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FEEDING HABITS IN *RANA ESCULENTA* COMPLEX

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***Key words**: amphibians, food, Ciric River*

INTRODUCTION

Green frogs food was studied by numerous authors. It is known that food vary according to habitat and season. Ciric river basin is important because of the presence of artificial ponds populated by frogs. These ponds are located in the outskirts of Iaşi town. (North-eastern part). Amphibians, especially green frogs, by their abundance, are an important component of the ecosystem. The aim of the study was to determine the feeding habits in *Rana esculenta* complex and to complete the research run in the region so far.

MATERIAL AND METHOD

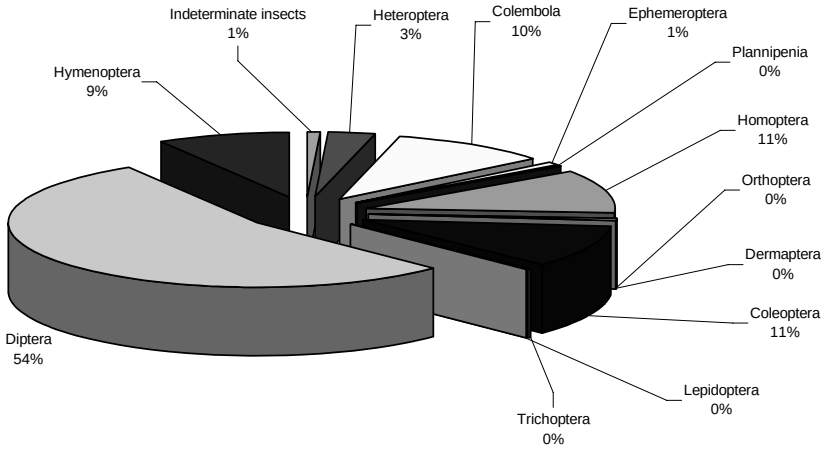
The frogs were collected from the Ciric river basin (Iaşi County) in March-October 2005. We analysed the stomach contents of 128 individuals. Adults were caught by dip-netting while the stomachal flush method was used for the content that was further kept in absolute ethanol. For preys identification we utilised the binocular. We determined prey types and calculated the relative abundance of preys (Ar% = percentage of the total number of preys accounted for each prey type).

RESULTS AND DISCUSSIONS

In the 128 frog individuals investigated were found 1080 preys belonging to 88 taxa (table 1).

Best-represented order of insects was Diptera (53.91%), suited by Homoptera (10.88%), Coleoptera (10.67%) and Colembolla (10.25%) (Fig.1).

Fig. 1 Insects abundance spectre in the food of *Rana esculenta* complex



Insects were dominant (87.59%) with 12 orders, suited by crustaceans (5.74%) and oligochetes (1.94%) (Fig. 2).

4% from the amphibian specimens manifested cannibalism, (juveniles and tadpoles of the same species were identified in their stomachs).

Among the 128 stomachs, 13 were empty (10.15%), and about one half presented vegetables, seeds and solid materials (sand, little rocks).

A literature comparative study revealed that many authors have found similar results: Sin Gh. et al., 1975 (Homoptera 29.15%, Diptera 23.6%, Amphibia 8.61%), Valenciuc N., Ion I., 1986 (Diptera 30.08%, Coleoptera 22.66%), Chiminello A., Generani M., 1992 (Hymenoptera 16.45%, Coleoptera 16.45%), Ghira I. et al., 1997 (Izopoda 25%, Diptera 10.38%), Cogălniceanu et al., 2000 (Coleoptera 24.4%, Diptera 13.1%),. Similar researches in Ciric ponds showed the following data: Vancea S. et al., 1960 (Coleoptera 31.25%, Diptera 27.94%), Nicoară A. et. al., 2004 (Diptera 49%, Colembola 17%, Coleoptera 10%, Crustacea 10%).

Prey types founded in the food of *Rana esculenta* complex were: 32.47% aquatic and 67.52% terrestrial.

Fig. 2 Preys abundence spectre in food of *Rana esculenta* complex

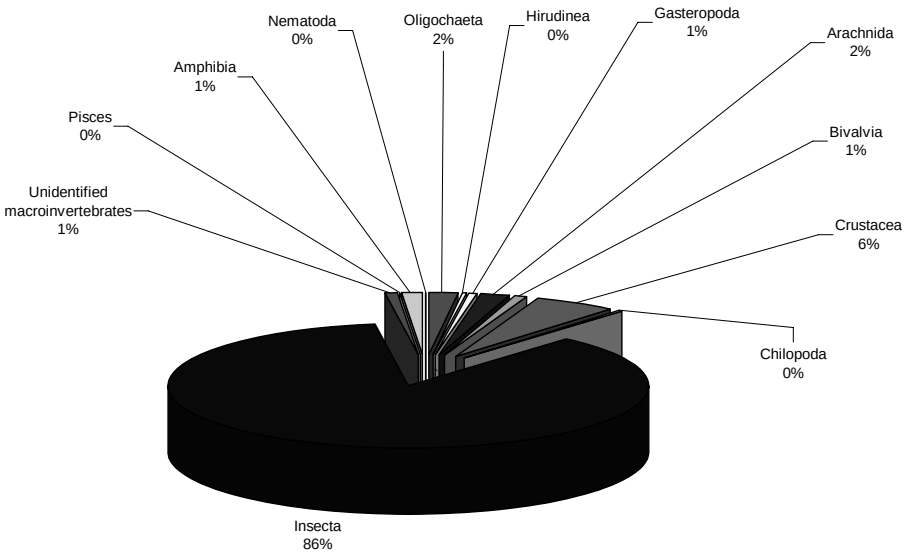


Table 1. Food spectre in *Rana esculenta* complex

Nr. crt.	Taxa	No. ind.	Ar %
1	**Nematoda**	1	0.09
2	**Oligochaeta**	14	1.29
3	Lumbriculidae	7	0.64
4	**Hirudinea**	1	0.09
5	**Gastropoda**	1	0.09
6	*Radix ovata*	2	0.18
7	*Physa acuta*	3	0.27
	Bivalvia		
8	*Sphaerium lacustre*	1	0.19
	Crustacea		
9	Ostracoda	19	1.75
10	*Cypris* sp.	4	0.27
	Cladocera		
11	*Chidorus* sp.	2	0.18
12	*Alona* sp.	1	0.09
13	Copepoda	1	0.09
14	Isopoda (terrestrial)	3	0.27
15	*Asellus aquaticus*	2	0.18
16	Amphipoda	1	0.09
17	Gammaridae	29	2.68
18	**Araneida**	23	2.12
	Chilopoda		
19	*Lithobius forficatus*	1	0.09
	Insecta		
20	Indeterminate insects	7	0.64
	Collembola		
21	*Podura aquatica*	91	8.42
22	*Sminthurides* sp.	6	0.55
23	**Ephemeroptera**	7	0.64
24	Baetidae	1	0.09
25	**Heteroptera**	4	0.27
26	*Nepa rubra*	2	0.18
27	*Gerris* sp.	1	0.09
28	*Corixa* sp.	2	0.18
29	*Hydrometra* sp.	1	0.09
30	*Sigara* sp.	19	1.75
31	*Micronecta* sp.	1	0.09
	Plannipenia		
32	Sysiridae	2	0.18
33	**Orthoptera**	1	0.09
	Dermaptera		
34	*Forficula auricularia*	3	0.27
	Homoptera		
35	Aphidoidea	98	9.07
36	Cicadoiea	5	0.46
	Coleoptera		
37	Larvae	3	0.27
38	Adults	4	0.27
39	Carabidae	16	1.48
40	*Zabrus tenebrioides*	2	0.18
41	Curculionidae	7	0.64
42	Sphaeriusiidae	3	0.27
43	*Sphaerius* sp.	1	0.09
44	Hydrophillidae (larvae)	5	0.46
45	*Enochrus* sp.(larvae)	5	0.46
46	*Berosus* sp.	1	0.09
47	*Laccobius* sp.	8	0.73
48	*Cymbiodita* sp.	1	0.09
49	Heteroceridae - *Heterocerus* sp.	3	0.27
50	Helodidae (larvae) - *Scirtes tibialis*	2	0.18
51	Haliplidae (larvae) - *Brychius* sp.	4	0.27
52	*Haliplus* sp.	2	0.18
53	Staphylinidae	3	0.27
54	Elmidae	1	0.09
55	Coccinelidae	25	2.31
56	Scarabeidae	2	0.18
57	Dytiscidae	1	0.09
58	*Rhantus* sp.	2	0.18
59	Trichoptera (adults)	2	0.18
60	Lepidoptera (larvae)	1	0.09
	Diptera		
61	Nematocera (adults)	68	6.29
62	Nematocera (pupae)	1	0.09
	Chironomidae		
63	larvae	6	0.55
64	adults	4	0.27
65	*Chironomus tricolor*	303	28.05
66	Ceratopogoninae larvae	2	0.18
67	*Bezzia* sp. (nymphs)	1	0.09
68	Stratiomyidae (larvae)	2	0.18
69	Syrphidae	2	0.18
70	Psychodidae (larvae)	79	7.31
71	Psychodidae (nymphs)	1	0.09
72	*Pericoma* sp.	2	0.18
73	Dolichopodidae	1	0.09
74	Tipulidae - *Tipula* sp.	1	0.09
75	Culicidae	4	0.18
76	*Anopheles* sp.	3	0.27
77	*Orthopodomyia* sp.	1	0.09
78	*Culex* sp.	1	0.09
79	Brachycera (adults)	10	0.92
80	Muscidae	17	1.57
81	*Lucilla caesar*	1	0.09
	Hymenoptera		
82	Adults	3	0.27
83	Apidae	3	0.27
84	Ichneumonidae	1	0.09
85	Formicidae	74	6.85

86	Indeterminate macroinvertebrates	9	0.5
87	Pisces	1	0.09
88	*Rana* sp.	14	1.29
Total preys		**1080**	

CONCLUSIONS

Composition of food in *Rana esculenta* complex showed a preference for terrestrial preys, with a preponderance of insects, crustaceans or oligochaetes.

Species of the investigated complex of *Rana esculenta* have a large food spectrum, which varied with season and habitats. *Chironomus tricolor* represented 28.05% (303 preys) from the total number of eaten individuals, suited by aphids 9.07% (98 individuals) and *Podura aquatica* 8.42% (91 individuals).

We noticed the cannibalism too, as demonstrated the by juveniles and tadpoles identified in the stomachs analysed.

REZUMAT

Bazinul râului Ciric prezintă o importanță deosebită datorită prezenței acumulărilor artificiale localizate la periferia oraşului Iaşi. Broaştele verzi sunt prezente în număr mare. Probele au fost colectate în perioada martie-octombrie 2005. La cei 128 de indivizi investigați au fost găsite în stomac 1080 prăzi, aparținând la 88 taxoni.

Compoziția hranei la *Rana esculenta* a arătat o preferință pentru prăzile terestre, în special insecte, crustacee şi oligochete.

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REFERENCES

1. CHIMINELLO A., GENERANI M., 1992 – *Hyla arborea* L., *Pelobates fuscus insubricus* C. and *Rana esculenta* "complex" feeding habits during the breeding period in some rice-fields on the PoPlane (Piemont, North Italy), Proc. Sixth Ord. Gen. Meet. S.E.H., Budapest, 115-120.
2. COGĂLNICEANU D., AIOANEI F., CIUBUC C., VĂDINEANU A., 1998 – Food and feeding in a population of common spadefoot toades (*Pelobates fuscus*) from an island in the lower Danube floodplain, Alytes 15 (4): 145-157.
3. COGĂLNICEANU D., PALMER M., CIUBUC C., 2000 – Feeding in anuran communities on islands in the Danube floodplain, Amphibia-Reptilia 22: 1-19.
4. COVACIU-MARCOV S., CUPŞA D., GHIRA I., 2000 – Trophical spectrum of a *Rana ridibunda ridibunda* Pallas 1771 population from Cefa (Bihor county, Romania), Studii şi Cercetări, Biologie, 5, 107-115, Bacău.
5. GHIRA I., UJVAROSY L., GYONGYVER M., 1997 – Trophical spectrum of *Rana ridibunda* and its importance in trophic web in the Crişul Repede river ecosystems, Tiscia 1: 361-366.
6. ANDREEA NICOARĂ, M. NICOARĂ, F. BIANCHINI, 2004 - Diet composition during breeding period in populations of *Bufo viridis, Pelobates fuscus* and *Rana esculenta* complex from river Ciric basin, Sesiunea ştiinţifică a Facultăţii de Biologie, Iaşi, 13-14 nov. 2004 (in print).
7. RATAJSKY F., VOJTKOVA L., 1971 – K Poznani potravy zab na jizni Morave, Scripta Fac. Sci. Nat. UJEP Brunensis, Biologia 3: 161-177.
8. SIN GH., LĂCĂTUŞU M., TEODORESCU I., 1975 – Hrana la broasca de lac, *Rana ridibunda* Pallas, Stud. Cerc. Biol., Ser. Biol. Anim., Bucureşti, 27, 4, 331-343.
9. VALENCIUC N., ION I., 1986 – Cercetări privind hrana la *Rana ridibunda* Pall. (Amphibia), An. Şt. Ale Univ. "Al.I. Cuza" Iaşi, Tom XXXII, s. II a. Biologie 69-70.
10. VANCEA Ş., MÎNDRU C., SIMIONESCU V., 1961 – Contribuţii la cunoaşterea hranei la *Rana ridibunda* din împrejurimile oraşului Iaşi, Studii şi Cercetări ştiinţifice, Biologie şi Ştiinţe Agricole, An. XII, Fasc. 1, 111-120 .

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