

BREEDING THE BEARDED BARBET *Lybius dubius* AT DISNEY'S ANIMAL KINGDOM

by Susan Congdon

At the heart of the Pangani Forest Exploration Trail at Disney's Animal Kingdom (DAK), Florida, is an aviary housing African birds. Amongst these is a striking species of barbet, the Bearded Barbet *Lybius dubius*. The following is an account of DAK's parent-rearing and hand-rearing successes with this species.

Natural history

Barbets are part of the diverse Order Piciformes, which also includes toucans, honeyguides and woodpeckers. Barbets are found in the Neotropics and African and Asian tropics. Mostly fruit-eaters, they will supplement their diet with insects when chicks are present. Most excavate nesting cavities in dead trees, and these cavities may also be used for roosting.

Barbets have long been popular avicultural subjects, and a member of the barbet family is sure to fit the theme of most exhibits. With its spectacular coloration and incredibly active personality, the Bearded Barbet is an especially fascinating species to display in an aviary. Coloured red, yellow and black, this West African species uses its sharp, serrated-edged beak for eating fruits growing on fruiting trees.

Very little is known about the breeding habits of the Bearded Barbet. Except for allopreening and tail flicking, no descriptions of courtship behaviour or nesting in the wild could be found. The Bearded Barbet has been reported to lay a clutch of two white eggs (Short and Horne, 2001), but our pair fledged three chicks in 2002. Also, there was speculation that the Bearded Barbet might be among species in which helpers (offspring from earlier nests) assist their parents raise subsequent broods. This was confirmed when the 2001 chick was observed entering the nest the following year and feeding the 2002 chicks once they had fledged.

Enclosure and diet

The walk-through African aviary is approximately 50m long x 20m wide x 14m high (approx. 162ft long x 62ft wide x 45ft high). It is divided into two distinct sections. The first of these is densely planted with various tropical African trees, shrubs and other plants. The trees are tall and effectively help to disguise the view of the wire mesh at the top of the aviary. The second section contains a pond that is fed by a two-story waterfall. The first waterfall pool is approximately 9.1m x 6.1m x 1.5m deep (30ft x 20ft x 5ft deep). The second is a large pond that is approximately 15.2m x 6.1m

(50ft x 20ft). The guest (visitor) walkway forms a bridge over the pond and visually divides it into two, though waterfowl can swim beneath it. There are no trees directly over the pond to allow more light to reach this area. The back of the aviary is formed by a gunnite wall that is approximately 3.7m tall x 2.1m wide (12ft tall x 7ft wide). The height and design of the aviary has created three distinct zones: the forest floor, sub-canopy and canopy.

The Bearded Barbets currently share the exhibit with approximately 120 other individuals of 32 species. These include Amethyst or Violet-backed Starlings *Cinnyricinclus leucogaster*, Superb Starlings *Lamprolornis* (formerly *Spreo*) *superbus*, Golden-breasted Starlings *L.* or *Cosmopsarus regius*, Wattled Starlings *Creatophora cinerea*, Hammerkops *Scopus umbretta*, White-headed Buffalo Weavers *Dinemellia dinemelli* and Magpie Shrikes *Urolestes melanoleucus*. There are ten feeding stations throughout the aviary that are utilized by the Bearded Barbets, five on the upper level and five on the lower level. There are mixed species bowls comprised of chopped mixed fruit, soaked Mazuri® parrot breeder and small bird breeder pellets, greens, carrots, seeds and Bevo® (a commercial insectivore diet). One of these mixed species bowls also contains Toronto® carnivore diet. The Bearded Barbets also favour the chunks of fresh fruit that are spiked on branches to provide enrichment. Food bowls are also placed daily in several built-in trap cages to acclimate the birds to going in and out of these. They are used when there is the need capture birds and are also used to introduce new birds into the aviary.

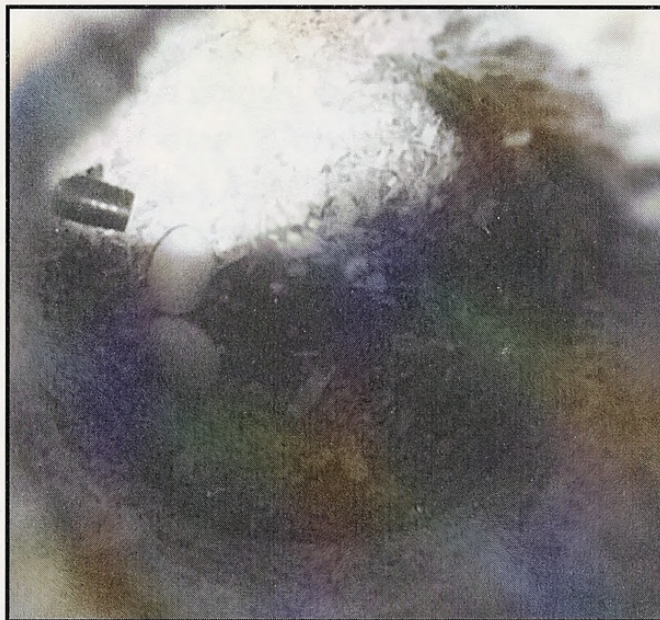
There are many nest-boxes positioned throughout the aviary. There are also several sections of dead palm tree that have been placed at different elevations. In addition, the aviary contains numerous large pieces of deadfall that are suitable for species that bore their own nest cavities.

Breeding

Disney's Animal Kingdom introduced two pairs of Bearded Barbets into the African aviary in May 1998. By July, all four birds were observed removing shavings from the same nest-box. They went on to do this with several different boxes and palm logs but no eggs were laid. In late 1998, one of the females died and in early 1999 a male disappeared and was not seen again. No aggression had been observed within the group.

In early 1999 the remaining pair had excavated a cavity in a palm log and were displacing other species from the area. The pairs' courtship behaviour often consisted of the male feeding the female, tail flicking by both sexes, and a raspy bark-like vocalization by the male. During the 1999 breeding season the pair laid four clutches of eggs over a five-month period. Each time eggs were laid, they disappeared from the nest. One disappeared

just five days from hatching. A video camera was set up and showed the female carrying an egg out of the nest; she was carrying it in her beak. Unfortunately the male was found dead in October, but luckily the two eggs that were in the nest (see photo below) were removed and the chicks were successfully hand-reared. A detailed account of the hand-rearing is given later in this paper.



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Two eggs in palm log.

In February 2000 a new male was acquired to pair with the female and was introduced to her in May. By June the two were observed tail flicking and spending time near the same palm log. By September 2000 a piece of rotten deadfall that extended over a pond was being excavated. In May 2001 we believed that the birds were incubating, but the log was too deep and narrow to be able to see inside. On May 12th the adults were observed participating in an insect feeding. The presence of a chick was confirmed on June 21st and by July 1st the chick was beginning to put its head out of the nest. The chick fledged on July 13th. Using Zoogen[®] sexing it was later determined to be a female.

In September of that year the pair as well as the juvenile female were observed drilling into palm logs, nest-box fronts, deadfall, and even the wooden cupola of a building. Early March 2002, the three were often observed entering the nest cavity that was used in 2001. At the beginning of April, there was one bird in the nest cavity most of the time. This was often the female chick from the 2001 clutch. On April 20th the adults were observed carrying insects to the nest. By April 30th, they were taking mostly fruit to the nest. Because the cavity was 52cm (1ft 8¹/₂in) long and the opening was only 5.4cm (fractionally over 2in) in diameter, it was impossible

to see all the way down into it. On May 14th a chick was seen sticking its beak out of the nest cavity, and by May 19th it had fledged.

Until then it was believed that as in 2001 we had just one chick. However, on May 20th a second chick was identified. During this time the adults had frequently been observed entering a palm log in another part of the aviary. On May 22nd a third chick was located in this palm log. It was slightly smaller and was believed to be the youngest. It was thought to have fledged from the same nest as the other two and had taken cover in the palm log. We hypothesize that the presence of the 2001 chick assisting with the rearing, increased the pair's ability to raise all three chicks. She was observed numerous times entering the nest and also feeding the chicks once they had fledged.

By June the adults were again drilling into various areas of the aviary. In March 2003, the pair was on several occasions observed feeding each other and tail flicking. Two of the 2002 chicks were females and one was a male. The group of six was kept in the aviary to see if they would act as helpers this year. No aggression towards the offspring by the adults was seen, unlike at St Louis Zoo, where aggression towards a male offspring by the adults was reported (pers. comm.). On April 16th of this year (2003) our male offspring was found dead, but the cause of death could not be determined due to decomposition. The pair and its three female offspring remain in the aviary and move about as a group.

Hand-rearing

June 24th 1999, two eggs were removed from the African aviary and placed in a Grumbach incubator in DAK's nursery. Following a 20 day incubation period both eggs hatched without any problems. The chicks were housed in a bowl lined with paper towels and placed in an AICU (Avian Intensive Care Unit) to simulate the nest environment. Using forceps they were fed pieces of soaked Mazuri® parrot breeder, chopped pinkies and chopped fruit. All the pieces of food were soaked and dipped in Pedialyte®. We began with 50% pinkies, 25% pellets and 25% fruit, and modified these percentages as the chicks grew. Further details are provided in the accompanying table (p. 160).

Chick development

Both chicks developed at a consistent rate. Strong gape responses and vocalizations were present from day one. Feeding was made difficult by the chicks' rapid head movements and eagerness to eat. Feather tracts on the wings and the pin feathers of the tail were already emerging on day one. Yellow pin feathers on the chest were emerging by day 14. The eye-slits were formed by day 10 and both eyes were open by day 15. The areas of



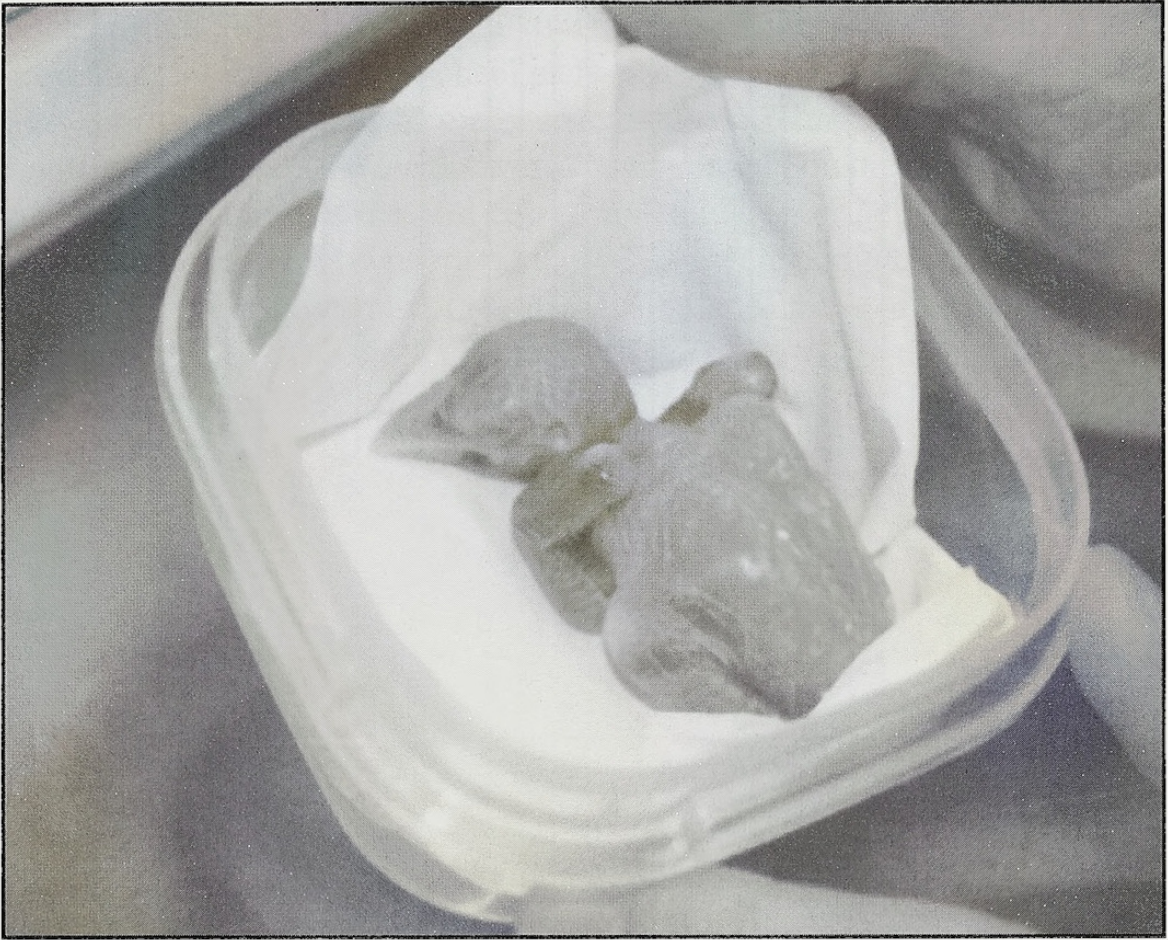
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Heel pad of six-day old chick.



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Chick aged 10 days old eating a piece of newborn mouse.



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Chick showing signs of dehydration.

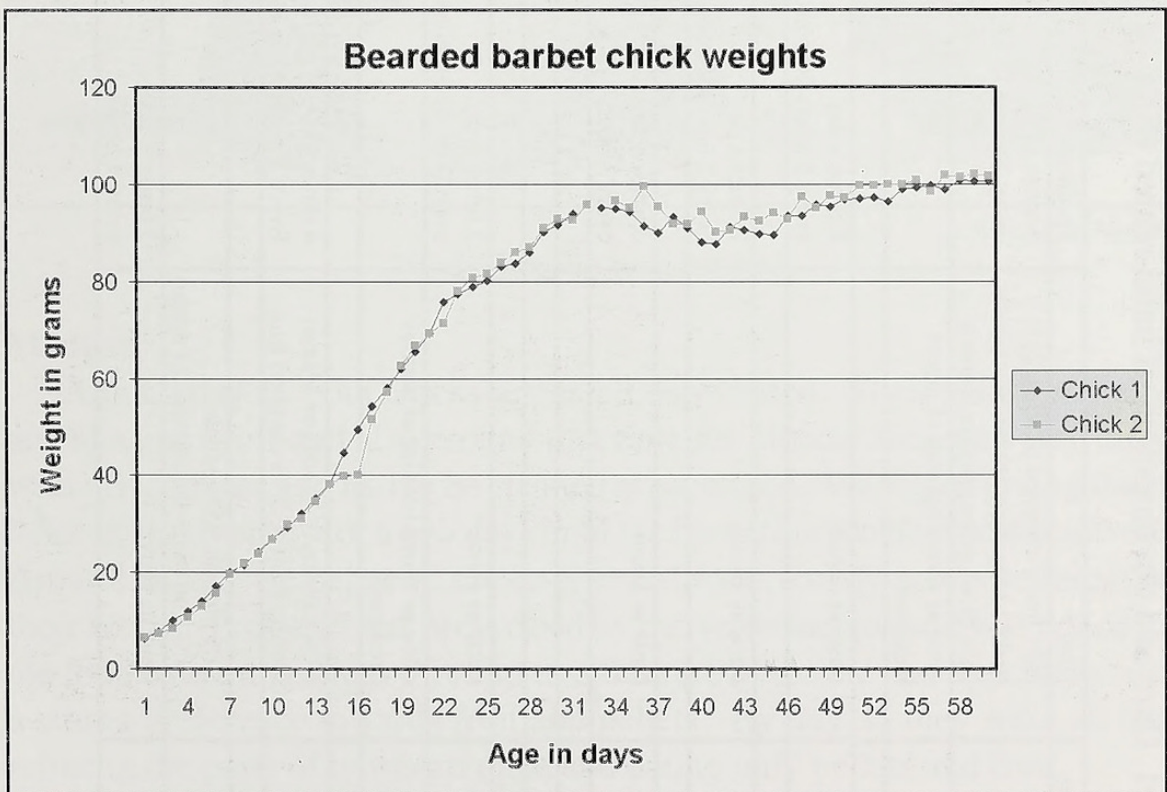


Table 1. Care and development of hand-reared chicks days 1-42.

| Day | Diet | Feedings | Brooder | Development |
|-----|---|--------------------------------------|------------------------------|--|
| 1 | 50% finely chopped pinkies, 25% soaked Mazuri parrot breeder pellets, 25% diced grape, papaya, banana | 9 times a day, every 2 hours 15mins | 95°F-96°F (35°C-35.6°C) | |
| 3 | same as above but size of pieces increased | | 94°F-95°F (34.4°C-35°C) | |
| 4 | | | | Feather tracts on wings, pin feathers of tail |
| 6 | same as above | 8 times a day, every 2 hours 20 mins | 93°F-94°F (33.9°C-34.4°C) | Feather tracts on legs and head Faeces encapsulated in faecal sac |
| 8 | | | | Pin feathers emerging on back and tail |
| 9 | same as above | 7 times a day, every 2 hours 30 mins | 92°F-93°F (33.3°C-33.9°C) | Back, primaries and tail pin feathers emerging |
| 10 | | | | Bill tip turning yellow, eyelids formed |
| 12 | same as above | 6 times a day, every 3 hours | 91°F-92°F (32.8°C-33.3°C) | Yellow cast to eyelids and tail |
| 13 | | | | Yellow pin feathers on chest, feather tracts on body |
| 16 | | | | Both eyes open |
| 18 | | | | Tail pin feathers unfurling |
| 20 | same as above | 5 times a day, every 3 hours 30 mins | 84°F (28.9°C) | |
| 28 | same as above but size of pinkies decreased | | | Chick out of nest within AICU |
| 30 | | | | Beginning to self-feed |
| 33 | 40% pinkies, 35% soaked Mazuri breeder pellets, 25% chopped fruit | 4 times a day, Every 3 hours 45 mins | 84°F (28.9°C) | |
| 36 | | | | Beginning to fly |
| 37 | 30% pinkies, 35% pellets, 30% fruit (with the addition of apple) | | 77°F (25°C) | Completely self-feeding |
| 42 | same as above | 3 times a day, every 4 hours | 70°F (21.1°C) | |

thick, rough skin below the tarsometatarsal joints were becoming less prominent by day 18. These heel pads (see photo p. 158) are an adaptation possessed by the chicks of many species that are hatched in unlined nest cavities. On day 28 the chicks were found perched on the edge of the bowl and were found out of the nest cup completely by day 30. The chicks also began eating on their own around day 30 and were completely self-feeding by day 37. Deep guttural vocalizations, similar to those of the adults, were heard by day 31. The chicks began to fly on day 36. On day 38 they were moved from the AICU to a large standing cage.



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Newly fledged young barbet.

Medical

Around day 11 both chicks appeared dehydrated. Their skin was flaky and sloughing off and also around that time the cloacal area was very dirty with dried faeces and had to be cleaned at each feed. We began giving them 0.5cc of fluids orally for a few days until the hydration problem was resolved. Around day 27 we began to see undigested food, mostly newborn mice, in their faeces. Prokura® was prescribed by the veterinarians and was added to the food to aid digestion. Around that time we observed that the chicks had a strong preference towards fruit and pellets. By day 35 they were all but refusing the parts of newborn mice and eating only pellets and fruit.

Even though the chicks were housed on what we considered an appropriate substrate, on several occasions we noted that they had splayed

legs. However, their legs and stance developed normally without any intervention. This was also noted by Parr (1996) when raising Flame-fronted Barbets *Megalaima armillaris*.

Acknowledgements

This paper would not have been possible without the detailed daily observations of the aviary staff. Special thanks to former DAK aviary keeper Greg Bockheim, current Director, Potowatomi Zoo, Indiana, for the photos.

Commercially manufactured foods

Bevo Insectivore Diet: Manufactured in Belgium, distributed by All Bird Supply. Tel:(305) 597-0640; Birds to Grow. Tel: (209) 869-5900.

Mazuri parrot breeder 56A9 and Mazuri small bird breeder: Purina Mills Speciality Group, PO. Box 66812, St Louis, MO 63166-6812, USA. Tel: (314) 768-4592.

Toronto Carnivore Diet: Toronto, Canada. Tel: (416) 869-5900.

References

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Short, L. L. and Horne, J. F. M. 2001. *Toucans, Barbets and Honeyguides*. Oxford University Press, Inc., New York, USA.

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