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Parasitas gastrointestinais e externos de guaracava de crista branca Elaenia albiceps chilensis (Aves, Tyrannidae) de Chile

Danny Fuentes1; Jaime Reyes1; María Soledad Sepúlveda2; Mike Kinsella3; Sergey Mironov4; Armando Cicchino5; Lucila Moreno6; Carlos Landaeta-Aqueveque1; Ignacio Troncoso7; Daniel González-Acuña1*

1Facultad de Ciencias Veterinarias, Universidad de Concepción – UDEC, Chillán, Chile
2Department of Forestry and Natural Resources, Purdue University, West Lafayette, IN, USA
3Helm West Lab, Missoula, MT, USA
4Zoological Institute, Russian Academy of Sciences – RAS, Universitetskaya Embankment 1, Saint Petersburg, Russia
5Universidad Nacional de Mar del Plata – UNMDP, Mar del Plata, Argentina
6Facultad de Ciencias Naturales y Oceanográficas, Universidad de Concepción – UDEC, Concepción, Chile
7Escuela de Medicina Veterinaria, Universidad Santo Tomás – USTA, Concepción, Chile

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Abstract

The objective of this study is to evaluate the ectoparasites and helminths of the white-crested elaenia, Elaenia albiceps chilensis. Feather mites Anisophyllodes elaeniae, Trouessartia elaeniae, and Analges sp. were detected in 51% of birds (n=106), whereas 24% were infected with lice (Tyranniphilopterus delicatulus, Menacanthus cfr. distinctus, and Ricinus cfr. invadens). Helminths Viguiera sp. and Capillaria sp. were found in five of the birds that were necropsied (n=20). With the exception of A. elaeniae, T. elaeniae, and T. delicatulus, all parasites represented new records found for the white-crested elaenia, and therefore for the Chilean repertoire of biodiversity.

Keywords: Birds, Elaenia albiceps chilensis, feather mites, Acarina, Phthiraptera, Nematoda.

Introduction

The knowledge of parasite–host associations provides vital information regarding the hosts, which should be taken into account in biodiversity and conservation initiatives (PÉREZ-PONCE DE LEON & GARCIA, 2001). The winter range of the white-crested elaenia Elaenia albiceps d’Orbigny and Lafresnaye, 1837 (Passeriformes: Tyrannidae) spans from southeastern Colombia to the Peruvian and Brazilian Amazonian regions, and is mainly represented by the subspecies Elaenia albiceps modesta Tschudi, 1844 has been recorded near Arica (MARTÍNEZ & GONZÁLEZ, 2004), in the valleys and oases of the Tarapacá Region, Chile northern (ARAYA & MILLIE, 2000).

Currently, only three studies have examined parasites in Elaenia albiceps. Kellogg & Mann (1912) described a louse Physostomum fasciatus var. arcuatus from Tyrannus vociferous collected from Cerros Island in Baja California, which later transferred to Ricinus De...
Materials and Methods

Over more than a decade (2001–2012), a total of 20 white-crested elanias was collected from different Chilean localities ranging from the northern (Arica and Parinacota), central (Valparaíso), and southern (Biobío and Los Lagos) regions. All birds were found dead on roads after being struck by cars or by unknown causes.

Immediately after collection, the birds were frozen in sealed plastic bags until laboratory examination. Ectoparasites were preserved in 70% ethanol. Lice were mounted in Canada balsam following protocols described by Palma (1978) and Price et al. (2003). Mites were cleared in Nesbitt’s solution (40 g of chloral hydrate, 25 mL of distilled water, and 2.5 mL of hydrochloric acid) for 72 h and were later mounted in Berlese solution (KRANTZ, 1978). Phthiraptera were identified using keys published by Kellogg & Mann (1912), Nelson (1972), and Mey (2004). Acarina were identified using different keys including those by Chabaud & Forrester (1972). Helminths were preserved in 70% ethanol. Lice were mounted in Canada balsam plastic bags until laboratory examination. Ectoparasites were captured between 2006 and 2014 from using mist nests (Permit number: 6082 23/11/2006; Servicio Agrícola Science, University of Concepción, Chile.

The family Proctophyllodidae includes mites that predominately parasitize Passeriformes and hummingbirds, with a few species

Results and Discussion

Ectoparasites

Ectoparasites were found in 51% (n = 54) of the birds examined. A total of 227 mites were collected from 37 birds (34.9%), with 116 belonging to Trouessartia elaeniae (15.1%) – a recently described species by Mironov & González-Acuña (2013) (Acarina, Trouessartiidae) (Figures 2 and 3). The overall male to female ratio was 1.5 and the adult to juvenile ratio was 5.8. The mites were collected in Chillán, Santa Elena Lagoon, Huemules del Niblento National Reserve, Los Peucos, Santa Juana, Santa Bárbara, La Mina, Altos de Lircay National Reserve, Parque Íngles, La Campana National Park, and El Yali National Reserve. One hundred and one specimens were identified as Anisophyllodes elaenae Mironov and González-Acuña, 2009 (Acarina, Proctophyllodidae) (21.4%) (Figures 4 and 5). The overall male to female ratio was 0.33 and the adult to juvenile ratio was 10.2, they were collected in Bosques Fray Jorge National Park, Chillán, Santa Elena Lagoon, Huemules del Niblento National Reserve, Los Peucos, Santa Juana, Santa Bárbara, La Mina, Altos de Lircay National Reserve, Parque Íngles, La Campana National Park, and Lago Pehuen National Reserve. The remaining ten specimens belonged to the genus Analges Nitzsch, 1818 (3.3%), and they possibly represented a new species. These mites were found in the breast and rump of three birds collected in Santa Elena Lagoon, La Mina, and La Campana National Park.

Mites of the family Trouessartiidae are known to parasitize birds belonging to the orders Caprimulgiformes, Coraciiformes, Cuculiformes, Piciformes and Passeriformes (PROCTOR, 2003; HERNANDES, 2014). The genus Trouessartia Canestrini, 1899 is the most species-rich one in the family, and there are currently over 100 species that have been counted, which have been collected from bird species belonging to 28 families of Passeriformes (GAUD & ATYEYO, 1996; MIRONOV & GONZÁLEZ-ACUÑA, 2013). Five species, including T. elaenae, have been recorded so far from birds of the family Tyrannidae (SANTANA, 1976; HERNANDES, 2014).

The family Proctophyllodidae includes mites that predominately parasitize Passeriformes and hummingbirds, with a few species
Figure 1. Map of Chile showing the sampling locations.

Figure 2. Trouessartia elaeniae: Male (A). Dorsal view.

Figure 3. Trouessartia elaeniae: Female. Dorsal view.
recorded from birds of the orders Gruiformes, Charadriiformes, and Psittaciformes (GAUD & ATYE, 1996; PROCTOR, 2003). Relatively little is known regarding the diversity of proctophyllodid mites found on South American Passeriformes (HERNANDES et al., 2007; VALIM & HERNANDES, 2010; MIRONOV & GONZÁLEZ-ACUÑA, 2011). Three other known species of the genus Anisophyllodes Atyeo, 1967 are also associated with birds of the family Tyrannidae: A. pipromorphae has been reported from Mionectes oleagineus (Tyrannidae); A. intermedius on Elaenia martinica Linnaeus, 1766 and Elaenia flavogaster (Tyrannidae) (ČERNÝ & LUKOSCHUS, 1975); A. candango on Elaenia chiriquensis Lawrence, 1865 from Brazil (HERNANDES et al., 2007) and Anisophyllodes sp. on Elaenia chiriquensis and Mionectes rufiventris Cabanis, 1846 (Tyrannidae) (KANEGAE et al., 2008).

The feather mites of the genus Analges, as is the case for all representatives of the family Analgidae, live exclusively on passerines and are mainly located in the hosts’ downy and body covert feathers. Given their location in the plumage of hosts, analgids are a quite difficult group of feather mites to collect from live birds, and even from museum skins. The genus Analges is also the most abundant genus of the family, and it currently includes over 50 species, most of which are known from passerines of the Old World. To date, only one species, Analges tyranni Tyrrell, 1882, was recorded on a tyrannid host, Tyrannus tyrannus Linnaeus, 1758 in Canada.

Three species of lice totaling 78 specimens were found on 25 birds (24%). These included 65 specimens of Tyranniphilopterus delicatulus Mey, 2004 (Ischnocera: Philopteridae) (Figure 6), which

Figure 4. Anisophyllodes elaeinae: Female.

Figure 5. Anisophyllodes elaeinae: Male.

Figure 6. Tyranniphilopterus delicatulus: Male. Drawing by Armando Cicchino.
were commonly found on the head and upper neck of 15 birds in Chillán, Altos de Lircay National Reserve, Parque Inglés, and La Campana National Park. Moreover, seven specimens (all nymphs) of *Menacanthus cfr. distinctus* Neumann, 1912 (Amblycera: Menoponidae) (Figure 7) were found on five white-crested elaenia birds from Chillán, Santa Bárbara, Sierras de Bellavista, and Altos de Lircay National Reserve. Finally, four specimens of *Ricinus* sp. (Figure 8) were found on three birds collected in Chillán and Valle de Azapa.

Lice of the genus *Tyranniphilopterus* Mey, 2004 are represented by 14 species, half of which are known as parasites of birds belonging to the family Tyrannidae (CICCHINO, 2007). These lice inhabit and lay their eggs in the plumage of the head of their passeriform hosts, which belong to the families Pipridae, Cotingidae, Tyrannidae, and Platysteiridae (MEY, 2004).

*Menacanthus* Neumann, 1912 is a cosmopolitan genus, which is known to parasitize birds in the orders Passeriformes, Galliformes, Piciformes, Tinamiformes, Coraciiformes, and Cuculiformes (PRICE et al., 2003). *Menacanthus distinctus* has been described as parasitizing the following species of Tyrannidae: *Myiarchus tyrannulus* Müller, 1776; *M. cinerascens* Lawrence, 1851; *M. ferox* Gmelin, 1789; *M. tuberculifer* d’Orbigny and Lafresnaye, 1837; *Rhytipterna simplex* Lichtenstein, 1823; *Contopus borealis* Swainson, 1832; and *Lathrotriccus euleri* Cabanis, 1868 (PRICE et al., 2003). The specimens obtained were nymphs of the first (N I) and second instars (N II), and they were tentatively attributed to this species (here noted as *M. cfr. distinctus*) by direct comparison with the N II available from numerous males, females, and nymphs of *M. distinctus* from *L. euleri* collected in Buenos Aires Province, Argentina.

The genus *Ricinus* De Geer, 1778 is composed of 72 species that are characterized by a relatively large size (3.1–5.3 mm), and which feed on blood, although some of them may complement their diet with feathers. They infest avian hosts belonging to at least 30 Passeriforme families (CICCHINO & CASTRO, 1998). The two heavily pigmented *Ricinus* female specimens collected from *E. albiceps chilensis* belong to the *invadens* species group *sensu* Nelson, 1972, but details of their pigmentation, cephalic chaetotaxy, and dimensions do not fit well with those typical of the only species included in this group, *Ricinus invadens* Kellogg, 1899 (NELSON, 1972). This species, primarily described as a member of the family Pipridae, has been collected from birds of at least three genera in this family, and also from one member of the family Tyrannidae, *Anairetes parulus* (Kitlitz, 1830) (PRICE et al., 2003).
Table 1. Infection and infestation parameters of endoparasites from 20 *Elaenia albiceps chilensis*, and ectoparasites from 126 same hosts, during 2001-2012.

<table>
<thead>
<tr>
<th>Parasite species</th>
<th>Location in host</th>
<th>Positive birds (Prevalence)</th>
<th>Mean intensity</th>
<th>Range</th>
<th>Abundance Mean</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endoparasites (n=20)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nematoda</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><em>Viguiera</em> sp.</td>
<td>SI*</td>
<td>5 (25.0%)</td>
<td>2.6</td>
<td>0–5</td>
<td>0.65</td>
<td>13</td>
</tr>
<tr>
<td><em>Capillaria</em> sp.</td>
<td>SI*</td>
<td>1 (5.0%)</td>
<td>1</td>
<td>0–1</td>
<td>0.05</td>
<td>1</td>
</tr>
<tr>
<td>Ectoparasites (n=126)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Acari</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><em>Trionesartia elaeniae</em></td>
<td>WT</td>
<td>19 (15.1%)</td>
<td>6.1</td>
<td>0–16</td>
<td>0.92</td>
<td>116</td>
</tr>
<tr>
<td><em>Anisophyllodes elaeniae</em></td>
<td>WT</td>
<td>27 (21.4%)</td>
<td>3.7</td>
<td>0–22</td>
<td>0.80</td>
<td>101</td>
</tr>
<tr>
<td><em>Analges</em> sp.</td>
<td>AR</td>
<td>3 (2.4%)</td>
<td>3.3</td>
<td>0–5</td>
<td>0.08</td>
<td>10</td>
</tr>
<tr>
<td>Phthiraptera</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><em>Tyranniphilopterus delicatulus</em></td>
<td>HN</td>
<td>15 (4.3%)</td>
<td>4.3</td>
<td>0–11</td>
<td>0.52</td>
<td>65</td>
</tr>
<tr>
<td><em>Menacanthus cfr. distinctus</em></td>
<td>BD</td>
<td>5 (1.4%)</td>
<td>1.4</td>
<td>0–2</td>
<td>0.06</td>
<td>7</td>
</tr>
<tr>
<td><em>Ricinus cfr. invadens</em></td>
<td>BD</td>
<td>3 (1.3%)</td>
<td>1.3</td>
<td>0–2</td>
<td>0.03</td>
<td>4</td>
</tr>
</tbody>
</table>


2003). Another well-pigmented species belonging to another very different species group, *Ricinus arcuatus* (KELLOGG & MANN, 1912), which is widely distributed on several tyrannid hosts, has also been recorded on this same host (PRICE et al., 2003). A larger number of specimens, including males, is required for the proper identification of the taxa recorded here.

**Endoparasites**

Of the 20 *E. albiceps chilensis* necropased, five harbored a total of 14 nematodes. Thirteen of these (93%) were identified as *Viguiera* sp. Seurat, 1913 (Nematoda: Habronematidae) and were found in the small intestine of the white-crested elaenia from Chillán. The specimens were not identified due to the lack of sufficient material. All individuals were adults (eight males, five females), with a male to female ratio of 1.6. No females were gravid, which could indicate that *E. albiceps chilensis* may not be the true definitive host for this nematode. The genus *Viguiera* includes 20 species (NANDI, 2005), some of which parasitize Passeriformes of the families Cuculidae (Cuculiformes) and Paridae (Passeriformes) in the United States (PENCE, 1973). *Viguiera buckleyi* (Chabaud, 1957) has been reported on *Nectaria pulchella incidentes* (Passeriformes: Nectariniidae) in Africa (CANARIS & GARDNER, 2002). In addition, nine *Viguiera* species have been described from India (NANDI, 2005). In South America, *Viguiera osmanhilli* Yeh, 1955 has been reported from *Cyanerpes cyanus* Linneaus, 1766 (Passeriformes: Thraupidae) in Brazil (Yeh, 1954).

A single male of the nematode genus *Capillaria sens. lat.* Zeder, 1800 (Nematoda, Trichuridae) was also recovered from the small intestine of the white-crested elaenia from Chillán. This genus, which is characterized by the absence of caudal alae and a spiny spicule sheath in the male, is known to infect the gastrointestinal tract of all vertebrate groups (MORAVEC, 1982). Identification at the species level could not be made on the basis of the single specimen found.

Infection and infestation parameters of parasites of *E. albiceps chilensis* are shown in Table 1.

With the exception of *A. elaenae*, *T. elaenae*, and *T. delicatulus*, all of the parasites reported here represent new parasitological records for *E. albiceps chilensis* and for the Chilean repertoire of biodiversity.

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