

# Endoparasitic nematohelminthes collected from inside frog *Rana ridibunda* (Pallas, 1771) in two rivers near Baghdad/Iraq

Saad Muhi Arif

Al-Rasheed Private University College/Iraq

## Abstract

A total of 200 frogs were examined for helminthes. Specimens were collected within three seasons (summer, spring and winter 2017). Specimens of frogs *Rana ridibunda* were collected from two sites, Dijla arm river edge and Diala river edge (site 1 and site 2). Results showed there were four species of round worm helminthes located at four locations in the body of frog (lungs, small intestine, large intestine and body cavity). The intensity infections were higher in spring season and less in summer season, and the lower infections were in winter season. The order of intensity infections were large intestine > lungs > body cavity > small intestine respectively with the worms of genus of ornate, genus commutate, genus excises and then genus befonis for each site.

Results showed that food supplying, mating season, water temperature and individual activities were playing an important role on the gained results and the important factor was the organic pollution in site 2 (Diala river) comparatively with site 1 (Dijla river)

**Keywords:** Helminthes, *Rana ridibunda*, amphibian, nematohelminth.

## INTRODUCTION

Iraq generally is considered poor in amphibian species due to the nature of most of its parts with a number of species not exceeds eleven (1). Among them, the urasian marsh and rivers frog *Rana ridibunda* (Figure 1) which is a widespread species in western central and eastern Europe and ranges as far east wards as eastern Kazakhstan (2). It is native and relatively common also in suitable aquatic areas from north to south of Iraq (3).



Figure 1 *Rana ridibunda* frog external image

The Eurasian marsh frog *Pelophylax ridibundus* is a widespread species in Iraq. Examination of intestine of 25 marsh frogs collected in Al-Diwaniya city (4).

The Eurasian marsh frog, *Pelophylax ridibundus* (Formerly known as *ridibunda*), is a medium sized semi aquatic anura species.

*Pelophylax ridibundus* inhabits lakes, pools, or slow flowing streams. It is a highly opportunistic diurnal amphibian, living in mixed and deciduous forests, forest steppe, steppe and other grasslands, semi-desert and desert zones, and areas are largely colonized through river valleys and channels. *Pelophylax ridibundus* open well-warmed areas with abundant herbaceous vegetation (5).

Many researchers tried to determine the feeding habits of the frog

*Rana ridibunda* by the analysis of the stomach contains on both male and female, they found that the frog diet contains of a wide variety of arthropods like dipteral, coleopteran, odonata and so on.

This frog has a wide range of food, like small fish, worms, snails, and small vertebrate animals.

The diet data would also be useful in understanding the predatory role of this frog in the ecology of food chains and food webs. (6) (7).

Frog *Rana ridibunda* is the largest frog native to Europe and belongs to the family of true frogs (Figure 1). It is very similar in appearance to the closely related edible frog and pool frog. These three species now again in the genus *Pelophylax* are often referred to as "green frogs" to distinguish them from the more terrestrial European *Rana* species, which are known as "brown frogs". The marsh frog is a water-dwelling, generally green-colored frog species. It can reach a maximum length of 17 centimeters, but males remain smaller (around 12 cm). The head is proportionally large and 2<sup>nd</sup> legs are long, which gives them excellent jumping abilities (8).

*Rana ridibunda* frog is not the only one frog infected by other kinds of helminths, *Bufo viridis* frog and *Hylaborea* frog infected by platyhelminths, nematohelminths and acanthocephalan species, the infections depend on the nature of habitat, types of food and its abundance. This fact is depending on seasons of the year (9).

The parasites of *Rana* frogs were little studied. The aim of this study therefore was establish an initial helminth for *Rana ridibunda* and also determine their helminth richness and diversity.

## MATERIAL AND METHODS

Frogs were collected from the edge of the two rivers (Tigers and Diala rivers) (Figure 2), the total of 200 frogs captured by hand or using a long stick net for each

experimental season (summer, winter and spring, 2017-2018). Amphibians were scarified (Killed) using chloroform and then dissected and examined for their. Nematohelminths parasites inhabit inside small and large intestine, lung and body cavity of frog.



Figure 2 Map of Iraq showing its rivers (site 1, site 2)

**Isolation of the parasites**

Parasites were placed separately in a Petri dish containing amphibian saline. Contents were clean in saline and examined under a dissecting microscope. Parasites were fixed using hot water and then put into 70% alcohol included 5% glycerin. Specimens stained using acetocarmine for clear identification.

Frogs sex (Male and Female) were neglected experimentally within the 50 collected individuals (10), (11) were used.



Figure 2 *Cosmocera commutate*



Figure 3 *Eustrongyldes excises*



Figure 1 *Cosmocera ornate*



Figure 4 *Rabdia bufonis*

## RESULTS AND DISCUSSIONS

The present study results has showed the distribution and parasitism of the four studied worms, that are found inside four parts within the body of the frog on the three seasons, and they were concentrated in a higher numbers inside the large intestine with the Ornate species (Figure 3) and less with the commutate species (Figure 4) inside the frog lungs.

The small number was for the excises species (Figure 5) inside the body cavity, whereas the smallest number was inside the small intestine (Table 1 and table 2).

The ornate species showed the higher number at spring season and less at summer season and the lower number at winter season (Table 3), this can be explained that at spring season the mating may need more feeding and more activity while at autumn the activity will be lower, this behavior was the same with the other three studied species. In the winter season there was no appearance for the species excises and befonis (Figure 6), (0%) inside body cavity of the frog and inside the small intestine and they were preferred not to exist inside such places but inside the large intestine and lungs of the frogs (Tables 4 and 5) (9).

Results obtained showed that the worms behavior was differ with each species, because each one preferred one or more locality to settle in it.

Generally it seems that the distribution of these parasites were so higher for the samples get from the site (2) rather than get from site (1), and that could explained by the increase of organic pollution and for the food supplying for these worms, and this may encourage the active reproduction for these parasites, in addition the differences of water temperature may affect by the differences of temperature at different seasons. In winter season there was no infections with the less activity, low food and get the hibernation (Table 6) (12).

Table 1 prevalence of Nematohelminths inside the *Rana ridibunda* frogs at spring season from site (1) Tigris river

Parasite	No's of Examined	No's of Infected	No's of % of infection	Site of infection
1. <i>Cosmocerca ornata</i>	50	25	50%	Large intestine
2. <i>Cosmocerca commutate</i>	50	20	40%	Lungs
3. <i>Eusronglydes excises</i>	50	15	30%	Body cavity
4. <i>Rabdiabufonis</i>	50	10	20%	Small intestine

Table 2 Prevalence of Nematohelminths inside the *Rana ridibunda* frogs At summer season from site (1) Tigris river

Parasite	No's of Examined	No's of Infected	No's of % of infection	Site of infection
1- <i>Cosmocerca ornata</i>	50	18	36%	Large intestine
2- <i>Cosmocerca commutate</i>	50	12	24%	Lungs
3- <i>Eusronglydes excises</i>	50	10	20%	Body cavity
4- <i>Rabdiabufonis</i>	50	5	10%	Small intestine

Table 3 Prevalence of Nematohelminths inside the *Rana ridibunda* frogs At winter season from site (1) Tigris river

Parasite	No's of Examined	No's of Infected	No's of % of infection	Site of infection
1- <i>Cosmocerca ornata</i>	50	6	12%	Large intestine
2- <i>Cosmocerca commutate</i>	50	4	8%	Lungs
3- <i>Eusronglydes excises</i>	50	0	0%	Body cavity
4- <i>Rabdiabufonis</i>	50	0	0%	Small intestine

Table4 Prevalence of Nematohelminths inside the *Rana ridibunda* frogs At spring season from site (2) Diala river

Parasite	No's of Examined	No's of Infected	No's of % of infection	Site of infection
1- <i>Cosmocerca ornata</i>	50	40	80%	Large intestine
2- <i>Cosmocerca commutate</i>	50	32	64%	Lungs
3- <i>Eusronglydes excises</i>	50	26	52%	Body cavity
4- <i>Rabdiabufonis</i>	50	17	34%	Small intestine

Table5 Prevalence of Nematohelminths inside the *Rana ridibunda* frogs At summer season from site (2) Diala river

Parasite	No's of Examined	No's of Infected	No's of % of infection	Site of infection
1- <i>Cosmocerca ornata</i>	50	23	46%	Large intestine
2- <i>Cosmocerca commutate</i>	50	18	36%	Lungs
3- <i>Eusronglydes excises</i>	50	15	30%	Body cavity
4- <i>Rabdiabufonis</i>	50	12	24%	Small intestine

Table 6 Prevalence of Nematohelminths inside the *Rana ridibunda* frogs At winter season from site (2) Diala river

Parasite	No's of Examined	No's of Infected	No's of % of infection	Site of infection
1- <i>Cosmocerca ornata</i>	50	12	24%	Large intestine
2- <i>Cosmocerca commutate</i>	50	5	10%	Lungs
3- <i>Eusronglydes excises</i>	50	0	0%	Body cavity
4- <i>Rabdiabufonis</i>	50	0	0%	Small intestine

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