



Original Article

The role of *Pelophylax ridibunda* (Marsh frogs) in food chain, northern provinces of Iran.

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Abstract

Among Anuras, *Pelophylax ridibunda* has great interest in living in farms and fields. This species can always be seen in the vast areas of rice fields, particularly in North of Iran. Therefore, they have always been important because of their close relationship with crops there is a debate as whether these animals can be used as biological pest control in the fields?

So that, the type and method of their nutrition is specifically important from the perspective of agriculture and conservation of natural resources.

This study is an attempt to investigate the diet of *Pelophylax ridibunda*s around Caspian Sea and its effect on pest control in rice fields. For achieving this aim, 112 samples were collected from 14 stations in the North of Iran between 2009-2010. After being hunted, they were anesthetized and got an injection of formalin in their stomachs. Then all the samples were moved to laboratory, and after being coded, they were fixed. Their stomach contents were removed and identified. The results indicated that the frequency of these animals is the only factor determining their nutrition kind. It is also indicated that females eat more plants and have a stronger tendency toward cannibalism. These characteristics of *Pelophylax ridibunda* leave no doubt that they are one of the natural pest controls that can regulate the frequency of pests in the fields.

Keywords: *Anuras, Nutrition, Iran, Rana ridibunda*

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INTRODUCTION

Among amphibians, Ranidae family with 6 subfamilies, 3 genera and 500 species is the most important anura family (Poesen et al., 2003), it has been reported 1 species from *Pelophylax* in Iran (Molavi, 2000). *Pelophylax* genus has wide distribution (San Mauro et al. 2005) and is seen in all areas of the world.

As this genus of Marsh frog live in agricultural farms (Weyrauch and Grubb, 2004 and Smiley et al., 2007), it has been always discussed as a biological pest control factor (Maul et al., 2005). A brief study about this subject was begun by these authors in 2000 that was not continued but because of the importance of this animal for the precious agricultural crops, this research was done for fulfillment and complement of this aim.

As *Pelophylax ridibunda* (Marsh frog) are very interested in living in rice fields and damp agricultural farms, (Henning and Schirato, 2006) so that, if it is determined that their diet has relation with the pests of these farms, their cultivating and preserving will be beneficial to farmers.

MATERIAL AND METHODS

Sampling was carried out in Northern provinces of Iran in 2009-2010 from 14 stations and 8 samples from each station were achieved. (Fig 1, Table 1).

The stations were chosen in a manner that included different habitats. The Sampling was done in sunset time with specific long handled nets.

After trapping the samples, they received field codes and anesthetized by chloroform and

formalin 10 % was injected to their Venter by syringe and they were taken to zoological lab of Islamic Azad University, Branch of Mashhad. As the food is changed in the posterior end of the intestine, the contents of the stomachs were just studied. For doing this, the stomachs of the samples were expelled and the food present in the stomachs was put

in a Petri contained alcohol70 %, then, the semi digested animals were inspected by the help of lob.

Identification of the achieved samples was done by the common keys (Hojat, 1996 and Esmaili et al., 1995) at the family level.



Fig 1. Geographic map of the sampling stations

Table1.Characteristics of sampling stations.

Stations	Longitude	Latitude	Number males	Number females	Height(m)
Alangdarreh,Gorgan-Golestan	54 27	36 26	8	4	200
Naharkhoran,Golestan	54 27	36 26	6	6	155
Ziyarat village-Gorgan-Golestan	54 24	36 54	5	1	250
Aghghala-Golestan	54 25	37 00	3	2	00
Alagol pond-Golestan	54 36	37 17	4	1	00
Zaghmarz-Mazandaran	53 33	36 43	9	2	-10
Ziyaratmahalle-Mazandaran	53 24	36 39	6	4	-8
Fereydounkenar-Mazandaran	53 23	36 50	1	3	-10
Chalous-Mazandaran	51 40	36 27	—	3	-25
Langaroud-Mazandaran	50 09	37 13	—	3	-10
Lestoukelaye-Gilan	50 00	37 20	2	2	-20
Anzali lagoon-Gilan	49 27	37 29	15	6	-25
Anzali port-Gilan	49 25	37 28	—	2	15
Siyahdarreh-Gilan	49 08	37 07	6	13	10

RESULTS

Regarding to results and studies that were reported before, nutrition in anuras are dependent on two factors (Peltzer et al., 2006): 1- The size of the prey and 2- The abundance of it. Specially the abundance of food in the environment has direct relation with the frequency of that food in anuras.

Regarding to this conclusion, that is observed in other amphibians, this study is carried out specifically on *Pelophylax ridibunda*.14 stations in north of Iran were covered for sampling and 8 samples were described from each station.

In this species which is a very gluttonous animal, (Molavi et al., 2011) various food has

been observed. Every food that fits with the animals' mouth size is swallowed by them.

It seems that the taste of different food is similar for this animal. Very small food like ants to big food like tree frogs and Marsh frogs were gained from its stomach. Eating big animals by this species was reported before, too (Gardner et al., 2007).

The amount of plants in their stomach was very little and scanty. Especially in males, there is no tending for herbivores but females particularly with big built show more interest for eating plants. There are other differences in choosing food between two genders that is shown in figure 2.

The high motive animals like bees, beetles, aphises are hunted by males but females feed low motive creatures or more abundant like larva's of insects, plants, ants, snails, Daphnis

and flies, It seems that females don't want to spend a lot of energy for hunting but males do this. Figure 3, indicates the differences of the stomachs' content relating to habitats.

For example, in flowing water that there are lots of spiders and larva's, these animals are the main food .In Marsh areas, Daphnis and beetles are present in their stomachs, because of the abundance of these samples. In fields which the aphises and locusts are present in large number, these samples can be observed in their stomachs. So that, In the nutrition of these animals, addition to the size of food, abundance of it is a very important factor for choosing the type of food, certainly, males tend too much to eat variable food and sometimes make an effort to hunt scarce or high motive animals by spending energy.

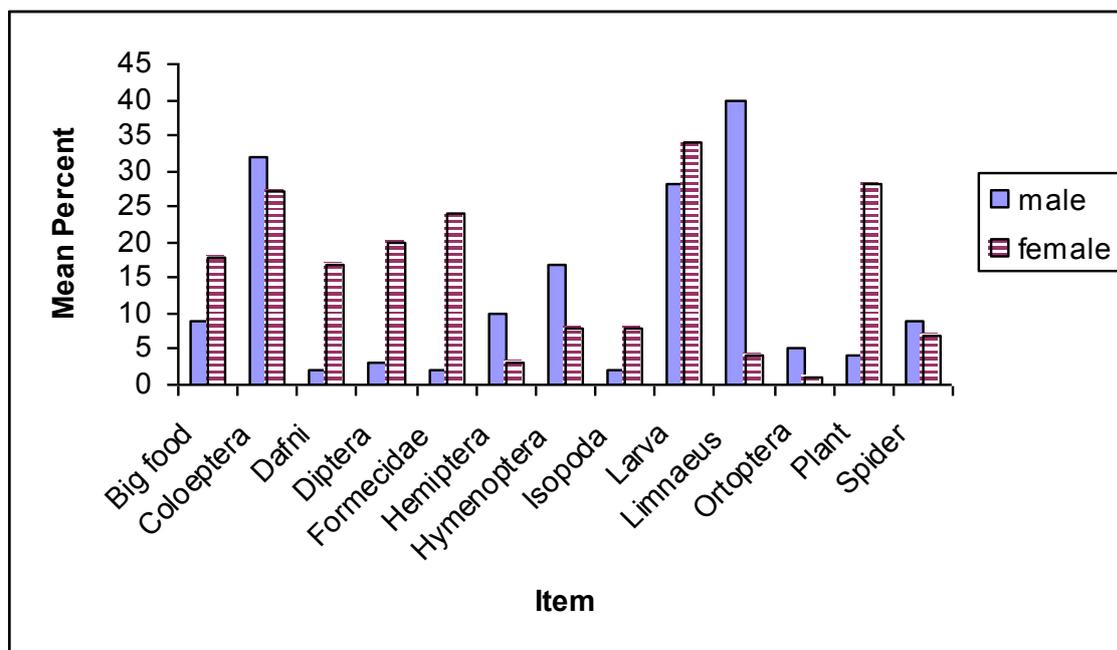


Fig 2.The nutrition diet in *Pelophylax ridibunda* in males and females.

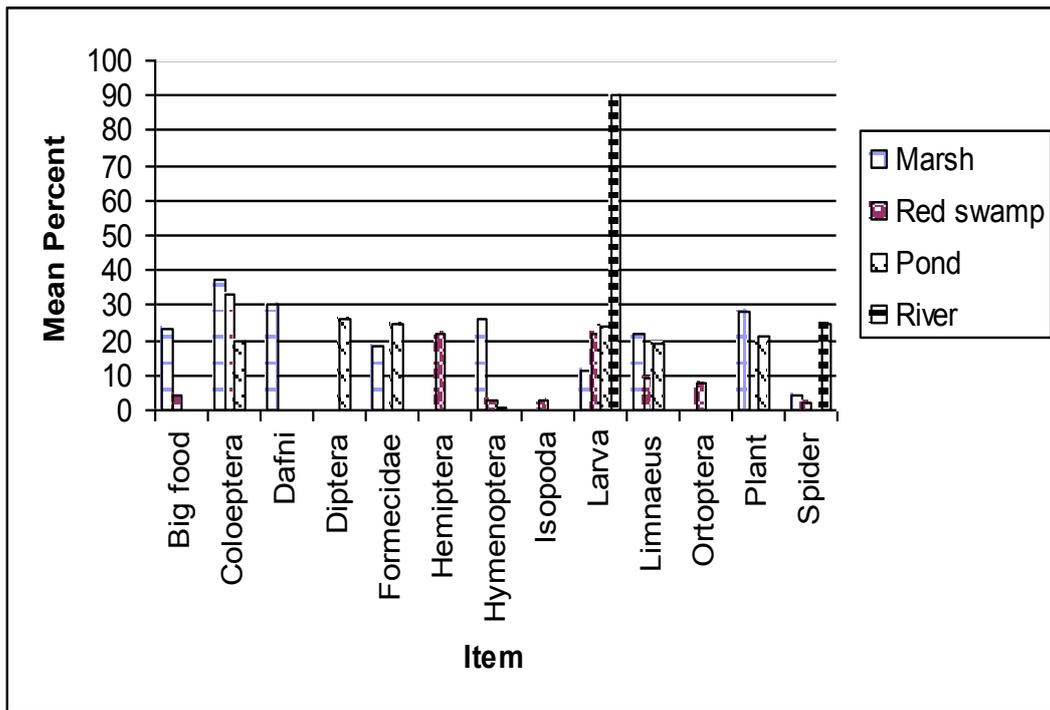


Fig 3. Nutrition diet of *Pelophylax ridibunda* in different stations

Figure 4, shows the abundance percentage of each food compare to total food that larvas, beetles, snails and plants are identified as more abundant food respect in their diet. As it can be observed, the main diet of these animals is carnivority, every kind of meat even died animals can be considered as their food. As arthropods and different types of larvas are the fleshiest food in their habitat, they constitute their main nutrition.

In another words, every abundant arthropod in their living environment can be their main food, it means that these animals (*Pelophylax ridibunda*) can be appropriate biological pest controls for our fields.

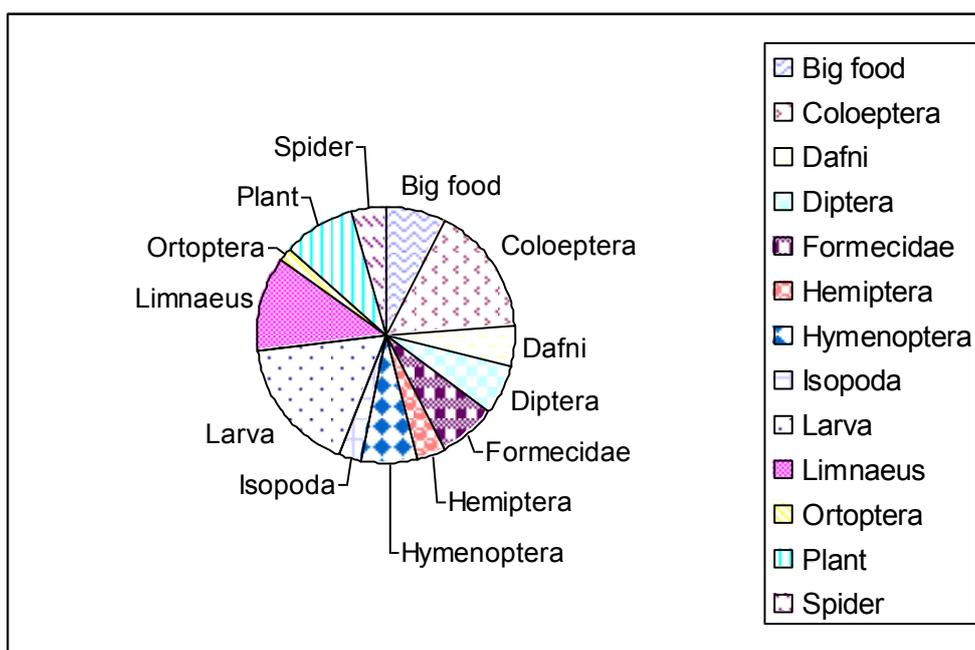


Fig4. The abundance percentage of found preys in the stomach of *Pelophylax ridibunda*

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