

## Feather mites of *Calidris fuscicollis* (Aves: Scolopacidae) in Brazil

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### Abstract

During the period 2010-2012, eighty individuals of *Calidris fuscicollis* (Vieillot, 1819) were collected on the southern coast of Rio Grande do Sul, Brazil, with the objective of determining the presence of feather mites. Of the 80 birds examined, 32.5% were infested by mites, identified as *Avenzoaria calidridis* (Oudemans, 1904) (Avenzoariidae) (31.25%), *Montchadskiana securicata* (Megnin & Trouessart 1884) (Pterolichidae) (22.5%) and *Alloptes limosae* (Dubinin, 1951) (Alloptidae) (6.25%). This is the first report of feather mites on *Calidris fuscicollis* in Brazil

**Keywords:** feather mites, Avenzoariidae, Pterolichidae, Alloptidae, white-rumped sandpiper.

## Ácaros plumícolas de *Calidris fuscicollis* (Aves: Scolopacidae) no Brasil

### Resumo

Durante o período de 2010-2012, oitenta espécimes de *Calidris fuscicollis* (Vieillot, 1819) foram coletados na costa sul do Estado do Rio Grande do Sul, com o objetivo de determinar a presença de ácaros de pena. Das 80 aves examinadas, 32,5% estavam infestadas por ácaros, os quais foram identificados como *Avenzoaria calidridis* (Oudemans, 1904) (Avenzoariidae) (31,25%), *Montchadskiana securicata* (Megnin & Trouessart 1884) (Pterolichidae) (22,5%) e *Alloptes limosae* (Dubinin, 1951) (Alloptidae) (6,25%). Este é o primeiro relato de ácaros de pena em *Calidris fuscicollis* no Brasil.

**Palavras-chave:** ácaros plumícolas, Avenzoariidae, Pterolichidae, Alloptidae, maçarico-de-sobre-branco.

### 1. Introduction

Belonging to the suborder Astigmata, feather mites (Acari: Analgoidea, Pterolichoidea) are symbionts that are located on the skin or feathers of birds (Rubtsov and Yakimenko, 2012) which, along with lice (Insecta: Phthiraptera), are the most commonly found ectoparasites. Mites are the most numerous and diverse group associated with birds (Kanegae et al., 2008), where each order has a specific mite fauna (Gaud and Atyeo, 1979). There are at least 40 feather mite families with about 2,400 species described (Mironov, 2003). Despite this diversity, this number represents only a small part of the real world fauna of feather mites (Gaud and Atyeo, 1996).

The nearctic migrant, *Calidris fuscicollis* (Vieillot, 1819) belongs to the order Charadriiformes and breeds in the tundra of Alaska and north of Canada. It winters on the sandy beaches and other coastal habitats in South America and is found in abundance on the coast of Rio Grande do Sul State (Fedrizzi and Carlos, 2009). To date there are no reports in the literature, of feather mites on *Calidris fuscicollis* in Brazil, so this study contributes to the knowledge of the biodiversity of mites in wild and migratory birds. Thus, the objective was to identify the

species of mites found on the white-rumped sandpiper while on its summering grounds in Brazil.

### 2. Material and Methods

We collected 80 individuals of *Calidris fuscicollis* with mist nets (Licence ICMBIO n° 26234-1 and UFPel Ethics Committee No 2.13.00.013) during their migratory period (April-September) from 2010 to 2012, on the southern coast of Rio Grande do Sul State, Brazil (–32° 15' 32.57" S –52° 14' 00.04" W), for parasitological studies. The procedure of sedation and euthanasia was performed according to CFMV (2002) and each bird was individually wrapped in a plastic bag and transported to the Laboratório de Parasitologia de Animais Silvestres da Universidade Federal de Pelotas. Euthanasia of specimens was necessitated by conducting microbiological tests and other parasitological studies. Migratory birds such as *Calidris fuscicollis*, can carry a parasitic and microbiological fauna over long distances, which is an important factor in the spread and transmission of disease between different countries. The birds were washed in detergent water to

**Table 1.** Feather mites of *Calidris fuscicollis* (Aves: Scolopacidae) on the south coast of the State of Rio Grande do Sul, Brazil.

Species	N	Females	Males	P (%)	MI±SD	MA±SD
<i>Avenzoaria calidridis</i>	25	146	11	31.25	6.28±5.4	1.96±4.1
<i>Montchadskiana securicata</i>	18	30	17	22.5	3±2.4	0.67±1.7
<i>Alloptes limosae</i>	5	2	3	6.25	1±0	0.06±0.2

N - Number of hosts infested. P - Prevalence. MI - Mean Intensity. MA - Mean Abundance. SD - Standard Deviation.

release the mites. The wash contents were then sieved in a mesh strainer of 150µm. The mites were collected, preserved in 70% alcohol and mounted on microscope slides using Hoyer's Medium. Identifications were carried out according to Gaud and Atyeo (1996), Dabert and Ehrnsberger (1999) and Badek and Dabert (2006) and infestation parameters (prevalence, mean intensity and mean abundance) were calculated according to Bush et al. (1997). Representative specimens were deposited in the parasitological collection of the Universidade Federal de Pelotas.

### 3. Results

Of the 80 specimens of *Calidris fuscicollis* examined, only 26 (32.5%) had feather mites. We found 3 genera belonging to families Avenzoariidae (Oudemans, 1905), Pterolichidae (Trouessart and Mègnin, 1884) and AlLOPTIDAE (Gaud, 1957) (Table 1). From the family Avenzoariidae we identified *Avenzoaria calidridis* (Oudemans, 1904) (31.25%) where 91% were females and 8% males. The pterolichid mite *Montchadskiana securicata* (Mègnin & Trouessart 1884) (22.5%), showed 68.5% females and 31.4% males. And the alLOPTID, *Alloptes limosae* (Dubinin, 1951) (6.25%) showed 40% females and 60% males.

### 4. Discussion

The low prevalence of mites may be explained by the molting. According to Boyd (1951), who studied parasites of *Sturnus vulgaris* (Linnaeus, 1758) (Passeriformes: Sturnidae), there is a decrease in parasitism after the period of molting, which occurs after leaving the breeding site and before arriving at the wintering site.

The subfamily Avenzoariinae (Analoidea: Avenzoariidae) has 8 genera and 60 named species (Mironov, 1991). Mites of this subfamily are restricted exclusively to the birds of the order Charadriiformes (Mironov and Dabert, 1995). Genus *Avenzoaria* (Oudemans, 1905) includes 18 species (Gaud, 1972) that occur on the surface of the feathers of waders including species in the Scolopacidae (Badek and Dabert, 2006). Species such as *A. totani* (Canestrini, 1878) and *A. calidridis* (Oudemans, 1904) are commensals of snipes (*Tringa* sp. Linnaeus, 1758) and sandpipers (*Calidris* sp. Merrem, 1804), respectively (Badek and Dabert, 2005).

Feather mites of the subfamily Magimeliinae (Pterolichidae) parasitize sandpipers of the order Charadriiformes, being well adapted to live in conditions of strong airflow (Dabert and Ehrnsberger, 1999). Both mite sexes have an elongated body, flattened and covered with well developed dorsal plates, and legs inserted laterally (Vasyukova and Mironov, 1991). The genus *Montchadskiana* (Dubinin, 1951) is the

most species-rich within the subfamily Magimeliinae, comprising 12 named species (Dubinin, 1951). According to Dabert and Ehrnsberger (1999), *M. securicata* has been recorded in *Calidris ferruginea*, *C. alba*, *C. minuta*, *C. ruficollis* and *C. tenuirostris* in Russia.

*Alloptes* is the genus with the highest species richness of the family AlLOPTIDAE, comprising about 45 named species (Mironov and Palma, 2006). According to Gaud and Atyeo (1979), mites of the subfamily AlLOPTINAE are associated with a large number of sandpipers and other waterfowl such as Gaviiformes, Procellariiformes, Pelecaniformes, Ciconiiformes, Anseriformes, Gruiformes and Charadriiformes.

Feather mites exhibit morphological variations according to their location on the feathers of the host (Roda and Farias, 1999). According to Dabert and Mironov (1999), mites belonging to these 3 families have plates highly chitinized as an adaptation to their habitats in birds, since they must endure high wind conditions and movements caused by the continual rubbing of the feathers during flight. This may explain the high prevalence of *A. calidridis* (31.25%), followed by *M. securicata* (22.5%), since these mites have plates that cover the entire body, protecting them during flight.

### 5. Conclusion

Avenzoariidae, Pterolichidae and AlLOPTIDAE are common on birds of the Order Charadriiformes and each order of the class Aves has a specific set of mites, demonstrating a close adaptation to their host and that the evolution of feather mites occurred in parallel with the birds, allowing them to have the same geographic distribution.

*Avenzoaria calidridis*, *Montchadskiana securicata* and *Alloptes limosae* are reported, for the first time, on *Calidris fuscicollis* in Brazil.

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