



The Auk 119(3):815–819, 2002

Description of a New Species of *Pionopsitta* (Aves: Psittacidae) Endemic to Brazil

RENATO GABAN-LIMA, MARCOS A. RAPOSO, AND ELIZABETH HÖFLING¹

Departamento de Zoologia, Instituto de Biociências, Universidade de São Paulo, Rua do Matão, Travessa 14, no. 101, CEP 05508-900, São Paulo, SP, Brazil

ABSTRACT.—A new species from Brazil—*Pionopsitta aurantiocephala*—is described, which is easily distinguished from the other species of that genus by its completely bare, intensely orange colored head. Specimens of this species have been historically identified as immatures of *P. vulturina*, which occur in sympatry with *P. aurantiocephala* on the Middle Tapajós River and possibly on the Lower Madeira River. The description of a new species of Psittacidae stresses the importance of new studies in the regions of the Madeira and Tapajós rivers.

RESUMO.—É descrita uma nova espécie do Brasil, *Pionopsitta aurantiocephala*, que pode ser, facilmente, diagnosticada das demais espécies do gênero pela cabeça nua corada de laranja intenso. Indivíduos desta nova espécie têm sido, historicamente, identificados como imaturos de *P. vulturina*, que ocorre em simpatria com *P. aurantiocephala* no médio Rio Tapajós e, possivelmente, no baixo Rio Madeira. A descrição desta nova espécie de Psittacidae reforça a importância de novos estudos na região dos rios Tapajós e Madeira.

The genus *Pionopsitta* Bonaparte, 1854 is composed of eight known species (Cracraft and Prum 1988) allopatrically distributed in Central and South America: *P. pileata* Scopoli, 1769; *P. haematotis* Sclater and Salvin, 1860; *P. coccinillarioris* Lawrence, 1862; *P. pulchra* Berlepsch, 1897; *P. pyrilia* Bonaparte, 1853; *P. barrabandi* Kuhl, 1820; *P. caica* Latham, 1790; and *P. vulturina* Kuhl, 1820. The last three species occur in the Amazon basin. *Pionopsitta barrabandi* is distributed along the western portion of the Amazon basin, extending from southern Venezuela to northeastern Mato Grosso (Brazil), and westwards as far as eastern Ecuador (Forshaw and Cooper 1977). *Pionopsitta caica* occurs from southeastern Venezuela to Guyana, and in the Brazilian states of Roraima and Amapá, on the left bank of the lower Amazon River (Pinto 1978). According to Forshaw and Cooper (1977), *P. vulturina* is distributed south of the Amazon River, from the Gurupi River to the Madeira River and southwards as far as Serra do Cachimbo (Forshaw and Cooper 1977).

Bonaparte (1856) established the genus *Gypopsitta* to include only *P. vulturina*, on the basis of the unique condition of total absence of head feathers in that species, an arrangement later adopted also by many authors (e.g. Cory 1918, Peters 1937, Pinto 1938, Griscom and Greenway 1941). Griscom and Greenway (1941) pointed out the significant resemblance in plumage between *P. vulturina* and *P. barrabandi*, whereas Haffer (1970) considered *P. vulturina* a representative of the superspecies *P. caica*. Some authors continued to use however the genus name *Gypopsitta* to refer to the single bare-headed species (Forshaw and Cooper 1977, Pinto 1978). Based exclusively on plumage characters, Cracraft and Prum (1988) performed a phylogenetic analysis of the genus *Pionopsitta* and suggested the following affinities among the species: (*P. pileata* [(*P. haematotis*, *P. coccinillarioris*) *P. pulchra*] [(*P. barrabandi*, *P. vulturina*) *P. pyrilia*] *P. caica*). According to Cracraft and Prum's (1988) phylogenetic scheme, which shows *P. vulturina* rooted within the genus as the sister-species of *P. barrabandi*, there is no support for recognizing a separate genus for the former species.

Sick (1997) described the characteristic immature plumage of *P. vulturina* as being a bare orange or orange-tawny head sparsely covered with black bristles and lacking a collar of yellow-and-black feathers. By recognizing those characteristics as an immature condition, Sick assumes that this plumage succeeds that characteristically seen in young specimens of *P. vulturina*, whose head feathers are green with a yellow base. Similar conclusions, based on an analysis of taxidermized specimens from Museu Paraense Emílio Goeldi, were presented by Forshaw and Cooper (1977). Sick (1997) also states that birds with the characteristic immature bare orange-headed condition were seen flying in flocks separated from adults.

Four specimens, identical to those described by Sick (1997) as immature individuals of *P. vulturina*, were collected during a recent field trip to the region of the Cururu-açu River, an affluent on the right bank of the Lower Teles Pires River (headwaters of the Tapajós) in southwestern Pará. Besides the four specimens collected, several others were observed in the area along this river and farther south on the São Benedito River, and each had an orange head. On the

¹ Address correspondence to this author. E-mail: ehofling@ib.usp.br

other hand, no black-headed specimens were observed or collected during the field trip. Some of the specimens collected also had well-developed gonads and a well-ossified skull, with no indication of being immature.

Moreover, the analysis of several ornithological collections clearly showed all stages of plumage change—from young to adult—in *P. vulturina*, with a gradual loss of green and yellow feathers and an immediate acquisition of black coloring by the bare skin of the head, none of the analyzed specimens presenting any signs of the ontogenetic gradation suggested by Sick (1997).

The study of the museum specimens mentioned below, which included the holotype of *P. vulturina* deposited at the Museum für Naturkunde (Berlin), along with collected specimens and field observations suggest that flocks composed of immature specimens referred to by Sick (1997) were in fact members of a new species of *Pionopsitta*.

Materials and Methods.—The specimens analyzed in this article belong to the following collections: Museu de Zoologia, Universidade de São Paulo (MZUSP); Museu Paraense Emílio Goeldi (MPEG); Museu Nacional, Universidade Federal do Rio de Janeiro (MN); American Museum of Natural History (AMNH); National Museum of Natural History, Smithsonian Institution (USNM); Academy of Natural Sciences (ANSP); Museum of Comparative Zoology (MCZ); Natural History Museum, Tring (NHM); Muséum National d'Histoire Naturelle de Paris (MNHN); and Museum für Naturkunde, Berlin (MFN).

A total of 74 typical *P. vulturina* (including the type MFN 9825) and of 11 orange-headed specimens were examined. The coordinates used to reconstruct the geographical distribution map (Fig. 2) of the two species were taken from the *Ornithological Gazetteer of Brazil* (Paynter and Traylor 1991), or taken directly from specimens' labels.

Morphological analysis focused on plumage coloring and on morphometric characters (length of wing, tail, and bill). Color description was made according to Smithe (1975). The field works were performed with written permission from IBAMA, no. 144/99-DIFAS.

Results.—The analysis we performed indicates the existence of a new species of bird, described in the lines below.

Holotype. *Pionopsitta aurantiocephala* sp. nov. MZUSP 75188 (Fig. 1). Skin; adult female with completely ossified skull; moulted feathers on head ("bristles"), lower and upper wing coverts, neck, flank, and breast; accumulated fatty tissue; carcass preserved in ethyl alcohol 70% v/v. Specimen collected by R.G.-L. and M.A.R. on 26 November 1999, on the left bank of the Cururu-açu River (08°55'N, 056°40'W), in the municipality of Jacareacanga, Pará, Brazil.



FIG. 1. Holotype of *Pionopsitta aurantiocephala* (MZUSP 75188) showing overall pattern of plumage and main diagnostic characteristics of the taxon. (Drawing by Frederico Lencioni.)

Paratypes. MZUSP 75189: Male (right testicle 10×4 mm, left testicle 9×4 mm), skull 95% ossified, collected on 28 August 1999, skin prepared without skull, carcass preserved in ethyl alcohol 70% v/v, same collectors and site. MZUSP 75190: adult female (developed ovary), completely ossified skull, sparse moulted feathers on neck, specimen preserved whole in ethyl alcohol 70% v/v, collected on 30 August 1999, same collectors and site. MZUSP 75191: adult male (right testicle 10×3 mm, left testicle 7×3.5 mm), completely ossified skull, moulted remiges, wing-coverts and neck, preserved whole in ethyl alcohol 70% v/v, collected on 2 September 1999, same collectors and site. MPEG 18142: male, collected on 18 October 1960 by E. Dente on the Cururu River (Cururu-ri River), an affluent on the right bank of the Upper Tapajós River.

Diagnosis. *Pionopsitta aurantiocephala* differs from other congeneric species, except *P. vulturina*, by being bare-headed and from *P. vulturina* by its orange head (rather than a black head like the latter) and a bare nape and head, whereas in *P. vulturina* the bare skin extends only to the region of the occiput. *Pionopsitta aurantiocephala* does not have the unique pronounced yellow-and-black collar found in *P. vulturina*.

Measurements. *Pionopsitta aurantiocephala* and *P. vulturina* exhibit no significant morphometric differences, except in relation to bill measurements in male specimens (Table 1).

TABLE 1. Body measurements (millimetre) of *Pionopsitta aurantiocephala* and its neighbor species *P. vulturina*. Mean values with corresponding standard deviation in parentheses are shown in the first line, with the range of values and samples sizes shown in the lines below.

Measure- ment	<i>P. aurantiocephala</i>		<i>P. vulturina</i>		<i>t</i> -test	
	Male	Female	Male	Female	Male	Female
Tail	68.0 (5.29) 62–72 (<i>n</i> = 3)	65.9 (2.92) 63–69 (<i>n</i> = 5)	67.75 (3.76) 62–74 (<i>n</i> = 12)	67.6 (3.74) 62–72 (<i>n</i> = 10)	<i>t</i> = 1.36 <i>P</i> > 0.05	<i>t</i> = 0.77 <i>P</i> > 0.05
Wing	159.6 (4.04) 155–162 (<i>n</i> = 3)	154.60 (4.82) 147–159 (<i>n</i> = 5)	152.38 (4.91) 146–161 (<i>n</i> = 12)	149.96 (2.76) 145.3–153.60 (<i>n</i> = 11)	<i>t</i> = 3.81 <i>P</i> > 0.05	<i>t</i> = 1.89 <i>P</i> > 0.05
Bill	21 (0.80) 20.2–21.8 (<i>n</i> = 3)	19.29 (1.25) 17.3–20.4 (<i>n</i> = 5)	19.17 (0.69) 18.10–20.50 (<i>n</i> = 12)	19.22 (0.54) 18.7–20.0 (<i>n</i> = 11)	<i>t</i> = 4.33 <i>P</i> < 0.05	<i>t</i> = 0.28 <i>P</i> > 0.05

Description of holotype. Both the mandible and upper maxilla are black with a large orange spot at the base; bare-head chrome orange to spectrum orange (colors 16 and 17); lores, forehead, pileum, nape, face, and chin with no true feathers, covered only with black bristles and some white bristles in lores; true feathers beginning in dorsal area of neck, spectrum yellow (55) in proximal half and yellow-green in distal half with black apex, passing rapidly to parrot green (160) as basic color of mantle, back, uropigium, and supracaudal coverts; feathers in bend of wing and scapulars orange-yellow (18) with scarlet (14) base; lesser wing coverts parrot green except scarlet carpal edge; median and greater wing coverts with large suffusion of ultramarine blue (270); upper surface of remiges black with outer web shaded with indigo blue (173); undersurface of remiges black with a shamrock green (162b) inner web; outer web and apex of upper surfaces of rectrices indigo blue shaded in different degrees with parrot green; base of inner web of rectrices spectrum yellow; breast feathers with greenish base and yellow apex forming a large pectoral band; lower breast, abdomen, and crissum emerald green (163) sprinkled with cyan (164); under wing coverts scarlet; thighs yellow; feet orange yellow with suffusion of ochre; iris orange.

Individual variation. All specimens analyzed resemble the holotype in their overall characteristics. Specimens collected on the Cururu-açu River show various degrees of invasion of black coloring on the apex of the feathers of the nape. However, such nape shading is quite distinct from the pronounced and unique dark-line pattern present in *P. vulturina*. Specimen MZUSP 75189 did not have black-tipped nape feathers. As in *P. vulturina*, young individuals of *P. aurantiocephala* show green head feathers that apparently moult simultaneously on the forehead and nape as the immature bird changes into the adult condition (exemplified by specimens MN 21704 and 21707). Apparently, both species get the characteristic head color of adults when they moult the feathers of this region.

Color degradation. The old specimens of *P. aurantiocephala* housed at the Museu Nacional (MN 21704, 21705, 21706, 21707, and 37467) and Museu Paraense Emílio Goeldi (MPEG 18142, 14809) have completely or partially lost the typical orange color tone of the bare head, that became paler (colors 53–54). That was not the case, however, with the old specimens of *P. vulturina* analyzed, which retain the black skin coloration of the head.

Habitat and distribution. *Pionopsitta aurantiocephala* is known only from a few localities encompassing the Lower Madeira and Upper Tapajós rivers. More specifically, the São Benedito River (field observations) and Cururu-açu River (MZUSP 75188, 75189, 75190, 75192), both tributaries on the right bank of the Lower Teles Pires River being itself a tributary of the Tapajós River; the Cururu-ri River (MN 37467 and MPEG 18142), a tributary on the right bank of the Upper Tapajós River; Itaituba (MPEG 14809), on the left bank of the Middle Tapajós; and vicinities of Lago Baptista (MN 21704, 21705, 21706, and 21707), on the right bank of the Lower Madeira River (Fig. 2). Individuals were observed in the field in the gallery forest and in “campinarana” forest (forest on white-sand soils) occurring in the interfluvium between the São Benedito and Cururu-açu rivers. Kevin Zimmer (pers. comm.) informed us that there exist several recent records of this new species from the Madeira in the vicinity of Borba, made by Andrew Whittaker and Curtis Marantz. All were found in mono-specific flocks (birds with orange heads).

Specimens examined. *Pionopsitta aurantiocephala* (11 specimens): Pará: Rio Cururu-açu (4); Missão São Francisco, Rio Cururu-ri (1); Rio Cururu-ri (1); Itaituba (1). Amazonas: Lago Baptista (4). *Pionopsitta vulturina* (74 specimens): Pará: Santo Antônio da Prata (1); Alcobaça, Rio Tocantins (2); Altamira, Rio Xingu (2); Belém (3); Mosqueiro (1); Mun. Capim (Br 14, Km 93, Belém-Brasília) (13); Br 14, Km 75, Belém-Brasília, (1); Castanhal (2); Mazagão, Rio Tocantins (2); Mocajuba, Rio Tocantins (4); Ilha de Outeiro (1); Jacundá, Rio Tocantins (5); Vila Acará (1); Porto de

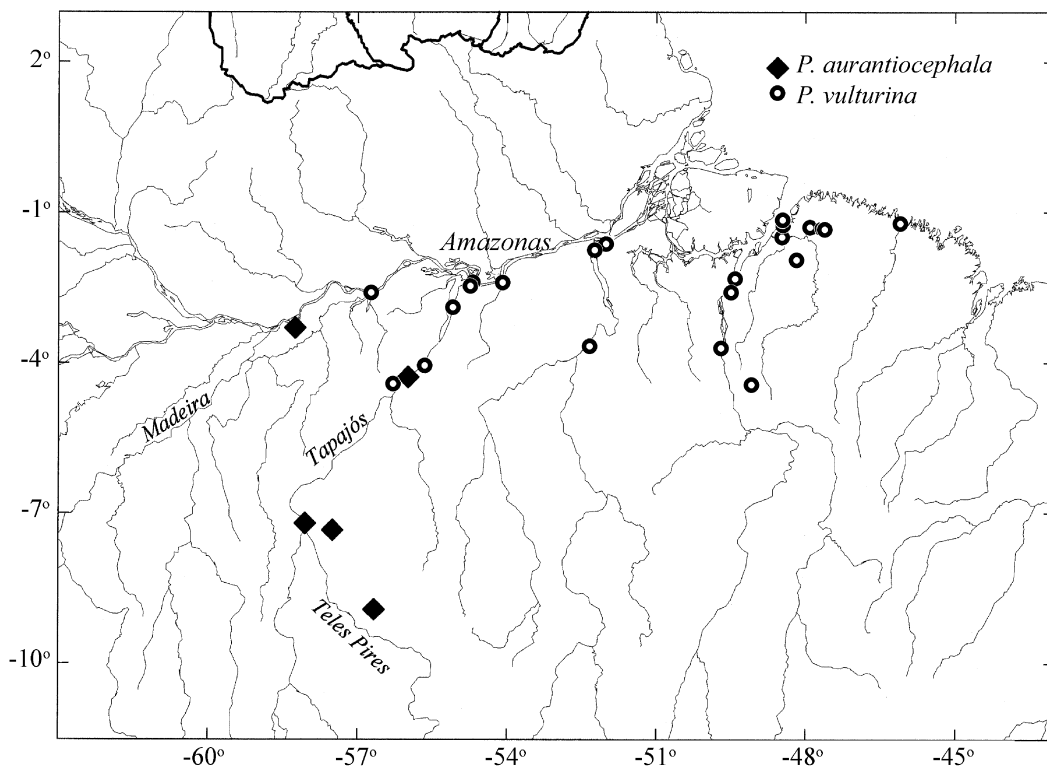


FIG. 2. Map showing the distribution of specimens of *Pionopsitta aurantiocephala* and *P. vulturina* deposited in the collections analyzed here.

Moz, Rio Xingu (1); Villarinho do Monte, Rio Xingu (1); Providência (1); Rio Gurupy (1); Santarém, Rio Tapajós (10); Tapaiúna, Rio Tapajós (1); Villa Braga, Rio Tapajós (1); Colônia Mojuy (1); Igarapé Pará (2); Limoal, Rio Tapajós (7); Monte Cristo, Rio Tapajós (7). Amazonas: Villa Bela Imperatriz, Rio Amazonas (3).

Etymology. The proposed name is designed to highlight the diagnostic orange bare-headed characteristic of the species.

Discussion.—*Pionopsitta aurantiocephala* is a species found mainly in the Madeira–Tapajós interfluvium as far as the right bank of the Tapajós near its headwaters. In that sense, its distribution is unusual, especially in comparison with that of *P. vulturina*, because the two species probably are sympatric on both sides of the middle and lower Tapajós (Fig. 2), but none of the collections studied contain an intermediate form of the two species. Although the Tapajós River forms a major geographic barrier for many species (Haffer 1997), it does not seem to be especially significant as far as the distribution of these two species is concerned.

An analysis of 74 specimens belonging to *P. vulturina* and of 11 specimens of *P. aurantiocephala* failed to produce any convincing evidence corroborating

Sick's proposition (1997), namely that the bare orange-headed individual is an immature form of the bare black-headed morphology of *P. vulturina*. Three of the four specimens of *P. aurantiocephala* collected on the Cururú-açu River exhibited well-developed gonads and completely ossified skulls, without any indication of supporting Sick's statement. Additionally, our analysis shows that the ontogenetic development of *P. vulturina* does not include a stage in which the bird is bare-headed without the black skin coloring. In the youngest stage observed for the latter species, the head is covered with green-and-yellow feathers (green predominating in some specimens and yellow in others). In that stage of plumage development, specimens of *P. vulturina* do not have a pronounced yellow collar or any evidence of the characteristic black band on the nape. Simultaneously with the loss of head feathers, the number of yellow feathers around the neck increases and a black band appears on the nape. That is exemplified by three young specimens deposited at the Museu de Zoologia, Universidade de São Paulo (MZUSP 46437, 46438, and 10603). The skin of the head becomes black as soon as the young begins to lose their head feathers (exemplified by specimens ANSP 80381, MZUSP 46437, 46438, and 10603). The yellow collar,

the black band on the nape and the black head are already distinct before the head becomes completely bare.

Pionopsitta aurantiocephala is an easily diagnosable phylogenetic species that can be considered the sister species to *P. vulturina*. The bare head present in both species, interpreted by Cracraft and Prum (1988) as being an autapomorphy of the latter, can be understood as a synapomorphy uniting these two taxa. In spite of *P. aurantiocephala* and *P. vulturina* forming a monophyletic group, the generic name *Gypopsitta* cannot be applied because it would render the genus *Pionopsitta* paraphyletic.

Although the region from which we collected specimens of *Pionopsitta aurantiocephala* is economically managed through environmental tourism, it is important to mention that the region around the headwaters of the Tapajós River and the entire southern fringe of Amazonia are constantly threatened by the destructive activities of logging companies.

New studies on the diversity of species in the regions of the Madeira and Tapajós rivers are very important for a better understanding of Neotropical fauna and the processes that have endowed the region with unique elements, because they might point to the existence of other new species, thus generating additional information for clarifying the actual status of poorly known species such as *Pipra villasboasi* Sick, 1958 and *Phaethornis longuemareus aethopyga* Zimmer, 1950. Also, they will identify and therefore protect areas of primary importance for the conservation of biodiversity in the Amazon region.

Acknowledgments.—The authors are grateful to Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) for the financial support granted to R.G.-L. (Proc. 98/12672-1) and M.A.R. (Proc. 97/05079-0), to Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), for financial support to E.H. (303926/85-6 RV), and to The American Museum of Natural History for financial assistance to M.A.R. We also thank H. F. Camargo and M. de Vivo (MZUSP); D. Teixeira and J. Nacinovic (MN); F. Novaes, D. Oren, M. Marceliano, and A. L. Prudente (MPEG); P. Sweet, J. Cracraft, G. Barrowclough, and M. Lecroy (AMNH); M. Adams (NHM); E. Pasquet (MNHN); S. Frahnert (MFN); J. Dean, C. Milensky, and R. Zusi (USMN); N. Rice and L. Joseph (ANSP); D. Causin (MCZ). We also wish to thank A. Percequillo, H. Zaher, P. A. Otto, W. Bock, S. Hackett, K. Zimmer, and J. O'Neil for their valuable comments;

F. Lencioni for the illustration; C. M. Arroyo, owner of Pousada Salto Thaimaçu, and N. Silva, guide and field assistant, for their excellent hospitality and the splendid infrastructure and support.

LITERATURE CITED

- BONAPARTE, C. L. J. L. 1856. *Conspectus psittacorum*. Naumannia 6:352–356.
- CRACRAFT, J., AND R. O. PRUM. 1988. Patterns and processes of diversification: Speciation and historical congruence in some Neotropical birds. *Evolution* 42:603–620.
- CORY, C. B. 1918. Catalogue of birds of the Americas, part 2. Field Museum of Natural History, Zoological Series 13.
- FORSHAW, J. M., AND W. T. COOPER. 1977. *Parrots of the World*, 2nd ed. T.F.H. Publications, Neptune City, New Jersey.
- GRISCOM, L., AND J. C. GREENWAY, JR. 1941. Birds of lower Amazonia. *Bulletin of the Museum of Comparative Zoology at Harvard University* 88: 83–344.
- HAFFER, J. 1970. Art-Entstehung bei einigen Waldvögeln Amazoniens. *Journal für Ornithologie* 111:285–331.
- HAFFER, J. 1997. Contact zones between birds of southern Amazonia. *Ornithological Monographs* 48:281–305.
- PAYNTER, R. A., AND M. A. TRAYLOR. 1991. *Ornithological Gazetteer of Brazil*, vols. 1 and 2. Museum of Comparative Zoology, Cambridge, Massachusetts.
- PETERS, J. L. 1937. *Check-list of Birds of the World*, vol. 3. Harvard University Press, Cambridge, Massachusetts.
- PINTO, O. M. DE O. 1938. Catálogo de Aves do Brasil e lista dos exemplares que as representam no Museu Paulista. *Revista do Museu Paulista* 22:1–566.
- PINTO, O. M. DE O. 1978. Novo catálogo das aves do Brasil: aves não Passeriformes e Passeriformes não Oscines com exclusão da Família Tyrannidae, primeira parte. Empresa Gráfica da Revista dos Tribunais, São Paulo.
- SICK, H. 1997. *Ornitologia Brasileira*. Editora Nova Fronteira, Rio de Janeiro, Brazil.
- SMITHE, F. B. 1975. *Naturalist's Color Guide*. American Museum of Natural History, New York.

Received 21 May 2001, accepted 15 March 2002.

Associate Editor: S. J. Hackett