin supplement (Nekton-Produkte, 7530 Pforzheim, West Germany) is dissolved in the drinking water which is provided fresh each day. Food and water bowls are washed and disinfected daily.

Breeding

The breeding hen is known to have been hand-raised in 1984 by R. Noegel, and the male is of unknown origin, but is probably wild-caught and significantly older than the female. After retreating to the nest box for five consecutive days, the hen's first egg (ever) was laid on 20 April 1992, after which she immediately left the box. We were experiencing cool evening



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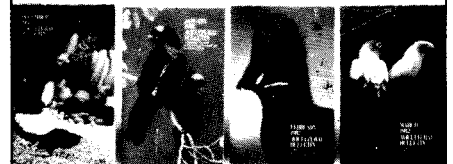
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Outdoor flight at RSC's aviary.



temperatures (45°F) and feared if the egg were fertile and she did not sit within two days it would die. Hence, we removed the egg for artificial incubation on 22 April; the hen had made no attempt to return to the box. Visibly indistinguishable from the eggs of other larger Amazons like the Blue-front (*A. aestiva*), it was placed in a Roll-X incubator calibrated to 99.0°F and relative humidity roughly 60%. The egg was hand-turned six times per 24 hours with 60 to 90 degree rotations each turn. After six days, candling revealed the presence of a healthy embryo.

The hen laid the remainder of her three-egg clutch on 23 and 27 April 1992, and the whole clutch proved to

Parent-hatched chicks at 18 and 21 days (left, weight 283.2 grams and 260.2 grams) with hand-reared chick at 24 days, (right, weight 44.5 grams).



Breeding pair of A.d. rhodocorytha.

be fertile. During this time she remained in the box and, to our amazement, stayed there for the next 46 days. Both artificially and naturally incubated eggs hatched on the 25th days of their respective incubation calendars, though the artificially incubated chick was assisted because it pipped early below the air-cell line. We initially left the two younger chicks with the hen to see how well she would feed them and because removing them without injury would be difficult. She remained with the chicks, without leaving the box, until

Photos courtesy of Rare Species Conservatory



Hand-reared baby at six weeks, weight 600 grams.

we finally removed them for hand-feeding on 8 June 1992 (18 and 21 days of age) because one appeared in a weakened condition. Removing the weak chick required wrestling the hen from the box, which was so traumatic that we thought it best to take both chicks. Until that time, both the hen and the babies relied upon the male for food since the female did not visit the food bowl; the hen regurgitated to the chicks food that had been regurgitated to her from the male. The parent-hatched babies weighed 283.2 g and 260.2 g when pulled from the box, compared to 289.7 g for the day-one chick (at 19 days of age).

Hand Feeding

The day-one chick was started on

Pedialyte solution for hydration upon hatching. Our basic pediatric formula is based upon CeDe Lorifood (CeDe Vofelvoeders BV., St. Ceciliastraat 2, 5038 HA Tilburg, Holland), Kaytee Exact Handfeeding Formula, Kaytee Products, Inc., Chilton, WI 53014) and papaya, mango and guava babyfood purees (Beech-Nut Stages 2, Beech-Nut Nutrition Corp., Canajoharie, NY 13317). Papaya puree and lorifood are the main constituents for the first two weeks, with Kaytee Exact added at approximately 1/8 to 1/4 of the total dry mix volume. The Kaytee is added mostly for grit, as the CeDe fed exclusively to young babies produces a looser dropping than we prefer. Puree

and dry mix are blended 2:3 by volume, and water, occasionally supplemented with Pedialyte during the first two weeks, is added to produce the proper consistency. Over time, the ratio of CeDe to Kaytee is decreased, until by the third week the CeDe:Kaytee ratio is about 1:3. Even by weaning, the ratio never drops below 1:4. As the dry mix is changed gradually and the volume per feeding is increased, the fraction of puree also becomes somewhat reduced, until by week three the puree constitutes roughly 25% of the total moisture in the formula. Between the third and fourth weeks mango and guava purees are introduced, although these are always mixed with papaya because of its enzymatic properties. This formula is continued until weaning is begun, at which time seeds, soaked Zupreem monkey biscuit and fresh fruits and vegetables are provided.

worse, the pox was tracheal — affecting swallowing ability and upper digestive-tract tissues — which meant that it would be a systemic illness and that we were in for a rough battle. In our geographical area, tracheal pox is nearly always fatal for immunologically naive Amazons that contract it.

The chick in the nest that appeared not to thrive as well as its sibling was our first hint of a problem. Pulled at 18 days of age at 260.2 g and isolated from its siblings in an intensive-care unit, it gained weight for a week and then began to rapidly decline. Despite immune stimulants, intensive antibiotic therapy and I.V. fluids, the chick died of aspiration pneumonia on 18 June 1992 at 28 days of age. Necropsy (by Dr. K.S. Latimer, University of Georgia, Dept. of Veterinary Pathology, Athens, GA) revealed the presence of systemic pox virus in skin, feather follicle, crop, tongue and pharynx tissues.

The other parent-hatched chick was similarly isolated in an ICU, but unlike its deceased brother showed no visible signs of illness when first brought indoors. However, since birds can remain asymptomatic for up to a month after exposure to pox virus, we were not relieved. Sure enough, the chick developed full-blown systemic pox 16 days after the death of its sibling, even though the chicks had been isolated from one another since removal from the nest box 25 days earlier. Fortunately, this chick was stronger, and better able to endure both the illness itself and the treatment used to fight it. While being handfed, the bird endured ten weeks of immunotherapy, vitamin supplements and multiple antibiotic and antifungal regimens. In addition, twice each day for five to six weeks, mature pox lesions were removed from the tongue, beak, nares and eyelids — a tortuous ordeal for any patient. Although its feathers, beak and nails were severely affected, the bird (a male) made a full recovery and was weaned by week 15. (A full discussion of the pox therapy is beyond the scope of this paper, but interested persons are invited to direct questions or comments to the author.)

Thanks to stringently applied rules of quarantine, the day-one chick (female) was never infected, and experienced a normal and unremarkable development being fully weaned by week 10.

Development/Pediatrics

Since there were no available data on growth rates for Red-brows, we had little reference for weight gains for the chicks, other than data for other Amazons. One of our initial concerns was the rapid growth rate for the day-one chick, which for the first three weeks out-paced its siblings in the nest, both in size and feather development. As most aviculturists can attest from personal experience, parents tend to feed chicks better in the early stages than humans do, even with the best of formulas. Despite this anomaly, the day-one chick appeared very healthy in all respects, and we were impressed by the fantastic weight gains.

Shortly after the two chicks were pulled from the nest we surmised why the day-one chick appeared so exceptional by comparison — the other babies had contracted a virus which would later prove to be avian pox. Pox outbreaks occur in this area of Florida as local epidemics that sweep through aviaries, mediated by mosquito vectors and wild birds as pox reservoirs. Interestingly, none of the other babies that were being parent-raised in our aviary at that time were infected, and we had no history of pox among adults. However, our proximity to other large aviaries and the horrible mosquito season clearly had left us vulnerable. To make matters

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The Future

The current status of *A.d. rhodocorytha* in the wild and its CITES Appendix 1 listing prohibit most aviculturists from ever acquiring, or even personally observing, this species. The viability of the captive North American population rests upon our breeding success and the genetic management of progeny. With such a small founder group, producing a sizeable, much less stable, population is a formidable challenge. The Rare Species Conservatory's principal objective with the Red-brow project is to produce a model for conservation in private aviculture. Genuine conservation practices in the private sector hold perhaps the greatest promise for preserving threatened and endangered psittacines worldwide (Low, 1984; Beissinger and Snyder, 1991).

It is painfully obvious that we live in a novel age of disaster with regard to the world's natural resources. The extinction of many taxa within our lifetime is no longer likely, but certain. If humans are to mitigate the loss of species at an unprecedented rate in biological history, then those in animal husbandry must merge their skills in propagation with a new and profound conservation ethic. Our unique moment in time gives us both the opportunity to preserve extraordinary biological diversity and the vantage point to witness its disappearance.

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