

## Checklist of parasites reported from *Athene cunicularia*

Group and parasite species	Geographic location	References
<b>Viruses</b>		
West Nile virus	California (USA)	Dusek et al. (2010)
<b>Protists</b>		
<i>Eimeria</i> sp.	Brazil	da Silva et al. (2009)
<i>Eimeria speotytoi</i>	Brazil	Alfaleh et al. (2012)
<i>Entamoeba</i> sp.	California (USA)	Franson (2017)
<i>Histomonas</i> sp.	Brazil	Andery et al. (2013)
	California (USA)	Franson (2017)
<i>Tetratrichomonas</i> sp.	California (USA)	Franson (2017)
<i>Toxoplasma gondii</i>	south Brazil	Vitaliano et al. (2014)
<i>Trichomonas</i> sp.	California (USA)	Franson (2017)
<b>Acanthocephala</b>		
<i>Centrorhynchus</i> sp.	Buenos Aires	Drago et al. (2015)
<b>Trematoda</b>		
<i>Echinoparyphium speotyto</i>	Oklahoma (USA)	Buscher (1978)
<i>Maritrema patulus</i>	Canada	Hernandez-Orts et al. (2015)
<i>Maritrema</i> sp.	Florida (USA)	Kinsella et al. (2001)
<i>Microphallus</i> sp.	Florida (USA)	Kinsella et al. (2001)
<i>Neodiplostomum americanum</i>	Florida (USA)	Kinsella et al. (2001)
<i>Neodiplostomum travassosi</i>	Argentina	Drago et al. (2015)
<i>Prosthogonimus ovatus</i>	Florida (USA)	Kinsella et al. (2001)
<b>Nematoda</b>		
<i>Cyathostoma</i> sp.	Canada	Redig et al. (1993)
<i>Pelecitus</i> sp.	Brazil	Silva et al. (2014)
<i>Subulura alfensis</i>		
<i>Subulura forcipata</i>	Florida (USA)	Kinsella et al. (2001)
<i>Subulura reclinata</i>	Florida (USA)	Kinsella et al. (2001)
<i>Tetrameres</i> sp.	Brazil	Andery et al. (2013)
<b>Acari</b>		
<i>Argas dalei</i>	Peru	Need et al. (1991)
<i>Dermonoton</i> sp.	USA	Kurey (1976)
	Brazil	de Almeida & Hernandes (2016)
<i>Euschoengastoides gurneyi</i>	Kansas (USA)	Loomis (1956)
<i>Glaucalges</i> sp.	Brazil	de Almeida & Hernandes (2016)
<i>Hypodectes propus</i>	Texas (USA)	Pence & Bergan (1996)
	Brazil	Goulart (2011)
<i>Hyponeocula montanensis</i>	Kansas (USA)	Loomis (1956)
<i>Kramerella major</i>		Philips (2000)
<i>Neobubophilus cunicularius</i>	Paraguay	Skoracki et al. (2016)
<i>Neoschoengastia americana</i>	Kansas (USA)	Loomis (1956)
<i>Ornithodoros parkeri</i>	Washington (USA)	Jellison (1940)
<i>Proctophyllodes polyxenus</i>	Nebraska (USA)	Atyeo & Braasch (1966)
<i>Rhinoecius bisetosus</i>	Brazil	Mascarenhas et al. (2018)
<i>Sternostoma augei</i>	Brazil	Mascarenhas et al. (2018)
<i>Tytodectes speotyto</i>	Texas (USA)	Pence & Bergan (1996)
<b>Phthiraptera</b>		
<i>Colpocephalum pectinatum</i>	Nebraska (USA)	Thompson (1950)
	Argentina	Daciuk et al. (1981)
	Texas (USA)	Skoruppa et al. (2006)
	Brazil	Oliveira da Silva et al. (2009)
	Mexico	Bolaños-García et al. (2018)
<i>Strigiphilus speotyti</i>	Nebraska, Colorado (USA)	Thompson (1950)
	Argentina	Daciuk et al. (1981)
	Idaho (USA)	Smith & Belthoff (2001)
	Texas (USA)	Skoruppa et al. (2006)
	Chile	González-Acuña et al. (2006)

	Brazil	Marietto-Gonçalves et al. (2012)
<b>Siphonaptera</b>		
<i>Aetheca wagneri</i>	Colorado (USA) Idaho (USA)	Seery et al. (2003) Riding (2010)
<i>Dactylopsylla ignota</i>		Llyuh & Goncharov (2005)
<i>Diamanus montanus</i>		Llyuh & Goncharov (2005)
<i>Echidnophaga gallinacean</i>	California (USA)	Belthoff et al. (2015)
<i>Epitedia inopina</i>		Llyuh & Goncharov (2005)
<i>Epitedia wenmanni</i>	Colorado (USA)	Seery et al. (2003)
<i>Foxella ignota</i>	Colorado (USA)	Seery et al. (2003)
<i>Hoplopsyllus anomalus</i>		Llyuh & Goncharov (2005)
<i>Megabothris clantoni</i>		Llyuh & Goncharov (2005)
<i>Megabothris exilis</i>		Llyuh & Goncharov (2005)
<i>Megabothris wagneri</i>		Llyuh & Goncharov (2005)
<i>Meringis hubbardi</i>	Idaho (USA)	Riding (2010)
<i>Neopsylla hamiltoni</i>	Alberta (Canada)	Brown (1944)
<i>Nosopsyllus fasciatus</i>	California (USA)	Schwan (1984)
<i>Opisocrostis tuberculatus</i>		Llyuh & Goncharov (2005)
<i>Oropsylla hirsuta</i>	Colorado (USA)	Seery et al. (2003)
<i>Oropsylla idahoensis</i>	Alberta (Canada)	Brown(1944)
		Llyuh & Goncharov (2005)
<i>Polygenis (Polygenis) biturus</i>	Tucumán (Argentina)	Lareschi et al., (2016)
<i>Polygenis (Polygenis) platensis</i>	Santa Cruz (Argentina)	Lareschi et al., (2016)
<i>Pulex irritans</i>	Idaho, Oregon, Washington, Colorado (USA)	Belthoff et al. (2015)
<i>Pulex simulans</i>	Idaho, Oregon, Washington, Colorado (USA)	Belthoff et al. (2015)
<i>Rectofrontia fraterna</i>	Alberta, Canada	Brown (1944)
<i>Rhadinopsylla fraterna</i>		Llyuh & Goncharov. (2005)
<i>Thrassis fotus</i>	Colorado (USA)	Seery et al. (2003)
<i>Thrassis pandorae</i>		Llyuh & Goncharov (2005)
<b>Diptera</b>		
<i>Icosta americana</i>	Wisconsin (USA) Brazil Argentina	Mueller et al. (1969) Graciolli & Barros de Carvalho (2003) Liébana et al. (2011)
<i>Icosta rufiventris</i>	Brazil	Fontanelli Vaz & Teixeira (2016)
<i>Ornithoica vicina</i>	Brazil	Fontanelli Vaz & Teixeira (2016)
Carnidae fly	SW Idaho (USA)	Smith (1999)

**REFERENCES** Alfaleh, F.A.; Alyousif, M.S.; Al-Quraishy, S.; Al-Shawa, Y.R. *Eimeria biarmicus* sp.n. (Apicomplexa: Eimeriidae) infecting falcons from the genus *Falco* in Saudi Arabia. *Parasitol. Res.* **2012**, *110*, 1655–1657.

Andery, D. de A.; Ferreira Junior, F.; Araújo, A.V.; Vilela, D. da R.; Marques, M.; Marin, S.Y.; Horta, R.S.; Ortiz, M.C.; Resende, J.S.; Martins, N.S. Health assessment of raptors in triage in Belo Horizonte, MG, Brazil. *Rev. Bras. Cien. Avic.* **2013**, *15*, 247–256.

Atyeo, W.T.; Braasch, N.L.; Norman, L. The feather mite genus *Proctophyllodes* (Sarcoptiformes: Proctophyllodidae). *Bull. Univ. Nebr. State Mus.* **1996**, *39*: 1-354.

Belthoff, J.R.; Bernhardt, S.A.; Ball, C.L.; Gregg, M.; Johnson, D.H.; Ketterling, R.; Price, E.; Tinker, J.K. Burrowing owls, *Pulex irritans*, and plague. *Vector-Borne Zoonotic Dis.* **2015**, *15*, 557-564.

Brown, J.H. Sylvatic plague: the recovery of fleas from the burrowing owl and its burrow in a plague area in Alberta. *Entomol. News* **1994**, *55*, 15-18.

Buscher, H.N. *Echinoparyphium speotyto* sp. n. (Trematoda: Echinostomatidae) from the burrowing owl in Oklahoma, with a discussion of the genus *Echinoparyphium*. *J. Parasitol.* **1978**, *64*, 52-58.

Daciuk, J.; Cicchino A.C.; Mauri, R.; Capri, J.J. Notas faunísticas y bioecológicas de Península Valdes y Patagonia. XXIV. Artrópodos ectoparásitos de mamíferos y aves colectados en la Península Valdes y alrededores (Provincia de Chubut, Argentina). *Physis C* **1981**, *39*, 41-48.

da Silva, A.S.; Zanette, R.A.; Lara, V.M.; Gressler, L.T.; Carregaro, A.B.; Santurio, J.M.; Monteiro, S.G. Gastrointestinal parasites of owls (Strigiformes) kept in captivity in the Southern region of Brazil. *Parasitol. Res.* **2009**, *104*, 485–487.

de Almeida Pedroso, L.G.; Hernandes, F.A. New records of feather mites (Acariformes: Astigmata) from non- passerine birds (Aves) in Brazil. *Check List. Biodiv. Data J.* **2016**, *12*, 2000.

Drago, F.B.; Lunaschi, L.I.; Cabrera, N.E.; Barbieri, L. Helminth parasites of four species of strigiform birds from Central and Northeastern Argentina. *Rev. Arg. Parasitol.* **2015**, *4*, 15-23.

Dusek, R.J.; Iko, W.M.; Hofmeister, E.K. Occurrence of West Nile virus infection in raptors at the Salton Sea, California. *J. Wildl. Dis.* **2010**, *46*, 889-895.

Fontanelli-Vaz, F.; Teixeira, V.N. New records of three hippoboscoid species on newly captured birds from nature in Paraná, Brazil. *Rev. Bras. Parasitol. Vet.* **2016**, *25*, 501-503.

Franson, J.C. Protozoal hepatitis in a western burrowing owl (*Athene cunicularia hypugaea*). *Southw. Nat.* **2017**, *62*, 75-77.

González-Acuña, D.; Rodrigo Muñoz, C.; Cicchino, A.; Figueroa-R., R.A. Lice of Chilean owls: a first description. *J. Raptor Res.* **2006**, *40*, 301-302.

Goulart, T.M. *Ácaros associados à "avoante" Zenaida auriculata (Des Murs, 1847) na região de Campinas-SP, Brasil*. Tesis de Maestría, Universidade Estadual de Campinas, Brazil, **2011**.

Gracioli, G.; Barros de Carvalho, C.J. Hippoboscidae (Diptera, Hippoboscoidea) no Estado do Paraná, Brasil: chaves de identificação, hospedeiros e distribuição geográfica. *Rev. Bras. Zool.* **2003**, *20*, 667-674.

Hernández-Orts, J.S.; Pinacho-Pinacho, C.D.; García-Varela, M.; Kostadinova, A. *Maritrema corai* n. sp. (Digenea: Microphallidae) from the white ibis *Eudocimus albus* (Linnaeus) (Aves: Threskiornithidae) in Mexico. *Parasitol. Res.* **2015**, *115*, 547-559.

Jellison, W.L. The burrowing owl as a host of the argasid tick, *Ornithodoros parkeri*. *Public Health Rep.* **1940**, *55*, 206-208.

Kinsella, J.M.; Foster, G.W.; Forrester, D.J. Parasitic helminths of five species of owls from Florida, U.S.A. *Comp. Parasitol.* **2001**, *68*, 130-134.

Kurey, W.J. *Ectoparasitic Acarina (Analgoidea) from non-passeriform birds of North America*. M.S. Thesis. Youngstown State University, Youngstown, OH, USA, 1976.

Lareschi, M.; Sánchez, J.; Autino, A. A review of the fleas (Insecta: Siphonaptera) from Argentina. *Zootaxa* **2016**, *4103*, 239-258.

Liébana, M.S.; Santillán, M.Á.; Cicchino, A.C.; Sarasola, J.H.; Martínez, P.; Cabezas, S.; Bó, M.S. Ectoparasites in free-ranging American kestrels in Argentina: implications for the transmission of viral diseases. *J. Raptor Res.* **2011**, *45*, 335-341.

Llyuh, M.P.; Goncharov, A.I. On the fleas IDS. Caucasian *Ornithol. Gaz.* **2005**, *17*, 5-8 [in Bielorussian].

Loomis, R.B. The chigger mites of Kansas (Acarina, Trombiculidae). *Univ. Kansas Sci. Bull.* **1956**, *37*, 1195-1442.

Marietto-Gonçalves, G.A.; Martins, T.F.; Andreatti Filho, R.L. Chewing lice (Insecta, Phthiraptera) parasitizing birds in Botucatu, SP, Brazil. *Rev. Bras. C. Vet.* **2012**, *19*, 206-212.

Mascarenhas, C.S.; Bernardon, F.F.; Gastal, S.; Müller, G. Checklist of the parasitic nasal mites of birds in Brazil. *Syst. App. Acarol.* **2018**, *23*, 1672-1692.

Mueller, N.S.; Mueller, H.C.; Berger, D.D. Host records and phenology of louse-flies on Wisconsin birds. *Trans. Wisconsin Acad. Sci. Arts Lett.* **1969**, *57*, 189-207.

Need, J.T.; Dale, W.E.; Keirans, J.E.; Dasch, G.A. Annotated list of ticks (Acari: Ixodidae, Argasidae) reported in Peru: distribution, hosts, and bibliography. *J. Med. Entomol.* **1991**, *28*, 590-597.

Pence, D.B.; Bergan, J.F. Hypopi (Acari: Hypoderatidae) from Owls (Aves: Strigiformes: Strigidae). *J. Med. Entomol.* **1996**, *33*, 828-834.

Philips, J.R. A review and checklist of the parasitic mites (Acarina) of the Falconiformes and Strigiformes. *J. Raptor Res.* **2000**, *34*, 210-231.

Redig, P.T.; Cooper, J.E.; Remple, D.; Hunter, D.B. *Raptor Biomedicine*. Minneapolis, University of Minnesota Press, Minneapolis, USA, **1993**.

Riding, C.S. *Effects of old nest material on occupancy and reuse of artificial burrows, and breeding dispersal by burrowing owls (Athene cunicularia) in southwestern Idaho*. PhD Thesis, Boise State University, Boise, USA, **2010**.

Schwan, T.G. *Nosopsyllus fasciatus* parasiting house mice on Southeast Farallon Island, California (Siphonaptera: Ceratophyllidae). *Pan-Pacific Entomol.* **1984**, *60*, 345-349.

- Seery, B.D.; Biggins, D.E.; Montenieri, J.A.; Ensore, R.E.; Tandia, D.T.; Gage, K.L. Treatment of black-tailed prairie dog burrows with deltamethrin to control fleas (Insecta: Siphonaptera) and plague. *J. Med. Entomol.* **2003**, *40*, 718-722.
- Silva, T.M.; Sakai-Okamoto, A.; Firmino da Silva, L.A.; Domeneghetti-Smaniotto, B.; Da Silva, R.J.; Andreatti-Filho, R.L. New record of *Pelecitus* sp. (Nematoda, Onchocercidae) as a parasite of *Athene cunicularia* (Strigiformes, Strigidae) in southeastern Brazil. *Rev. Bras. Parasitol. Vet.* **2014**, *23*, 274-275.
- Skoracki, M.; Unsoeld, M.; Marciniak, N.; Sikora, B. Diversity of quill mites of the family Syringophilidae (Acari: Prostigmata) parasitizing owls (Aves: Strigiformes) with remarks on the host-parasite relationships. *J. Med. Entomol.* **2016**, *53*, 815-826.
- Skoruppa, M.K.; Pearce, B.; Woodin, M.C.; Hickman, G.C. Ectoparasites of burrowing owls (*Athene cunicularia hypugaea*) wintering in Southern Texas. *Texas J. Sci.* **2006**, *58*, 73-78.
- Smith, B.W. *Nest-site selection, ectoparasites, and mitigation techniques: studies of burrowing owls and artificial burrow systems in southwestern Idaho*. MS Thesis, Boise State University, Boise, USA, **1999**.
- Smith, B.W.; Belthoff, J.R. Identification of ectoparasites on burrowing owls in southwestern Idaho. *J. Raptor Res.* **2001**, *35*, 159-161.
- Thompson, G.B. XXX.-A list of the type-hosts of the Mallophaga and the lice described from them. *Ann. Mag. Nat. Hist.* **1950**, *3*, 365-382.
- Vitaliano, S.N.; Soares, H.S.; Pena, H.F.J.; Dubey, J.P.; Gennari, S.M. Serologic evidence of *Toxoplasma gondii* infection in wild birds and mammals from southeast Brazil. *J. Zoo Wildl. Med.* **2014**, *45*, 197-199.

**Iconography of ectoparasites found in burrowing owls from Bahia Blanca, Argentina.**



**Figure S1.** General view of a mite collected from *Athene cunicularia* from Bahia Blanca (Argentina): family Laelapidae (order Mesostigmata), scale bar: 200 μm.



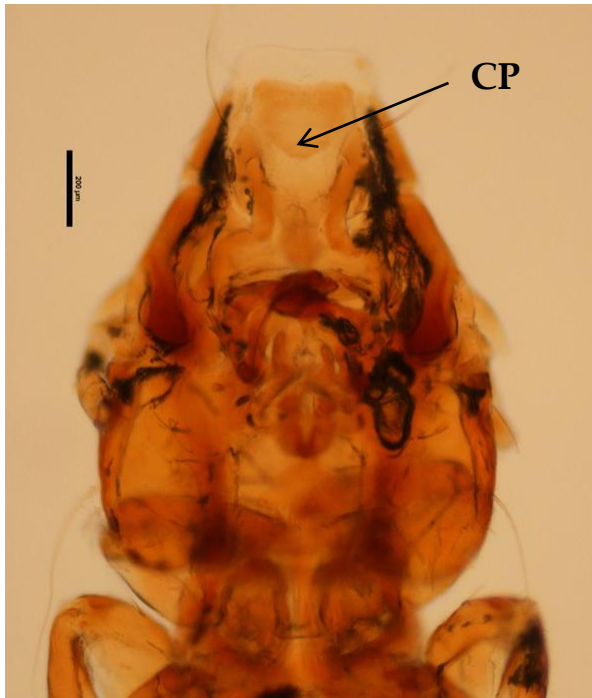
**Figure S2.** Laelapid mite collected from *Athene cunicularia* from Bahia Blanca (Argentina): detail of the gnathosoma, scale bar: 20 μm.



**Figure S3.**  
Laelapid mite  
collected from  
*Athene*  
*cunicularia* from  
Bahia Blanca  
(Argentina):  
ventral setae of  
tibia I, scale  
bar: 20 μm.

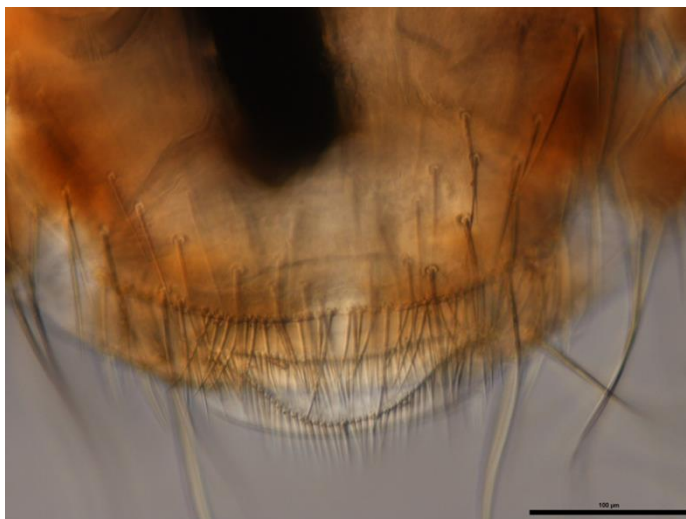


**Figure S4.** *Strigiphilus speotyti*: habitus of an adult  
male, scale bar: 200 μm.

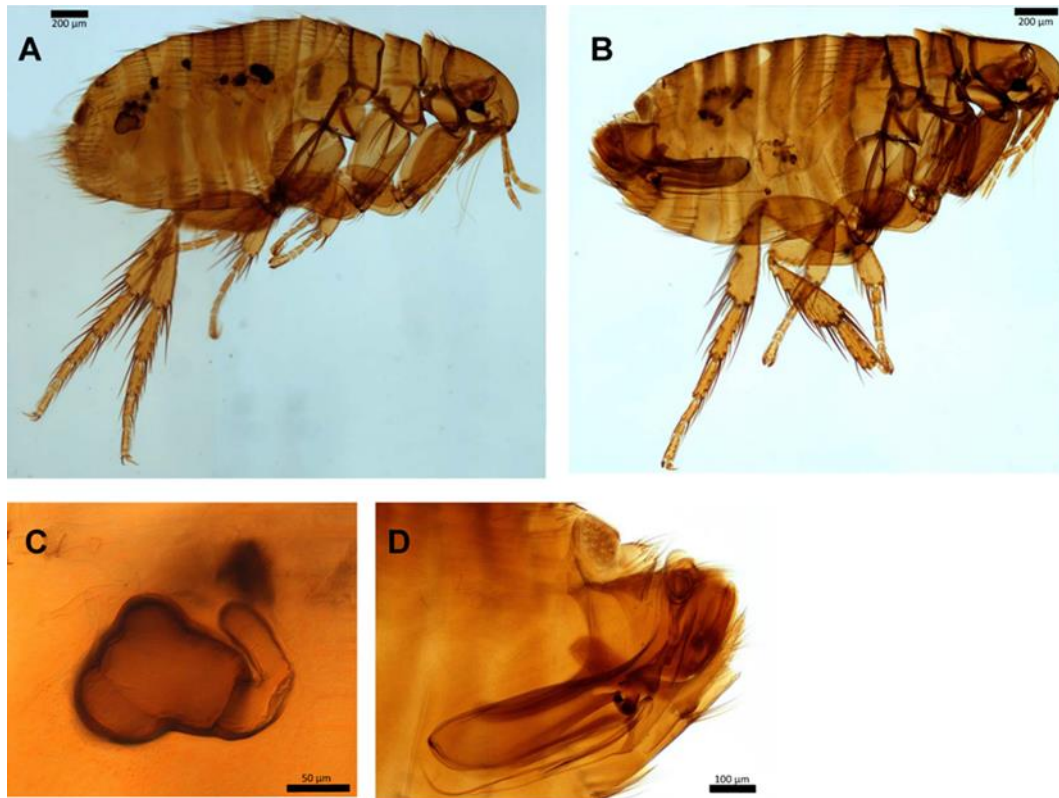


head and clipeal plate (CP), scale bar: 200  $\mu\text{m}$ .

**Figure S5.** *Strigiphilus speotyti*: detail of the



**Figure S6.** *Colpocephalum pectinatum*. Female genitalia, scale bar: 100  $\mu\text{m}$ . A complete description of *Colpocephalum pectinatum* collected from Bahia Blanca, Argentina can be found in Liébanas et al. *Arthropod Struct Develop.* **2021**, 64, 101085.



**Figure S7.** *Polygenis plantensis*. **A.** General view of an adult female. **B.** General view of an adult male. **C.** Spermatheca. **D.** male genitalia. Specimens collected on *Athene cunicularia* from Bahia Blanca, Argentina.