

1-1-2011

Helminth parasites of the Balkan green lizard, *Lacerta trilineata* Bedriaga 1886, from Bursa, Turkey

HİKMET SAMİ YILDIRIMHAN

CHARLES ROBERT BURSEY

FAYIK NACİ ALTUNEL

Follow this and additional works at: <https://journals.tubitak.gov.tr/zoology>



Part of the [Zoology Commons](#)

Recommended Citation

YILDIRIMHAN, HİKMET SAMİ; BURSEY, CHARLES ROBERT; and ALTUNEL, FAYIK NACİ (2011) "Helminth parasites of the Balkan green lizard, *Lacerta trilineata* Bedriaga 1886, from Bursa, Turkey," *Turkish Journal of Zoology*. Vol. 35: No. 4, Article 7. <https://doi.org/10.3906/zoo-0910-1>
Available at: <https://journals.tubitak.gov.tr/zoology/vol35/iss4/7>

This Article is brought to you for free and open access by TÜBİTAK Academic Journals. It has been accepted for inclusion in Turkish Journal of Zoology by an authorized editor of TÜBİTAK Academic Journals. For more information, please contact academic.publications@tubitak.gov.tr.

Helminth parasites of the Balkan green lizard, *Lacerta trilineata* Bedriaga 1886, from Bursa, Turkey

Hikmet Sami YILDIRIMHAN^{1*}, Charles Robert BURSEY², Fayık Naci ALTUNEL¹

¹Uludağ University, Science and Literature Faculty, Department of Biology, 16059 Bursa - TURKEY

²Department of Biology, Pennsylvania State University, Shenango Campus, Sharon, Pennsylvania 16146, USA

Received: 01.10.2009

Abstract: Thirty-eight Balkan green lizards, *Lacerta trilineata*, from Turkey were examined for helminths. Three species of Digenea, *Plagiorchis elegans*, *Pleurogenoides medians*, *Brachylaemus* sp. (metacercaria); 2 species of Cestoda, *Oochoristica tuberculata* and *Mesocestoides* sp. (tetrathyridium); and 6 species of Nematoda, *Abbreviata abbreviata*, *Ascarops strongylina* (larva in cysts), *Falcaustra armenica*, *Oswaldocruzia filiformis*, *Skrjabinelazia hoffmanni*, *Skrjabinodon medinae*, were found. *Lacerta trilineata* represents a new host record for each of the parasite species; *Plagiorchis elegans*, *Brachylaemus* sp., *Oochoristica tuberculata*, *Mesocestoides* sp., *Abbreviata abbreviata*, *Ascarops strongylina* (larva), *Falcaustra armenica*, *Skrjabinelazia hoffmanni*, and *Skrjabinodon medinae* are reported from Turkey for the first time.

Key words: Digenea, Cestoda, Nematoda, Balkan green lizard, *Lacerta trilineata*, Turkey

Bursa (Türkiye) ilinden toplanan İri Yeşil Kertenkele (*Lacerta trilineata*, Bedriaga 1886)'nin helmint faunası

Özet: 38 iri yeşil kertenkele Bursa'dan (Türkiye) (*Lacerta trilineata*) helmintleri incelenmek üzere toplanmıştır. Bulunan türlerin 3'ü Digenea; *Plagiorchis elegans*, *Pleurogenoides medians*, *Brachylaemus* sp. (metacercaria), 2'si Cestoda; *Oochoristica tuberculata*, *Mesocestoides* sp. (tetrathyridium), 6'sı Nematoda; *Abbreviata abbreviata*, *Ascarops strongylina* (kist içinde larva), *Falcaustra armenica*, *Oswaldocruzia filiformis*, *Skrjabinelazia hoffmanni*, *Skrjabinodon medinae* grubuna aittir. *Lacerta trilineata*, her bir parazit türü için yeni konak kaydı olup, bu parazitler iri yeşil kertenkeleden ilk kez rapor edilmiştir. *Plagiorchis elegans*, *Brachylaemus* sp., *Mesocestoides* sp., *Abbreviata abbreviata*, *Ascarops strongylina* (larva), *Falcaustra armenica*, *Skrjabinelazia hoffmanni*, *Skrjabinodon medinae* türleri Türkiye için yeni kayıttır.

Anahtar sözcükler: Digenea, Cestoda, Nematoda, İri Yeşil Kertenkele, *Lacerta trilineata*, Bursa, Türkiye

Introduction

The Balkan green lizard, *Lacerta trilineata* Bedriaga, 1886 (Lacertidae), is known from the Adriatic Sea coast to the Balkan countries, Turkey,

Caucasus, southwestern Iran, Syria, and Israel to elevations up to 650 m (Baran and Atatur, 1998). To our knowledge, there are no reports of helminths in *L. trilineata*. The purpose of this paper is to provide an initial helminth list for *L. trilineata*.

* E-mail: yhikmet@uludag.edu.tr

Materials and methods

Thirty-eight specimens of *Lacerta trilineata* (23 males, 15 females, mean snout-vent length = 42 ± 4 mm, range 35-48 mm) were collected by hand 1996-1998 at Osmangazi (40°10'N, 29°01'E, 650 m elevation), Bursa province, Turkey. Lizards were killed with an overdose of sodium pentobarbital. The body cavity was opened, and the digestive tract removed. The esophagus, stomach, small and large intestine, and lungs were opened and separately examined for helminths under a dissecting microscope. Nematodes were killed in hot saline solution, fixed in 70% ethanol, and mounted in glycerol. Digeneans and cestodes were fixed in 70% ethanol, stained with iron-carmin as described by Georgiev et al. (1986), cleared in clove oil, and mounted in Entellan®. Helminth identification was based on keys given by Schmidt (1986) and Yamaguti (1961). Helminth voucher specimens were deposited in the helminth collection of Uludağ University Museum of Zoology, Bursa, Turkey. Lizard specimens were deposited in the Department of Biology, Uludağ University, Bursa, Turkey.

Lacerta trilineata

Bedriaga, 1886

Thirty-eight *L. trilineata* (23 males, 15 females), Osmangazi, Turkey (6 collected in June 1996, 3 in May 1997, 1 in August 1997, 3 in May 1998, 7 in June 1998, 16 in July 1998, and 2 in October 1998).

Results

Plagiorchis elegans

(Rudolphi, 1802) Braun, 1902

(Syn. *Fasciola elegans* Rudolphi, 1802; *Fasciola cirratus* Rudolphi, 1802; *Distoma colubri natricis intestinale* Rudolphi, 1809; *Distoma elegans* (Rudolphi, 1802) Rudolphi, 1809; *Distoma colubri tessellati* Rudolphi, 1819; *Distoma lacertae* Rudolphi, 1819; *Distomum (Brachylaimus) elegans* (Rudolphi, 1802) Dujardin 1845; *Distomum erraticum* Linstow 1894; *Plagiorchis cirratus* (Rudolphi, 1802) Lühe, 1899; *Plagiorchis mentulatus* (Rudolphi 1819) Stossich, 1904; *Plagiorchis asperus* Stossich, 1904; *Plagiorchis notabilis* Nicoll, 1909; *Plagiorchis marii* Skrajabin, 1920; *Plagiorchis blumbergi* Massino

1927; *Plagiorchis brauni* Massino 1927; *Plagiorchis loossi* Massino 1927; *Plagiorchis massino* Petrov and Tichonoff, 1927; *Plagiorchis multiglandularis* Semenow, 1927; *Plagiorchis skrajabini* Massino 1927; *Plagiorchis uhlworni* Massino, 1927; *Plagiorchis potanini* Skrajabin, 1928; *Plagiorchis eutamiatis* Schulz, 1932; *Plagiorchis casarci* Mehra, 1937; *Plagiorchis ferrigunum* Mehra, 1937; *Plagiorchis eutamiatis* Zibethicus Vassiliev 1939; *Plagiorchis extremus* Strom, 1940; *Plagiorchis strictus* Strom, 1940; *Plagiorchis fuji* Ogata, 1941; *Plagiorchis ptschelkini* Sobolev, 1946; *Plagiorchis petrovi* Fediushin, 1949; *Plagiorchis oscineus* Sudarikov, 1950; *Plagiorchis castoris* Orloff et Moskalev, 1953; *Plagiorchis blatnensis* Chalupsky, 1954; *Plagiorchis raabei* Furmaga, 1956; *Plagiorchis stefanski* Furmaga, 1956; *Plagiorchis muris* sensu Prokopic and Genov, 1974; *Plagiorchis proximus* sensu Prokopic and Genov, 1974; *Plagiorchis cuculi* Schaladybin, Anikin, Budkin et Suslova, 1977)

Prevalence and mean intensity: 1/38 (3%), 1 individual.

Temporal distribution: 10 Jun 1996, 1 host with 1.

Site of infection: Small intestine.

Type host and type locality: House sparrow, *Passer domesticus*, Germany (Rudolphi, 1802).

Additional Turkish records: None.

Other reported hosts: **Amphibia:** yellowbelly toad, *Bombina variegata*, (Prokopic and Krivanec, 1975); pool frog, *Pelophylax lessonae*, (reported as *Rana esculenta*, Prokopic and Krivanec, 1975); common frog, *Rana temporaria*, (Capuse, 1971); **Reptilia:** sand lizard, *Lacerta agilis*, (Shevchenko and Barabashova, 1958; Moravec, 1963; Capuse, 1971; Lewin, 1992a; Shimalov et al., 2000; Sharpilo et al., 2001; Borkovcova and Kopriva, 2004); European green lizard, *Lacerta viridis*, (Capuse, 1971); viviparous lizard, *Zootoca vivipara*, (reported as *Lacerta vivipara*, Lewin, 1992b; Shimalov et al., 2000); European grass snake, *Natrix natrix* (Capuse, 1971); **Aves:** northern goshawk, *Accipiter gentilis*, (Sitko, 1998); Eurasian sparrowhawk, *Accipiter nisus*, (Sitko, 1998); spotted sandpiper, *Actitis macularius*, (Didyk et al., 2007); Balkal teal, *Anas formosa*, (Bykhovskaya-Pavlovskaya, 1962); mallard, *Anas platyrhynchos*, (Styczynska-Jurewicz, 1962); little stint, *Calidris minuta*, (Bykhovskaya-Pavlovskaya,

1962); twite, *Carduelis flavirostris*, (Massino, 1929); ruddy shelduck, *Casarca ferruginea*, (Mehra, 1937); black tern, *Chlidonias nigra*, (Massino, 1929); western marsh harrier, *Circus aeruginosus*, (Bykhovskaya-Pavlovskaya, 1953; Krasnolobova, 1987); northern harrier, *Circus cyaneus*, (Krasnolobova, 1987); pallid harrier, *Circus macrourus*, (Bykhovskaya-Pavlovskaya, 1953; Krasnolobova, 1987); common quail, *Coturnix coturnix*, (Bykhovskaya-Pavlovskaya, 1953); common raven, *Corvus corax*, (Massino, 1927); carrion crow, *Corvus corone*, (Mühling, 1896); rook, *Corvus frugilegus*, (Braun, 1902); Eurasian jackdaw, *Corvus monedula*, (Massino, 1927); corncrake, *Crex crex*, (Macko, 1969); common cuckoo, *Cucullus canorus*, (Dubinia and Kulakova, 1960); common house-martin, *Delichon urbica*, (Odening, 1961); great spotted woodpecker, *Dendrocopos major*, (Styczynska-Jurewicz, 1962); merlin, *Falco columbarius*, (Massino, 1927; Krasnolobova, 1987); peregrine falcon, *Falco peregrinus*, (Krasnolobova, 1987); Eurasian hobby, *Falco subbuteo*, (Bykhovskaya-Pavlovskaya, 1953; Styczynska-Jurewicz, 1962; Krasnolobova, 1987; Ferrer et al., 2004); Eurasian kestrel, *Falco tinnunculus*, (Sitko, 1998); red-footed falcon, *Falco vespertinus*, (Styczynska-Jurewicz, 1962; Krasnolobova, 1987); common chaffinch, *Fringilla coelebs*, (Bykhovskaya-Pavlovskaya, 1962); common snipe, *Gallinago gallinago*, (Massino, 1927); chicken, *Gallus gallus domesticus*, (Odening, 1959); Eurasian jay, *Garrulus glandarius*, (Bykhovskaya-Pavlovskaya, 1953); collared pratincole, *Glareola pratincola*, (Braun, 1902; Bykhovskaya-Pavlovskaya, 1962); barn swallow, *Hirundo rustica*, (Odening, 1961); red-backed shrike, *Lanius collurio*, (Massino, 1927); herring gull, *Larus argentatus*, (Bykhovskaya-Pavlovskaya, 1962); great black-headed gull, *Larus ichthyaetus*, (Mhaisen et al., 1990); common black-headed gull, *Larus ridibundus*, (Bykhovskaya-Pavlovskaya, 1962); Hudsonian godwit, *Limosa haemastica* (Kinsella et al., 2007); black-tailed godwit, *Limosa limosa*, (Bykhovskaya-Pavlovskaya, 1962); Eurasian black grouse, *Lyrurus tetrix*, (Bykhovskaya-Pavlovskaya, 1962); Eurasian swift, *Micropus apus*, (Odening, 1961); black kite *Milvus migrans*, (Krasnolobova, 1987); white wagtail, *Motacilla alba*, (Bykhovskaya-Pavlovskaya, 1962); yellow wagtail, *Motacilla flava*, (Bykhovskaya-Pavlovskaya, 1962); spotted flycatcher, *Muscicapa striata*, (Styczynska-

Jurewicz, 1962); Eurasian curlew, *Numenius arquata*, (Bykhovskaya-Pavlovskaya, 1962); slender-billed curlew, *Numenius tenuirostris*, (Bykhovskaya-Pavlovskaya, 1962); tufted duck, *Nyroca fuligula*, (Styczynska-Jurewicz, 1962); Eurasian golden oriole, *Oriolus oriolus*, (Bykhovskaya-Pavlovskaya, 1962); Eurasia scops owl, *Otus scops*, (Braun, 1902); osprey, *Pandion haliaetus*, (Krasnolobova, 1987); bearded reeding, *Panurus biarmicus* (Bykhovskaya-Pavlovskaya, 1962); great tit, *Parus major*, (Braun, 1902; Bykhovskaya-Pavlovskaya, 1962); house sparrow, *Passer domesticus*, (Braun, 1902); Eurasian sparrow, *Passer montanus*, (Bykhovskaya-Pavlovskaya, 1962); coal tit, *Periparus ater*, (Massino, 1929); honey buzzard, *Pernis apivorus*, (Ferrer et al., 2004); ruff, *Philomachus pugnax*, (Bykhovskaya-Pavlovskaya, 1962); black-billed magpie, *Pica pica*, (Braun, 1902); glossy ibis, *Plegadis falcinellus*, (Bykhovskaya-Pavlovskaya, 1962); dunnoek, *Prunella modularis*, (Styczynska-Jurewicz, 1962); Eurasian nuthatch, *Sitta europaea*, (Styczynska-Jurewicz, 1962); common tern, *Sterna hirundo*, (Bykhovskaya-Pavlovskaya, 1962); common starling, *Sturnus vulgaris*, (Bykhovskaya-Pavlovskaya, 1953); barred warbler, *Sylvia nisoria*, (Bykhovskaya-Pavlovskaya, 1962); hazel grouse, *Tetrastes bonasia*, (Bykhovskaya-Pavlovskaya, 1962); wood sandpiper, *Tringa glareola*, (Bykhovskaya-Pavlovskaya, 1962); fieldfare, *Turdus pilaris* (Bykhovskaya-Pavlovskaya, 1962); hoopoe, *Upupa epops*, (Bykhovskaya-Pavlovskaya, 1962); **Mammalia:** arctic fox, *Alopex lagopus*, (Malczewski, 1961; Rausch et al., 1983); striped field mouse, *Apodemus agrarius*, (Furmaga, 1956; Zarnowski, 1960; Shimalov, 2002); yellow-necked mouse, *Apodemus flavicollis*, (Matskasi, 1971); wood mouse, *Apodemus sylvaticus*, (Furmaga, 1956); dog, *Canis familiaris*, (Petrov and Tichonoff, 1927; Desrochers and Curtis, 1987); bank vole, *Clethrionomys glareolus*, (Matskasi, 1971; Tenora et al., 1983; Mazeika et al., 2003); cat, *Felis domesticus*, (Petrov and Tichonoff, 1927); harvest mouse, *Micromys minutus*, (Matskasi, 1971); common vole, *Microtus arvalis*, (Chalupsky, 1954); house mouse, *Mus musculus*, (Odening, 1959); water shrew, *Neomys fodiens*, (Panov and Karpenko, 2004); muskrat, *Ondatra zibethicus*, (Sey, 1965; Matskasi, 1971); common shrew, *Sorex araneus*, (Matskasi, 1971).

Geographic range: Northern hemisphere.

Remarks: All species of *Plagiorchis* use aquatic snails as first intermediate hosts and insects as second intermediate hosts (Roberts and Janovy, 2000). Given the broad host-range any insectivore might be expected to harbor *Plagiorchis elegans*. *Lacerta trilineata* represents a new host record for *P. elegans*; Turkey is a new locality record.

***Pleurogenoides medians* (Olsson, 1876) Travassos, 1921**

(Syn. *Distomum medians* Olsson, 1876)

Prevalence, mean intensity, and range: 2 of 38 (5%), 3.0 ± 2.8, 1-5.

Temporal distribution: 13 August 1997, 1 host with 5; 4 June 1998, 1 host with 1.

Site of infection: Small intestine.

Type host and type locality: common European toad, *Bufo bufo*, Sweden (reported as *Bufo vulgaris*, Olsson, 1876).

Additional Turkish records: European treefrog, *Hyla arborea*, (Dusen and Oz, 2004); marsh frog, *Pelophylax ridibundus*, (reported as *Rana ridibunda*, Yıldırımhan et al., 1996; Yıldırımhan et al., 2005; Düşen and Öz, 2006; Sağlam and Arıkan, 2006); Caucasian brown frog, *Rana macrocnemis*, (Yıldırımhan et al., 2006, reported as *Rana camerani*, Düşen, 2007).

Other reports: **Amphibia:** European fire-bellied toad, *Bombina bombina*, (Vojtkova, 1961; Vojtkova et al., 1963; Kozak, 1973); *Bufo bufo*, (Volna-Nabelkova, 1964; Cox, 1971; Kozak, 1973; Fernandez et al., 1986; Shimalov and Shimalov, 2001); *Hyla arborea*, (Volna-Nabelkova, 1964; Kozak, 1969, 1973); *Pelophylax lessonae*, (reported as *Rana esculenta*, André, 1913; Bovien, 1916; Kopriva, 1957; Vojtkova, 1961; Vojtkova et al., 1963; Volna-Nabelkova, 1964; Kozak, 1966, 1968, 1969, 1973; Combes et al., 1973; Prokopic and Krivanec, 1975; Kuc and Sulgostowska, 1988a; Popovic and Mikes, 1989); *Pelophylax ridibundus*, (reported as *Rana ridibunda*, Buchvarov, 1962; Combes and Gerbeaux, 1970; Cox, 1971; Kozak, 1973; Kuc and Sulgostowska, 1988b; Popovic and Mikes, 1989; Saeed et al., 2007); green toad, *Pseudepidalea viridis*, (reported as *Bufo viridis*, Kolendo, 1959); moor frog, *Rana arvalis*, (Volna-

Nabelkova, 1964; Kozak, 1973); agile frog, *Rana dalmatina*, (Kozak, 1973; Prokopic and Krivanec, 1975); *Rana temporaria* (Kopriva, 1957; Vojtkova and Krivanec, 1970; Prokopic and Krivanec, 1975; Cedhagen, 1988; reported as *Rana platyrhinus*, Bovien, 1916); common newt, *Lissotriton vulgaris*, (reported as *Triturus vulgaris*, Vojtkova, 1963; Vojtkova and Vojtek, 1972); northern crested newt, *Triturus cristatus*, (Vojtkova, 1963; Vojtkova and Vojtek, 1972); **Reptilia:** *Lacerta agilis*, (Lewin, 1992a; Sharpilo et al., 2001); Iberian wall lizard, *Podarcis hispanica*, (Roca et al, 1986a; Roca and Lluch, 1988).

Geographic range: Western Palaearctic.

Remarks: *Lacerta trilineata* represents a new host record for *P. medians*.

***Brachylaemus* sp. (metacercariae)**

Prevalence, mean intensity, and range: 3 of 38 (9%), 5.0 ± 6.9, 1-13.

Temporal distribution: 22 May 1997, 1 host with 1; 4 June 1998, 1 host with 13; 24 June 1998, 1 host with 1.

Site of infection: Small intestine.

Additional Turkish records: None.

Other reported hosts (metacercaria in Reptilia only): **Reptilia:** Slow worm, *Anguis fragilis*, (Lewin, 1990); *Lacerta agilis*, (Lewin, 1992a); Bocage's wall lizard, *Podarcis bocagei*, (Roca et al, 1989); Carbonell's wall lizard, *Podarcis carbonelli*, (Galdón et al., 2006); Lilford's wall lizard, *Podarcis lilfordi*, (Hornero and Roca, 1992b; Roca and Hornero, 1994); Ibiza wall lizard, *Podarcis pityusensis*, (Roca and Hornero, 1994).

Geographic range: For metacercaria in reptiles: Poland (Lewin, 1990); Portugal (Galdon et al., 2006); Spain (Roca et al., 1989); Turkey (this report).

Remarks: In the life cycle of *Brachylaemus* spp., terrestrial gastropods and rodents are intermediate and definite hosts, respectively (Gracenea and González-Moreno, 2002). The presence of *Brachylaemus* in lizards is considered atypical, probably due to ingestion of snails harboring this trematode (Galdón et al., 2006). *Lacerta trilineata* represents a new host record for the genus *Brachylaemus*. However, this occurrence should be considered as accidental parasitism. Turkey is a new locality record.

Oochoristica tuberculata**(Rudolphi, 1819) Lühe, 1898**

(Syn. *Taenia tuberculata* Rudolphi, 1819; *Taenia rotundata* Molin, 1859; *Taenia pseudopodis* Krabbe, 1879; *Taenia truncata* Krabbe, 1879, in part; *Oochroistica rotundata* [Molin, 1859] Parona, 1900; *Oochoristica pseudopodis* [Krabbe, 1879] Zschokke, 1905; *Oochoristica truncata* [Krabbe, 1879] Zschokke, 1905, in part; *Oochoristica indica* Misra, 1945; *Oochoristica agamae* Baylis, 1919 sensu Roca et al., 1986).

Prevalence, mean intensity, and range: 6 of 38 (16%), 6.5 ± 4.5, 1-11.

Temporal distribution: 4 May 1998, 2 hosts with 1, 7, respectively; 3 June 1998, 1 host with 9; 24 June 1998, 1 host with 10; 25 June 1998, 1 host with 11; 7 July 1998, 1 host with 1.

Site of infection: Small intestine.

Type host and type locality: Ocellated lizard, *Timon lepidus*, Spain (= *Lacerta lepida*, Rudolphi, 1819).

Additional Turkish records: Caucasian agama, *Laudakia caucasia*, (Yildirimhan et al., 2006).

Other reported hosts: **Reptilia:** fringe-fingered lizard, *Acanthodactylus erythrurus*, (Dollfus, 1958; Busack and Jaksic, 1982; Roca et al., 1986b; Roca and Lluch, 1988); rainbow lizard, *Agama agama*, (Joyeux and Baer, 1928; Della Santa, 1956); eastern garden lizard, *Calotes versicolor*, (Misra, 1945); ocellated skink, *Chalcides ocellatus*, (Lühe, 1898; Parona, 1887, 1900; Barbagallo, 1901; Rizzo, 1902; Mingazzini, 1904; Della Santa, 1956; Groschaft and Moravec, 1983; Ibrahim et al., 2005); Gran Canaria skink, *Chalcides sexlineatus*, (Lamas et al., 1985); Canarian cylindrical skink, *Chalcides viridanus*, (Roca et al., 1987); Schneider's skink, *Eumeces schneideri*, (Baer, 1928); keeled Indian mabuya, *Eutropis carinata*, (Della Santa, 1956); *Lacerta agilis*, (Ivanitsky, 1940; Della Santa, 1956; Shevechenko and Barabashova, 1958; Sharpilo et al., 2001; Mihalca et al., 2007); *Lacerta viridis*, (Della Santa, 1956); Kashmir rock agama, *Laudakia tuberculata*, (Raina et al., 1975); common wall lizard, *Podarcis muralis*, (Cerutti, 1902; Joyeux and Baer, 1936; Lopez-Neyra, 1944; Della Santa, 1956); Algerian psammmodromus,

Psammmodromus algirus, (Della Santa, 1956); Spanish psammmodromus, *Psammmodromus hispanicus*, (Della Santa, 1956; Roca et al., 1986b; Roca and Lluch, 1988); European glass lizard, *Pseudopus apodus*, (Della Santa, 1956; Vakker et al., 1985); sandfish skink, *Scincus scincus*, (Groschaft and Moravaec, 1983); Tenerife wall gecko, *Tarentola delalandii*, (Roca et al., 1987); common wonder gecko, *Teratoscincus scincus*, (Markov and Paraskiv, 1956); steppe agama, *Trapelus sanguinolenta*, (Della Santa, 1956); North African mastigure, *Uromastix acanthinura*, (Della Santa, 1956; Dupouy and Kehemir, 1973); desert monitor, *Varanus griseus*, (Della Santa, 1956); Sahara sand viper, *Cerastes vipera*, (Dollfus, 1932); Montpellier snake, *Malpolon monspessulanus*, (Joyeux and Gaud, 1945; Della Santa, 1956; Dupouy and Kehemir, 1973); striped sand snake, *Psammophis sibilans*, (Joyeux and Baer, 1928).

Geographic range: Palaearctic (Della Santa, 1956).

Remarks: *Oochoristica*, a cosmopolitan genus of cestodes parasitic in lizards, snakes, and turtles, was erected by Lühe (1898) to receive a revision of the cestode, *Taenia tuberculata*, originally described by Rudolphi (1819). Since then, over 65 species have been assigned to the genus (see Schmidt, 1986). Several of these species have been shown to exhibit marked similarity and synonymy has often been proposed. For example, Baer (1927) considered *Taenia* (= *Oochoristica*) *truncata* Krabbe, 1879 to be a synonym of *O. tuberculata* Dollfus (1932) and Hughes (1940) also advocated synonymy. However, Spasskii (1951) considered geographic distribution (western Palaearctic vs. Africa) sufficient to separate the 2 species and did not accept the synonymy but did synonymize *Oochoristica agamae* Baylis, 1919; *Oochoristica africana* Malan, 1939; and *Oochoristica africana* var. *ookispensis* Malan, 1939 with *O. truncata*. Raina et al. (1975) in their report of cestodes from *Agama tuberculata* collected in Kashmir discuss the difficulty of assigning their specimens to *O. truncata* or *O. tuberculata* and after comparing structural attributes of the 2 species concluded that *O. truncata* is a synonym of *O. tuberculata*. We refer all published Palaearctic occurrences of *O. truncata* to *O. tuberculata* and retain, at least temporarily, sub-Saharan occurrences as *O. truncata*.

Mesocestoides sp. (tetrathyridium)

Prevalence, and intensity: 1 of 38 (3%), 80.

Temporal distribution: 10 June 1996, 1 host with 80.

Site of infection: Body cavity.

Additional Turkish records: None.

Other reported hosts: Reptilia: *Anguis fragilis* (Lewin, 1990); *Lacerta agilis* (Lewin, 1992a; Sharpilo et al., 2001); Iberian emerald lizard, *Lacerta schreiberi*, (Roca and Ferragut, 1989); *Lacerta viridis*, (Biserkov and Kostadinova, 1980); secret toadhead agama, *Phrynocephalus mystaceus*, (Ikromov and Cho, 2004); *Podarcis bocagei*, (Roca et al., 1989); *Podarcis hispanica*, (Roca et al., 1989); *Podarcis muralis*, (Kirin, 2002a); *Podarcis pityusensis*, (Roca and Hornero, 1994); *Psammotromus hispanicus*, (Roca et al., 1986b; Roca and Lluch, 1988); smooth snake, *Coronella austriaca*, (Biserkov, 1996); Aesculapean snake, *Zamenis longissimus* (reported as *Elaphe longissima*, Biserkov, 1996); Haly's pit viper, *Glodius halys*, (reported as *Ancystrodon halys*, Bogdanov et al., 1969); *Natrix natrix*, (Lewin, 1992b).

Geographic range: Cosmopolitan (McAllister et al., 1991).

Remarks: The life cycle of *Mesocestoides* spp. is thought to require 3 hosts, i.e. a vertebrate definite host, a vertebrate second intermediate host, and a purported arthropod first intermediate host (Rausch, 1994). Tetrathyrida are frequently found in the body cavities of amphibians, reptiles, and rodents (Padgett and Boyce, 2004). *Lacerta trilineata* represents a new host record for the genus *Mesocestoides*. Turkey is a new locality record.

Abbreviata abbreviata

(Rudolphi, 1819) Travassos, 1920

Prevalence, mean intensity, and range: 1 of 38 (3%), 15.

Temporal distribution: 10 June 1996, 1 host with 15.

Site of infection: Stomach.

Type host and type locality: unknown lizard, Spain (Rudolphi, 1819).

Additional Turkish records: None.

Other reports: Reptilia: *Lacerta agilis*, (Goldin, 1975); *Lacerta schreiberi*, (Roca and Ferragut, 1989); Algerian ocellated lizard, *Timon pater*, (Seurat, 1917); *Dolichophis jugularis*, (reported as *Coluber jugularis*, Biserkov, 1995); *Natrix natrix*, (Kirin, 2002b); *Platycephalus najadum*, (reported as *Coluber najadum*, Biserkov, 1995); *Vipera ammodytes*, (Biserkov, 1995).

Geographic range: Algeria (Seurat, 1917); Bulgaria (Biserkov, 1995); Crimea (Goldin, 1975); Spain (Roca and Ferragut, 1989); Turkey (this report).

Remarks: *Lacerta trilineata* represents a new host record for *A. abbreviata*; Turkey is a new locality record.

Ascarops strongylina

(Rudolphi, 1819) Alicata and McIntosh, 1933

(larvae in cysts)

(Syn. *Spiroptera strongylina* Rudolphi, 1819).

Prevalence and intensity: 1 of 38 (3%), 7.

Temporal distribution: 10 July 1998, 1 host with 7.

Site of infection: cysts on stomach wall.

Type host and type locality: Mammal, pig, *Sus scrofa*, Europe (Rudolphi, 1819).

Additional Turkish records: None

Other reports: Amphibia: *Bufo viridis*, (Vashetko and Siddikov, 1999); **Reptilia:** *Anguis fragilis*, (Shimalov et al., 2000); *Lacerta agilis*, (Shimalov et al., 2000; Sharpilo et al., 2001); *Zootoca vivipara*, (reported as *Lacerta vivipara*, (Shimalov et al., 2000); large whip snake, *Dolichophis jugularis*, (reported as *Coluber jugularis*, Biserkov, 1995); Dahl's whip snake, *Platycephalus najadum*, (reported as *Coluber najadum*, Biserkov, 1995); *Coronella austriaca*, (Shimalov and Shimalov, 2000); *Gloydius halys* (reported as *Ancystrodon halys*, Bogdanov et al., 1969); *Malpolon monspessulanus*, (Biserkov, 1995), *Natrix natrix*, (Shimalov and Shimalov, 2000); Asp viper, *Vipera aspis*, (Santos et al., 2006); *Vipera berus*, (Shimalov and Simalov, 2000); Lataste's viper, *Vipera latastei* (Santos et al., 2006).

Geographic range: Cosmopolitan (Yamaguti, 1961).

Remarks: Only western Palaearctic records of larval infections are given here. Larvae in cysts are frequently found in the body cavities of amphibians, reptiles, birds, and mammals (Goldberg and Bursey, 2000). *Lacerta trilineata* represents a new host record for larva of *Ascrops strongylina*. Turkey is a new locality record.

Falcaustra armenica

Massino, 1924

(Syn. *Spironoura armenica* [Massino 1924] Yorke and Maplestone, 1926).

Prevalence and intensity: 1 of 38 (3%), 10.

Temporal distribution: 10 June 1996, 1 host with 10.

Site of infection: Large intestine.

Type host and type locality: European pond turtle, *Emys orbicularis*, Armenia (Massino, 1924).

Additional Turkish records: *Emys orbicularis*, (reported as *Spironoura armenica*, Yildirimhan and Şahin, 2005); Western Caspian turtle, *Mauremys rivulata*, (Yildirimhan et al., 2005).

Other reports: **Reptilia:** *Emys orbicularis*, (Ivanitzky, 1940; Hristovski, 1973; Sharpilo, 1976; Velikanov, 1982, Mihalca et al., 2007); Caspian turtle, *Mauremys caspica*, (reported as *Clemmys caspica*, Hristovski, 1973; Sharpilo, 1976; Lees et al., 1985).

Geographic range: Central Asia (Sharpilo, 1976); Romania (Mihalca et al., 2007); Turkey (Yildirimhan and Şahin, 2005); Yugoslavia (Hristovski, 1973).

Remarks: *Lacerta trilineata* represents a new host record for *F. armenica*.

Oswaldocruzia filiformis

(Goeze, 1782) Travassos, 1917

(Syn. *Ascaris filiformis*, Goeze, 1782; *Cucullanus ranae* Goeze, 1782; *Ascaris tennissima* Schrank, 1788; *Ascaris intestinalis* Gmelin, 1790; *Ascaris bufonis* Gmelin, 1790; *Strongylus auricularis* Zeder, 1800; *Ascaris setiformis* Goeze in Zeder, 1800; *Strongylus dispar* Dujardin, 1845; *Oswaldocruzia insulae* Morishita, 1923; *Strongylus bialata* Molin, 1861; *Oswaldocruzia molgeta* Lewis, 1928; *Oswaldocruzia skrjabini* Travassos, 1937; *Oswaldocruzia problematica* Ivanitzky, 1940; *Oswaldocruzia goezi* Skrjabin and Schulz, 1952)

Prevalence, mean intensity, and range: Hosts infected, 2 of 36 (5%), 1.5 ± 0.7, 1-2.

Temporal distribution: 2 July 1998, 2 hosts with 1, 2, respectively.

Site of infection: Small intestine.

Additional Turkish hosts: Square-marked toad, *Amietophrynus regularis*, (reported as *Bufo regularis*, Schad et al., 1960); *Bufo bufo*, (Yildirimhan and Karadeniz, 2007); *Pseudepidalea viridis*, (reported as *Bufo viridis*, Schad et al., 1960; Yildirimhan, 1999); *Hyla arborea*, (Yildirimhan, Altunel, et al., 2006); *Rana macrocnemis*, (Schad et al. 1960; Yildirimhan et al., 1997; Yildirimhan, Bursey et al., 2006; reported as *Rana camerani*, Yildirimhan, Goldberg et al., 2006); *Pelophylax ridibundus* (reported as *Rana ridibunda*, Yildirimhan, et al., 2005; Sağlam and Arıkan, 2006); banded newt, *Ommatotriton vittatus*, (reported as *Triturus vittatus*, Yildirimhan, 2008); *Anguis fragilis*, (Schad et al., 1960); Crimean wall lizard, *Podarcis tauricus*, (reported as *Lacerta taurica*, Schad et al., 1960); *Lacerta viridis*, (Schad et al., 1960).

Type host and locality: *Rana temporaria*, Europe (Goeze, 1782).

Other reported hosts: **Pisces.** chub, *Leuciscus cephalus*, (Moravec and Scholz, 1991); burbot, *Lota lota*, (Novokhatskaya, 2007). **Amphibia.** *Bombina bombina*, (Volna-Nabelkova, 1964; Kozák, 1969, 1973; Moravec and Vojtková, 1975; Prokopic and Krivanec, 1975; Rozman, 1976; Vojtková, 1976); *Bombina variegata*, (Prokopic, 1957; Buchvarov, 1962; Volna-Nabelkova, 1964; Kozák, 1969, 1973; Prokopic and Krivanec, 1975; Rozman, 1976; Vojtková, 1976; Kirin and Buchvarov, 2002a); *Bufo bufo*, (John, 1957; Prokopic, 1957; Kozłowska, 1960; Vojtková, 1961, 1976; Buchvarov, 1962; Vojtková et al, 1963; Volna-Nabelkova, 1964; Kozák, 1969, 1973; Hristovski and Riggio, 1971; Schmidt and Enigk, 1972; Canning et al., 1973; Frandsen, 1974; Moravec and Vojtková, 1975; Prokopic and Krivanec, 1975; Rozman, 1976; Ryzhikov et al., 1980; Hendrikx, 1983; Galli et al., 2001; Shimalov and Shimalov, 2001; reported as *Bufo vulgaris*, Baylis, 1928; Travassos, 1937); Himalayan toad, *Duttaphrynus himalayanus* (reported as *Bufo himalayanus*, Soota and Dey Sarka, 1980); natterjack toad, *Epidalea calamita* (reported as *Bufo calamita*, Frandsen, 1974); *Euphlyctis cyanophlyctis*, (Tandon et al., 2001); *Hyla arborea*, (Kozłowska, 1960; Vojtková,

1961, 1976; Volna-Nabelkova, 1964; Kozák, 1969, 1973; Frandsen, 1974; Hristovski and Riggio, 1974; Prokopic and Krivanec, 1975; Rozman, 1976; Ryzhikov et al., 1980); Mediterranean treefrog, *Hyla meridionalis*, (Baker, 1981; Galeano et al., 1990); *Pelobates fuscus*, (Kozłowska, 1960; Kozák, 1969, 1973; Prokopic and Krivanec, 1975; Antsyshkina et al., 1976; Vojtková, 1976; Ryzhikov et al., 1980); *Pelophylax lessonae* (reported as *Rana lessonae*, Borisova, 1988; reported as *Rana esculenta*, Rozman, 1971, 1976; Ryzhikov et al., 1980); *Rana macrocnemis*, (Ryzhikov et al., 1980); marsh frog, *Pelophylax ridibundus*, (reported as *Rana ridibunda*, Dubinina, 1950; Buchvarov, 1962, 1965; Tscherner, 1966; Kozák, 1969, 1973; Combes and Gerbeaux, 1970; Frandsen, 1974; Buchvarov et al., 1975; Prokopic and Krivanec, 1975; Rozman, 1976; Ryzhikov et al., 1980; Kirin and Buchvarov, 2002b; reported as *Rana esculenta*, Kozłowska, 1960; Vojtková, 1961, 1976; Vojtková et al., 1963; Volna-Nabelkova, 1964; Kozák, 1968; Plasota, 1969; Messner and Kerstan, 1978; Kuc and Sulgostowska, 1988a); *Pseudepidalea viridis* (reported as *Bufo viridis*, Kolendo, 1959; Kozłowska, 1960; Volna-Nabelkova, 1964; Buchvarov, 1965; Kozák, 1969, 1973; Frandsen, 1974; Hristovski and Riggio, 1974; Buchvarov et al., 1975; Prokopic and Krivanec, 1975; Vojtková, 1976; Ryzhikov et al., 1980; Al-Barwari and Nassir, 1983; Vashetko and Siddikov, 1999; Rozman, 1976; Shimalov and Shimalov, 2001; Saeed et al., 2007); Khabarovsk frog, *Rana amurensis*, (Ryzhikov et al., 1980); moor frog, *Rana arvalis*, (Prokopic, 1957; Kozłowska, 1960; Vojtková et al., 1963; Volna-Nabelkova, 1964; Kozák, 1969, 1973; Plasota, 1969; Frandsen, 1974; Prokopic and Krivanec, 1975; Antsyshkin et al., 1976; Vojtková, 1976; Ryzhikov et al., 1980; Borisova, 1988; Cedhagen, 1988; Kuc and Sulgostowska, 1988a; Zhigileva, 2007); spring frog, *Rana dalmatina*, (Buchvarov, 1962; Volna-Nabelkova, 1964; Kozák, 1969, 1973; Frandsen, 1974; Buchvarov et al., 1975; Prokopic and Krivanec, 1975; Vojtková, 1976; Moravec and Scholz, 1991; Kirin and Buchvarov, 2002b; reported as *Rana agilis*, Prokopic, 1957; Rozman, 1976); Balkan stream frog, *Rana graeca*, (Hristovski, 1974); European frog, *Rana temporaria*, (Baylis, 1928; Travassos, 1937; Ivanitzky, 1940; Kozłowska, 1960; Lees, 1962; Vojtková et al., 1963; Volna-Nabelkova, 1964; Kozák, 1969, 1973; Combes et al., 1971; Hristovski and Lees, 1973; Frandsen, 1974;

Moravec and Vojtková, 1975; Prokopic and Krivanec, 1975; Rozman, 1976; Vojtková, 1976; Ryzhikov et al., 1980; Sattmann, 1986; Cedhagen, 1988; Kuc and Sulgostowska, 1988a; Griffin, 1988, 1989; Kirin and Buchvarov, 2002a); Sardinia salamander, *Atylodes genei* (reported as *Speleomantes genei*, Ricci, 1987); fire salamander, *Salamandra salamandra*, (Barus et al., 1963; Moravec and Vojtková, 1975; Grabda and Grabda, 1953; Bertman, 1986); Laurenti's alpine newt, *Ichthyosaura alpestris* (reported as *Triturus alpestris*, Barus and Groschaft, 1962); palmate newt, *Lissotriton helveticus* (reported as *Molge palmate*, Lewis, 1928; reported as *Triturus helveticus*, Avery, 1971); smooth newt, *Lissotriton vulgaris* (reported as *Molge vulgaris*, Baylis, 1928; Lewis, 1928; Hsü and Chow, 1938; reported as *Triturus vulgaris*, Tranko-Tulecka, 1959; Kozłowska, 1960; Barus and Groschaft, 1962; Vojtková, 1963, 1976; Avery, 1971; Daiya, 1973; Frandsen, 1974; Moravec and Vojtková, 1975; Ryzhikov, et al. 1980); northern crested newt, *Triturus cristatus*, (Kozłowska, 1960; Frandsen, 1974; Vojtková, 1976; Bertman, 1994). **Reptilia.** *Anguis fragilis*, (Sharpilo, 1962, 1976; Moravec, 1963; Bertman and Okulewicz, 1987; Lewin, 1990; Shimalov et al., 2000; Borkovcova and Kopriva, 2005); *Lacerta agilis*, (Shevechenko and Barabashova, 1958; Moravec, 1963; Moravec and Vojtková, 1975; Okulewicz, 1976; Lewin, 1992b; Shimalov et al., 2000; Sharpilo et al., 2001); *Lacerta viridis*, (Moravec, 1963; Marconcini and Triantafillu, 1970; Moravec and Vojtková, 1975; Biserkov and Kostadinova, 1998; Kirin, 2002a; Borkovcova and Kopriva, 2005); armored glass lizard, *Pseudopus apodus*, (reported as *Ophisaurus apodus*, Sharpilo, 1976); Amur grass lizard, *Takydromus amurensis*, (Sharpilo, 1976); *Zootoca vivipara*, (Sanchis et al., 2000; reported as *Lacerta vivipara*, Travassos, 1937; Moravec, 1963; Moravec and Vojtková, 1975; Shimalov et al., 2000); *Coronella austriaca*, (Sharpilo, 1976); *Natrix natrix*, (Moravec, 1963; Kozák, 1967; Moravec and Vojtková, 1975; Bertman and Okulewicz, 1987; Lewin, 1992a; Biserkov, 1995; Shimalov and Shimalov, 2000; Kirin, 2002b); *Natrix tessellata*, (Sharpilo, 1976); European catsnake, *Telescopus fallax*, (Sharpilo, 1976); *Vipera ammodytes*, (Sharpilo, 1976); adder, *Vipera berus*, (Moravec, 1963; Markov and Mozgovoï, 1969; Moravec and Vojtková, 1975; Shimalov and Shimalov, 2000; Novokhatskaya, 2008).

Table. Helminths of Turkish lizards (1. Schad et al., 1960; 2. Tinar, 1982; 3. Tinar, 1983; 4. Saygı et al., 1993; 5. Yıldırımhan et al., 2006; 6. Yıldırımhan et al., 2008; 7. Yıldırımhan et al., 2009; 8. this paper.

Lizard species	<i>Anguis fragilis</i>	<i>Bianus strauchi</i>	<i>Hemidactylus turcicus</i>	<i>Lacerta parva</i>	<i>Lacerta trilineata</i>	<i>Lacerta viridis</i>	<i>Laudakia caucasica</i>	<i>Yauramia bkeyyio</i>	<i>Podarcis tauricus</i>
Helminth									
Digenea									
<i>Plagiorchis elegans</i>	---	---	---	---	8	---	---	---	---
<i>Pleurogenoides medians</i>	---	---	---	---	8	---	---	---	---
<i>Brachylaemus</i> sp. (metacercaria)	---	---	---	---	8	---	---	---	---
Cestoda									
<i>Oochoristica tuberculata</i>	---	---	---	---	8	---	5	---	---
<i>Joyeuxiella pasqualei</i>	---	---	3	---	---	---	---	---	---
<i>Mesocestoides</i> sp. (tetrathyridia)	---	---	---	---	8	---	---	---	---
Nematoda									
<i>Abbreviata abbreviata</i>	---	---	---	---	8	---	---	---	---
<i>Ascrops strongylina</i> (larva)	---	---	---	---	8	---	---	---	---
Ascaridae (larva)	---	---	---	---	---	---	---	5	---
<i>Entomelas entomelas</i>	1	---	---	---	---	---	---	---	---
<i>Falcaustra armenica</i>	---	---	---	---	8	---	---	---	---
<i>Foleyella candezei</i>	---	---	---	---	---	---	5	5	---
<i>Oswaldocruzia filiformis</i>	1	---	---	---	---	1	---	---	1
<i>Oxysomatium brevicaudatum</i>	1	---	---	---	---	---	---	---	---
<i>Parapharyngodon kasauli</i>	---	---	---	---	---	---	---	---	1
<i>Parapharyngodon tyche</i>	---	---	---	---	---	---	5	5	---
<i>Parapharyngodon micipsae</i>	---	7	---	---	---	---	---	---	---
<i>Physaloptera</i> sp. (larva)	---	---	---	---	---	1	---	---	---
<i>Spauligodon cinsi</i>	---	---	---	4	---	---	---	---	---
<i>Spauligodon laevicauda</i>	---	---	2,3,6	---	---	---	---	---	---
<i>Skrjabinodon medinae</i>	---	---	---	---	8	---	---	---	---
<i>Skrjabinelazia hoffmanni</i>	---	---	---	---	8	---	---	---	---
<i>Skrjabinelazia taurica</i>	---	---	---	---	---	---	---	---	1
<i>Strongyluris calotis</i>	---	---	---	---	---	---	---	5	---
<i>Thelandros baylisi</i>	---	---	---	---	---	---	5	---	---
<i>Thelandros taylori</i>	---	---	---	---	---	---	---	5	---
<i>Thelastomoides</i> sp.	---	7	---	---	---	---	---	---	---
Acanthocephala									
<i>Macracanthorhynchus catulinus</i>	---	---	6	---	---	---	---	---	---

Geographic range: Europe (Baker, 1987).

Remarks: *Lacerta trilineata* represents a new host record for *O. filiformis*.

***Skrjabinelazia hoffmanni* Li, 1934**

Prevalence and intensity: 1 of 38 (3%), 26.

Temporal distribution: 24 June 1998, 1 host with 26.

Site of infection: Small intestine.

Type host and type locality: Mongolia racerunner, *Eremias agus*, China (Li, 1934).

Additional Turkish records: None.

Other reports: **Reptilia:** comb-toed gecko, *Crossobamon eversmanni*, (Sharpilo, 1976); Kirghiz racerunner, *Eremias nikolskii*, (Sharpilo, 1976); *Lacerta agilis*, (Sharpilo, 1976; Sharpilo et al, 2001); Azerbaijan lizard, *Darevskia raddei*, reported as *Lacerta raddei*, Khomustenka and Ataev, 1979); Caucasian rock lizard, *Darevskia saxicola*, (reported as *Lacerta saxicola*, Sharpilo, 1976); *Lacerta viridis*, (Biserkov and Kostadinova, 1998); *Podarcis bocagei*, (Galdón et al., 2006); Carbonell's wall lizard, *Podarcis carbonelli* (Galdón et al., 2006); *Podarcis lilfordi*, (Hornero and Roca, 1992b; Roca and Hornero, 1994); *Podarcis muralis*, (Kirin, 2002a); *Tarentola angustimentalis*, (Roca et al., 1990); *Teratoscincus scincus*, (Sharpilo, 1976).

Geographic range: Azerbaijan (Khomustenka and Ataev, 1979); Bulgaria (Biserkov and Kostadinova, 1998); Central Asia (Sharpilo, 1976); China (Li, 1934); Portugal (Galdón et al., 2006); Spain (Hornero and Roca, 1992b); Turkey (this report).

Remarks: *Lacerta trilineata* represents a new host record for *S. hoffmanni*; Turkey is a new locality record.

Skrjabinodon medinae

(García-Calvente, 1948) Specian and Ubelaker, 1974

(Syn. *Pharyngodon medinae* García-Calvente 1948; *Parathelandros medinae* [García-Calvente, 1948] Read and Amrein, 1953).

Prevalence, mean intensity, and range: 3 of 38 (8%), 5.0 ± 3.0 , 2-8.

Temporal distribution: 10 June 1996, 1 host with 8; 4 May 1998, 2 hosts with 2, 5, respectively.

Site of infection: Large intestine.

Type host and type locality: *Lacerta muralis*, Spain (García-Calvente, 1948)

Additional Turkish records: None.

Other reports: **Reptilia:** *Podarcis muralis*, (Dollfus et al., 1961; Hornero and Roca, 1992a); *Lacerta schreiberi*, (Roca and Ferragut, 1989); *Podarcis bocagei*, (Roca et al., 1989); *Podarcis hispanica*, (Roca et al., 1986a; Roca and Lluch 1988; Roca et al., 1989; Hornero and Roca, 1992a); *Podarcis lilfordi*, (Hornero and Roca, 1992b; Roca and Hornero, 1994); *Podarcis pityusensis*, (Hornero and Roca, 1992a; Roca and Hornero, 1994); *Zootoca vivipara* (reported as *Lacerta vivipara*, Dollfus et al., 1961)

Geographic range: France (Dollfus et al., 1961); Spain (García-Calvente, 1948); Turkey (this report).

Remarks: *Lacerta trilineata* represents a new host record for *S. medinae*; Turkey is a new locality record.

Discussion

Sixteen (42%) of 38 *Lacerta trilineata* harbored 217 helminths representing 11 species: 12 lizards harbored 1 species, 3 lizards harbored 2 species, and 1 harbored 4 species. There were 13.6 ± 25.5 SD helminth individuals per infected host and 1.4 ± 0.8 helminth species per infected host.

To our knowledge, helminth lists are available for 5 species of Turkish lizards, *Anguis fragilis*, *Blanus strauchi*, *Hemidactylus turcicus*, *Lacerta parva*, *Lacerta viridis*, *Laudakia caucasia*, *Laudakia stellio*, and *Podarcis tauricus* (Schad et al., 1960; Tinar, 1982, 1983; Yıldırımhan et al., 2006, 2008, 2009). This report presents an initial helminth list for the ninth species. Baran and Atatür (1998) identify 53 species known to occur in Turkey; thus, additional studies will be required before the component community of helminths infecting Turkish lizards can be determined. Currently, we can say that Turkish lizards are infected by generalist nematodes, i.e. nematode species that infect more than one host species. A summary of known Turkish lizard helminths is presented in the Table.

References

- Al-Barwari, S.E. and Nassir, J.K. 1983. First record of ten species of helminthic parasites from vertebrates in Iraq. *Iraqi J. Sci.* 24: 101-108.
- André, E. 1913. Recherches parasitologiques sur les amphibiens de la suisse. II. *Rev. Suisse. Zool.* 21: 179-200.
- Antsyshkina, L.M., Bulakhov, V.L., Palagina, G.I. and Maguza, V. 1976. The helminth fauna of some tailless amphibians in the Samara Valley. *Vest. Zool.* 2: 82-84. (In Russian.)
- Avery, R.A. 1971. Helminth parasite populations in newts and their tadpoles. *Freshwater Biol.* 1: 113-119.
- Baer, J.G. 1927. Monographie des cestodes de la famille des Anoplocephalidae. *Bull. Biol. France et Belgique.* 10:1-241.
- Baer, J.G. 1928. Contribution à la faune helminthologique de la Suisse. *Rev. Suisse. Zool.* 35: 27-41.
- Baker, M.R. 1981. On three *Oswaldocruzia* spp. (Trichostrongyloidea: Molineidae) in amphibians from Africa. *Can. J. Zool.* 59: 246-251.
- Baker, M.R. 1987. Synopsis of the Nematoda parasitic in amphibians and reptiles. Memorial University of Newfoundland, Occ. Pap. Biol. 11: 1-325.
- Baran, I. and Atatür, M.K. 1998. Turkish Herpetofauna (Amphibians and Reptiles).
- Republic of Turkey, Ministry of Environment, Ankara. 214 pp.
- Barbagallo, P. 1901. Ricerche sperimentali sulla durata della vitalità degli endoparassiti animali racchiusi entro gli organi dopo la morte dei loro ospiti. *Arch. Parasitol.* 4: 531-549.
- Barus, V. and Groschaft, J. 1962. Helminthofauna colku *Triturus alpestris* (Laurenti, 1768) a *Triturus vulgaris* L. ze Sumavske oblasti. *Zoologicke List.* 25: 253-264.
- Barus, V., Groschaft, J. and Otcenasek, M. 1963. Helminthofauna ocašatých oboživelníků z území Československa. *Česk. Parasitol.* 10: 43-59.
- Baylis, H.A. 1928. Records of some parasitic worms from British Vertebrates. *Ann. Mag. Nat. Hist.* 1(10): 329-343.
- Bertman, M. 1986. *Brachycoelium salamandrae* (Frolich, 1789) (Trematoda, Brachycoeliidae) u Salamandry plamistej-*Salamandra salamandra* L. *Wiad. Parazytol.* 32: 173-176.
- Bertman, M. 1994. Parasites of the smooth newt - *Triturus vulgaris* L. and the crested newt-*Triturus cristatus* (Laur.) of the Tarnobrzeg voivodship. *Wiad. Parazytol.* 40: 93-97.
- Bertman, M. and Okulewicz, A. 1987. Blindworm-*Anguis fragilis* L. and the grass snake-*Natrix natrix* (L.) new hosts of *Oswaldocruzia filiformis* (Goeze, 1782) Travassos 1917 (Nematoda) in Poland. *Wiad. Parazytol.* 33: 209-212. (In Polish.)
- Biserkov, V.Y. 1995. New records of nematodes and acanthocephalans from snakes in Bulgaria. *Comp. Ren. Acad. Bul. Sci.* 48: 87-89.
- Biserkov, V.Y. 1996. New records of platyhelminth parasites from snakes in Bulgaria. *Comp. Ren. Acad. Bul. Sci.* 49: 73-75.
- Biserkov, V. and Kostadinova, A. 1998. Intestinal helminth communities in the green lizard, *Lacerta viridis*, from Bulgaria. *J. Helminthol.* 72: 267-271.
- Bogdanov, O.P., Lutta, A.S., Markov, G.S. and Ryzhikov, G.S. 1969. New data on the parasite fauna of *Agistrodon halys* (Reptilia: Crotalidae). *Zool. Zh.* 48: 179-183.
- Borisova, V.I. 1988. Studies on the geographical distribution of amphibian helminths. *Parazitologia* 22: 471-475.
- Borkovcova, M. and Kopriva, J.K. 2005. Parasitic helminths of reptiles (Reptilia) in South Moravia (Czech Republic). *Parasitol. Res.* 5: 77-78.
- Bovien, P. 1916. Forelobig meddelelse om forekomst og hyppighed af trematoder hos *Rana esculenta* og *R. platyrhinus*. Videnskabelige meddelelser fra Dansk naturhistorisk forening I kbenhavn. 67: 16-17.
- Braun, M. 1902. Fascioliden der Vögel. *Zool. Jahr.* 16: 1-162.
- Buchvarov, G.K., Petrov, P. and Chochev B. 1975. To the question about helminthofauna of Amphibious Eucaudate (Amphibia-Eucaudata) of Velingrad's District. *Universite de Plovdiv "P Hilendarski," Trav. Sci. Biologie.* 13(4): 53-64.
- Buchvarov, G.K. 1962. Helminthofauna of the acaudate amphibians from the district of Plovdiv. *Bulletin of the Central Helminthological Laboratory. Bulg. Acad. Sci., Sofia.* 7: 103110. (In Bulgarian).
- Buchvarov, G.K. 1965. Helminthofauna of the acaudate amphibians from Kirdjali district. *Bulletin of the Central Helminthological Laboratory. Bulg. Acad. Sci., Sofia.* 10:145-163. (In Bulgarian).
- Busack, S.D. and Jaksic, F.M. 1982. Autecological observations of *Acanthodactylus erythurus* (Sauria: Lacertidae) in southern Spain. *Amphibia-Reptilia* 3: 237-255.
- Bykhovskaya-Pavlovskaya, I.E. 1953. Fauna of trematodes of birds in West Siberia and its dynamics. *Parazitologicheskii Sbornik.* 15: 5-117. (In Russian).
- Bykhovskaya-Pavlovskaya, I.E. 1962. Trematodes of birds in the fauna of the USSR. *Izdatel'stvo Akademii Nauk, Moscow and Leningrad, Russia.* 407 pp. (In Russian).
- Canning, E.U., Cox, F.E.G., Croll, N.A. and Lyons, K.M. 1973. The natural history of Slapton Ley Nature Reserve: VI Studies on the parasites. *Field Stud.* 3: 681-718.
- Capuse, I. 1971. Contributions a l'étude des trematodes parasites chez les reptiles du Roumanie. *Trav. Mus. Hist. Nat. Gr. Antipa.* 11: 33-40.
- Cedhagen, T. 1988. Endoparasites in some Swedish amphibians. *Acta. Parasitol. Pol.* 33: 107-113.
- Cerutti, A. 1902. Sull' *Oochoristica* (*Taenia*) *tuberculata* Rud. *Bull. Soc. Nat. Napoli.* 16: 311.

- Chalupsky, J. 1954. *Plagiorchis blatnensis* n. sp. from the small intestine of *Microtus arvalis*. Vestnik. Cesk. Zool. Spol. 18: 181-188.
- Combes, C. and Gerbeaux, M.T. 1970. Recherches eco-parasitologiques sur l'helminthofaune de *Rana ridibunda perezii* (Amphibien, Anoure) dans l'est des Pyrenees. Vie et milieu, Serie C: Biologie Terrestre. 21(1): 121-158.
- Combes, C., Leger, N. and Pesson, B. 1971. Variations dans le temps des populations d'helminthes parasites de *Rana temporaria* L. Ann. Parasitol. Hum. Comp. 46: 685-698.
- Combes, C., Leger, N. and Vidal, D. 1973. Inventaire des helminthes de *Rana esculenta* L. (Amphibien, Anoure) dans l'île de Corse. An. Parasitol. (Paris) 48: 761-766.
- Cox, F.E.G. 1971. Parasites of British amphibians. J. Biol. Educ. 5: 35-51.
- Daiya, G.G. 1973. *Oswaldocruzia molgeta* Lewis, 1928-a new nematode for the Latvian fauna. Izv. Akad. Nauk. Latv. SSR. 11: 29-30.
- Della Santa, E. 1956. Revision du genre *Oochoristica* Lühe (Cestodes). Rev. Suisse. Zool. 63: 1-113.
- Desrochers, F. and Curtis, M.C. 1987. The occurrence of gastrointestinal helminths in dogs from Kuujuaq (Fort Chimo), Quebec, Canada. C. J. Public Health. 78: 403-406.
- Didyk, A.S., Canaris, A.G. and Kinsella, J.M. 2007. Intestinal helminths of the spotted sandpiper, *Actitis macularius* (L.), during fall migration in New Brunswick, Canada, with a checklist of helminths reported from this host. Comp. Parasitol. 74: 359-363.
- Dollfus, R.P. 1932. Mission saharienne Augiéras Draper 1927-1928. Cestodes de Reptiles. Bull. Mus. Natl. Hist. Nat. 4: 439-554.
- Dollfus, R.P. 1958. Deux nouvelles variétés d'*Oochoristica* chez les sauriens d'Afrique du Nord (Cestoda, Linstowiidae). Arch Inst Pasteur Alger. 36: 32-40.
- Dollfus, R.P., Desportes, C., Chabaud, A.G. and Campana-Rouget, Y. 1961. Station expérimentale de parasitologie de Richelieu (Indre-et Loire). Contribution a la faune parasitaire régionale. An. Parasitol. Hum. Comp. 36: 303-313.
- Dubinina, M.N. 1950. Ecological studies on the parasite fauna of *Rana ridibunda* Pall. in the delta of the Volga. Parazitol. 12: 300-351.
- Dubinina, M.N. and Kulakova, A.P. 1960. Materials to parasitofauna of passeriformes in the delta of the Volga River. Parazitol. 19: 344-372.
- Dupouy, J. and Kechemir, N. 1973. Les cestodes de reptiles en Algérie. Essai de revision du genre *Oochoristica* Lühe (Cestoda, Anoplocephalidae). Bull. Soc. Hist. Nat. Afr. Nord. 64: 47-98.
- Düşen, S. 2007. Helminths of the two mountain frogs, banded frog, *Rana camerani* Boulenger, 1886 and Uludag frog, *Rana macrocnemis* Boulenger, 1885 (Anura: Ranidae), collected from the Antalya Province. Acta Parasitol. Turcica. 31: 84-88.
- Düşen, S. and Öz, M. 2004. Helminth parasites of the tree frog, *Hyla arborea* (Anura: Hylidae) from southwest Turkey. Comp. Parasitol. 71: 258-261.
- Düşen, S. and Öz, M. 2006. Helminths of the marsh frog, *Rana ridibunda* Pallas, 1771 (Anura: Ranidae), from Antalya Province, southwestern Turkey. Comp. Parasitol. 73: 121-129.
- Fernandez, J.P., Raga, J.A., Carbonell, E. and Rodriguez-Babio, C. 1986. Sobre algunos platelmintos hallados en anfibios del genero *Bufo* (L.). Misc. Zool. Barcelona 10: 61-64.
- Ferrer, D., Molina, R., Adelantado, C. and Kinsella, J.M. 2004. Helminths isolated from the digestive tract of diurnal raptors in Catalonia, Spain. Vet. Rec. 154: 17-30.
- Frandsen, F. 1974. A study of Danish amphibian parasite fauna. Acta Parasitol. Polon. 22: 49-66.
- Furmaga, S. 1956. *Plagiorchis stefanskii* sp. n. and *Plagiorchis raabei* sp. n., parasites of field rodents (Rodentia). Acta Parasit. Polon., 4-12
- Galdón, M.A., Roca, V., Barbosa, D. and Carretero, M.A. 2006. Intestinal helminth communities of *Podarcis bocagei* and *Podarcis carbonelli* (Sauria: Lacertidae) in NW Portugal. Helminthologia (Bratislava). 43: 37-41.
- Galeano, M., Navarro, P. and Lluch, J. 1990. Helminthofauna de *Hyla* spp. (Amphibia, Hylidae) en algunas localidades espanolas. Misc. Zool. (Sumatrana). 14: 1-6.
- Galli, P., Crosa, G., Gentili, A. and Santagostino, M. 2001. New geographical records of parasitic nematodes from *Bufo bufo* in Italy. Parasitologia. 43: 147-149.
- García-Calvente, I. 1948. Revisión del género *Pharyngodon* y descripción de especies nuevas. Rev. Ibérica. Parasitol. 8: 367-410.
- Georgiev, B.B., Biserkov, V.Y. and Genov, T. 1986. *In toto* staining method for cestodes with iron acetocarmine. Helminthologia 23: 279-281.
- Goeze, J.A.E. 1782. Versuch einer Naturgeschichte der Eingeweidewürmer thierischer Körper. P. Pape, Blankenburg, Germany, 471 pp.
- Goldberg, S.R. and Bursey, C.R. 2000. Helminth records for the house gecko, *Hemidactylus frenatus* (Gekkonidae) from Hawaii. Bishop. Mus. Occ. Pap. 64: 56-59.
- Goldin, E.B. 1975. Helminthofauna of Crimean reptiles. Vestn. Zool. 2: 86-88. (In Russian.)
- Gracenea, M. and González-Moreno, O. 2002. Life cycle of *Brachylaima mascomai* n. sp. (Trematoda: Brachylaimidae), A parasite of rats in the Llobregat Delta (Spain). J. Parasitol. 88(1): 124-133.
- Grabda, E. and Grabda, J. 1953. Contribution a la connaissance de la faune parasitaire de salamandre *Salamandra salamandra* (L.) des environs de Bielsko (Pologne). Frag. Faun. Mus. Zool. Pol. 6: 243-247.

- Griffin, C.T. 1988. The effect of constant and changing temperatures on the development of the eggs and larvae of *Oswaldocruzia filiformis* (Nematoda: Trichostrongyloidea). *J. Helminthol.* 62: 281-292.
- Griffin, C.T. 1989. *Oswaldocruzia filiformis* (Nematoda: Trichostrongyloidea) in frogs (*Rana temporaria*) from three locations in Ireland. *J. Helminthol.* 63: 53-62.
- Groschaft, J. and Moravec, F. 1983. Some trematodes and cestodes from amphibians and reptiles in Egypt. *Vestn. Cesk. Spol. Zool.* 47: 241-249.
- Hendriks, W.M.L. 1983. Epidemiological aspects of the infection with *Oswaldocruzia filiformis* (Goeze, 1782), Travassos, 1917 (Nematoda: Trichostrongylidae) in the common toad (*Bufo bufo* L., 1785) in the Netherlands. *Neth. J. Zool.* 33: 99-124.
- Hornero, M.J. and Roca, V. 1992a. Redescription of *Skrjabinodon mediane* (Garcia-Calvente, 1948) (Nematoda: Pharyngodonidae) from the cloaca of *Podarcis pityusensis* (Bosca, 1883) (Sauria: Lacertidae) of the Balearic Islands (Spain). *Syst. Parasitol.* 23: 31-35.
- Hornero, M.J. and Roca, V. 1992b. Helminthofauna de *Podarcis lilfordi* (Gunther, 1874) (Sauria, Lacertidae) de los islotes de Menorca (Islas Baleares, Mediterraneo Occidental). *Misc. Zool.* 16: 1-6.
- Hristovski, N.D. and Riggio, S. 1971. On some helminths from two toad species (*Bufo bufo* and *B. viridis*) collected in localities of Macedonia, Serbia (Yougoslavia), and Sicily (Italy). *Fragm. Balc.* 8: 17-25.
- Hristovski, N.D. 1973. Nematodes of the suborder Oxyurata Skrjabin, 1923 which parasitize the bodies of poikilothermic animals from the vicinity of Bitola (Macedonia-Yugoslavia). *Arh. Biol. Nauka.* 25: 85-94.
- Hristovski, N.D. 1974. Helminthofauna na *Rana graeca* Boulenger od Bitolsko Makedonija-Jugoslavija). *Acta Parasitol. Iugoslavica.* 6: 3-5.
- Hristovski, N.D. and Lees, E. 1973. The helminth fauna of *Rana temporaria* in relation to that of Europe generally. *Acta Parasitol. Iugoslavica.* 4: 93-98.
- Hsü, H.F. and Chow, C.Y. 1938. Notes on three species of Strongyloidea (Nematoda) from Germany. *Bull. Fan. Mem. Inst. Biol.* 8: 115-119.
- Hughes, R.C. 1940. The genus *Oochoristica* Lühe, 1898. *Am. Midl. Nat.* 23: 368-381.
- Ibrahim, H.M.S., Fadiel, M.M. and Nair, G.A. 2005. Gastrointestinal helminths of the lizard *Chalcides ocellatus* from Benghazi, Libya. *J. Helminthol.* 79: 35-30.
- Ikromov, E.K. and Cho, M.R. 2004. On new representatives of the helminth fauna of reptiles (Testudines and Sauria) in Uzbekistan. *J. Asia-Pacific. Entomol.* 7: 13-17.
- Ivanitzky, S.V. 1940. On the helminth fauna of vertebrates in the Ukraine (Cestoda, Nematoda and acanthocephala). *Sb. Trud.* 19: 129-155. (In Russian).
- John, B. 1957. The chromosomes of zooparasites II. *Oswaldocruzia filiformis* (Nematoda: Trichostrongylidae). *Chromosoma.* 9: 61-68.
- Joyeux, C. and Baer, J.E. 1928. Collection de la Société de Pathologie Exotique (Paris), Monographie II, 9-15.
- Joyeux, C., and Baer, J.E. 1936. Cestodes. Faune de France. 30: 1-613.
- Joyeux, C. and Gaud, J. 1945. Recherches helminthologiques marocaines. *Arch. Inst. Pasteur. Maroc.* 3: 111-143.
- Khomustenko, Y.D. and Ataev, C.A. 1979. Find of an Azerbaijan lizard *Lacerta raddei* in the Turkmen SSR, USSR. *Izdatel'stvo Akad. Nauk Turk. SSR, Series Biology.* 6: 72-74. (In Russian.)
- Kinsella, J.M., Didyk, A.S. and Canaris, A.G. 2007. Helminths of Hudsonian godwits, *Limosa haemastica*, from Alaska and Manitoba. *J. Parasitol.* 93: 716-717.
- Kirin, D. 2002a. New data on the helminth fauna of *Lacerta viridis* Lalurenti, 1768, and *Podarcis muralis* (Lalurenti, 1768) (Reptilia: Lacertidae) in Bulgaria. *Acta Zool. Bulg.* 54: 43-48.
- Kirin, D. 2002b. New records of the helminth fauna from grass snake, *Natrix natrix* L., 1758 and dice snake, *Natrix tessellata* Laurenti, 1768 (Colubridae: Reptilia) in South Bulgaria. *Acta Zool. Bulg.* 54: 49-53.
- Kirin, D. and Buchvarov, G. 2002a. Biodiversity of the helminths communities of caudated amphibians (Amphibia—Ecaudata) from Bistritsa riverside (Gotse Delhev region) Exp. Path. Parasitol. 5: 13-16.
- Kirin, D. and Buchvarov, G. 2002b. Biodiversity and trematode assemblages in *Rana ridibunda* Pallas. From the district of Troyan town. *Exp. Path. Parasitol.* 5(8): 7-12.
- Kolendo, A. 1959. Helminthofauna of the green toad-*Bufo viridis* Laur. in the Lubin Palatinate. *Acta Parasitol. Pol.* 7: 431-439.
- Kopriva, J. 1957. Trematodes of frogs in Czechoslovakia. *Cesk. Parasitol.* 4: 191-199.
- Kozak, A. 1966. Helminth fauna of frogs from the surroundings of Kosice. *Biologia* 21: 606-611.
- Kozak, A. 1968. Sezonna dynamika helmintofauny skokana zelenecho (*Rana esculenta* L.). *Biologia Bratislava* 23: 872-876.
- Kozak, A. 1969. Die nematodenfauna der frosche der Theisssebene. *Helminthologica* 10: 285-295.
- Kozak, A. 1973. Die nematodenfauna der frosche in dem Karpathengebiet der CSSR. *Biologia Bratislava* 28: 325-334.
- Kozłowska, J. 1960. On the nematodes of amphibians of Poland, mainly from the environment of Lodz. *Acta Parasitol. Pol.* 8: 215-230.
- Krasnolobova, T.A. 1987. Trematodes of the USSR. Genus *Plagiorchis*. Nauka, Moscow. (In Russian).
- Kuc, I. and Sulgostowska, T. 1988a. Helminth fauna of frogs in the forests of Kampinos near Warszawa. *Acta Parasitol. Pol.* 33: 267-272.

- Kuc, I. and Sulgostowska, T. 1988b. Helminth fauna of *Rana ridibunda* Pallas, 1771 from Goclawski Canal in Warszawa (Poland). *Acta Parasitol. Pol.* 33: 101-105.
- Lamas, A.M., López-Orge, R.H., González-Lama, Z., Zapatero Ramos, L. and Martínez-Fernández, A.R. 1985. *Chalcides sexlineatus* Boettger y Mührer, 1914, Nuevo hospedador de *Oochoristia tuberculata* Lühe, 1896. *Rev. Ibérica Parasitol.* 47: 263-270.
- Lees, E. 1962. The incidence of helminth parasites in a particular frog population. *Parasitology* 52: 95-102.
- Lees, E., Hristovski, N. and Brglez, J. 1985. The helminth fauna of some species of reptile from Yugoslavia. *Soc. Sci. Art Bitola, Prilozi (Contributions)* 26: 69-75.
- Lewin, J. 1990. Parasitic worms in a slowworm (*Anguis fragilis* L.) population from the Bieszczady Mountains (Poland). *Acta Parasitol. Pol.* 35: 207-215.
- Lewin, J. 1992a. Parasites of the sand lizard (*Lacerta agilis* L.) in Poland. *Acta Parasitol.* 37: 19-24.
- Lewin, J. 1992b. Parasites of *Lacerta vivipara* Jacquin, 1787 in Poland. *Acta Parasitol.* 37: 79-82.
- Lewis, E.A. 1928. On a new species of the nematode genus *Oswaldocruzia* from the newt. *J. Helminthol.* 6: 113-116.
- Li, H.C. 1934. Report on a collection of parasitic nematodes, mainly from north China. Part II. Spiruroidea. *Trans. Amer. Microsc. Soc.* 53: 174-195.
- Lopez-Neyra, D.R. 1944. Compendio de helminthological iberica (continuación). *Rev. Ibérica Parasitol.* 4: 138-198.
- Lühe, M. 1898. *Oochoristia* nov. gen. Taeniadarum (Vorläufige Mittheilung). *Zool. Anz.* 21: 650-652.
- Macko, J.K. 1969. Die Helminthenfauna von *Crex crex* aus der Ostslowakei. *Helminthologia* 10: 297-305.
- Malczewski, A. 1961. Helminth fauna of bred foxes and mink. *Wiadomosci Parazytologiczne* 7: 283-286. (In Polish).
- Marconcini, A. and Triantafyllu, G. 1970. Note helmintologiche sulla fauna selvatica in Italia. *Ann. Fac. Med. Vet. Pisa.* 22: 217-229.
- Markov, G.S. and Mozgovoï, A.A. 1969. Causes of the low level of helminth infection in *Vipera berus* in the northern European part of its distribution area. *Trudy Gelmintologicheskoi Laboratorii.* 20: 91-96.
- Markov, G.C. and Paraskiv, K.R. 1956. On the helminth fauna of reptiles in Kaskhstan. *Tr. Inst. Zool. Akad. Nauk Kaskhstan Parasitol.* 5: 120-128. (In Russian).
- Massino, B.G. 1924. On the nematode parasites of *Emys orbicularis* from the River Arax. *Trans. Trop. Inst. Armenii.* 1: 55-66. (In Russian.)
- Massino, B.G. 1927. Kopredeleniu vidov roda *Plagiorachis* Lühe. *Sbor. Rabot Gelm. Posv. Prov K. I. Skryainu.* z.pdlbs pp. 108-112.
- Massino, B.G. 1929. Die Trematoden der gattung *Plagiorachis* Lühe, 1889, der Vögel Russlands. *Beitrag zur Kenntnis der Helminthenfauna Russlands.* *Cent. f. Bakt. U. Parasit.* 78: 125-142.
- Matskasi, I. 1971. The trematode fauna of rodents and insectivora (Mammalia) in Hungary I. *Parasitol. Hung.* 4: 125-136.
- Mazeika, V., Paulauskas, A. and Balciauskas, L. 2003. New Data on the helminth fauna of rodents of Lithuania. *Acta Zool. Lit.* 13: 41-47.
- McAllister, C.T., Conn, D.B., Freed, P.S. and Brudick, D.A. 1991. A new host and locality record for *Mesocestoides* sp. tetrathyridia (Cestoidea; Cyclophyllidea), with a summary of the genus from snakes of the world. *J. Parasitol.* 77: 329-331.
- Mehra, H.R. 1937. Certain new and already known distomes of the family Lepodermatidae Odhner (Trematoda), with a discussion on the classification of the family. *Z. Parasitenk.* 9: 429-469.
- Messner, B. and Kerstan, U. 1978. The histochemical evidence of peroxidase in invertebrate animals (Nematoda and Insecta). *Acta Histochem.* 62: 244-253.
- Mhaisen, F.T., Khamees, N.R. and Al-Sayab, A.A. 1990. Flat worms (Platyhelminthes) of two species of gull (*Larus ichthyaetus* and *L. canus*) from Basrah, Iraq. *Zool. Middle East.* 4: 113-116.
- Mihalca, A.D., Gherman, C., Ghira, I. and Cozma, V. 2007. Helminth parasites of reptiles (Reptilia) in Romania. *Parasitol. Res.* 101: 491-492.
- Mingazzini, P. 1904. Ricerche sul vario modo di fissazione delle tenie alla parete intestinale e sul loro assorbimento. *Ricerche fatte nel laboratorio di anatomia normale della Reale Università di Roma.* 10: 5-24.
- Misra, V.R. 1945. On a new species of genus *Oochoristia* from the intestine of *Calotes versicolor*. *P. Indian Acad. Sci.* 22: 1-5.
- Moravec, F. 1963. Prispevek k poznani helmintofauny nasich plazu. *Spisy Prir. Fak. Univ. Brno.* 446: 353-396.
- Moravec, F. and Scholz, T. 1991. Occurrence of endohelminths in chub, *Leuciscus cephalus*, of the Rokytná River, Czechoslovakia. *Acta Soc. Zool. Bohem.* 55: 12-28.
- Moravec, F. and Vojtkova, L. 1975. Variabilitat von zwei nematodenarten-*Oswaldocruzia filiformis* (Goeze, 1782) und *Oxysomatium brevicaudatum* (Seder, 1800), der gemeinsamen parasiten der Europäischen amphibien and reptilien. *Scripta Fac. Sci. Nat.* 5: 61-76.
- Mühling, P. 1896. Beiträge zur Kenntnis der Trematoden. *Arch. Naturg.* 118 pp.
- Novokhatskaya, O.V. 2007. The first finding of the nematode *Oswaldocruzia filiformis* (Molineidae) in the burbot (*Lota lota*). *Zool. Zh.* 86: 891-892.
- Novokhatskaya, O.V. 2008. On the occurrence of the nematode *Oswaldocruzia filiformis* (Strongylida: Molineidae) in Karelia. *Parazitologîâ* 42: 204-209.
- Odening, K. 1959. Über Plagiorchis, Omphalometra und Allocreadium (Trematoda, Digenea). *Z. Parasitenk.* 19: 442-457.
- Odening, K. 1961. Mischinfektionen mit zwei Plagiorchis-Arten (Trematoda, Digenea) bei einheimischen Schwalben und Mauerseglern. *S.A. Monatsber. Dtsch. Akademie Wiss. Bln.* Bd. 3(10): 584-589.

- Okulewicz, A. 1976. *Oswaldocruzia filiformis* (Goeze, 1782) Travassos 1917-Nowy pasożyt jaszczurki zwinki (*Lacerta agilis* L.). Wiad. Parazytol. 12: 297-301.
- Olsson, P. 1876. Bidrag till skandinavien helminthfauna. I. K. svenska VetenskAkad. Handl. 14: 1-35.
- Padgett, K.A. and Boyce, W.M. 2004. Life-history studies on two molecular strains of *Mesocestoides* (Cestoda: Mesocestoididae); Identification of sylvatic hosts and infectivity of immature life stages. J. Parasitol. 90: 108-113.
- Panov, V.V. and Karpenko, S.V. 2004. The population dynamics of the water shrew *Neomys fodiens* (Mammalia, Soricidae) and its helminthes fauna in the northern Baraba. Parazitologiya (St. Petersburg). 38: 448-456. (In Russian).
- Parona, C. 1887. Elmintologia Sarda. Contribuzione allo studio del vermin parassiti in animali di Sardegna. Ann. Mus. Civ. St. nat. Genova 24: 275-384.
- Parona, C. 1900. Helminthum ex Conradi Paronae Museo Catalogus. Sect. II. Cestodes Genova, pp. 6.
- Petrov, A.M. and Tichonoff, P.N. 1927. Novaia trematoda kiscecnika domasnich plotoiadnych, *Plagiorochis massino* n. sp. Sbor. Rab. Gem. posv. K. I. Skrjabinu, pp. 150-154.
- Plasota, K. 1969. The effect of some ecological factors on the parasitofauna of frogs. Acta Parasitol. Pol. 16: 47-60.
- Popovic, E. and Mikes, M. 1989. Infestation of tailless amphibians of genus *Rana* by trematodes in the valley of the Tisa River (Yugoslavia). Tiscia (Szeged). 23: 77-85.
- Prokopic, J. 1957. K helmintofaune nasich zab. Cesk. Parasitol. 4: 249-262.
- Prokopic, J. and Krivanec, K. 1975. Helminths of amphibians, their interaction and host-parasite relationships. Acta Sci. Nat. Brno. 9: 1-48.
- Raina, M.K., Chisti, M.Z. and Kaul, R.K. 1975. A new report of *Oochoristia tuberculata* (Rudolphi, 1819) Lühe, 1898 from the intestine of *Agama tuberculata* in Kashmir, with remarks on its synonyms. Indian J. Helminthol. 27: 1-4.
- Rausch, R.L., Fay, F.H. and Williamsson, F.S.L. 1983. Helminths of the Arctic fox, *Alopex lagopus* (L.) in Greenland. Can. J. Zool. 61: 1847-1851.
- Rausch, R.L. 1994. Family Mesocestoididae Fuhrmann, 1907. Keys to the cestode parasites of vertebrates, L.F. Khalil, A. Jones, and R.A. Bray (eds.) CAM International, Oxon, U.K. pp. 309-314.
- Ricci, M. 1987. Parassiti del gen. *Speleomantes* (Amphibia Urodela: Plethodontidae) in Italia. Riv. Parasitol. 4: 5-25.
- Rizzo, A. 1902. La fauna elmintologica dei rettili nella provincia Catania. Arch. Parasitol. 6: 26-41.
- Roberts, L.S. and Janovy, J. Jr. 2000. Gerald D. Schmidt & Larry S. Robertson Foundations of Parasitology, Sixth Editon. McGraw Hill, Boston, Massachusetts. 670 pp.
- Roca, V. and Lluch, J. 1988. L'helminthofaune des lacertidae (Reptilia) de la zone thermomediterraneenne de lest de l'Espagne. Aspects ecologiques. Vie Milieu. 38: 201-205.
- Roca, V. and Hornero, M.J. 1994. Helminth infracommunities of *Podarcis pityusensis* and *Podarcis lilfordi* (Sauria: Lacertidae) from the Balearic islands (western Mediterranean basin). Canadian J. Zool. 72: 658-664.
- Roca, V. and Ferragut, M.V. 1989. Helminthofauna del lagarto verdinegro, *Lacerta schreiberi* Bedriaga, 1878 (Reptilia: Lacertidae) del Sistema Central (España). Rev. Iberia de Parasitol. 49: 291-300.
- Roca, V., Lopez-Balaguer, E. and Hornero, M.J. 1989. Helminthofauna de *Podarcis hispanica* (Steindachner, 1870) *Podarcis bocager* (Seoane, 1884) (Reptilia: Lacertidae) en el Cuadrante Noroccidental de la Peninsula Iberica. Rev. Iberia de Parasitol. 49: 127-135.
- Roca, V., Lopez-Blaguer, E., Hornero, M.J. and Ferragut, M.V. 1990. *Skrjabinelazia hoffmanni* Li 1934 (Nematoda; Seuratidae) parasite of lizards in the Iberian peninsula. Bol. R. Soc. Española Hist. Nat. (Biol.) 86: 125-132.
- Roca, V., Garcia-Adell, G., Lopez, E. and Zapatero-Ramos, L.M. 1987. Algunas formas adultas y larvarias de platelmintos de reptiles de las Islas Canarias. Rev. Iberia de Parasitol. 37: 263-270.
- Roca, V., Linch, J. and Navarro, P. 1986a. Contribucion al conocimiento de la helmintofauna de los herpetos ibericos. I. Parasitos de Lacertidae: *Lacerta lepida* Daudin, 1802 y *Podarcis hispanica* Steindachner, 1870. Rev. Iberia de Parasitol. 46: 129-136.
- Roca, V., Linch, J. and Navarro, P. 1986b. Contribucion al conocimiento de la helmintofauna de los herpetos ibericos. V. Parasitos de *Psammodromus algirus* (L., 1758) Boulenger, 1887, *Psammodromus hispanicus* Fitzinger, 1926 y *Acanthodactylus erythrurus* (Schinz, 1833) Mertens, 1925 (Reptilia: Lacaertidae). Bol. R. Soc. Española Hist. Nat. (Biol.) 81: 69-78.
- Rozman, M. 1976. A contribution to the knowledge of endohelminths of anura in some regions of Bosnia and Herzegovina and Yugoslavia. Veterinaria. 25: 449-475. (In Czech.).
- Rudolphi, C. 1802. Fortsetzung der Beobachtungen über die Eingeweidewürmer. Arch. für Zool. y. Zoot. 3(1): 61-125.
- Rudolphi, C. 1819. Entozoorum Synopsis, cui Accedunt manissa duplex et indices locupletissimi. Augusti Rücker, Berlin, Germany. 811 pp.
- Ryzhikov, K.M., Sharpilo, V.P. and Shevechenko, N.N. 1980. Helminths of amphibians of the fauna of the USSR. Izdatel'stov Nauka, Moscow, Russia. 278 pp. In Russian.
- Saeed, I., Al-Barwari, S.E. and Al-Harmni, K.I. 2007. A metazoan parasitological research of some Iraqi amphibians. Acta Parasitol. Turcica. 31: 337-345.
- Sağlam, N. and Arıkan, H. 2006. Endohelminth fauna of the marsh frog *Rana ridibunda* from Lake Hazar, Turkey. Dis. Aquat. Organ. 72: 253-260.
- Sanchis, V., Roig, J. M., Carretero, M. A., Roca, V. and Llorente, G. A. 2000. Host-parasite relationships of *Zootoca vivipara* (Sauria: Lacertidae) in the Pyrenees (North Spain). Folia Parasit. 47: 118-122.

- Santos, X, Martínez-Freiría, F., Pleguezuelos, J. M. and Roca, V. 2006. First helminthological data on Iberian vipers: Helminth communities and host-parasite relationships. *Acta Parasitol.* 51: 130-135.
- Sattmann, V.H. 1986. Über die Helminthenfauna von *Triturus alpestris* Laurenti 1768 and *Rana temporaria* L. aus Almtümpeln in Oberösterreich. (Amphibia, Plathelminthes und Nematelminthes). *Ann. Nat. Mus. in Wien, Serie B.* 87: 193-196.
- Schad, G.A., Kuntz, R.E. and Wells, W.H. 1960. Nematode parasites from Turkish vertebrates. An annotated list. *Can. J. Zoolog.* 38: 949-963.
- Schmidt, G.D. 1986. *Handbook of Tapeworm Identification.* CRC Press, Boca Raton, Florida. 675 pp.
- Schmidt, U. and Enigk, K. 1972. Ungewöhnlich starker helmilnthenbefall bei erdkoten. *Deut. Tierarztl. Woch.* 79: 625-626.
- Seurat, L.G. 1917. Physaloptères des reptiles du nord-africain. *Cr. Soc. Biol.* 80: 43-52.
- Sey, O. 1965. A pezsmapocok (*Ondatra zibethica* D. 1776) magyarorszagi belso eloskodo fergei I. *Vertebrat. Hung.* 7: 153-175.
- Sharpilo, V.P. 1962. On the study of the helminth fauna of reptiles in the Transcaucasia. *Zbirn. Prats Zool. Muz. Akad. Nauk USSR* 31: 63-69. (In Russian.)
- Sharpilo, V.P. 1976. Parasitic worms of the reptilian fauna of the USSR. *Izdat. 'Naukova Dumka', Kiev USSR.* 287 pp. (In Russian.)
- Sharpilo, V.P., Biserkov, V., Kostadinova, A., Behnke, J.M. and Kuzmin, Y.I. 2001. Helminths of the sand lizard, *Lacerta agilis* (Reptilia, Lacertidae), in the Palaearctic: faunal diversity and spatial patterns of variation in the composition and structure of component communities. *Parasitology* 123: 389-400.
- Shevchenko, N.N. and Barabashova, V.N. 1958. Helminth fauna of *Lacerta agilis* L. and *Vipera berus* L. in the Kharkov area. *Roboty Po Gelmintologii* pp. 389-394.
- Shimalov, V.V. 2002. Helminth fauna of the striped field mouse (*Apodemus agrarius* Pallas, 1778) in ecosystems of Belorussian Polesie transformed as a result of reclamation. *Parasitol. Res.* 88: 1009-1010.
- Shimalov, V.V. and Shimalov, V.T. 2000. Helminth fauna of snakes (Reptilia, Serpentes) in Belorussian Polesye. *Parasitol. Res.* 86: 340-341.
- Shimalov, V.V., Shimalov, V.T. and Shimalov, A.V. 2000. Helminth fauna of lizards (Reptilia, Sauria) in the southern part of Belarus. *Parasitol. Res.* 86: 343.
- Shimalov, V.V. and Shimalov, V.T. 2001. Helminth fauna of toads in Belorussian Polesie. *Parasitol. Res.* 87(1): 84.
- Sitko, J. 1998. Trematodes of birds of prey (Falconiformes) in Czech Republic. *Helminthologia* 35: 131-146.
- Soota, T.D. and Dey Sarkar, S.R. 1980. On some nematodes from Darjeeling District, West Bengal, India. *P. Zool. Soc. Calcutta.* 31: 39-46.
- Spasskii, A.A. 1951. *Essentials of Cestodology: Anoplocephalate Tapeworms of Domestic and Wild Animals.* The Academy of Sciences of the USSR, Moscow. 1: 783 pp.
- Styczynska-Jurewicz, E. 1962. The life cycle of *Plagiorchis elegans* (Rud., 1802) and the revision of the genus *Plagiorchis* Lühe, 1889. *Acta Parasitol. Pol.* 10: 419-445.
- Tandon, V., Imkongwapang, R. and Kar, P.K. 2001. Helminth infracommunities in anuran amphibia of Nagaland, India. *J. Parasitic Dis.* 25: 8-20.
- Tenora, F., Henttonen, H. and Haukisalmi, V. 1983. On helminths of rodents in Finland. *Ann. Zool. Fenn.* 20: 37-46.
- Tınar, R. 1982. Güney Anadolu bölgesi *Hemidactylus turcicus* türü kertenkelelerde *Pharyngodon laevicauda* Seuret, 1914 bulgusu. *Ankara Üniv. Vet. Fak. Derg.* 29: 164-174.
- Tınar, R. 1983. Güney Anadolu bölgesinden yakalanan *Hemidactylus turcicus* türü kertenkelelerde helmintolojik arařtırmalar. *U. Ü. Vet. Fak. Derg.* 2: 1-7.
- Tranko-Tulecka, H. 1959. Helminthofauna of smooth newt-*Triturus vulgaris* L. of the Lublin environment. *Acta Parasitol. Pol.* 7: 423-429.
- Travassos, L. 1937. Sur les especes europeennes du genre *Oswaldocruzia.* pages 725-733 in *Papers on helminthology published in commemoration of the 30 year jubileum of the scientific, educational and social activities of the honoured worker of science K. J. Skrjabin.*
- Tscherner, W. 1966. Helminthofaunistische untersuchungen an *Rana esculenta* L. und *Rana ridibunda* Pall., mit besonderer berucksichtigung der europaischen *Prosotocus*-arten (Trematoda: Lecithodendriidae). *Mitt. Zool. Mus. in Bln.* 42: 259-279.
- Vakker, V.G., Brushko, Z.K. and Kolbintsev, V.G. 1985. Parasite fauna of *Ophisaurus apodus* in the Kazakh S.S.R., U.S.S.R. *Izv. An. Kazakhskoi SSR Biol.* 4: 36-39.
- Vashetko, E.V. and Siddikov, B.H. 1999. The effect of the ecology of toads on the distribution of helminths. *Turk. J. Zool.* 23: 107-110.
- Velikanov, V.P. 1982. Helminth fauna of fresh water turtles from the lower reaches of the Atrek River, Turkmen-SSR, USSR. *Izv. An. Turkmenskoi SSR Biol.* 3: 70-71. (In Russian.)
- Vojtková, L. 1961. Notes on the helminth fauna of frogs from the Komarno area. *Biologia (Bratislava).* 16: 25-30.
- Vojtková, L. 1963. Zur Kenntnis der Helminthenfauna der Schwanzlurchen (Urodela) der Tschechoslowakei. *Vestn. Cesk. Spol. Zool.* 27: 20-30.
- Vojtková, L., Moravec, F. and Nabelkova, L. 1963. K dosavadnimu stavu vyzkumu helmintofauny obojzivelniku CSSR. *Casopis Nar. muzea* 9: 121-131.

- Vojtková, L. 1976. Nematoda of amphibians of CSSR I. Adult nematodes. Folia Fac. Sci. Nat. Un. 17: 5-80. In Czech.
- Vojtková, L. and Krivanec, K. 1970. The helminth fauna of frogs from Moravia. Spisy prirodov. Fak. Univ. J. E. Purkyne, Brno. 515: 253-281.
- Vojtková, L. and Vojtek, J. 1972. The dependence of the trematode fauna of caudatae amphibians on their environment. Scripta Fac. Sci. Nat. Un. 2: 25-31.
- Volna-Nabelkova, L. 1964. On the helminth fauna of frogs. Spisy prirodov. Fak. Univ. J. E. Purkyne, Brno. 17: 57-100.
- Yamaguti, S. 1961. Systema Helminthum. Volume III. The Nematodes of Vertebrates, Part I. Interscience Publishers Inc., New York. 679 pp.
- Yıldırımhan, H.S. 1999. Researches on parasitic helminths of *Bufo viridis* Laurenti, 1768 (Anura: Amphibia). Turk. J. Zool. 23: 177-195. In Turkish.
- Yıldırımhan, H.S. 2008. An investigation of the helminth fauna of *Triturus vittatus* (Jenyns, 1835) and *Triturus karelinii* (Strauch, 1870). Turk Parazitol. Derg. 32: 158- 60.
- Yıldırımhan, H.S., Altunel, F.N. and Uğurlutaş, I.H. 2006. Helminth parasites of *Hyla arborea* (Linnaeus, 1758) (tree frog) collected from Bursa, Edirne and Sakarya. Acta Parasitol. Turcica 30: 56-59.
- Yıldırımhan, H.S., Bursey, C.R. and Goldberg, S.R. 2005. *Mauremys rivulata* (Balkan terrapin). Endoparasites. Herpetol. Rev. 36: 442-443.
- Yıldırımhan, H.S., Bursey, C.R. and Goldberg, S.R. 2006. Helminth parasites of the Taurus frog, *Rana holtzi*, and the Uludag frog, *Rana macrocnemis*, with remarks on the helminth community of Turkish anurans. Comp. Parasitol. 73: 237-248.
- Yıldırımhan, H.S., Goldberg, S.R. and Bursey, C.R. 2006. Helminth parasites of the banded frog *Rana camerani* (Ranidae) from Turkey. Comp. Parasitol. 73: 222-236.
- Yıldırımhan, H.S., Goldberg, S.R. and Bursey, C.R. 2006. Helminth parasites of the Caucasian agama, *Laudakia caucasia*, and the rougtail rock agama, *Laudakia stellio* (Squamata: Agamidae), from Turkey. Comp. Parasitol. 73: 257-262.
- Yıldırımhan, H.S. and Karadeniz, E. 2007. Helminth parasites of the common toad, *Bufo bufo* (Linnaeus, 1758) (Anura: Bufonidae) from northeast Turkey. Comp. Parasitol. 74: 176-178.
- Yıldırımhan, H.S., Karadeniz, E., Gurkan, E. and Koyun, M. 2005. Metazoon parasites of the marsh frog (*Rana ridibunda* Pallas, 1771; Anura) collected from the different regions in Turkey. Acta Parasitol. Turcica. 29: 135-139. (In Turkish).
- Yıldırımhan, H.S. and Şahin, R. 2005. The helminth fauna of *Emys orbicularis* (European pond turtle) (Linnaeus 1758) living in freshwater. Acta Parasitol. Turcica. 29: 56-62.
- Yıldırımhan, H.S., Sümer, N. and Yılmaz, N. 2008. Hatay'dan Toplanan *Hemidactylus turcicus* (Linnaeus, 1758) (Geniş Parmaklı Keler)'in Helminth Faunası. Acta Parasitol. Turcica. 32: 393-395.
- Yıldırımhan, H.S., Uğurtaş, I.H. and Altunel, F.N. 1996. *Rana ridibunda* Pallas, 1771 (Ova Kurbagasi)'nin helmintleri üzerinde bir araştırma. T. Parazitoloji Derg. 20: 113-130.
- Yıldırımhan, H.S., Uğurtaş, I.H. and Altunel, F.N. 1997. An investigation on parasitic helminths of *Rana macrocnemis* Boulenger, 1885 (Uludag frog). Tr. J. of Zoology 21: 467-473. In Turkish.
- Yıldırımhan, H.S., Yılmaz, N. and İncedoğan, S. 2009. Helminth Fauna of the Anatolian Worm Lizard, *Blanus strauchi* (Bedriaga, 1884) from Hatay. Türk. Parazitol Derg. 33(4): 327-329.
- Zarnowski, E. 1960. Parasitic worms of forest micromammals (Rodentia and Insectivora) of the environment of Pulawy (district Lublin) II. Trematoda. Acta Parasitol. Pol. 8: 128-168.
- Zhigileva, O.N. 2007. Indices of genetic variability of parasites with a different life cycle structure. Acta Zool. Lit. 17: 129-138.