

Parasites of Spur-Winged Lapwings *Vanellus spinosus* at a colony on the south coast of Turkey

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In this study we examined Spur-winged Lapwings *Vanellus spinosus* from a colony on the south coast of Turkey for parasites.

The Spur-winged Lapwing has an extensive distribution as a resident in sub-Saharan Africa and the Middle East, and also occurs in Greece and Turkey as a breeding summer visitor (Wiersma & Kirwan 2017). Adults arrive at colonies in Turkey in March and the breeding season extends until August. Breeding habitats include barren lands, pastures, croplands and sand dunes where nests are built on the ground (Aye & Salmanzadeh 2007, Charalambidou 2012).

Parasites of the *Vanellus* species, including Spur-winged Lapwing, have been particularly studied in terms of mites. Thus different species of the mite genus *Magimelia* were detected on *Vanellus miles*, *V. indicus*, *V. davaucellii*, *V. tricolor*, and *V. senegallus* (Dabert *et al.* 2002), and the genus *Magimelia* was found on *V. spinosus* (Gaud 1972). Also it has been reported that *Skoloviana*-type mites have been found on *Vanellus* genera, the *Skoloviana chilensis* mite on *V. chilensis*, and the *S. vanelli* mite on *V. indicus* (Dabert & Ehrnsberg 1998). Mironov *et al.* (2002) reported that genus *Triphyllochaet* mites were found on *Vanellus* species and one of them, *Triphyllochaet vanelli*, was found on *V. vanellus*; while *T. paravanelli* was found on *V. resplendens*. In other studies, the mite *Bychovskiati chilensis* was found on *V. chilensis* (Mironov & Dabert 1995) and *Actornithophilus gracilis* (order Phthiraptera) was found on *V. chilensis* (Gonzalez-Acuna 2008).

Our research was carried out in a Spur-winged Lapwing breeding area 2–3 km from the coast near Boğazkent in the Province of Antalya, SW Turkey (36°51'N, 31°09'E) between the town of Belek in the west and the Köprüçay River in the east. It has many habitat types including, grasslands, sand dunes, marshes, barren lands, and croplands. The fieldwork reported here was carried out in the 2015 breeding season, when the Spur-winged Lapwing population of the study area comprised 50 adults and we found 17 nests. Twenty adult lapwings were captured using traps deployed over nests and each was examined for ectoparasites; first with the naked eye and then with the help of a loupe (magnifying glass). Blood samples (0.5 cc) were taken from the lower wing veins of each bird and stored in anticoagulant tubes for endoparasite examination; blood smears were taken from each bird

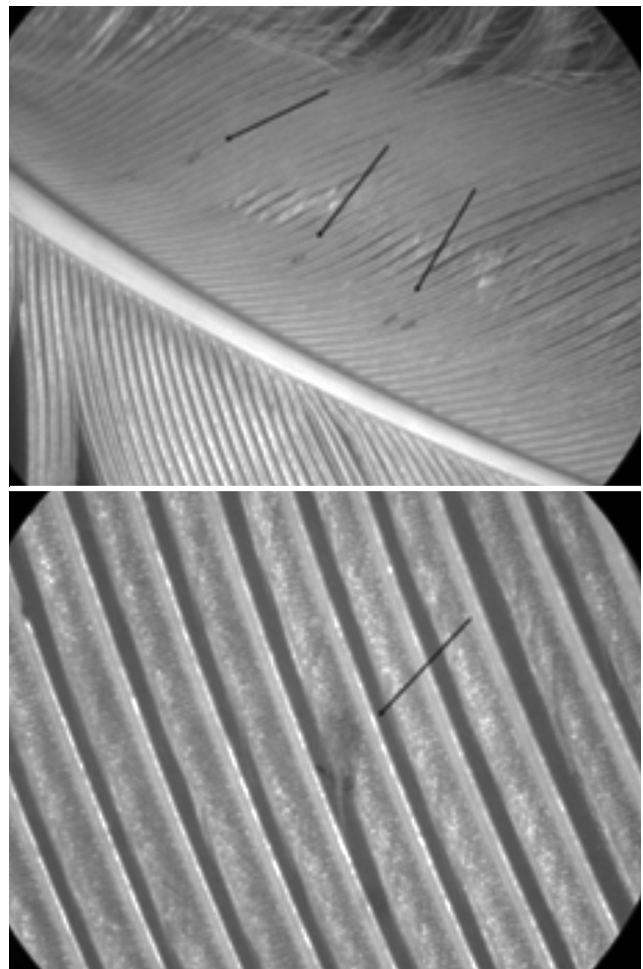


Fig. 1. Feather mites of the species *Brephosceles vanelli* on Spur-winged Lapwing feathers.

and faecal samples collected for investigation for gastrointestinal parasites and feather samples for ectoparasites. Faeces were collected from boxes lined with paper in which the birds were held pending examination. Thirteen of the 20 birds defecated in the boxes.

Blood smears made in the field were brought to the laboratory where they were prepared for microscopic examination by staining with Giemsa. Faecal samples, which were brought to the laboratory in plastic containers, were examined by the centrifugal flotation method using a

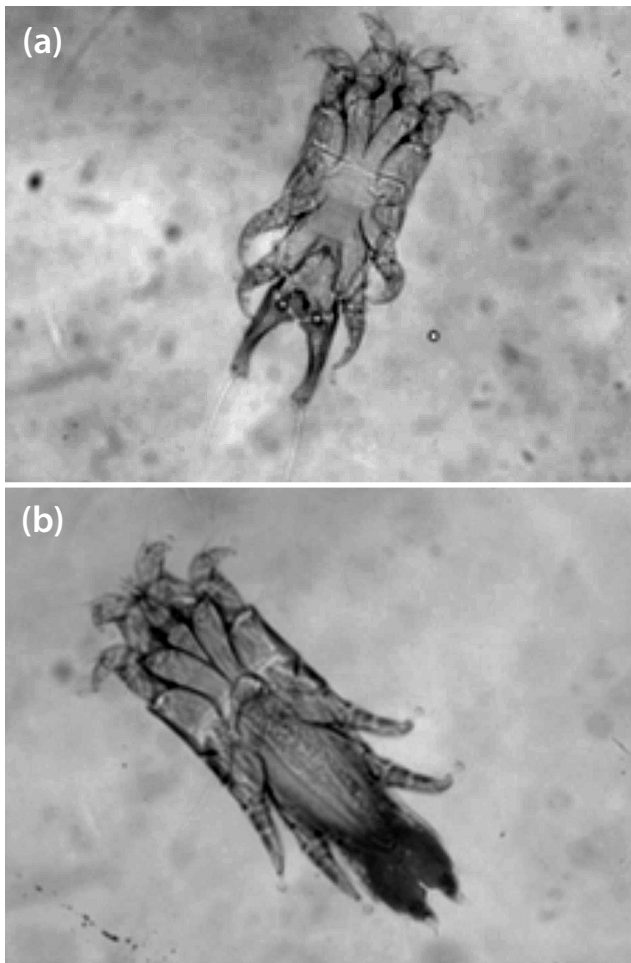


Fig. 2. The mite *Brephosceles vanelli*; (a) male, (b) female.

solution of physiological saline native, $ZnSO_4$ (Ministry of Agriculture, Fisheries & Food 1986). Feather samples taken from the birds were kept in Ziploc bags and brought to the laboratory. These were carefully examined and all feather mites collected and identified under a microscope in accordance with literature (Gaud 1957) and photographs of them were taken.

As it is known that birds can have blood flukes belonging to the genera *Plasmodium*, *Leucocytozoon* and *Haemoproteus* (Mendes *et al.* 2005, Gonzalez-Quevedo *et al.* 2014), all blood samples were scanned for them, but none were detected in our samples from the Bogazkent Spur-winged Lapwing population.

Many mites were found in the feathers of all 20 captured Spur-winged Lapwings and the species *Brephosceles vanelli* was found on all individuals; both males and females were identified (Figs. 1 & 2; Gaud 1957).

Lice were detected in about half of the 20 Spur-winged Lapwings during examination for ectoparasites and two of them identified as *Actornithophilus hoplopteri*, of which Spur-winged Lapwing is a known host (Carriker 1963, Price *et al.* 2003). The morphological characteristics of this louse are shown in Fig. 3.

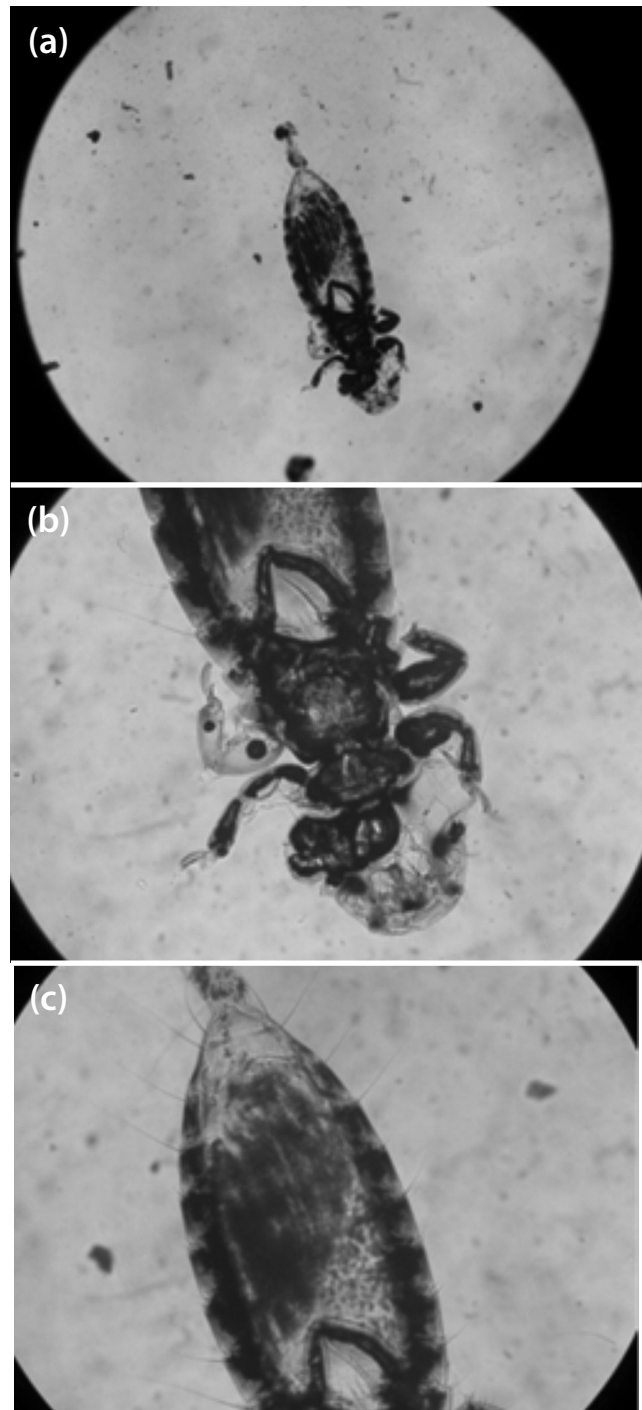


Fig. 3. The louse *Actornithophilus hoplopteri*; (a) general view, (b) head and legs (c) radial stripe.

When the examination of faecal samples was carried out using native and flotation methods, spirurid type nematode eggs were found in the specimens from five birds (Fig. 4).

Ecological research involves studies that examine and investigate living creatures and the biotic and abiotic environments with which they interact. Living creatures leading a parasitic life are also an important part of the ecology of the host species. Wild birds are particularly important in terms of carrying many types of parasites owing to active translocation capabilities.



Fig. 4. Spirurid type of nematode egg.

There are many species of the genus *Haemoproteus*, *Leucocytozoon* and *Plasmodium* blood flukes that cause the disease malariosis in birds. Vectors of this species on birds are some of the biting fly species, mainly mosquitoes of *Culex* species. In this study, Spur-winged Lapwings were examined for blood flukes, but they were not detected.

Generally, climatic factors, especially temperature changes, affect the presence and density of parasites. The decline in wetlands is another factor that has reduced parasite presence and density because of the development of the larvae of mosquitos (which are vectors) is limited.

Our Boğazkent study site and the surrounding area is used for pasture and tourism. Therefore pesticides are applied both to reduce the impact of insects and parasites on farm animals and to make the area pleasant for tourists. Such factors also suppress the occurrence and/or density of blood flukes depending on the decrease in mosquito activity. On the other hand, because Spur-winged Lapwings build their nests on the ground, they have an important host role in terms of ectoparasites.

This is the first field study of the parasites of Spur-winged Lapwing in Turkey. Similar studies in larger populations are needed for a full understanding of the role of parasites in the species' life-cycle.

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REFERENCES

- Aye, R. & R. Salmanzadeh. 2007. The Status of Spur-winged Lapwing *Vanellus spinosus* in Iran with first evidence of breeding. *Podoces* 2: 151–153.
- Carriker, M.A. 1963. Neotropical Mallophaga (Insecta) miscellany. *Revista Brasileira de Biologia* 23: 293–316.
- Charalambidou, I., N. Kassinis, S. Gücel & W. Fuller. 2012. The status and breeding population of the Spur-winged Lapwing *Vanellus spinosus* in Cyprus. *Podoces* 7: 1–8.
- Dabert, J. & R. Ehrnsberger. 1998. Phylogeny of the feather mite family Ptiloxenidae Gaud, 1982 (Acari: Pterolichoidea). *Arthropod Biology: Contributions to Morphology, Ecology and Systematics. Biosystematics & Ecology Series* 14: 145–178.
- Dabert, J., S.V. Mironov & R. Ehrnsberger. 2002. A revised diagnosis of the feather mite genus *Magimelia* Gaud, 1961 (Pterolichoidea: Pterolichidae: Magimeliinae) and the description of three new species. *Systematic Parasitology* 53: 69–79.
- Gaud, J. 1957. Acariens Plumicoles (Analgesoidea) Parasites Des Oiseaux Du Maroc: Proctophylloidae. *Bulletin de la Société de Sciences Naturelles et Physiques du Maroc* 37: 105–136. [In French]
- Gaud, J. 1972. Acariens sarcoptiformes plumicoles (Analgoidea) parasites sur les oiseaux Charadriiformes d'Afrique. *Annales du Musée Royal de l'Afrique Centrale, Sciences Zoologiques* 193: 1–116. [In French]
- Gonzalez-Acuna, D., P. Olmedo & A. Cicchino. 2008. Parasitos de *Vanellus chilensis chilensis* (Aves, Charadriidae) En Chillán, Centrosur De Chile. *Boletín Chileno de Ornitología* 14: 36–48. [In Spanish]
- Gonzalez-Quevedo, C., R.G. Davies & D.S. Richardson. 2014. Predictors of malaria infection in a wild bird population: Landscape-level analyses reveal climatic and anthropogenic factors. *Journal of Animal Ecology* 83: 1091–1102.
- Mendes, L., T. Piersma, M. Lecoq, B. Spaans & E. Ricklefs. 2005. Disease-limited distributions? Contrasts in the prevalence of avian malaria in shorebird species using marine and freshwater habitats. *Oikos* 109: 396–404.
- Ministry of Agriculture, Fisheries & Food. 1986. *Manual of veterinary parasitological laboratory techniques*. Reference Book 418, 3rd edition. Her Majesty's Stationery Office, London.
- Mironov, S. & J. Dabert. 1995. New species of feather mites of the subfamily Avenzoariinae from waders (Aves: Charadriiformes) of the New World (Acarina: Analgoidea). *Genus* 6: 201–223.
- Mironov, S. & J. Dabert. 2001. *Monofreyana* gen. n. – A new feather mite genus of the family Freyanidae (Acari: Astigmata) from plovers (Charadriiformes: Charadriidae). *Acarina* 9: 223–231.
- Mironov, S., J. Dabert & R. Ehrnsberger. 2002. On systematics of the feather mite genus *Triphyllochaeta*. *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg* 14: 27–37.
- Price, R.D., R.A. Hellenthal & R.L. Palma. 2003. *The chewing lice: world checklist and biological overview, Vol. 24*. Illinois Natural History Survey, Champaign-Urbana, Illinois.
- Wiersma, P. & G.M. Kirwan. 2017. Spur-winged Lapwing (*Vanellus spinosus*). In: *Handbook of the Birds of the World Alive* (J. del Hoyo, A. Elliott, J. Sargatal, D.A. Christie & E. de Juana, Eds.). Lynx Edicions, Barcelona. Accessed 4 April 2017 at: <http://www.hbw.com/node/53795>