BREEDING THE SCARLET IBIS *Eudocimus ruber* AT BELO HORIZONTE ZOO, MINAS GERAIS, BRAZIL

by Cristiano Schetini de Azevedo, Ângela Bernadete Faggioli and João Bôsco Ferraz

Introduction

The red or reddish plumage of the Scarlet Ibis *Eudocimus ruber* always arouses interest. Owing to its scarcity in bird collections here though, it is not well known (Antas, 1979). A bird characteristic of mangroves, it was found along the Brazilian coast, from Santa Catarina in the south, to Amapá in the north (Teixeira & Best, 1981). However, despite suitable ecosystem stretching along almost the entire Brazilian coast, there are no records of Scarlet Ibis in the States of Espírito Santo and Rio Grande do Norte (Marcondes-Machado & Filho, 1989). In the past, this species nested in Guanabara Bay, Rio de Janeiro, but due to hunting and habitat loss, the ibis were forced to occupy only the northern part of their original distribution. Nowadays, the Scarlet Ibis is a threatened species in Brazil (IBAMA, 2002).

Reproduction is a rare event in captivity in Brazil. According to records in the birds census, only São Paulo Zoo (SP Zoo) 1981, Porto Alegre Zoo (RS Zoo) 1983 and Emílio Goeldi Museum (EGM) 1999 have achieved reproduction in recent years, with one chick being reared in each institution. Earlier, Rio de Janeiro Zoo (RJ Zoo) in the 1970s, obtained a good rate of reproduction, with 15 chicks reared (Antas, 1979). The Scarlet Ibis is a species that nests colonially, but is extremely territorial, defending its nest from conspecifics. At the above institutions, the number of individuals kept was not high, but sufficient (eight SP Zoo, 10 RS Zoo, 17 EGM and 30 RJ Zoo) to trigger successful reproductive behaviour. Belo Horizonte Zoo (BH Zoo) has three Scarlet Ibis, a male which has been here since 1985, and a pair which arrived in 2000.

The first breeding of *E. ruber* at Belo Horizonte Zoo

The enclosure

The Scarlet Ibis are kept in a large, outdoor enclosure 590 sq m (approx. 6,350sq ft). It has a freshwater lake 113sq m x 20cm deep (approx. 1,215sq ft x 8in deep), one clay island 7sq m (approx.75sq ft) and a grassed area 470 sq m (approx. 5,000sq ft), planted with ornamental shrubs and trees, such as *Ficus* sp. (Moraceae), *Oreodoxo oleracea* (Palmae), *Sanchesia nobilis* (Acanthaceae), *Eugenia sprengelii* (Myrtaceae), *Impatiens walleriana* (Balsaminaceae), *Zantedeschia aethiopica* (Araceae) and *Cuphea gracilis* (Lyrthaceae). The enclosure is surrounded by a 1.4m (approx. 4ft 9in) high fence.

The enclosure contains three Scarlet Ibis, 10 Chilean Flamingos *Phoenicopterus chilensis*, one Cayenne Ibis *Mesembrinibis cayennensis* and a few White-faced Whistling Ducks *Dendrocygna viduata* and Fulvous Whistling Ducks *D. bicolor*.

Diet

At Bela Horizonte Zoo the Scarlet Ibis are given minced (ground) meat, minced fish and dog ration. They are fed 300g (100g per bird), once a day at 14.00hrs (2.00pm).

The red colour of the Scarlet Ibis' plumage is an important factor in inducing reproduction (Sick, 1997). The pigment cantaxanthin (carotenoid) must be added to their diet to prevent the gradual loss of this colour, but when this pigment is stored in large quantities in the liver, it can be very harmful to the liver (Saad pers. comm.). At this zoo the ibises are given l0g per day of a natural red pigment extracted from the urucum plant *Bixa orellana* (Bixacea). This plant provides carotenoid pigments less harmful than cantaxanthin.

The nest

As the enclosure is open at the top, the ibis are pinioned and therefore nest on or near the ground, whereas in the wild, nests are built in treetops. The nests are twig platforms (Sick, 1997), with dried and fresh leaves also being used in their construction (Antas, 1979). The nests are, in general, 45cm (approx. 18in) in diameter (Olmos & Silva, 2001).

At Bela Horizonte Zoo both the male and female participated in nest construction (two nests in total) (see photos p.167). Generally, the male carried twigs to the female, which effectively built the nest, though eventually, he too was seen carrying twigs.

One of the nests was built 10cm (approx. 4in) above the ground and was 30cm wide x 16cm high (1ft wide x 6¼in high). The other nest was built directly on the ground and was 29cm wide x 27cm high (approx. 11½in wide x 10½in high). Both were built beneath a *Sanchesia nobilis* (Acanthaceae) shrub. The nests were difficult to observe, being visible only from a short distance. They were built 1.5m (almost 5ft) from each other.

The first nest was built in October 2001, and three eggs were laid in November. The second nest was built in January 2002 and, again, three eggs were laid. These disappeared from the nest in February, after which two more eggs were laid that month. Following the disappearance of the earlier eggs, a trap was set in the enclosure in the hope of capturing the cats, opossums (Didelphidae) or lizards *Tupinambis* sp., which may have taken the eggs.

Cynthia Cipreste

The nest was a platform of twigs and dry leaves

Cynthia Cipreste

The chick was covered with black down, had a short, straight bill and its eyes had not yet opened

Eggs

The eggs are greenish with dark brown markings, the shade of green and the distribution of the markings varying. The eggs are oval in shape with one end slightly narrower (see photos p.167). Clutch size varied from two to three eggs, with three being more common. The eggs were laid usually at two day intervals. To avoid the danger of desertion only one egg was measured; it was 53mm x 34mm.

The young and parental behaviour

The incubation period varied from 24-25 days, as cited by Antas (1979) and Sick (1997). It was not possible to determine the intervals between hatches because only one egg hatched in each clutch, producing two nestlings. These had black down, straight short bills, black at the tip and base, with a median white-reddish stripe and bluish edges and the eyes were closed, characteristic of altricial birds (Pough et al. 1993) (see photo p.167).

Outside the breeding period, the Scarlet Ibis is a shy bird. Flight is the main defence. There is a pecking order within the colony. During the breeding season, the behaviour changes and nests are defended against other ibis and anyone who disturbs the nest site. The bill is effectively used in a pincer movement and the nest is abandoned only as the last resort, the bird remaining nearby and returning as soon as possible. After the chicks have hatched, the protective instinct becomes even stronger and some birds will attempt to remain on the nest even when handled (Antas, 1979).

At BH Zoo, nest protection was undertaken mainly by the female. Antas (1979) described this behaviour as having been undertaken by the male, which when the female "squeaked", immediately returned and defended the chick. The opposite behaviour was observed here. When the female began to "squeak", the male ran away from the nest site, leaving the chick and female alone. The female abandoned the nest only when touched by a keeper.

By two weeks old, the young had already moved off the nest and were hiding among the vegetation, where they remained immobile. The young were fed by regurgitation and parental care continued for 40 days in the case of the first chick and for 44 days in the case of the second, after which the young began to feed alone and to explore the enclosure.

The immature ibis (at one month old) is blackish, except for the underparts and rump which are white. The bill is now long and curved, just like that of the adult.

Discussion

At BH Zoo the reproductive period extended from October-February and not April-July as described by del Hoyo et al. (1991). Although Scarlet Ibis breed in large colonies, the number of individuals does not seem to be a

limiting factor, as here at Belo Horizonte we had only two males and one female. Neither did the plumage colour seem to be a limiting factor to reproduction, as the Belo Horizonte birds lack bright red plumage and instead are a faded pinkish colour.

According to del Hoyo et al. (1991), in the tropics the main factor that induces nesting is not well understood, but it is usually related to hydrological patterns (availability of food for the development of the chicks) and varies between the different species. At BH Zoo, reproduction occurred in the rainy season (September-May), which concurs with del Hoyo et al. (1991).

The zoo's breeding pair laid three clutches during the one reproductive period. This number of clutches was also cited by Antas (1979) for captive birds, and by Olmos & Silva (2001) for wild birds.

It is hoped that, in spite of the initial failures, breeding in captivity can play an important role in the recovery of this species (del Hoyo et al. 1991). The reproduction in captivity of threatened species can provide an efficient tool for conservation projects, for educational programmes and for collecting biological data.

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Cristiano Schetini de Azevedo, Ângela Bernadete Faggioli and João Bôsco Ferraz, Bird Department, Fundação Zoo-Botânica de Belo Horizonte, Av. Otacílio Negrão de Lima, 8000 Pampulha, CEP 31365-450, Belo Horizonte, Brazil. Tel:(55) 31-277-7979/ Fax: (55) 31-277-7974/ E-mail: fzbzoo@pbh.gov.br and cristianoroxette@yahoo.com

FOURTEENTH HARPY EAGLE CHICK AT NUREMBERG ZOO

At Nuremberg Zoo, Germany, the fourteenth Harpy Eagle *Harpia harpyja* has been hatched, 10 (8.2) of which have been reared to independence.

Back in 1980, Nuremberg Zoo received a pair of Harpy Eagles from a private falconry collection. The first chick hatched in 1984, but died shortly afterwards. The male chick hatched in July 1986 was the first to be successfully reared by its parents and the following year went to Antwerp

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The photo above, taken August 8th 2002, shows the female Harpy Eagle hatched at Nuremberg Zoo in July 1992 and hand-reared there, acting as foster-mother to the chick hatched earlier in 2002

Zoo, Belgium. The parents reared their young only in the years 1986-1987; other chicks have been hand-reared. Birds reared at Nuremberg Zoo have also gone to Wuppertal, Dortmund, Mallorca (the former breeding station belonging to Vogelpark Walsrode), Prague,Tierpark Berlin and São Paulo Zoo.

It was at Tierpark Berlin that the first captive breeding occurred in 1981, altogether four young were reared up until 1986, after which further breeding attempts were unsuccessful. In 1997, following an exchange of partners between two pairs in the collection, the original breeding male was killed by the female.

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Keeper Martin Gelsendörfer feeding the chick while its foster-mother looks on. The chick received two feeds a day, one given by Martin in the morning, who in the afternoon fed the female, which then passed the food to the chick

As well as at Tierpark Berlin and Nuremberg, the Harpy Eagle has been bred at Los Angeles, San Diego, the Peregrine Fund's World Center for Birds of Prey (Boise, Idaho, USA) and in Panama at the Neotropical Raptor Center.

At San Diego Zoo, at least one egg has been laid every year for the past eight years, and two of the birds reared there have been released back into the wild. At Boise, two females laid seven eggs, six of which were fertile and three of which hatched, from which two young survived in 2001. Roberto Ascerado, Belo Horizonte, Brazil, is also said to be breeding Harpy Eagles, but no details are available.

BREEDING THE YELLOW-BREASTED MAGPIE
Cissa hypoleuca

by Neil Owen

Introduction

The genus *Cissa* can be somewhat confusing, as various authorities have over the years recognised from two (King, Dickinson & Woodcock, 1975) to six species (Delacour, 1929). More recent works (Goodwin, 1986 and Madge & Burn, 1999) consider that three is the most likely number.

Description

The Yellow-breasted or Eastern Green Magpie is a stocky bird measuring approximately 35cm (14in) long including the tail. Much of the plumage is green, including the tail, which has the outer feathers edged with black and white. The bill and legs are bright coral red, the toes are pink and the eyes are dark brown, surrounded by a narrow red orbital ring. There is a black mask from the base of the bill passing above and below the eyes to the nape. The crown and nape are green and these feathers are rather long and can be raised to form a crest when the bird is excited. The wing feathers are rich chestnut-brown with the secondary feathers tipped with pale green.

As with the other green magpies *Cissa* spp., the plumage can fade from a vivid pea green to a paler green, turquoise or even a very pale blue. The reasons for this are not totally clear, although it seems likely that the plumage fades because the birds are kept in bright sunlight for long periods and are unable to hide in thick undergrowth. It may also be related to their diet. In the wild green magpies have been seen feeding on bright green mantids, crickets and stick insects (A. Owen pers. obs.).

Distribution

The Yellow-breasted Magpie is found in tropical and sub-tropical evergreen hill and lowland forest, and at lower elevations its range often meets that of *C. chinensis*. The Yellow-breasted species is found in southern China and is widespread through Vietnam from south Tonkin to Cochinchina and west into parts of Laos and south-east Thailand. There are also isolated populations on Hainan Island and the Yao Shan Hills of Guangxi in China. Five subspecies are recognised (Madge & Burn, 1999).

Voice

This species has a wide range of calls, some typically harsh and scolding alarm calls similar to those of the European Magpie *Pica pica*, as well as others which are quite musical and unusual. Both sexes whistle quite loudly,

particularly in the morning and also make a strange sound which is very similar to the "meeow" sound made by a cat. This sound is usually made by two birds calling together. They sing out in the open and when hidden in deep cover.

Accommodation

My birds are housed in an aviary measuring approximately 6m long x 2.5m wide x 2m high (20ft long x 8ft wide x 6ft 6in high). This has a wooden shelter attached in which the birds are fed and in which they can be shut in if the weather in the winter is severe. The back and part of the sides of the aviary have wooden lapped fence panels attached to provide privacy and some protection from strong winds. The roof is covered with corrugated Perspex (Plexiglas) to give protection from the elements and to prevent possible contamination from wild birds. Part of the roof is painted green and a section is covered with dark coloured garden mesh in an attempt to shield the birds from direct sunlight, which could affect the colour of their plumage. The aviary is planted with various shrubs such as laurels, clematis, ivy and a small conifer. There are several rotten logs on the aviary floor, where the birds spend a lot of time. The earth floor is covered with a thick layer of leaf litter, which is replenished regularly. A small concrete pond is used by the birds for bathing.

Diet

The basic diet consists of a universal mixture to which is added soaked mynah pellets, mashed hard-boiled egg, minced (ground) lean beef and various chopped fruits, although the latter are not very popular. A day-old chick, with the yolk sac removed, is given most days and occasionally a small mouse. A few mealworms or crickets are scattered around the aviary once a day. There is little doubt that the birds are mainly carnivorous, as the meat and chicks are always favourite items. Various insects and earthworms are found in the aviary and the birds become very excited if a small snail is caught.

Behaviour

Although there are times when they hide in the undergrowth, the birds are active a lot of the day and can often be seen sifting through the leaf litter, bathing or flying back and forth the length of the aviary. They are very inquisitive and usually come to investigate anything new, such as a new perch or a rotten log that I have turned over. Various objects such as stones are carried about and are often found in the food pots. One hot day I tipped a jar of ants and their eggs into the aviary and both birds came down to investigate, eating some of the eggs, but also spreading some through their plumage in typical Jay-like anting behaviour.

Andrew Owen

Adult Yellow-breasted Magpie *Cissa hypoleuca*
(see footnote p.177)

Breeding

In the summer of 2000 I bought from a private aviculturist what I hoped was a pair of these birds. One was slightly larger and generally bolder than the other, this I took to be the male. After coming through a heavy moult in October the birds were in immaculate condition, although the smaller one was not such a vibrant green as its mate. They preferred to roost outside, but on very cold nights I shut them inside the shelter. In late January 2001 we had a few days which although cold were very bright and sunny and the male was seen offering mealworms to the female. She did not appear interested and as the male then began chasing her around the aviary while whistling loudly, I decided to move him to another aviary for a while. As soon as they were parted both birds began calling to each other but I decided to keep the male separate for a week, in the hope that he might calm down. When the pair was reunited the male was less boisterous and the pair seemed more compatible.

In early March I provided several potential nest sites, including a wooden platform high up in the aviary and hidden by conifer branches, a wire basket fixed in a laurel bush and a 30cm (10in) wicker basket placed low down in a small conifer tree. As the weather warmed up both birds became more vocal; in fact the singing was so loud and so similar that I thought I might have two males. However, the larger bird once again offered mealworms to

Andrew Owen

Aged 18 days

Andrew Owen

Aged one month

the smaller bird and this time they were accepted.

I began offering more varied livefood including not only mealworms but crickets, waxmoth larvae, locusts, and occasionally a 'fuzzy' mouse (a young mouse with soft velvety fur). I also scattered around the aviary floor twigs of various sizes and some coconut fibre. The female was later seen carrying coconut fibre but both birds were getting more secretive and observing them was not easy.

One morning when I was cleaning the pond, I had a look in the conifer where the birds were spending a lot of time, and was delighted to see a completed nest in the wicker basket. It seemed to be made mostly from coconut fibres with a few dried leaves woven into it. On May 10th I went in to feed the birds and as both were in the shelter, I was able to look in the nest which now contained two eggs, these were very pale blue with brown speckles at the thick end.

The male was spending a lot of time in the shelter and I assumed and hoped that the female was sitting, but observations were difficult as there was more vegetation at this time of the year. On May 28th both birds were away from the nest calling in alarm. I checked the nest and was relieved to see that it now contained four eggs. The female went back as soon as I left the aviary. At the morning feeding time on June 3rd both birds were again briefly shut inside the shelter. I checked the nest and was delighted to see a newly hatched chick. I swiftly left and returned with a handful of newly sloughed mealworms, small waxmoth larvae and small crickets, these having been lightly dusted with a 'stress' vitamin and mineral supplement.

Two days later a second chick hatched. I watched the female fly down to bathe and the male go straight to the nest. Due to the thick vegetation it was difficult to see if he was feeding the chicks or brooding them, but he seemed to stay for a long time. As some corvids are known to eat their young, I was concerned. However, I thought it best to keep disturbance down to a minimum.

On June 9th I found an egg on the floor of the shelter (presumably removed from the nest by one of the birds). This was found to be infertile. It measured 31.6mm x 22.9mm. The adults were taking mainly waxmoth larvae and 'fuzzy' mice but not in the huge amounts I had anticipated, in fact there was often livefood from the previous day left in the pots. While the adults were away feeding on June 12th, the nest was checked and still contained two chicks which by then were covered in pin feathers. The fourth egg had disappeared. I was by then giving six 'fuzzy' mice, one chopped day-old chick and a few waxmoth larvae, hardly anything else was being eaten. I was unable to check the nest for the next week as both adults had become aggressive and attacked me whenever I entered the aviary.

On June 22nd the adults seemed quieter and I was able to approach

close enough to see the chicks, which by then almost filled the nest. Both were fully feathered. They were blue with dark brown wings and had the distinctive black eye stripe. The preferred food remained 'fuzzy' mice (10 a day) and waxmoth larvae. Locusts and crickets were ignored but small pieces of day-old chick were taken to the nest.

Both chicks left the nest on June 28th and were well cared for by their parents and were first seen feeding themselves four weeks after leaving the nest. Two months later they were removed to their own aviary. The adults did not attempt to re-nest and soon afterwards went into a moult.

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Neil Owen, who lives in Carmarthenshire, Wales, is interested to hear from anyone in the UK who keeps the Yellow-breasted Magpie. His telephone number is: 01558 668336.

As described above, the Yellow-breasted Magpie *Cissa hypoleuca*, has been bred by Neil Owen. This is probably the first successful breeding of this species in Great Britain or Ireland. Anyone who knows of a previous breeding is asked to inform the Hon. Secretary.

Footnote

Surprised that the bird in the photo has a green rather than a yellowish breast, I consulted Crows & Jays by Madge and Burn (Christopher Helm/A & C Black, 1999) and decided that it must belong to one of the two isolated Chinese subspecies, probably C. h. jini, described as: "relatively longer-tailed and greener below than other races." Though I must say that the example depicted on Plate 16(4b) has a paler green breast than the bird in the photo.

Later, when doubts were expressed over the identity of the bird in the photo and Roland Cristo was quoted as having said, it is "definitely chinensis" (the Green Magpie or Hunting Cissa), I contacted Neil Owen and asked if he had any photos in which the tertials (inner secondaries) can clearly be seen?

He has provided me with photos which show that the tertials are broadly tipped light green (without any black or white markings) a diagnostic feature which distinguishes C. hypoleuca from C. chinensis. The two-colour pattern on the tertials and the length of the tail of the bird in the photo also seem to rule out C. thalassina (the Short-tailed Magpie), sometimes considered conspecific with the Yellow-breasted, which Madge and Burn treat as a separate species, on account of the latter's "striking vocal differences" - Ed.

AVICULTURAL SOCIETY TO HELP FUND FURTHER RESEARCH

Having recently adopted a pair of Bushy-crested Hornbills *Anorrhinus galeritus* living in the wild in Thailand (see *Avicultural Magazine* 108,2:89 (2002)) as part of its policy of becoming more actively involved in conservation and research, the Avicultural Society has now taken the decision to help fund a research project on the Yellow-throated Laughingthrush *Garrulax galbanus* in China. It is a project that is already well established and has the full support of the Chinese Government, local forestry authorities and the local community.

In European collections since the late 1980s there have been several apparently self-sustaining populations of the Yellow-throated Laughingthrush. It is far from clear, however, how these birds were imported and from where. An exhaustive search of customs documents relating to birds exported from China failed to find any records of this species.

In the early 1990s, when concern grew as to the status of the two subspecies which occur on mainland China - *G. g. courtoisi* and *G. g. simaoensis* - the Munich-based German conservation organisation ZGAP, provided grants to Chinese colleagues to investigate the status of the wild populations of these two Chinese forms. It required successive field surveys over a seven year period though before, in the 2000 breeding season, *G. g. courtoisi* was finally rediscovered in the wild in Wuyuan; *G. g. simaoensis* has yet to be rediscovered.

During field observations in 2000, a total of 80-90 birds were counted, in two breeding flocks approximately 40km (about 25 miles) apart. Although researchers obtained a rudimentary understanding of the breeding biology and habitat selection of the birds, all that could be said about their status was that they appeared to be extremely rare. However, following field work in 2001, when two more breeding sites were found, a more integrated picture emerged, making it possible to outline the breeding range and status of *G. g. courtoisi* in Wuyuan.

They breed in flocks, close to rivers. All four breeding flocks found so far have been around villages, very close to villagers' houses, and the 20 or more nests found have all been in the canopy of mature trees. The cinnamon trees are traditionally protected by the villagers at these sites and with their cooperation. the local forest office has declared the breeding sites mini-protected areas.

From the limited data available at present, it is known there are 150-160 *G. g. courtoisi* living in one small area. In accordance with the latest IUCN *Red List* Criteria 2000, on this evidence this subspecies qualifies as Endangered or quite possibly even Critically Endangered, taking account of

its presumed population size and range. Of the four breeding sites found, none is larger than 10 hectares (approx. 25 acres), which means that a very small area is supporting this breeding population.

Much remains to be learnt about *G. g. courtoisi*, for example, we know nothing about where the birds go and what they do during the non-breeding season. Shortly after the young are able to fly, all the birds both young and adult, disappear into the hills.

Finding the wintering place/places of *G. g. courtoisi* is an important unresolved mystery. The quickest way to achieve this may be to fit some of the birds with tiny radio transmitters, and this could be one of the things for which the funding is used.

Prof. He Fen-qi, Academia Sinica, Beijing, is happy for the society to publish in the magazine material and photographs from the project.

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SUCCESSFUL SCANDINAVIAN SYMPOSIUM

A symposium on the Omei Shan Liocichla *Liocichla omeiensis*, attended by keepers from Denmark and Sweden, was held August 3rd 2002, at Copenhagen Zoo, Denmark, reports John Sidor.

As a European Studbook has recently been established for this species, it was felt there was the need to attempt to find answers to a number of questions. How will it work? How can private keepers participate? How to adapt to the ways of management of non-commercial zoos? And many other questions.

Flemming Nielsen of Copenhagen Zoo, gave a very interesting talk about studbook keeping and related issues, and there were constructive discussions, which produced helpful suggestions and initiatives.

The main outcome was:

1. All keepers agreed to follow the recommendations of the Studbook Keeper (Nigel Hewston, UK (e-mail:nigelhewston@supanet.com)).
2. Work towards obtaining official import/export permits from/to Sweden and the UK.
3. Set-up a website for the exchange of information.
4. Plan an international meeting in 2003, to which German and British ESB (European Studbook) members should also be invited.