

Preliminary bird observations in the rio Jauaperí region, rio Negro basin, Amazonia, Brazil

Mogens Trolle and Bruno A. Walther

Cotinga 22 (2004): 81–85

Um total de 191 espécies de aves foi observado durante um levantamento de mamíferos feito na Reserva Natural de Xixuaú, situada na margem esquerda do curso médio do rio Jauaperí, Roraima, Brasil. Estas observações preliminares sugerem que cerca de 200 outras espécies poderão ainda ser encontradas na reserva caso haja continuidade do trabalho ornitológico. O pato-corredor, *Neochen jubata*, foi o único registro de espécie listada como Quase Ameaçada pela BirdLife International. Em três diferentes estações de auto-foto (*camera-trap*), indivíduos de urubu-da-mata *Cathartes melambrotos* foram atraídos por iscas de peixe colocadas sob folhas secas, o que sugere que o olfato tenha sido utilizado na localização das iscas.

The Amazon rainforest is sufficiently large that vast areas have never been ornithologically explored. For the entire rio Negro catchment, we are only aware of two published studies of the local avifauna, both along the rio Jaú^{3,4}, although there may be others. Therefore, we report on ornithological observations made during a mammal survey¹⁷ of the remote Xixuaú Nature Reserve which has also never been ornithologically explored. The reserve can be visited by contacting the Amazon Association (www.amazonia.org), which will arrange transportation from Manaus. The boat trip from Manaus to Xixuaú takes c.2 full days. Accommodation at the headquarters is in rustic huts with hammocks or beds. Camps further upriver can be arranged. We hope that these preliminary observations are valuable, even if they are incomplete, and that they will spark further ornithological research at this very interesting lowland site.

Study area and methods

The study was conducted in the Xixuaú Nature Reserve, on the west bank of the middle rio Jauaperí, Roraima, Brazil (headquarters at 00°48'S 61°33'W). A few observations made on the east bank of the rio Jauaperí (in Amazonas state) are also included. The reserve is situated in the black-water river system of the rio Negro and consists of the typical major forest types of the region: high, unflooded *terra firme* forest and lower, seasonally flooded *igapó* forest, as well as secondary forest in various successional stages, minor plantations, minor watercourses and oxbow lakes¹⁸. The study focused on the area of, and around, the lower rio Xixuaú, a narrow tributary of the rio Jauaperí.

The area was first visited for one month, in August 1996, at the peak of the flood season, when MT explored the watercourses, lakes and inundated *igapó* by canoe. MT again visited the reserve in January–April 2001 (i.e. from the peak of the low-water season, when sandy beaches were present, especially on the rio Jauaperí, until the start of the

rainy season, when waters rose considerably, flooding the lower *igapó* forest). During this visit, MT walked almost daily one of nine 3–6 km-long trails situated on both sides of an 8-km stretch of the lower rio Xixuaú and its tributaries. These trails typically started at the river and led inland, thus covering all of the above-mentioned terrestrial habitats. Walks usually started in early morning and lasted 5–8 hours. The main focus was to observe mammals, but any bird species was also carefully observed and, if possible, identified using various field guides^{6,7,9,13–15}. Additional bird observations were made from the canoe when travelling to the trails. Several were photographed, some with the help of automatic *TrailMaster*[®] camera traps which were baited with various foods, mainly to attract mammals.

The methodology did not permit the compilation of a complete avian inventory or reliable assessments of abundance. However, great care was taken to exclude uncertain species identifications. We also include an abundance category for each species (see Table 1), but caution that only the common category is reliable, as these bird species were indeed seen frequently, if not daily. Species that are categorised as rare or single observations may be more common, but were simply not detected because of the sampling methodology. Furthermore, because of the observational method employed, under- and midstorey birds had a much greater probability of being observed than canopy species.

Results

A total of 185 species was observed in Xixuaú Nature Reserve, and another six species on the rio Jauaperí (Table 1). Of these, seven could have involved one of two sister taxa, and another six species were only identified to genus. Of the recorded species, 111 (58%) were non-passerines, and 100, 39, and 52 species were categorised as common, rare or involved single observations. Of these, only Orinoco Goose *Neochen jubata* is listed as Near Threatened by BirdLife International².

Cotinga 22

Bird observations in the rio Jauaperí region, Brazil

Table 1. List of bird species recorded in the lower rio Xixuaú area, with additional records from [†]nearby on the rio Jauaperí, above the village of São Pedro and [‡]on the rio Jauaperí below São Pedro (e = observed on the east bank, Amazonas state; w = observed on the west bank of the river, Roraima state). Nomenclature and systematics follow Sick¹⁵. Evidence: s = sight record, p = photographed by Mogens Trolle (MT) or Erik Falk (EF) in the Xixuaú area, a = vocalisation heard. Abundance: c = common (>5 observations), r = rare (2–5 observations), s = single observation. ^{*}*Mitu tomentosa* was assumed to be present because locals reported a second species of curassow, and the call of a second curassow species was repeatedly heard in the *igapó* forest. ^{**}*Pionopsitta barrabandi* was identified due to the characteristic orange cheek. ^{***}*Myrmotherula cherriei* was identified due to the presence of the characteristically streaked female.

Family and species	Evidence	Abundance
Tinamidae		
<i>Tinamus major</i> Great Tinamou	p (MT)	c
<i>Crypturellus soui</i> Little Tinamou	s	r
<i>Crypturellus undulatus</i> Undulated Tinamou	p (MT)	c
Phalacrocoracidae		
<i>Phalacrocorax brasilianus</i> Neotropical Cormorant	s	c
Anhingidae		
<i>Anhinga anhinga</i> Anhinga	s	c
Ardeidae		
<i>Ardea cocoi</i> White-necked Heron	s	c
<i>Casmerodius albus</i> Great Egret	s	c
<i>Butorides striatus</i> Green-backed Heron	s	c
<i>Ptilerodius pileatus</i> Capped Heron	s	s
<i>Tigrisoma lineatum</i> ^(e, w) Rufescent Tiger-heron	s	c
Threskiornithidae		
<i>Mesembrinibis cayennensis</i> Green Ibis	s	c
<i>Platalea ajaja</i> Roseate Spoonbill	p (EF)	s
Ciconiidae		
<i>Mycteria americana</i> Wood Stork	s	r
<i>Jabiru mycteria</i> Jabiru	p (EF)	s
Cathartidae		
<i>Sarcorampus papa</i> King Vulture	p (MT)	c
<i>Coragyps atratus</i> Black Vulture	s	c
<i>Cathartes aura</i> Turkey Vulture	s	c
<i>Cathartes melambrotos</i> Greater Yellow-headed Vulture	p (MT)	c
Anatidae		
<i>Neochen jubata</i> ^(e, w) Orinoco Goose	s	s
<i>Cairina moschata</i> Muscovy Duck	s	c
Accipitridae		
<i>Gampsonyx swainsonii</i> Pearl Kite	s	s
<i>Elanoides forficatus</i> Swallow-tailed Kite	s	c
<i>Leptodon cayanensis</i> Grey-headed Kite	s	s
<i>Harpagus bidentatus</i> Double-toothed Kite	s	s
<i>Ictinia plumbea</i> Plumbeous Kite	s	c
<i>Rupornis magnirostris</i> Roadside Hawk	s	c
<i>Busarellus nigricollis</i> Black-collared Hawk	s	s
<i>Buteogallus urubitinga</i> Great Black-hawk	p (MT)	r
<i>Geranospiza caerulescens</i> Crane Hawk	s	r
Pandionidae		
<i>Pandion haliaetus</i> Osprey	s	c
Falconidae		
<i>Herpetheres cachinnans</i> ^(w) Laughing Falcon	s	s
<i>Daptrius ater</i> Black Caracara	s	c
<i>Daptrius americanus</i> Red-throated Caracara	s	r
<i>Falco ruficularis</i> Bat Falcon	s	c
Cracidae		
<i>Ortalis motmot</i> Little Chachalaca	s	c
<i>Penelope jacquacu</i> Spix's Guan	s	c
<i>Pipile pipile</i> Blue-throated Piping-guan	s	c
<i>Crax alector</i> Black Curassow	s	c
<i>Mitu tomentosa</i> [*] Lesser Razor-billed Curassow	a	c
Phasianidae		
<i>Odontophorus gujanensis</i> Marbled Wood-quail	s	s
Opisthocomidae		
<i>Opisthocomus hoazin</i> Hoatzin	s	r
Psophiidae		
<i>Psophia crepitans</i> Grey-winged Trumpeter	p (MT)	c
Rallidae		
<i>Aramides cajanea</i> Grey-necked Wood-rail	s	c
Heliornithidae		
<i>Heliomis fulica</i> Sungrebe	s	r
Eurypygiidae		
<i>Eurypyga helias</i> Sunbittern	s	c
Charadriidae		
<i>Vanellus chilensis</i> Southern Lapwing	s	r
<i>Hoploxypterus cayanus</i> ^(e, w) Pied Lapwing	s	c
<i>Charadrius collaris</i> ^(e, w) Collared Plover	s	r
Scolopacidae		
<i>Tringa solitaria</i> Solitary Sandpiper	s	r
Laridae		
<i>Phaetusa simplex</i> Large-billed Tern	s	c
<i>Sterna supercilialis</i> Yellow-billed Tern	s	c
Rynchopidae		
<i>Rynchops niger</i> Black Skimmer	s	c
Columbidae		
<i>Columba speciosa</i> Scaled Pigeon	s	s
<i>Columba subvinacea</i> Ruddy Pigeon	s, a	c
<i>Columbina passerina</i> Common Ground-dove	s	c
<i>Geotrygon montana</i> Ruddy Quail-dove	s	s
Psittacidae		
<i>Ara ararauna</i> Blue-and-yellow Macaw	s	c
<i>Ara macao</i> Scarlet Macaw	s	c
<i>Ara chloroptera</i> Red-and-green Macaw	s	c
<i>Ara severa</i> Chestnut-fronted Macaw	s	r
<i>Aratinga leucophthalmus</i> White-eyed Parakeet	s	c
<i>Aratinga pertinax</i> Brown-throated Parakeet	s	r
<i>Protopteris chrysopterus</i> Golden-winged Parakeet	s	r
<i>Pionopsitta barrabandi</i> ^{**} Orange-cheeked Parrot	s	r
<i>Pionus menstruus</i> Blue-headed Parrot	s	c
<i>Amazona festiva</i> Festive Parrot	s	c
<i>Amazona amazonica</i> Orange-winged Parrot	s	c
<i>Derophterus accipitrinus</i> Red-fan Parrot	s	c
Cuculidae		
<i>Coccyzus melacoryphus</i> Dark-billed Cuckoo	s	s
<i>Piaya cayana</i> Squirrel Cuckoo	s	c
<i>Crotophaga ani</i> ^(w) Smooth-billed Ani	s	r
<i>Crotophaga major</i> Greater Ani	s	c
Nyctibiidae		
<i>Nyctibius griseus</i> Common Potoo	a	c
Caprimulgidae		
<i>Nyctiprogne leucopyga</i> Band-tailed Nighthawk	s	c
<i>Nyctidromus albicollis</i> Pauraque	a	c
<i>Caprimulgus nigrescens</i> Blackish Nightjar	s	s
Apodidae		
<i>Chaetura spinicauda</i> Band-rumped Swift	s	c
Trochilidae		
<i>Phaethornis</i> sp. unidentified hermit	s	c
<i>Phaethornis ruber</i> Reddish Hermit	s	c
<i>Campylopterus largipennis</i> Grey-breasted Sabrewing	s	s
<i>Thalurania furcata</i> Fork-tailed Woodnymph	s	s
<i>Heliothryx aurita</i> Black-eared Fairy	s	s
Trogonidae		
<i>Trogon melanurus</i> Black-tailed Trogon	s	s
<i>Trogon viridis</i> White-tailed Trogon	s	c

Cotinga 22

Bird observations in the rio Jauaperi region, Brazil

<i>Trogon violaceus</i> Violaceous Trogon	s	c		
Alcedinidae				
<i>Ceryle torquata</i> Ringed Kingfisher	s	c		
<i>Chloroceryle amazona</i> Amazon Kingfisher	s	c		
<i>Chloroceryle americana</i> Green Kingfisher	s	c		
<i>Chloroceryle inda</i> Green-and-rufous Kingfisher	s	c		
Momotidae				
<i>Momotus momota</i> Blue-crowned Motmot	s, a	c		
Galbulidae				
<i>Galbula albirostris</i> Yellow-billed Jacamar	s	s		
<i>Galbula galbula</i> Green-tailed Jacamar	s	c		
<i>Galbula leucogastra</i> Bronzy Jacamar	s	c		
<i>Galbula dea</i> Paradise Jacamar	s	c		
Bucconidae				
<i>Bucco tamatia</i> Spotted Puffbird	s	s		
<i>Monasa atra</i> Black Nunbird	s	c		
<i>Chelidoptera tenebrosa</i> Swallow-wing	s	c		
Capitonidae				
<i>Capito niger</i> Black-spotted Barbet	s	s		
Ramphastidae				
<i>Pteroglossus viridis</i> Green Aracari	s	c		
<i>Ramphastos vitellinus</i> Channel-billed Toucan	s	c		
<i>Ramphastos tucanus</i> Red-billed Toucan	s	c		
Picidae				
<i>Picumnus</i> sp. unidentified piculet	s	s		
<i>Colaptes punctigula</i> Spot-breasted Woodpecker	s	r		
<i>Piculus flavigula</i> Yellow-throated Woodpecker	s	s		
<i>Celeus elegans</i> Chestnut Woodpecker	s	s		
<i>Celeus grammicus/undatus</i>				
Scale-breasted/Waved Woodpecker	s	r		
<i>Celeus flavus</i> Cream-coloured Woodpecker	s	s		
<i>Dryocopus lineatus</i> Lineated Woodpecker	s	c		
<i>Venillornis affinis/cassini</i>				
Red-stained/Golden-collared Woodpecker	s	r		
<i>Campophilus melanoleucus</i>				
Crimson-crested Woodpecker	s	r		
<i>Campophilus rubricollis</i> Red-necked Woodpecker	s	c		
Formicariidae				
<i>Sakesphorus canadensis</i> Black-crested Antshrike	s	c		
<i>Thamnophilus punctatus</i> Eastern Slaty Antshrike	s	r		
<i>Thamnophilus amazonicus</i> Amazonian Antshrike	s	c		
<i>Thamnomanes caesius/ardesiacus</i>				
Cinereous/Dusky-throated Antshrike	s	s		
<i>Myrmotherula axillaris</i> White-flanked Antwren	s	c		
<i>Myrmotherula guttata</i> Rufous-bellied Antwren	s	r		
<i>Myrmotherula cherriei</i> *** Cherrie's Antwren	s	s		
<i>Microrhopias quixensis</i> Dot-winged Antwren	s	c		
<i>Myrmoborus leucophrys</i> White-browed Antbird	s	c		
<i>Hypocnemis cantator</i> Warbling Antbird	s	c		
<i>Hypocnemoides melanopogon</i> Black-chinned Antbird	s	c		
<i>Percnostola rufifrons</i> Black-headed Antbird	s	r		
<i>Myrmeciza ferruginea</i> Ferruginous-backed Antbird	s	s		
<i>Pithys albifrons</i> White-plumed Antbird	s	s		
<i>Gymnopathys rufigula</i> Rufous-throated Antbird	s	r		
<i>Formicarius colma</i> Rufous-capped Antthrush	s	s		
<i>Myrmornis torquata</i> Wing-banded Antbird	s	s		
<i>Hyllopezus macularius</i> Spotted Antpitta	s	s		
Furnariidae				
<i>Synallaxis rutilans</i> Ruddy Spinetail	s	s		
<i>Automolus infuscatus/ochrolaemus</i>				
Olive-backed/Buff-throated Foliage-gleaner	s	s		
<i>Xenops minutus</i> Plain Xenops	s	r		
Dendrocolaptidae				
<i>Dendrocincla fuliginosa</i> Plain-brown Woodcreeper	s	s		
<i>Glyphorhynchus spirurus</i> Wedge-billed Woodcreeper	s	c		
<i>Nasic longirostris</i> Long-billed Woodcreeper	s	s		
<i>Xiphorhynchus</i> sp. unidentified woodcreeper	s	c		
<i>Campylorhynchus trochilrostris/procurvoides</i>				
Red-billed/Curve-billed Scythebill	s	s		
Tyrannidae				
<i>Tyrannulus elatus</i> Yellow-crowned Tyrannulet	s	s		
<i>Mionectes oleagineus</i> Ochre-bellied Flycatcher	s	s		
<i>Todirostrum maculatum</i> Spotted Tody-flycatcher	s	r		
<i>Laniocera hypopyrrha</i> Cinereous Mourner	s	s		
<i>Myiarchus</i> sp. unidentified flycatcher	s	s		
<i>Pitangus sulphuratus</i> Great Kiskadee	s	c		
<i>Philohydor lictor</i> Lesser Kiskadee	s	c		
<i>Myiozetetes cayanensis</i> Rusty-margined Flycatcher	s	c		
<i>Myiodynastes maculatus</i> Streaked Flycatcher	s	r		
<i>Legatus leucophaeus</i> Piratic Flycatcher	s	r		
<i>Tyrannus savana</i> Fork-tailed Flycatcher	s	r		
<i>Tyrannus melancholicus</i> Tropical Kingbird	s	c		
<i>Pachyrhamphus polychopterus/marginatus</i>				
White-winged/Black-capped Becard	s	s		
<i>Tityra cayana</i> Black-tailed Tityra	s	r		
Pipridae				
<i>Pipra erythrocephala</i> Golden-headed Manakin	s	r		
<i>Pipra pipra</i> White-crowned Manakin	s	c		
<i>Manacus manacus</i> White-bearded Manakin	s	s		
<i>Heterocercus flavivertex</i> Yellow-crested Manakin	s	s		
Cotingidae				
<i>Xipholena punicea</i> Pompadour Cotinga	s	s		
<i>Lipaugus vociferans</i> Screaming Piha	s, a	c		
<i>Perissocephalus tricolor</i> Capuchinbird	s	r		
<i>Gymnoderus foetidus</i> Bare-necked Fruitcrow	s	r		
Hirundinidae				
<i>Tachycineta albiventer</i> White-winged Swallow	s	c		
<i>Phaeoprogne tapera</i> Brown-chested Martin	s	c		
<i>Progne chalybea</i> Grey-breasted Martin	s	c		
<i>Progne subis</i> Purple Martin	s	s		
<i>Atticora fasciata</i> White-banded Swallow	s	c		
<i>Stelgidopteryx ruficollis</i>				
Southern Rough-winged Swallow	s	c		
Troglodytidae				
<i>Thryothorus coraya</i> Coraya Wren	s	c		
<i>Thryothorus leucotis</i> Buff-breasted Wren	s	c		
<i>Troglodytes aedon</i> House Wren	s	r		
<i>Cyphorhinus aradus</i> Musician Wren	s, a	r		
Sylviidae				
<i>Polioptila plumbea</i> Tropical Gnatcatcher	s	r		
Turdidae				
<i>Turdus fumigatus</i> Cocoa Thrush	s	s		
Emberizidae				
<i>Coereba flaveola</i> Bananaquit	s	c		
<i>Tachyphonus cristatus/surinamus</i>				
Flame-crested/Fulvous-crested Tanager	s	s		
<i>Tachyphonus luctuosus</i> White-shouldered Tanager	s	r		
<i>Ramphocelus carbo</i> Silver-beaked Tanager	s	c		
<i>Thraupis episcopus</i> Blue-grey Tanager	s	c		
<i>Thraupis palmarum</i> Palm Tanager	s	c		
<i>Euphonia</i> sp. unidentified euphonia	s	c		
<i>Dacnis lineata</i> Black-faced Dacnis	s	s		
<i>Dacnis flaviventer</i> Yellow-bellied Dacnis	s	s		
<i>Dacnis cayana</i> Blue Dacnis	s	r		
<i>Chlorophanes spiza</i> Green Honeycreeper	s	r		
<i>Cyanerpes caeruleus</i> Purple Honeycreeper	s	r		
<i>Paroaria gularis</i> Red-capped Cardinal	s	c		
<i>Saltator</i> sp. unidentified saltator	s	c		
<i>Psarocolius decumanus</i> Crested Oropendola	s	c		
<i>Psarocolius viridis</i> Green Oropendola	s	c		
<i>Cacicus cela</i> Yellow-rumped Cacique	s	c		
<i>Cacicus haemorrhous</i> Red-rumped Cacique	s	s		
<i>Icterus chrysiocephalus</i> Moriche Oriole	s	s		
<i>Scaphidura oryzivora</i> Giant Cowbird	s	c		

Three different baited camera-trap stations, all situated in primary *terra firme* forest, attracted single Greater Yellow-headed Vultures *Cathartes melambrotos*. As the fish bait used was placed under dead leaves, sense of smell was probably employed to detect these. At one, the yellow-headed vulture was subsequently replaced by a King Vulture *Sarcorampus papa*, but the latter was most likely attracted by the presence of the former (see Discussion).

Discussion

The geographically proximate localities that have been ornithologically explored yielded the following species totals: 445 species along the rio Jaú⁴, 394 species north of Manaus⁵, 387 species in Tapajós National Park¹¹, 440 species around La Esmeralda¹, and 398 species at Junglaven and Camani Camps¹⁹. Based on those studies, we predict that c.200 more species might be expected to occur in Xixuaú Nature Reserve. These would mostly comprise hard-to-detect species (e.g. puffbirds, owls, potoos and nightjars) and difficult-to-identify species (e.g. woodcreepers and flycatchers). For example, mist-netting and vocalisation studies are required in Xixuaú. Moreover, many canopy species went undetected because of the sampling methodology employed; the importance of vocalisations and using tape-recorders in avifaunal surveys is now well known¹². As in all studies of rainforest birds, canopy access would vastly improve observational opportunities^{10,18}. Nonetheless, those species recorded in Xixuaú Nature Reserve correspond well with those found in the two closest Brazilian sites, along the rio Jaú⁴ and north of Manaus⁵.

Orinoco Goose, the only bird species recorded by the survey considered to be of conservation concern by BirdLife International², inhabits forest-covered banks of tropical rivers and damp clearings. Because it is heavily hunted, the species is in severe population decline and is now mostly found in remote and protected areas². The discovery of hidden bait by two Greater Yellow-headed Vultures, later visited by a King Vulture, adds to the existing evidence that *Cathartes* use their acute sense of smell to locate food, and is consistent with the suggestion that other vultures, e.g. Black Vulture *C. aura* and King Vulture, have no functional sense of smell but rely on *Cathartes* species to locate food⁸.

Acknowledgements

The project was a collaboration between the Zoological Museum, University of Copenhagen, National Institute for Amazonian Research, Manaus (INPA) and Museu Nacional, Universidade Federal de Rio de Janeiro, Rio de Janeiro. Thanks are due to Associação Amazônia for providing the opportunity to undertake the study in Xixuaú Nature Reserve. The project was made economically feasible by the generous support of

WWF-Denmark/Novo Nordisk, Explorers Club-US, Copenhagen Zoo, the University of Copenhagen, Zoological Museum of Copenhagen, Frimodt-Heineke Fonden, Torben og Alice Frimodts Fond, H.R. og Grete Siim Frederiksens Fond, Direktør Peder Mortensen og Hustru Marry Mortensens Fond, Kjebi Fonden, NetTravel, Duracell, Photographica, and Fuji. For collaboration, advice and support our thanks to Dr João Alves de Oliveira, Dra Maria Nazareth Ferreira da Silva and Prof. Jon Fjeldså. We extend our gratitude to the reserve staff of Xixuaú, in particular João Soares Gomes da Silva, for invaluable help in the field. Erik Falk provided photos from Xixuaú. Mario Cohn-Haft and Guy Kirwan commented on the submitted draft.

References

- Anhuf, D. & Winkler, H. (1999) Geographical and ecological settings of the Surumoni-Crane Project (Upper Orinoco, estado Amazonas, Venezuela). *Anz. Math.-naturwissenschaftliche Klasse Abt. I, Österreichische Akad. Wissenschaften* 135: 3–23.
- BirdLife International (2000) *Threatened birds of the world*. Cambridge, UK: BirdLife International & Barcelona: Lynx Edicions.
- Borges, S. H. & Carvalhães, A. (2000) Bird species of black water inundation forests in the Jaú National Park (Amazonas state, Brazil): their contribution to regional species richness. *Biodiv. & Conserv.* 9: 201–214.
- Borges, S. H., Cohn-Haft, M., Carvalhães, A. M. P., Henriques, L. M., Pacheco, J. F. & Whittaker, A. (2001) Birds of the Jaú National Park, Brazilian Amazon: species check-list, biogeography and conservation. *Orn. Neotrop.* 12: 109–140.
- Cohn-Haft, M., Whittaker, A. & Stouffer, P. C. (1997) A new look at the “species-poor” central Amazon: the avifauna north of Manaus, Brazil. *Orn. Monogr.* 48: 205–235.
- Dunning, J. S. (1987) *South American birds: a photographic guide to identification*. Newtown Square, PA: Harrowood Books.
- Hilty, S. L. & Brown, W. L. (1986) *A guide to the birds of Colombia*. Princeton, NJ: Princeton University Press.
- Houston, D. C. (1994) Family Cathartidae (New World vultures). In: del Hoyo, J., Elliott, A. & Sargatal, J. (eds.) *Handbook of the birds of the world*, 2. Barcelona: Lynx Edicions.
- Meyer de Schauensee, R. & Phelps, W. H. (1978) *A guide to the birds of Venezuela*. Princeton, NJ: Princeton University Press.
- Munn, C. A. & Loiselle, B. A. (1995) Canopy access techniques and their importance for the study of tropical forest canopy birds. In: Lowman, M. D. & Nadkarni, N. M. (eds.) *Forest canopies*. San Diego, CA: Academic Press.
- Oren, D. C. & Parker, T. A. (1997) Avifauna of the Tapajós National Park and vicinity, Amazonian Brazil. *Orn. Monogr.* 48: 493–525.
- Parker, T. A. (1991) On the use of tape recorders in avifaunal surveys. *Auk* 108: 443–444.

13. Ridgely, R. S. & Tudor, G. (1989) *The birds of South America*, 1. Austin: University of Texas Press.
14. Ridgely, R. S. & Tudor, G. (1994) *The birds of South America*, 2. Austin: University of Texas Press.
15. Sick, H. (1993) *Birds in Brazil: a natural history*. Princeton, NJ: Princeton University Press.
16. Stotz, D. F., Fitzpatrick, J. W., Parker, T. A. & Moskowitz, D. K. (1996) *Neotropical birds: ecology and conservation*. Chicago: University of Chicago Press.
17. Trolle, M. (2003) Mammal survey in the rio Jauaperí region, rio Negro basin, the Amazon, Brazil. *Mammalia* 67: 75–83.
18. Walther, B. A. (2004) Why canopy access is essential to understand canopy birds: four examples from the Surumoni Crane Project. *Orn. Neotrop.* 15: 41–52.
19. Zimmer, K. J. & Hilty, S. L. (1997) Avifauna of a locality in the upper Orinoco drainage of Amazonas, Venezuela. *Orn. Monogr.* 48: 865–885.

Mogens Trolle and Bruno A. Walther

Address for correspondence: Bruno A. Walther, Zoological Museum, University of Copenhagen, Universitetsparken 15, DK 2100 København Ø, Denmark. E-mail: bawalther@zmuc.ku.dk.

OPENING SOON
The Marica Naturalist Lodge,
Rio, Brazil



Budget Brazilian holiday accommodation for birders, hill walkers, orchid lovers and all other naturalists.

email: rrabybrasil@yahoo.com
 Visit: www.guide_birding.com (Richard Raby)

Winter 04/05
Dec & Jan

Low budget birding
 adventure to
 the Organ Mountains,
 S.E Brazil

4 Centres, Scrub forest, Rainforest (2), Cloud forest
 Exotic endemics, including mountain cotingas
 Overnight camp-out in Grey-winged Cotinga territory

Led by Richard Raby expat, fluent Portuguese,
 15 years resident Rio, 18 years S. America

Small groups from
 £750 per person starting Rio de Janeiro Airport
 (evening meals not included)