

ON THE ODONATA FAUNA OF THE HUNGARIAN PART OF THE LAKE FERTÖ (IMAGOS; LARVAE)

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Introduction

Compared to other insect groups the Odonata fauna of Hungary is known. A comprehensive study by STEINMANN (1959) in some detail on the Odonata in Hungary has been published.

The Odonata fauna of the various geographical microregions has also been discussed in several studies. We know in details e.g. the Odonata fauna of the plain in North-Western Hungary (ARADI and BODOCS, 1954), the Bakony mountain (TOTH 1980), the Köszag mountain (PONGRATZ, 1941), the Zemplen mountains (DEVAI and VARGA, 1963), the Nyirseg and the Szatmar regions - Bereg plain (BENEDEK, DEVAI and DEVAI, 1969).

Systematically collected data have been published for Debrecen (VARGA, 1958), Sarospatak (DEVAI, 1962), (DEVAI and VARGA, 1963 etc.), the Tapolca river (BENEDEK, 1961, 1965), Kecskemet (BODOCS, 1908), Leányfalu (BENEDEK, 1962) as well as for the area of the Hortobágy (KATAI and DEVAI 1977), the Native Juniperos area at Barcs (DEVAI, 1978) and for the districts of Batorliget (UJHELYI, 1953), Budapest (STEINMANN 1960) and Tihany (WEBER, 1941).

These principal and comprehensive works - considering faunistic respects - are supplemented with several studies based on museum data and on perhaps less systematic collections. (These are not detailed here.)

These numerous faunistic data have been published in some recent studies attempting to give a relatively modern synthesis and to evaluate the chronologic and phenologic characteristics of the Odonata fauna as well (DEVAI, BODNAR and BENEDEK, 1976, DEVAI, 1976 a,b).

These synthesizing works but even more so the distribution maps published reveal, that the western border of Hungary and within this the Fertő-region has been little studied. There are on the previous distribution maps altogether 6 species recorded (STEINMANN, 1959) whilst in 1976 Devai et al. reported the occurrences of 11 Odonata species within two districts (No. 8/18, 8/19) of the Lake Fertő region. In the Kistomalom and Nagytomalom districts, situated closely to the Lake Fertő, 25 species have been reported so far (CSIBY, 1981).

In contrast to the data of Hungary, 50 species have been reported in the Northern part of Burgenland, particularly in the Austrian district of the Lake Fertő (STARK 1980, HÜBNER 1984). The Austrian Fertő monography refers 48 species (LÖFFLER 1979).

Apart from faunistic aspects, we report here the flying periods of the frequent and more interesting species, the distribution patterns of the Odonata larvae in various biotops, as well as the trophic relationships of the larvae in the Lake.

Dates and Sites of Collection and Methods

The Odonata larvae and imagos have been collected systematically since 1975 in the Hungarian section of the Lake Fertő. The sites of collection are given in Fig. 1. The imagos have been collected in the southern boggy-marshy areas of the Hungarian section of the Fertő (Fertőrákos, Balf, Fertőboz and Fertőhomok) and larger inner ponds within the reed belt) Rakospatak, Rakosi-tó, Kis-Herlakni and Hidegseg ponds).

The sex ratio and the list of the place of occurrence will be published elsewhere (ANDRIKOVICS and TAKATS, in press). The imagos and larvae were caught in nets. The quantitative collections of the larvae were carried out with the so called frame method. The food studies were carried out by analysing the alimentary canals of the larvae. These two latter methods - supplemented with other macrofauna elements - have been published elsewhere) ANDRIKOVICS, 1980, 1981, ANDRIKOVICS and KERTESZ, 1979.

Results and Discussion

In the Hungarian district of the Lake Fertő a total of 34 Odonata species (58,7 % of the Hungarian fauna) has been found. The geographic distribution of these 34 species is as follows: 58,8% is for mediterranean with a contribution of 17,6 % and 14,8% of the Siberian and the Ponto-Caspian fauna elements, respectively. The list of the species is presented in Table 1.

Species	imagos	larvae	fauna element
<i>Platycnemis pennipes pennipes</i> Pallas, 1771	+	+	ponto-caspian
<i>Coenagrion pulchellum interruptum</i> Charpentier, 1825	+	+	ponto-caspian
<i>Coenagrion puella puella</i> Linnaeus 1758	+	+	ponto-caspian
<i>Erythronma najas najas</i> Hansemann, 1823	+	+	siberian
<i>Erythronma viridulum viridulum</i> Charpentier, 1840	+	+	pontomedit.
<i>Ischnura elegans pontica</i> Schmidt, 1938	+	+	ponto-caspian
<i>Ischnura pumilio</i> Charpentier, 1825	+	+	ponto-medit.
<i>Enallagma cyathigerum cyathigerum</i> Charpentier, 1840	+	+	siberian
<i>Sympecma fusca</i> Van der Linden, 1823	+	-	holomedit.
<i>Lestes sponsa sponsa</i> Hansemann, 1923	+	-	siberian
<i>Lestes dryas</i> Kirby, 1890	+	-	siberian
<i>Lestes virens vestalis</i> Rambur, 1842	+	-	pontomedit.
<i>Lestes macrostigma</i> Eversmann, 1836	+	-	holomedit.
<i>Agrion splendens splendens</i> Harris, 1782	+	+	pontomedit.
<i>Brachytron pratense</i> Müller, 1764	+	-	ponto-caspian
<i>Aeshna affinis</i> Van der Linden, 1820	+	-	holomedit.
<i>Aeshna mixta</i> Latreille, 1805	+	+	holomedit.
<i>Anaciaeschna isoceles isoceles</i> Müller, 1767	+	-	atlantomedit.
<i>Anax imperator imperator</i> Leach, 1815	+	+	pontomedit.
<i>Anax parthenope parthenope</i> Selys-Longchamps, 1839	+	-	pontomedit.
<i>Cordulia aeneaturfosa aeneaturfosa</i> Förster 1902		+	+ west-siberian.
<i>Libellula depressa</i> Linnaeus, 1758		+	+ pontomedit.
<i>Libellula fulva fulva</i> Müller 1764		+	- pontomedit.

<i>Libellula quadrimaculata</i>	+	-	siberian
<i>quadrimaculata</i> Linnaeus 1758			
<i>Orthetrum coerulesceus anceps</i>	+	-	pontomedit.
Schneider, 1845			
<i>Orthetrum cancellatum cancellatum</i>	+	+	holomedit.
Linnaeus, 1758			
<i>Orthetrum albistylum albistylum</i>	+	-	pontomedit.
Selys-Longchamps, 1848			
<i>Crocothemis servilia servilia</i>	+	+	holomedit.
Drury, 1770			
<i>Sympetrum sanguineum sanguineum</i>	+	-	holomedit.
Müller, 1764			
<i>Sympetrum meridionale</i>	+	-	holomedit.
Selys-Longchamps, 1848			
<i>Sympetrum striolatum striolatum</i>	+	-	holomedit.
Charpentier, 1840			
<i>Sympetrum vulgatum vulgatum</i>	+	+	siberian
Linnaeus, 1758			
<i>Sympetrum pedemontanum pedemontanum</i>	+	-	west siberian
Alloni, 1766			
<i>Leucorrhinia pectoralis</i>	+	-	west-siberian
Charpentier, 1825			
Total : 34	34	15	

Of the familie Platycnemidae, *Platycnemis pennipes* was recorded. We have frequently collected its larvae and the imagos in the lower section of the Lake Fertő. However, we failed to collect this species since 1980. The species belonging the family Coenagrionidae are generally frequent in the surroundings of the lake. Of these the larvae of *Erythronma najes* and *Enallagma cyathigerum* couldn't be found.

Of the familie Lestidae we could collect 5 species. Contrary to the Hungarian Plain where *Lestes macrostigma* is the most frequent species, here in the Fertő district this species is not so abundand.

Of the familie Agrionidae, *Agrion splendens* develops in the Rakospatak river. However, we failed to catch larvae or imagos.

Of the familie Aeshnidae, the adult forms of 6 species were found. The larvae of the two most frequent species - *Aeshna mixta* and *Anax imperator* - were also collected.

Of the familie Libellulidae, 13 species were recorded. Among these *Leucorrhinia pectoralis* and *Sympetrum pedemontanum* are interesting. The former species is characteristic for the swamp-waters, whilst the latter is considered a typical mountain-species. Of the 34 species found, 14 Zygoptera, 20 Anisoptera and the larvae of 15 species were recorded.

The zoogeographic distribution of the species and individuals collected are as follows:

Fauna element	Species		Individual	
	No.	%	No.	%
Holomediterran	10	29,4	75	14,2
Atlantomediterran	1	2,9	8	1,5
Pontomediterran	9	26,5	196	37,1
Ponto-caspian	5	14,8	114	21,6
Siberian	6	17,6	104	19,7
West-siberian	3	8,8	31	5,9
Total:	34	100,0	528	100,0

We have not collected adriatomediterran, Mongol and Eremial fauna elements. The majority of the species could be divided into the holomediterran, pontomediterran and siberian fauna element groups. The holomediterran, pontomediterran and ponto-caspian species constituted greater proportions than usual in the fauna of Hungary (DEVAI 1976 a).

Almost 60 % of the individuals collected were composed of the following species: *I. pumilio*: 84 specimens, *I. elegans*: 52 specimens, *Er. viridulum*: 47 specimens, *En. cyathigerum*: 38 specimens and *Coe. puella*: 34 specimens.

When the zoogeographical grouping is carried out according to the individuals, the majority of the specimens can be divided into the ponto-caspian, pontomediterran and siberian fauna elements groups. Compared to the previous grouping the decline in the proportion of the holomediterran elements is conspicuous whilst the proportions of the pontomediterran and pontocaspian groups showed considerable increases.

In the Hungarian section of the Lake Fertő, two Odonata coenoses can basically be distinguished (SENSU and JACOB 1969), similarly to STARKS' report (1980).

1) *Erythromma* - *Anax*

This species-group is characteristic for the water-side parts of the reed margin and also for the smaller-larger inner ponds. Apart from the species of the two nominating genera, the *Coenagrion*, *Orthetrum*, *Libellula* and *Aeshna* species are, of course, also abundant.

2) *Lestes* - *Sympetrum*

The autochthonous species are composed of the various Lestidae and Sympetridae of the coenosis. This species-group can be found in the external, terrestrial part of the reed zone and within the surrounding marshy-meadows.

All the 34 species found belong to the original fauna of the area since we could collect freshly-hatched specimens of the migratory species, too.

The species found showed the usual fauna-patterns characteristic of the standing waters. However, the consistant occurrence of the *Leucorrhinia pectoralis* population with a high abundance is interesting, because this is a rare species through wide parts of the country.

The flying periods of the imagos correspond generally to those recorded in Hungary, and the flying periods for the 10 most frequent species have already been published (ANDRIKOVICS 1980).

Of the Zygoptera larvae, the arval forms of *Ischnura elegans* and *Enallagma cyathigerum* are the most abundant in reeds. Their densities varied from 8 to 32 i/m².

In the bulrush zone we could catch Odonata larvae in considerable lower number. Here, the larvae of *Coenagrionidae* juv. were collected together with the well-identifiable larvae of *Coenagrion puella*, at a density of 4-8 i/m².

Of the submerged vegetations *Potamogeton pectinatus* was studied most exactly. Here, the larval forms of *Ischnura pumilio* and *Coenagrion puella* were the most frequent. The total number of the Zygoptera larvae amounted to 44 i/m² as a maximum.

Of the Odonata larvae, *Enallagma cyathigerum* (25 specimens), *Ischnura pumilio* (10 specimens), *Erythromma najas* (10 specimens), *Coenagrionidae* juv. (50 specimens) and *Crocothemis servilia* (10 specimens) were subjected to alimentary analyses (ANDRIKOVICS and KERTESZ, 1979).

The results revealed no considerable differences among the food of the various Odonata species. Predominant in the majority of the samples were fragments of non-biting midges. The larvae found in the open waters seemed to have more frequently Cladocera and Copepoda fragments in the alimentary canal.

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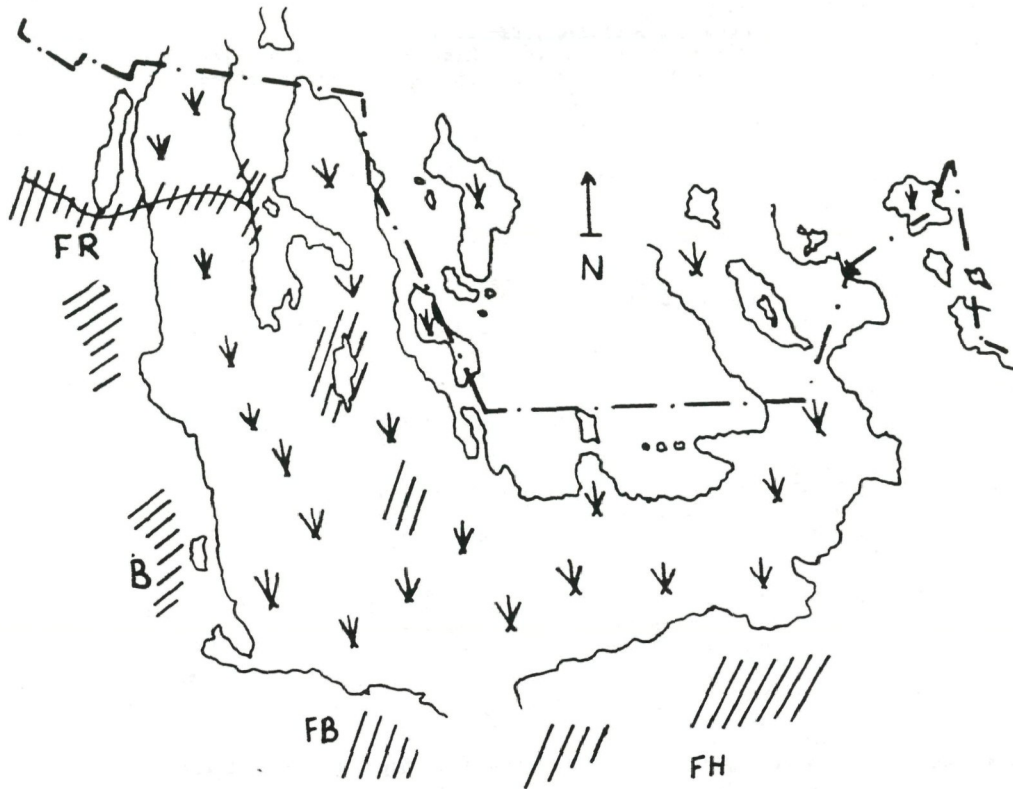


Fig.1. Sketch of the collecting sites

Legend: FR= Fertörakas B= Balf FB= Fertöboz
 FH= Fertöhomok v = reed ● = collecting site

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