

Bird-termite interactions in Brazil: A review with perspectives for future studies

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Abstract: We present a review on the principal interactions between birds and termites in Brazil. We found 218 bird species feeding on termites or using termitaria for nesting or perching. Termites were mentioned as food source for 179 bird species. Alates were the most consumed caste. Termitaria were mentioned as nest site for 45 bird species. Some bird species also perch on the top of termite mounds to search for their prey or to conduct territorial and/or courtship displays. Considering all interactions between both animal groups, little is known about the identification of termite genera or species. Therefore, we suggest more detailed studies to be conducted on the natural history and ecology of interactions between birds and termites in Brazil.

Keywords: birds, Brazil, feeding, nesting, termites.

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Resumo: Apresentamos aqui uma revisão sobre as principais interações entre aves e cupins no Brasil. Foram registradas 218 espécies de aves alimentando-se de cupins ou usando cupinzeiros para nidificar ou se empoleirar. Os cupins foram citados como recurso alimentar para 179 espécies de aves, sendo as formas aladas as mais consumidas. Os cupinzeiros foram citados como sítio de nidificação para 45 espécies de aves. Algumas espécies de aves também se empoleiram no alto de termiteiros para localizar suas presas ou para realizar exibições territoriais e/ou de corte. Considerando-se todas as interações entre ambos os grupos de animais, pouco ainda se conhece sobre a identificação dos gêneros e espécies de térmitas envolvidos. Assim, sugerimos a realização de estudos mais detalhados sobre história natural e ecologia das interações entre aves e cupins no Brasil.

Palavras-chave: aves, Brasil, alimentação, nidificação, cupins.

Introduction

Termites (Insecta: Isoptera) have been reported as an important food resource for birds around the world (Eisenmann 1961, De Bont 1964, Thiollay 1970, Dial & Vaughan 1987, Paiva 1998, Kok et al. 2000, Kopij 2000, Mallet-Rodrigues 2001, Gussoni & Campos 2003, Olson & Alvarenga 2006, Faria 2007, Sazima 2008). Termitaria (termite nests) also represent nest sites for several bird species (Hardy 1963, Sazima 1989, Dubs 1992, Naka 1997, Sick 1997, Brightsmith 2000).

Brazil holds one of the richest world avifaunas, with c. 1,800 bird species (Sick 1997, CBRO 2014). Nevertheless, little is known about various aspects of natural history of these species. Examples are the interactions between birds and termites. The 19th century German naturalist, Prince Maximilian of Wied-Neuwied explored the Campos Geraës, between the states of Minas Gerais and Bahia, and appears to have been the first to report such observations (Wied-Neuwied 1821).

Later, the German ornithologist Helmut Sick, who visited and stayed in Brazil since 1939 and is one of the leading exponents of Brazilian ornithology of the 20th century, also studied termites when he was a prisoner on Ilha Grande, during the World War II (Gonzaga 1991, Sick 1997). He also remarked the importance of termites either as food as providing shelter for birds and other animals, especially in his study of the Cerrado fauna (Sick 1965) and in his classic book on Brazilian ornithology (Sick 1997).

The naturalist Balthasar Dubs was also devoted to the study of birds in the vegetations of the central-western regions of Brazil. His book on the birds of the Pantanal and adjacent areas (Dubs 1992) presents a discussion on the role of termite mounds in forming the landscape of patches of cerradão or forest in the Pantanal region (the mounds are called “murundus” – for a review of the theories on their role in the landscape formation, see Oliveira-Filho 1992a, b), including photographs of this habitat type.

Recently, some authors reported termites as a food resource for birds in Brazil (Paiva 1998, Mallet-Rodrigues 2001, Gussoni & Campos 2003, Olson & Alvarenga 2006, Faria 2007, Sazima 2008). Nevertheless, studies and information on the interaction between birds and termites in this country are very scarce and fragmentary. The aim of this paper is to present a review on the importance of termites for Brazilian birds and to suggest perspectives for future research.

Materials and methods

The present review attempted to cover all published information on interactions between birds and termites in Brazil, which includes articles, book chapters, books and photographs available online (www.wikiaves.com.br) until January 2014 (see Table 1). On the Wiki Aves database we searched for photos using the keywords for “foraging”, “feeding” and “nest” or “nesting”. The principal interactions we found were those related to birds using termites as food resources and termitaria as nest sites or perches. We also included unpublished observations made by several colleagues, as well as some of our personal field observations. Wherever possible, for each record, we considered the lowest taxonomic level of identification of the termites, the castes involved (alates, soldiers and workers - in the case of food resource) and the type of termite nest, according to the building site: epigeal or mound; arboreal (supported on a tree or similar); rupicolous (upon a rock). Taxonomy of bird species follows the Comitê Brasileiro de Registros Ornitológicos (CBRO 2014).

Results and Discussion

1. General inventory of bird-termite interactions in Brazil

We found a total of 218 bird species that use the termites in a direct way (food resource) or indirectly (such as the use of termitaria as nesting or perching sites) (Table 1). This number represents approximately only c. 12% of Brazilian the avifauna (Sick 1997, CBRO 2014). Below, we present and discuss each of these types of interactions.

2. Termites as food resource for Brazilian birds

Termites have been reported as food resource for 179 species of birds in Brazil, of 51 families (Table 1). The families with the largest number of bird species feeding on termites are: Thraupidae (29 species), Tyrannidae (25), Picidae (11) and Thamnophilidae (10) (Figure 1).

Little is known about the taxonomic groups of termites consumed by birds. Among the 277 records, in 189 (68.2%) termites were identified at order level; in 50 (18.1%), at the family level; in 33 (11.9%), at the genus level and only in 5 (1.8%), at specific level (Figure 2).

Considering the different castes consumed by birds, among the 290 records, 189 (65.2%) report alates, 17 (5.9%) are related to soldiers and 15 (5.2%) mention workers. In 69 records (23.7%), castes were not mentioned (Figure 3).

Thus, alates seem to represent the main caste consumed by birds. But the problem is that swarms are unpredictable events in space and time, so that winged termites represent a resource that should be exploited in an opportunistic manner. Predation of alates by birds has been studied in more details in Africa (e.g., De Bont 1964, Thiollay 1970, Dial & Vaughan 1987, Kok et al. 2000, Kopyj 2000). Unfortunately, little has

been studied about this interaction in Brazil. For example, opportunistic information was reported by Cunha (1961), who observed a domestic hen, swallows and tyrant-flycatchers feeding on winged termites. In September 1989, Paiva (1998) observed 12 species of birds preying alates in an urban park in Piracicaba/SP.

Gussoni & Campos (2003) reported 26 species of birds feeding on alates in Arujá/SP, in January 2002.

In the montane forests of the Serra da Mantiqueira, in April 2001, Olson & Alvarenga (2006) observed 23 species of birds feeding on winged termites. In this event, they recorded many specimens of the Buff-throated Warbling-Finch (*Poospiza lateralis*), a species endemic to the high mountains of southeastern Brazil (Assis et al. 2007). Further, three Black-capped Piprites (*Piprites pileata*), a threatened species (BirdLife International 2000, Machado et al. 2005), were also feeding on alates. The authors observed that several species that commonly forage on the ground or among bushes were catching those termites in the air during this event.

In the same mountain range, in December 2002, C. R. M. Abreu and M. Maldonado-Coelho (*pers. comm.*) observed alates swarming after rain, in a transitional area of montane forest and high-altitude grassland (*campo de altitude*), in Matutu Valley (elevation: 1,990 m), Aiuruoca/MG. Six bird species were consuming these insects: the Highland Elaenia (*Elaenia obscura*), the Blue-billed Black-Tyrant (*Knipolegus cyanostris*), the Blue-and-white Swallow (*Pygochelidon cyanoleuca*), the Diademed Tanager (*Stephanophorus diadematus*), the Rufous-collared Sparrow (*Zonotrichia capensis*) and the Bay-chested Warbling-Finch (*Poospiza thoracica*). *Pygochelidon cyanoleuca* captured termites in flight, while *K. cyanostris*, *Z. capensis* and *P. thoracica* caught insects among leaves (in the forest edge) and in the bushes (in the grassland). *Elaenia obscura* and *S. diadematus* captured termites both in flight, as well as among the foliage.

Also in the Serra da Mantiqueira, a termite swarm was observed after a light rain in the late afternoon of 27 March 2007, in a transition area between a montane forest and the *campo de altitude* at Pedra de São Domingos (elevation: c. 1,970 m), in Gonçalves/MG (MFV *pers. obs.*). Only one specimen of *Z. capensis* and two individuals of *P. lateralis* were observed feeding on the winged termites among the foliage.

In November 2001, MFV and S. D'Angelo-Neto observed a swarm in Lavras/MG. Alates were flying in the edge of a secondary forest and adjacent open areas (pastures), being captured by the domestic Helmeted Guineafowl (*Numida meleagris*, n = 2), and the following native species: Green-barred Woodpecker (*Colaptes melanochloros*, n = 1), Rufous Hornero (*Furnarius rufus*, n = 2), Masked Water-Tyrant (*Fluvicola nengeta*, n = 2), Social Flycatcher (*Myiozetetes similis*, n = 1), Boat-billed Flycatcher (*Megarynchus pitangua*, n = 1), Streaked Flycatcher (*Myiodynastes maculatus*, n = 1), Variegated Flycatcher (*Empidonomus varius*, n = 1), Crested Becard (*Pachyrhamphus validus*, n = 1), Hooded Tanager (*Nemosia pileata*, n = 2), Pileated Finch (*Lanio pileatus*, n = 1), Sayaca Tanager (*Tangara sayaca*, n = 3), Swallow Tanager (*Tersina viridis*, n = 2), Rufous-collared Sparrow (n = 1), Saffron Finch (*Sicalis flaveola*, n = 2), Crested Oropendola (*Psarocolius decumanus*, n = 1) and Shiny Cowbird (*Molothrus bonariensis*, n = 1). Except *F. nengeta*, *Z. capensis* and *L. pileatus*, which caught the alates when they landed on the ground, all other species caught insects in the air. The Helmeted

Table 1. Bird species and their interactions with termites in Brazil.

Family / Species	Interaction Type			Feeding on termites			Nesting on termitaria			Source
	Feeding	Nesting	Perching	Taxon	Caste	Taxon	Termitaria type	Taxon		
Tinamidae										
<i>Crypturellus soui</i>	X			Termitidae	soldier	-	-	-	Schubart et al. (1965)	
<i>Crypturellus parvirostris</i>	X			Isoptera	worker	-	-	-	Moojen et al. (1941)	
				Isoptera	not mentioned	-	-	-	Hempel (1949)	
<i>Rhynchotus rufescens</i>	X			Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
				<i>Syntermes sihvestrii</i>	not mentioned	-	-	-	Hempel (1949)	
				<i>Syntermes parallelus</i>	not mentioned	-	-	-	Hempel (1949)	
				Isoptera	not mentioned	-	-	-	Hempel (1949)	
				Termitidae	worker, soldier	-	-	-	Schubart et al. (1965)	
				<i>Syntermes</i> sp.	not mentioned	-	-	-	Penha (1995)	
<i>Nothura minor</i>	X			Isoptera	not mentioned	-	-	-	Sick (1997)	
<i>Nothura maculosa</i>	X			Isoptera	not mentioned	-	-	-	Hempel (1949)	
				Isoptera	not mentioned	-	-	-	Hempel (1949)	
				Isoptera	alate	-	-	-	Belton (1994)	
<i>Taoniscus nanus</i>	X			<i>Procornitermes araujoi</i>	not mentioned	-	-	-	Teixeira & Negret (1984)	
				Isoptera	not mentioned	-	-	-	Sick (1997)	
Cracidae										
<i>Crax blumenbachii</i>	X			Isoptera	not mentioned	-	-	-	Sick (1997)	
Odontophoridae										
<i>Odontophorus gujanensis</i>	X			Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
Numididae										
<i>Numida meleagris</i>	X			Isoptera	alate	-	-	-	pers. obs.	
Phasianidae										
<i>Gallus gallus</i>	X			Isoptera	alate	-	-	-	Cunha (1961)	
Accipitridae										
<i>Elanoides forficatus</i>	X		X	Isoptera	alate	-	-	-	Sick (1997)	
<i>Ictinia plumbea</i>	X			Isoptera	not mentioned	-	-	-	Hempel (1949)	
				Termitidae	alate, soldier	-	-	-	Schubart et al. (1965)	
				Isoptera	alate	-	-	-	Sick (1997)	
<i>Rupornis magnirostris</i>	X			Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
<i>Leucopternis</i> sp.	X			Termitidae	alate	-	-	-	Schubart et al. (1965)	
Psophiidae										
<i>Psophia crepitans</i>	X			Termitidae	worker	-	-	-	Schubart et al. (1965)	
<i>Psophia viridis</i>	X			Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
Rallidae										
<i>Neorex erythropis</i>	X			Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
Charadriidae										
<i>Vanellus chilensis</i>	X			Termitidae	worker	-	-	-	Schubart et al. (1965)	
<i>Pluvialis dominica</i>	X			Termitidae	soldier	-	-	-	Schubart et al. (1965)	

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Table 1. Continued.

Family / Species	Interaction Type			Feeding on termites			Nesting on termitaria			Source
	Feeding	Nesting	Perching	Taxon	Caste	Taxon	Termitaria type	Termitaria type		
Scolopacidae										
<i>Actitis macularius</i>	X			Isoptera	alate	-	-	-	Sick (1997)	
<i>Tringa melanoleuca</i>	X			Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
<i>Tringa flavipes</i>	X			Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
Laridae										
<i>Chroicocephalus maculipennis</i>	X			Isoptera	alate	-	-	-	Belton (1994)	
Sternidae										
<i>Phaetusa simplex</i>	X			Isoptera	alate	-	-	-	Belton (1994)	
<i>Sterna hirundinacea</i>	X			Isoptera	alate	-	-	-	Sick (1997)	
<i>Sterna</i>	X			Isoptera	alate	-	-	-	Sick (1997)	
Cuculidae										
<i>Guira guira</i>	X			Isoptera	alate	-	-	-	Belton (1994)	
Strigidae										
<i>Megascops choliba</i>		X		-	-	<i>Constrictotermes cyphergaster</i>	arboreal	-	Negret & Teixeira (1983)	
<i>Glaucidium brasiliannum</i>	X	X		-	-	Isoptera	arboreal	-	Sick (1997)	
<i>Athene cunicularia</i>	X	X	X	<i>Nasutitermes</i> sp.	soldier	-	-	-	Schubart et al. (1965)	
	X	X		Isoptera	alate	-	-	-	Sick (1997)	
				Isoptera	-	-	-	-	Martins & Egler (1990)	
				Isoptera	-	-	-	-	Burmeister apud Euler (1900)	
				Isoptera	-	-	-	-	Wied-Neuwied (1821)	
				Isoptera	-	-	-	-	Cunha (1961)	
				Isoptera	-	-	-	-	Negret & Teixeira (1983)	
				Isoptera	-	-	-	-	Sick (1997)	
				Isoptera	-	-	-	-	pers. obs.	
Nyctibiidae										
<i>Nyctibius aethereus</i>	X			Isoptera	not mentioned	-	-	-	Moojen et al. (1941)	
<i>Nyctibius griseus</i>	X			Isoptera	alate	-	-	-	Sick (1997)	
Caprimulgidae										
<i>Hydropsalis albicollis</i>	X			Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
<i>Hydropsalis parvula</i>	X			Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
<i>Hydropsalis candicans</i>			X	-	-	-	-	-	Rodrigues et al. (1999)	
<i>Hydropsalis longirostris</i>	X			Isoptera	alate	-	-	-	Sick (1997)	
<i>Hydropsalis torquata</i>	X			Isoptera	alate	-	-	-	Vasconcelos et al. (1999)	
<i>Hydropsalis forcipata</i>	X			Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
<i>Chordeiles rupestris</i>	X			Isoptera	not mentioned	-	-	-	Moojen et al. (1941)	
	X			Isoptera	alate	-	-	-	Sick (1997)	

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Table 1. Continued.

Family / Species	Interaction Type			Feeding on termites			Nesting on termitaria			Source
	Feeding	Nesting	Perching	Taxon	Caste	Taxon	Termitaria type	Taxon	Termitaria type	
<i>Chordeiles acutipennis</i>	X			Termitidae	alate	-	-	-	-	Schubart et al. (1965)
Apodidae										
<i>Streptoprocne zonaris</i>	X			Isoptera	alate	-	-	-	-	Olson & Alvarenga (2006)
<i>Tachornis squamata</i>	X			Termitidae	not mentioned	-	-	-	-	Schubart et al. (1965)
<i>Panyptila cayennensis</i>	X			Isoptera	not mentioned	-	-	-	-	Sick (1997)
<i>Panyptila cayennensis</i>	X			Termitidae	not mentioned	-	-	-	-	Schubart et al. (1965)
<i>Cypseloides</i> sp.	X			Isoptera	not mentioned	-	-	-	-	Sick (1997)
<i>Cypseloides</i> sp.	X			Isoptera	alate	-	-	-	-	Sick (1997)
Trochilidae										
<i>Eupetomena macroura</i>	X			Isoptera	alate	-	-	-	-	Gussoni & Campos (2003)
<i>Eupetomena macroura</i>	X			Isoptera	alate	-	-	-	-	Sazima (2008)
Trogonidae										
<i>Trogon viridis</i>		X		-	-	Isoptera	arboreal	Isoptera	arboreal	von Ihering (1914)
<i>Trogon viridis</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Dubs (1992)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Sick (1997)
<i>Trogon surrucura</i>	X	X		-	-	Isoptera	arboreal	Isoptera	arboreal	Ribas (2010)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Euler (1900)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Dubs (1992)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Sick (1997)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Silva (2004)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Alexandrino (2009)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Menq (2009)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Santos (2009)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Boso (2010)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Bucci (2010)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Konze (2010)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Licco (2010)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Oliveira (2010b)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Pereira (2010a)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Pereira (2010b)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Sanson (2010)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Si (2010)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Zimer (2010)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Amaral (2011)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Biazotto (2011)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Hansch (2011)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Luccia (2011)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Motta (2011)
<i>Trogon surrucura</i>				-	-	Isoptera	arboreal	Isoptera	arboreal	Riedtmann (2011)

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Table 1. Continued.

Family / Species	Interaction Type			Feeding on termites			Nesting on termitaria			Source
	Feeding	Nesting	Perching	Taxon	Caste	Taxon	Termitaria type	Taxon	Termitaria type	
<i>Trogon violaceus</i>	X			Isoptera	alate	Isoptera	arboreal	Isoptera	arboreal	Salazar (2012) pers. obs.
<i>Trogon curucui</i>		X		Termitidae	not mentioned	<i>Nasutitermes</i> sp.	arboreal	-	-	Olson & Alvarenga (2006)
<i>Trogon rufus</i>		X		-	-	Isoptera	arboreal	-	-	Schubart et al. (1965)
<i>Trogon collaris</i>		X		-	-	Isoptera	arboreal	-	-	Soares (2010)
Alcedinidae		X		-	-	Isoptera	arboreal	-	-	Silveira (2010)
<i>Chloroceryle americana</i>		X		-	-	Isoptera	arboreal	-	-	Adeodato (2012)
Galbulidae		X		-	-	Isoptera	epigeal	-	-	Sick (1997)
<i>Jacamaralcyon tridactyla</i>	X			Isoptera	not mentioned	-	-	-	-	Melo-Junior (2001)
<i>Galbula ruficauda</i>		X		-	-	Isoptera	epigeal	-	-	Sick (1997)
Bucconidae		X		-	-	-	-	-	-	-
<i>Notharchus macrorhynchos</i>		X		-	-	Isoptera	arboreal	-	-	Sick (1997)
<i>Notharchus tectus</i>		X		-	-	Isoptera	arboreal	-	-	Sick (1997)
<i>Bucco tamatia</i>		X		-	-	Isoptera	arboreal	-	-	Castro (2012)
<i>Monasa nigrifrons</i>	X			Termitidae	not mentioned	Isoptera	arboreal	-	-	Mazzoni et al. (2013)
<i>Chelidoptera tenebrosa</i>	X			Isoptera	not mentioned	Isoptera	arboreal	-	-	Czaban (2003)
Ramphastidae		X		-	-	-	-	-	-	Schubart et al. (1965)
<i>Ramphastos toco</i>		X		-	-	Isoptera	epigeal	-	-	Sick (1997)
				-	-	<i>Cornitermes</i>	epigeal	-	-	Buzzetti & Silva (2005)
				-	-	sp.	-	-	-	-
<i>Ramphastos vitellinus</i>	X		X	Isoptera	alate	Isoptera	not mentioned	-	-	Rodrigues & Costa (2006)
<i>Pteroglossus castanotis</i>		X		-	-	Isoptera	arboreal	-	-	Sick (1997)
				-	-	<i>Cornitermes</i>	epigeal	-	-	Sick (1997)
				Isoptera	-	sp.	-	-	-	Silva e Silva (pers. comm.)
Picidae		X		-	-	-	-	-	-	-
<i>Veniliornis passerinus</i>	X			<i>Heterotermes</i> sp.	soldier	-	-	-	-	Schubart et al. (1965)
		X		Termitidae	not mentioned	-	-	-	-	Schubart et al. (1965)
<i>Veniliornis mixtus</i>	X			Isoptera	not mentioned	-	-	-	-	Vasconcelos et al. (2006)
<i>Piculus chrysochloros</i>		X		-	-	Isoptera	arboreal	-	-	Dubs (1992)
<i>Colaptes melanochloros</i>	X			Isoptera	alate	-	-	-	-	Sazima (2008)
				Isoptera	alate	-	-	-	-	pers. obs.

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Table 1. Continued.

Family / Species	Interaction Type			Feeding on termites			Nesting on termitaria			Source
	Feeding	Nesting	Perching	Taxon	Caste	Taxon	Termitaria type	Taxon		
<i>Colaptes campestris</i>	X	X	X	Isoptera	not mentioned	-	-	-	Wied (1821) -Neuwied	
				Isoptera	-	Isoptera	not mentioned		von Ihering (1900)	
				-	-	Isoptera	arboreal		Negret & Teixeira (1983)	
				-	-	Isoptera	epigean		Negret & Teixeira (1983)	
				-	-	<i>Cornitermes cumulans</i>	epigean		Negret & Teixeira (1983)	
				-	-	<i>Cornitermes cumulans</i>	epigean		Redford (1984)	
				-	-	Isoptera	not mentioned		Dubs (1992)	
				-	-	<i>Cornitermes cumulans</i>	epigean		Sick (1997)	
				-	-	<i>Constrictotermes cyphergaster</i>	arboreal		Sick (1997)	
				-	-	Isoptera	epigean		Castro (2000)	
				-	-	Isoptera	arboreal		Amaral (2003)	
				-	-	Isoptera	not mentioned		Silva e Silva (2004)	
				-	-	Isoptera	not mentioned		Rodrigues & Costa (2006)	
				-	-	Isoptera	epigean		Santos (2007)	
				-	-	Isoptera	epigean		Avelino (2009)	
				-	-	Isoptera	epigean		Bete (2009)	
				-	-	Isoptera	epigean		Bucci (2009)	
				-	-	Isoptera	epigean		Rodrigues (2009)	
				-	-	Isoptera	epigean		Cezar (2010)	
				-	-	Isoptera	epigean		Zachetti (2010)	
				-	-	Isoptera	epigean		Bessa (2011)	
				-	-	Isoptera	epigean		Filho (2011)	
				-	-	Isoptera	epigean		Vieira (2011)	
				-	alate, worker	-	-		Schubart et al. (1965)	
				Termitidae	not mentioned	-	-		Sick (1997)	
<i>Celeus elegans</i>	X			Isoptera	alate, worker, soldier	-	-		Schubart et al. (1965)	
				<i>Nasutitermes</i> sp.	worker, soldier	-	-		Schubart et al. (1965)	
<i>Celeus lugubris</i>	X	X		<i>Nasutitermes</i> sp.	worker, soldier	-	-		Dubs (1992)	
				Termitidae	worker, soldier	-	-		Schubart et al. (1965)	
<i>Celeus flavescens</i>	X			-	worker, soldier	-	arboreal		Schubart et al. (1965)	
				Termitidae	worker, soldier	-	-		Sick (1997)	
				<i>Nasutitermes</i> sp.	not mentioned	-	-		Schubart et al. (1965)	
<i>Celeus torquatus</i>	X			Isoptera	worker, soldier	-	-		Schubart et al. (1965)	
				<i>Nasutitermes</i> sp.	worker, soldier	-	-		Schubart et al. (1965)	

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Table 1. Continued.

Family / Species	Interaction Type			Feeding on termites			Nesting on termitaria			Source
	Feeding	Nesting	Perching	Taxon	Caste	Taxon	Termitaria type	Taxon	Termitaria type	
<i>Dryocopus lineatus</i>	X			Termitidae	worker, soldier	-	-	-	Schubart et al. (1965)	
<i>Campephilus rubricollis</i>	X			<i>Nasutitermes</i> sp.	soldier	-	-	-	Schubart et al. (1965)	
<i>Campephilus robustus</i>	X			Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
<i>Picumnus</i> sp.		X		Isoptera	not mentioned	-	-	-	Moojen et al. (1941)	
Carianidae				-	-	-	Isoptera	epigeal	Sick (1997)	
<i>Cariama cristata</i>			X	-	-	-	-	-	Redford (1984)	
Falconidae				-	-	-	-	-	-	
<i>Daptrius ater</i>	X			Isoptera	alate	-	-	-	Sick (1997)	
<i>Ibycter americanus</i>	X			Isoptera	alate	-	-	-	Sick (1997)	
<i>Caracara plancus</i>	X		X	<i>Cornitermes cumulans</i>	not mentioned	-	-	-	Redford (1984)	
<i>Milvago chimachima</i>	X			Isoptera	alate	-	-	-	Sick (1997)	
<i>Falco sparverius</i>	X		X	-	-	-	<i>Constrictotermes cyphergaster</i>	arboreal	Negret & Teixeira (1983)	
<i>Falco femoralis</i>	X			-	-	-	<i>Cornitermes cumulans</i>	epigeal	Redford (1984)	
<i>Falco peregrinus</i>	X			-	-	-	<i>Cornitermes cumulans</i>	epigeal	Redford (1984)	
Psittacidae				-	-	-	-	-	-	
<i>Primolius maracana</i>		X		Termitidae	alate	-	-	-	Sick (1997)	
<i>Aratinga auricapillus</i>		X		Isoptera	alate	-	-	-	Schubart et al. (1965)	
<i>Eupsittula aurea</i>	X		X	Isoptera	alate	-	-	-	Sick (1997)	
				Isoptera	not mentioned	-	-	-	Sick (1997)	
				Isoptera	alate	-	-	-	Faria (2007)	
				-	-	-	<i>Constrictotermes cyphergaster</i>	arboreal	Negret & Teixeira (1983)	
				-	-	-	<i>Cornitermes cumulans</i>	epigeal	Redford (1984)	
				-	-	-	Isoptera	arboreal	Sazima (1989)	
				-	-	-	Isoptera	arboreal	Dubs (1992)	
				-	-	-	<i>Constrictotermes cyphergaster</i>	arboreal	Sick (1997)	
				-	-	-	Isoptera	not mentioned	Bianchi et al. (2000)	
				-	-	-	Isoptera	not mentioned	Silva e Silva (2004)	
				-	-	-	Isoptera	rupicolous	Rodrigues & Costa (2006)	
				-	-	-	Isoptera	arboreal	Stamato (2009)	
				-	-	-	Isoptera	epigeal	Camargo (2010)	

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Table 1. Continued.

Family / Species	Interaction Type			Feeding on termites			Nesting on termitaria			Source
	Feeding	Nesting	Perching	Taxon	Caste	Taxon	Termitaria type			
<i>Eupsittula pertinax</i>		X		-	-	Isoptera	arboreal	Dalessandro (2010)		
<i>Eupsittula cactorum</i>		X		-	-	Isoptera	arboreal	Araujo (2011)		
				-	-	Isoptera	arboreal	Costa (2011)		
				-	-	Isoptera	arboreal	Oliveira (2011)		
				-	-	Isoptera	arboreal	Olyntho (2011)		
				-	-	Isoptera	epigeal	Sales (2011)		
				-	-	Isoptera	arboreal	Ribeiro (2012)		
				-	-	<i>Cornitermes</i> sp.	epigeal	Silva e Silva (pers. comm.)		
				-	-	<i>Cornitermes</i> sp.	epigeal	pers. obs.		
				-	-	<i>Constrictotermes cyphergaster</i>	arboreal	pers. obs.		
				-	-	Isoptera	arboreal	Carvalho (2010)		
				-	-	<i>Nasutitermes</i> sp.	arboreal	Naka (1997)		
				-	-	Isoptera	arboreal	Netto (2010a)		
				-	-	Isoptera	epigeal	Netto (2010b)		
				-	-	Isoptera	arboreal	Netto (2010c)		
				-	-	Isoptera	arboreal	Netto (2010d)		
				-	-	Isoptera	arboreal	Teixeira (2010)		
				-	-	Isoptera	arboreal	Couto (2010)		
				-	-	Isoptera	not mentioned	Sick (1997)		
				-	-	Isoptera	arboreal	Costa (2008)		
				-	-	<i>Nasutitermes</i> sp.	arboreal	Negret & Teixeira (1983)		
				-	-	Isoptera	arboreal	Dubs (1992)		
				-	-	<i>Nasutitermes</i> sp.	not mentioned	Sick (1997)		
				-	-	Isoptera	arboreal	Raso (2008)		
				-	-	Isoptera	arboreal	Santos (2008)		
				-	-	Isoptera	arboreal	Cunha (2010a)		
				-	-	Isoptera	arboreal	Flores (2010)		
				-	-	Isoptera	arboreal	Lima (2012)		
				-	-	Isoptera	arboreal	Costa (2009)		
				-	-	Isoptera	arboreal	Sonntag (2011)		
				-	-	<i>Cornitermes</i> sp.	epigeal	Silva e Silva (2004)		
				-	-	<i>Cornitermes</i> sp.	epigeal	Silva e Silva (pers. comm.)		
				-	-	Isoptera	not mentioned	Bianchi et al. (2000)		
				-	-	<i>Cornitermes</i> sp.	epigeal	Buzzetti & Silva (2005)		
Thamophilidae										
<i>Myrmeciza atrothorax</i>	X			Termitidae	not mentioned	-	-	Schubart et al. (1965)		
<i>Formicivora grisea</i>	X			Isoptera	alate	-	-	Sick (1997)		
<i>Formicivora melanogaster</i>	X			<i>Eutermes</i> sp.	alate	-	-	Teixeira (1987)		

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Table 1. Continued.

Family / Species	Interaction Type			Feeding on termites			Nesting on termitaria			Source
	Feeding	Nesting	Perching	Taxon	Caste	Taxon	Termitaria type	Taxon	Termitaria type	
<i>Herpsilochmus sellowi</i>	X			<i>Eutermes</i> sp.	alate	-	-	-	Teixeira (1987)	
<i>Sakesphorus cristatus</i>	X			<i>Eutermes</i> sp.	alate	-	-	-	Teixeira (1987)	
<i>Thannophilus pelzelni</i>	X			Isoptera	not mentioned	-	-	-	Lopes et al. (2005)	
<i>Thannophilus ambiguus</i>	X			Isoptera	not mentioned	-	-	-	Lopes et al. (2005)	
<i>Taraba major</i>	X			Termitidae	worker	-	-	-	Schubart et al. (1965)	
<i>Rhopornis ardesiacus</i>	X			<i>Nasutitermes</i> sp.	not mentioned	-	-	-	Schubart et al. (1965)	
<i>Willisornis poecilnotus</i>	X			<i>Eutermes</i> sp.	alate	-	-	-	Teixeira (1987)	
Melanopareidae				Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
<i>Melanopareia torquata</i>	X			Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
Rhinocryptidae				Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
<i>Scytalopus novacapitalis</i>	X			Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
Formicariidae				Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
<i>Formicarius analis</i>	X			Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
Scleruridae				Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
<i>Sclerurus rufifigularis</i>	X	X		Termitidae	alate	-	-	-	Schubart et al. (1965)	
<i>Geositta poeciloptera</i>			X	-	-	Isoptera	epigeal	-	Silva e Silva (2005)	
Dendrocolaptidae				-	-	-	-	-	-	
<i>Sittasomus griseicapillus</i>	X			Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
<i>Xiphorhynchus obsoletus</i>		X		Isoptera	alate	-	-	-	Olson & Alvarenga (2006)	
<i>Lepidocolaptes angustirostris</i>		X		-	-	Isoptera	arboreal	-	Dubs (1992)	
Xenopidae				-	-	Isoptera	epigeal	-	Marantz et al. (2003)	
<i>Xenops rutilans</i>	X			Isoptera	alate	-	-	-	Olson & Alvarenga (2006)	
Furnariidae				-	-	-	-	-	-	
<i>Furnarius leucopus</i>	X			Termitidae	soldier	-	-	-	Schubart et al. (1965)	
<i>Furnarius rufus</i>	X			Termitidae	worker, soldier	-	-	-	Schubart et al. (1965)	
				Isoptera	alate	-	-	-	Sazima (2008)	
				Isoptera	alate	-	-	-	pers. obs.	
				<i>Ruptitermes</i> sp.	alate	-	-	-	pers. obs.	
<i>Philydor erythrocerum</i>	X			Isoptera	not mentioned	-	-	-	Schubart et al. (1965)	
<i>Philydor atricapillus</i>	X			Isoptera	not mentioned	-	-	-	Mallet-Rodrigues (2001)	
<i>Philydor rufum</i>	X			Isoptera	not mentioned	-	-	-	Olson & Alvarenga (2006)	
<i>Syndactyla dimidiata</i>	X	X		Isoptera	alate	-	-	-	Olson & Alvarenga (2006)	
				-	-	Isoptera	arboreal	-	Pacheco (1995a)	
				-	-	Isoptera	arboreal	-	Pacheco (1995b)	
<i>Synallaxis spixi</i>	X			Isoptera	alate	-	-	-	Belton (1994)	
				Isoptera	alate	-	-	-	Olson & Alvarenga (2006)	
<i>Synallaxis scutata</i>	X			Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
<i>Furnarius</i> sp.	X			Isoptera	alate	-	-	-	Sick (1997)	

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Table 1. Continued.

Family / Species	Interaction Type			Feeding on termites			Nesting on termitaria			Source
	Feeding	Nesting	Perching	Taxon	Caste	Taxon	Termitaria type			
Onychorhynchidae										
<i>Onychorhynchus</i> sp.	X			Isoptera	alate	-	-	Sick (1997)		
Tityridae										
<i>Pachyrhamphus validus</i>	X			Isoptera	alate	-	-	pers. obs.		
Cotingidae										
<i>Gymnoderus foetidus</i>	X	X		Isoptera	alate	Isoptera	arboreal	Sick (1997)		
<i>Cotinga maculata</i>				-	-	-	-	Sick (1997)		
Pipritidae										
<i>Piprites pileata</i>	X			Isoptera	alate	-	-	Olson & Alvarenga (2006)		
Rhynchochrysididae										
<i>Mionectes rufiventris</i>	X			Isoptera	alate	-	-	Olson & Alvarenga (2006)		
<i>Phylloscartes ventralis</i>	X			Isoptera	alate	-	-	Olson & Alvarenga (2006)		
<i>Tolmomyias flaviventris</i>	X			Termitidae	not mentioned	-	-	Schubart et al. (1965)		
Tyrannidae										
<i>Camptostoma obsoletum</i>	X			Isoptera	alate	-	-	Gussoni & Campos (2003)		
<i>Elaenia flavogaster</i>	X			Isoptera	alate	-	-	Paiva (1998)		
				Isoptera	alate	-	-	Gussoni & Campos (2003)		
				<i>Ruptitermes</i> sp.	alate	-	-	pers. obs.		
				<i>Ruptitermes</i> sp.	alate	-	-	pers. obs.		
<i>Elaenia parvirostris</i>	X			Isoptera	alate	-	-	Belton (1994)		
<i>Elaenia chiriquensis</i>	X			Isoptera	alate	-	-	pers. obs.		
<i>Elaenia obscura</i>	X			Isoptera	alate	-	-	C. R. M. Abreu & M. M. Coelho (pers. comm.)		
				Isoptera	alate	-	-	Gussoni & Campos (2003)		
<i>Elaenia</i> sp.	X			Isoptera	alate	-	-	pers. obs.		
<i>Phaeomyias murina</i>	X			<i>Ruptitermes</i> sp.	alate	-	-	Gussoni & Campos (2003)		
<i>Legattus leucophaius</i>	X			Isoptera	alate	-	-	pers. obs.		
				<i>Ruptitermes</i> sp.	alate	-	-	pers. obs.		
<i>Myiarchus swainsoni</i>	X			Isoptera	alate	-	-	Gussoni & Campos (2003)		
<i>Myiarchus tyrannulus</i>	X			Isoptera	alate	-	-	Gussoni & Campos (2003)		
<i>Pitangus sulphuratus</i>	X			Isoptera	alate	-	-	Sazima (2008)		
<i>Machetornis rixosa</i>	X			Isoptera	alate	-	-	Paiva (1998)		
				<i>Ruptitermes</i> sp.	alate	-	-	pers. obs.		
<i>Myiodynastes maculatus</i>	X			Isoptera	alate	-	-	Gussoni & Campos (2003)		
				Isoptera	alate	-	-	pers. obs.		
<i>Megarynchus pitangua</i>	X			Isoptera	alate	-	-	Gussoni & Campos (2003)		
				Isoptera	alate	-	-	pers. obs.		
				Isoptera	alate	-	-	Gussoni & Campos (2003)		
				Isoptera	alate	-	-	pers. obs.		
<i>Myiozetetes similis</i>	X			<i>Ruptitermes</i> sp.	alate	-	-	pers. obs.		
				Isoptera	alate	-	-	Gussoni & Campos (2003)		
				Isoptera	alate	-	-	pers. obs.		

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Table 1. Continued.

Family / Species	Interaction Type		Feeding on termites			Nesting on termitaria			Source
	Feeding	Nesting	Perching	Feeding on termites		Nesting on termitaria			
				Taxon	Caste	Taxon	Termitaria type		
<i>Tyrannus melancholicus</i>	X			Isoptera	alate	-	-	Paiva (1998)	
				Isoptera	alate	-	-	Gussoni & Campos (2003)	
				Isoptera	alate	-	-	Sazima (2008)	
<i>Tyrannus savana</i>	X			<i>Rapitermes</i> sp.	alate	-	-	pers. obs.	
				Isoptera	alate	-	-	Cunha (1961)	
				Termitidae	alate	-	-	Schubart et al. (1965)	
				Isoptera	alate	-	-	Sick (1997)	
<i>Empidonomus varius</i>	X			Isoptera	alate	-	-	Gussoni & Campos (2003)	
				Isoptera	alate	-	-	Gussoni & Campos (2003)	
				Isoptera	alate	-	-	pers. obs.	
<i>Colonia colonus</i>	X			<i>Rapitermes</i> sp.	alate	-	-	pers. obs.	
<i>Myiophobus fasciatus</i>	X			Isoptera	alate	-	-	Paiva (1998)	
<i>Fluvicola nengeta</i>	X			Isoptera	alate	-	-	Gussoni & Campos (2003)	
				Isoptera	alate	-	-	pers. obs.	
<i>Lathrotriccus euleri</i>	X			<i>Rapitermes</i> sp.	alate	-	-	pers. obs.	
<i>Knipolegus cyanirostris</i>	X			Isoptera	alate	-	-	Gussoni & Campos (2003)	
				Isoptera	alate	-	-	C. R. M. Abreu & M. M. Coelho (pers. comm.)	
<i>Knipolegus lophotes</i>	X			Isoptera	alate	-	-	pers. obs.	
<i>Xolmis velatus</i>		X		-	-	-	-	Sick (1997)	
<i>Xolmis irupero</i>		X		-	-	-	-	Buzzetti & Silva (2005)	
<i>Xolmis</i> sp.		X		-	-	-	-	von Ihering (1914)	
				-	-	-	-	Redford (1984)	
<i>Muscipipra vetula</i>	X			Isoptera	alate	-	-	Olson & Alvarenga (2006)	
Vireonidae									
<i>Cyclarhis gujanensis</i>	X			Isoptera	alate	-	-	Olson & Alvarenga (2006)	
<i>Vireo olivaceus</i>	X			Termitidae	not mentioned	-	-	Schubart et al. (1965)	
				Isoptera	alate	-	-	Gussoni & Campos (2003)	
<i>Hylophilus poicilotis</i>	X			Isoptera	alate	-	-	Olson & Alvarenga (2006)	
Corvidae									
<i>Cyanocorax cyanomelas</i>	X			Termitidae	not mentioned	-	-	Schubart et al. (1965)	
<i>Cyanocorax cyanopogon</i>	X			Isoptera	alate	-	-	Sick (1997)	
Hirundinidae									
<i>Pygochelidon cyanoleuca</i>	X			Isoptera	alate	-	-	Paiva (1998)	
				Isoptera	alate	-	-	Gussoni & Campos (2003)	
				Isoptera	alate	-	-	Olson & Alvarenga (2006)	
				Isoptera	alate	-	-	Sazima (2008)	

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Table 1. Continued.

Family / Species	Interaction Type			Feeding on termites			Nesting on termitaria			Source
	Feeding	Nesting	Perching	Taxon	Caste	Taxon	Taxon	Termitaria type		
<i>Progne tapera</i>	X	X		Isoptera	alate	-	-	-	C. R. M. Abreu & M. M. Coelho (pers. comm.)	
<i>Progne chalybea</i>			X	Isoptera	alate	-	-	-	pers. obs.	
<i>Tachycineta leucorrhoa</i>		X	X	<i>Ruptitermes</i> sp.	alate	-	-	-	pers. obs.	
				Isoptera	alate	Isoptera	arboreal	arboreal	Sick (1997)	
				Isoptera	alate	-	-	-	Sick (1997)	
				Isoptera	alate	Isoptera	arboreal	arboreal	Gussoni & Campos (2003)	
				Isoptera	alate	Isoptera	arboreal	arboreal	Sazima (2008)	
				Isoptera	alate	Isoptera	epigeal	epigeal	Sick (1997)	
				Isoptera	alate	Isoptera	epigeal	epigeal	Oliveira (2010a)	
				Isoptera	alate	Isoptera	epigeal	epigeal	Bessa (2008)	
				Isoptera	alate	Isoptera	epigeal	epigeal	Guedes (2009)	
				Isoptera	alate	Isoptera	epigeal	epigeal	Couto (2011)	
Troglodytidae										
<i>Troglodytes musculus</i>	X			Isoptera	alate	-	-	-	Paiva (1998)	
<i>Cyphorhinus arada</i>	X			Isoptera	alate	-	-	-	Sazima (2008)	
Turdidae				Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
<i>Turdus leucomelas</i>	X			Isoptera	not mentioned	-	-	-	Lopes et al. (2005)	
<i>Turdus amaurochalinus</i>	X			Isoptera	alate	-	-	-	Sazima (2008)	
				<i>Ruptitermes</i> sp.	alate	-	-	-	pers. obs.	
<i>Turdus subalaris</i>	X			Isoptera	alate	-	-	-	Belton (1994)	
Mimidae				Isoptera	not mentioned	-	-	-	Lopes et al. (2005)	
<i>Mimus saturninus</i>	X			Isoptera	alate	-	-	-	Olson & Alvarenga (2006)	
				Isoptera	not mentioned	-	-	-	Moojen et al. (1941)	
				Termitidae	worker, soldier	-	-	-	Schubart et al. (1965)	
				Isoptera	alate	-	-	-	Schubart et al. (1965)	
				Isoptera	alate	-	-	-	Paiva (1998)	
				Isoptera	alate	-	-	-	Sazima (2008)	
Passerellidae										
<i>Zonotrichia capensis</i>	X			Isoptera	alate	-	-	-	Belton (1994)	
				Isoptera	alate	-	-	-	Paiva (1998)	
				<i>Neocapritermes</i> sp.	alate	-	-	-	Vasconcelos (1999)	
				Isoptera	alate	-	-	-	Gussoni & Campos (2003)	
				Isoptera	alate	-	-	-	Olson & Alvarenga (2006)	
				Isoptera	alate	-	-	-	Sazima (2008)	
				Isoptera	alate	-	-	-	C. R. M. Abreu & M. M. Coelho (pers. comm.)	

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Table 1. Continued.

Family / Species	Interaction Type			Feeding on termites			Nesting on termitaria			Source
	Feeding	Nesting	Perching	Taxon	Caste	Taxon	Termitaria type			
							Taxon	Termitaria type		
<i>Arremon taciurnus</i>				Isoptera	alate	-	-	-	pers. obs.	
Paruliidae				Isoptera	alate	-	-	-	pers. obs.	
<i>Termitidae</i>				Termitidae	not mentioned	-	-	-	Schubart et al. (1965)	
<i>Setophaga pitiayumi</i>	X			Isoptera	alate	-	-	-	Belton (1994)	
<i>Basileuterus culicivorus</i>	X			Isoptera	alate	-	-	-	Olson & Alvarenga (2006)	
<i>Myiothlypis flaveola</i>	X			Isoptera	not mentioned	-	-	-	Lopes et al. (2005)	
Icteridae				Isoptera	alate	-	-	-	pers. obs.	
<i>Psarocolius decumanus</i>	X			Isoptera	alate	-	-	-	Olson & Alvarenga (2006)	
<i>Cacicus chrysopterus</i>	X			Isoptera	alate	-	-	-	Schubart et al. (1965)	
<i>Icterus cayanensis</i>	X			Termitidae	not mentioned	-	-	-	Sick (1997)	
<i>Gnorinopsar chopi</i>		X		-	-	Isoptera	epigeal	-	Belton (1994)	
<i>Molothrus bonariensis</i>	X			Isoptera	alate	-	-	-	pers. obs.	
<i>Quiscalus lugubris</i>	X			Isoptera	alate	-	-	-	Sick (1997)	
<i>Psarocolius</i> sp.	X			Isoptera	alate	-	-	-	Sick (1997)	
<i>Cacicus</i> sp.	X			Isoptera	alate	-	-	-	Sick (1997)	
Thraupidae				Isoptera	alate	-	-	-	Gussoni & Campos (2003)	
<i>Coereba flaveola</i>	X			Isoptera	alate	-	-	-	Sazima (2008)	
				Isoptera	alate	-	-	-	pers. obs.	
<i>Saltator similis</i>	X			<i>Rupitermes</i> sp.	alate	-	-	-	Paiva (1998)	
				Isoptera	alate	-	-	-	Olson & Alvarenga (2006)	
<i>Orchesticus abeillei</i>	X			Isoptera	alate	-	-	-	Sick (1997)	
<i>Nemosia pileata</i>	X			Isoptera	alate	-	-	-	pers. obs.	
<i>Thlypopsis sordida</i>	X			Isoptera	alate	-	-	-	Paiva (1998)	
				Isoptera	alate	-	-	-	Gussoni & Campos (2003)	
<i>Pyrrhocomma ruficeps</i>	X			Isoptera	alate	-	-	-	Olson & Alvarenga (2006)	
<i>Tachyphonus coronatus</i>	X			Isoptera	not mentioned	-	-	-	Lopes et al. (2005)	
				Isoptera	alate	-	-	-	Gussoni & Campos (2003)	
<i>Ramphocelus carbo</i>	X			Isoptera	alate	-	-	-	Sazima (2008)	
<i>Lanio pileatus</i>	X			Isoptera	alate	-	-	-	pers. obs.	
<i>Lanio melanops</i>	X			Isoptera	alate	-	-	-	Sick (1997)	
<i>Tangara sayaca</i>	X			Isoptera	alate	-	-	-	Belton (1994)	
				Isoptera	alate	-	-	-	Sick (1997)	
				Isoptera	alate	-	-	-	Paiva (1998)	
				Isoptera	alate	-	-	-	Gussoni & Campos (2003)	
				Isoptera	alate	-	-	-	Sazima (2008)	
				Isoptera	alate	-	-	-	pers. obs.	

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Table 1. Continued.

Family / Species	Interaction Type			Feeding on termites			Nesting on termitaria			Source
	Feeding	Nesting	Perching	Taxon	Caste	Taxon	Termitaria type	Taxon	Termitaria type	
<i>Tangara palmarum</i>	X			<i>Ruptitermes</i> sp.	alate		-		-	pers. obs.
<i>Tangara ornata</i>	X			<i>Ruptitermes</i> sp.	alate		-		-	pers. obs.
<i>Tangara cayana</i>	X			Isoptera	alate		-		-	Gussoni & Campos (2003)
				Isoptera	alate		-		-	Olson & Alvarenga (2006)
				Isoptera	alate		-		-	Sazima (2008)
				Isoptera	alate		-		-	pers. obs.
<i>Stephanophorus diadematus</i>	X			<i>Ruptitermes</i> sp.	alate		-		-	pers. obs.
				Isoptera	alate		-		-	Olson & Alvarenga (2006)
				Isoptera	alate		-		-	C. R. M. Abreu & M. M. Coelho (pers. comm.)
<i>Neothraupis fasciata</i>	X			Isoptera	not mentioned		-		-	Alves (1991)
<i>Schistochlamys ruficapillus</i>	X			Isoptera	alate		-		-	pers. obs.
<i>Pipraeidea melanonota</i>	X			Isoptera	alate		-		-	Olson & Alvarenga (2006)
<i>Pipraeidea bonariensis</i>	X			Isoptera	alate		-		-	Belton (1994)
<i>Tersina viridis</i>	X			Isoptera	not mentioned		-		-	Sick (1997)
				Isoptera	alate		-		-	pers. obs.
<i>Daenis cayana</i>	X			<i>Ruptitermes</i> sp.	alate		-		-	pers. obs.
				Isoptera	alate		-		-	Gussoni & Campos (2003)
<i>Cyanerpes cyaneus</i>	X			Isoptera	alate		-		-	pers. obs.
<i>Conirostrum spectosum</i>	X			<i>Ruptitermes</i> sp.	alate		-		-	Sick (1997)
<i>Poospiza thoracica</i>	X			Isoptera	alate		-		-	Gussoni & Campos (2003)
				Isoptera	alate		-		-	C. R. M. Abreu & M. M. Coelho (pers. comm.)
<i>Poospiza lateralis</i>	X			Isoptera	alate		-		-	Coelho (pers. comm.)
<i>Sicalis flaveola</i>	X			Isoptera	alate		-		-	pers. obs.
<i>Embernagra longicauda</i>	X			Isoptera	alate		-		-	pers. obs.
<i>Volatinia jacarina</i>	X			Isoptera	not mentioned		-		-	pers. obs.
<i>Sporophila nigricollis</i>	X			Termitidae	not mentioned		-		-	Schubart et al. (1965)
Cardinalidae				<i>Ruptitermes</i> sp.	alate		-		-	pers. obs.
<i>Piranga flava</i>	X			Termitidae	not mentioned		-		-	Schubart et al. (1965)
Passeridae										
<i>Passer domesticus</i>	X			Isoptera	alate		-		-	Sick (1997)
				Isoptera	alate		-		-	Paiva (1998)
				Isoptera	alate		-		-	Sazima (2008)

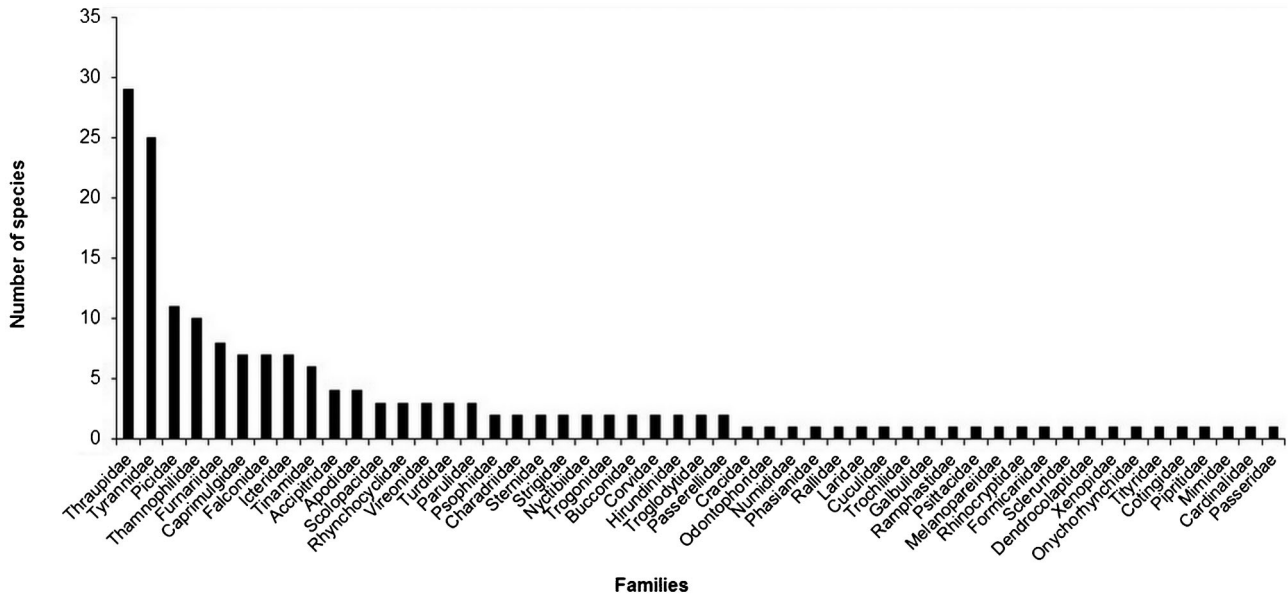


Figure 1. Number of bird species, per family, recorded feeding on termites in Brazil.

Guineafowl, despite being a terrestrial species, jumped and caught the termites in flight. Although it is a domestic and exotic species, it also feeds on termites in wildlife, as recorded by Thiollay (1970) in Africa.

In the course of another swarm, observed in December 2005 at a grassland savannah (*campo cerrado*), in the Serra do Mascate, Congonhas/MG, MFV (*pers. obs.*) recorded the following species of birds feeding on winged termites: Lesser Elaenia (*Elaenia chiriquensis*, n = 1), Crested Black-Tyrant (*Knipolegus lophotes*, n = 1), Blue-and-white Swallow (n = 5), Cinnamon Tanager (*Schistochlamys ruficapillus*, n = 2), Sayaca Tanager (n = 2), Burnished-buff Tanager (*Tangara cayana*, n = 3) and Blue Dacnis (*Dacnis cayana*, n = 2).

On 22 January 2008, at c. 17:30 h, MFV and L. N. Souza observed a swarm of *Ruptitermes* sp. at a light rain in Fazenda Bocaina (20° 00' 01"S, 43° 28' 17"W; elevation: c. 750 m), Santa Bárbara/MG. The alates were emerging from a hole in the soil of an orchard, protected by workers. Birds of the following species were observed catching these winged termites: Rufous Hornero (n = 2), Yellow-bellied Elaenia (*Elaenia*

flavogaster, n = 1), Masked Water-Tyrant (n = 1), Long-tailed Tyrant (*Colonia colonus*, n = 1), Cattle Tyrant (*Machetornis rixosa*, n = 1), Piratic Flycatcher (*Legatus leucophaeus*, n = 1), Boat-billed Flycatcher (n = 1), Tropical Kingbird (*Tyrannus melancholicus*, n = 1), Blue-and-white Swallow (n = 1), Pale-breasted Thrush (*Turdus leucomelas*, n = 1), Bananaquit (*Coereba flaveola*, n = 1), Palm Tanager (*Tangara palmarum*, n = 2), Golden-chevrons Tanager (*Tangara ornata*, n = 2), Burnished-buff Tanager (n = 2) and Swallow Tanager (n = 2). Interestingly, several birds that usually do not perform aerial foraging tactics, such as: *E. flavogaster*, *T. leucomelas*, *T. ornata*, *T. palmarum*, *T. cayana* and *T. viridis*, caught insects in flight, landing later to consume them. In the case of *T. viridis*, the same specimen (a male) captured up to five alates in a single attempt. *Megarynchus pitangua* and *C. flaveola* captured winged termites that landed in trees and shrubs. One specimen of *T. cayana* combined both foraging techniques (in flight and perched in the shrubs). Birds that usually forage on the ground caught alates that were still on the ground, such as: *F. rufus*, *F. nengeta* and *M. rixosa*.

Around 17:00 h, on 28 January 2008, another swarm of *Ruptitermes* sp. was observed by MFV and L. N. Souza in a

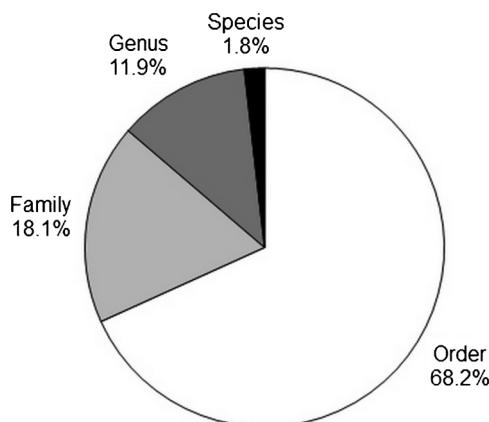


Figure 2. Percentages of identification, in different taxonomic levels, of the termites recorded as food resource for birds in Brazil.

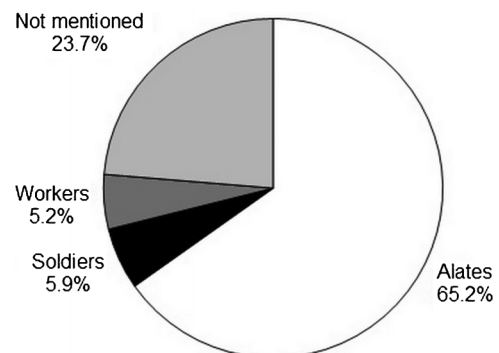


Figure 3. Percentage of termite castes recorded as food resource by birds in Brazil.

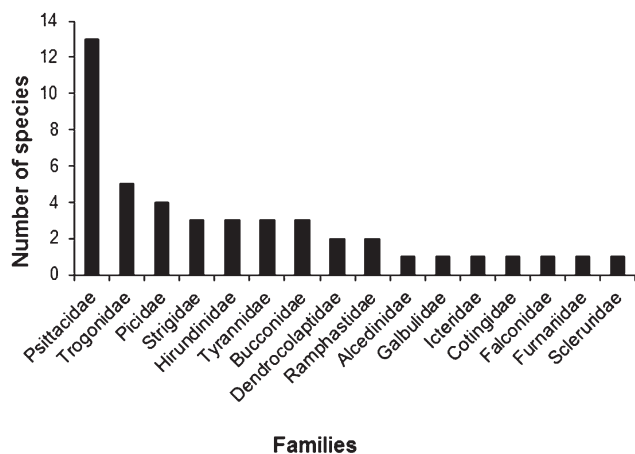


Figure 4. Number of bird species, per family, using termitaria as nesting sites in Brazil.

secondary forest edge at Córrego do Sítio (20° 00' 36" S, 43° 30' 45" W), also in Santa Bárbara/MG. The following species of birds captured insects in flight: Yellow-bellied Elaenia ($n = 1$), Mouse-colored Tyrannulet (*Phaeomyias murina*, $n = 1$), Blue Dacnis ($n = 2$; a couple) and Yellow-bellied Seedeater (*Sporophila nigricollis*, $n = 2$; a couple).

In a recent paper, Sazima (2008) also reported 16 bird species feeding on alates in Campinas/SP, in July 2007. He also noted the changing of regular foraging behavior of several species as pointed out by Olson & Alvarenga (2006).

The flight activity is unknown for most termites. Although not a rule, in southeastern Brazil swarmings generally occur from the end of the dry season to the beginning of the rainy season (between September and March), but in some parts of the Amazon region the effects of seasonality are less pronounced (Silvestri 1903, Costa-Lima 1938, Martius et al. 1996, Medeiros et al. 1999). It is noteworthy that most termite swarms seems to coincide with the breeding season of birds, i.e. the beginning of the rainy season. As alates are rich in proteins and lipids (Nutting 1969), their predation during the breeding season of birds seems to be important to supplement their energy and protein demands. The Rufous-collared Sparrow was recorded feeding on alates of *Neocapritermes* sp. at the time that this species reproduces in the central state of Minas Gerais (Vasconcelos 1999). Melo-Júnior (2001) observed the Three-toed Jacamar (*Jacamaralcyon tridactyla*), a rare bird species endemic to the Atlantic Forest, also feeding on termites during its breeding season.

In the case of ground-foraging birds, such as the Red-winged Tinamou (*Rhynchotus rufescens*) and the Dwarf Tinamou (*Taoniscus nanus*), there are reports that these species dig termite mounds with their beaks to feed on those insects (Teixeira & Negret 1984, Sick 1997). Sick (1997) mentioned that this work is facilitated when mounds were previously damaged by other predators (such as anteaters) and repaired by termites with still fresh material. Other species of tinamous (Tinamidae) probably also exhibit this behavior, but have not yet been observed. When birds dig termite mounds, they can feed on other castes (workers and soldiers) and immatures (as nymphs, which are rich in fat and protein). Probably, the termites also enrich the diet of other groups of flying birds that burrow into

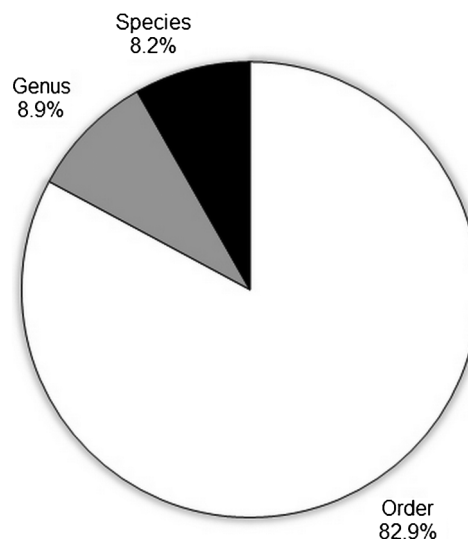


Figure 5. Percentages of identification, in different taxonomic levels, of the termites that build termitaria used as nest site by birds in Brazil.

mounds for nesting sites, such as parrots (Psittacidae), woodpeckers (Picidae) and trogons (Trogonidae) (see Euler 1900, Schubart et al. 1965, Sazima 1989, Dubs 1992, Naka 1997, Sick 1997).

3. Termitaria as nest sites for Brazilian birds

Termitaria were recorded as nesting sites for 45 species of Brazilian birds of 16 families (Table 1). The most representative families are: Psittacidae (13 species), Trogonidae (5), Picidae (4), Strigidae, Hirundinidae, Bucconidae and Tyrannidae (3) (Figure 4). These families are represented by several species that nest in holes in trees or natural walls. In general, birds of the families Alcedinidae (kingfishers) and Galbulidae (jacamars) nest in holes dug into ravines, being noteworthy Sick's (1997) observations on one species of each family nesting in termite mounds.

Again, little is known about the termite species that build termitaria used by birds as nest sites. Among the 146 records, in 121 (82.9%) termites were identified at the order level; in 13 (8.9%), at the generic level and only in 12 (8.2%), at species level (Figure 5).

Concerning the types of termitaria used by birds, from 146 records, 84 (57.5%) are arboreal, 50 (34.3%) are epigeal and only one (0.7%) is rupicolous. In 11 records (7.5%) termitaria types were not mentioned (Figure 6). In the only record of rupicolous mound, Rodrigues & Costa (2006) described the Peach-fronted Parakeet (*Eupsittula aurea*) nesting on a termitaria built on rocky walls of a canyon in the Serra do Cipó/MG.

Nesting inside termitaria can offer advantages to birds, as protection against predators and propitious micro-climate (Sick 1997). However, it is not always possible to know whether a bird that nests inside the termitaria dig its own nest or use a cavity excavated by another bird. Woodpeckers (Picidae), parrots (Psittacidae), trogons (Trogonidae) and puffbirds (Bucconidae) were reported excavating termitaria for nesting (Sazima 1989, Dubs 1992, Sick 1997). On the afternoon of 6 August 1999, for about 15 minutes, MFV observed a male of the Surucua Trogon (*Trogon surrucura surrucura*) digging an arboreal termitarium of *Nasutitermes* sp. at Morro do Diabo State Park, Teodoro Sampaio/SP. This termitarium was about

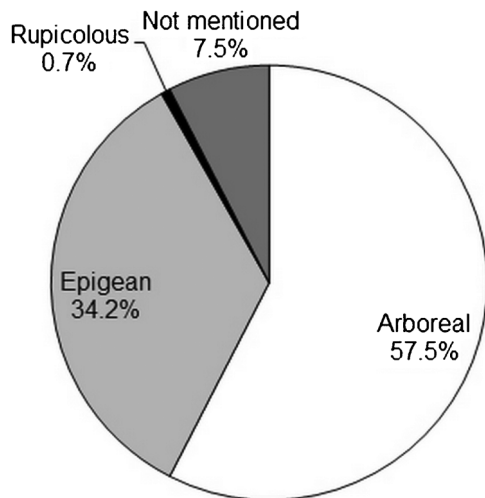


Figure 6. Percentages of termitaria types used by birds as nest sites in Brazil.

3 m above the ground in a tree at the edge of secondary forest. The bird perched on the termitarium like a woodpecker, grabbed by its feet. It also used its tail as a support, working its rectrices (Figure 7). The female remained perched in a nearby tree and watched the work carried out by the male, without participating in the excavation.

Among parrots, R. Silva e Silva (*pers. comm.*) observed the following bird species nesting in mounds of *Cornitermes* sp.: Peach-fronted Parakeet (in Tapira/MG) and Yellow-faced Parrot (*Alipiopsitta xanthops*; at Emas National Park, Mineiros/GO). In the *cerrado* region of Minas Gerais state, the Peach-fronted Parakeet is also commonly observed nesting in arboreal termite nests of *Constrictotermes cyphergaster*, in Sete Lagoas, Paraopeba and Inhaúmas (Figure 8). This parakeet was recorded nesting in these termitaria between the months of April and July (MFV *pers. obs.*).

It is noteworthy that termites restore the termitaria walls that were excavated by birds, but generally respects the birds'



Figure 7. A male of the Surucua Trogon (*Trogon surrucura surrucura*) digging an arboreal termitarium of *Nasutitermes* sp. at Morro do Diabo State Park/SP, showing the working of its rectrices that support him in the termitaria. Photo by Marcelo Ferreira de Vasconcelos.



Figure 8. In the *cerrado* region of Minas Gerais state, the Peach-fronted Parakeet (*Eupsittula aurea*) is commonly observed nesting in arboreal nests of *Constrictotermes cyphergaster*. This nest was found in July 2007 in the *cerrado* of Inhaúma/MG. In its interior it was found a single white and rounded egg. Photo by Marcelo Ferreira de Vasconcelos.

incubatory chamber (Sick 1997) and it remains unchanged even after the nest is abandoned by the birds. Naka (1997) reported that termites also restored the exterior walls damaged in arboreal termitaria which were used for nesting by the Cactus Parakeet (*Eupsittula cactorum*). In this context, it is noteworthy that parrots have a preference for active termitaria, *i.e.*, those occupied by termites, since abandoned termitaria are very dry and break easily (Hardy 1963).

Sick (1997) mentioned the following bird species that use excavations in termitaria previously made by other birds: the American Kestrel (*Falco sparverius*), the Tropical Screech-Owl (*Megascops choliba*), the Ferruginous Pygmy-Owl (*Glaucidium brasilianum*), the Toco Toucan (*Ramphastos toco*), the White-rumped Monjita (*Xolmis velatus*), the Brown-chested Martin (*Progne tapera*) and the Chopi Blackbird (*Gnorimopsar chopi*). In Catalão/GO, R. Silva e Silva (*in litt.*) photographed one specimen of the Chestnut-eared Aracari (*Pteroglossus castanotis*) leaving its nest, located in a mound of *Cornitermes* sp., which was probably dug by another bird. This species can nest in both epigeal and in arboreal termitaria (Sick 1997). Bird species reported by Sick (1997) as diggers of holes in termitaria which are later used by other species were parakeets (Psittacidae) and woodpeckers (Picidae), especially the Peach-fronted Parakeet and the Campo Flicker (*Colaptes campestris*). The Burrowing Owl (*Athene cunicularia*) is also mentioned as an excavator of termite mounds, but also exploits pre-existing holes, so that a couple simply extend it, using their feet and beaks (see Euler 1900, Cunha 1961, Negret & Teixeira 1983, Sick 1997).

It is also noteworthy that termitaria appear to be a critical resource for maintaining populations of many species of birds that nest in cavities. This is because large trees, which forms potential hollows for nesting-cavity birds, are extremely scarce in secondary forests, as well as in the *cerrado* of central Brazil (Negret & Teixeira 1983, MFV *pers. obs.*).

Despite birds use termitaria as nest sites, there is a recent report of termites (*Microcerotermes* cf. *exiguus*) using an abandoned nest of the Pale-legged Hornero (*Furnarius leucopus*) in the Caatinga of northeastern Brazil (Silva et al. 2013).

4. Termitaria as perching sites for Brazilian birds

Termite mounds can also be used as perching sites for birds. In some cases, these mounds are marked by manure of birds that use them (Fontes 1998a: 218). Thus termitaria provide for birds of prey, such as the Southern Caracara (*Caracara plancus*) and the Burrowing Owl, strategic points to search for preys in the open landscapes of Brazil, represented the various grassland and savannah natural physiognomies of the *cerrado* region and man-made pastures (Cunha 1961, Redford 1984, Develey & Endrigo 2004, Silva e Silva 2004; MFV pers. obs.). Some species also use termitaria as a spot to feed on alates in flight, like the Swallow-tailed Kite (*Elanoides forficatus*) and the Channel-billed Toucan (*Ramphastos vitellinus*) (Sick 1997). Importantly, in the *cerrado* of central Brazil, the termite mounds are important perching sites for two species of endangered birds that are endemic to this region (following Silva 1995, Silva & Bates 2002, Machado et al. 2005): the White-winged Nightjar (*Hydropsalis candicans*) and the Campo Miner (*Geositta poeciloptera*) (Rodrigues et al. 1999, Remsen Jr. 2003, Silva e Silva 2004). The Campo Miner perches on mound in the *cerrado* to sing and to perform a wing display which is related to territoriality and attraction of sexual partners (Remsen Jr. 2003). Similar behavior has been recorded for the Red-legged Seriema (*Cariama cristata*), which perches on top of mounds of *Cornitermes cumulans* to vocalize its territorial song (Redford 1984).

5. Conclusions and perspectives for future researches

Based on the present review, we conclude that the small number of bird species recorded using termites, for the purposes above described, reflects the lack of observations and the limited published data on natural history. In several bird families recorded in those interactions, other species have the same feeding and breeding habits of the recorded species. Thus, the consumption of termites and the use of termitaria should be more widespread than that reported in the literature. For example, in the families Hirundinidae (swallows) and Apodidae (swifts), with several species represented exclusively by aerial insectivorous, a higher number of species that feed on alates is expected. The same applies to other aerial insectivores, like the nightjars (Caprimulgidae) and tyrant-flycatchers (Tyrannidae). Similarly, it is also expected that many more bird species use termitaria as nest sites or perches in comparison to the current knowledge.

Furthermore, there are other interactions between birds and termites, not addressed in this review, which should be better studied. For example, Sick (1997) mentions that barbets (Capitonidae) hammer termite mounds with their beaks in search for arthropods and that the Lineated Woodpecker (*Dryocopus lineatus*), puffbirds (Bucconidae) and trogons (Trogonidae), use arboreal termitaria as roosting sites.

The majority of termite species used by Brazilian birds was not identified even at the family or generic levels. This shows a lack of basic natural history information in Brazil. Studies on molecular biology and modeling algorithms are now highly valued, while those on the basic interactions between organisms in nature are declining. Worse, thousands of hectares of native

vegetation are destroyed each year in Brazil and we passively watch the biodiversity loss without knowing basic interactions between species. In future studies on termites as food resource or on termitaria as nesting or perching sites for birds, we suggest the collection and identification of these insects. Alates may be easily collected. Sometimes the exit holes can be found in the ground or in the mounds or nests (see Vasconcelos 1999), and this will be an opportunity to also obtain specimens of the soldier caste and the workers, which greatly facilitates the taxonomic identification.

All termite castes (soldiers, workers, nymphs, alates) should be collected preferably with delicate forceps or with small brushes impregnated with alcohol. Termites must be kept in 70-80% alcohol (Fontes 1995) for later identification with the aid of keys and illustrations (see Mathews 1977, Fontes 1992, 1995, 1998b, Constantino 1999, Milano & Fontes 2002) or should preferably be sent to taxonomists. It is important to stress that collection should be conducted with permission provided by the Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio), the Brazilian environment agency that deals with scientific collection activities.

Since different species of birds change their foraging behavior when feeding on alates (Eisenmann 1961, Belton 1994, Olson & Alvarenga 2006; MFV pers. obs.), foraging tactics of each species must be described in detail (see Fitzpatrick 1980, Remsen Jr & Robinson 1990). Photographs of birds feeding on termites or using termitaria as nesting or perching sites are also recommended in new publications.

Termitaria used by birds as nest sites should be photographed with details of the surface, and eventually one similar mound or nest may be collected or dissected and documented, since the architectural pattern is useful for the recognition of the termite species (see Mathews 1977, Fontes 1995). It is also important to record at the time of the bird nesting, if the mound was active (occupied by termites) or abandoned. Detailed measurements of the nest entrance, the access tunnel and the incubation chamber should be made carefully. It is also desirable to conduct schematic drawings showing the position of the incubation chamber, as well as the direction of the access tunnel inside the termitarium (see Naka 1997). Moreover, it is necessary to study the material that constitutes the incubation chamber (if present) and describe details about the nest according to the recent review on this subject (Simon & Pacheco 2005). In case of arboreal termitaria, it is always suggested to note its height from the ground, the tree species support and the direction of the nest entrance (north, south, east or west).

Finally, we conclude that there is still a gap in understanding various aspects concerning the natural history and the ecology of interaction between birds and termites. These are some of the challenges that must be faced by naturalists and field biologists in the future.

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References

- ADEODATO, A. 2012. WA666626, *Trogon curucui* Linnaeus, 1766. www.wikiaves.com/666626 (last access at 10/12/2013)
- ALEXANDRINO, E.R. 2009. WA83814, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/83814 (last access at 10/12/2013)
- ALVES, M.A.S. 1991. Dieta e táticas de forrageamento de *Neothraupis fasciata* em cerrado no Distrito Federal, Brasil (Passeriformes: Emberizidae). Ararajuba 2:25-29.
- AMARAL, H.L. 2011. WA483401, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/483401 (last access at 10/12/2013)
- AMARAL, R.S. 2003. WA238231, *Colaptes campestris* (Vieillot, 1818). www.wikiaves.com/238231 (last access at 10/12/2013)
- ARAUJO, F.M. 2011. WA440048, *Eupsittula aurea* (Gmelin, 1788). www.wikiaves.com/440048 (last access at 10/12/2013)
- ASSIS, C.P., RAPOSO, M.A. & PARRINI, R. 2007. Validação de *Poospiza cabanisi* Bonaparte, 1850 (Passeriformes: Emberizidae). Rev. Bras. Ornitol. 15(1):103-112.
- AVELINO, E. 2009. WA60226, *Colaptes campestris* (Vieillot, 1818). www.wikiaves.com/60226 (last access at 10/12/2013)
- BELTON, W. 1994. Aves do Rio Grande do Sul: distribuição e biologia. Editora Unisinos, São Leopoldo.
- BESSA, R. 2008. WA7541, *Tachycineta leucorrhoa* (Vieillot, 1817). www.wikiaves.com/7541 (last access at 10/12/2013)
- BESSA, R. 2011. WA456296, *Colaptes campestris* (Vieillot, 1818). www.wikiaves.com/456296 (last access at 10/12/2013)
- BETE, D. 2009. WA57343, *Colaptes campestris* (Vieillot, 1818). www.wikiaves.com/57343 (last access at 10/12/2013)
- BIANCHI, C.A., BAUMGARTEN, L. & ANDRADE, S.M.A. 2000. Cavidades como sítios reprodutivos no cerrado: evidências de competição e partilha de recursos. In Ornitologia brasileira no século XX (incluindo os Resumos do VIII Congresso Brasileiro de Ornitologia) (F.C. Straube, M.M. Argel-De-Oliveira & J.F. Cândido-Jr, eds). Universidade do Sul de Santa Catarina, Florianópolis, p.299-300.
- BIAZOTTO, C.R. 2011. WA457699, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/457699 (last access at 10/12/2013)
- BIRDLIFE INTERNATIONAL 2000. Threatened birds of the world. BirdLife International & Barcelona, Cambridge.
- BOSO, M. 2010. WA231057, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/231057 (last access at 10/12/2013)
- BRIGHTSMITH, D.J. 2000. Use of arboreal termitaria by nesting birds in the Peruvian Amazon. Condor 102(3):529-538.
- BUCCI, A.D. 2009. WA58374, *Colaptes campestris* (Vieillot, 1818). www.wikiaves.com/58374 (last access at 10/12/2013)
- BUCCI, D. 2010. WA251294, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/251294 (last access at 10/12/2013)
- BUZZETTI, D.R.C. & SILVA, S. 2005. Berços da vida: ninhos de aves brasileira. Terceiro Nome, São Paulo.
- CAMARGO, J.E. 2010. WA221591, *Eupsittula aurea* (Gmelin, 1788). www.wikiaves.com/221591 (last access at 10/12/2013)
- CARVALHO, A.V. 2010. WA152348, *Eupsittula pertinax* (Linnaeus, 1758). www.wikiaves.com/152348 (last access at 10/12/2013)
- CASTRO, M.K. 2000. WA8369, *Colaptes campestris* (Vieillot, 1818). www.wikiaves.com/8369 (last access at 10/12/2013)
- CASTRO, V.G. 2012. WA572959, *Notharchus tectus* (Boddaert, 1783). www.wikiaves.com/572959 (last access at 10/12/2013)
- CBRO. 2014. Lista de Aves do Brasil. Versão 2014. www.cbro.org.br (last access in 12/02/2014)
- CEZAR, M. 2010. WA202667, *Colaptes campestris* (Vieillot, 1818). www.wikiaves.com/202667 (last access at 10/12/2013)
- CONSTANTINO, R. 1999. Chave ilustrada para identificação dos gêneros de cupins (Insecta: Isoptera) que ocorrem no Brasil. Pap. Avulsos Zool. (São Paulo) 40(25):387-448.
- COSTA-LIMA, A.M. 1938. Insetos do Brasil. Escola Nacional de Agronomia, Rio de Janeiro.
- COSTA, S.S. 2008. WA293953, *Protogeris tirica* (Gmelin, 1788). www.wikiaves.com/293953 (last access at 10/12/2013)
- COSTA, S.S. 2009. WA293384, *Touit melanonotus* (Wied, 1820). www.wikiaves.com/293384 (last access at 10/12/2013)
- COSTA, T.C. 2011. WA421369, *Eupsittula aurea* (Gmelin, 1788). www.wikiaves.com/421369 (last access at 10/12/2013)
- COUTO, J. 2010. WA267635, *Pyrrhura frontalis* (Vieillot, 1817). www.wikiaves.com/267635 (last access at 10/12/2013)
- COUTO, P.H. 2011. WA530951, *Tachycineta leucorrhoa* (Vieillot, 1817). www.wikiaves.com/530951 (last access at 10/12/2013)
- CUNHA, J.G. 2010a. WA181460, *Protogeris chiriri* (Vieillot, 1818). www.wikiaves.com/181460 (last access at 10/12/2013)
- CUNHA, L.M. 2010b. WA147520, *Primolius maracana* (Vieillot, 1816). www.wikiaves.com/147520 (last access at 10/12/2013)
- CUNHA, O.R. 1961. Mundo estranho: a vida dos cupins. Irmãos Pongetti, Rio de Janeiro.
- CZABAN, R.E. 2003. WA83477, *Bucco tamatia* Gmelin, 1788. www.wikiaves.com/83477 (last access at 10/12/2013)
- DALESSANDRO, R. 2010. WA170786, *Eupsittula aurea* (Gmelin, 1788). www.wikiaves.com/170786 (last access at 10/12/2013)
- DE BONT, A.F. 1964. Termites et densité d'oiseaux. In Etudes sur les termites africains (A. Bouillon, ed). Masson, Paris, p. 273-283.
- DEVELEY, P.F. & ENDRIGO, E. 2004. Aves da Grande São Paulo: guia de campo. Aves e Fotos Editora, São Paulo.
- DIAL, K.P. & VAUGHAN, T.A. 1987. Opportunistic predation on alate termites in Kenya. Biotropica 19(2):185-187, <http://dx.doi.org/10.2307/2388744>
- DUBS, B. 1992. Birds of southwestern Brazil: catalogue and guide to the birds of the Pantanal of Mato Grosso and its border areas. Betrona-Verlag, Künsnacht.
- EISENMANN, E. 1961. Favorite foods of Neotropical birds: flying termites and *Cecropia* catkins. Auk 78(4):636-638, <http://dx.doi.org/10.2307/4082198>
- EULER, C. 1900. Descrição de ninhos e ovos das aves do Brasil. Rev. Mus. Paulista 4:9-148.
- FARIA, I.P. 2007. Peach-fronted parakeet (*Aratinga aurea*) feeding on arboreal termites in the Brazilian cerrado. Rev. Bras. Ornitol. 15(3):457-458.
- FILHO, U.B. 2011. WA532435, *Colaptes campestris* (Vieillot, 1818). www.wikiaves.com/532435 (last access at 10/12/2013)
- FITZPATRICK, J.W. 1980. Foraging behavior of Neotropical tyrant flycatchers. Condor 82(1):43-57, <http://dx.doi.org/10.2307/1366784>
- FLORES, F.M. 2010. WA207539, *Protogeris chiriri* (Vieillot, 1818). www.wikiaves.com/207539 (last access at 10/12/2013)
- FONTES, L.R. 1992. Key to the genera of New World Apicotermittinae (Isoptera: Termitidae). In Insects of Panamá and Mesoamerica: selected studies (D. Quintero & A. Aiello, eds). Oxford University Press, Oxford, p. 242-248.
- FONTES, L.R. 1995. Sistemática geral de cupins. In Alguns aspectos atuais da biologia e controle de cupins (E. Berti Filho & L.R. Fontes, eds). FEALQ, Piracicaba, p. 11-17.

- FONTES, L.R. 1998a. Cupins nas pastagens do Brasil: algumas indicações de controle. In Cupins: o desafio do conhecimento (L.R. Fontes & E. Berti Filho, eds). FEALQ, Piracicaba, p. 211-225.
- FONTES, L.R. 1998b. Novos aditamentos ao “Catálogo dos Isoptera do Novo Mundo”, e uma filogenia para os gêneros neotropicais de Nasutitermitinae. In Cupins: o desafio do conhecimento (L.R. Fontes & E. Berti Filho, eds). FEALQ, Piracicaba, p. 309-412.
- GONZAGA, L.P. 1991. In memoriam: Helmut Sick. Ararajuba 2:107-115.
- GUEDES, M.A. 2009. WA59776, *Tachycineta leucorrhoa* (Vieillot, 1817). www.wikiaves.com/59776 (last access at 10/12/2013)
- GUSSONI, C.O.A. & CAMPOS, R.P. 2003. Registro de uma grande concentração de aves se alimentando de “aleluias” (Isoptera). *Lundiana* 4(1):71.
- HANSCH, L.A. 2011. WA490480, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/490480 (last access at 10/12/2013)
- HARDY, J.W. 1963. Epigamic and reproductive behavior of the orange-fronted parakeet. *Condor* 65(3):169-199.
- HEMPEL, A. 1949. Estudo da alimentação natural de aves silvestres do Brasil. *Arq. Inst. Biol.* 19:237-268.
- KOK, O.B., KOK, A.C. & VANE, C.A. 2000. Diet of the migrant Lesser Kestrels *Falco naumanni* in their winter quarters in South Africa. *Acta Ornithol.* 35(2):147-151, <http://dx.doi.org/10.3161/068.035.0207>
- KONZE, J.C. 2010. WA205318, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/205318 (last access at 10/12/2013)
- KOPIJ, G. 2000. Diet of swifts (Apodidae) and swallows (Hirundinidae) during the breeding season in South African grassland. *Acta Ornithol.* 35(2):203-206, <http://dx.doi.org/10.3161/068.035.0201>
- LICCO, S.C. 2010. WA233355, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/233355 (last access at 10/12/2013)
- LIMA, R.D. 2012. WA684609, *Brotogeris chiriri* (Vieillot, 1818). www.wikiaves.com/684609 (last access at 10/12/2013)
- LOPES, L.E., FERNANDES, A.M. & MARINI, M.Â. 2005. Diet of some Atlantic Forest birds. *Ararajuba* 13(1):95-103.
- LUCCIA, V.P. 2011. WA462781, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/462781 (last access at 10/12/2013)
- MACHADO, A.B.M., MARTINS, C.S. & DRUMMOND, G.M. 2005. Lista da fauna brasileira ameaçada de extinção: incluindo as listas das espécies quase ameaçadas e deficientes em dados. Fundação Biodiversitas, Belo Horizonte.
- MALLET-RODRIGUES, F. 2001. Foraging and diet composition of the black-capped foliage gleaner (*Philydor atricapillus*). *Ornitol. Neotrop.* 12(3):255-264.
- MARANTZ, C.A., ALEIXO, A., BEVIER, L.R. & PATTEN, M.A. 2003. Family Dendrocolaptidae (woodcreepers). In *Handbook of the birds of the world* (J. Del Hoyo, A. Elliott & D.A. Christie, eds). Lynx Edicions, Barcelona v. 8, p. 358-447.
- MARTINS, M. & EGLER, S.G. 1990. Comportamento de caça em um casal de corujas buraqueiras (*Athene cucularia*) na região de Campinas, São Paulo, Brasil. *Rev. Bras. Biol.* 50(3):579-584.
- MARTIUS, C., BANDEIRA, A.G. & MEDEIROS, L.G.S. 1996. Variation in termite alate swarming in rain forests of central Amazonia. *Ecotropica* 2(1):1-11.
- MATHEWS, A.G.A. 1977. Studies on termites from the Mato Grosso State, Brazil. *Academia Brasileira de Ciências*, Rio de Janeiro.
- MAZZONI, L.G., CANUTO, M., GOMES, V.M. & RODRIGUES, V.C. 2013. Notes on the breeding biology of the Pied Puffbird *Notharchus tectus* in southeastern Pará, Brazil. *Atual. Ornitol.* 17:24-25.
- MEDEIROS, L.G.S., BANDEIRA, A.G. & MARTIUS, C. 1999. Termite swarming in the northeastern Atlantic rain forest of Brazil. *Stud. Neotrop. Fauna Environ.* 34(2):76-87, <http://dx.doi.org/10.1076/snfe.34.2.76.2103>
- MELO-JÚNIOR, T.A. 2001. Comportamento alimentar de *Jacamaralcyon tridactyla* (Galbuliformes, Galbulidae), em duas reservas no Estado de Minas Gerais. In *Ornitologia sem fronteiras* (incluindo os Resumos do IX Congresso Brasileiro de Ornitologia) (F.C. Straube, ed). Pontifícia Universidade Católica do Paraná, Curitiba, p. 277-278.
- MENQ, W. 2009. WA54382, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/54382 (last access at 10/12/2013)
- MILANO, S. & FONTES, L.R. 2002. Cupim e cidade: implicações ecológicas e controle. Edição dos autores, São Paulo.
- MOOJEN, J., CARVALHO, J.C. & LOPES, H.S. 1941. Observações sobre o conteúdo gastrico das aves brasileiras. *Mem. Inst. Oswaldo Cruz* 36(3):405-444, <http://dx.doi.org/10.1590/S0074-02761941000300016>
- MOTTA, C.A. 2011. WA527971, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/527971 (last access at 10/12/2013)
- NAKA, L.N. 1997. Nest and egg description of an endemism of the Brazilian north-east: the cactus parakeet, *Aratinga cactorum*. *Ararajuba* 5(2):182-185.
- NEGRET, J.A. & TEIXEIRA, D.M. 1983. O uso de termiteiros para a nidificação de algumas aves do Planalto Central. In Resumos do X Congresso Brasileiro de Zoologia. Universidade Federal de Minas Gerais, Belo Horizonte, p. 348-349.
- NETTO, A. 2010a. WA97858, *Eupsittula cactorum* (Kuhl, 1820). www.wikiaves.com/97858 (last access at 10/12/2013)
- NETTO, A. 2010b. WA110000, *Eupsittula cactorum* (Kuhl, 1820). www.wikiaves.com/110000 (last access at 10/12/2013)
- NETTO, A. 2010c. WA218354, *Eupsittula cactorum* (Kuhl, 1820). www.wikiaves.com/218354 (last access at 10/12/2013)
- NETTO, A. 2010d. WA266067, *Eupsittula cactorum* (Kuhl, 1820). www.wikiaves.com/266067 (last access at 10/12/2013)
- NUTTING, W.L. 1969. Flight and colony foundation. In *Biology of termites* (K. Krishna & F.M. Weesner, eds). Academic Press, New York v. 1, p. 233-282.
- OLIVEIRA-FILHO, A.T. 1992a. Floodplain ‘murundus’ of Central Brazil: evidence for the termite-origin hypothesis. *J. Trop. Ecol.* 8(1):1-19, <http://dx.doi.org/10.1017/S0266467400006027>
- OLIVEIRA-FILHO, A.T. 1992b. The vegetation of Brazilian ‘murundus’ - the island-effect on the plant community. *J. Trop. Ecol.* 8(4):465-486, <http://dx.doi.org/10.1017/S0266467400006817>
- OLIVEIRA, D.M. 2010a. WA237339, *Progne chalybea* (Gmelin, 1789). www.wikiaves.com/237339 (last access at 10/12/2013)
- OLIVEIRA, D.R. 2011. WA443672, *Eupsittula aurea* (Gmelin, 1788). www.wikiaves.com/443672 (last access at 10/12/2013)
- OLIVEIRA, J.C. 2010b. WA221232, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/221232 (last access in 10/12/2013)
- OLSON, S.L. & ALVARENGA, H. 2006. An extraordinary feeding assemblage of birds at a termite swarm in the Serra da Mantiqueira, São Paulo, Brazil. *Rev. Bras. Ornitol.* 14(3):297-299.
- OLYNTHO, M.S. 2011. WA417501, *Eupsittula aurea* (Gmelin, 1788). www.wikiaves.com/417501 (last access at 10/12/2013)
- PACHECO, J.F. 1995a. Notulae et corrigenda. *Atual. Ornitol.* 66:10.
- PACHECO, J.F. 1995b. Notulae et corrigenda II. *Atual. Ornitol.* 67:10.
- PAIVA, C.L. 1998. Cupins e o patrimônio histórico edificado. In Cupins: o desafio do conhecimento (L.R. Fontes & E. Berti Filho, eds). FEALQ, Piracicaba, p. 133-162.
- PENHA, J.M.F. 1995. Alimentação de *Rhynchotus rufescens* na serra de São Vicente, município de Santo Antônio de Leverger, Mato Grosso (Tinamiformes: Tinamidae). *Ararajuba* 3:55-56.
- PEREIRA, H. 2010a. WA209056, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/209056 (last access at 10/12/2013)
- PEREIRA, L.G. 2010b. WA254562, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/254562 (last access at 10/12/2013)
- RASO, T.T. 2008. WA11849, *Brotogeris chiriri* (Vieillot, 1818). www.wikiaves.com/11849. (last access at 10/12/2013)
- REDFORD, K.H. 1984. The termitaria of *Cornitermes cumulans* (Isoptera, Termitidae) and their role in determining a potential keystone species. *Biotropica* 16(2):112-119, <http://dx.doi.org/10.2307/2387842>

- REMSEN JR, J.V. & ROBINSON, S.K. 1990. A classification scheme for foraging behavior of birds in terrestrial habitats. *Stud. Avian Biol.* 13:144-160.
- REMSEN JR, J.V. 2003. Family Furnariidae (ovenbirds). In *Handbook of the birds of the world*, v. 8 (J. Del Hoyo, A. Elliott & D.A. Christie, eds). Lynx Edicions, Barcelona, p.162-357.
- RIBAS, C.F. 2010. WA494935, *Trogon viridis* Linnaeus, 1766. www.wikiaves.com/494935 (last access at 10/12/2013)
- RIBEIRO, V.M. 2012. WA669775, *Eupsittula aurea* (Gmelin, 1788). www.wikiaves.com/669775 (last access at 10/12/2013)
- RIEDTMANN, Z. 2011. WA513634, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/513634 (last access at 10/12/2013)
- RODRIGUES, F.E. 2009. WA54894, *Colaptes campestris* (Vieillot, 1818). www.wikiaves.com/54894. (last access at 10/12/2013)
- RODRIGUES, F.H.G., HASS, A., MARINI FILHO, OJ., GUIMARÃES, M.M. & BAGNO, M.A. 1999. A new record of White-winged Nightjar *Caprimulgus candicans* in Emas National Park, Goiás, Brazil. *Cotinga* 11:83-85.
- RODRIGUES, M. & COSTA, L.M. 2006. Diversidade e conservação de aves na Serra do Cipó, Minas Gerais. *Atual. Ornitol.* 130:28-31.
- SALAZAR, L.F. & COSTA, L.M. 2012. WA596533, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/596533. (last access at 10/12/2013).
- SALES, M.M. 2011. WA431775, *Eupsittula aurea* (Gmelin, 1788). www.wikiaves.com/431775 (last access at 10/12/2013)
- SANSON, P. 2010. WA200998, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/200998 (last access at 10/12/2013)
- SANTOS, D.W. 2007. WA89944, *Colaptes campestris* (Vieillot, 1818). www.wikiaves.com/89944 (last access at 10/12/2013)
- SANTOS, D.W. 2008. WA87863, *Brotogeris chiriri* (Vieillot, 1818). www.wikiaves.com/87863 (last access at 10/12/2013)
- SANTOS, K. 2009. WA56373, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/56373 (last access at 10/12/2013)
- SAZIMA, I. 1989. Peach-fronted Parakeet feeding on winged termites. *Wilson Bull.* 101(4):656-657.
- SAZIMA, I. 2008. Dancing in the rain: swarms of winged termites congregate a varied bird assemblage at an urban backyard in southeastern Brazil. *Rev. Bras. Ornitol.* 16(4):402-405.
- SCHUBART, O., AGUIRRE, Á.C. & SICK, H. 1965. Contribuição para o conhecimento da alimentação das aves brasileiras. *Arq. Zool. (São Paulo)* 12:95-249.
- SI, L.P. 2010. WA363938, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/363938. (last access at 10/12/2013)
- SICK, H. 1965. A fauna do Cerrado. *Arq. Zool. (São Paulo)* 12:71-92.
- SICK, H. 1997. *Ornitologia brasileira*. Nova Fronteira, Rio de Janeiro.
- SILVA E SILVA, R. 2004. *Magia do Cerrado: aves na imensidão*. Dórea Books and Art, São Paulo.
- SILVA E SILVA, R. 2005. Biologia reprodutiva de *Geositta poeciloptera* (Passeriformes: Furnariidae) em Minas Gerais. In *Resumos do XIII Congresso Brasileiro de Ornitologia*. Universidade Federal do Pará, Belém, p. 28.
- SILVA, J.G. 2004. WA101826, *Trogon surrucura* Vieillot, 1766. www.wikiaves.com/101826 (last access at 10/12/2013)
- SILVA, J.M.C. 1995. Biogeographic analysis of the South American Cerrado avifauna. *Steenstrupia* 21(1):49-67.
- SILVA, J.M.C. & BATES, J.M. 2002. Biogeographic patterns and conservation in the South American Cerrado: atropical savanna hotspot. *Bioscience* 52(3):225-234. [http://dx.doi.org/10.1641/0006-3568\(2002\)052\[0225:BPACIT\]2.0.CO;2](http://dx.doi.org/10.1641/0006-3568(2002)052[0225:BPACIT]2.0.CO;2)
- SILVA, L.B., COUTO, A.A.V.O., ARRUDA, A.R., SILVA, J.S. & MOURA, C.C.M. 2013. Utilização de ninho de *Furnarius leucopus* (Passeriformes: Furnariidae) por *Microceroterme* cf. *exiguus* (Isoptera: Termitidae) na Caatinga, nordeste do Brasil. *Atual. Ornitol.* 175:26.
- SILVEIRA, M. 2010. WA105882, *Trogon curucui* Linnaeus, 1766. www.wikiaves.com/105882 (last access at 10/12/2013)
- SILVESTRI, F. 1903. Contribuzione alla conoscenza dei termiti e termitofili dell'America Meridionale. *Redia* 1(1):1-234.
- SIMON, J.E. & PACHECO, S. 2005. On the standardization of nest descriptions of neotropical birds. *Rev. Bras. Ornitol.* 13(2):7-18.
- SOARES, R.M. 2010. WA118230, *Trogon curucui* Linnaeus, 1766. www.wikiaves.com/118230 (last access at 10/12/2013)
- SONNTAG, F.A. 2011. WA623142, *Touit surdus* (Kuhl, 1820). www.wikiaves.com/623142 (last access at 10/12/2013)
- STAMATO, M. 2009. WA22918, *Eupsittula aurea* (Gmelin, 1788). www.wikiaves.com/22918 (last access at 10/12/2013)
- TEIXEIRA, D.M. 1987. Notas sobre o "gravatazeiro", *Rhopornis ardesiaca* (Wied, 1831) (Aves, Formicariidae). *Rev. Bras. Biol.* 47(3):409-414.
- TEIXEIRA, D.M. & NEGRET, A. 1984. The dwarf tinamou (*Taoniscus nanus*) of Central Brazil. *Auk* 101(1):188-189.
- TEIXEIRA, P.M. 2010. WA107448, *Eupsittula cactorum* (Kuhl, 1820). www.wikiaves.com/107448 (last access at 10/12/2013)
- THIOLLAY, J.-M. 1970. L'exploitation par les oiseaux des essaimages de fourmis et termites dans une zone de contact savane-forêt en Côte-D'Ivoire. *Alauda* 38:255-273.
- VASCONCELOS, M.F. 1999. Cupins alados (*Neocapritermes* sp.) como alimento do tico-tico, *Zonotrichia capensis*. *Atual. Ornitol.* 87:12.
- VASCONCELOS, M.F., D'ANGELO NETO, S., KIRWAN, G.M., BORNSCHEIN, M.R., DINIZ, M.G., & SILVA, J.F. 2006. Important ornithological records from Minas Gerais state, Brazil. *Bull. Br. Ornithol. Club* 126(3):212-238.
- VASCONCELOS, M.F., FIGUEREDO, C.C. & OLIVEIRA, R.S. 1999. Tácticas de forrageamento do bacurau-da-telha *Caprimulgus longirostris* (Aves, Caprimulgidae) na Serra do Curral, Minas Gerais, Brasil. *Bol. Mus. Biol. Mello Leitao Nova Ser.* 10:33-38.
- VIEIRA, V.C. 2011. WA470574, *Colaptes campestris* (Vieillot, 1818). www.wikiaves.com/470574 (last access at 10/12/2013)
- VON IHERING, H. 1900. Catálogo critico-comparativo dos ninhos e ovos das aves do Brasil. *Rev. Mus. Paulista* 4:191-300.
- VON IHERING, H. 1914. Novas contribuições para a ornithologia do Brasil. *Rev. Mus. Paulista* 9:411-448.
- WIED-NEUWIED, M. 1821. *Reise nach Brasilien in den Jahren 1815 bis 1817*. Brönnner, Frankfurt.
- ZACHETTI, U. 2010. WA250626, *Colaptes campestris* (Vieillot, 1818). www.wikiaves.com/250626 (last access at 10/12/2013).
- ZIMER, M.S. 2010. WA223410, *Trogon surrucura* Vieillot, 1817. www.wikiaves.com/223410 (last access at 10/12/2013).

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