

Breeding the Jambu Fruit Dove

at the Memphis Zoo and Aquarium

(*Ptilinopus jambu*)

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Author's Note: *the format of this article was designed primarily to convey facts concerning the captive breeding and husbandry of Jambu Fruit Doves. What it fails to convey is that broad range of feelings these beautiful little birds have instilled in their keepers. Beginning with an appreciation of their beauty, running the gamut of hope and despair and, finally, experiencing the thrill of success, we have gained considerably from the experience. We have recently broadened our captive breeding program to include three additional species of fruit doves. Hopefully, I will be reporting on our future success with these species as well.*

Abstract

In late 1984, the Memphis Zoo acquired 2.2 wild-caught Jambu Fruit Doves (*Ptilinopus jambu*). Little information has been published concerning the frugivorous columbids. Our program for maintaining and breeding these doves developed by trial, error and correction.

In mid-1985, we hatched what may have been the first captive-hatched Jambu Fruit Dove. One year later, that individual had produced offspring after being paired with a wild-caught bird.

Since the original acquisition in 1984, the program has produced 28 captive-hatched offspring, with 12 individuals surviving to adulthood.

The knowledge gained from these experiences has contributed to the husbandry guidelines described here.

This portrait of a male Jambu Fruit Dove shows the brilliant coloration of this bird. This dove originates from the Malay Peninsula, Borneo and Sumatra.



Photo by Jim Mulhern

The male Jambu Fruit Dove assists in the incubation process. Typical of most doves, the nest is not elaborate and they usually must be supplied with a container or support in which to build the nest.

Pigeons and doves comprise the unique, highly recognizable order of birds Columbiformes. Within this order, most taxonomists recognize only one family, *Columbidae*. Within this single family, however, the diversity is great. With 43 genera and 299 extant species, columbids can be found throughout most of the world (Walters, 1980).

The group comprising the fruit pigeons and doves (*Treroninae*), occur in the Old World only, primarily in the Australasian region. These birds are usually vividly colored with green being the dominant color. They are arboreal and feed primarily on fruits and berries (Delacour, 1980). Within this group can be found the singularly beautiful genus, *Ptilino-*

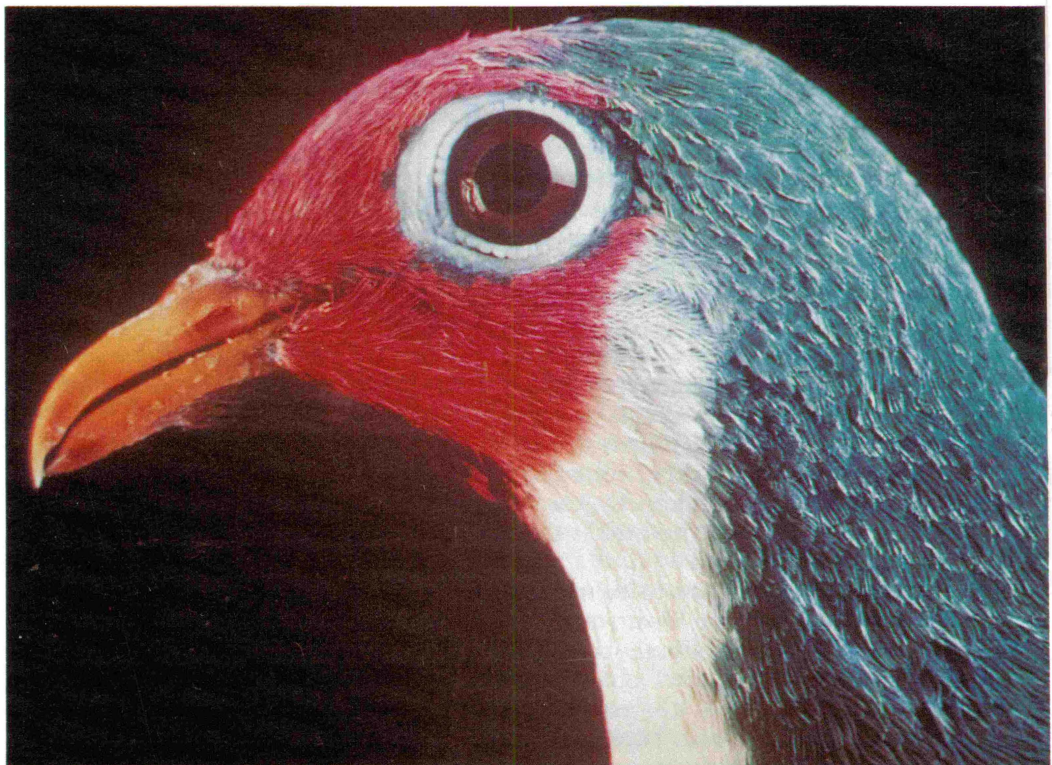


Photo by Jack Kenner

pus. These generally small columbids are commonly referred to as the fruit doves. There are 47 species of fruit doves. They vary in size from the sparrow-sized Dwarf Fruit Dove (*Ptilinopus maina*) to the Magnificent Fruit Dove (*Ptilinopus magnificus*), which can be larger than the common feral pigeon (Goodwin, 1983).

Based on our successful experience with other exotic pigeons and doves, the Memphis Zoo decided to acquire two pairs (2.2) of Jambu Fruit Doves in September of 1984.

The Jambu Fruit Dove is native to the Malay Peninsula, Sumatra, Borneo and adjacent small inlands. It inhabits forests and semi-wooded areas and is partly migratory (Goodwin, 1983).

The Jambu Fruit Dove is a medium sized dove, averaging 23 cm in length. The sexes are chromatically dimorphic. The male has a crimson-pink face, forehead and forecrown. The upper throat and chin are blackish. The upper parts are green, while the underparts are white with a pink breast patch. The under tail coverts are chestnut colored. The female is much duller colored, being predominantly green with a dull purple head, whitish belly and chestnut under tail coverts. The newly fledged chick has green upper parts with white lower parts. Head feathers are greenish until later in the young's development. Juveniles resemble females, but assume recognizably different plumage by three to four months of age.

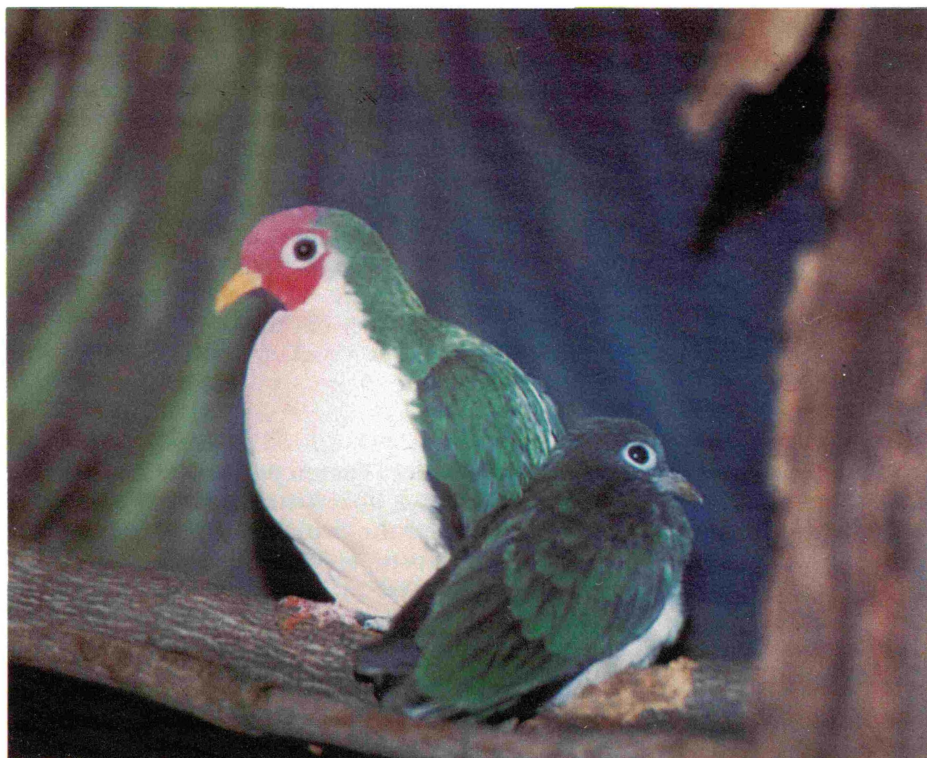
In 1984, little was known about the Jambu Fruit Doves' reproductive behavior. In spite of our lack of knowledge, on June 10, 1985, one pair of Jambu hatched a chick. Possibly the first captive hatching for this species, it was the start of a breeding program that continues today. Since its inception, the program has produced 28 offspring of which 12 have survived to adulthood.

Captive Husbandry Facility

When the original two pairs of Jambu were acquired, the decision was made to set up one pair in an off-exhibit breeding compound. The other pair was set up in an exhibit in our Tropical Bird House. The breeding compound consists of a series of adjacent wire cages, each with an outside run measuring 2.3 meters in height, 1.8 meters in length and 0.9 meter in width. There is an inside run of the same dimensions. The birds have access between the two runs via

a small door measuring 30 centimeters by 30 centimeters. These cages have concrete floors and the interior portion of the compound has artificial lighting with some indirect natural light. The building is heated in cold weather and the fruit doves are kept inside during the winter.

The display enclosures are considerably smaller. The largest of our individual displays measures only 3.6 meters wide by 1.7 meters high by 1.2 meters deep. The floor is elevated 0.3 meter above ground floor level, while the ceiling of the exhibit is only 2 meters above ground floor level. The



A three week old youngster has just fledged and perches beside its father.



This young Jambu Fruit Dove is a miniature of its mother. This immature bird has similar coloration as the adult female. The youngster is four weeks of age.

Photo by Jim Mulhern

Photo by Jim Mulhern

exhibit is glass fronted and visitors are restricted by a hand rail placed 1.1 meters away from the front of the exhibit. What these measurements illustrate is the fact that the birds cannot retreat above or away from the visitors for any considerable distance. Lighting is currently provided by a combination of artificial light and natural light. The exhibits are entirely enclosed and are heated in the winter. Ventilation is accomplished by a system of fans that circulate air through a base vent and the screen wire top.

At various times, we have kept individuals in exhibit cages measuring 1.7 meters by 1.7 meters by 1.14 meters. We have also housed them in large, planted, community aviaries. These were primarily used for holding facilities and no attempts have been made to breed the species in these exhibits.

Diet

Based on a successful diet used for Green Imperial Fruit Pigeons (*Ducula anea*), the original diet consisted of a variety of fresh fruits, canned mixed vegetables, egg, spinach and an in-house formula softbill mix. Since then, the diet has undergone some modification. Due to an unacceptable level of juvenile mortality, the diets were re-evaluated. Several necropsies indicated the possibility of liver and kidney damage. We decided to reduce the level of protein in the diet. Based on diet comparisons with other institutions, as well as our own experience, we came up with the diet we currently use.

Fruit Dove Diet

2 parts brown rice (cooked)
2 parts apple, diced ¼" size
1½ parts banana, diced ¼" to ½" size
1 part raisins, dry, then soaked overnight
3½ parts fresh, seasonally available fruits
Vitamin and calcium supplement
(2 tbs. vitamins added to ¼ tsp. calcium)
Roll above mixture in a powder made of:
2/3 pigeon pellets to 1/3 dog food

The diet is prepared in a size that enables the birds to swallow whole pieces. Rolling moist food items in meal not only provides additional nutrients, but keeps the beak and face from becoming matted and soiled.

Reproduction

Jambu Fruit Doves in captivity are not seasonal breeders. They may go through their reproductive cycle any time during the year. Under optimum conditions, they will cycle several times yearly.

Courtship behavior in Jambu Fruit

Doves is subtle compared to typical pigeon courtship. The Jambu's voice is not strong and all calls are soft by comparison. The "nest" call is usually associated with nest site selection. I have only observed the male Jambu using this call. He will hold himself in an erect posture and make a series of short coos. This is usually done on or close by the nest site. The "display" call of the Jambu does not consist of the elaborate bowing and cooing exhibited by many columbids. Instead, the male Jambu tucks his beak into his breast and utters a short series of coos. One unusual display I've observed consists of the male Jambu slowly weaving his head from side to side. This is done when the female is fairly close by and seems to attract her attention. The brightly colored head obviously enhances the effectiveness of this display. Due to background noise interference, I have not yet actually heard a Jambu's voice. Therefore, I must infer the calls from observations based on posture and the typical throat swelling that accompanies vocalizations.

The male will pursue the female prior to nesting but, again, this "driving" behavior is not as aggressive as in most species I've observed. If the female is responsive, she will allow the male to approach her or may approach the male herself. She will sit beside the male and ruffle his breast feathers with her beak. Most of this ruffling is directed to the pink breast patch of the male. Prior to copulation, she will sit beside the male and assume a low position. The male mounts in typical fashion and copulation is brief (five to ten seconds). Copulation has only been observed taking place on natural wood perches. Since fruit doves have small, weak feet, correct perch sizing and type may be important in allowing the female to maintain balance. In established pairs, considerable allopreening takes place. Much of the grooming is directed to the face and upper breast of the mate.

Nest site preference seems to be determined by both the male and the female. Prior to nest building, the male will occupy a suitable nest site by either perching very close to it or actually sitting in a brooding posture on the site. If the female finds it acceptable, she will sit on the nest site and arrange whatever material is within reach into a crude nest. I have never observed either sex bringing nest material to the site. To prevent

loss of the egg or squab, we provide a variety of sturdy nest platforms made of wire baskets or covered wicker baskets. We pre-line these with various materials including grass, hay, sphagnum moss, and small twigs. The location of the preferred nest site may be anywhere within the enclosure including the feed pan or platform. Once a site is chosen, it is best to accommodate the birds as they will persist in nesting at their first choice. Usually, other nest sites can be removed once a pair has chosen an acceptable site.

Within two to three days after nest site selection, the female lays a single white egg. Incubation is by both sexes with a tendency for the female to incubate at night. Incubating Jambus will change off several times daily. This is facilitated by the incoming parent sitting close to the incubating parent and touching the sitting parent with its breast. Occasionally, the incoming bird will also briefly preen the sitting bird about the face. Usually, this results in a change of duty, but sometimes the incubating parent will ignore the advances of its mate. When this happens, the incoming bird leaves the nest and attempts are made later. During the day, incubating periods vary from two to four hours between changes. Incubation lasts 18 to 19 days.

Growth and Development

The Jambu hatchling is covered with a sparse, grey down and its eyes stay closed for approximately two to three days. Both parents care for the young and development is rapid. Unlike the growth pattern of most seed eating columbids, the early development of the Jambu Fruit Dove is concentrated on feather growth and coordination rather than attaining large mass. By the time the squab is 10 to 11 days old, its eyes are open, it has fully functional wing feathers, rudimentary tail feathers, a downy breast and a totally bald head. At this vulnerable age, and all of 2½ inches long, it leaves the nest.

After fledging, the young dove continues to stay close to its parents. Both parents continue to feed the young bird and it is usually observed nestled beside one or the other of its parents. By the age of four weeks, the young dove has started to follow the adults to the feed pan and will consume a small amount of food on its own. Although the young bird will continue to solicit feeding from its

parents, over the next four to eight weeks the parents gradually respond less although close physical contact is still tolerated. By the age of eight to twelve weeks, the young Jambu is fully weaned.

In some cases, the adult pair will exhibit breeding behavior and will actually go back to nest before the young Jambu is fully weaned. Usually, the adults will continue to provide parental care for the fledgling between bouts of incubation. Occasionally, the adult male may exhibit some modified aggressive behavior toward the young during this reproductive overlap. Unless this aggressive behavior becomes overt, we have found it best to leave the fledgling with the parents, even if they have gone back to nest. If the young Jambu is separated for much time before weaning, its chances for survival are slim. In most cases where we have observed this overlap, the young bird has reached independence before the hatching of the new chick and can then be safely separated.

At the age of eight to twelve weeks, the juvenile Jambu Fruit Dove looks like a slightly smaller version of the adult female. By the time the juvenile is 16 to 18 weeks old, it has attained full size and is beginning to acquire the adult plumage variations.

At about nine months of age, the young birds have taken on a fully adult appearance. They have successfully bred here at Memphis Zoo at one year of age and conceivably could do so sooner.

Summary

There are several factors that influenced our captive reproduction program for Jambu Fruit Doves. Obviously, the birds must be in good health and mature. Beyond that, such factors as pair compatibility and reproductive experience will affect reproductive efforts. We have had cases where apparently healthy adults exhibited no breeding behavior with their cage mate over an extended period of time, yet when paired with another bird, courtship and nesting ensued. There are cases where a compatible pair has lost the first two to three of their eggs or newly hatched chicks because of inadequate parental care, yet go on to successfully raise subsequent chicks.

Jambus appear to be tolerant of a variety of enclosure types, although for best breeding results, they should be kept where their nesting effort will

not be disturbed. As stated earlier, nest type and location are simple and easy to determine.

Dietary requirements are not complex and quite easily fulfilled. Other than an increase in volume during chick rearing, there are no seasonal or nutritional variations required.

Last, but not least of the considerations that influenced our decision to include Jambu Fruit Doves in our collection, is the desirability of fruit doves as exhibit specimens. Less flighty than many columbids, the sedentary nature and beautiful appearance of fruit doves make them excellent candidates for zoological exhibition. Their peaceful habits make it possible to include them in multiple species exhibits, while their colorful appearance makes them worthy of notice in individual exhibits.

As information is acquired concerning husbandry techniques and reproductive requirements, the reasons for not keeping fruit doves and pigeons are vanishing. A small handful of zoos and private individuals have been successfully working with the group. That number needs to

expand in order to maintain viable captive populations. If you are interested or know someone who might be interested, please consider including one or more fruit dove species in your collection. I promise you won't be disappointed.

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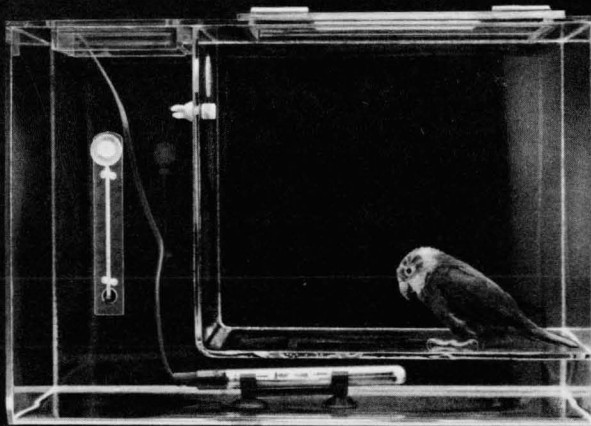
Mrs. Clara Wright, who struggled through my handwriting and typed the presentable version.

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