

Monitoring dragonflies on the section of the Dráva between Órtilos and Vízvár (Insecta: Odonata)

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TÓTH S.: *Monitoring dragonflies on the section of the Dráva between Órtilos and Vízvár (Insecta: Odonata)*

Abstract: The power plant planned on the Croatian section of the Dráva can result in unfavourable changes in the fauna of wetlands by the river and may - among others - affect the dragonflies developing there, too. This necessitates the long-term monitoring of the local dragonfly fauna. Already the experiences of the first few years of monitoring referred to the fact that the shallower wetlands of the area are particularly vulnerable. In the course of the examinations it turned out that the dragonfly fauna of the area is rich - 14 of the 48 species detected so far are protected by law. Outstanding among these are the 5 taxons listed in the Bern Convention (*Aeshna viridis*, *Gomphus flavipes*, *Ophiogomphus cecilia*, *Leucorrhinia caudalis*, *Leucorrhinia pectoralis*). The composition of the local fauna - similarly to the national situation - is dominated by Pontic-Mediterranean, Siberian and West-Siberian faunal elements. However, the proportions alter to some extent from group to group. The author gives a detailed analysis of the composition of the fauna of the individual sampling sites and offers a separate depiction of the quantitative composition of the fauna according to the subordo.

Key words: Odonata, Drava river, biomonitoring

Introduction

The operation of the power plant planned for the Croatian area of the Dráva (Novo Virje) is expected to affect the wetlands by the river, particularly the fauna living there and bound to the water due to the development of its larvae: such as dragonflies among others.

Dragonflies (Odonata), as insects developing in the water and sensitively reacting to the characteristics of the habitat (indicator organisms), are suitable for tracking the changes occurring in the condition of the habitat. The examinations carried out with them are facilitated by the fact that the Hungarian fauna is well-researched and the number of permanent species is relatively low: altogether 65.

As a result of the odonatological examinations in process for a longer period in the area of the Duna-Dráva National Park, the dragonfly fauna of the area is relatively well known. Based on the publications prepared in the course of the work (DÉVAI 1978, 1981, DÉVAI et al. 1978, 1993, TÓTH 1995, 1998), the occurrence of altogether 54 species (83 per cent of the Hungarian fauna) can be regarded as proven.

The monitoring of dragonflies can be built on larvae, exuviums and imagoes as well. Undoubtedly, primarily the survey of imagoes is justified in the establishment of a quantitative fauna picture. In spite of this, especially in certain periods, e.g. in early spring (when imagoes do not yet fly) and late autumn (when most of the species do not fly any longer) it is worth collecting larvae, too. Collecting exuviums is much easier and far

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Fig. 1.: Sampling site in the Holt-Dráva (Bélavár)



Fig. 2.: Exuvium of *Cordulia aeneatufosa*



Fig. 3.: *Libellula quadrimaculata* (female, freshly crawled out of the exuvium)



Fig. 4.: Sampling site in Vízvár (living Dráva)



Fig. 5.: *Ophiogomphus cecilia* (male, meanwhile crawling out of the exuvium)



Fig. 6.: Male imago of *Ophiogomphus cecilia*

Examined variables

In order to be able to determine the possible later changes owing to the power plant, the examination of particularly the following indices is justified:

- The exact species composition, i.e. the number of occurring species.
- The density per species.
- The stages of the life cycle (imago, larva, exuvium).

Results and conclusions

The list of species detected in the sampling sites of monitoring between 2000 and 2004 on the section between Órtilos and Vízvár in systematical order (the taxons protected in Hungary are marked with one, the species listed in the Bern Convention with two asterisks).

ZYGOPTERA

Calopterygidae

1. *Calopteryx splendens* (Harris, 1782)
2. *Calopteryx virgo* (Linnaeus, 1758)*

Lestidae

3. *Lestes barbarus* (Fabricius, 1798)
4. *Lestes dryas* Kirby, 1890*
5. *Lestes sponsa* (Hansemann, 1823)
6. *Lestes virens vestalis* Rambur, 1842
7. *Lestes viridis* (Van der Linden, 1825)
8. *Sympecma fusca* (Van der Linden, 1820)

Platynemididae

9. *Platynemis pennipes* (Pallas, 1771)

Coenagrionidae

10. *Coenagrion ornatum* (Sélys-Longchamps, 1850)*
11. *Coenagrion puella* (Linnaeus, 1758)
12. *Coenagrion pulchellum interruptum* (Charpentier, 1825)
13. *Erythromma najas* (Hansemann, 1823)
14. *Erythromma viridulum* Charpentier, 1840
15. *Pyrrhosoma nymphula interposita* Varga, 1968
16. *Ischnura elegans pontica* Schmidt, 1938
17. *Ischnura pumilio* (Charpentier, 1825)
18. *Enallagma cyathigerum* (Charpentier, 1840)

ANISOPTERA

Aeshnidae

19. *Aeshna affinis* Van der Linden, 1820
20. *Aeshna cyanea* (Müller, 1764)
21. *Aeshna mixta* Latreille, 1805
22. *Aeshna viridis* Eversmann, 1836 **

23. *Brachytron pratense* (Müller, 1764)
24. *Anaciaeschna isosceles* (Müller, 1767) *
25. *Anax imperator* Leach, 1815
26. *Anax parthenope* (Sélys-Longchamps, 1839)

Gomphidae

27. *Gomphus flavipes* (Charpentier, 1825) **
28. *Gomphus vulgatissimus* (Linnaeus, 1758) *
29. *Ophiogomphus cecilia* (Fourcroy, 1785) **
30. *Onychogomphus forcipatus* (Linnaeus, 1758)

Corduliidae

31. *Cordulia aeneatufosa* Förster, 1902
32. *Somatochlora aenea* (Linnaeus, 1758) *
33. *Epiptera bimaculata* (Charpentier, 1825) *

Libellulidae

34. *Libellula depressa* Linnaeus, 1758
35. *Libellula fulva* Müller, 1764 *
36. *Libellula quadrimaculata* Linnaeus, 1758
37. *Orthetrum albistylum* (Sélys-Longchamps, 1848)
38. *Orthetrum brunneum* (Fonscolombe, 1837) *
39. *Orthetrum cancellatum* (Linnaeus, 1758)
40. *Orthetrum coerulescens anceps* (Schneider, 1845)
41. *Crocothemis servilia* (Drury, 1770)
42. *Sympetrum flavolum* (Linnaeus, 1758)
43. *Sympetrum meridionale* (Sélys-Longchamps, 1841)
44. *Sympetrum sanguineum* (Müller, 1764)
45. *Sympetrum striolatum* (Charpentier, 1840)
46. *Sympetrum vulgatum* (Linnaeus, 1758)
47. *Leucorrhinia caudalis* (Charpentier, 1840) **
48. *Leucorrhinia pectoralis* (Charpentier, 1825) **

Depiction of the sampling sites based on the dragonfly fauna

Sampling site 1. Dráva (Órtilos)

The riverbank on the two sides of the port by Órtilos railway station

Examined area: 50 × 3 m riverside.

Type of the water body: middle size river (code number 2220)

Depiction of the sampling site based on the fauna:

The number of species observed in the water between 2000 and 2004: 7 (+ 10 presumably roaming taxa)

Protected species: *Agrion virgo*, *Coenagrion ornatum*, *Gomphus vulgatissimus*

Strictly protected species: *Gomphus flavipes*, *Ophiogomphus cecilia*

Number of individuals: 577

Number of larvae: 95

Number of exuviums: 62

Number of imagoes: 420

Zygoptera material: *Agrion splendens* (42,59%), *Platycnemis pennipes* (34,82%), *Coenagrion ornatum* (3,76%). Other species together (18,83%).

In the composition of the Zygoptera fauna *Ischnura elegans*, whose larva probably develops only in small numbers in the Dráva, has a relatively high proportion (14.12%). The majority of the samples collected/observed in the sampling site could have been roaming imagoes.

Anisoptera material: *Gomphus vulgatissimus* (52,32%), *Gomphus flavipes* (13,24%), *Ophiogomphus cecilia* (11,26%). Other species together (23.18%).

Out of the protected species *Anaciaeschna isosceles* and *Orthetrum brunneum* were detected in the sampling site, but only in imago stage. The development of the latter in the Dráva cannot be completely ruled out but so far its larva has not been collected from the water.

Sampling site 2. Dráva (Vízvár)

The river near Vízvár by the stone dam.

Examined area: 50 × 3 m riverside.

Type of the water body: middle size river (code number 2220)

Depiction of the sampling site based on the fauna:

The number of species observed in the water between 2000 and 2004: 12 (+ 12 presumably roaming taxa)

Protected species: *Agrion virgo*, *Coenagrion ornatum*, *Gomphus vulgatissimus*

Strictly protected species: *Gomphus flavipes*, *Ophiogomphus cecilia*

Number of individuals: 1192

Number of larvae: 267

Number of exuviums: 496

Number of imagoes: 829

Zygoptera material: *Agrion splendens* (39,50%), *Platycnemis pennipes* (41,57%), Other species together (18,93%).

Similarly to the previous sampling site, *Ischnura elegans* - less characteristic of the Dráva - also represents a significant part of the collected/observed species (13.68%).

Anisoptera material: *Gomphus vulgatissimus* (37,77%), *Gomphus flavipes* (14,39%), *Ophiogomphus cecilia* (14,03%). Other species together (33,81%).

Out of the protected species *Anaciaeschna isosceles* and *Orthetrum brunneum* were detected in the sampling site, but only in imago stage. The development of the latter in the Dráva cannot be completely ruled out but so far its larva has not been collected from

the water. *Sympetrum sanguineum* - whose individuals found in the sampling site must have been roaming specimens - comes second (19.06%) in the quantitative composition of the species.

Sampling site 3. Patacsini-gravel-pit lake (Murakeresztúr)

Abandoned gravel-pit south-east from Órtilos railway station, in the flood plain of the Dráva. Examined area: 150 m².

Type of the water body: marshy artificial still water (code number: 1620)

Depiction of the sampling site based on the fauna:

The number of species with proved detection in the water between 2000 and 2004: 33. In the course of the samplings, only the imagoes of a further 8 species were detected, however, presumably the larvae of these also mostly developed there. The protected *Orthetrum brunneum* and *Somatochlora aenea* also belong to these.

Protected species: *Anaciaeschna isosceles*, *Epitheca bimaculata*, *Lestes dryas*, *Leucorrhinia pectoralis*, *Libellula fulva*

Strictly protected species: *Leucorrhinia caudalis*

Number of individuals: 3025

Number of larvae: 635

Number of exuviums: 149

Number of imagoes: 1241

Zygoptera material: *Ischnura elegans* (32,83%), *Coenagrion puella* (21,41%), *Erythromma viridulum* (16,53%), *Lestes virens* (8,41%), *Erythromma najas* (6,23%). Other species together (14,59%).

Anisoptera material: *Crocothemis servilia* (18,59%), *Orthetrum cancellatum* (12,34%), *Cordulia aeneatufosa* (9,27%), *Leucorrhinia caudalis* (8,62%), *Sympetrum sanguineum* (8,50%), *Sympetrum vulgatum* (8,38%), *Anax imperator* (6,14%), *Anaciaeschna isosceles* (4,95%). Other species together (23,21%).

Sampling site 4. Dombó-canal (Gyékényes)

A 50 metre section of the canal on the north-western edge of Lankóci forest

Type of the water body: artificial small watercourse (code number: 2340)

Depiction of the sampling site based on the fauna:

The number of species with proved detection in the water between 2000 and 2004: 12. In the course of the surveys, only the imagoes of a further 16 species were detected, but the occurrence of some of these (*Agrion virgo*, *Coenagrion puella*, *Brachytron pratense*, *Sympetrum flaveolum*, *Sympetrum vulgatum*) in larva stage cannot be ruled out either. In droughty periods Dombó-csatorna (Dombó Canal) is almost like still water in some places, which has a favourable effect on the development of several species.

Protected species: *Coenagrion ornatum*, *Anaciaeschna isosceles*, *Gomphus vulgatissimus*, *Libellula fulva*, *Orthetrum brunneum*

Strictly protected species: *Ophiogomphus cecilia*

Number of individuals: 2343

Number of larvae: 271

Number of exuviums: 136

Number of imagoes: 1936

Zygoptera material: *Platynemesis pennipes* (30,39%), *Coenagrion ornatum* (28,72%), *Agrion splendens* (26,73%), *Ischnura elegans* (10,81%). Other species together (3,35%)

Anisoptera material: *Orthetrum brunneum* (44,42%), *Sympetrum sanguineum* (13,84%), *Libellula depressa* (13,23%), *Gomphus vulgatissimus* (5,37%). Other species together (23,14%).

Sampling site 5. Büdös-ér (Gyékényes)

Sampling site 6. Méhes-tó (Gyékényes)

Between 2002 and 2004 there were no collecting in two sampling sites due to they were unsuitable for monitoring.

Sampling site 7. Holt-Dráva (Bélaár)

The former bed of the Dráva to the south of Bélaár, in Lókai-mező in the flood-plain of the Dráva.

Examined area: 50 × 3 m.

Type of the water body: marshy natural still water (code number: 1610)

Depiction of the sampling site based on the fauna:

The number of species with proved detection in the water between 2000 and 2004: 35. In the course of the samplings, only the imagoes of a further 8 species were detected, however, presumably, their larvae also mostly developed in the water. *Aeshna viridis* is an exception: it can only be listed as belonging to the fauna of the Holt-Dráva when its larvae are also found there.

Protected species: *Agrion virgo*, *Anaciaeschna isosceles*, *Epitheca bimaculata*, *Gomphus vulgatissimus*, *Lestes dryas*, *Libellula fulva*, *Somatochlora aenea*

Strictly protected species: *Leucorrhinia caudalis*, *Leucorrhinia pectoralis*

Number of individuals: 2971

Number of larvae: 513

Number of exuviums: 161

Number of imagoes: 2297

Zygoptera material: *Ischnura elegans* (22,03%), *Coenagrion puella* (14,19%), *Erythromma viridulum* (14,00%), *Coenagrion pulchellum* (12,97%), *Platycnemis pennipes* (11,62%), *Lestes virens* (8,03%). Other species together (17,16%).

Anisoptera material: *Crocothemis servilia* (29,26%), *Orthetrum cancellatum* (13,19%), *Cordulia aeneatufosa* (12,12%), *Anaciaeschna isosceles* (9,42%), *Sympetrum sanguineum* (8,53%), *Leucorrhinia caudalis* (7,63%), *Brachytron pratense* (7,27%), *Sympetrum vulgatum* (6,82%). Other species together (6,75%).

Sampling site 8. Csíkos-árok (Bélaár)

Little north-south watercourse to the north of Bélaár, in a pasture called Csíkos outside the flood plain of the Dráva. As far as the type of the body of water is concerned, originally it could have been a brook but some parts of it have been canalised and its sampling section is an artificial small watercourse. It is a shallow, slow watercourse widening at some points and has a rich vegetation. Especially in summer it stagnates in several places or fully dries out.

Examined area: 50 × 3 m.

Type of the water body: artificial small watercourse (code number: 2340)

Depiction of the sampling site based on the fauna:

The number of species with proved detection in the water between 2000 and 2004: 20. In the course of the surveys, the imagoes of a further 14 species were detected. Presumably their larvae also develop in the small watercourse without exception.

Protected species: *Anaciaeschna isosceles*, *Coenagrion ornatum*, *Gomphus vulgatissimus*, *Libellula fulva*, *Orthetrum brunneum*

Strictly protected species: -

Number of individuals: 1354

Number of larvae: 302

Number of exuviums: 66

Number of imagoes: 986

Zygoptera material: *Ischnura elegans* (22,47%), *Pyrrosoma nymphula* (17,24%), *Coenagrion ornatum* (14,64%), *Agria splendens* (12,01%), *Lestes barbarus* (11,29%), *Platycnemis pennipes* (10,11%). Other species together (12,24%).

Anisoptera material: *Libellula depressa* (23,78%), *Sympetrum sanguineum* (17,35%), *Orthetrum brunneum* (10,14%), *Sympetrum vulgatum* (9,55%), *Sympetrum flaveolum* (5,65%), *Libellula fulva* (5,26%), *Anaciaeschna isosceles* (4,87%). Other species together (23,40%).

Sampling site 9. Lankóci lake (Gyékényes)

Permanent pond in a small gravel pit on Grófi út (Grófi Road) leading from the forester's lodge to Dombó-csatorna (Dombó Canal) in Lankóci-forest.

Examined area: the complete riverside in the water body (about 50×2-3 m).

Type of the water body: pond type other artificial still water (code number: 1350)

Depiction of the sampling site based on the fauna:

The number of species with proved detection in the water between 2000 and 2004: 22. In the course of the samplings, the imagoes of a further 17 species were detected. Presumably the larvae of most of these also developed there. Out of these four species are protected (*Coenagrion ornatum*, *Lestes dryas*, *Libellula fulva*, *Orthetrum brunneum*).

Protected species: *Anaciaeschna isosceles*, *Epithea bimaculata*, *Gomphus vulgatissimus*

Strictly protected species: *Leucorrhinia caudalis*, *Leucorrhinia pectoralis*

Number of individuals: 902

Number of larvae: 102

Number of exuviums: 82

Number of imagoes: 718

Zygoptera material: *Ischnura elegans* (24,04%), *Platycnemis pennipes* (19,71%), *Erythromma viridulum* (16,59%), *Lestes virens* (8,17%), *Coenagrion puella* (7,45%), *Lestes barbarus* (5,05%). Other species together (18,99%).

Anisoptera material: *Sympetrum meridionale* (23,88%), *Sympetrum vulgatum* (10,87%), *Crocothemis servilia* (10,23%), *Orthetrum cancellatum* (9,59%), *Sympetrum sanguineum* (8,17%), *Libellula depressa* (8,31%), *Sympetrum striolatum* (5,12%). Other species together (22,81%)

Quantitative composition of the fauna (based on frequency)

György Dévai and his colleagues dealt with the relative abundance of Hungarian dragonfly species determined on the basis of UTM maps in several works (DÉVAI & MISKOLCZI 1978, DÉVAI et al. 1994). With the help of the 5-grade experimental scale created by them, the dragonfly species detected in the course of monitoring the Dráva are distributed in the following way:

I. Sporadic species: 6 (19 species in Hungary)

II. Rare species: 7 (8 species in Hungary)

III. Less frequent species: 15 (16 species in Hungary)

IV. Frequent species: 19 (19 species in Hungary)

V. Very frequent species: 1 (1 species in Hungary)

The distribution of species according to abundance is similar to the national one. There is a significant deviation only in the proportion of species with a scattered (i.e. the rarest) presence (nation-wide 19, on the monitored section of the Dráva only 6 species can be put into this category). The abundance of the species is shown in the table summarising the data of monitoring (Table 1.).

Table 1: Summarising data of the dragonfly monitoring

No	Taxon	Sampling sites									Sum of individuals	Percentage (%)			Faunalelements	Frequency
		1.	2.	3.	4.	5.	6.	7.	8.	9.		From total	From Zygoptera	From Anisoptera		
	Suborder ZYGOPTERA															
1.	<i>Calopteryx splendens</i>	181	361	4	497	2		14	101	12	1172	9,33	15,17		Pm.	IV
2.	<i>Calopteryx virgo</i>	8	12		2			1	1		24	0,19	0,31		Ws.	III
3.	<i>Coenagrion ornatum</i>	16	13	1	534			11	123	8	706	5,62	9,14		Pm.	III
4.	<i>Coenagrion puella</i>	9	16	258	20	106	21	221	22	31	704	5,41	9,11		Pc.	IV
5.	<i>Coenagrion pulchellum</i>		2	39		17	1	202	3	4	268	2,12	3,47		Pc.	IV
6.	<i>Enallagma cyathigerum</i>			3							3	0,02	0,04		S.	IV
7.	<i>Erythromma najas</i>			83		3	4	69		2	161	1,25	2,08		S.	III
8.	<i>Erythromma viridulum</i>			220	14	9	11	218	11	69	552	4,28	7,15		Pm.	III
9.	<i>Ischnura elegans</i>	60	125	437	201	67	49	343	189	100	1571	12,17	20,33		Pc.	IV
10.	<i>Ischnura pumilio</i>			13		4	4	6	11	5	43	0,33	0,56		Pm.?	IV
11.	<i>Lestes barbarus</i>			53	14	14	1	72	95	21	270	2,09	3,5		Hm	IV
12.	<i>Lestes dryas</i>			3	4		1	6		3	17	0,13	0,22		S.	IV
13.	<i>Lestes sponsa</i>		1	25	2	7	2	51	13	11	112	0,87	1,45		S.	IV
14.	<i>Lestes virens</i>		4	112	4	10	6	125	35	34	330	2,63	4,27		Pm.	IV
15.	<i>Lestes viridis</i>			12		1	1	5	5	1	25	0,2	0,32		Am.	II
16.	<i>Platynemis pennipes</i>	148	380	40	565	4	1	181	85	82	1486	11,51	19,24		Pc.	IV
17.	<i>Pyrhosoma nymphula</i>					6	5	145	14	170	1,32	2,2			Pm.	II
18.	<i>Sympecma fusca</i>	4		28	2	16	12	27	2	19	110	0,85	1,42		Hm.	V
	Suborder ANISOPTERA												99,97			
19.	<i>Aeshna affinis</i>			4		1	1	18	5	1	30	0,23		0,58	Hm.	IV
20.	<i>Aeshna cyanea</i>			5				5	5	4	19	0,15		0,37	Hm.	III
21.	<i>Aeshna mixta</i>	2	5	42	3	6		39	9	12	118	0,91		2,27	Hm.	IV
22.	<i>Aeshna viridis</i>							1			1	0,01		0,02	Ws.	I
23.	<i>Anaciaeschna isosceles</i>	1	2	84	10	5	7	105	25	11	250	1,94		4,82	Am.	III
24.	<i>Anax imperator</i>			104	2	3	8	59	18	20	214	1,66		4,13	Hm.	III
25.	<i>Anax parthenope</i>			26		1		18			45	0,35		0,87	Pm.	I
26.	<i>Brachytron pratense</i>	2	1	65	4	24	7	81	14	8	206	1,59		3,98	Pc.	III
27.	<i>Cordulia aeneaturfosa</i>		10	157	4	7	3	135	5	12	333	2,58		6,42	Ws.	II
28.	<i>Crocothemis servilia</i>		1	315		6	4	326	10	48	708	5,5		13,69	Hm.	III
29.	<i>Eitheca bimaculata</i>			63				18		4	85	0,66		1,64	Ws.	I
30.	<i>Gomphus flavipes</i>	20	40		3						63	0,49		1,21	Ws.	II
31.	<i>Gomphus vulgatissimus</i>	79	105		26			1	12	1	224	1,73		4,32	Pm.	III
32.	<i>Leucorrhinia caudalis</i>			146				85		6	237	1,83		4,57	Ws.	I
33.	<i>Leucorrhinia pectoralis</i>			15			1	14		15	45	0,35		0,87	Ws.	I
34.	<i>Libellula depressa</i>		1	34	117	12	14	21	122	39	360	2,79		6,94	Pm.	IV
35.	<i>Libellula fulva</i>			21	12	3	2	17	27	2	84	0,65		1,62	Pm.	II
36.	<i>Libellula quadrimaculata</i>		2	53		4	2	58	6	4	129	1,1		2,49	S.	III
37.	<i>Ophiogomphus cecilia</i>	17	39		4						60	0,46		1,16	Ws.	II
38.	<i>Onychogomphus forcipatus</i>		2								2	0,01		0,02	Pc.	I
39.	<i>Orthetrum albistylum</i>			18				20		6	44	0,34		0,85	Pm.	III
40.	<i>Orthetrum brunneum</i>	2	2	1	215				52	8	280	2,17		5,4	Hm.	III
41.	<i>Orthetrum cancellatum</i>			209	3	3	9	147	11	45	427	3,31		8,23	Hm.	III
42.	<i>Orthetrum coerulescens</i>			11				6	2		19	0,15		0,37	Pm.	III
43.	<i>Somatochlora aenea</i>			4		4		7			15	0,12		0,29	Ws.	II
44.	<i>Sympetrum falveolum</i>		1	15	3	3	1	30	29	10	92	0,71		1,77	S.	IV
45.	<i>Sympetrum meridionale</i>	2	6	6	2		1	11	10	112	150	1,16		2,89	Hm.	IV
46.	<i>Sympetrum sanguineum</i>	19	53	144	67	8	1	95	89	43	519	4,02		10,01	Hm.	IV
47.	<i>Sympetrum striolatum</i>			10		2	2	21	13	24	72	0,56		1,39	Hm.	IV
48.	<i>Sympetrum vulgatum</i>	7	10	142	9	4	6	76	49	51	354	2,74		6,83	S.	IV
Total		577	1192	3025	2343	356	189	2971	1354	902	12515	99,58		100,0		

Abbreviations: Hm.=Holomediterranean, Am.=Atlantomediterranean, Pm.=Pontomediterranean, Pc.=Ponto-caspian, S.=Siberian, Ws.=West-siberian

Qualitative composition of the fauna

The quantitative processing of the data gained in the course of the monitoring happened according to subordo.

Qualitative composition of the Zygoptera-fauna

In the Zygoptera-fauna of the sampling sites six species reached more significant results (Fig. 7.). These are responsible for 84.43% of the whole collected Zygoptera material.

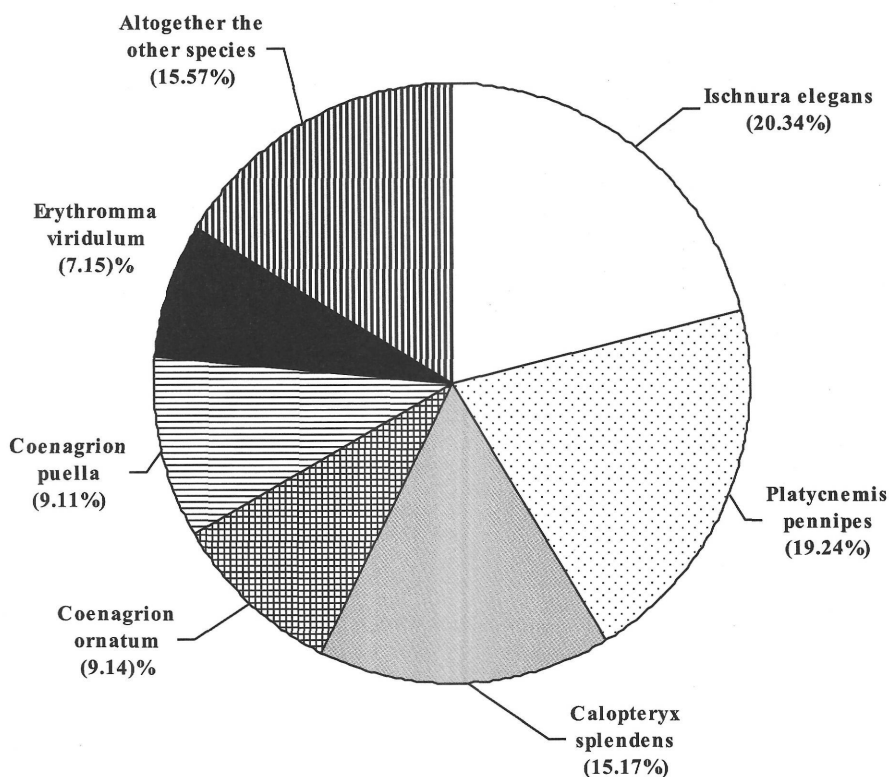


Fig. 7.: Qualitative composition of the Zygoptera-fauna

Qualitative composition of the Anisoptera-fauna

In the Anisoptera-fauna also six species reached more significant results (Fig. 8.). An essential deviation, however, is the fact that these species only make up 47.87% of the full Anisoptera material. The reason for this might be the fact that the number of the taxons belonging to the Anisoptera ordo is significantly larger.

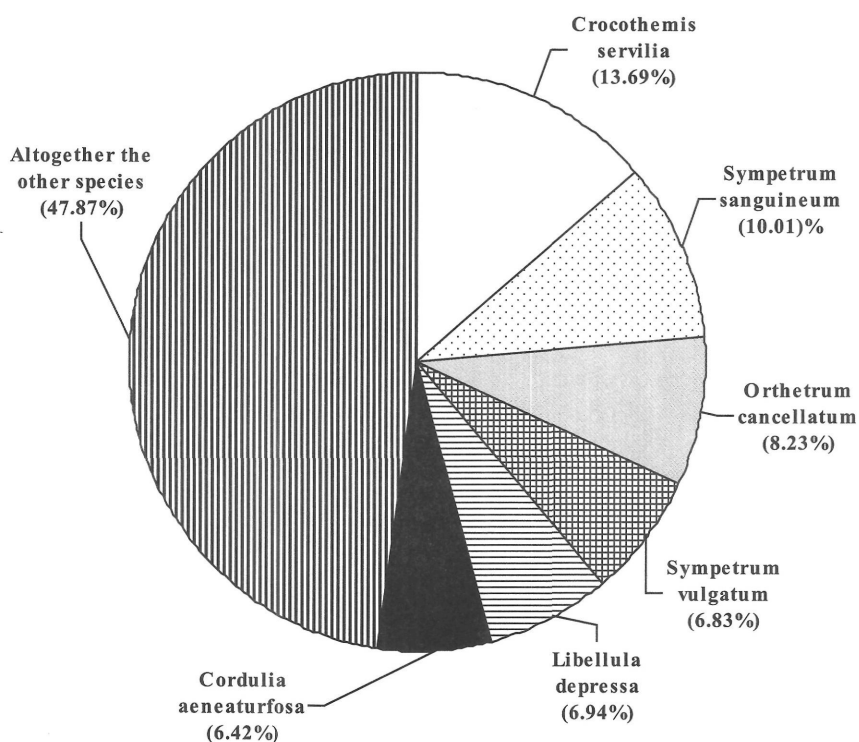


Fig. 8.: Qualitative composition of the Anisoptera-fauna

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Szitakötők monitorozása a Dráva mente Őrtilos és Vízvár közötti szakaszán (Insecta: Odonata)

TÓTH SÁNDOR

A Dráva horvátországi szakaszán (Novo Virje) tervezett vízi erőmű működése előreláthatólag kedvezőtlen változásokat eredményez a folyót kísérő vizes élőhelyek faunájára, többek között az ott fejlődő szitakötőkre. A várható hatások figyelemmel kísérését célozza a szitakötők hosszú távú monitorozása. A munkát indokolja az, hogy a terület szitakötő-faunája gazdag, már az eddigi vizsgálatok során 14 törvényesen védett taxon előfordulását sikerült igazolni. Ezek között több kiemelten értékes elem található, amilyen elsősorban mind az 5, a Berni Egyezményben szereplő taxon (*Aeshna viridis*, *Gomphus flavipes*, *Ophiogomphus cecilia*, *Leucorrhinia caudalis*, *Leucorrhinia pectoralis*). Már a monitorozás első éveinek tapasztalatai is arra utaltak, hogy a terület vizes élőhelyei közül főleg a sekélyebbek nagyon sérülékenyek, mindenekelőtt az aszályos időjárás hatására bekövetkező részleges vagy esetenkénti teljes kiszáradás miatt.

A kvantitatív faunakép kialakításában elsősorban a szitakötő imágók felmérése indokolt. A monitorozása során azonban kellő hangsúlyt kapott a lárvák és a lárvabőrök felmérése is. A Dráva mentén folyó monitorozásban cél a mintaterületek teljes szitakötő népségének vizsgálata. Ezen belül azonban kiemelten kezeljük a már említett, berni egyezményben szereplő, többnyire ritka taxonokat.

A mintavételezésben mind a populációsintű, mind a közösségintű monitorozásnak szerepe van. Mindkét módszer alapját a Nemzeti Biodiverzitás-monitorozó Rendszer V. kötetében (FORRÓ 1997) lefektetett alapelvek képezik.

A Duna-Dráva Nemzeti Park igazgatósága három területegységet (Zákány-Őrtilos környéke, Lankóci-erdő, Bélavár-Vízvár térsége) javasolt monitorozásra. Ezek mindegyike megfelel a szitakötő fauna hosszú távú vizsgálatára, mivel illeszkednek a tervezett vízi erőmű valószínűsíthető hatásai által befolyásolt vizes élőhelyekhez. A szitakötők monitorozása jelenleg 7 mintavételi helyen folyik. (A monitorozás indulásakor mintavételi helyül szolgált Búdös-ér, valamint Méhes-tó 2001-ben alkalmatlanná vált a vizsgálatra.).

Az elmúlt 5 évben megfigyelt (kisebb részben begyűjtött) egyedek száma meghaladja a 10 ezret. A vizsgált anyag 48 taxonhoz tartozik, vagyis a hazai fauna 73,8 %-át képviseli.

Az anyag faunaelem csoportok szerinti megoszlásának vizsgálata szerint a helyi faunában - hasonlóan az országos tendenciához - a pontomediterrán, a szibíriai és a nyugat-szibíria faunaelemek dominálnak. Azonban a három kategória tekintetében mind a sorrendben, mind a százalékos arányban jelentős különbségek tapasztalhatók.

A fauna gyakoriság szerinti összetételében 6 faj képviseli a szórványos, 7 faj a ritka, 15 faj a mérsékelten gyakori, 19 faj a gyakori és 1 faj az igen gyakori előfordulási taxonokat. A fajok relatív gyakoriság szerinti megoszlása nagyon közel áll az országoséhoz, csupán a szórványosan előforduló (vagyis a legritkább) fajok aránya tér el jelentősen (országosan 19, a Dráva vizsgált szakaszán mindössze 6 faj sorolható ebbe a kategóriába).