New Records About Helminth Parasites of the Marsh Frog, *Rana ridibunda ridibunda* (Anura : Ranidae) from the North of Iran

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Abstracts: A field trials were conducted to assess the helminth parasites of 12 marsh frogs (*Rana ridibunda ridibunda*) in the Anzali, Astara and Aghbaba regions in the north of Iran in May 1994. Experimental results showed that 83.8% of the Anzali marsh frogs were infected by one or two kinds of metacercarian cysts of digenetic trematodes. The helminth parasites were included Skrjabineoeces breviansa, S. simlis, Gorgodera dollfusi, Opisthioglyphe ranae, Prosotocus confessus, Encyclometra colubrimurorum and Codonoccephalus urniger. Frogs collected form the Astara region were infected by the helminth parasites such as Diplodiscus subelavatus, *P. confessus*, C. urniger and Cosmocerca ornata. There was only one digenetic trematodes cysts such as Pleurogenoides medians in the Aghbaba region. In this paper, except the S. simlis, C. urniger and *O. ranae* we report 7 new helminth parasites in the north Iranian freshwater systems for the first time.

Key Words: Parasite, Helminth, Digenea, Nematode, Frog, Iran

Introduction

*R. ridibunda ridibunda*, is among the most common marsh frog which is found in a wide variety of aquatic habitats of the Iranian freshwater systems, except in some small area of Southeast. The infection of the marsh frog in the
Anzali port city, Astara and Aghbaba regions by helminth parasites were reported by Combes and Knoepffler in 1972. They also had reported 5 different parasites of marsh frog on the *R. ridibunda ridibunda* such as *Acanthocephalus ranae* Schrank, 1788; *Opisthioglyphe ranae* Frohlich, 1791; *Haematoloechus variegatus* Rudolphi, 1819; *H. similis* Looss, 1899; *Gorgodera microovata* Fuhrmann, 1924 and the *Prosotocus fueleborni* Travassos, 1930. The objective of this research was to examine the better understanding of the helminth parasites of *R. ridibunda ridibunda* in the Iranian frog community. Also, some new records of helminth parasites at all experimental sites introduced.

**Materials and Methods**

On May 1994, 12, 2 and 4 specimens of the adult marsh frog (*Rana ridibunda ridibunda*) were randomly collected from the 3 experimental sites in the north of Iran. Experimental sites were Anzali port and Astara in the Guilan province and Aghbaba region in the Ghazvin provinces receptively (Fig. 1).

![Figure 1: Map of sampling sites](image-url)
To determine the parasites cysts in the frog bodies, samples were dissected immediately after collection. The frog body were separated to urinary bladder, lungs, stomach, intestine and liver in the different Petri dishes. The Petri dishes were sealed with sodium chloride in the low light microscope at 12x magnification. The helminth parasites were separated and fixed into the 10% formalin. Thereafter, they stained in the carmine alum mounted in the Canade balsam on microscope slides. The parasitic species were examined according to the procedures used by Skrjabin (1964); Vojtkova (1974); Vojtkova & Vojtek (1975); Smyth & Smyth (1980) and Prudhoe & Bray (1982). The confirmation of helminth parasites was carried out by the London Natural Museum History.

Results

Experimental results showed those 7 adult digeneans, 2 digenetic trematodes and 1 nematodes were found on *R. ridibunda ridibunda* in all experimental sites. The Anzali lagoon frogs were infected by 5 digenetic trematodes and 2 metacercarian cysts (Table 1).

<table>
<thead>
<tr>
<th>Parasite</th>
<th>Microhabitats</th>
<th>Prevalence</th>
<th>No. of Hosts</th>
<th>Mean Intensity (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Skrjabinoeces breviansa</em></td>
<td>Lungs</td>
<td>8.3</td>
<td>1</td>
<td>$(\pm) 3$</td>
</tr>
<tr>
<td><em>Skrjabinoeces similis</em></td>
<td>Lungs</td>
<td>16.7</td>
<td>2</td>
<td>$(\pm) 1.5$</td>
</tr>
<tr>
<td><em>Gorgodera dollfusi</em></td>
<td>Urinary bladder</td>
<td>8.3</td>
<td>1</td>
<td>$(\pm) 2$</td>
</tr>
<tr>
<td><em>Opisthioglyphe ranae</em></td>
<td>Intestine</td>
<td>41.7</td>
<td>5</td>
<td>$(\pm) 9.2$ (6.54)</td>
</tr>
<tr>
<td><em>Prostotocus confusus</em></td>
<td>Intestine</td>
<td>8.3</td>
<td>1</td>
<td>$(\pm) 6$</td>
</tr>
<tr>
<td><em>Encyclometra</em></td>
<td>Liver</td>
<td>8.3</td>
<td>1</td>
<td>$(\pm) 1$</td>
</tr>
<tr>
<td><em>Codonocephalus urniger</em></td>
<td>Body cavity,</td>
<td>33.3</td>
<td>4</td>
<td>$(\pm) 10.5$ (8.22)</td>
</tr>
<tr>
<td></td>
<td>peritoneum,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>mesenteries</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Metacercarian cysts were included *E. colubrimurorum* and *C. urniger*; *S. similis* and *O. ranae* were reported by Combes and Knoepffler in 1972. The *S. similis* and *O. ranae* helminth parasites were reported from Chahar Mahal-o-
Bakhtiari provience in the Southwest of Iran by Mashaii (1999). Most specimens of marsh forges (83.3%) in the Anzali lagoon were infected by one or two species of digenetic trematodes such as *S. breviansa*, *S. similis*, *G. dullfusi*, *O. ranae* and *P. confusus* (Fig. 2). There were no significant differences (P<0.05) between the size of marsh frogs in the range of 3.4 to 4.41 cm which female. The other helminth parasites on marsh frog in the Anzali region was first introduced.

There were 2 adult digenetic trematods species including: *Diplodiscus subclavatus* and *Prosotocus confusus*, one metacercarian cyst: *Condonocephalus urniger* and one nematode species: *Cosmocerca ornata* in the body of experimental marsh frogs collected from the Astara region. Although, in the Aghbaba region, there was only an infected marsh frog with *Pleurogenoides medians* (Table 2).

Table 2: Parasites of *Rana ridibunda* *ridibunda* from Astara and Aghbaba regions, their microhabitat, number of infested hosts and number of parasites in each host

<table>
<thead>
<tr>
<th>Sites</th>
<th>Parasites</th>
<th>Microhabitats</th>
<th>Num. of hosts</th>
<th>Num. of parasites</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>Diplodiscus subclavatus</em></td>
<td>Rectum</td>
<td>2</td>
<td>7.17</td>
</tr>
<tr>
<td>Astara</td>
<td><em>Prosotocus confusus</em></td>
<td>Intestine</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Aghbaba</td>
<td><em>Condonocephalus urniger</em></td>
<td>Body cavity, peritoneum, mesenteries</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td><em>Cosmocerca ornata</em></td>
<td>Rectum</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><em>Pleurogenoides medians</em></td>
<td>Urinary bladder</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Except *C. urniger*, all helminth parasites found in Astara and Aghbaba regions were new records reported first in Iran. All the marsh frogs helminth parasites which found in the experimental sites were recorded in Russia, some African countries and east of Europe (Vojtkova, 1974; Vojtkova & Vojtek, 1975; Moravec et al., 1987) (figs. 2 to 10).

There were no significant differences in helminth parasites taxonomy between experiment of sites and neighbouring countries. Compare to Moravec et al., (1987) results who reported 5 pairs of plectans on the tail of *C. ornata*, this study showed eight pairs on it (plate 1).
Figure 2: *Skrabinoces breviansa*  
(Scale bar: 1 mm)

Figure 3: *Skrabinoces similis*  
(Scale bar: 1 mm)
Figure 4: Gorgodera dollfusi
(Scale bar: 1 mm)

Figure 5: Opisthioglyphe ranae
(Scale bar: 1 mm)
Figure 6: Proxotocus confusus  
(Scale bar: 1 mm)

Figure 7: Encyclometra colubrimurorum  
(Scale bar: 1 mm)
Figure 8: *Codonocephalus urniger*
(Scale bar: 1 mm)

Figure 9: *Diplodiscus subclavatus*
(Scale bar: 1 mm)
Figure 10: *Pleurogenoides medians* (Scale bar: 1 mm)

Plate 1: Body end of male *Cosmocerca ornata*, ornamented with a large gubernaculum and eight pairs of plectanes (x 50)
Discussion

Amongst 12 marsh frogs, *R. ridibunda* ridibunda specimens collected from Anzali region, 2 specimens (16.2%) had no helminth parasites, 10 others (83.3%) were infected with one or two kinds of digenetic trematodes, including *Skrjabinoecest breviansa* Sudarikov, 1950; *S. similis* (Loos, 1899) Sudarikov, 1950; *Gorgodera dollfusi* Pigulevski, 1946; *Opisthioglyphe ranae* (Frölich, 1971) Loos, 1907; *Prosotocus confusus* Looss, 1894 or their metacercarian cysts, *Encyclometra colubrimurorum* (Rudolphi, 1819) Dollfus, 1931 and *Codonocephalus urniger* (Rudolphi, 1819) Lühe, 1909. *S. similis* and *O. ranae* were previously reported from Bandar Anzali (Pahlavi) (Combes and Knoepffler, 1972). *S. similis* and *C. urniger* were also reported from southwest of Iran (Mashaii, 1999). Other parasite species are recorded from Iran for the first time. Samples collected from Astara region were infected with *Diplodiscus subclavatus* Pallas, 1760; *P. confusus*; *C. urniger*; and *Cosmocerca ornata* Diesing, 1861. Only *Pleurogenoides medians* Olsson, 1876; was found in one of samples collected from Aghbaba. Except *C. urniger*, parasite species found in frogs from Astara and Aghbaba regions are also reported from Iran for the first time. All ten parasite species mentioned above, reported from western, southern and southwestern Republics of Russia and some of East European countries (Vojtkova, 1974; Vojtkova & Vojtek, 1975; Moravec et al., 1987; see also The Checklist of Helminth Parasites of Amphibia, 1982).

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References