

First record of *Amblyomma longirostre* (Koch, 1844) (Acari: Ixodidae) from Peru, with a review of this tick's host relationships

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Abstract

Four males of *Amblyomma longirostre* (Acari: Ixodidae) were collected on the rodent *Coendou bicolor* (Erethizontidae) at Área de Conservación Municipal Mishquiyacu Rumiyacu-Almendra (06°04'30.2"S, 76°58'33.5"W), Orquidiario Waqanki, Province of Moyabamba, Department of San Martín, Peru. This is the first Peruvian record of *A. longirostre*, which in South America has previously been reported from Argentina, Bolivia, Brazil, Colombia, French Guiana, Paraguay, Uruguay and Venezuela. Mammals and birds of various orders have been cited as hosts for adults of *A. longirostre*, but most records are from erethizontid rodents of the genera *Coendou*, *Chaetomys* and *Sphiggurus*. Birds appear to be the principal hosts for immature stages, although most records are from members of the order Passeriformes. *Amblyomma longirostre* appears not to be a threat to domestic vertebrates, from which it has seldom been reported, and its role as a vector of human rickettsioses is undetermined.

Key words: *Amblyomma longirostre*, ticks, hosts, *Coendou bicolor*, Peru

Introduction

Amblyomma longirostre (Koch, 1844) is a hard tick species with a Neotropical distribution, ranging from southern Mexico to Argentina and Uruguay (Guglielmone *et al.* 2003; Venzal *et al.* 2003). Although immature stages have also been found in the Nearctic on migratory birds (Fairchild *et al.* 1966; Scott *et al.* 2001), *A. longirostre* is not established in that biogeographic region, probably due to adverse environmental conditions or the absence of appropriate hosts for adults (Guglielmone *et al.* 2003; Labruna *et al.* 2007). Rodents of the family Erethizontidae and birds have been recorded as the principal hosts for adults and immature stages, respectively (Fairchild *et al.* 1966; Jones *et al.* 1972; Guglielmone *et al.* 2003; Labruna *et al.* 2007). Herein we present the first record of *A. longirostre* from Peru, with a review of the host relationships of both immature and adult stages.

Materials and methods

Four male ticks of the genus *Amblyomma* were collected by one of us (PMV) on *Coendou bicolor* (Rodentia: Erethizontidae: Erethizontinae) at Área de Conservación Municipal Mishquiyacu Rumiyacu-Almendra (06°04'30.2"S, 76°58'33.5"W), Orquidiario Waqanki, Province of Moyabamba, Department of San Martín, Peru, altitude 970 m. The ticks were determined using the keys and descriptions of Jones *et al.* (1972), Barros-Battesti *et al.* (2006) and Labruna *et al.* (2009),

and all were deposited in the tick collection of INTA Rafaela and the Field Museum of Natural History, Chicago, Illinois, USA.

Published records of *A. longirostre* containing references to tick life history stages were used to compile our host lists. Where necessary, scientific names of mammals and birds reported here have been updated following Wilson & Reeder (2005) and Dickinson (2003), respectively.

Results and discussion

The four male ticks collected on *C. bicolor* in Peru were determined as *A. longirostre*. Key morphological characters of males of this species are the presence of 5 large plates ventrally on the idiosoma, coxa I with two short spurs (the external longer than the internal), hypostomal dentition 3/3, marginal groove incomplete, and basis capituli triangular. In South America, *A. longirostre* has been reported from Argentina, Bolivia, Brazil, Colombia, French Guiana, Paraguay, Uruguay and Venezuela (Guglielmone *et al.* 2003; Venzal *et al.* 2003). Our collection constitutes the first record of *A. longirostre* from Peru and extends its known distribution.

Adults of *A. longirostre* have been found on 15 mammal species, while nymphs have been collected from 9 species of this group (Table 1). A total of 84 bird species in 7 orders and 20 families are known to serve as hosts for larvae and nymphs of *A. longirostre*, and 3 bird species belonging to 2 orders and 3 families have been cited as hosts for adults (Table 2). Despite the great diversity of hosts listed for this tick, most records are concentrated in a few taxa. For adults, 95.4% of collections are from mammals, the majority (83.7%) from rodents in the genera *Coendou*, *Chaetomys* and *Sphiggurus* (family Erethizontidae) (Fig. 1A). Nymphs have been recorded from various orders of birds and mammals, but passeriform birds are the principal hosts, with 84% of collections (Fig. 1B). All records of larvae are from birds, again chiefly (90.3%) passeriforms (Fig. 1C). A nymph of *A. longirostre* was recorded parasitizing *Muscicapa* sp. (or “Gobe mouche”) in the Antilles (Neumann 1899; Morel 1967), but this may be an error because the genus *Muscicapa* is confined to the Eastern Hemisphere (Dickinson 2003).

This review of the host relationships of *A. longirostre* confirms the observations of previous workers, who found that erethizontid rodents are the principal hosts for adults, and passeriform birds are preferred by immature stages (Aragão 1936; Fairchild *et al.* 1966; Jones *et al.* 1972; Guglielmone *et al.* 2003; Barros-Battesti *et al.* 2006; Labruna *et al.* 2007). Labruna *et al.* (2007) affirm that arboreal passeriform birds are the most important hosts for subadult *A. longirostre*, suggesting that this is an arboreal tick whose developmental stages inhabit the tree canopy. The remaining hosts listed in Tables 1 and 2 appear to play a minor role in the life cycle of *A. longirostre*. Nevertheless, some hosts of adult *A. longirostre* are common in the Nearctic Region (mammals of the families Canidae and Cervidae). It is uncertain whether fertilized females are able to produce viable eggs after feeding on such hosts. A positive answer might indicate that infestation with subadults of *A. longirostre* on migrant birds represents a way to overcome terrestrial barriers, rather than a dead end in this species' life cycle.

The single record of *A. longirostre* from a dog suggests that this tick poses a low risk to domestic vertebrates. However, in Brazil, Labruna *et al.* (2004) and Ogrzewalska *et al.* (2008) described infection of *A. longirostre* with rickettsiae belonging to the spotted fever group, a finding that could be of medical significance in cases where humans are parasitized. It remains to be determined whether *A. longirostre* is involved in the transmission of human rickettsioses.

TABLE 1. Records of mammals as hosts for larvae (LL), nymphs (NN) and adults (AA) of *Amblyomma longirostre*.

HOST	LL	NN	AA	Reference
Rodentia				
Erethizontidae				
<i>Coendou bicolor</i>			1	Keirans 1992
<i>Coendou prehensilis</i>		1	15	Aragão 1918; Floch & Fauran 1958; Jones <i>et al.</i> 1972; Keirans 1992; Labruna <i>et al.</i> 2002; Ferreira <i>et al.</i> 2004; Labruna <i>et al.</i> 2004; Barros-Battesti <i>et al.</i> 2005; Voltzit 2007
<i>Coendou rothschildi</i>		1	8	Fairchild <i>et al.</i> 1966
<i>Chaetomys subspinosus</i>			1	Silveira <i>et al.</i> 2008
<i>Sphiggurus insidiosus</i>			1	Silva <i>et al.</i> 1999
<i>Sphiggurus mexicanus</i>			2	Hoffmann <i>et al.</i> 1972; Varma 1973
<i>Sphiggurus spinosus</i>		1	7	Boero & Delpietro 1970; Barros & Baggio 1992; Ivancovich & Luciani 1992; Arzua <i>et al.</i> 2005
<i>Sphiggurus vestitus</i>			1	Guerrero 1996
<i>Sphiggurus villosus</i>		1	14	Barros & Baggio 1992; Oliveira <i>et al.</i> 1997; Brum <i>et al.</i> 2003; Arzua <i>et al.</i> 2005
Sciuridae				
<i>Sciurus granatensis</i>		1		Jones <i>et al.</i> 1972
Artiodactyla				
Cervidae				
<i>Blastocerus dichotomus</i>			1	Arzua <i>et al.</i> 2005
Carnivora				
Canidae				
<i>Cerdocyon thous</i>			1	Labruna <i>et al.</i> 2005
Dog			1	Moraes-Filho <i>et al.</i> 2009
Felidae				
<i>Leopardus geoffroyi</i>		1		Barros & Baggio 1992
Mustelidae				
<i>Eira barbara</i>			1	Keirans 1992
Chiroptera				
Phyllostomidae				
<i>Artibeus lituratus</i>		1		Jones <i>et al.</i> 1972
Pilosa				
Bradypodidae				
<i>Bradypus tridactylus</i>		1	1	Floch & Fauran 1958
Primates				
Hominidae				
Man		1	4	Floch & Fauran 1958; Arzua <i>et al.</i> 2005; Guglielmone <i>et al.</i> 2006

TABLE 2. Records of birds as hosts for larvae (LL), nymphs (NN) and adults (AA) of *Amblyomma longirostre*.

HOST	LL	NN	AA	Reference
Coraciiformes				
Momotidae				
<i>Baryphthengus ruficapillus</i>	1	1		Arnold 1970; Arzua <i>et al.</i> 2005
Falconiformes				
Accipitridae				
<i>Buteo platypterus</i>	1			Tonn <i>et al.</i> 1963
Galbuliformes				
Bucconidae				
<i>Malacoptila striata</i>	2	1		Labruna <i>et al.</i> 2007; Ogrzewalska <i>et al.</i> 2008
Galliformes				
Cracidae				
<i>Penelope obscura</i>			1	Arzua <i>et al.</i> 2005
Gruiformes				
Gruidae				
<i>Laterallus albigularis</i>	1			Arnold 1970
Passeriformes				
Cardinalidae				
<i>Cyanocopsa brisonii</i>		1		Arzua <i>et al.</i> 2005
<i>Saltator maximus</i>		1		Aragão 1936
<i>Saltator similis</i>	1	3		Arzua <i>et al.</i> 2005; Labruna <i>et al.</i> 2007
<i>Cyanocopsa cyanoides</i>	1			Arnold 1970
Conopophagidae				
<i>Conophaga lineata</i>		2		Arzua <i>et al.</i> 2005; Ogrzewalska <i>et al.</i> 2008
Dendrocolaptidae				
<i>Sittasomus griseicapillus</i>	1	1		Arzua <i>et al.</i> 2005; Labruna <i>et al.</i> 2007
<i>Dendrocincla fuliginosa</i>	1			Arzua <i>et al.</i> 2005
<i>Xiphorynchus fuscus</i>	2			Labruna <i>et al.</i> 2007
<i>Xiphorynchus guttatus</i>	1	1		Arnold 1970
<i>Xiphorynchus lachrymosus</i>		1		Tonn <i>et al.</i> 1963
<i>Campylorhamphus facularius</i>	1			Labruna <i>et al.</i> 2007
<i>Lepidocolaptes squamatus</i>	1			Labruna <i>et al.</i> 2007
<i>Lepidocolaptes souleyetii</i>	1	1		Tonn <i>et al.</i> 1963; Arnold 1970
<i>Glyphorynchus spirurus</i>		1		Cooley & Kohls 1944
Furnariidae				
<i>Philydor atricapillus</i>		1		Arzua <i>et al.</i> 2005
<i>Philydor rufum</i>		1		Labruna <i>et al.</i> 2007
<i>Automolus leucophthalmus</i>	1	1		Labruna <i>et al.</i> 2007
<i>Automolus ochrolaemus</i>	1			Arnold 1970

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TABLE 2 (continued)

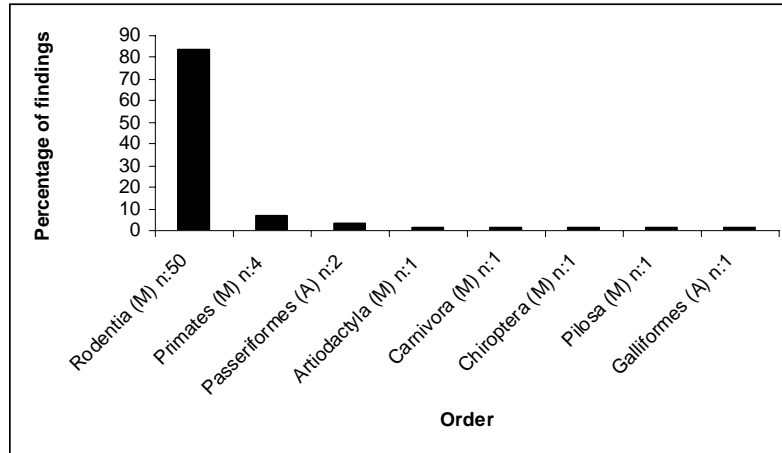
HOST	LL	NN	AA	Reference
<i>Anabazenops fuscus</i>	1			Labruna <i>et al.</i> 2007
<i>Synallaxis spixi</i>		1		Arzua <i>et al.</i> 2005
<i>Synallaxis ruficapilla</i>		1		Labruna <i>et al.</i> 2007
<i>Syndactyla rufosuperciliata</i>		1		Venzal <i>et al.</i> 2005
Icteridae				
<i>Cacicus cela</i>		1		Aragão 1936
<i>Icterus icterus</i>		1		Aragão 1936
Parulidae				
<i>Basileuterus culicivorus</i>	1	3		Arzua <i>et al.</i> 2005; Labruna <i>et al.</i> 2007
<i>Basileuterus rufifrons</i>			1	Tonn <i>et al.</i> 1963
Pipridae				
<i>Chiroxiphia caudata</i>	4	2		Arzua <i>et al.</i> 2005; Labruna <i>et al.</i> 2007
<i>Chiroxiphia linearis</i>	1			Arnold 1970
<i>Manacus manacus</i>	2	3		Arzua <i>et al.</i> 2005; Labruna <i>et al.</i> 2007
<i>Ilicura militaris</i>	1	1		Labruna <i>et al.</i> 2007
Thamnophilidae				
<i>Dysithamnus mentalis</i>	2	1		Labruna <i>et al.</i> 2007; Ogrzewalska <i>et al.</i> 2008
<i>Thamnophilus caerulescens</i>		2		Labruna <i>et al.</i> 2007
<i>Thamnophilus bridgesi</i>		1		Arnold 1970
<i>Cercomacra tyrannina</i>	1			Arnold 1970
<i>Taraba major</i>	1			Arnold 1970
<i>Euphonia violacea</i>		1		Arzua <i>et al.</i> 2005
<i>Euphonia pectoralis</i>		1		Arzua <i>et al.</i> 2005
<i>Mackenziaena severa</i>		1		Arzua <i>et al.</i> 2005
Thraupidae				
<i>Tangara seledon</i>		5		Arzua <i>et al.</i> 2005; Labruna <i>et al.</i> 2007
<i>Tachyphonus coronatus</i>	2	5		Arzua <i>et al.</i> 2005; Labruna <i>et al.</i> 2007
<i>Tachyphonus cristatus</i>		1		Labruna <i>et al.</i> 2007
<i>Trichothraupis melanops</i>	1	1		Labruna <i>et al.</i> 2007
<i>Tersina viridis</i>		1		Arzua <i>et al.</i> 2005
<i>Piraeideia melanonota</i>		1		Arzua <i>et al.</i> 2005
<i>Leptopogon amaurocephalus</i>	2			Labruna <i>et al.</i> 2007; Ogrzewalska <i>et al.</i> 2008
<i>Thraupis sayaca</i>	1			Labruna <i>et al.</i> 2007
<i>Ramphocelus sanguinolentus</i>		1		Hoffmann 1962
<i>Habia rubica</i>	1			Arzua <i>et al.</i> 2005
<i>Eucometis penicillata</i>		1		Labruna <i>et al.</i> 2009
Troglodytidae				
<i>Thryothorus longirostris</i>		1		Arzua <i>et al.</i> 2005

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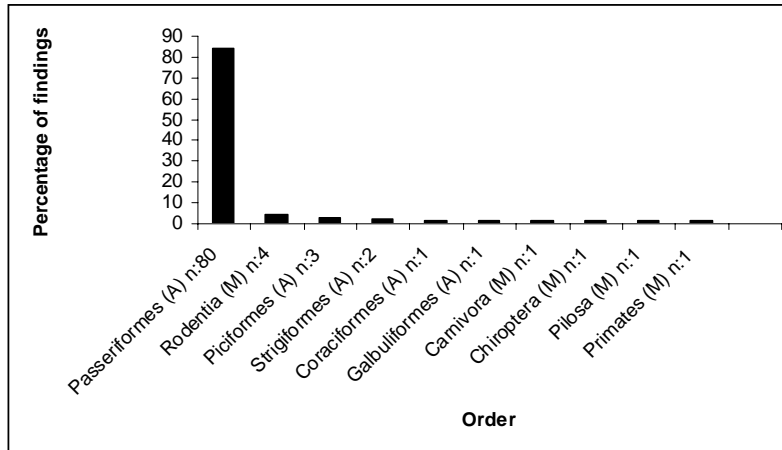
TABLE 2 (continued)

HOST	LL	NN	AA	Reference
<i>Thryothorus nigricapillus</i>	2	1		Arnold 1970
<i>Thryothorus modestus</i>	1			Arnold 1970
<i>Thryothorus atrogularis</i>	1			Arnold 1970
Turdidae				
<i>Turdus</i> sp.		1		Aragão 1918
<i>Turdus nigriceps</i>		2		Arzua <i>et al.</i> 2005
<i>Turdus rufiventris</i>		2		Arzua <i>et al.</i> 2005; Labruna <i>et al.</i> 2007
<i>Turdus albicollis</i>	1	3		Venzal <i>et al.</i> 2005; Labruna <i>et al.</i> 2007
<i>Turdus amaurochalinus</i>		1		Arzua <i>et al.</i> 2005
<i>Turdus fumigatus</i>		1		Labruna <i>et al.</i> 2007
<i>Turdus grayi</i>		1		Tonn <i>et al.</i> 1963
<i>Turdus nudigenis</i>		1		Voltzit 2007
Tyrannidae				
<i>Phylloscartes ventralis</i>		2		Venzal <i>et al.</i> 2003; Arzua <i>et al.</i> 2005
<i>Tolmomyias sulphurescens</i>		2	1	Hoffmann 1962; Arzua <i>et al.</i> 2005
<i>Myiarchus ferox</i>		1		Arzua <i>et al.</i> 2005
<i>Myodynastes maculatus</i>		1		Arzua <i>et al.</i> 2005
<i>Myiopagis viridicata</i>	1			Labruna <i>et al.</i> 2007
<i>Myiophobus fasciatus</i>	1			Labruna <i>et al.</i> 2007
<i>Mionectes oleagineus</i>	1			Arnold 1970
<i>Mionectes rufiventris</i>	2			Arzua <i>et al.</i> 2005; Labruna <i>et al.</i> 2007
<i>Empidonax traillii</i>		1		Scott <i>et al.</i> 2001
<i>Platyrinchus mystaceus</i>	3	1		Labruna <i>et al.</i> 2007; Ogrzewalska <i>et al.</i> 2008
<i>Rhynchocyclus brevirostris</i>		1		Hoffmann 1962
<i>Elaenia parvirostris</i>		1		Venzal <i>et al.</i> 2005
<i>Lathroticcus euleri</i>		1		Arzua <i>et al.</i> 2005
<i>Hemitriccus nidipendulus</i>		1		Labruna <i>et al.</i> 2007
<i>Cyclarhis guyanensis</i>		1		Labruna <i>et al.</i> 2007
Vireonidae				
<i>Vireo olivaceus</i>		1		Scott <i>et al.</i> 2001
<i>Vireo griseus</i>		1		Cooley & Kohls 1944
Piciformes				
Picidae				
<i>Celeus flavescens</i>		1		Arzua <i>et al.</i> 2005
Ramphastidae				
<i>Rhamphastos dicolorus</i>		2		Keirans 1985
Strigiformes				
Strigidae				
<i>Pulsatrix koeniswaldiana</i>		1		Arzua <i>et al.</i> 2005

A)



B)



C)

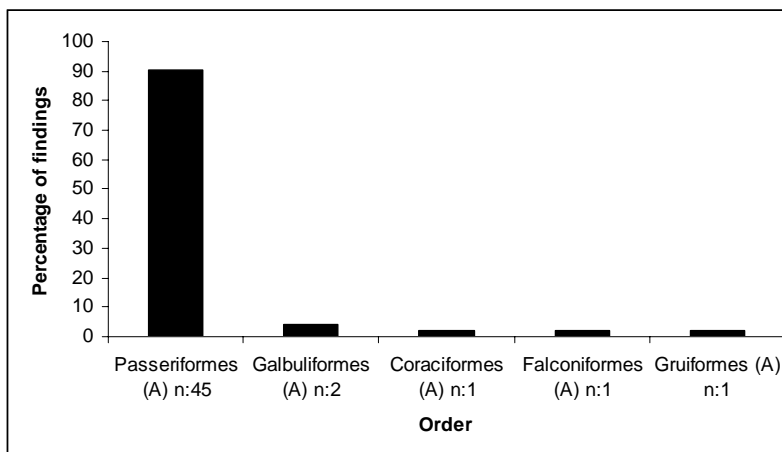


FIGURE 1. Percentages for collections of adults (A), nymphs (B) and larvae (C) of *Amblyomma longirostre* from different orders of mammals and birds. M: Mammalia. A: Aves.

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