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The helminth parasites of the two bufonid toads, European Common Toad, *Bufo bufo* (Linnaeus, 1758) and European Green toad, *Bufo* (*Pseudepidalea*) *viridis* Laurenti, 1768 (Anura: Bufonidae), collected from Denizli Province, Inner-West Anatolia Region, Turkey

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Summary

In this research, two bufonid toad species (*Bufo bufo* and *Bufo* (*Pseudepidalea*) *viridis*) were collected in Denizli province (Inner-west Anatolia Region - the eastern part of Aegean Region) Turkey between 2006 and 2009 and examined first time for helminths. Of 6 *Bufo bufo*, 5 (97.87 %) were infected with one or more helminths, of 47 *Bufo viridis* 46 (87.91 %) were infected with one or more helminths. The helminth fauna of *Bufo bufo* included 5 species of which were 4 species of nematodes (*Rhabdias bufonis, Oswadocruzia filiformis, Cosmocerca ornata,* and *Oxysomatium brevicaudatum*), and 1 species of acanthocephalan (*Acanthocephalus ranae*). The helminth fauna of *Bufo* (*Pseudepidalea*) *viridis* comprised 7 species with 1 species of monogenean (*Polystoma viridis*), 1 species of cestoda (*Nematotaenia dispar*), and 5 species of nematodes (*R. bufonis*, *O. filiformis, C. ornata, C. commutata,* and *O. brevicaudatum*). *R. bufonis, O. filiformis, C. ornata,* and *O. brevicaudatum* were observed in both bufonid toads.

Keywords: Amphibians; *Bufo bufo; Bufo* (*Pseudepidalea*) *viridis*; Denizli; European common toad; European green toad; helminths; Turkey

Introduction

The European common toad *Bufo Bufo* (Linnaeus, 1758) lives in damp, rocky-pebbly areas with sparse vegetation, or in forest grounds. Fossorial, sheltering under the rocks or in soil. Forages nocturnally, move the small ponds or pools for breeding. European green toad, *Bufo viridis* (Laurenti, 1768) recently placed into Genus *Pseudepidalea* by Frost *et al.* (2006), but there is continuing disagreement over the use of the generic name *Pseudepidalea* over the use of *Bufo* (IUCN, 2011). In this study, both generic names are used. *Bufo* (*Pseudepidalea*) *viridis* (Laurenti, 1768) is a nocturnal species shelters in the daytime under stones or within subterranean burrows in garden or open fields, goes to water only for breeding. In Turkey, *B. viridis* is widespread in suitable biotopes. (Baran & Atatür, 1997; Budak & Göçmen, 2008).

The previous reports of parasites in European common toad (*B. bufo*) from Turkey is recorded by Yıldırımhan *et al*. (1997a) and Düşen *et al*. (2010a) from north-western parts of Turkey. Yıldırımhan & Karadeniz (2007) reported helminths of *B. bufo* from northeast of Turkey; Düşen & Oğuz (2010) recorded helminths of *B. bufo* Middle Black Sea Region of Turkey.

To our knowledge, the first helminthological study in *B. viridis* was reported by Schad *et al*. (1960) in Turkey, Schad *et al*. (1960) recorded 5 nematode species in *B. viridis.* Other helminthological studies on European green toad (*B. viridis*) published by Yıldırımhan (1999a) and Düşen *et al*. (2010a) from north-western Turkey. Also, Düşen (2003) recorded five helminth species from South-western Turkey.

So far, there has been no published study on helminths of European common toad (*Bufo bufo*), and European green toad (*Bufo* (*Pseudepidalea*) *viridis*) from Denizli province, and its vicinity (Inner-west Anatolia Region - the eastern part of Aegean Region) in Turkey. This is the first helminthological research, which has been done in this mentioned geographic area.

Materials and methods

Fifty-three anurans representing two species were collected between 2006 – 2009 years in Denizli province and its vicinity. Six *B. bufo* (2 ♂♂, 4♀♀, mean± SD snout-vent length (SVL) of *B. bufo* specimens was 78.24 ± 11.67 mm, with a range from 65.90 to 91.34 mm); Forty-seven *B. viridis* (30 ♂♂, 17♀♀, mean± SD snout-vent length (SVL) of *B. viridis* specimens was 67.78 ± 15.83 mm, with a range from 27.16 to 86.07 mm) were collected by dip net and hand from the suitable habitats in Denizli province

(38°29' - 38° 52' N - 28°38' - 30° 05' E), within 48 hr, toads were overdosed in ether-filled glass containers.
The body cavity was opened by a longitidunal ventral incision, alimentary canal was excised and seperated into stomach, small intestine, large intestine and rectum. The contents of each part and other organs (lungs, liver, gall bladder, kidneys and urinary bladder) were each mixed with 0.5 % saline solution and were poured into petri dishes for examination under a stereomicroscope. The muscles, plus portions of peritoneum and spinal cord, were teased out with needles and examined under a stereomicroscope. Trematodes were immobilized by heat, fixed, and stored in 70 % ethanol. Nematodes were straightened by heat, fixed, and stored in 70 % ethanol with 5 % glycerol. Acanthocephalans were relaxed in saline and heat-fixed under slight coverslip pressure in warm alcohol-formalin-acetic acid. Monogenean, cestoda and acanthocephalans were stained with aceto-carmine, dehydrated, cleared in cedar oil, and mounted in Entellan®; nematodes were cleared in glycerol and examined. Intensities are presented as mean values (±SD) followed by the range.
Voucher specimens of parasites were deposited in the Ege University, Museum of Zoology, Izmir, Turkey (ZDEU-HEL); host specimens were deposited in Pamukkale University Faculty of Arts and Sciences and Department of Biology, Denizli, Turkey.

Results and discussion

Bufo bufo (Linnaeus, 1758)
Six specimens (2♂♂, 4♀♀) were collected between 2006 – 2009 years from Denizli province, Turkey (38°29' - 38° 52' N - 28°38' - 30° 05' E).

Family: Rhabdiasidae
Rhabdias bufonis (Schrank, 1788) Stiles and Hassal, 1905
Prevalence, intensity and range: Hosts infected, 1 of 6 (16.66 %); mean intensity 1 (1). *Rhabdias bufonis* is known from various amphibian species including, *Bufo* sp., *Rana* sp., *Pelobates* sp., *Bominato*r sp., *Anguis fragilis* (Yamaguti, 1961; Düşen *et al*., 2010b); *Bobina bombina* (Grabda-Kazubska & Lewin, 1989; Yıldırımhan *et al*., 2001a); *Pelodytes caucasicus* (Yıldırımhan *et al*., 2009), *R. esculenta* (Buchvarov, 1977; Kuc & Sulgostowska, 1988b); *R. temporaria, R. arvalis* (Kuc & Sulgostowska, 1988b; Cedhagen, 1988); *B. viridis* (Buchvarov *et al*., 1975; Buchvarov, 1977; Yıldırımhan, 1999a)*; R.. dalmatina* (Buchvarov *et al*., 1975; Buchvarov, 1977; Düşen *et al*., 2009); *B. variegata, P. syriacus* (Buchvarov, 1977*)*; *R. ridibunda* (Yıldırımhan *et al.,* 1996; Yıldırımhan *et al*., 1997a; Düşen & Öz, 2006; Sağlam & Arıkan, 2006), *R. camerani* (Yıldırımhan *et al*., 2006), *R. macrocnemis* (Yıldırımhan *et al*., 2006b). The geographic range of this specis Europe, Siberia, China, Canada, U.S.A. (Yamaguti, 1961).
Specimens deposited: ZDEU HEL-5/2009 (2 Slides)

Family: Molineidae
Oswaldocruzia filiformis (Goeze, 1782) Travassos, 1917
Prevalence, intensity and range: Two of 6 hosts infected (33.33 %, 1.50 ± 0.70 SD, 1 – 2).
Oswaldocruzia filiformis is recorded from various amphibian and reptile species, including *S. salamandra* (Buchvarov, 1977), *T. alpestris* and *T. karelini* (Buchvarov, 1977; Cedhagen 1988; Kirin & Buchvarov, 2002), *T. vulgaris* (Buchvarov, 1977; Shimalov *et al*., 2001), *Triturus vittatus* (Yıldırımhan, 2008), *Bombina bombina* and *B. variegata* (Buchvarov, 1977, Kirin & Buchvarov, 2002), *B. regularis* (probably *B. viridis*) (Schad *et al*., 1960), *B. viridis* (Buchvarov, 1977; Yıldırımhan, 1999; Shimalov & Shimalov, 2001; Düşen *et al*., 2010a; Düşen & Oğuz, 2010), *P. caucasicus* (Yıldırımhan *et al*., 2009), *H. arborea* (Buchvarov, 1977; Yıldırımhan *et al*., 2006c), *R. camerani*, *R. dalmatina*, (Batchvarov *et al*., 1975; Buchvarov, 1977; Kirin & Buchvarov, 2002; Düşen *et al.*, 2009), *R. kurtmuelleri* (Hristovski *et al*., 2006), *R. macrocnemis* (Schad *et al.,* 1960; Yıldırımhan *et al*., 1997b; Yıldırımhan *et al*., 2006b), *R. ridibunda* (Buchvarov, 1977; Yıldırımhan *et al*., 1996; Batchvarov *et al*., 1975; Kirin & Buchvarov, 2002; Yıldırımhan *et al*., 2005a; Sağlam & Arıkan 2006; Düşen & Oğuz, 2010), *Rana temporaria*, (Buchvarov, 1977; Cedhagen, 1988; Kirin & Buchvarov, 2002), *R. graeca* (Božkov & Stojkova, 1970; Buchvarov, 1977), *Lacerta agilis*, (Sharpilo *et al*., 2001; Shimalov *et al*., 2000; Mihalca *et al*., 2007), *L. trilineata* (Yıldırımhan, 1999b), *L. viridis* (Biserkov & Kostadinova, 1998; Yıldırımhan, 1999b; Kirin, 2002a; Borkovcová & Kopřiva, 2005), *L. vivipara* (Shimalov *et al*., 2000), *Anguis fragilis* (Schad *et al*., 1960; Bertman & Okulewicz, 1987; Shimalov *et al.,* 2000; Borkovcová & Kopřiva 2005; Düşen *et al*, 2010b), *Zootoca vivipara* (Sanchis *et al*., 2000), *N. natrix* (Bertman & Okulewicz, 1987; Shimalov & Shimalov, 2000; Kirin 2002b) and *V. berus* (Shimalov & Shimalov, 2000).
Schad *et al*. (1960) first time reported *O. filiformis* in *Bufo regularis* (probably *B. viridis*) and *R. macrocnemis* from Turkey. This species were observed in small and large intestines from two bufonid toads species in this study. The geographic range of *O. filiformis* includes Europe and Asia (Yamaguti, 1961).
Specimens deposited: ZDEU HEL-6/2009 (2 Slides)

Family: Cosmocercidae
Cosmocerca ornata (Dujardin, 1845)
Prevalence, intensity and range: Two of 6 hosts were infected (33.33 %, 10.50 ± 4.94 SD, 7 – 14).
There are several papers reporting *C. ornata* from many species of amphibians and reptiles, including *Bufo, Hyla, Rana, Triturus* (Yamaguti, 1961), *T. alpestris* (Walton, 1933; Buchvarov, 1977; Shimalov *et al*., 2000), *T. cristatus* (Walton, 1933; Shimalov *et al*., 2001) *T. vulgaris* (Shimalov *et al*., 2001), *Bombina bombina*, (Buchvarov, 1977; Grabda-Kazubska & Lewin, 1989), *B. variegata*

Table 1. Prevalence, intensity, infection sites and range of helminths in *Bufo bufo* and *Bufo* (*Pseudepidalea*) *viridis*

Identified helminth group	Developmental stage	Host species	Site of infection	No. of infected (%)	Mean Intensity (±SD)	Range
POLYSTOMATIDAE						
Polystoma viridis	Adult	*B. viridis*	UB	8 (17.02)	4.50 ± 2.72	1 – 8
NEMATOTAENIIDAE						
Nematotaenia dispar	Adult	*B. viridis*	LI, SI	10 (21.27)	1.90 ± 0.99	1 – 4
RHABDIASIDAE						
Rhabdias bufonis	Adult	*B. bufo*	L	1 (16.66)	1	1
		B. viridis		24 (51.06)	8.87 ± 11.89	1 – 53
MOLINEIDAE						
Oswaldocruzia filiformis	Adult	*B. bufo*	SI	2 (33.33)	1.50 ± 0.70	1 – 2
		B. viridis		15 (31.91)	4.60 ± 5.06	1 – 10
COSMOCERCIDAE						
Cosmocerca commutata	Adult	*B. viridis*	LI, SI, R	14 (29.78)	10.28 ± 9.65	1 – 30
Cosmocerca ornata	Adult	*B. bufo*	LI, SI, R	2 (33.33)	10.5 ± 4.95	7 – 14
		B. viridis		23 (48.93)	8.91 ± 7.49	1 – 28
Oxysomatium brevicaudatum	Adult	*B. bufo*	LI, SI	3 (50.0)	2.33 ± 1.52	1 – 4
		B. viridis		18 (38.29)	14.22 ± 11.52	2 – 40
ECHINORHYNCHIDAE						
Acanthocephalus ranae	Adult	*B. bufo*	SI	3 (50.0)	18.30±11.54	5 – 25

L - Lung, **LI -** Large intestine, **M -** Mesentery, **R -** Rectum, **SI -** Small intestine; **UB -** Urinary Bladder

(Buchvarov, 1977; Grabda-Kazubska & Lewin, 1989; Kirin & Buchvarov, 2002), *B. viridis* (Batchvarov *et al*., 1975; Buchvarov, 1977; Vashetko & Siddikov,1999; Masshaii, 2005; Düşen *et al*., 2010a, 2010b), *Pelodytes caucasicus* (Yıldırımhan *et al*., 2009), *H. arborea* (Buchvarov, 1977, Yıldırımhan *et al*., 2006c), *P. syriacus* (Shimalov *et al*., 2000), *R. esculenta* (Walton, 1933; Buchvarov, 1977), *R. arvalis* (Cedhagen, 1988; Kuc & Sulgostowska, 1988b), *R. temporaria*, (Walton, 1933; Buchvarov, 1977; Kuc & Sulgostowska, 1988b), *R. graeca* (Božkov & Stojkova, 1970; Buchvarov, 1977), *R. holtzi* (Yıldırımhan *et al*., 2006b), *R. macrocnemis* (Yıldırımhan *et al*., 2006b; Düşen, 2007), *R. ridibunda* (Batchvarov *et al.,* 1975; Buchvarov, 1977; Kuc & Sulgostowska, 1988a; Masshaii *et al*., 2000; Kirin & Buchvarov, 2002; Kirin, 2003a, b; Yıldırımhan *et al*., 2005a; Düşen & Öz, 2006; Düşen *et al*., 2010a, 2010b), *R. camerani* (Yıldırımhan *et al*., 2006a; Düşen, 2007), *Chiasmocleis capixaba* (Van Sluys *et al,*. 2006) and *A. fragilis* (Shimalov *et al*. 2000; Düşen *et al*., 2010b).

Schad *et al*. (1960) first time recorded *C. ornata* in *B. viridis, R. macrocnemis* and *R. ridibunda* from Turkey. *Cosmocerca ornata* was observed from two bufonid species intestines in this study. The geographic range of *C. ornata* New and Old Worlds (Baker, 1987).

Specimens deposited: ZDEU HEL-7/2009 (2 Slides)

Oxysomatium brevicaudatum (Zeder, 1800) Railliet and Henry, 1916

Prevalence, intensity and range: Three of 3 hosts were infected (50 %, 2.33 ± 1.52 SD, 1 – 4).

Oxysomatium brevicaudatum was reported from different hosts of amphibians and reptiles in Europe and Asia, including *Bombina, Bufo, Hyla, Pelobates, Rana, Salamandra* (Yamaguti, 1961), *S. salamandra*, *S. atra, Pseudotriton ruber* and *B. bombina* (Walton, 1933), *Triturus vittatus, T. karelinii* (Yıldırımhan, 2008), *P. syriacus* (Yıldırımhan *et al*., 1997a; Yıldırımhan & Bursey, 2010), *B. viridis* (Walton, 1933; Schad *et al*., 1960; Buchvarov, 1977; Yıldırımhan, 1999a; Düşen *et al.*, 2010b), *B. regularis* (probably *B. viridis*) (Schad *et al*.,1960), *H. arborea* (Walton, 1933), *R. dalmatina* (Buchvarov, 1977; Düşen *et al.*, 2009), *R. graeca* (Božkov & Stojkova, 1970; Buchvarov, 1977), *R. esculenta* (Walton, 1933), *R. kurtmuelleri* (Hristovski *et al*., 2006), *R. macrocnemis* (Schad *et al*., 1960), *R. ridibunda* (Schad *et al*., 1960, Kirin & Buchvarov, 2002; Yıldırımhan *et al*., 2005a; Sağlam & Arıkan, 2006; Düşen *et al.*, 2010a; Düşen & Oğuz, 2010), *R. temporaria* (Walton, 1933; Buchvarov, 1977; Kirin & Buchvarov, 2002), *P. fuscus* (Walton, 1933), *R. kurtmuelleri* (Hristovski *et al*., 2006), *A. fragilis* (Schad *et al*., 1960, Shimalov *et al*., 2000; Sharpilo, 2003; Borkovcová & Kop-řiva, 2005; Düşen *et al.*, 2010b), *N. natrix* (Schad *et al*., 1960; Shimalov & Shimalov, 2000) and

Vipera berus (Shimalov & Shimalov, 2000).
Schad *et al.* (1960) first time reported *O. brevicaudatum* in *Bufo regularis* (probably *B. viridis), B. viridis*, *R. macrocnemis, R. ridibunda and A. fragilis* from Turkey. Sharpilo (2003) pointed out that *O. brevicaudatum* has a great disperse in *A. fragilis* in the Caucasian Region. *Oxysomatium brevicaudatum* was observed in two toads species in this study. The geographic range of *O. brevicaudatum* Europe and Asia (Yamaguti, 1961).
Specimens deposited: ZDEU HEL-9/2009 (2 Slides)

Family: Echinorhynchidae
Acanthocephalus ranae (Schrank, 1788) Lühe, 1911
Prevalence, intensity and range: *Three* of 6 hosts were infected (50 %, 18.30.50 ± 11.54 SD, 5 – 25).
Other reported hosts: Rana sp., *Bombinator* sp., *Hyla* sp., *Triturus* sp., *Salamandra* sp., *Diemictylus viridescens* (Yamaguti, 1963), *B. bombina* (Buchvarov, 1977; Grabda-Kazubska & Lewin, 1989; Yıldırımhan *et al*., 2001a); *B. variegata* (Grabda-Kazubska & Lewin, 1989); *B. viridis* (Buchvarov, 1977; Yıldırımhan, 1999a; Vashetko & Siddikov, 1999; Shimalov & Shimalov, 2001); *B. calamita* (Shimalov & Shimalov, 2001); *H. Arborea* (Düşen & Öz, 2004), *R. arvalis*, *R. dalmatina* (Buchvarov, 1977; Düşen *et al*, 2009); *R. temporaria* (Buchvarov, 1977; Cedhagen, 1988; Kuc & Sulgostowska, 1988b); *R. esculenta* (Buchvarov, 1977; Kuc & Sulgostowska, 1988b); *R. macrocnemis* (Yıldırımhan *et al*., 1997a; Yıldırımhan *et al*., 2006b; Düşen, 2007); *R. camerani* (Yıldırımhan *et al*., 2006a), *Mertensiella caucasica* (Yıldırımhan *et al*., 2001b; 2005b); *R. kurtmuelleri* (Hristovski *et al*., 2006); *Anguis fragilis* (Shimalov *et al*., 2000). *N. natrix* (Yamaguti, 1963; Shimalov & Shimalov, 2000). Also, *A. ranae* was reported in *R. ridibunda* from different researchers in Turkey (Oğuz *et al.,* 1994; Yıldırımhan *et al*., 1996; Yıldırımhan *et al.,* 2005a; Düşen & Öz, 2006; Sağlam & Arıkan, 2006; Düşen & Oğuz, 2010).
The geographic range of *Acanthocephalus ranae,* Europe, U.S.A., Russia (Yamaguti, 1963); Turkey (Oğuz *et al*., 1994).
Specimens deposited: ZDEU HEL-3/2008

Bufo (*Pseudepidalea*) *viridis* (Laurenti, 1768)
Forty-seven (30♂♂, 17♀♀) specimens were collected between 2006-2009 years from Denizli province, Turkey (38°29' - 38° 52' N - 28°38' - 30° 05' E).
Family: Polystomatidae
Polystoma viridis Euzet, Combes, and Batchvarov, 1974
Prevalence, intensity and range: Eight of 47 hosts infected (17.02 %, 4.50 ± 2.72 SD, 1 – 8).
Polystoma viridis is commonly parasitic in the intestine of *B. viridis*, which it is reported from different localities such as Bulgaria (Buchvarov, 1977), Turkey (Yıldırımhan, 1999a; Düşen 2003, Düşen *et al*., 2010a), Jordan (Al-Sorkhy & Amr, 2003) and Iran (Masshaii *et al*., 2008). The geographic range of *P. viridis* is Europe and the Middle East (Buchvarov, 1977).
Specimens deposited: ZDEU HEL-1/2008

Family: Nematotaeniidae
Nematotaenia dispar (Goeze, 1782) Lühe, 1899
Prevalence, intensity and range: Ten of 47 hosts infected (21.27 %, 1.9 ± 0.99 SD, 1 – 4).
Nematotaenia dispar is commonly parasitic in the intestines of amphibians, but rarely reptiles, of the Oriental, Nearctic, and Palearctic regions (Prudhoe & Bray, 1982), including *B. bombina* (Buchvarov, 1977), *B. variegata* (Buchvarov, 1977; Prudhoe & Bray, 1982), *B. bufo* (Prudhoe & Bray, 1982), *B. alvarius* (Goldberg & Bursey, 1991), *H. arborea* (Buchvarov, 1977; Prudhoe & Bray, 1982; Vashetko & Siddikkov, 1999; Saeed *et al*., 2007), *H. savignyi* (Al-Sorkhy & Amr, 2003; Mashaii, 2005), *R. ridibunda*, *R. temporaria* (Buchvarov, 1977), *Mertensiella caucasica* (Yıldırımhan *et al*., 2001b; 2005b), and *Amietophrynus* (*Bufo*) *regularis* (Ibrahim, 2008). *Nematotaenia dispar* has been reported from *B. viridis* in Turkey (Yıldırımhan, 1999; Düşen, 2003 & Düşen *et al*., 2010a; Düşen & Oğuz, 2010), Bulgaria (Buchvarov, 1977), Iran (Masshaii *et al*., 2008), and Iraq (Saeed *et al*., 2007).
Specimens deposited: ZDEU HEL-2/2008

Family: Rhabdiasidae
Rhabdias bufonis (Schrank, 1788) Stiles and Hassal, 1905
Prevalence, intensity and range: Hosts infected, 24 of 47 (51.06 %, 8.87 ± 11.89 SD, 1 – 53).
Specimens deposited: ZDEU HEL-5/2009 (2 Slides)

Family: Molineidae
Oswaldocruzia filiformis (Goeze, 1782) Travassos, 1917
Prevalence, intensity and range: Fifteen of 47 hosts infected (31.91 %, 4.60 ± 5.06 SD, 1 – 20).
Specimens deposited: ZDEU HEL-6/2009 (2 Slides)

Family Cosmocercidae
Cosmocerca commutata (Diesing 1851)
Prevalence, intensity and range: Fourteen of 47 hosts infected (29.78 %, 10.28 ± 9.65 SD, 1 – 30).
Other reported hosts of *C. commutata: Bufo marinus*, *Hyla luteus*, *H. tschudii*, *Leptodactylus typhonius*, *B. viridis*, *R. esculenta*, *S. atra*, and *T. cristatus* (Walton, 1933), *T. alpestris*, *B. variegata*, *P syriacus, P. fuscus,* and *R. graeca* (Buchvarov, 1977), *Hyla arborea* (Walton, 1933; Düşen & Öz, 2004), *R. dalmatina* (Buchvarov *et al*., 1975; Buchvarov, 1977), *R. ridibunda* (Buchvarov, 1977; Düşen & Öz, 2006), *B. bombina*, *Bufo bufo, S. salamandra, P. fuscus,* and *R. temporaria* (Walton, 1933; Buchvarov, 1977), *Neurergus strauchii* (Yıldırımhan, 2007).
C. commutata is commonly parasitic in the intestine of *B. viridis*, reported from different localities from Bulgaria (Buchvarov, 1977), Turkey (Schad *et al.,* 1960; Yıldırımhan 1999, Düşen 2003, Düşen *et al*., 2010), Jordan (Al-Sorkhy & Amr, 2003) and Iran (Masshaii *et al*., 2008). The geographic range of *C. commutata* is Europe (Yamaguthi, 1961), Turkey (Yıldırımhan, 1999).
Specimens deposited: ZDEU HEL-7/2009

Cosmocerca ornata (Dujardin, 1845)
Prevalence, intensity and range: Twenty-three of 47 hosts were infected (48.93 %, 8.91 ± 7.49 SD, 1 – 28).
Specimens deposited: ZDEU HEL-7/2009 (2 Slides)

Oxysomatium brevicaudatum (Zeder, 1800) Railliet and Henry, 1916
Prevalence, intensity and range: Eightteen of 47 hosts were infected (38.29 %, 14.22 ± 11.52 SD, 2 – 40).
Specimens deposited: ZDEU HEL-9/2009 (2 Slides)

Eight helminth species were found infecting both *B. bufo* and *B. viridis.* The site of infection in the toads and the data on infection parameters for each host and species, are shown in Table 1. In summary, 71 individuals of 5 helminth species were collected from the six *B. bufo* examined. Nematodes were observed in large-small intestines, lungs and rectum; Acanthocephala was also observed in small intestine of this species. According the data obtained 5 (83.33 %) *B. bufo* harbored the one or more species of parasite and the remaining 1 (16.67 %) were uninfected. There were 2.5 ± 0.57 helminth species per infected host and there were 18 ± 14.15 helminth individuals per infected host.
Forty-seven *B. viridis* were examined, 907 individuals of 7 helminth species were observed. Nematodes were recorded in lungs, large and small intestines and of this species. Cestoda was observed in large and small intestines; Monogenea was observed in urinary bladder of *B. viridis*. Of the infected *B. viridis*, 46 (97.87 %) harbored more species of parasites; the remaining 1 (2.13 %) toad were uninfected. There were 2.96 ± 0.95 helminth species per infected host and 25.67 ± 18.37 helminth individuals per infected host. Four helminths were observed in both bufonid toads. (*R. bufonis, O. filiformis, C. ornata,* and *O. brevicaudatum.* The helminths that were observed in two bufonid toads species are common parasites of European anurans (Yamaguthi, 1961; 1963; Buchvarov, 1977; Anderson, 2000; Yıldırımhan, 1999; Yıldırımhan *et al*., 2007, Düşen & Öz, 2006, Düşen *et al*., 2010a).
These results reinforce the importance of carrying out furture studies, because, more helminthological studies are required in Turkey and these studies should also expand the host-parasite list of Turkish amphibians.

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