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The first record of feather mite *Alloptes* (*Conuralloptes*) *calidridis* Dubinin, 1951 (Acari: Allopidae) from the Dunlin, *Calidris alpina* (L., 1758) (Passeriformes: Scolopacidae) in southern of Portugal

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SHORT COMMUNICATION



The first record of feather mite *Alloptes (Conuralloptes) calidridis* Dubinin, 1951 (Acari: Allopidae) from the Dunlin, *Calidris alpina* (L., 1758) (Passeriformes: Scolopacidae) in southern of Portugal

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ABSTRACT

A single individual of feather mite *Alloptes (Conuralloptes) calidridis* Dubinin, 1951 is reported from the covert feathers of a juvenile Dunlin *Calidris alpina* Linnaeus, 1758. A redescription of a male of this mite is given. To the authors' knowledge, this is the first report of *Alloptes (C.) calidridis* in a wild bird from Portugal, expanding the geographical distribution range of this ectoparasite to Western Europe.

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Alloptes (Conuralloptes) calidridis; feather mite; *Calidris alpina*; covert feathers; Portugal

1. Introduction

Feather mites (Acariformes: Astigmata, Analgoidea, Pterolichoidea), with approximately 2,500 species described to date, are obligatory and the most common ectosymbionts associated with birds (Proctor and Owens 2000; Proctor 2003). These mites are highly specialized dwellers of several microhabitats of the bird body, namely wing and tail feathers, body and down feathers, internal cavities of quills and the skin. Dispersal of feather mites between hosts is mainly accomplished when birds have direct contact (Dabert and Mironov 1999; Walter and Proctor 2013).

The genus *Alloptes*, the most speciose genus of the family Allopidae, comprising about 45 species, is exclusively associated with birds belonging to the order Charadriiformes. On these hosts, *Alloptes* species mainly live on the vanes of flight feathers and upper wing-coverts (Mironov and Palma 2006).

According to BirdLife International (2018) there are 310 species of birds recorded in Portugal, but up to now only 3 feather mite species have been reported from Procellariiformes (Stefan et al. 2013, 2014; Mironov et al. 2015) and 19 species from 11 species of Passeriformes (Rodrigues et al. 2015).

2. Material and methods

In December 2013, during scientific ringing session with Thijs Valkenburg (ringing license number 229 certificated by the Research Centre for Migration and Bird Protection/National Ringing Authority) at the Ria Formosa Natural Park, southern Portugal, birds were examined for the presence of chewing lice. Samples of chewing lice and highly parasitized covert feathers were collected, stored in 70% ethanol and sent to the Faculty of Veterinary Medicine of University of Lisbon for a specific biologic examination.

In the laboratory, during selection of specimens of chewing lice using an Olympus Zoom SZ51 Stereomicroscope, a feather mite was found in the covert feather. The mite was exposed to Amman's Lactophenol for clearing for 72 h. After clearing, the specimen was placed on a slide containing two drops of Hoyer's Medium and a

coverslip was added. Morphological observations and measurements, in micrometres (µm), were made using an Olympus BX51 microscope coupled to a digital camera Olympus DP50 colour. Morphological identification of mite was done by one of the authors (SM), according to the keys proposed by Vasyukova and Mironov (1991).

Images were acquired with software Studio Lite® v1.0 (©Pixera Corporation, 1998–200). The drawing was made by microscopic observation of our specimen, but as some features of the mite as genital structures and mouthparts were damaged, possibly from the twisting of the mite during slide-mounting, these structures were reconstructed following Vasyukova and Mironov (1991). The specimen mounted on slide has been deposited at the Parasitology Department Laboratories of the Faculty of Veterinary Medicine of University of Lisbon, Portugal.

Results and discussion

Examination of the covert feathers of juvenile Dunlin *Calidris alpina* revealed the presence of a single feather mite. This mite was morphologically identified as male of *Alloptes (Conuralloptes) calidridis* Dubinin, 1951 (Astigmata: Allopidae) (Figure 1). The male exhibited the following morphological features: Idiosoma size (length × width) 263 × 160; prodorsal shield: posterior margin concave, greatest length 78, width at posterior margin 85, distance between setae *se* 100; length of hysterosoma from sejugal furrow to bases of setae *ps* 1 168; hysteronotal shield: greatest length from anterior end to bases of setae *ps* 1 183, width at anterior margin 65, anterior margin slightly concave; distance between prodorsal and hysteronotal shields along midline 23; opisthosoma gradually attenuate to posterior end; length of interlobar septa 55, width of opisthosoma at level of setae *h* 2 35; terminal lamella with three pairs of festoons, incision between inner pair slit-shaped; ventral sclerotized area of the opisthosoma fused with margins of hysteronotal shield flanking posterior part of opisthosoma; leg III with ambulacral discs extended beyond the apex of opisthosoma; setae *4a* surrounded by small sclerotized plates; setae *h* 2 slightly enlarged and flattened in middle part, greatest width 8;

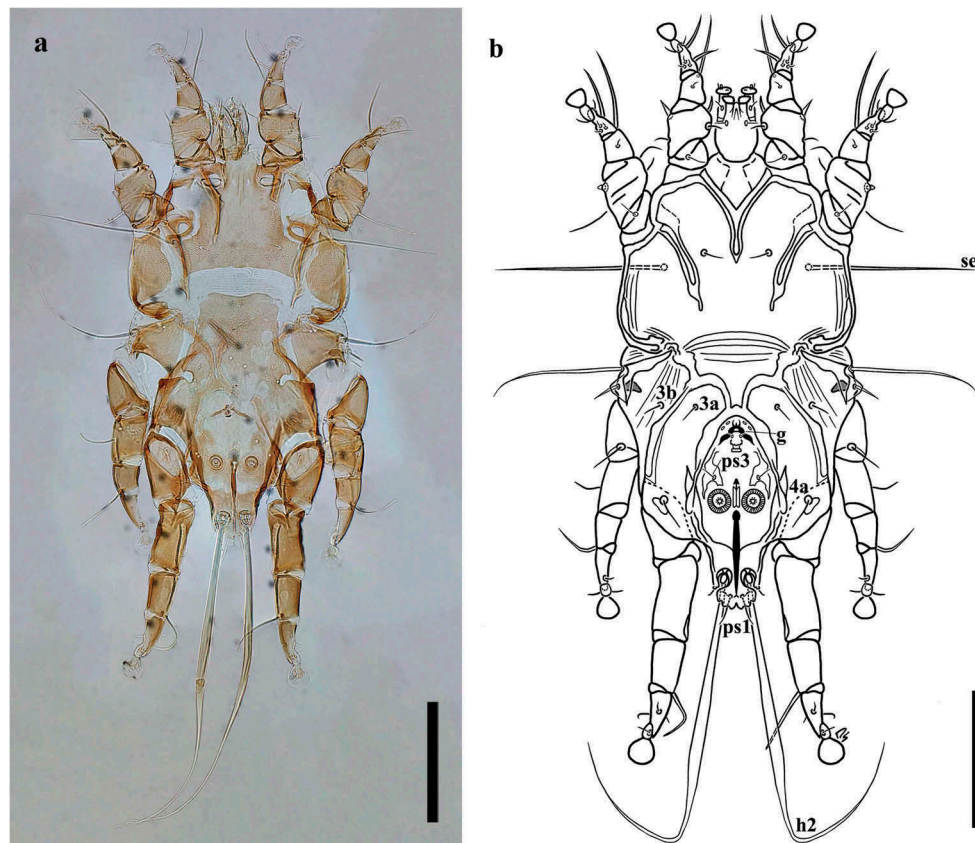


Figure 1. *Alloptes (Conuralloptes) calidridis*, male, collected from covert feather of juvenile Dunlin. a) Photograph; b) drawing, ventral view (scale bar = 100 µm).

legs IV 175 in length and tarsus IV 35 in length. Distance between ventral setae: 3a–3b 24, 3b–4a 71, ps3–ps1 80, 4a–4a 104.

This is the first report of *Alloptes (Conuralloptes) calidridis* from a wild Dunlin in Portugal. *Alloptes (C.) calidridis* is a common ectosymbiont living on various sandpipers of the genus *Calidris* occurring in marine and freshwater habitats and located on the covert and flight feathers. To our knowledge, this mite was previously found on the following sandpipers of the genus *Calidris*: on the Red-necked Stint *C. ruficollis* (Pallas, 1776 – type host) in Western Siberia and the Russian Far East, on the Dunlin *C. alpina* in Yakutia and the Russian Far East, and on the Curlew Sandpiper *C. ferruginea* (Pantopidan, 1763) and Little Stint *C. minuta* (Leisler, 1812) in Yakutia (Dubinin 1951; Vasyukova and Mironov 1991). In addition, Gaud (1972) suggested that *A. calidridis* is also likely to occur on the African continent. This is justified by the identification of other species of the subgenus *Conuralloptes* in Africa, the place also used by Dunlins to spend the winter.

The Dunlin is one of the most common shorebirds in Portugal during migration seasons. It mainly uses coastal and/or estuarine habitats, such as intertidal flat zones, salt-works, sandy coasts, lagoons and muddy freshwater shores. These habitats coincide with the existing habitats at the Ria Formosa Natural Park (Parque Natural da Ria Formosa 2007). Furthermore, this natural park is one of the places of passage and obligatory stop for the Dunlins that are migrating between Northern Europe and Western Africa (Parque Natural da Ria Formosa 2007; Catry et al. 2010).

All these evidences in conjunction with the fact that these mites are bird ectosymbionts, make expected the identification in this study of the mite *Alloptes (C.) calidridis* on *C. alpina*. The absence of more specimens detected in this study, as well as the lack of reports on this mite in Portugal, to date, is probably due to the absence of methodology and studies, respectively, that focus on their detection in wild birds.

This report of *Alloptes (C.) calidridis* from a wild Dunlin in Southern Portugal expands the geographical distribution range

of this ectoparasite to Western Europe and alert the investigators working in that subject for the possible occurrence of this mite in other places frequented by *C. alpina*.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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Ethical approval

All applicable institutional, national and international guidelines for the care and use of animals were followed. Animal manipulation was performed by suitably qualified professionals, according to the directive 86/609/EEC. All experimental assays, with or without the use of animals were performed in accordance with Government Veterinary Service (Direcção Geral de Veterinária/DGV).

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