PRELIMINARY DATA FOR PARASITIZING ON *ISCHNURA ELEGANS* (VANDER LINDEN, 1820) (ODONATA: COENAGRIONIDAE) BY *ARRENURUS (*ACARI: HYDRACHNIDIA*)* LARVAE FROM ODESSA PROVINCE (SOUTHWESTERN UKRAINE)

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Abstract

Of 256 specimens (160 males and 96 females) of *Ischnura elegans* from the Odessa province, 37 specimens were found with two parasitic water mite species: *Arrenurus claviger* and *A. papillator*. The prevalence (7.4%) and the intensity of infestation (1-6) was smaller than in *Ischnura elegans* collected in Poland. The parasites preferred the metathorax and mesothorax of their hosts. The largest number of parasiting larvae were collected on September, later than in Poland – probably because of the longer mating period.

Keywords: *Arrenurus claviger*, *A. papillator*, *Ischnura elegans*, larvae, parasitism

Introduction

Parasitization of aquatic insects by water mite larvae is very common, and very important because of species dispersal.

Species of the genus *Arrenurus* parasitize Diptera and Odonata. There are many publications on the parasitization of damselflies by water mite larvae but there are very few publications from the Ukraine (Pavlyuk 1968, Oliger 1975). Therefore even small amounts of information enrich our knowledge on this topic.

This paper, based on the *Ischnura elegans* collected in Odessa province give some new information about parasitization it by *Arrenurus* larvae.

Materials and methods

Damselflies (*Ischnura elegans*) were collected in the lower parts of the Danube and Dniestr rivers, near lakes, and near the small ponds in the surroundings of Odessa.
Localities:

1. Lake Kitai is a Predanube lake. It is situated in water-meadows of the lower Danube river and connected with the Danube by an artificial channel.
2. Lake Yaplug, as well as Kitai, Predanube lake situated in lower Danube.
3. Small pond, near small river Dal'nik (Sukhoi liman, surroundings of Odessa).
4. Small pond near coastal firth (Khadzhibejski liman, surroundings of Odessa).

The materials consist of 256 specimens (160 males and 96 females) of *Ischnura elegans* (Tab. 1).

Results

Among the collected specimens of *Ischnura elegans* 7.4% were infected with the larvae of *Arrenurus,* but the prevalence varied from 3.6% to 18.6% (Tab.1).

Table 1. All of the material collected.

Locality & the date of sampling	The whole specimens of Ischnura elegans			Infected specimens of Ischnura elegans								
							Prevalence			Range of intensity (average)		
	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total
Locality 1, 10.07.2003	0	48	48	0	0	0	0.0	0.0	0.0	-	-	-
Locality 2, 13.07.2003	1	0	1	1	0	1	100.0	0.0	100.0	4	-	4
Locality 3, 25.07.2003	89	48	137	4	1	5	4.5	2.1	3.6	1-3(1.4)	1	1-3(1.3)
Locality 4, 02.09.2003	70	0	70	13	0	13	18.6	0	18.6	1-6(1.8)	-	1-6(1.8)
Total	160	96	256	18	1	19	11.3	1.0	7.4			

Table 2. Number of water mite larvae on particular segments of hosts body.

Parasite species	between the bases of wings II	mesothorax	metathorax	coxa of legs II	Total
Arrenurus claviger	1	8	19	7	35
Arrenurus papillator	-	-	2	-	2
Total	1	8	21	7	37

The intensity of infection oscillated from 1 to 6 water mite larvae per host, average was from 1.3 to 1.8 (Tab. 1).

There were two water mite species (*Arrenurus claviger* and *A. papillator*) parasitizing *Ischnura elegans*. They prefered the metathorax, followed by the mesothorax, coxa of legs II and places between the bases of wings II (Tab. 2).

Most larvae were collected at locality 4 on 2nd September 2003, followed by the locality 3 on 25th July 2003 and locality 2 on 13th July 2003, at locality 1 have no parasites were found.

The larvae of *Arrenurus claviger* of all body sizes were collected at locality 4 on 2nd September 2003, the greatest numer were larvae of size 201-250 μm, followed by 150-200 μm, above 250 μm, and beneath 150 μm. The greatest number of larvae collected at locality 3 on 25th July 2003 were in size 201-250 μm, followed by 150-200 μm, and above 250 μm. At locality 2 on 13th July 2003 were found only those above 250 μm body size.

Discussion

The research based on only small sample collected over a short period of time, therephore firm conclusions can not be made and there are only some intuitions.

There are many publications which provide prevalence and intensity of infestation on damselflies by *Arrenurus* larvae, they are fluctuated between 9.8% and 100% - prevelence, and between 1 and over 100 parasites per one host – intensity of infestation (Conroy & Kuhn 1977, Forbes & Baker 1991, Léonard *et al*. 1999, Yourth *et al.* 2001). In this work,

prevalence and intensity of infestation are very low (Table 1), when compared with the *Ischnura elegans* collected in Poland: prevalence – 46.9%, intensity of infestation – 2-42 (Zawal 2004); prevalence – 43.9%, intensity of infestation – 1-38 (Zawal 2006a); prevalence – 18,6%, intensity of infestation – 1-144 (Zawal 2006b). However, the prevalence for this damselfly species from SE Ukraine was given as: 4-6% (Pavlyuk 1968) and 0,3% (Oliger 1975). Intensity of infestation recorded by Oliger (1975) was also low (on the average 2 parasites per host). It seems such low prevalence and intensity of infestation of *Ischnura elegans* are characteristic by the Black Sea basin.

Both of the two species parasitizing the damselfly was recordered as imogoes from Ukraina (Sokolov 1940) but only one of them (*Arrenurus papillator*) was recordered as a parasite of damselflies from SE Ukraine (Oliger 1975).

Pavlyuk (1968) has found the larvae of *Arrenurus* only on the wings and betweem the bases of the wings of *Ischnura elegans*. This place of attachment was confirmed in this work but the metathorax and mesothorax were preferred places of attachement. There is a difference between the Ukraine and Polish records where in the latter the abdominal segments of *Ischnura elegans* were preferred as places of attachment (Zawal 2004, 2006a, b).

It is significant that the largest number of parasitizing *Arrenurus claviger* larvae were found in September, and there were small (not feeding) and large sized (feeding) larvae as well. Pavlyuk (1968) and Oliger (1975) found parasitizing *Arrenurus* larvae so late in the year as well. In Poland the last significant numbers of *Arrenurus* larvae are found in July, and August and in September only single larvae are recorded (Zawal 2004, 2006a, b). The mating period of *Arrenurus claviger* is longer in the Black Sea basin than in Poland because of the climatic conditions.

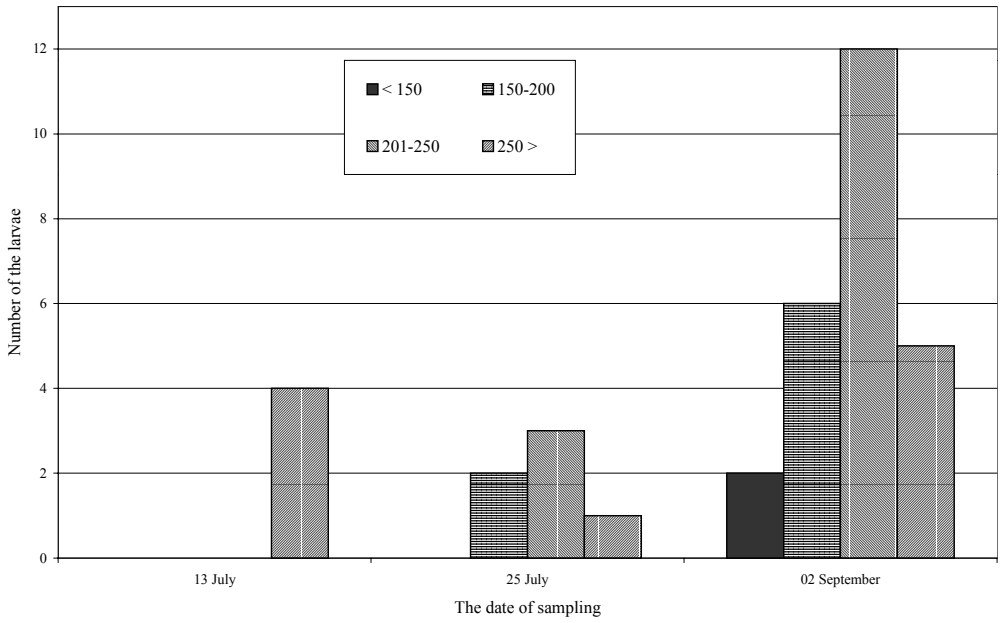

Fig. 1. The numbers of larvae of different body size from the dates of collecting (< 150, 150-200, 201-250, > 250 – body size in ųm).

Acknowledgments

The authors wish to thank Richard A. Baker. The project was partly financially supported by the Committee for Scientific Research for the years 2004-2007; grant No 2PO4C10527.

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