

Int. J. Aquat. Biol. (2017) 5(4): 260-262
ISSN: 2322-5270; P-ISSN: 2383-0956
Journal homepage: www.ij-aquaticbiology.com
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Short Communication

Helminth parasites fauna of the green toad, *Bufo variabilis*, Laurenti, 1768 (Anura: Bufonidae) from the Fars Province, Iran

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Abstract: The green toad, *Bufo variabilis* has been a common species of toads in Iran with a wide distribution in most provinces. The main goal of this study was to determine the helminth parasite fauna of *B. variabilis* in southwest of Iran. Among 30 toads inspected for helminth infection from different sites, 100% harbored one or more parasite species. Some toads were afflicted by intestinal obstruction, due to the infection with a large number of cestodes. Twenty-eight cases (93%) had mixed infection with cestodes (in intestine) and nematodes (in lung). Also, a toad was infected with a single monogenean parasite in its urinary bladder. The identified helminth parasites were monogenean, *Polystoma viridis*; cestode, *Nematotaenia dispar* and a species of nematode, *Rhabdias ranae*. This study reports for the first time the presence of nematode species *R. ranae* in *B. variabilis* in Iran.

Article history:

Received 13 June 2017

Accepted 24 August 2017

Available online 25 August 2017

Keywords:

Helminth infection

Polystoma

Nematotaenia

Rhabdias ranae

Introduction

The green toad, *Bufo variabilis* Laurenti, 1768 is one of the most widespread old world amphibian species. It belongs to the family Bufonidae, a widely distributed amphibian families (Degani et al., 2013). *Bufo viridis* is widely distributed in much of Europe, Russia, Mongolia, Mediterranean countries, and central and southwest Asia (Stock et al., 2001). The green toad is an important component of local ecosystems (Vashetko and Siddikov, 1999). In Iran, its populations are widely distributed in most provinces and observed from below sea level to 4600 m above (Balouch and Kami, 2007; Derakhshan and Nokhbat-olfoghahai, 2015).

In recent years, several species of helminth parasites has been reported from different organs of toads from Iran. Mashai et al. (2008) reported one monogenean (*Polystoma viridis*), one cyclophyllid cestode (*Nematotaenia dispar*), and two nematodes (*Rhabdias bufonis* and *Cosmocerca* sp.) in green toads collected from the North and Northeast of Iran. They also recorded Monogenea, *P. viridis*; Digenean,

Haplometra cylindracea; cyclophyllid cestode, *N. dispar* and Nematoda, *Cosmocerca ornata*, *C. commutata*, *R. bufonis* and *Aplectana* sp. from toads in different parts of Iran (Mashai, 1999; Mashai et al., 2000; Mashai, 2005; Massoud and Farahnak, 1994). These studies seem not enough and thus more precise investigations are still required to identify the complete fauna of helminthes in toads (Dusen, 2011; Mohammad, et al., 2010). Therefore, the present study was conducted to determine the parasitic fauna of *B. variabilis* in the Fars Province, southwest of Iran.

Materials and Methods

A total of thirty adult green toads were collected by hand from different locations in the Fars Province (29.1044°N, 53.0459°E), southwest of Iran. The frog carcasses transferred to the laboratory and dissected. The body cavity was opened by a longitudinal ventral incision and the alimentary canal was excised. Then, the contents of each organ (lungs, liver, gall bladder, kidneys and urinary bladder, and intestine) were

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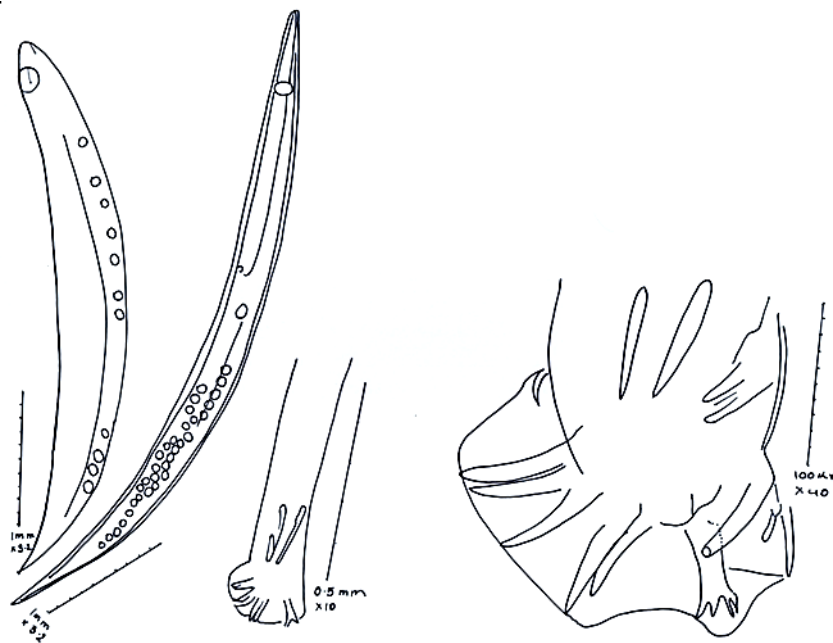


Figure 1. *Rhabdias ranae* Walton, 1929 (a, b): Posterior end of male, and (c) female.

mixed with 0.5% saline solution, poured into petridishes and examined under a stereomicroscope. The lungs were cut and checked out for infection. The worms were cleaned in saline and fixed in 70% ethanol. Monogeneans and cestodes were fixed in 70% alcohol while being slightly pressed between two glass slides, stained with acetocarmine, dehydrated in a series of alcohol concentrations of 80%, 90% and 100%, cleared in xylene and mounted in Canada balsam. Nematodes were cleared in lactophenol for examination. All the specimens were investigated morphologically by microscopic observations and identified based on Khalil et al. (1996) and Yamaguti (1959).

Results and Discussion

Despite its importance, the parasitic fauna in Iranian toads has received little attention from researchers (Mashaii, 1999, 2008; Massoud and Farahnak, 1994; Combes and Knoepffler, 1972). All collected toads were infected with at least one parasite. Helminth parasites of *B. viridis* were the monogenean, *B. variabilis* in the urinary bladder, and the cyclophyllid cestode, *N. dispar* and the nematodes, *R. ranae* (Fig. 1) in the intestine.

One of the toads was infected with only one

monogenea, *P. viridi*. Twenty-eight out of thirty toads (93.3%) had mixed infection with cestodes and nematodes. Except the nematode *R. ranae*, *P. viridis* and *N. dispar* has been previously reported as parasite of *B. variabilis* in various regions of Iran (Mashaii, 2005; Mashaii et al., 2008); It is also noteworthy that *N. dispar* has a wide distribution in amphibians and reptiles all over the world except Nearctic region (Prudhoe, 1982).

In this study, the nematode *R. ranae* was found in *B. variabilis* for the first time in Iran; however previous studies have reported one different species, *R. bufonis* (Mashaii, 2005; Mashaii et al., 2008). The nematode genus *Rhabdias*, Stiles et Hassall, 1905 is a world-wide distributed group of parasitic nematodes. Most species of the genus inhabit the lungs of amphibians (Kuzmin, 2005). *Rhabdias* species have a direct life cycle (toad to toad infection) and also a very short life span. They, therefore, represent a potential model for searching the mechanisms involved in a number of phenomena of biological matters, such as transmission, genetics and ageing processes (Saeed, 2007). The results of this works could contribute for increasing the current knowledge on geographic distribution of parasite species and also their relationships with their hosts.

Acknowledgments

We would like to thank Dr. Mobedi, M. Ahoo and A.M. Alavi for their kind assistances.

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چکیده فارسی

فون انگل‌های کرمی وزغ سبز (*Bufo variabilis*, Laurenti, 1768 (Anura: Bufonidae) در استان فارس، ایران

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چکیده:

وزغ سبز (*Bufo variabilis* Laurenti, 1768) گونه‌ای شایع از وزغ‌های ایران است که در بسیاری از استان‌ها پراکنش وسیعی ای دارد. هدف این مطالعه تعیین میزان آلودگی انگل‌های کرمی *B. variabilis* در جنوب غربی ایران می‌باشد. از بین ۳۰ وزغ که از نواحی مختلف بررسی شد، ۱۰۰ درصد آن‌ها دارای یک یا چند گونه انگلی بودند. برخی از آنها به علت آلودگی شدید با سستودها دچار انسداد روده شده بودند. ۲۸ مورد (۹۳ درصد) دارای عفونت همزمان به سستودها (روده) و نماتودها (ریه) بودند. همچنین یکی از وزغ‌ها در کیسه مثانه به یک انگل مونوژن آلوده بود. کرم‌های انگلی تشخیص داده، مونوژن: *Polystoma viridis*، سستود: *Nematotaenia dispar* و تنها یک گونه نماتود *Rhabdias ranae* بودند. این مطالعه برای اولین بار حضور نماتود *R. ranae* در وزغ *Bufo variabilis* در ایران را گزارش می‌دهد. کلمات کلیدی: آلودگی کرمی، *Rhabdias ranae*، *Nematotaenia*، *Polystoma*.