

Palm Cockatoos

Probosciger aterrimus

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The Genus *Probosciger*

This monotypic genus contains the largest and probably the most spectacular of the cockatoos. The main diagnostic features of the genus include the huge, sharply pointed, upper mandible, the bare, red cheek-patches, and the naked inner thighs. A peculiarity of the beak is that the upper and lower mandibles do not close completely, leaving the black-tipped, red tongue clearly visible. Another unique feature is the ability of the bird to

change the color of its naked cheek patches from red to pink and vice versa, depending on its mood. Excitement or alarm causes the patch to visibly deepen in color, a process known as "blushing."

Due to its blackish color *Probosciger* was formerly loosely classified along with the black cockatoos of the genus *Calyptorhynchus*. Studies have revealed, however, that *Probosciger* has distinctive anatomical peculiarities which clearly separate it from the black cockatoos. The superficiality of any resemblance can quick-

ly be ascertained by comparing the size of the birds, examining the beak, and checking the colors and patterns of the plumage. Apart from the bare red cheek patches which do not occur in any of the black cockatoos, the plumage of *Probosciger* is almost totally and uniformly black in both sexes. Conversely, in *Calyptorhynchus*, colorful and dominant bands are located on the tail, and there is quite marked plumage dimorphism of the sexes in most of the six species.

The relative enormity of *Probosciger* to other cockatoo species and the size of its beak led early researchers to compare them with macaws. Even Kuhl, who named the genus, was compelled to write "*Species intermedia inter Ara et Kakadoes*" (species intermediate between macaws and cockatoos).

On comparing the bone structures of *Probosciger* and other cockatoos species, the great Australian ornithologist, Gregory M. Mathews,



Photo by Sheldon Dingle.

Is there any wonder about the naming of P.a. goliath.....or Great Palm, when it is compared to one of the smaller subspecies P.a. aterrimus or P.a. stenolophus?

wrote that "The osteology differs so much from that of other cockatoos that I have separated the present species as of family rank, and it is possible that a closer examination would cause it to be placed nearer the Macaws than the Cockatoos. It is obviously a very isolated form, however it is viewed, and worthy of extended investigation." (Mathews, 1916).

The specialized beak is unique among the cockatoos both for its size and its apparent function. The sharply pointed tip of the upper mandible extends well below the lower mandible, making it the largest beak of any psittacine in relation to its body size (only in the Hyacinthine Macaw, *Anodorhynchus hyacinthinus*, a larger bird, is the beak consistently more massive). The makeup of the upper mandible is interesting in that there are two projecting areas of flat horny tissue (ramprotheca), which forms three steps. The inner step is used to deal with food items such as small seeds, while the middle step deals with the larger items. The tip of the beak, and the outermost step are used for tearing open large fruits. Holyoak (1972) concluded that, without these specialized steps, the bird would have great difficulty in dealing with small seeds.

The crest is also quite distinct from that of other cockatoo genera. It consists of numerous backward-curving, narrow feathers which separate when the crest is raised. The elongated feathers give the crest of the Palm Cockatoo a distinctive, plume-like quality unique among the cockatoos.

The Palm Cockatoo

***Probosciger aterrimus* (Gmelin)**

Synonyms: Great Palm Cockatoo, Great Black Cockatoo, Cape York Cockatoo, Black Macaw, Goliath Cockatoo, Aratoo.

Three subspecies are now generally recognized:

1. *Probosciger aterrimus aterrimus* (Gmelin)
2. *Probosciger aterrimus goliath* (Kuhl)

3. *Probosciger aterrimus stenolophus* (Van Oort)

Native Range: Coastal and inner lowland areas of New Guinea to an altitude of some 1,300 m. but generally below 750 m. Also on islands in Geelvink Bay, the Aru Islands, and the West Papuan Islands. The northern tip of Cape York Peninsula, Queensland, Australia, south to Princess Charlotte Bay in the east, and the Archer River in the west. Formerly, introduced to Kai Cecil (east of Aru Archipelago) and still present in 1981.

Conservation Status: The Papua New Guinea and Indonesian populations of these birds are under threat from illegal trade, habitat loss, and human predation. The Australian population is under stricter protection. Wild populations of all three subspecies are estimated to be slightly in excess of 30,000 individuals. The species is listed under Appendix I in CITES.

Description

Length: 57-69 cm (22-27.5 in) depending on subspecies. *Weight Range:* 500-1,100 g/ 171/2 -383/4 OZ.

Color: The plumage of the Palm Cockatoo is uniformly glossy black, though it is often described as being grayish or slaty black. This "slatiness" is due to the preening powder which is produced by the preening gland situated over the rump. The powder is regularly and systematically applied to the plumage during grooming. In this connection, Dr. D.E. d'Ombraïn (1933) who made a detailed and prolonged study on a pet Palm Cockatoo over a number of years described the following findings: "The usual gland over the end of the spine has a tuft of down feathers.... This is full of powder secreted by the gland. To use the powder, the bird throws the head completely back, at the same time elevating the end of its spine to meet the back of the head. The latter is then rubbed into the tuft and enough powder is obtained to dust over the whole of the feathers, including the upper surface of the wing feathers. I am of the opinion that this powder is designed for two purposes: first to act as a protection from rain and

secondly (probably) as a means of keeping the bird free from lice."

The only deviation in feather color is the prominent, backward curving crest, which appears to be a naturally dark gray. The other major color deviation is, of course, the naked cheek patch, which extends from the area of the lores and beneath the eye into the cheek. The bare flesh is pinkish toned, but this rapidly becomes scarlet when the bird is excited or feels threatened.

General: The cere is feathered, and the massive beak (see description under genus, above) is grayish-black. The legs and toes are gray, and the iris is dark brown. The tail is relatively long when compared to other cockatoos, and both the tail and the wing appear somewhat rounded.

Dimorphism: Casual observation shows little obvious dimorphism of the sexes, though the male is slightly larger and heavier than the female. This, however, does not help if you are observing a small male and a large female! A more reliable indication perhaps, is the size of the upper mandible which, in the male, is wider at the base, and altogether longer. Though broader, its length makes it appear somewhat more tapered than that of the female. Modern testing methods (e.g. DNA) have much alleviated the problems of sex determination in captive birds.

Juveniles: Because the powder down is not produced until the young are a few months of age, they initially appear to be quite black, though less glossy than the adults. Juveniles can be readily distinguished, however, by the presence of very fine, light yellow bars on the breast and flanks, as well as on the underwing coverts. This barring, according to d'Ombraïn (1933), is caused by minute yellow dots arranged in parallel rows." Forshaw, 1973, describes the barring as "feathers of underwing coverts and underparts edged with yellow." He also states that the bill in very young birds is tipped with white, but this is now thought to be the hatchling egg tooth, which is cast off after a couple of days.

Very little was known about down development in nestling Palm

Cockatoos until fairly recently. It is now known that hatchlings are completely naked with a deep pink skin. No juvenile down is developed, and the juvenile feathers start to develop within a few days. McGillivray (1914), notes that nestlings at 3-4 weeks of age resemble porcupines because their sprouting feathers are encased in sheaths as much as one or two inches in length.

Variation of Subspecies: Without adequate comparative material, it would be almost impossible to ascertain the subspecies of Palm Cockatoo you are dealing with unless you know its exact origin. Even then, there may be problems with those birds that originate in areas where subspecies may overlap. As with all wild birds bred in captivity, it is extremely important that natural subspecies are kept pure.

There is, in fact, very little significant variation in appearance between the subspecies and the subspecific status of some races is still a bone of contention among many ornithologists. General observations have concluded that *P. a. stenolophus* and *P. a. goliath* are similar in size but with the former having a somewhat narrower crest. *P. a. goliath*, however, is considered to be somewhat larger than *P. a. aterrimus*. But this is not necessarily a solution as *P. a. goliath* and *P. a. aterrimus* demonstrate considerable, inconsistent size variation among the various populations.

Voice: The literature contains many descriptions of the call of the Palm Cockatoo. Rand and Gilliard (1967) described it simply as "loud whistled calls," while MacDonald (1973) depicts it as "a harsh shriek and various whistling noises." Other ornithologists have studied the calls in greater detail. Slater (1970), for example, noted that the call is disyllabic, a whistle in which the first note is mellow and deep and the second a shrill and prolonged call in an upward inflection." And Diamond (1972) "A rapid series of alternative upslurs and downslurs 'whik-whik-whik...' at a rate of four per second. Occasionally, a melodious, whistled jumbled call with a quality similar to the *Dominella lory*."

Forshaw (1973), describes the

normal contact call as "a disyllabic whistle; the first note is mellow and deep, while the second is shrill and high-pitched terminating with an abrupt, upward inflection. Other calls are a deep monosyllabic whistle uttered three or four times and a mournful, drawn out, wailing cry."

Dr. d'Ombain (1933), described the calls of his pet Palm Cockatoo in some detail: "...my bird has a peculiarly loud and not unusual whistle, which is uttered at all times of excitement, or when in a merry mood. In addition, some notes are as deep as a Raven's, whilst, when alarmed, especially when the bird is in the dark, it emits a most blood-curdling loud and drawn out growl or scream...The clarion whistle notes sound very much like 'cheea-rity-oureeo-reeo' with the latter part (reeo) repeated sometimes six times. While uttering these calls the mandibles are opened to their widest, and the larynx can be seen working. The call is of such clear, carrying nature that it can be heard upwards of half a mile away."

Observers have often described considerable physical behavior associated with the vocal activity. Lendon (1973) described its main call note as "a shrill, quite indescribable whistle," and "it has a peculiar habit of stamping one foot when excited or alarmed, and the color of the bare facial patch becomes brighter with the same emotions."

Interesting display behavior associated with various vocal activities was similarly reported by Forshaw (1964): "As the first note of the call is emitted, the bird adopts an upright stance with the crest half raised...On giving the high pitched drawn out second note the cockatoo lunges forward, extends the wings, raises the crest and the tail... This display was performed two or three times in rapid succession by different birds in the tree." From this account, it seems that the display/vocal activity was not specifically restricted to courtship behavior.

Taxonomical Considerations

We have touched upon the problems of systematics and taxonomy in the genus description. In relation to the determination of the Palm Cockatoo

into subspecific groupings, it is clear that physical dimensions could be of considerable importance. After lengthy investigation Forshaw (1977) took a bold step in concluding that the Palm Cockatoo occurs in only three distinguishable races. Most modern authors, including the author of article, still list three subspecies, as I have done above, but the problem remains complex and will not be concluded until a more thorough understanding of the genus is reached.

The main problems arise from the fact that minor anatomical and size differences occur throughout the range of the genus and there has, and probably will continue to be, arguments regarding the taxonomic importance of these differences.

The resolution of this problem will depend ultimately on further extensive field and laboratory research.

The Palm Cockatoo in the Wild

Dr. W. T. Greene was one of the first authors to describe the Palm Cockatoo in some detail, in his three volume work, *Parrots in Captivity* which was written between 1884 and 1887 (TFH Publications, New Jersey, published a reprint of these works in 1979). The original work was perhaps the only standard reference work for parrot fanciers at the time and was so for about 30 years. Unfortunately the work contains few reliable references. Greene maintained that the Palm Cockatoo was first described in Western literature in 1707 by a certain Van der Meulen, a Dutch writer. In 1764, the species was more accurately described by Edwards after seeing a drawing sent to him by the Dutch governor of Ceylon (present day Sri Lanka).

The German naturalist Johann Friedrich Gmelin who published the 13th edition of Linné's *Systema Naturae* (1789/96) listed the species in the work as "*Psittacus erithacus*, location Nova Hollandia, error Salwatty. Extra limital." For the next 50 or so years, the species was discussed only briefly in various field notes but it was Macgillivray (Mathews, 1916) who first gave more detailed attention to his observations of the Palm Cockatoo in the field. In 1847,

Macgillivray, who was an officer on the British ship *H.M.S. Rattlesnake*, found the bird to be quite abundant in the deeper forests although it could, at times, be observed in more open areas. When seen, it was invariably perched high in the tops of *Eucalyptus* trees. When he revisited the area two years later he wrote that the birds were always in pairs and displayed a shyness and wariness which made them difficult to approach.

The Palm Cockatoo indeed is a wary bird and, when out of the forest, it usually perches at the tops of the highest trees often on dead branches which give the birds an adequate view of the surrounding area. According to Macdonald (1973) it may occasionally be seen in groups of five to seven individuals, but it more generally remains solitary or in the company of its mate.

After spending the night in its roosting site, the Great Black Cockatoo begins to stir and preen itself well after sunrise. It then responds to the calls of other birds in the vicinity. Preening may take an hour or so before the birds travel in small groups to the "meeting tree." Another Macgillivray and ornithologist (a distant relative of the Macgillivray mentioned above), observed that these groups of birds would perform "...a whole series of evolutions and antics. Sometimes a pair would take up a position on a spout and all the others would try to displace them by flying at them from all sides, and this would often be kept up for half an hour."

The performance described occurs in the highest of trees in forest clearings or at the forest edges. Because such tall trees are generally scarce in the more open areas, a single suitable tree often becomes a favorite meeting place for long periods. After their morning preening and recreation sessions, the birds fly off together to the feeding grounds, the departure usually initiated by a single "leader." The flight of the Palm Cockatoo is slow and majestic but somewhat labored; several, almost leisurely, wing beats being interspersed with periods of gliding. Forshaw (1964) states that they "...make a most impressive sight as they float through the rain

forest tree tops..." After normal flight the birds prepare to land with a long glide directly into a tree, rather than adopting the spiral course attributed to other cockatoos.

Palm Cockatoos remain at their feeding sites for most of the day returning to their individual roosting sites only as the sun is setting. In the wild, the main food source for Palm Cockatoos is the nut of the Screw Pine (*Pandanus* species), though they will also feed upon various other seeds, fruits, leaves, and flowers. Although most authorities state that the birds feed primarily in the trees, they are occasionally seen on the ground, feeding on low vegetation or fallen fruit. Macgillivray (Mathews, 1916) reported finding pieces of quartz in the birds' gizzards (obviously to help in the digestive process) while Rand (1942) reported finding about two tablespoons of sedge seeds (from a small forest floor plant) in a dissected gizzard.

Early reports that Palm Cockatoos also ate various grubs and insects have since been rejected as all gizzard contents examined reveal evidence that the birds feed almost exclusively on vegetative materials.

Interspecific aggression was observed by Forshaw (1964) on two occasions when, in each case, a Sulfur-crested Cockatoo *Cacatua galerita galerita* had landed on a branch of a congregation tree. In the first case the intruder was immediately and aggressively driven off while, in the second case, the trespasser was "greeted with resentment," the Palm Cockatoo raising its crest and approaching the other with slow deliberate steps.

Reproduction of Palm Cockatoos

In the Wild

To date, most evidence points to there being only a single egg in a clutch. Only one egg, nestling, or fledgling was found in any of the 17 nests inspected by McLelland in his expedition to Cape York Peninsula in 1911 (as reported in Macgillivray, 1914). However, Eastman and Hunt (1966) in their book *Parrots of Australia* maintain that the average clutch contains two

eggs, though they do not clarify the source of this information.

The eggs of the Palm Cockatoo are white, somewhat pitted and showing limy excrescences. Eggs in the H.L. White Collection and the Australian museum exhibit a dimension range of 44.7 - 54.9 x 34.5 - 39.9 mm (Forshaw, 1977).

Until relatively recently, little data was available in regard to the courtship behavior of wild Palm Cockatoos, while information on incubation and rearing was also scarce. The Marquis of Tavistock (a serious aviculturist), however, writes in *Avicultural Magazine* (1928): "I have a pair of Palm Cockatoos in my collection for about a year. In the spring they were turned into a large aviary but they have been so shy and secretive, spending nearly all their time in the shelter, that ... one might almost have said of them that they 'had no habits'. This afternoon, however, they were both in the flight and the hen ... began to make advances to her companion. With her crest partly erect, she walked up to him in a jaunty manner, and when quite close puffed out the feathers on her breast. She then faced in the same direction as the cock and stamped either foot alternatively, posturing and bowing and cocking her head in a ridiculously affected manner which she evidently considered quite becoming. The performance was enlivened by the distinctive calls - a kind of snarling croak and a crescendo scream which I can only describe as indistinguishable from that uttered by a housemaid in bandage with her swain. During the performance the bare skin on the hen's face became a much deeper pink. The cock...did not respond to her advances, but made no attempt to drive her away."

Another reference from Tavistock (1933) describes his observations of the male feeding the female, but again no further "mating" interest was noted.

Wood (1984) provides the first substantial description of courting Palm Cockatoos in the wild. He studied a pair of birds in the Cape York Peninsula between March and August 1983. Most courtship activity occurred early morn-

ings and late afternoons. One of the pair was seen to pirouette around the top of a tree trunk with its wings outstretched while..."beating the trunk with an object in its left foot..." The display was interspersed by head rolling and erection of the crest. After witnessing the display from a nearby vantage point, the partner flew down to join the other bird which proceeded to stroke the partner on the neck with its head. Wood does not distinguish the sexes in his report. Low (1993) reports observing (via a monitor screen) a captive male displaying to a female. Perching next to the female the male turned his head sideways, briefly shook his head, opened his wings and held them open for a few seconds. "He then whistles and calls 'oow-wah'."

Although our knowledge of the Palm Cockatoo's reproductive cycle and rearing of young in the wild is virtually non-existent, there have been some observations on nest preparation. The nest is invariably situated in a hollow trunk or limb in the highest of trees, often 50 feet or more above the ground. The cavity of the nest may be as much as 10 feet down in the hollow. Palm Cockatoos are the only members of the cockatoo family known to construct a "nest" from materials collected from outside the nest cavity (other cockatoo species may inadvertently line the nest hollow with wood chips originating from cavity enlargement). A layer of wood splinters is carefully laid by the birds at the bottom of the hole, to act as a bed for the single egg. The breeding pair collect pieces of wood and sticks of varying sizes, take them to the nest entrance and drop them into the cavity. They then climb into the hollow and splinter the wood gradually into pieces about the size of matchsticks. The layer of sticks may be anything from a few centimeters to more than a meter in depth.

It is thought that this "bedding" serves two purposes, the major one being to prevent the egg or chick being submerged and/or drowned during periods of heavy rain. Secondly, the loosely laid stick platform will allow fecal matter to pene-

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trate below the surface and help keep the nest dry and clean.

The breeding season for Palm Cockatoos of Cape York Peninsula is July to January and nestlings have been found as early as the first week of August and as late as the end of January. Most breeding, however, seems to occur between September and November. In New Guinea, reports suggest that the birds breed somewhat later. In Rand (1942) Archbold reports finding specimens with enlarged gonads during August. Ripley (1942), however, states that, in his experience, *P. a. goliath* breeds primarily in December.

Captive Breeding

There are few reports of successful breeding of the Palm Cockatoo in captivity prior to 1975. Lack of success could be attributed to a number of factors. Maybe the species has a natural inhibition to reproducing in captivity or perhaps not enough specimens are kept to make up viable breeding pairs. The most likely reason is that environmental conditions for captive birds were not quite right. Modern breeding successes of many species of animals have only occurred after careful consideration has been given to providing "natural" conditions or close compromises.

There are some early reports of infertile eggs being laid – as in d'Ombain's pet, which laid over 80 eggs in a course of 20 years (d'Ombain, 1933) – and the few clutches of fertile eggs reported have either failed to hatch or the hatched youngsters ejected.

A few unsubstantiated reports exist on successful breedings but the first documented success was reported by Robert T. Lynn of Sydney, Australia in 1968 (Sindell and Lynn, 1989). The breeding pair had been collected from the wild in New Guinea about 30 years previously. The nest was in a vertical hollow log about 1.5 m (5 ft) high. The cavity was 37-45 cm (15-18 in) in diameter and the entrance was near the top. The male fledged at 81 days. Two further successful breedings were reported, both females

(1970 and 1972) both of which left the nest after 78 days.

A number of successes have been reported from public collections since the early 1980s the most notable being Leipzig Zoo (Germany) which reared eight chicks to maturity from 1981 through 1989. The most successes of all, however, are reported by the Avicultural Breeding and Research Center (ABRC) a privately owned enterprise at Loxahatchee, Florida, USA, who claim to have hand-reared more than 20 individuals in the period 1987-1991.

A stud book for the Palm Cockatoo was started in the USA in 1985. During 1985-1991, 74 chicks were reported hatched at various establishments, of which 49 survived more than one year (Low, 1993).

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