Breeding, Husbandry and Management of Tanager Species

by Erika Harris, Unit Keeper
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The majority of tanagers are found from Costa Rica in Central America through the northern half of South America into Paraguay. Some species occur through Argentina (Skutch, 1954; Dunning, 1982). They inhabit the lower edge of coastal foothills and 4,000-7,000 feet elevations into the mountains. These mainly frugivorous birds roam through tropical forest tree tops and edges of forest clearings foraging for fruits, berries, small insects, and vegetation (Skutch, 1954). Many tanager species are brilliantly colored and their songs are generally short, sharp monosyllabic chirpings. This chirping is especially evident when they are agitated, alarmed, or excited. The majority of tanagers are basically monomorphic, with the males a shade or more brighter than the females, making the sexes indistinguishable in some species. However, several species display a striking sexual dimorphism, with the males brilliantly colored and the females a drab, subtle-colored plumage. Tanager species vary in sizes from as small as 9 cm to 26 cm in the larger species (Dunning, 1982). The tanagers displayed at Woodland Park Zoological Gardens have been mostly medium to large species ranging from 12-17 cm in length.

Husbandry and Management

On May 18, 1984, Woodland Park Zoo received a shipment of twelve tanagers from Hendee Zoological Gardens. After a 14 day quarantine, the two pairs of each species of bay-headed tanagers (Tangara gyrola), golden tanagers (Tangara arthus), and silver-throated tanagers (Tangara icterocephala) were set up into pairs and placed into holding cages until appropriate displays were available. A tanager breeding program was established based on data and experience collected from previous breedings of palm tanagers (Thraupis palmarum) in May, 1980 and Brazilian tanagers (Ramphocelus bresilius) in March, 1981.

A pair of each species was set up in a heavily planted tropical display, with some displays having a pair of small-billed titamou (Crypturellus parvirostris) or crested quail doves (Geop-
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age begin additional feedings by

tossing 5-10 insects per chick on
plate at 10 a.m., 2 p.m. and 6 p.m.

Dry Mix w/Meat Recipe
20 C. dry mix
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brand
1/3 C. oystershell, fine
3 T. mineralized salt
** Mix to an even texture.

Dry Mix Recipe
50 lb. Purina Trout Chow
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10 lb. bone meal
** Grind all pellets to powder form,
then combine all ingredients and mix.

Breeding and Nesting
The two pairs of silver-throated
tanagers were initially set up together
during quarantine holding and then
were released into the display as a
group. While on display these birds split
up into two pairs and began breeding
activity. This turned out to be disas-
trous. Although they are a more social
tanager, during breeding they become
competitive and territorial. This
resulted in the first pair hatching out two
chicks, but unable to rear them. The
nesting male continually chased and
displaced the other pair throughout the
day in an attempt to keep them from
approaching the nest. Whenever the
nest was unoccupied during food collec-
tion, the other pair would hop into the
nest and inspect the chicks. For this
reason the nesting female almost con-
tinually brooded, and the chicks lit-
erally starved, dying at three and five
days of age. The pairs were eventually
split up and the second pair later suc-
cessfully raised two chicks to fledging.
One chick died at 22 days as it was
unable to compete with the stronger
chick for food.

The other two pairs of golden tan-
gers and bay-headed tanagers were
surgically sexed by laparoscopy. The
golden tanager pairs were left together,
but the bay-headed tanagers were the
most difficult to pair up. Three different
combinations were attempted before a
compatible pair was established. The
incompatible pairs displayed a total lack
of interest, or frequently displayed open
beak threats when approached by the
other individual, and fights were even
observed. Finally, the most aggressive
male and female were paired together
and their compatibility was instantly
noticed. The remaining pair of bay-
headed tanagers was set up and has so
far appeared to be compatible.

Prior to breeding, all pairs of tanagers
(including non-breeding pairs on display)
are removed from exhibits and set up
into holding cages in preparation for
breeding. These pairs are kept in 3' wide x 3' long x 8' high or 6' wide x 12' long x 8 1/2' high cages with concrete
floors. The pairs are left in holding to
rest and put on extra weight for a period
of one or two months, and then they are
transferred back onto display for breed-
ing. The differences in environment
from a sterile holding cage to a heavily
planted display usually triggers breeding
activity by the first week back on dis-
play. In addition, the tanagers usually
put on a significant amount of weight in
holding and are in good general health
for breeding. Once back on display, courtship and the laying of the first egg
may occur as early as two weeks or as
late as eight weeks, with the norm being
around six weeks.

Initial courtship begins with an
increased frequency of the pair perch-
ing within a six inch proximity of each
other. Shortly after the male begins
courtship, feeding choice foods of
insects, blueberries, and papaya to the
female. The only male courtship display
we have observed has been in the
Brazilian tanager. The entire display
lasts about five seconds, during which
he sings a two-syllable call as he spreads
his wings in a full stretch while bowing
on a perch facing the female. When the
female is ready, she begins to frequently
solicit copulation and will follow the
male through the display soliciting. No
displays or copulations have been observed in the other species.

Soon after soliciting is noted, dried
grasses are placed on display for the
female to use at the nest building site. By
daily observations, one can determine
the nest site choice of the female where
she has draped several blades of grass or
stripped dracaena leaves in a crotch of a
tree or plant. All the nest sites have
occurred either in dracaena crotches or
in a dense bambusa species. It is impor-
tant that a basket be placed at or near
the exact spot she has chosen, other-
wise she will continue to attempt build-
ing a nest at her chosen site. This is done
because many of the females are initially
not able to complete a nest on their own
and appear to be lacking in building
skills. Several of the more experienced
breeders are later able to proficiently
build nests. The square wire hardware
cloth baskets (5' x 5' x 2' deep) are
first lined with unmilled sphagnum moss
and partially cupped out by keepers,
then additional moss and grasses are
laid on the cage floor for the female to
use in finishing her nest by lining it with
grasses and leaves and cupping it out.
Males show little or no interest, although
several bachelor pairs have repeatedly
built nests on display. As soon as the
nest is completed and cupped out, the
female will usually lay within the next
day or two. Some females lay on con-
secutive days and others with a day
between layings. In general, clutches
consist of two lightly mottled eggs and
are laid early in the morning before or
just at sunrise. The female incubates
100\% with the male staying relatively
close and attentive. Some of the males
have been observed carrying food back
to the nest for the female and feeding
her as she incubates. There appears to
be no definite breeding season, but
there is an increase in intensity and
activity in the spring and summer.
Winter chicks do not appear to be as
vigorous and large as the rest of the
hatch, so in general we avoid having
chicks hatch from December through
February.

Incubation and Rearing
Incubation begins either on the day
the second egg is laid or on the day
after. The incubation varies from 12 to
14 days. The chicks are usually found
hatched or are in the process of hatch-
ing by sunrise. They are characteristi-
cally typical of tanager nestlings having
sparse natal down and the interior of
the mouth red. The first chick to hatch
is generally the stronger of the two and
usually remains so even through
fledging and weaning.

As soon as it is light enough in the
display after sunrise, the pair begins
gathering food and feeding the chicks.
Feedings range from every 20 to 40
minutes the first day or two, 15 to 30
minutes until seven days of age, and
then 10 to 20 minutes until weaning.
From approximately five to ten days the
chicks begin developing feathers, and at
14 days at fledging they are almost com-

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Continued on page 24
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Palm tanager (Thraupis palmarum).

Brazilian tanager male (Ramphocelus breシリス).

Brazilian tanager female.

Planted displays. Silver-throated and golden tanagers bred in display on left, bay-beaded tanagers on the right.

Golden tanager (Tangara arthus).

A female bay-beaded tanager (Tangara gyrola).

Silver-throated tanager male (Tangara icterocephala).

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Completely feathered out but will not be able to fly well for another week. The pair will feed the chicks exclusively on insects (waxmoth larvae, cricket abdomens, white mealworms) for the first seven days, then they begin to slowly add ripe papaya and dogmeal to their feedings. By the tenth day, the pair is feeding the entire contents of the supplemental food pans, as at eight to ten days the chicks begin to call almost incessantly for food and continue to do so for another two to four weeks until they are weaned. At 16 to 17 days of age, the fledglings become flighty and skittish at any disturbances such as a keeper entering the enclosure. During this time extreme care is taken while feeding and no display cleaning is done.

Continued on page 26
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for several days, as we have lost several chicks from fatal injuries when they flew into trees or walls. Fledglings at 21 to 25 days begin to settle down and become proficient at flying, making the commencement of daily routine possible again.

Frequently, the female will reclutch and begin incubating shortly after the chicks have fledged. At the onset of incubation of the second clutch, we start the weaning process by deleting the supplemental food pans from their diet so the fledglings can be pulled the day before the next clutch is due to hatch. These fledglings are then placed in holding cages and watched very closely, as four-week-old fledglings are not quite ready to be on their own. On occasion we have had to hand feed for a day or two until the fledglings have figured out how and where to feed themselves. The chicks are pulled to prevent completely wearing the breeding male out, as he would continue feeding two adult size fledglings and the additional new chicks. This also prevents the fledglings from consuming all the supplemental food, which leaves the pair with nothing to feed the newly hatched chicks.

After the chicks from the second clutch have fledged, the nest basket is immediately removed from the display. The pair will continue to feed the fledglings for another two to six weeks, during which the supplemental pans are slowly deleted from their diet. The weaning process seems to vary widely from clutch to clutch and individual fledglings, depending on their rate of development. Eventually, the chicks are being fed only the basic adult diet. The pair is then pulled into holding to rehabilitate and gain some weight back, because at this point they have become fairly thin during the demands of rearing two clutches. The chicks are left on display for a few weeks or months until another pair is placed on display for breeding. Occasionally the breeding pair is pulled early as one to two weeks after the chicks have fledged because the female has begun building another nest in preparation for a third clutch. The pair will stay in holding for several months and then they are placed back on display to repeat the process again.

Problems Encountered During Breeding

This is a list of problems we have experienced during several years of tanager breeding.

- Pair incompatibility.
- Pair not in good health or weight for breeding.
- Dietary problems, especially in calcium deficiency in breeding females. Signs appear as shellless or thin shelled eggs, leg splaying, infertility, long egg laying periods (over one to two hours).
- Death of either sex from stress. Causes such as competition from another pair or inability to complete a nest (reason for providing nest basket).
- First time breeders usually lose one or both chicks in their first clutch due to inexperience, if only one egg hatches the pair seem to be able to rear their first chick.
- Death of breeding female after or during laying of third clutch.
- Death of chicks if old, or molding food fed out. One example is dark colored waxmoth larvae that have ingested a moldy food medium.
- Several unexplained deaths occurring with keeper staff changes or interruptions in routine that interfere with continuity.
- Death of second chick if not enough supplemental food provided. The pair feeds first chick until satiated then the second chick.
- Death of one or both chicks if left too long on display with the pair, including holding situations. Generally hard to observe a problem, as birds usually cease activity when being observed by keepers. Dead chicks are usually found with little or no trauma evident or with severe cases of aspergillosis (evident upon necropsy). Usually some aggressive chirping and displacement can be observed and the chicks separated from the pair in time.
- Breeding females at too early an age, especially under one and one-half years. Problems begin appearing as leg splaying, infertility, shellless and thin shelled eggs, calcium deficiency, and general poor condition.

Summary

Basic guidelines and set up for tanager breeding (parent reared chicks):
- Pairs are set up, placed into holding situations, and compatibility noted. Good health and weight desirable prior to breeding.
- Pairs are put into heavily planted displays, and observed for breeding activity.
- Nesting materials placed into the display to note nest site chosen, and a basket placed.
- Courtship, nestbuilding, egg laying, and incubation begins.
- 12-14 day incubation, chicks hatch.
- Five to ten days chick food consumption gradually increases, feather development begins.
- Chicks fledge at 14 days, almost fully feathered but cannot fly well. They will spend next two days hopping from perch to perch. Front of display glass waxed.
- Fledglings at 16-17 days become flighty at disturbances. No cleaning is done for several days and at 21-25 days they begin to settle down.
- Two to six weeks weaning process of fledglings either by pair or keeper intervention. Time varies widely from clutch to clutch and individual fledglings.
- Fledglings pulled off display and monitored for self sufficiency. The pair is usually on a second clutch. If the second clutch has already been reared the pair is pulled and the chicks left on display. A pair is sometimes pulled after the first clutch if they are looking in poor condition, then another species of tanager is put on display to be bred.

This system has worked well with the tanagers at Woodland Park Zoo, and we have gone through many steps in developing the tanager breeding program to its current state. Hopefully this program's success will continue to the point of establishing an F1 breeding population of tanagers. Much thanks goes to Lee Gartner in helping to develop this project and for all the time, effort, and support he contributed as my co-worker. There are still the "problems" that occur periodically and the new ones that always surface, but with diligence and commitment the success of tanager breeding in captivity should continue to climb.

Woodland Park Zoo first surviving hatching:
Palm tanagers—July 17, 1980
Brazilian tanagers—March 30, 1981
Golden tanagers—Sept. 19, 1984
Silver-throated tanagers—Oct. 23, 1985
Bay-headed tanagers—June 11, 1986

REFERENCES

PRODUCTS
Plexidyne, iodine based detergent/sanitizer, Perf Products, Flex Chemical Corp., Union City, CA 94587.
Osteof orm, calcium/phosphorous/D, powder supplement, Vet A Mix Inc., Shenandoah, IA 51601. Sold to licensed veterinarians only.
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