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Feather mites (Acari, Astigmata) associated with birds in an Atlantic Forest fragment in Northeastern Brazil

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Abstract

The present study reports associations between feather mites (Astigmata) and birds in an Atlantic Forest fragment in Rio Grande do Norte state, in Brazil. In the laboratory, mites were collected through visual examination of freshly killed birds. Overall, 172 individuals from 38 bird species were examined, between October 2011 and July 2012. The prevalence of feather mites was 80.8%, corresponding to 139 infested individuals distributed into 30 species and 15 families of hosts. Fifteen feather mite taxa could be identified to the species level, sixteen to the genus level and three to the subfamily level, distributed into the families Analgidae, Proctophyllodidae, Psoroptoididae, Pteronyssidae, Xolalgidae, Trouessartiidae, Falculiferidae and Gabuciniidae. Hitherto unknown associations between feather mites and birds were recorded for eleven taxa identified to the species level, and nine taxa were recorded for the first time in Brazil. The number of new geographic records, as well as the hitherto unknown mite-host associations, supports the high estimates of diversity for feather mites of Brazil and show the need for research to increase knowledge of plumicole mites in the Neotropical region.

Keywords: hosts, ectosymbionts, prevalence, community, Rio Grande do Norte.

Ácaros de pena (Acari: Astigmata) associados com aves em um fragmento de Mata Atlântica no Nordeste do Brasil

Resumo

O presente estudo reporta associações entre ácaros (Astigmata) e aves em um fragmento de Mata Atlântica no estado do Rio Grande do Norte, Brazil. Em laboratório, ácaros foram coletados através de examinação visual de aves recentemente mortas. No total, 172 indivíduos de 38 espécies de aves foram examinados entre Outubro de 2011 e Julho de 2012. A prevalência de ácaros na comunidade de aves foi de 80,8%, correspondendo a 139 indivíduos infestados distribuídos em 30 espécies e 15 famílias de hospedeiros. Quinze táxons de ácaros de pena foram identificados em nível de espécie, dezesseis em nível de gênero e três em nível de subfamília, distribuídos nas famílias Analgidae, Proctophyllodidae, Psoroptoididae, Pteronyssidae, Xolalgidae, Trouessartiidae, Falculiferidae and Gabuciniidae. Associações ainda não conhecidas entre ácaros e aves foram registradas para onze táxons identificados em nível específico, e nove táxons foram registrados pela primeira vez no Brasil. O número de novos registros geográficos, assim como as associações ácaro-hospedeiro até então desconhecidas, suportam as altas estimativas de diversidade de ácaros de pena e apontam a necessidade de mais pesquisas que ampliem o conhecimento dos ácaros plumícolas da região Neotropical.

Palavras-chave: ectossimbiontes, prevalência, comunidade, Rio Grande do Norte.

1. Introduction

Feather mites (Astigmata: Analgoidea and Pterolichoidea) occur in every order of birds worldwide (Gaud and Atyeo, 1996; Mironov and Proctor, 2008). They inhabit the skin (dermicoles), the surface of feathers (plumicoles) or the inner calamus (syringicoles) (Proctor, 2003). Many species exhibit high host specificity resulting from, among other reasons, their morphological and physiological adaptations to the structure of feathers and the transmission mechanism between parents and offspring, pairs, or through any behavior that promotes contact between hosts (Proctor and Owens, 2000; Proctor, 2003). Thus, each group of birds generally has a distinct acarofauna at some taxonomic level (Gaud and Atyeo, 1976, 1996).

In Brazil, a country that harbors one of the richest avifaunas in the world (ca. 1800 species), knowledge of feather mite species is inversely proportional to host diversity (Valim et al., 2011). Several recent systematic and taxonomic studies have contributed to knowledge of the Brazilian feather mites (e. g. Hernandes and Valim, 2005, 2006; Valim and Hernandes, 2006, 2008, 2010; Hernandes et al., 2007; Mironov et al., 2008; Valim et al., 2011; Hernandes, 2012, 2013a, b). Among the main studies aimed at identifying and inventorying feather mites in country are those carried on Cerrado areas (wooded grasslands) in the Central Brazil (Kanegae et al., 2008; Enout et al., 2012). In the Northeast region, few investigations in the Atlantic Forest contributed to the knowledge of mites associated with passerines (Roda and Farias, 1999) and, more specifically, to the family Emberizidae (Lyra-Neves et al., 2003).

In light of the limited knowledge of feather mites associated with the Brazilian avifauna, especially in the Northeast, the aim of this study is to survey the feather mites associated with birds from a fragment of seasonal deciduous Atlantic Forest.

2. Materials and Methods

Mites were collected from freshly killed birds from Olho D'água Forest, located in the municipality of Macaíba, Rio Grande do Norte state, Brazil (270 ha, 5°53'S and central coordinates 35°23'W, 40m average altitude). The collection of birds was authorized by the Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA) under permanent zoological material collection license number 19849-1 (authentication code: 28111788; date of issue: 27/04/2009).

Mites were searched for over the entire length of each specimen's body (head, dorsum, venter, wings and tail), under stereoscope. Samples were removed and preserved in 70% alcohol for subsequent mounting and identification. Mites from the suborder Astigmata were mounted on glass slides in Hoyer's medium (Flechtmann, 1975) and identified to the lowest possible level with the aid of keys of Gaud and Atyeo (1996) and subsequent literature (e.g. Mironov, 2004; Hernandes et al., 2007; Mironov and González-Acuña, 2011; Hernandes, 2012, 2013a, b). Authorities of acarine species are included in Table 1; bird nomenclature followed the CRBO (2011). All birds

Table 1. Associations between feather mites (Acari, Astigmata) and birds from Olho D'água Forest, Macaíba, Rio Grande do Norte (RN), Brazil, examined between October 2011 and July 2012.

Birds	NE	%	Feather Mites		Taxonomic Literature
Acciptridae	1	0			
Buteo brachyurus Vigors	1	0	-	-	
Caprimulgidae	2	100			
Hydropsalis albicollis (Gmelin)	2	100	Gabuciniidae	*Paragabucinia brasiliensis* Hernandes[1,2]	Hernandes (2014b)
Columbidae	1	100			
Leptotila verreauxi Bonaparte	1	100	Falculiferidae	*Falculifer leptotilae* Gaud and Barré[1]	Gaud and Barré (1992)
Picidae	5	100			
Picumnus fulvescens Stager	5	100	Analgidae	*Analges* sp.	Gaud and Atyeo (1996)
			Psoroptoididae	*Picalgoides* sp.[2]	Mironov (2004)
			Pteronyssidae	*Ramphastobius scutatus* Hernandes[2]	Hernandes (2012)
			Trouessartiidae	*Trouessartia picumni* Hernandes	Hernandes (2014a)
Trochilidae	8	75			
Amazilia fimbriata (Gmelin)	3	100	Analgidae	Protalginae	Gaud and Atyeo (1996)
			Proctophyllodidae	*Xynonodectes* sp.	Gaud and Atyeo (1996)

NE: number of birds examined; **%:** Prevalence. [1]: feather mite recorded for the first time in Brazil. [2]: previously unknown association. The first five families (Accipitridae to Trogonidae) are non-Passeriformes, and the remainders are Passeriformes. Gaud and Atyeo (1996) was used to identify most taxa to family and genus; literature used to identify to species is indicated in the far right column.

Table 1. Continued...

Birds	NE	%	Feather Mites		Taxonomic Literature
				Allodectes amaziliae Park and Atyeo[1]	Park and Atyeo (1972)
				Trochilodectes mucronatus Park and Atyeo[2]	Park and Atyeo (1974)
				Toxerodectes sp.	Gaud and Atyeo (1996)
Anopetia gounellei (Boucard)	2	100	Proctophyllodidae	*Allodectes* sp.	Gaud and Atyeo (1996)
Chlorostilbon notatus (Reich)	1	100	Analgidae	Protalginae	Gaud and Atyeo (1996)
			Proctophyllodidae	*Trochilodectes* sp.	Gaud and Atyeo (1996)
				Xynonodectes sp.	Gaud and Atyeo (1996)
				Allodectes sp.	Gaud and Atyeo (1996)
				Toxerodectes sp.	Gaud and Atyeo (1996)
Phaethornis pretrei (Lesson & Delattre)	1	0	-	-	
Phaethornis ruber (Linnaeus)	1	0	-	-	
Trogonidae	2	50			
Trogon curucui Linnaeus	2	50	Proctophyllodidae	Proctophyllodinae	Gaud and Atyeo (1996)
Furnariidae	3	100			
Synallaxis frontalis Pelzeln	1	100	Proctophyllodidae	*Tyrannidectes* sp.	Mironov and González-Acuña (2011)
Synallaxis scutata Sclater	2	100	Proctophyllodidae	*Tyrannidectes* sp.	Mironov and González-Acuña (2011)
			Proctophyllodidae	*Nycteridocaulus* sp.	Gaud and Atyeo (1996)
			Psoroptoididae	*Mesalgoides* sp.	Gaud and Atyeo (1996)
			Trouessartiidae	*Trouessartia* sp.	Gaud and Atyeo (1996)
			Xolalgidae	Ingrassiinae	Gaud and Atyeo (1996)
Parulidae	16	100			
Basileuterus culicivorus (Deppe)	6	100	Proctophyllodidae	*Amerodectes* sp.	Mironov and González-Acuña (2011)
			Psoroptoididae	*Mesalgoides* sp.	Gaud and Atyeo (1996)
			Trouessartiidae	*Trouessartia* sp.	Gaud and Atyeo (1996)

NE: number of birds examined; **%:** Prevalence. [1]: feather mite recorded for the first time in Brazil. [2]: previously unknown association. The first five families (Accipitridae to Trogonidae) are non-Passeriformes, and the remainders are Passeriformes. Gaud and Atyeo (1996) was used to identify most taxa to family and genus; literature used to identify to species is indicated in the far right column.

Table 1. Continued...

Birds	NE	%	Feather Mites		Taxonomic Literature
Basileuterus flaveolus (Baird)	10	100	Proctophyllodidae	*Amerodectes* sp.	
				Nycteridocaulus sp.	Gaud and Atyeo (1996)
			Psoroptoididae	*Mesalgoides* sp.	Gaud and Atyeo (1996)
			Trouessartiidae	*Trouessartia* sp.	Gaud and Atyeo (1996)
			Xolalgidae	*Xolalgoides* sp.[1]	Gaud and Atyeo (1996)
Pipridae	8	100			
Neopelma pallescens (Lafresnaye)	8	100	Proctophyllodidae	*Diproctophyllodes dielytra* (Trouessart)[2]	Atyeo and Gaud (1968)
				Mimicalges neopelmae Hernandes[1,2]	Hernandes (2013b)
			Psoroptoididae	*Mesalgoides* sp.	Gaud and Atyeo (1996)
			Trouessartiidae	*Trouessartia* sp.	Gaud and Atyeo (1996)
Rhynchocyclidae	20	100			
Hemitriccus margaritaceiventer (d'Orbigny & Lafresnaye)	4	100	Proctophyllodidae	*Hemitriccodectes furcatus* Hernandes[1,2]	Hernandes (2013a)
			Trouessartiidae	*Trouessartia* sp.	Gaud and Atyeo (1996)
Hemitriccus striaticollis (Lafresnaye)	4	100	Proctophyllodidae	*Hemitriccodectes furcatus* Hernandes[2]	Hernandes (2013a)
Tolmomyias flaviventris (Wied)	12	100	Proctophyllodidae	*Tyranniphyllodes* sp.[2]	Hernandes et al. (2007)
				Nycteridocaulus pectinatus Atyeo	Atyeo (1966)
			Trouessartiidae	*Trouessartia* sp.	Gaud and Atyeo (1996)
Thamnophilidae	34	61.7			
Formicivora grisea (Boddaert)	15	80	Proctophyllodidae	*Nanopterodectes* sp.	Mironov et al. (2008)
				Proctophyllodinae	Gaud and Atyeo (1996)
			Trouessartiidae	*Calcealges formicivorae* Hernandes[1,2]	Hernandes (2014b)
Taraba major (Vieillot)	1	0	-	-	
Thamnophilus pelzelni Hellmayr	18	50	Proctophyllodidae	*Nanopterodectes formicivorae* (Mironov)[2]	Mironov et al. (2008)
Thraupidae	16	93.7			
Dacnis cayana (Linnaeus)	2	100	Analgidae	*Analges* sp.	Gaud and Atyeo (1996)

NE: number of birds examined; **%:** Prevalence. [1]: feather mite recorded for the first time in Brazil. [2]: previously unknown association. The first five families (Accipitridae to Trogonidae) are non-Passeriformes, and the remainders are Passeriformes. Gaud and Atyeo (1996) was used to identify most taxa to family and genus; literature used to identify to species is indicated in the far right column.

Table 1. Continued...

Birds	NE	%	Feather Mites		Taxonomic Literature
			Proctophyllodidae	*Amerodectes* sp.	Mironov and González-Acuña (2011)
				Proctophyllodes sp.	Gaud and Atyeo (1996)
			Psoroptoididae	*Mesalgoides* sp.	Gaud and Atyeo (1996)
Lanio pileatus (Wied)	1	0	-	-	
Tachyphonus rufus (Boddaert)	12	100	Proctophyllodidae	*Amerodectes* sp.	Mironov and González-Acuña (2011)
			Trouessartiidae	*Trouessartia* sp.	
Tangara cayana (Linnaeus)	1	100	Proctophyllodidae	*Amerodectes tangarae* (Mironov)	Mironov et al. (2008)
Troglodytidae	6	100			
Cantorchilus longirostris (Vieillot)	6	100	Proctophyllodidae	*Amerodectes* sp.	Mironov and González-Acuña (2011)
			Trouessartiidae	*Trouessartia* sp.	Gaud and Atyeo (1996)
Turdidae	14	78.5			
Turdus amaurochalinus Cabanis	12	75	Proctophyllodidae	*Amerodectes turdinus* (Berla)	Valim and Hernandes (2006)
				Proctophyllodes sp.	Gaud and Atyeo (1996)
			Trouessartiidae	*Trouessartia* sp.	Gaud and Atyeo (1996)
Turdus leucomelas Vieillot	2	100	Proctophyllodidae		
			Trouessartiidae	*Trouessartia* sp.	Gaud and Atyeo (1996)
Tyrannidae	26	76.9			
Camptostoma obsoletum (Temminck)	1	100	Proctophyllodidae	Proctophyllodinae	Gaud and Atyeo (1996)
			Trouessartiidae	Trouessartia sp.	Gaud and Atyeo (1996)
Casiornis fuscus Sclater & Salvin	1	0	-	-	
Cnemotriccus fuscatus (Wied)	11	100	Proctophyllodidae	*Amerodectes* sp.	Mironov and González-Acuña (2011)
				Nycteridocaulus bilobatus Atyeo[1,2]	Atyeo (1966)
			Psoroptoididae	*Mesalgoides* sp.	Gaud and Atyeo (1996)
			Trouessartiidae	*Trouessartia* sp.	Gaud and Atyeo (1996)

NE: number of birds examined; **%:** Prevalence. [1]: feather mite recorded for the first time in Brazil. [2]: previously unknown association. The first five families (Accipitridae to Trogonidae) are non-Passeriformes, and the remainders are Passeriformes. Gaud and Atyeo (1996) was used to identify most taxa to family and genus; literature used to identify to species is indicated in the far right column.

Table 1. Continued...

Birds	NE	%	Feather Mites		Taxonomic Literature
			Xolalgidae	Ingrassiinae	Gaud and Atyeo (1996)
Elaenia chilensis Hellmayr	7	42.8	Proctophyllodidae	*Anisophyllodes candango* Hernandes et al.[2]	Hernandes et al. (2007)
				Amerodectes sp.	Mironov and González-Acuña (2011)
			Trouessartiidae	*Trouessartia elaenia* Mironov and González-Acuña	Mironov and González-Acuña (2013)
Elaenia spectabilis Pelzeln	4	100	Proctophyllodidae	*Amerodectes* sp.	Mironov and González-Acuña (2011)
			Trouessartiidae	*Trouessartia* sp.	Gaud and Atyeo (1996)
Euscarthmus meloryphus Wied	1	0	-	-	
Myiopagis viridicata (Vieillot)	1	100	Proctophyllodidae	*Nycteridocaulus foliatus* Atyeo[1,2]	Atyeo (1966)
				Amerodectes sp.	Mironov and González-Acuña (2011)
			Trouessartiidae	*Trouessartia* sp.	Gaud and Atyeo (1996)
Vireonidae	10	40			
Hylophilus amaurocephalus (Nordmann)	6	50	Proctophyllodidae	*Amerodectes* sp.	Mironov and González-Acuña (2011)
			Trouessartiidae	*Trouessartia* sp.	Gaud and Atyeo (1996)
			Xolalgidae	*Xolalgoides* sp.	Gaud and Atyeo (1996)
Cyclarhis gujanensis (Gmelin)	1	100	Proctophyllodidae	*Amerodectes* sp.	Mironov and González-Acuña (2011)
Vireo olivaceus (Linnaeus)	3	0	-	-	
Total	172	80.8			

NE: number of birds examined; **%:** Prevalence. [1]: feather mite recorded for the first time in Brazil. [2]: previously unknown association. The first five families (Accipitridae to Trogonidae) are non-Passeriformes, and the remainders are Passeriformes. Gaud and Atyeo (1996) was used to identify most taxa to family and genus; literature used to identify to species is indicated in the far right column.

were taxidermied and deposited in the Ornithological Collection of the Federal University of Rio Grande do Norte (UFRN). Feather mites were deposited in the mite collection of the Department of Zoology, São Paulo State University, Rio Claro, SP. The prevalence of mites was calculated according to Bush et al. (1997).

3. Results

A total of 172 birds belonging to 38 species (28 Passeriformes and ten non-Passeriformes) were examined (Table 1). The prevalence of feather mites was 80.8%, corresponding to 139 infested individuals distributed into 30 species and 15 families of host birds (Table 1). Three new species of the genera *Trouessartia*, *Calcealges*, and *Paragabucinia* were described based on material collected in this study (Hernandes, 2014a, 2014b, 2015).

Fifteen mite taxa were identified at the species level, sixteen at genus level and three only at subfamily level, distributed into the superfamilies Analgoidea (families Analgidae, Proctophyllodidae, Psoroptoididae, Pteronyssidae, Xolalgidae and Trouessartiidae) and Pterolichoidea (families Falculiferidae and Gabuciniidae). Among undetermined

Table 2. Absolute frequency (FA) and prevalence (%) of feather mite genera (Acari, Astigmata), at generic level, associated with birds from Olho D'água Forest, Macaíba, Rio Grande do Norte (RN), Brazil, examined between October 2011 and July 2012.

		Genera	FA	%
ANALGOIDEA	Analgidae	*Analges*	2	1.2
	Proctophyllodidae	*Amerodectes*	65	**37.8**
		Allodectes	4	2.3
		Anisophyllodes	2	1.2
		Diproctophyllodes	8	4.7
		Mimicalges	6	3.5
		Nanopterodectes	17	9.9
		Nycteridocaulus	30	**17.4**
		Proctophyllodes	2	1.2
		Toxerodectes	3	1.7
		Trochilodectes	3	1.7
		Tyrannidectes	3	1.7
		Tyranniphyllodes	6	3.5
		Xynonodectes	3	1.7
	Psoroptoididae	*Mesalgoides*	23	**13.4**
		Picalgoides	5	**2.9**
	Pteronyssidae	*Ramphastobius*	5	2.9
	Xolalgidae	*Xolalgoides*	4	2.3
	Trouessartiidae	*Trouessartia*	72	**41.9**
		Calcealges	7	4.1
PTEROLICHOIDEA	Faculiferidae	*Faculifer*	1	0.6
	Gabuciniidae	*Paragabucinia*	2	1.2

species, most of which are probably still undescribed, are representatives of the genera *Amerodectes* (Proctophyllodidae) and *Trouessartia* (Trouessartiidae), including estimated thirteen and ten new species, respectively (Table 1).

The most prevalent feather mite family in the bird community was Proctophyllodidae (71.5%), with 13 taxa found in association with 26 host species, followed by Trouessartiidae (45.9%), found on 17 host species, and Psoroptoididae (16.2%), found on six and one species of Passeriformes and Piciformes, respectively; the remaining families had a prevalence of less than 5%. The family Proctophyllodidae was found in association with all Passeriformes examined, in addition to the non-passerine families Trochilidae and Trogonidae (Table 1).

Species of the genus *Trouessartia* were recovered from 72 birds (41.9%), followed by species of the genus *Amerodectes*, reported in 65 birds (37.8%), *Nycteridocaulus* and *Mesalgoides*, associated with 30 and 23 individuals (17.4% and 13.4%, respectively). The remaining taxa showed a prevalence of less than 10% (Table 2).

Hitherto unknown associations between feather mites and birds were recorded for eleven taxa identified to the species level, and nine taxa were recorded for the first time in Brazil (Table 1).

4. Discussion

The high prevalence of Proctophyllodidae, the most common feather mite family found on flight feathers of passerines, is often reported in inventory studies of feather mites (Lyra-Neves et al., 2003; Kanegae et al., 2008; Enout et al., 2012), and may be due to the wide range of species associated with passerines and hummingbirds (Valim and Hernandes, 2010; Enout et al., 2012), as well as the ecology of their representatives. The family usually inhabits the ventral and dorsal portions of remiges and rectrices, which are easy-to-sample microhabitats for those examining birds (Proctor, 2003). Another reason why proctophyllodids, and in fact also trouessartiids are so frequently reported is that the most common method for capturing birds in ornithological surveys, *i.e.*, mistnets, is often biased to capture passerines (Passeriformes) and hummingbirds (Apodiformes). In addition, field ornithologists often collect wing feathers for ectoparasites, which are the natural habitat of mites of these families.

The subfamily Proctophyllodinae was represented in this study by a considerable number of species. *Anisophyllodes candango*, described from *Elaenia chiriquensis* in the Central Brazil (Hernandes et al., 2007), was recorded for the first time also on *E. chilensis*, confirming its relationship with the subfamily Elaeniinae (Tyrannidae). *Diproctophyllodes dielytra* is known for its association with Pipridae (Valim et al., 2011), and is herein reported from another bird of this family, *Neopelma pallescens*. Also from the latter host, *Mimicalges neopelmae* was recently described (Hernandes, 2013a) based on specimens collected in the present study.

Species of *Nycteridocaulus* were hosted by five bird species belonging to four families in the present study.

Among the eight described species of the genus, three were recovered in the present study: *N. pectinatus* on *Tolmomyas flaviventris,* confirming the association originally reported in Trindad (Atyeo, 1966); *N. bilobatus* on *Cnemotriccus fuscatus*; and *N. foliatus*, on *Myiopagis viridicata*, the last two hosts are reported for the first time in such associations. Other undetermined species of this genus were associated with *Basileuterus flaveolus* and *Synallaxis scutata*, previously reported as hosts of *Nycteridocaulus tyranni*, in Central Brazil (Kanegae et al., 2008). Those two species are herein regarded as new to science.

The species of the subfamily Pterodectinae, *Hemitriccodectes furcatus*, was found on both *Hemitriccus margaritaceiventer* and *H. striaticollis* (Hernandes, 2013b). Species of the genera *Allodectes*, *Toxerodectes*, *Trochilodectes*, and *Xynonodectes*, all of them restricted to hummingbirds (Trochilidae) (Park and Atyeo, 1975), are herein reported for the first time in association with these birds (Table 1).

The family Trouessartiidae was widely distributed among the bird species studied. *Calcealges formicivorae* was recently described from *Formicivora grisea* (Hernandes, 2015). Despite the wide occurrence of species of *Trouessartia* in association with around ten previously documented families of Passeriformes in the country, their occurrence in the families Rhynchocyclidae and Vireonidae were hitherto unknown, and widens the knowledge of their host groups. One species of this genus, *T. picumni* Hernandes, was recently described from *Picumnus temmincki*, being the first species of this genus to be described from a non-passerine host (Hernandes, 2014a).

In Brazil, three genera of Pteronyssidae are known to be associated with the families Picidae and Ramphastidae (*Pterotrogus*, *Pteronyssoides* and *Ramphastobius*). The genus *Pterotrogus* was registered in species of Piciformes and Apodiformes in the Federal District, Amazonas, Rio Grande do Sul, and São Paulo (Valim et al., 2011; Hernandes, 2012); and *Pteronyssoides* was reported on *Stelgidopteryx ruficollis* (Hirundinidae) in Pernambuco and Tocantins (Roda and Farias, 1999; Enout et al., 2012). *Ramphastobius* sp. was recorded on a host of the family Ramphastidae in Paraná and Amazonas (Valim et al., 2011), and the recently described species, *R. scutatus*, previously known only from *Picumnus cirratus* (type-host), is herein reported on *P. fulvescens.*

The family Gabuciniidae is represented in Brazil by two species: *Piciformobia guirae* Alzuet, Cicchino and Abrahamovich, found on *Guira guira* (Cuculidae) in São Paulo state; and *Tocolichus allepimerus* Gaud and Atyeo, which has *Selenidera maculirostris* (Ramphastidae) as type-host, reported in Santa Catarina state (Valim et al., 2011). The family was cited for the last time by Alzuet et al. (1988), and here, one recently described species of *Paragabucinia*, *P. brasiliensis* Hernandes was found on *Hydropsalis albicollis* (Caprimulgidae) (Hernandes, 2014b).

In recent years, the few studies in Brazil investigating the association between arthropods and birds were conducted at the family or genus level (e.g. Marini et al., 1996; Roda and Farias, 1999; Lyra-Neves et al., 2003; Roda and Farias, 2007). The lack of research dealing with specific relationships points to the little attention paid to collecting samples for taxonomic studies, as well as the scarcity of specialists (Arzua and Valim, 2010). However, recent taxonomic efforts have slowly contributed to increase the knowledge of the group (e.g. Hernandes and Valim, 2005, 2006; Hernandes et al., 2007; Mironov et al., 2008; Valim and Hernandes, 2008, 2010).

The species richness of feather mites in Brazil is estimated to be at least five times greater than that currently known (Valim et al., 2011). The number of new geographic records, as well as the hitherto unknown mite-host associations reported in the present study, supports these estimates and shows the need for research to increase knowledge of plumicole mites in the Neotropical region.

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