

BREEDING THE GREEN JAY *Cyanocorax yncas* AT BARCELONA ZOO

by Miguel Sierra and Rosana Gallego

The Green Jay *Cyanocorax yncas* is a relatively small forest jay with green to bluish green upperparts and yellow or green underparts and has a relatively long and narrow tail with yellow outer tail feathers. The lores, ear-coverts, face and throat are black. The nominate subspecies has a small tuft of ultramarine coloured feathers on the forehead, an ultramarine spot above the eye and a large patch the same colour below the eye. The crown and nape are pale yellow, or in some individuals, these are white.

The Green Jay has a complex taxonomy with 13 subspecies recognised by del Hoyo et al. (2009). These can be divided into two groups, which have sometimes been treated as two (or more) species. The Andean (nominate) group (Inca Jay) is found from Venezuela and Colombia, south to Bolivia. The subspecies in this group are slightly larger than the Central American subspecies and have a larger frontal crest (on the forehead) and yellow underparts. The upperparts are darker green or bluish and they have a whitish or blue nape. The Central American (*luxuosus*) group (Green Jay) is found from Texas to Honduras. The subspecies in this group are smaller and have a short and inconspicuous frontal tuft (on the forehead) and a blue crown and nape. The northern subspecies have green underparts and the southern subspecies have yellow underparts.

All have a black bill. The colour of the iris varies from brown to yellow depending on the subspecies. Likewise, the colour of the legs and feet vary from reddish-brown to brown or greyish/blackish, again depending on the subspecies. Many of the subspecies intergrade. The sexes look alike.

The Green Jay is strangely absent from El Salvador, Nicaragua, Costa Rica and Panama.

Green Jays measure 25cm-27cm (approx. 10in-10½in) in length. The males at Barcelona Zoo weigh 70g-83g (n=8) and the females weigh 68g-78g (n=4).

Housing

Here at Barcelona Zoo our breeding pairs of Green Jays are kept in an indoor exhibit. The exhibit covers an area of 70sq m (approx. 750sq ft) and has a 10sq m (approx. 108sq ft) pond. During the winter the temperature in the exhibit is maintained at 20°C-24°C (68°F -75.2°F). One side and half of the rear wall are decorated to resemble a rock cliff and the other half of the back of the exhibit has a photo poster. The exhibit has seven skylights,

each protected with welded wire mesh, which can be opened in the summer. At the front of each exhibit we have installed glass. The floor of the exhibit is a mixture of earth and turf. Caution must be exercised when designing an exhibit for Green Jays, because being members of the corvid family, they are inquisitive and are liable to swallow unlikely/unusual items (e.g. the necropsy on one bird showed what was thought to be silicone in its stomach).

The exhibit is thickly planted with *Ficus benjamina*, *F. alii*, *Pseudosasa japonica*, *Philodendron xanadu*, another *Philodendron* sp., *Monstera* sp., *Spathiphyllum*, *Chamaorea* and *Schefflera*. Green Jays share the exhibit with the following species: crowned pigeons *Goura* spp., Nicobar Pigeon *Caloenas nicobarica*, Screaming Piha *Lipaugus vociferans*, Golden-headed Quetzal *Pharomachros auriceps*, Crested Oropendola *Psarocolius decumanus*, Great Curassow *Crax rubra*, Long-wattled Umbrellabird *Cephalopterus penduliger*, Wattled Jacana *Jacana jacana*, White-naped Pheasant Pigeon *Otidiphaps nobilis aruensis*, Boat-billed Heron *Cochlearius cochlearius* and Sunbittern *Eurypyga helias*, as well as Lyle's Flying Fox *Pteropus lylei*. The only problem we have encountered is the eggs of the White-naped Pheasant Pigeons have been broken.

When youngsters are separated from their parents, they are housed in smaller exhibits in the same house. We also use hanging cages made of 2.5cm x 2.5cm (lin x lin) welded wire mesh that measure 193cm x 101cm x 102cm (approx. 6ft 3in x 3ft 3in x 3ft 4in). Each cage is fitted with two perches and houses only one jay.

During the winter of 2009, three males were housed in an outdoor exhibit measuring 4.1m x 3.5m x 4.5m high (approx. 13ft 6in x 11ft 6in x 14ft 10in high) with access to a heated area measuring 3.2m x 3m x 3.5m high (approx. 10ft 6in x 9ft 9in x 11ft 6in high) in which the food tray was placed. In the winter the temperature in Barcelona dropped as low as -1°C (30.2°F) but all three birds came through without difficulty. In 2010, a breeding pair was set-up in this outdoor exhibit.

Diet

Our Green Jays are fed once a day in stainless steel food trays placed at least 1m (approx. 3ft 3in) above the ground. They are offered diced fruit and vegetables, which consist of avocados (we do not use oranges, mandarins or kiwi fruit because their high Vitamin C content aids the absorption of iron), grated carrots, boiled potatoes or yams, boiled maize, lettuce, Witte Molen egg-rearing food with hedgerow plants, Tropical Bits, T16 low iron pellets and, during October-June, hard-boiled egg. Calcium is sprinkled on the food. Nekton Lori is offered once a day in the morning. Livefood consists of mealworms, zobhoba (*Zophobas morio*), locusts and crickets. Livefood

is offered once a day each afternoon, but is increased to twice a day when the birds have young to feed. The locusts and crickets are scattered on the floor of the exhibit.

The mealworms are maintained on a diet of bran and pieces of fruit. Mealworms and crickets have low levels of calcium and high levels of phosphorous, which creates an imbalance of calcium and phosphorous. Therefore, three days before the mealworms are about to be fed to the birds, they are fed a mixture of (poultry) chick food (400g) and CaCO_3 (50g), in order to gut-load them and increase the level of calcium.

We find that after several moults Green Jays lose their colour. The yellow feathers fade and turn whitish and the green feathers turn blue, because the green colour is a combination of yellow and blue (Vince, 1996). In an attempt to avoid this loss of colour we sprinkle Nekton Gelb (intended to intensify the yellow plumage of birds) onto the food. To be effective this must of course be done when the birds are moulting, which in Barcelona is between August -November. The difficulty is that the Green Jays share the exhibit with other species and lose their colour faster than they would were they housed alone, as in the mixed exhibit they are free to eat whatever they like, rather than the diet intended for them. So in a mixed exhibit it is almost impossible to retain their natural green and yellow coloration.

Breeding

In January 2000, we acquired a breeding pair of Green Jays from a dealer. The pair produced a chick in October 2001 which, unfortunately, was stolen in January 2002. On that first occasion the pair used small sticks from plants in the enclosure to build a nest 3m (approx. 9ft 9in) above the ground on a fork of a *Ficus* sp.

In September 2007, we acquired three males and a female from Faunia Zoo here in Spain. The first clutch of eggs was laid at the beginning of April the following year and two chicks were found on April 21st 2008. On that occasion a platform was used on which the nest was built using sticks collected from the zoo grounds. All three males and the female continued to be housed together, though only the pair incubated the eggs and reared the chicks. On May 28th, however, one of the males was found dead; another was found dead on June 21st.

On May 21st a second brood, of four chicks, had been found in the same nest, after which the pair built a new nest 3m (approx. 9ft 9in) above the ground in a *Ficus benjamina*. All six youngsters were separated from their parents on July 22nd. Blood samples were taken and the birds were DNA sexed and proved to be four males and two females.

All six were housed together as a group in the same exhibit. In April

2009, however, one of the males was killed by the others. We removed the two females and following this there was no further aggression of any kind. Later, one of the females was transferred to Attica Zoo in exchange for a male, so that an unrelated second pair could be established.

We have observed that before the beginning of any breeding activity, Green Jays are very noisy and make a number of different sounds, but the calls stop when the eggs are laid.

In 2009, the first two youngsters were found in the exhibit on March 13th. Two further chicks had died in the nest and, on April 20th, one of the youngsters hatched on March 13th was found dead. The remaining youngster was removed to an off-exhibit area. Two further chicks were seen on June 12th and a further two on August 6th and, the last two of the 2009 breeding season, were seen on October 19th.

In 2010, we changed the set-up and housed the breeding pair on its own, as we were concerned about the important loss of colour. The new pair was established in the breeding exhibit. The male proved to be very aggressive towards the other birds sharing the exhibit, which he chased and displayed to and was also aggressive with the keepers.

On May 10th, a chick was found beheaded on the floor of the exhibit. A replacement clutch was laid and a new chick was found on June 30th. Unfortunately, however, on July 2nd it was found dead tangled up in some branches.

Green Jays can begin to breed at two years of age. The breeding season at Barcelona Zoo begins in March and ends in October. The female usually lays a clutch of four eggs, but may lay as many as five or as few as three eggs. They are very pale greyish with greenish colouring and dark markings. One infertile egg measured 30mm x 21mm and another measured 29mm x 21mm. The incubation period is 16-21 days. The young are fed in the nest for 19-22 days and for at least a further three weeks after fledging. They are fed by both parents. Youngsters are separated from their parents at between one to three months of age.

Transport

They are transported in crates measuring 35cm x 17cm x 25cm high (approx. 1ft 1³/₄in x 6³/₄in x 9³/₄in high), with a padded foam roof and a single perch. Each crate houses only one bird.

Pest control

One of the main problems we have to deal with is mice. We avoid any kind of poison because we have seen our Green Jays hunting mice and feeding on them. What we do is to remove the food trays from the exhibit in the late afternoon and set-up (Ketch-All) multiple catch mouse traps.

Veterinary procedures

To do any veterinary procedures and avoid the risk of shock, birds are anaesthetized using isofluorane. Induction is done at 5% concentration and maintained at 2.5%-3% and with 0.6-0.8 l O₂/min. Blood samples are taken mainly from the ulnar vein. Sexing is done by DNA analysis from blood samples.

Acknowledgements

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Products mentioned in the text

Nekton Gelb and Nekton Lori: produced by Nekton GmbH. Kieselbronnerstr. 28, Germany, D-75177. Website: www.nekton.de

Nutribird T16 low iron pellets: manufactured by Versele-Laga NV, Kappellestraat 70, B-9800, Deinze, Belgium. Website: www.versele-laga.com

Tropical Bits: manufactured by Marion Zoological Inc., 2003 E Ctr., Plymouth, MN 55441, USA. Website: www.marionzoological.com

Witte Molen egg-rearing food: manufactured by Witte Molen, Moleneind 2, 4268 GD Meeuwen, Postbus 25, 4260 AA Wijk en Aalburg, the Netherlands. Website: www.wittemoten.nl

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Miguel Sierra and Rosana Gallego, Parc Zoològic de Barcelona, Parc de la Ciutadella s/n, 08003 Barcelona, Spain. E-mail: msierra@bsmsa.cat and rgallego@bsmsa.cat

NEWS & VIEWS

GETTING A HELPING HAND

In News & Views (Vol.116, No.3, pp.140-141 (2010)) I wrote of the plight of the Orange-bellied Parrot *Neophema chrysogaster* and problems concerning both the wild and captive-breeding populations. In *The Sydney Morning Herald* Weekend Edition, p.4, January 29th-January 30th 2011, Peter Ker reported that at least 12 were hatched at Melaleuca during the past breeding season. It is the same number thought to have been hatched there in 2010, which was considered a dreadful failure. However, Mark Holdsworth declared himself relieved that at least the pattern of decline has been halted.

The parrots nest some 7m (approx. 23ft) above the ground in trees, the trunks of which are banded with grease to deter snakes. Forty nest boxes have been put up at Melaleuca, but only four were used during the past breeding season. They produced nine chicks with, it is believed, a further three chicks having been hatched in natural cavities.

A team led by Mark Holdsworth planned to spend February trying to capture as many as possible of this year's crop of young, which were to be transferred to the Tasmanian Government wildlife quarantine centre in Hobart. The plan is to use them to invigorate the captive-breeding population that has become dangerously inbred. The hope is to increase the captive-breeding population (last time put at 160-170 birds), so that there are sufficient Orange-bellied Parrots to be able to release further captive-bred birds into the wild. If the plan works, it is suggested that within two years, captive-bred birds could be released to bolster the wild population at Melaleuca.

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POORLY KNOWN LAUGHINGTHRUSH

The Wilson Journal of Ornithology Vol.123, No.1, March 2011, includes a short paper (pp. 146-150) on a study of the breeding biology of the White-cheeked Laughingthrush *Garrulax sukatschewi* (also known as the Black-fronted or Sukatshev's Laughingthrush), which is largely restricted to the Min Shan Mountains of southern Gansu and north-central Sichuan, China. Considered vulnerable, it is thought to have a small, declining, severely fragmented population, as a result of the destruction of temperate forest, which has been logged and land converted to agricultural use.

A study of the Austral Parakeet *Enicognathus ferrugineus*, also the subject of a short paper (pp. 168-171) in the same issue, suggests that this parakeet is more insectivorous than previously thought. In the northern part of its range in the austral temperate forests of Argentine Patagonia, where there

are marked seasonal shortages of food, it has been observed eating insect larvae during the “pre- and post-reproductive seasons.”

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MAJOR HORSBRUGH

When writing about Major Horsbrugh's Indian Collection, which was brought to England by Wilfred Frost in 1913 (Vol.116, No.4, p.163 (2010)), I remarked on the fact that I knew little about Major Horsbrugh. As a result, I was contacted by Michael Watkins, who directed me to - http://en.wikipedia.org/wiki/Boyd_Robert_Horsbrugh - where I discovered that he was born in Poona, India in 1871 and died in England in 1916. He joined the Avicultural Society in 1898, while stationed in Sierra Leone. Later, in what is now Ghana, he acquired a pet hornbill (which unfortunately was later killed by his pet genet), reared two Grey Parrots *Psittacus erithacus* which he taught to talk and which became his constant companions and had a very tame turaco, which as soon as he poured water into his bath tub each morning jumped in and splashed about and, sometimes continued to do so, even after he had got into it.

In 1902, he was invalided back to England from the Boer War in South Africa and as part of his convalescence visited the USA and while there studied birds, particularly gamebirds and waterfowl, and met and married Elizabeth Mitchell of Philadelphia. He returned to South Africa with his wife in 1905 and was posted to Bloemfontein, where he built some large aviaries in the garden. He returned to England on leave in 1906 with a large collection of birds and his brother brought a collection to England the following year, which was said to have “caused great excitement in the avicultural world.” Two Levaillant's (Crested) Barbets *Trachyphonus vaillantii* were among the birds brought home and in 1909 an article by Boyd Horsbrugh on this now rarely seen barbet, illustrated by a coloured plate, was published in the magazine. In 1912, *The Gamebirds and Waterfowl of South Africa* by Boyd Horsbrugh and Claude Finch-Davies was published by Witherby & Co., London. The same year an article by him on the Secretary Bird *Sagittarius serpentarius* appeared in the magazine. W. H. Quintin, apparently, received two Secretary Birds from him and wrote in the magazine (1931) that they came from Potchefstroom in the Transvaal, and had been brought as nestlings to his friend Major Horsbrugh. St Quintin found that they ate an extraordinary amount of food including rats, Moles *Talpa europaea* and even Stoats *Mustela erminea* and Weasels *M. nivalis* and swallowed hen's eggs whole, without breaking the shell.

Major Horsbrugh's younger brother C. B. Horsbrugh (1874-1952) later collected birds-of-paradise in New Guinea. Seth-Smith (*Avicultural Magazine* Fourth Series, Vol.1, No.2, pp.40-60 (1923)), wrote that in 1908



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