

THE NESTS OF TWO BAMBOO SPECIALISTS: *CELEUS SPECTABILIS* AND *CERCOMACRA MANU*

ANDREW W. KRATTER¹

Museum of Natural Science and Department of Zoology and Physiology
119 Foster Hall, Louisiana State University
Baton Rouge, Louisiana 70803 USA

Abstract.—The nests of *Celeus spectabilis* (Rufous-headed Woodpecker) and *Cercomacra manu* (Manu Antbird) are described. These are the first published descriptions of the nests of these species, both of which are restricted to thickets of spiny bamboo (*Guadua weberbaueri*) in southwestern Amazonia. The nest of the woodpecker, a hole placed 2.8 m high in a soft-wooded dead tree, was similar to the nests of other species in the genus. The nest was in an area of almost pure bamboo. The nest of the antbird, also in a dense bamboo thicket, was a pensile pouch suspended by the nest rim. The nest was 3.5 m high and attached to small bamboo branches. The previously defined groups in the genus (the *tyrannina* group and the *nigricans* group) may differ in nest structure, although comparative material is scant.

NIDOS DE DOS ESPECIALISTAS DE BAMBÚ: *CELEUS SPECTABILIS* Y *CERCOMACRA MANU*

Sinopsis.—Los nidos de *Celeus spectabilis* y de *Cercomacra manu* son descritos en este trabajo. Los mismos se encuentran solamente en matorrales espinosos de bambú (*Guadua weberbaueri*) en el suroeste de la Amazonia. El nido de *Celeus*, se encontró en un área virtualmente pura de bambú, y consistió de un hueco situado a 2.8 m del suelo en un árbol muerto de madera blanda. Este es similar a otras especies dentro del género. El nido de *Cercomacra*, también situado en un matorral de bambú, es una bolsa suspendida y unida a ramitas de bambú. El nido estaba situado a 3.5 m del suelo. Los dos grupos del género que han sido descritos previamente (el grupo *tyrannina* y el grupo *nigricans*) pudieran diferenciarse en las estructuras de sus nidos. No obstante, los datos obtenidos no son suficientes para establecer comparaciones.

The degree of habitat specialization in Amazonian birds has only been recently appreciated. Among the best known Amazonian habitat specialists are the bamboo specialists, particularly those species restricted to thickets of *Guadua* bamboo in southwestern Amazonia (Fitzpatrick and Willard 1990; Kratter 1997; Kratter and Parker 1997; Parker 1982; Parker and Remsen 1987; Parker et al. 1997; Pierpont and Fitzpatrick 1983; Stotz et al. 1996). Nevertheless, many aspects of their biology, including nest site selection, remain poorly known. In this paper I document the discovery of the first nests of two bamboo specialists, *Cercomacra manu* (Manu Antbird) and *Celeus spectabilis* (Rufous-headed Woodpecker), in southeastern Peru. These species are usually closely associated with thickets of *Guadua* bamboo. Kratter (1997) classified *Celeus spectabilis* as a near-obligate specialist (it has been occasionally recorded away from bamboo) and *Cercomacra manu* as an obligate specialist (it has only been recorded in bamboo).

¹ Current address: Florida Museum of Natural History, University of Florida, Gainesville, Florida 32611 USA.

STUDY AREA

I discovered both nests during studies of bamboo specialist birds at the Tambopata Research Center (also known as Ccollpa de Guacamayos) along the Río Tambopata in the department of Madre de Dios, Peru (13°08' S, 69°36' W). The dominant vegetation at this lowland (ca. 350 m elevation) Amazonian site is mature forests on low-lying floodplain soils and an extensive (ca. 56 km²; Kratter 1995) thicket of *Guadua weberbaueri* bamboo on higher elevation soils (see Foster et al. 1994). Smaller bamboo thickets (*G. weberbaueri* and *G. angustifolia*) are scattered throughout the floodplain forest. Other habitats present include various stages of early successional vegetation, a *Mauritia flexuosa* palm swamp (or *aguajal*), and mature *terra firme* forest (Foster et al. 1994). A marked dry season occurs from May–October in lowland southeastern Peru (Erwin 1984), although rainfall increases somewhat in September (1981–1993 records from Explorer's Inn on the Río Tambopata). As a whole, breeding activity for forest birds appears to be low during the early part of the dry season, but picks up substantially by the end of August (pers. obs.).

THE NEST OF *CELEUS SPECTABILIS*

On 26 Jun. 1992, I flushed a *Celeus spectabilis* from a hole in an 18-m tall, dead snag with a broken off top. I saw a male within 5 m of the nest hole the day before. The nest tree, 60 cm in diameter at breast height, was partially decomposed; it lacked bark and the wood was quite soft. The oval hole (120 × 100 mm) was on the south side of the tree, 2.8 m above the ground, with the long axis vertically oriented. The entrance tunnel angled upward at 45° and had a round and smaller, although unmeasured, inside diameter. In July of the following year (1993), I felled the nest tree, then unused, to investigate the cavity. The angled entrance tunnel was 150-mm long and the cavity was placed toward the back (north) side of the tree. The unlined cavity had a diameter of 150 mm at the top and narrowed gradually toward the bottom; the cavity was 240-mm deep. I found no egg fragments or signs of nestlings.

From 25 Jun.–3 Jul. 1992, I observed unmarked males and females at the nest hole eight different times at various hours during daylight (0750–1540 h). On 29 June, I watched the nest continuously for 2.5 h (0730–1000 h), but the nest was only visited once (by a male, which departed within 30 s of arriving). Given the infrequent visits, I suspect that the birds were incubating at this time. The adults carried no food to the nest, no fecal sacs were removed from the nest, and no chicks were heard. I did not see adults near the nest site between 4–17 July (when I left the site) although I visited the nest nearly daily. I suspect that the nest was abandoned or predated by this time.

The nest tree was within 75 m of a bluff edge over the Río Tambopata. The bluff is cloaked in a blanket of spiny, *Guadua weberbaueri* bamboo. The vegetation was rather open in the vertical stratum of the nest, except for dense bamboo stems; the nest hole was not hidden by foliage. How-

ever, this open area was sandwiched between a layer of dense ground cover (<1 m) and a dense foliage layer of bamboo (3–8 m). The woodpeckers often approached or departed the nest with long (>50 m) unimpeded flights. Bamboo foliage gave nearly 100% cover on vegetation transects near the nest, but there was little canopy cover (<25%) above the bamboo.

Guadua bamboo thickets are the preferred habitat of *Celeus spectabilis* (Kratter 1997, Parker 1982, Stotz et al. 1996). Although this habitat was extensive at the study site, this woodpecker was the least-common bamboo specialist there, with only 3–4 territories in ca. 150 ha of bamboo habitats surveyed (Kratter 1997). If this species requires large (i.e., >50-cm diameter), dead trees for nesting, then the scarcity of these trees in bamboo thickets (pers. obs.) may limit the population density of this woodpecker.

The nesting behavior of *Celeus spectabilis* (see Short 1982, Winkler et al. 1995) appears to be undocumented. This species appears to breed during the dry season in Peru. In addition to the record herein, I collected a female with enlarged gonads on 5 Jun. 1993 and a male with enlarged gonads (testis size = 9×4 mm) on 25 Jun. 1993 at sites adjacent to the Tambopata Research Center, and two females in breeding condition were collected on 4 Aug. 1978 and 9 Aug. 1977, in depto. Amazonas, Peru (Louisiana State University Museum of Natural Science specimen AWK611 [uncatalogued], LSUMZ 87655, and LSUMZ 84580, respectively). Winkler et al. (1995) gave a “probable” breeding season of June–November.

The nest of *Celeus spectabilis* does not seem strikingly different from the nests of other species in the genus. Although some species of *Celeus* (*C. brachyurus* [Rufous Woodpecker], *C. lugubris* [Pale-crested Woodpecker], and *C. flavescens* [Blonde-crested Woodpecker]) nest in arboreal ant (especially *Crematogaster*) or termite nests, at least *brachyurus* and *lugubris* also excavate nests in live or dead trees (Ali and Ripley 1987, Short 1970, 1982, Winkler et al. 1995). The other species in the genus for which nests have been described (*C. castaneus* [Chestnut-colored Woodpecker], *C. loricatus* [Cinnamon Woodpecker], *C. elegans* [Chestnut Woodpecker], *C. undatus* [Waved Woodpecker]) excavate holes in the soft wood of live trees or in recently dead trees (French 1973, Oniki and Willis 1982b, Russell 1964, Short 1982, Slud 1964, Stiles and Skutch 1989, Winkler et al. 1995). Unfortunately, the breeding and nesting behavior of *C. torquatus* (Ringed Woodpecker), probably the closest relative of *C. spectabilis* (Short 1982), are unknown. Nest heights in the genus vary from 0.9 m (*C. castaneus*) to 30 m (*C. undatus*) (Russell 1964, Winkler et al. 1995). The only published nest dimensions in the genus are for *C. brachyurus* (hole diameter = 50 mm; Ali and Ripley 1987) and *C. elegans* (hole diameter = 50 mm, cavity depth = 150–300 mm; French 1973). The wood of the nest tree may be softer in *C. spectabilis* than the nest trees used by other species in the genus (see citations above). In addition, the entrance hole of *C. spectabilis* was larger than the other *Celeus* species

described above, although this may have resulted from the soft substrate of the *C. spectabilis* nest tree.

THE NEST OF *CERCOMACRA MANU*

On 3 Sept. 1993, I discovered a male *Cercomacra manu* building a nest in a *Guadua weberbaueri* bamboo thicket. On 5 September the nest appeared incomplete; no birds were seen near it in over 1 h of observation. However, on 11 September a male was sitting on the apparently completed nest, presumably incubating. A male was also sitting on the nest on 13 September, the last day I checked the nest. Because the nest was in a protected area and the bird was still incubating when I left the site, I did not collect the nest.

The nest, a pensile pouch, was suspended from near the rim, which was woven onto approximately 3-mm diameter bamboo branchlets near where they forked. The nest was 3.5 m above the ground in dense bamboo foliage. I was able to investigate the nest only with binoculars. The nest was composed of dead bamboo leaves laced with long dry fibers, which may have been stripped from the dry outer clasping sheaths of bamboo. No green vegetation was incorporated in the nest. Based on the length of the sitting bird, I estimated an outside nest diameter of 100 mm and an outside depth of 150 mm.

The nest was in a thicket of almost pure bamboo. Although this thicket was continuous with the extensive bamboo thicket mentioned above for *Celeus spectabilis*, the habitat structure nearby was somewhat different. Bamboo foliage near the antbird nest was closer to the ground (from 2.5–8 m up), and there was less canopy cover above the bamboo than near the woodpecker nest. Without canopy trees to support the spiny stems of *Guadua* bamboo, the heavy weight of foliage apparently causes bamboo stems to bend or break, thus maintaining a low, dense canopy of bamboo foliage (Foster et al. 1994). Territories of *Cercomacra manu* were densely packed in this habitat in the vicinity of the nest (Kratter 1995); often three or four pairs could be heard countersinging at one point. I made several voucher tape-recordings (to bioacoustic collection of Florida Museum of Natural History) of the distinct vocalizations of this species (see Fitzpatrick and Willard 1990, Ridgely and Tudor 1994) in the vicinity of the nesting site.

I found no previous documentation of nesting behavior of this recently described species (Fitzpatrick and Willard 1990). Specimens in breeding condition have been collected between 24 June–6 October only 200 km north of the study area, also in depto. Madre de Dios, Peru. A juvenile of this species was collected there on 8 September (Fitzpatrick and Willard 1990).

Nesting behavior is poorly known in the genus *Cercomacra*. The nests of only two species have been described, *C. tyrannina* (Dusky Antbird) and *C. nigricans* (Jet Antbird), although the genus contains either 10 (e.g., Sibley and Monroe 1990, Ridgely and Tudor 1994) or 11 species (Sick 1993, Stotz et al. 1996). T. K. Salmon (in Sclater and Salvin 1879)

described the nest of *Cercomacra nigricans* as made of dry grasses and placed in a fork in low bushes. Skutch (1969) described six nests of *tyrannina* from Costa Rica and Panama and gave the following summary (p. 231):

“The completed nest of the Tyrannine [=Dusky] Antbird is a pensile pouch attached by its rim to the arms of a supporting crotch. The nest is much higher in the back than [sic] at the front, and the opening is strongly oblique, facing upward and outward. The deep pocket is widest near the bottom and narrows toward the orifice. The thick walls and bottom consist largely of dry leaves. In one nest there were bamboo leaves and fragments of leaves of dicotyledonous plants; in another nest there were grass blades and other leaves; in a third nest there were papery strips of dead monocotyledonous leaves, while in another nest there were pinnae of fern fronds and narrow strips from dead palm fronds. This leafy material is loosely held together and attached to the supporting fork by black fungal strands, brown fibers and the like. Some nests have more or less green moss around the rim and on the outer surface. The lining is usually scanty, consisting of a few fungal filaments or other fibers coiled down in the bottom to form a flattish mat. The overall measurements of the three nests varied from 5 to 7 ¼ inches [127–184 mm] in height and from 3 to 4 inches [76–102 mm] in diameter.”

All but one of the six nests were placed in branch forks within 1.5 m of the ground; the other was 3-m high. Near Manaus, Brazil, *C. tyrannina* also had pouch-shaped nests with one side higher than the other (dimensions: external diameters = 85 and 90 mm, external heights = 115 and 160 mm; Oniki and Willis 1982a); the nests were 0.7 and 1.6 m above the ground. These latter two nests could presumably refer to *C. latea*, which occurs syntopically with *C. tyrannina* in the Manaus area (M. Cohn-Haft, pers. comm.), but was only recently recognized as possibly specifically distinct (Sick 1993, Ridgely and Tudor 1994, Stotz et al. 1996). In contrast, Huber (1932, p. 226) described a somewhat different nest for *C. tyrannina* in Nicaragua:

“a more or less pendant globular affair hanging from the end of a very thin limb. It is carefully woven at the ends of two twigs having a bunch of green leaves at their ends. The entrance is near the top and on one side, nearly roofed over. Composed of dry leaves and palm shreds woven together with the long shredded stems of ferns, some of these fern stems hanging down eighteen inches below the nest. The lining of fine fern stems, the whole nest with green moss and long dripping fern stems looks like so many other branches of moss hanging everywhere. . .

The measurements of the nest are, outside, length 230 mm, width 110 mm. Inside, depth from bottom of the entrance 40, width 45 mm.”

Although he did not explicitly state his sources, Sick (1993, p. 405) ap-

parently used Skutch's (1969) description to classify the "deep bag . . . with a high side entrance" nests of *Cercomacra* apart from other nests in Formicariidae, either the "open basket" nests of species in *Thamnophilus*, *Taraba*, *Sakesphorus*, *Thamnomanes*, *Myrmotherula* (two species), and *Formicivora*; the large closed ball nests of *Pyriglena*, *Myrmotherula gutturalis*, and *Rhopornis*; or the open saucer nests of *Hylophylax*, *Myrmeciza*, *Formicarius*, *Chamaeza*, *Gymnopithys*, *Grallaria*, and *Hylopezus*. Skutch (1969) is the only reference with information on nesting in the genus *Cercomacra* that Sick gave in his bibliography of the family (1993: 422–423).

In comparison to the nine nests of *C. tyrannina* described above, the nest of *Cercomacra manu* contained neither an oblique entrance, nor a globular structure. The nest of *C. manu* was also higher above the ground than any described nests of *C. tyrannina*; this height corresponds to the foraging height of *C. manu* (Kratter 1995), whereas *tyrannina* forages lower in the undergrowth (Skutch 1969, Ridgely and Tudor 1994). The nest of *C. manu* appears to be similar to *C. tyrannina*, however, in dimensions, materials, and attachment to substrate. *Cercomacra manu* has clear phylogenetic affinities with the "nigricans-group" of the genus that includes *nigricans*, *ferdinandi* (Bananal Antbird), *carbonaria* (Rio Branco Antbird), and *melanaria* (Mato Grosso Antbird), and is closest to the latter (Fitzpatrick and Willard 1990, Silva 1992); *C. cinerascens* (Gray Antbird) is the sister taxon to the *nigricans* group (Silva 1992). The other species in the genus form another clade—the "*tyrannina*-group"—that includes *C. nigrescens* (Blackish Antbird), *serva* (Black Antbird), *brasiliana* (Rio de Janeiro Antbird), *latea* (Belem Antbird), and *tyrannina* (Fitzpatrick and Willard 1990). Although they did not mention an oblique entrance, Sclater and Salvin's (1879) description of the nest of *nigricans*, the only described nest in the *nigricans* group, is too brief to provide a useful comparison. Although it appears that the oblique nest entrance or even globular nest structure of the *tyrannina* group may be useful for differentiating it from the *nigricans* group, with so few adequate descriptions of nests known in the genus, the usefulness of nest structure as a character for either uniting the genus (e.g., Sick 1992) or for defining groups within the genus remains unclear. Nesting behavior in the Thamnophilidae as a whole is so poorly known that it is difficult to draw phylogenetic conclusions from nest structure or placement.

ACKNOWLEDGMENTS

I thank J. V. Remsen for providing comments on the manuscript, Mort and Phyllis Isler for tracking down bibliographic material, Krista Lee for helping prepare specimens, Dan Lane and John Bates for helping gather museum data, and Amanda Stronza for translating the abstract. I thank Ing. Briceño and Rosario Acero of INRENA in Lima for permission to study and collect birds in the Tambopata-Candamo Reserve Zone. My field work in Peru in 1992 was made possible by Conservation International's Rapid Assessment Program, directed by Theodore A. Parker, III. Research in 1993 was funded by a Frank M. Chapman grant from the American Museum of Natural History, a Grants-in-Aid research award from Sigma Xi, Alexander Wetmore and AOU Council awards from the American Ornithologists' Union, and a Fugler Fellowship in Tropical Biology from the Museum of Natural Science, Louisiana

State University. My stay at the Tambopata Research Center was facilitated by the staff of Rainforest Expeditions.

LITERATURE CITED

- ALI, S., AND S. D. RIPLEY. 1987. Compact handbook of the birds of India and Pakistan. Oxford Univ. Press, Oxford, United Kingdom. 841 pp.
- ERWIN, T. L. 1984. Tambopata Reserve Zone, Madre de Dios, Peru: history and description of the reserve. *Revista Peruana de Entomologia* 27:1-8.
- FFRENCH, R. 1973. A guide to the birds of Trinidad and Tobago, Livingston Press Wynnewood, Pennsylvania.
- FITZPATRICK, J. W., AND D. E. WILLARD. 1990. *Cercomacra manu*, a new species of antbird from southwestern Amazonia. *Auk* 107:239-245.
- FOSTER, R. B., T. A. PARKER, III, A. H. GENTRY, L. H. EMMONS, A. CHICCHÓN, T. SCHULENBERG, L. RODRÍGUEZ, G. LAMAS, H. ORTEGA, J. ICOCHEA, W. WUST, M. ROMO, J. A. CASTILLO, O. PHILLIPS, C. REYNEL, A. KRATTER, P. K. DONAHUE, AND L. J. BARKLEY. 1994. The Tambopata-Candamo Reserved Zone of southeastern Perú: a biological assessment. RAP working papers 6. Conservation International, Washington, D.C. 184 pp.
- HUBER, W. 1932. Birds collected in northeastern Nicaragua in 1922. *Proc. Acad. Nat. Sci. Philadelphia* 84:205-249.
- KRATTER, A. W. 1995. Bamboo specialization in Amazonian birds. Ph.D. diss. Louisiana State Univ., Baton Rouge, Louisiana.
- . 1997. Bamboo specialization by Amazonian birds. *Biotropica* 29:100-110.
- , AND T. A. PARKER, III. 1997. Relationship of two bamboo specialist foliage-gleaners: *Automolus dorsalis* and *Anabazenops fuscus* (Furnariidae). In J. V. Remsen, Jr., ed. *Studies in Neotropical ornithology honoring Ted Parker*. *Ornithol. Monogr.* 48:383-398.
- ONIKI, Y., AND E. O. WILLIS. 1982a. Breeding records from Manaus, Brazil: Formicariidae to Pipridae. *Rev. Brasil. Biol.* 42:563-569.
- , AND ———. 1982b. Breeding records from Manaus, Brazil: 2. Apodidae to Furnariidae. *Rev. Brasil. Biol.* 42:745-752.
- PARKER, T. A., III. 1982. Observations of some unusual rainforest and marsh birds in southeastern Peru. *Wilson Bull.* 94:477-493.
- , AND J. V. REMSEN, JR. 1987. Fifty-two Amazonian bird species new to Bolivia. *Bull. Brit. Ornith. Club* 107:94-107.
- , D. F. STOTZ, AND J. W. FITZPATRICK. 1997. Notes on avian bamboo specialists in southwestern Amazonian Brazil. In J. V. Remsen, Jr., ed. *Studies in Neotropical ornithology honoring Ted Parker*. *Ornithol. Monogr.* 48:543-548.
- PIERPONT, N. J., AND J. W. FITZPATRICK. 1983. Specific status and behavior of *Cymbilaimus sanctaemariae*, the Bamboo Antshrike, from southwestern Amazonia. *Auk* 100:645-652.
- RIDGELY, R., AND G. TUDOR. 1994. The birds of South America, vol. 2. Univ. Texas Press, Austin, Texas. 814 pp.
- RUSSELL, S. M. 1964. A distributional study of the birds of British Honduras. *Ornithol. Monogr.* 1:1-195.
- SCALTER, P. L., AND O. SALVIN. 1879. On the birds collected by the late Mr. T. K. Salmon in the state of Antiquia, United States of Colombia. *Proc. Zool. Soc. London* 25:486-550.
- SHORT, L. L. 1970. Notes on the habits of some Argentine and Peruvian woodpeckers (Aves, Picidae). *Am. Mus. Novitates.* 2413:1-37.
- . 1982. *Woodpeckers of the World*. Delaware Mus. Nat. Hist. Monogr. Ser. No. 4. 676 pp.
- SIBLEY, C. G., AND B. L. MONROE, JR. 1990. *Distribution and taxonomy of birds of the world*. Yale Univ. Press, New Haven, Connecticut. 1111 pp.
- SICK, H. 1993. *Birds in Brazil: a natural history*. Princeton Univ. Press, Princeton, New Jersey. 703 pp.
- SILVA, J. M. C. DA. 1992. Phylogeny of the *Cercomacra nigricans* species group (Aves: Thamnophilidae) and the biogeographical importance Pliocene-Pleistocene tectonic movements. *Goeldiana Zoologia* 18:1-8.
- SKUTCH, A. F. 1969. Life histories of Central American birds. *Pacific Coast Avifauna* 35. 580 pp.

- SLUD, P. 1964. The birds of Costa Rica: distribution and ecology. *Bull. Am. Mus. Nat. Hist.* 128:1-430.
- STILES, F. G., AND A. F. SKUTCH. 1989. A guide to the birds of Costa Rica. Comstock Publishing Associates, Ithaca, New York. 511 pp.
- STOTZ, D. F., J. W. FITZPATRICK, T. A. PARKER, III, AND D. K. MOSCOVITS. 1996. Neotropical birds: ecology and conservation. Univ. of Chicago Press, Chicago, Illinois. 478 pp.
- WINKLER, H., D. A. CHRISTIE, AND D. NUVNEY. 1995. Woodpeckers: An Identification Guide. Houghton Mifflin, Boston. 406 pp.

Received 20 Nov. 1996; accepted 3 Mar. 1997.