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FIRST DESCRIPTION OF SONG DISPLAY AND OTHER NOTES ON THE BARE-NECKED FRUITCROW (*GYMNODERUS FOETIDUS*, COTINGIDAE)

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Resumen. – Primera descripción del canto nupcial y otras notas sobre de la Pavita pesdecipelada (*Gymnoderus foetidus*, Cotingidae). – Aquí presento la primera observación de campo publicada del despliegue nupcial y de la vocalización de la Pavita pesdecipelada (*Gymnoderus foetidus*). Incluyo datos tomados de especímenes del Museo de Ciencias Naturales de la Universidad del Estado de Louisiana (LSUMZ), tales como color de zonas sín plumas, dimorfismo sexual en tamaño, dieta, una descripción del plumaje juvenil y del mantenimiento de plumaje. A pesar de ser común y vista con frecuencia, esta especie ha sido poco estudiada.

Abstract. – I present here the first published field observations of display behavior and vocalizations of the Bare-necked Fruitcrow (*Gymnoderus foetidus*). Data taken from specimens at Louisiana State University Museum of Natural Science (LSUMZ) are also given, including bare part colors, sexual size dimorphism, diet, a description of juvenile plumage, and notes on plumage maintenance. This species, although common and often seen, is remarkably understudied. *Accepted 28 February 2003.*

Key words: Bare-necked Fruitcrow, *Gymnoderus foetidus*, Cotingidae, natural history, specimen data, vocalizations, song display.

Surprisingly little has been published about the Bare-necked Fruitcrow (*Gymnoderus foetidus*), a rather common and widespread Amazonian cotinga (Snow 1982, Hilty & Brown 1986, Ridgely & Tudor 1994, Ridgely & Greenfield 2001a, 2001b, Hilty 2003). Here, I present field observations of this species that include, it seems, the first descriptions of male courtship behavior and vocalizations. These observations were made in June 2000 at a site in the Río Pauya valley in the Cordillera Azul, southwestern departmento Loreto, Peru (07°35'S, 75°56'W). Also, data from specimens deposited in the Louisiana State University Museum of Natural Science (Baton Rouge, hereafter LSUMZ) are presented here to augment those reported by Snow (1982).

BEHAVIOR AND VOICE

Snow (1982) cited one previous description of the species' voice, made by Penard &Penard (1910), as simply "moe moe." Sick (1996) gave a description of the voice as a sonorous growl. Evidently, no behavioral information was recorded in conjunction with either of these vocal descriptions. Hilty & Brown (1986), Ridgely & Tudor (1994), Ridgely & Greenfield (2001b), and Hilty (2003) stated that they were unaware of any vocalization made by the species. Furthermore, although facial wattles adorn both sexes (more pronounced in males), and are an obvious physical feature of the species, there is no mention in the literature of their use.

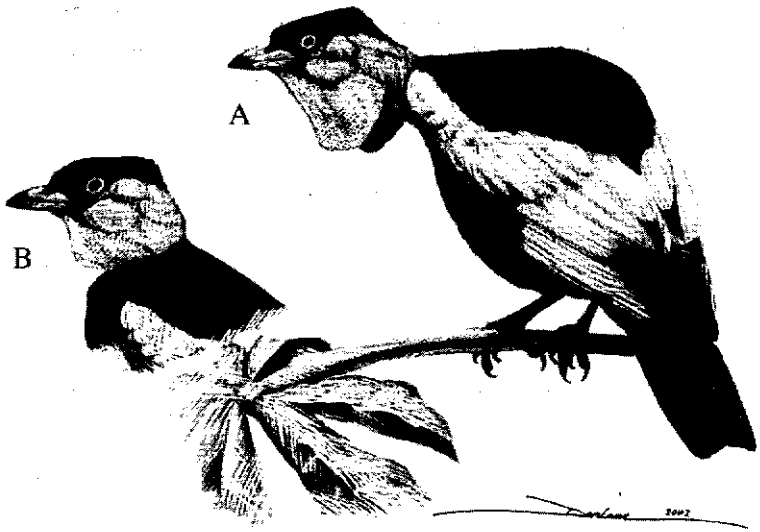

FIG. 1. A: Male Bare-necked Fruitcrow displaying before female; B: Male relaxed.

About mid-morning of 12 June 2000, I watched a male and a female Bare-necked Fruitcrow in a stand of 10–12 m tall *Cecropia* trees beside the Río Pauya at about 350 m elevation. Although the birds were actively feeding on *Cecropia* catkins, the male stopped and faced the female while shaking his head periodically with his neck extended and throat wattles enlarged and drooping (Fig. 1). No vocalizations or more elaborate displays were given. The female did not appear to be particularly attentive to these movements.

Late in the afternoon of 26 June 2000, at about 420 m elevation along a smaller tributary of the Río Pauya, I observed an adult male Bare-necked Fruitcrow perched in the highest branches (about 40 m above the ground) of an emergent tree as it performed a more elaborate display. This display was observed for nearly 30 min, but attempts to tape-record it were not successful, because the cassette recorder was overwhelmed by the sound of nearby rushing water. I did, however, take photographs, make sketches, and tape record a verbal description of the behavior of the bird.

The bird frequently shook its head wattles exaggeratedly. About every five min, it would pull its neck back slightly and inflate the blue bare-skinned portion like a balloon (Figs 2C, 2D), simultaneously producing a deep, foghorn-like, bellowing "ooooooo," somewhat like that of the Amazonian Umbrellabird *(Cephalopterus ornatus)*. Usually, this vocalization was followed by a quick, upward jabbing motion of the head, with the bill slightly open and pointing straight up, and ending with the head extended forward (Fig. 2E). If another, softer vocalization was produced with this movement, I was unable to hear it over the sound of rushing water. No females or other males were observed in the vicinity at the time.

While preparing a specimen of a subadult male from the Río Pauya on 19 June 2000, I noted its syrinx was remarkably large and well-developed (also see Ames 1971). Given the size of the syrinx of the Bare-necked

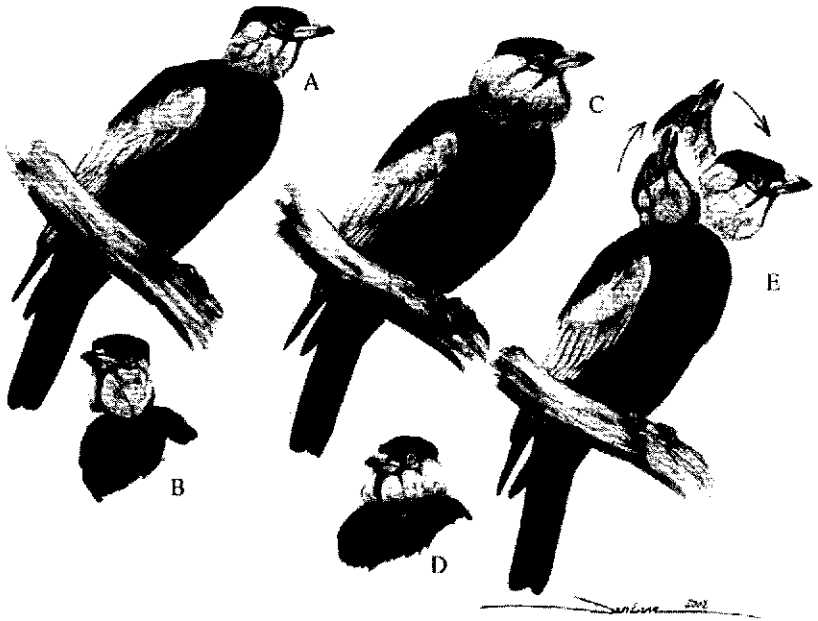

FIG. 2. Male Bare-necked Fruitcrow song display. A: Relaxed; B: Same, from front; C: Bellowing; D: Same, from front; E: Upward head jab after bellowing.

Fruitcrow, it is not surprising that the bird produces such a deep vocalization. Perhaps this vocalization has not been noted before because of its relative quietness or its vocal similarity to syntopic cotingids such as the Amazonian Umbrellabird. The Bare-necked Fruitcrow is a rather common and highly visible cotinga in "varzea" and adjacent *terra firme* forest in Amazonian South America, thus the fact these behaviors and vocalizations have not been noted previously may be because they are genuinely infrequently given.

The behavior observed in conjunction with the vocalization of the Bare-necked Fruitcrow is marginally similar to that mentioned by Snow (1982) for portions of the vocal displays of the Red-ruffed Fruitcrow (*Pyroderus scutatus*) and members of genus *Cephalopterus,* particularly the Bare-necked Umbrellabird (*C. glabricollis*) and to a lesser extent the Capuchinbird (*Perissocephalus tricolor*). Both the Red-ruffed Fruitcrow and umbrellabirds inflate gular airsacs and produce a deep booming sound as well, but in both genera a bowing-and-rising motion accompanies these vocalizations. The Capuchinbird also inflates gular airsacs, but has a different sounding voice and more elaborate posturing. Other large cotingids, presumably related to this group [e.g., Crimson Fruitcrow (*Haematoderus militaris*), Black-faced Cotinga (*Conioptilon mcilhennyi*), and Purple-throated Fruitcrow (*Querula purpurata*)], do not appear to share similar vocal displays or their displays are imperfectly known (Ames 1971, Snow 1982, Ridgely & Tudor 1994).

SPECIMEN NOTES

Iris color. Snow (1982) described the iris color of the Bare-necked Fruitcrow from the descriptions of various collectors as anything

TABLE 1. Data for Bare-necked Fruitcrows from specimens at Louisiana State University Museum of Natural Science.

	Catalog number	Age (by plumage)	Iris color	Mass (g)	Fat	Locality
Females	52157	Adult	Brown	-	-	Peru: Ucayali
	92589	Adult	Brown	-	-	Peru: Amazonas
	133081	Adult	Brown	231	Trace	Bolivia: Pando
	137291	Adult	Dark brown	238	No	Bolivia: Santa Cruz
	137292	Adult	Pale bluish-white	230	Trace	Bolivia: Santa Cruz
	133080	Adult	1 brown, 2 gray rings	232	No	Bolivia: Pando
	AUT 719	Adult	Dark brown	222	No	Peru: Loreto
	119973	Immature	1 brown, 1 gray ring	228	Moderate	Peru: Loreto
	110281	Juvenile	Dark brown	160	No	Peru: Loreto
Males	119972	Adult	1 brown, 2 gray rings	340	no	Peru: Loreto
	35227	Adult	Brown	-	-	Peru: Ucayali
	133082	Adult	Gray	330	No	Bolivia: Pando
	151291	Adult	1 brown, 1 gray ring	300	-	Bolivia: Santa Cruz
	133083	Adult	Pale grayish	360	No	Bolivia: Pando
	JPO 8016	Adult	1 brown, 1 gray ring	430	Heavy	Peru: Loreto
	83396	Immature	1 brown, 2 gray rings	-	Light	Ecuador: Napo
	DFL 1255	Immature	1 brown, 1 gray ring	255	No	Peru: Loreto
	JPO 8054	Immature	1 brown, 1 gray ring	282	Light	Peru: Loreto

from "gray or plumbeous" or "grayish-cream" to "dark crimson," "deep red," and "dark red." Hilty & Brown (1986), perhaps citing the above, gave the iris color as simply "red." Because the birds with red irides were largely collected in Bolivia, Snow (1982) postulated that there may be geographic variation involved. Haverschmidt (1968) and Haverschmidt & Mees (1994) give the iris color of specimens from Suriname as "dark gray." Iris color is not specifically mentioned in the text of any modern field guide, but illustrations in Ridgely & Tudor (1994) and Ridgely & Greenfield (2001b) show it with dark reddish or chestnut irides, probably also following Snow's descriptions, whereas it is portrayed with pale brown irides in Hilty (2003). Based on LSUMZ specimen labels (n = 18), the iris color of the Bare-necked Fruitcrow is actually more complicated: the most detailed label data describe it as having a narrow dark brown to golden-brown band immediately around the pupil that is then ringed by a wider cerulean blue-gray band that fades to paler gray outwardly (Table 1). Some labels only mention "dark brown" or "pale gray" but this may be due more to cursory inspection of irides while preparing the specimen in the field or to decaying irides than to true iris color. Alternatively, perhaps the size of the two bands may change depending on mood, much as do the irides of *Amazona* parrots (pers. observ.), this having resulted in the variation in descriptions cited by Snow and LSUMZ specimen labels. LSUMZ label data do not support the presence of geographic variation in iris color, nor does there seem to be sexual dimorphism or age variation, with the possible exception of the single juvenile specimen from Peru that has irides "dark brown" (Table 1).

Bare skin color. Bare skin on head, neck, and belly of adult males (n = 6) is described as

"blue," "campanula blue," "bluish-gray, " or "purplish-blue," although the orbit skin for one individual is "flesh." For subadult males (n = 4), bare skin is described as "blue," "blue-gray," "dull blue, "and "cobalt blue becoming paler towards throat." In adult females (n = 2), bare skin is described as "campanula blue" and "orbit skin pale blue, neck dark blue." A photo of a freshly collected adult male prior to preparation show the orbital ring to have outwardly-pointing fleshy projections creating a "star-like" appearance.

Leg color. Tarsus and toe coloration is given as medium gray or blackish-gray in adult males (n = 4). Subadult males (n = 3) have legs "greenish blue-gray," "olive, soles of feet buffy," or "medium gray." Adult females (n = 5) have tarsi and toes described as "grayish-olive," "dark gray," "slate-gray," or simply "gray." One subadult female has feet "greenish-gray."

Bill color. Bills of nearly all age and sex classes (n = 12) are described as "gray," "blue-gray," or plumbeous-gray" on the basal 1/2 to 2/3 and black on the distal 1/3 to 1/2. One subadult female has bill "black, mouth lining yellow." The one juvenile specimen has maxilla "blackish" and mandible "dark gray."

Sexual dimorphism. As suggested by the measurements presented by Snow (1982), and Haverschmidt &Mees (1994) the Bare-necked Fruitcrow shows strong size dimorphism. Snow (1982) only presented weights for three males and no females, however, so it is not possible to judge differences in mass between sexes. Haverschmidt & Mees (1994) gave weights for two adult and two immature males and one female, but from such a small sample, it is difficult to ascertain if age plays a larger role than sex in weight differences. Therefore, I present here masses for adult and subadult male and female specimens housed at LSUMZ (Table 1). Mean weights (± SD) of adult males and females do not overlap (females: 230.6 ± 5.7 g, males: 352 ± 55.7 g; n = 5 for both sexes), confirming significant sexual size dimorphism in the species using a Mann-Whitney U test ($U = 25$, $P < 0.01$). Specimen labels noted fat deposits in some specimens, heavy fat in one case, although there seems to be no (temporal or geographic) pattern to fat deposition (Table 1). In addition, it appears that immature birds tend to weigh less than adults (aging based on plumage) as suggested by data presented by Haverschmidt &Mees (1994). The one juvenile specimen, apparently recently (?) fledged, weighing considerably less than any other specimen (Table 1).

Diet. Most sources report Bare-necked Fruitcrows to be frugivorous (Snow 1982, Hilty & Brown 1986, Ridgely & Tudor 1994, Sick 1996, Ridgely & Greenfield 2001b, Hilty 2003). Haverschmidt (1968) reported stomach contents including some arthropod remains, a mantid and a locust. Whittaker (1996) reported twice observing Bare-necked fruitcrows performing aerial sallies for flying ants or termites. Besides this evidence for insectivory, Snow (1982) found only fruit in the diet of the species, including palm fruits (*Oenocarpus* sp.) and various unidentified small (berry-like) and large (seeds weighing 13 g) fruits. Whittaker (1996) observed Bare-necked Fruitcrows feeding on ripe *Cecropia* fruits and *Euterpe* palm fruits. As noted above, my own observations include a pair feeding on *Cecropia* catkins, and I have also seen the species eating arboreal melastome (*Miconia*?) fruits. Label data from thirteen LSUMZ specimens also suggest the species to be highly frugivorous: three report "seeds," the other ten unidentified "fruit" (mostly small fruits under 20 mm diameter) or "fruit and seeds." There is no mention of arthropods in any stomach

of LSUMZ specimens, and thus insectivory may be fairly infrequent and opportunistic, as in the cases noted by Whittaker (1996), or possibly seasonal. There is anecdotal evidence of seasonal movements of Bare-necked Fruitcrows in northwestern Amazonia and Surinam (Haverschmidt 1968, Haverschmidt & Mees 1994, Snow 1982, J. V. Remsen, Jr. *pers. com.*); this may be tied to local seasonality of fruits that comprise the species' diet.

Juvenile plumage. LSUMZ 110281 represents a juvenile Bare-necked Fruitcrow. The juvenile plumage of the species is very poorly known and has only been mentioned once before in the literature (Snow 1982). The plumage identified as juvenile by Ridgely & Greenfield (2001b) is in fact the immature or subadult plumage after post-juvenal molt. Based on the LSUMZ specimen, the juvenile plumage of Bare-necked Fruitcrows is rather unique, appearing more like a miniature Great Potoo (*Nyctibius grandis*) than like a cotinga. It is considerably smaller than adults of the species (see above), and has almost no visible bare skin on the head, merely a small bare moustachial area on the side of the throat (color not noted on label). Bill is "black, base of mandible gray." Tarsi and toes are "dull olive." Otherwise, the contour feathers are entirely whitish with narrow blackish or dark brown chevrons on the breast, minute scaling on the throat and crown, and barring on the back. The rump has dark vermiculations on whitish feathers. The wings, which are fully developed, have primaries and primary coverts blackish. The remainder of the wing is largely white with darker gray smudging at the secondary bases and fine dark vermiculations on most feathers with a heavier dark subterminal bar. The tail is largely blackish-gray, but the very tips of all rectrices are whitish with black vermiculations. Juvenile rectrices can be retained into immature plumage, but most other juvenile plumage characters are lost in the post-juvenal molt. The LSUMZ juvenile Bare-necked Fruitcrow is already molting into immature plumage with patchy longitudinal rows of blackish feathers with white terminal bands appearing on the belly, chin, and scapulars, and single black feathers randomly distributed on the crown and face.

Plumage maintenance. Snow (1982) noted that members of both of the cotingid genera *Gymnoderus* and *Conioptilon* share the presence of powder down patches in their plumages and suggests this character may be an autapomorphy shared by the two genera. While preparing a specimen of a subadult male Bare-necked Fruitcrow, I noted the presence of an uropygial gland. The presence of this gland in conjunction with powder down is curious, suggesting that the latter may not be used necessarily for plumage maintenance, unlike other species in which it is present.

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