

INTESTINAL HELMINTH PARASITES OF THE EURASIAN MARSH  
FROG *PELOPHYLAX RIDIBUNDUS* (PALLAS, 1771) (AMPHIBIA:  
RANIDAE) COLLECTED IN AL-DIWANIYA CITY, MIDDLE OF IRAQ

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#### ABSTRACT

The Eurasian marsh frog *Pelophylax ridibundus* is a widespread species in Iraq. Examination of intestine of 25 marsh frogs collected in Al-Diwaniya city, middle of Iraq during the period from September to November 2014 revealed the presence of *Nematotaenia dispar* (Cestoda), *Cosmocerca commutata* and *Cosmocercoides variabilis* (Nematoda). Infection rates and intensity have been presented in this paper.

Keywords: *Cosmocerca commutata*, *Cosmocercoides variabilis*, helminth parasites, Iraq,  
*Nematotaenia dispar*, *Pelophylax ridibundus*.

#### INTRODUCTION

Iraq, generally, is considered poor in amphibian species due to the arid nature of most of its parts with a number of species not exceeds eleven (UNEP, 2003). Among them, the Eurasian marsh frog *Pelophylax ridibundus* which is a widespread species in western, central and eastern Europe and ranges as far eastwards as eastern Kazakhstan (Kuzmin *et al.*, 2009). It is native and relatively common also in suitable aquatic areas from north to south of Iraq (Khalaf, 1959).

The parasitic fauna of amphibians in Iraq is rather poorly studied and few fragmentary works had been carried out and dealt only with the two most common species *Bufo viridis* and *Pelophylax ridibundus* collected mostly from northern areas. Saoud and Roshdy (1969, 1970) recovered the digenetic trematodes *Opisthioglyphe endoloba* and *Halipegus alhaussaini* from *Rana esculenta* in Basrah, southern Iraq respectively. Dauood (1974) examined *Rana ridibunda*, *Hyla arborea* and *Bufo viridis* in Nineveh province, north of Iraq and recovered eight species of protozoan parasites, nine species of digenetic trematodes and one species of monogenetic trematodes. Hamad (1985) found 8 species of digenetic trematodes in *R. ridibunda* collected in Erbil Province, north of Iraq. Al-Barwari and Nassir (1988) reported one nematode from *Rana ridibunda*; and one cestode and four nematodes from *Bufo viridis* in Baghdad area, middle of Iraq. Molan *et al.* (1989) examined blood smears of 319 specimens of *Rana ridibunda* collected from Erbil, Sulaimaniya, Mosul and Kirkuk in the north of Iraq and found seven species of protozoan parasites in addition to larval nematode, microfilaria. Al-Alousi (1994) examined *B. viridis* in Nineveh province, north of Iraq and found unidentified plerocercoid larvae (spargana). Rahemo and Ami (1995) found *Microtetramers*

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sp. Larvae (Nematoda: Tropisuridae) encysted in the stomach wall of toad, *Bufo viridis* in Mosul city. Hassan and Mohamed (2007) examined intestines, lungs and urinary bladders in 50 specimens of *R. ridibunda* in Kirkuk and found three digenetic trematodes *Haematoleochus medioplexus*, *Pleurogenoides medians* and *Gorgoderina vitelliloba*. Saeed *et al.* (2007) studied the incidence and intensity of metazoan parasites in 3 species of Iraqi amphibians and found 24 species of helminths including 16 trematodes, 1 cestode and 7 nematodes. Jasim (2008) recovered the nematodes *Cosmocercoides variabilis* and *Oswaldocruzia filiformis* from the green toad *Bufo viridis* collected in Baghdad area, middle of Iraq. Abdulrahman *et al.* (2012) founded the cestode *Proteocephalus* sp. and the nematodes *Cosmocercoides variabilis* and *Rhabdias bufonis* in the toad *Bufo viridis* collected in Erbil city. Recently, Jarallah (2013) examined *R. ridibunda* collected in Basra marshes and found two digenetic trematodes and two nematodes.

The purpose of the present work is to investigate about the intestinal parasitic helminthes of the marsh frog *Pelophylax ridibundus* in Al-Diwaniya city, middle of Iraq.

### MATERIALS AND METHODS

A total of 25 marsh frogs were collected from pools and irrigation canals in Al-Diwaniya city during the period of September to November 2014. Then each frog dissected in the lab to open the intestine and searched for helminthes. The recovered parasites were kept in 70% ethanol. Cestodes were first stained with acetocarmine and dehydrated in a series of 70, 80, 90, and 100% ethanol for 15 minutes for each rinse, then put in 1:1 by volume of ethanol and xylene for 5 minutes, cleared in xylene and finally mounted in Canada balsam, while nematodes were cleared with lactophenol. Photomicrographs were taken with Micros microscope and Infinity Lite K-100 digital camera.

### RESULTS AND DISCUSSION

Examination for parasites showed that the intestine of 17 (68%) out of 25 specimens of the marsh Eurasian frog *Pelophylax ridibundus* were infected with one or more of the parasites *Nematotaenia dispar*, *Cosmocerca commutata*, and *Cosmocercoides variabilis*. Mixed infections were two only and both of them were with *N. dispar*, the first with *C. variabilis* and the second with both nematodes. Results on incidence and intensity of parasites were summarized in table 1.

Table 1: Parasite species, intensity, no. of males and females and infection rate of total sample.

Parasite species	No. hosts infected	Intensity	No. males	No. females	% infection rate of total sample
<i>Cosmocerca commutata</i>	3	1	-	2	12
<i>Cosmocercoides variabilis</i>	14	2.43	4	30	56
<i>Nematotaenia dispar</i>	2	1	-	-	8

*Nematotaenia dispar* (Goeze, 1782) (Order Cyclophyllidea, Family Nematotaeniidae) (figs.1&2). Al-Barwari and Nassir (1988) reported that 25% of *Hyla arborea* and 7% of *Bufo viridis* were infected with this cestode. Saeed *et al.* (2007) found it in 20% and 21% of *B. viridis* and 16.7% and 15% of *H. arborea* in males and females respectively from the northern

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region of Iraq. Mohammad *et al.* (2010) recorded an infection rate of 12% in *B. viridis* from Baghdad. These figures are in disagreement with the present finding and rather confusing and reflect the variations in host species and collection sites which represent different habitats.

This cestode was reported from the intestine of various amphibians in Europe, Africa, North America, and India and it was found in *Bufo bufo*, *B. viridis*, *Hyla arborea*, *Pleobatus fuscus*, *Rana esculenta*, *R. tempraraia*, *Salamandra salamandra*, and *S. atra* (Reichenbach-Klinke and Elkan, 1965). It was reported also from the gray monitor *Varanus griseus* (Reptilia, Varanidae) in Saudi Arabia (Al-Mohammed, 2009). In Iraq it was recorded in the small intestines of *Hyla arborea* and *Bufo viridis* in central and northern Iraq (Al-Barwari and Nassir, 1983; Mohammad *et al.*, 2010). Saeed *et al.* (2007) confirmed absence of this cestode in *Pelophylax (Rana) ridibundus*. Yildirimihan *et al.* (2001), Dusen (2011), and Dusen and Oz (2013) found this parasite in Caucasian salamander *Mertensiella caucasica*, *Bufo viridis*, and *P. ridibundus* respectively in Turkey. So, reporting *N. dispar* from *P. ridibundus* constitutes a new host record for Iraq.

According to Wardle and McLeod (1952), this cestode is with numerous paruterine organs each containing several uterine capsules and arranged in two parallel rows separate from one another. This is not the situation in this case they look overlapped more than paralleled (fig. 2). However, Jones (1987) considered this cestode as a variable species which covers a wide geographical range. So, it is clear that this matter may need more investigation.

*Cosmocerca commutata* (Diesing, 1851) (Ascaridida; Cosmocercidae) (Figs.3&4). It is widely distributed parasite of toads and frogs (Anderson, 2000). Saeed *et al.* (2007) and Mohammad *et al.* (2010) found it in *Rana ridibunda* and *Bufo viridis* respectively in the north and middle of Iraq. More recently, Jarallah (2013) reported this nematode from *R. ridibunda* collected in Basrah marshes, south of Iraq. Sattmann (1986) reported this nematode from *Rana temporaria* in Germany. Dusen (2011) and Yildirimihan *et al.* (2001) reported it from *Bufo viridis* and *Mertensiella caucasica* respectively in Turkey. The infection rate and intensity noticed in this study were 12% and 1% respectively. These are far from that reported by Saeed *et al.* (2007) who found 3.2 % and 1.8% infection rate for males and females respectively and 3.6 and 4.3 for intensity, while Mohammad *et al.* (2010) reported 28% and 4 respectively. These figures reflect the difference in vector potentiality between the two collection sites as well as the difference in regard to their final hosts.

*Cosmocercoides variabilis* (Harwood, 1930) (Order Ascaridida, Superfamily Cosmocercoides, Family Cosmocercidae) (Figs. 5&7). Males with 14 pairs of papillae present on tail. Females with long and gradually tapering tail. This nematode is a parasite of gut of amphibians and reptiles. In Iraq, it was reported from the green toad *Bufo viridis* by Jasim (2008) and Mohammad *et al.* (2010) in Baghdad area and by Abdulrahman *et al.* (2012) in Erbil city. To the best of our knowledge this is the first time in Iraq that this nematode reported from *P. ridibundus*. Joy and Bunten (1997) reported it from *Bufo a. americanus* in USA.

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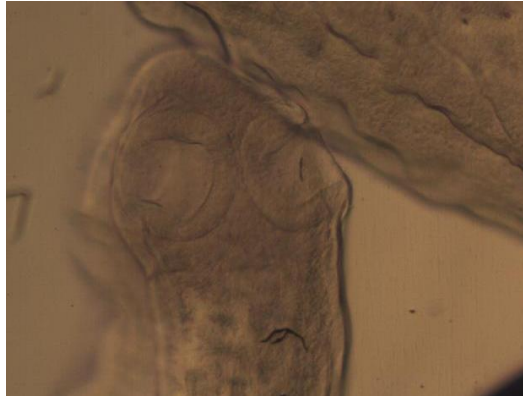


Fig. 1: *Nematotaenia dispar* scolex



Fig. 2: *Nematotaenia dispar* gravid segments



Fig. 3: *Cosmocerca commutata* anterior end



Fig. 4: *Cosmocerca commutata* male posterior end

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Fig. 5: *Cosmocercoides variabilis* anterior end



Fig. 6: *Cosmocercoides variabilis* male posterior end



Fig. 7: *Cosmocercoides variabilis* female trunk with eggs

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#### LITERATURE CITED

- Al-Barwari, S. E. and Nassir, J. K. 1983. First record of ten species of helminthic parasites from vertebrates in Iraq. *Iraqi J Science*, 24: 101-108.
- Abdulrahman, H. I., Sharif, K. A., and Abdullah, S. M. A. 2012. parasitic fauna of frog *Bufo viridis* (Laurenti, 1768) from Erbil city-Kurdistan region-Iraq. 1<sup>st</sup> Scientific Conference of Biology Department, College of Science, University of Baghdad, Baghdad, Iraq.
- Al-Alousi, T. I. 1994. Biological and morphological studies on spargana isolated from toads (*Bufo viridis*). *Iraqi J. Vet. Sci.*, 7: 207-212.
- Al-Barwari, S. E. and Nassir, J. K. 1988. First record of ten species of helminthic parasites from vertebrates in Iraq. *Iraqi J Science*, 24: 101-108.
- Al-Mohammed, H. I. 2009. Description of *Nematotaenia dispar* from gray monitor (*Varanus griseus*) a new record in Saudi Arabia. *J. Egypt Soc Parasitol.*, 39(1): 317-320.
- Anderson, R. C. 2000. Nematode parasites of vertebrates: their development and transmission. 2<sup>nd</sup> Edition. CABI Publishing, Wallingford, Oxon (UK), 650 pp.
- Dauood, K. S. 1974. Studies on the protozoan and trematode parasites of some amphibians from Nienava District, NorthIraq. M. Sc. Thesis, Mosul University, Mosul, Iraq.

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- Düşen, S. 2011. 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. *Helminthologia*, 48 (2): 101-107.
- Düşen, S. and Öz, M. 2013. Helminth fauna of the Eurasian marsh frog, *Pelophylax ridibundus* (Pallas, 1771) (Anura: Ranidae), collected from Denizli Province, Inner-West Anatolia Region, Turkey. *Helminthologia*, 50 (1): 57-66.
- Hamad, N. R. 1985. A Taxonomic Study of Digenetic Trematodes of Some Iraqi Vertebrates. M. Sc. Thesis, Salahaddin University, Erbil, Iraq.
- Hassan, H. F. and Mohamed, S. A. 2007. First record of digenetic trematodes of frogs *Rana ridibunda ridibunda* collected from Kirkuk, Iraq. *Kirkuk Univ. Bull. (Sci. Stud.)*, 2 (1): 34-42.
- Jarallah, H. M. 2013. Intestinal parasites of the marsh frog *Rana ridibunda* from Basrah marshes, south Iraq. *J. Env. Bio-Sci.*, 2013: Vol. 27 (1): 1-3
- Jasim, S. Y. 2008. Some nematode parasites of the green toad *Bufo viridis* Laurenti, 1768 in Baghdad area, central Iraq. *Bull. Iraq nat. Hist. Mus.*, 10 (3): 37-43.
- Jones, M. K. 1987. A taxonomic revision of the Nematotaenidae Luhe, 1910 (Cestoda: Cyclophyllidae). *Systematic Parasitology*, 10: 165-245.
- Joy, J. E. and Bunten, C. A. 1997. *Cosmocercoides variabilis* (Nematoda: Cosmocercidae) Populations in the Eastern American Toad, *Bufo a. americanus* (Salienta: Bufonidae), from Western West Virginia. *J. Helminthol. Soc. Wash.* 64 (1): 102-105.
- Khalaf, K. T. 1959. Reptiles of Iraq with some notes on amphibians. Baghdad (Ar-Rabitta Press), 96 pp.
- Kuzmin, S.; Tarkhishvili, D.; Ishchenko, V.; Dujsebayeva, T.; Tuniyev, B.; Papenfuss, T.; Beebee, T.; Ugurtas, I. H.; Sparreboom, M.; Rastegar-Pouyani, N.; Disi, A. M. M.; Anderson, S.; Denoël, M. and Andreone, F. 2009. *Pelophylax ridibundus*. The IUCN Red List of Threatened Species. Version 2014.3. <[www.iucnredlist.org](http://www.iucnredlist.org)>.
- Mohammad, M. K.; Al-Moussawi, A. A. and Jasim, S. Y. 2010. Helminth Parasites of the Green Toad *Bufo viridis* Laurenti, 1768 in Baghdad Area, Central Iraq. *Egypt. Acad. J. biolog. Sci., B. Zoology*: 2 (1): 17-25.
- Molan, A. L.; Saeed, I. S. and Miyata, A. 1989. Haemoprotozoa detected in *Rana ridibunda* in Iraq. *Proc. Japn. Soc. Syst. Zool.*, 40: 3-21.
- Rahemo, Z. I. F. and Ami, S. N. 1995. *Microtetramers* sp. Larvae (Nematoda: Tropisuridae) encysted in the stomach wall of toad, *Bufo viridis* in Iraq. *Revue Roumaine De Biologie-Biologie Animale*, 40: 19-23.



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- Reichenbach-Klinke, H. and Elkan, E. 1965. The Principal Diseases of Lower Vertebrates. Academic Press Inc. Published by Elsevier Inc. 600 pp. doi: 10. 1016 / B978-1-4832-3303-1.50002-0.
- Saeed, I., AL-Barwari, S. E. and Al-Harmni, K. I. 2007. A metazoan parasitological research of some Iraqi amphibians. *Türkiye Parazitol Derg.*, 31 (4): 337-345.
- Saoud, M. F. A. and Roshdy, M. A. 1969. *Opisthioglyphe endoloba* (Dujardin, 1845); a parasite of the frog, *Rana esculenta* in Iraq. *Curr. Sci.*, 38: 515-516.
- Saoud, M. F. A. and Roshdy, M. A. 1970. On *Halipegus alhaussaini* n. sp. (Trematoda: Halipegidae) from *Rana esculenta* in Iraq, with notes on *Halipegus* and related genera. *J Helminth*, 44: 349-356.
- Sattmann, H. 1986. Über die Helminthenfauna von *Triturus alpestris* LAURENTI 1768 und *Rana temporaria* L. aus Almtümpeln in Oberösterreich (Amphibia, Plathelminthes und Nematelminthes). *Ann. Naturhist. Mus. Wien*, 87 B: 193-196.
- UNEP. 2003. Earth trends, country profiles. <http://earthtrends.wri.org>
- Wardle, R. A. and McLeod, J. A. 1952. The Zoology of Tapeworms. Univ. Minn. Press, Minneapolis. 780 p.
- Yildirimihan, H. S.; Aydogdu, A.; Ugurtag, Y. H. and Altunel, F. N. 2001. Helminth fauna of *Mertensiella caucasica* (Amphibia) in Turkey. The Sixth National Conference of Parasitology, Sofia, 5-7 October 2001: 28.

الديدان المعوية في ضفدع الاهوار الاوراسي  
*Pelophylax ridibundus* (Pallas, 1771) (البرمائيات) المجموع في  
مدينة الديوانية وسط العراق

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الخلاصة

ان ضفدع الأهوار الاوراسي *Pelophylax ridibundus* من الانواع واسعة الانتشار في العراق. اظهر فحص امعاء ٢٥ من النماذج التي جمعت في مدينة الديوانية في وسط العراق خلال الفترة بين ايلول الى تشرين الثاني ٢٠١٤ وجود دودة شريطية واحدة هي *Nematotaenia dispar* واثنين من الديدان الخيطية هما *Cosmocerca commutata* و *Cosmocercoides variabilis*. وقد تم ادراج نسب الاصابة وشدها في هذا البحث.