

# Caddisflies (Trichoptera) of the Hungarian section of River Tisa<sup>1</sup>

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## *Abstract*

77 species occur along the river and its upper tributaries. Only 26 of them occur along the middle and lower sections of the river. The upper section and especially one of the tributaries (i.e. river Túr) had the most diverse caddisfly community. Both distribution data and the results of phenological examinations are presented. *Stactobiella risi* Felber lives only in the northeastern part of the Plain, in river Tisa and its water system.

Key words: caddisfly, Trichoptera, Hungary, River Tisa, phenology, communities, light trap

## *Introduction: a survey of earlier examinations*

Our knowledge about the Hungarian Trichoptera fauna has developed considerably during the last two decades. We discovered the first Hungarian occurrence of forty to fifty species at least, and studied many regions that had been totally unknown previously from the point of view of their caddisfly faunas. We already know well the caddisflies of the western and the southern parts of Hungary, and the Northern Mountains (mostly Bükk, Börzsöny and Mátra Mts. and Northern Borsod Karst). Several papers have been published about these regions. Many species were found in 100...200 sites in Hungary as we have presented (Nógrádi, Uherkovich 1995).

The caddisflies of the Great Hungarian Plain were known very poorly some years ago. The largest Hungarian collections had preserved hardly any material from this area, as it was published by Nógrádi (1989, 1995). Unquestionably, the fauna of the central part of the plain is not rich, but near the eastern and northeastern borders there are some microregions having more colourful vegetation and fauna. The middle-term examination (six years) along River Fekete-Körös yielded 57 species (Nógrádi, Uherkovich 1996), while 74 species were pointed out by our short but intensive study in Northeast Hungary, along River Tisa and its tributaries (Uherkovich, Nógrádi

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<sup>1</sup> The Hungarian name of the river is Tisza

1998). Besides, Ujhelyi (1971) also mentioned some leptocerid caddisflies from the Tisa region.

### *Material and method*

We collected 112 samples containing 1 to 32 species in 32 sites of the upper section of River Tisa and its tributaries, mostly river Túr, stream Batár and Gögő-Szenke, as it was published in our paper (Uherkovich, Nógrádi 1998). River Old Túr has a native bed and it has not been polluted yet until recent years. Close to the river a light trap functioned in 1994. During this time (from 11th June till 2nd November) the trap captured 15,914 adults of 66 species. Thus, this site proved to be one of the places with the most diverse caddisfly fauna in Hungary. Detailed results were published by us (above cited paper). Recently, about three years ago, a very heavy pollution arrived from the Romanian catchment area, but its influence on the caddisflies is still unknown.

We obtained and processed some samples originating from four sites from the middle and lower sections of the river too, and we also had some materials from further ones. Their detailed data were presented by Uherkovich and Nógrádi (1990).

The summary of the most important faunistic results is given in Table 1. In this table we do not present the results from River Körös; earlier they have been published in detail (Nógrádi, Uherkovich 1996).

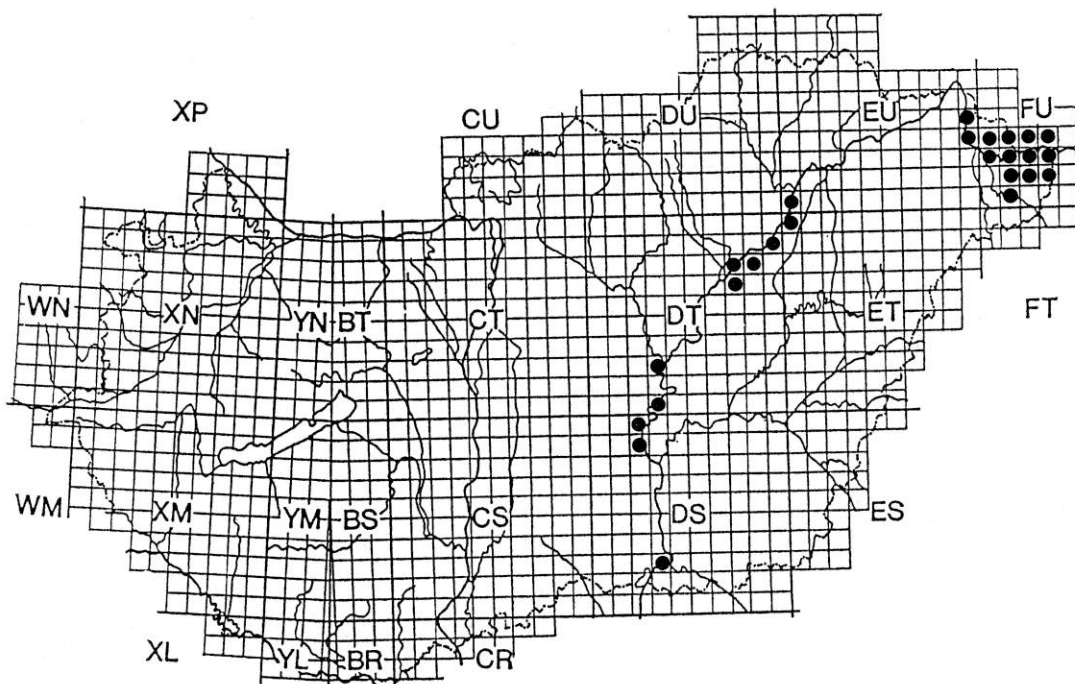


Figure 1. The collecting sites of caddisflies along River Tisa and tributaries of its upper Hungarian section, on the UTM map (10×10 km) of Hungary.

● = recent data; ○ = old data from literature.

Family/Species	Distribution		
	1	2	3
<b>Glossosomatidae</b>			
<i>Agapetus laniger</i> (Pictet, 1834)	●	●	.
<b>Hydroptilidae</b>			
<i>Stactobiella risi</i> (Felber, 1908)	●	●	.
<i>Orthotrichia costalis</i> (Curtis, 1834)	●	●	.
<i>Orthotrichia tragetti</i> Mosely, 1930	.	●	.
<i>Oxyethira falcata</i> Morton, 1893	.	●	.
<i>Oxyethira flavicornis</i> (Pictet, 1834)	.	●	.
<i>Oxyethira tristella</i> Klapálek, 1895	●	●	.
<i>Hydroptila dampfi</i> Ulmer, 1929	.	●	.
<i>Hydroptila forcipata</i> (Eaton, 1873)	●	●	.
<i>Hydroptila lotensis</i> Mosely, 1930	●	●	.
<i>Hydroptila occulta</i> (Eaton, 1873)	.	●	.
<i>Hydroptila sparsa</i> Curtis, 1834	.	●	.
<i>Agaylea sexmaculata</i> Curtis, 1834	.	●	●
<b>Hydropsychidae</b>			
<i>Hydropsyche angustipennis</i> Curtis, 1834	.	●	.
<i>Hydropsyche bulbifera</i> McLachlan, 1878	●	●	.
<i>Hydropsyche bulgaromanorum</i> Malicky, 1977	●	●	●
<i>Hydropsyche contubernalis</i> McLachlan, 1865	●	●	●
<i>Hydropsyche modesta</i> Navás, 1925	●	●	.
<i>Hydropsyche ornatula</i> McLachlan, 1878	●	●	.
<i>Hydropsyche pellucidula</i> (Curtis, 1834)	●	●	.
<i>Cheumatopsyche lepida</i> (Pictet, 1834)	●	.	.

Table 1. (A) Synopsis of the Trichoptera species occurring along the Hungarian section of River Tisa.

Glossary

Distribution areas: 1 = upper Tisa section, 2 = tributary of this section, 3 = middle and lower Tisa section;

Family/Species	Distribution		
	1	2	3
<b>Polycentropodidae</b>			
<i>Neureclipsis bimaculata</i> (Linnaeus, 1758)	●	●	●
<i>Polycentropus irroratus</i> Curtis, 1834	.	●	.
<i>Holocentropus picicornis</i> (Stephens, 1836)	●	●	.
<i>Holocetropus stagnalis</i> (Albarda, 1874)	.	.	●
<i>Cyrnus crenaticornis</i> (Kolenati, 1859)	●	●	●
<i>Cyrnus trimaculatus</i> (Curtis, 1834)	●	●	.
<b>Psychomyidae</b>			
<i>Psychomyia pusilla</i> (Fabricius, 1781)	●	●	.
<i>Lype phaeopa</i> (Stephens, 1836)	.	●	.
<b>Ecnomidae</b>			
<i>Ecnomus tenellus</i> (Rambur, 1842)	●	●	●
<b>Phryganeidae</b>			
<i>Trichostegia minor</i> (Curtis, 1834)	.	●	.
<i>Agrypnia varia</i> (Fabricius, 1793)	.	●	.
<i>Phryganea bipunctata</i> Retzius, 1783	.	●	●
<i>Phryganea grandis</i> Linnaeus, 1758	.	●	●
<b>Brachycentridae</b>			
<i>Brachycentrus subnubilus</i> Curtis, 1834	.	.	○
<b>Limnephilidae</b>			
<i>Limnephilus affinis</i> Curtis, 1834	●	●	●
<i>Limnephilus auricula</i> Curtis, 1834	●	●	○
<i>Limnephilus binotatus</i> Curtis, 1834	.	●	.
<i>Limnephilus bipunctatus</i> Curtis, 1834	●	●	○
<i>Limnephilus decipiens</i> (Kolenati, 1848)	.	●	●
<i>Limnephilus flavicornis</i> (Fabricius, 1787)	●	●	●
<i>Limnephilus griseus</i> (Linnaeus, 1758)	●	●	○
<i>Limnephilus hirsutus</i> (Pictet, 1834)	.	●	.
<i>Limnephilus incisus</i> Curtis, 1834	.	●	.
<i>Limnephilus lunatus</i> Curtis, 1834	●	●	.

Table 1. (B) Synopsis of the Trichoptera species occurring along the Hungarian section of River Tisa.

Glossary

Distribution areas: 1 = upper Tisa section, 2 = tributary of this section, 3 = middle and lower Tisa section;

Family/Species	D i s t r i b u t i o n		
	1	2	3
<i>Limnephilus rhombicus</i> Linnaeus, 1758	.	●	.
<i>Limnephilus vittatus</i> (Fabricius, 1798)	●	●	●
<i>Grammotaulius nigropunctatus</i> (Retzius, 1783)	●	●	●
<i>Grammotaulius nitidus</i> (Müller, 1764)	.	.	○
<i>Glyphotaelius pellucidus</i> (Retzius, 1783)	●	●	.
<i>Anabolia furcata</i> Brauer, 1857	.	●	.
<i>Halesus tessellatus</i> (Rambur, 1842)	.	●	.
<i>Stenophylax meridionalis</i> Malicky, 1980	.	●	.
<i>Stenophylax permistus</i> McLachlan, 1895	●	●	.
<i>Micropterna testacea</i> (Gmelin, 1798)	.	●	.
<b>Goeridae</b>			
<i>Goera pilosa</i> (Fabricius, 1775)	●	.	.
<b>Leptoceridae</b>			
<i>Athripsodes albifrons</i> (Linnaeus, 1758)	●	●	○
<i>Athripsodes aterrimus</i> (Stephens, 1836)	.	●	.
<i>Athripsodes cinereus</i> (Curtis, 1834)	●	●	.
<i>Ceraclea alboguttata</i> (Hagen, 1860)	●	●	.
<i>Ceraclea annulicornis</i> (Stephens, 1836)	●	.	.
<i>Ceraclea aurea</i> (Pictet, 1834)	●	●	.
<i>Ceraclea dissimilis</i> (Stephens, 1836)	●	●	.
<i>Ceraclea fulva</i> (Rambur, 1842)	.	●	.
<i>Ceraclea riparia</i> (Albarda, 1874)	●	●	.
<i>Ceraclea senilis</i> (Burmeister, 1839)	.	●	.
<i>Mystacides azurea</i> (Linnaeus, 1761)	.	●	.
<i>Mystacides longicornis</i> (Linnaeus, 1758)	●	●	●
<i>Mystacides nigra</i> (Linnaeus, 1758)	.	●	●
<i>Triaenodes bicolor</i> (Curtis, 1834)	●	●	.
<i>Oecetis furva</i> (Rambur, 1842)	●	●	●
<i>Oecetis lacustris</i> (Pictet, 1834)	.	●	●
<i>Oecetis notata</i> (Rambur, 1842)	●	●	.
<i>Oecetis ochracea</i> (Curtis, 1825)	●	●	●
<i>Oecetis tripunctata</i> (Fabricius, 1793)	●	●	.
<i>Setodes punctatus</i> (Fabricius, 1793)	●	●	.
<i>Leptocerus tineiformis</i> Curtis, 1834	●	●	●
77 species altogether	45	71	26

Table 1. (C) Synopsis of the Trichoptera species occurring along the Hungarian section of River Tisa.

Glossary

Distribution areas: 1 = upper Tisa section, 2 = tributary of this section, 3 = middle and lower Tisa section;

## Discussion

### 1. Distribution of some species

*Stactobiella risi* was first reported along the upper Tisa section and tributaries (Nógrádi 1994). Its distribution nowadays spreads over only the Szatmár-Bereg Plain, although an old specimen had been found (though not published) from West Hungary (Figure 2b). It sometimes reaches high dominance in the trichopteran community of upper Tisa and can be frequent elsewhere in that region.

The first Hungarian *Oxyethira tristella* was also collected here (Nógrádi literature cited). It is pretty common place by place in the Szatmár-Bereg Plain. In the recent years it has already been found along the upper Danube region, in Szigetköz (unpublished data, Figure 2a).

*Hydroptila dampfi* was published first by Andrikovics and Ujhelyi (1983) in Lake Fertő. Later we found this continental (East European) species in several sites in Hungary, both in the Great Hungarian Plain and in small stagnant waters of hilly regions (Figure 2f). Females were also recognized by Nógrádi (1986). Somewhere it is common, e. g. in lake Balaton and in some oxbow lakes of larger rivers.

*Cheumatopsyche lepida* belongs to the rare species in Hungary. It occurs only in a few hilly regions and somewhere in the upper Hungarian section of larger rivers. It is most frequent in the upper Tisa region (Figure 2c), but we never collected it in high numbers.

*Ceraclea aurea* (Figure 2d) and *Oecetis tripunctata* (Figure 2e) also belong to the rare species currently. Both of them are members of communities of larger rivers. During the last years we collected them only along the upper section of River Tisa, and from many regions they have already completely disappeared by recent years. Ujhelyi (1971) presented some more localities.

Authentic *Phryganea bipunctata* adults had been known from the Great Hungarian Plain, from the Tisa region and from a few other sites (see Nógrádi 1989), later it was not caught for years. Recently it became a not very rare species of some water bodies of Szigetköz, and other collecting sites became known. Along River Túr a single adult was captured.

### 2. Phenology

The activity and phenology of European species are well known in general. The Hungarian (Central European) caddisflies have two main types in their phenology: with or without a summer diapause. *Limnephilus*, *Stenophylax*, *Microptera*, *Grammotaulius* and some phryganeid species have shorter or longer diapause as it is shown by our graphs (Figure 3.). At first sight it seems these species have two generations, for their periods of activity are in May-June and in October-November. The adults of most species have an unbroken - but sometimes varying - activity lasting 2-4 months. The duration of life of individuals usually does not reach a month, but

hatching is permanent in the late spring, summer and early autumn months Figure 3-4.). The peak of activity in some of the species is in early summer (e.g. *Ceraclea annulicornis*), while we know some typically autumn caddisflies being on wing in September-November or only in October-November (e.g. *Anabolia furcata*, *Halesus tessellatus*).

During the last dry years some of limnephilids disappeared or became rarities. Most probably they could not survive the too long dry and hot periods. Thus, *Limnephilus sparsus*, *L. rhombicus*, *L. bipunctatus*, *L. hirsutus*, etc. became rarer and disappeared from some of the regions. The years 1997 and 1998 were rich in precipitation, without long dry periods, therefore we can hope these species will be able to spread their distribution area.

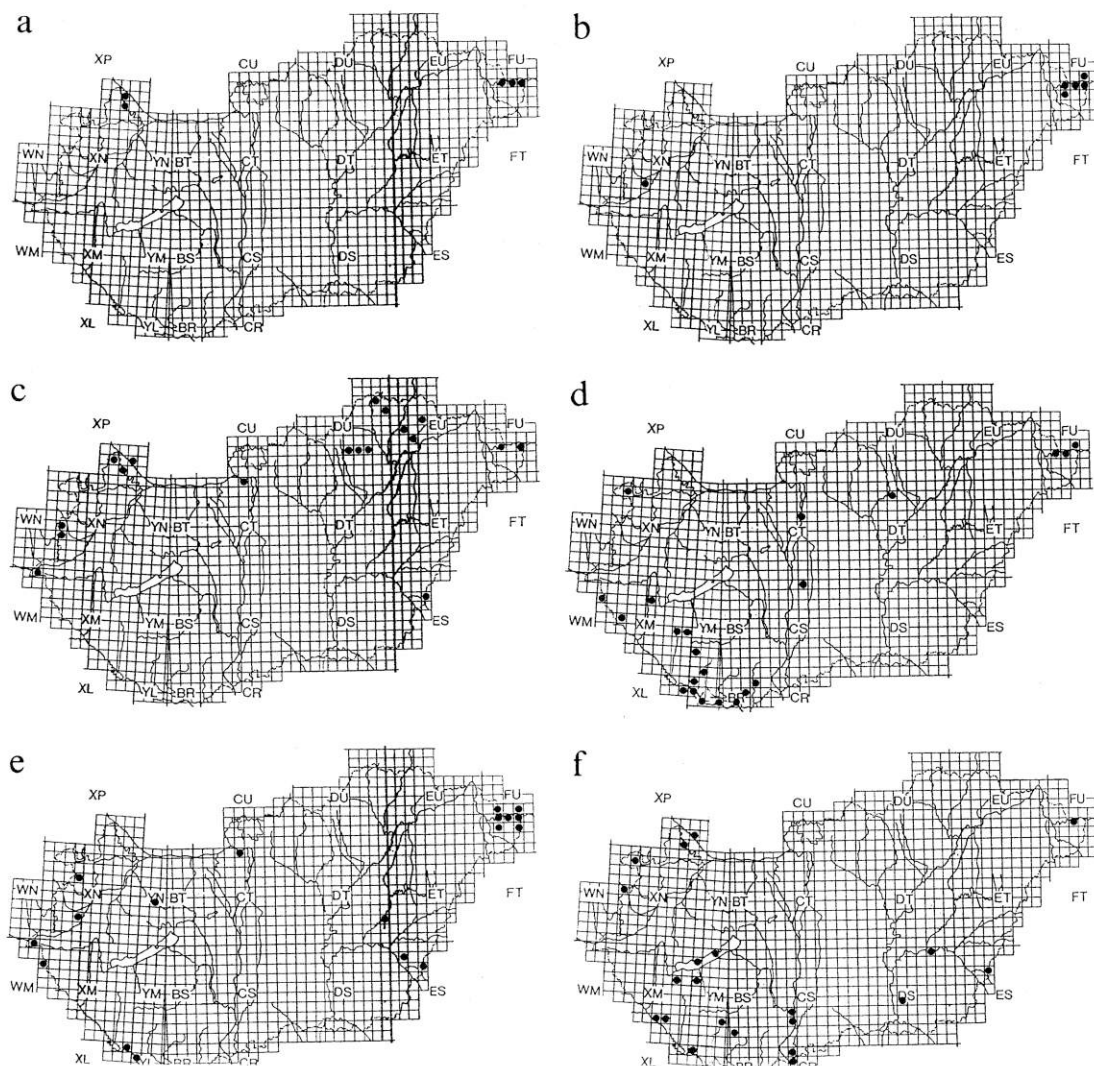


Figure 2. The distribution of some species in Hungary on UTM grid map. a: *Oxyethira tristella* Klapálek, b: *Stactobiella risi* Felber, c: *Cheumatopsyche lepida* Pict., d: *Ceraclea aurea* Pict., e: *Oecetis tripunctata* Fabr., f: *Hydroptila dampfi* Ulmer.

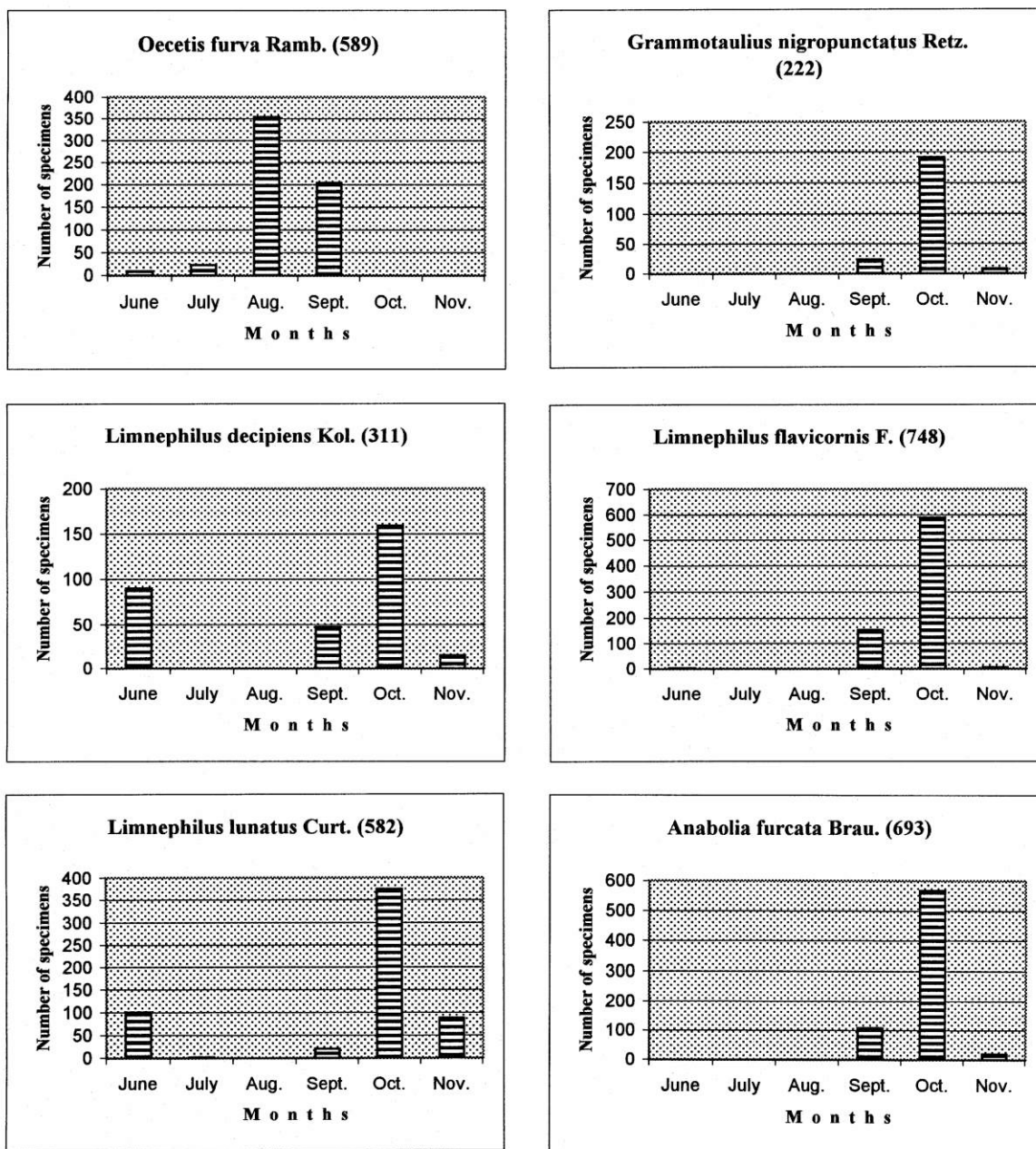


Figure 3. Activity graph of six caddisfly species in Túrístvándi, 1994. The total number of specimens collected by the light trap is shown in brackets.



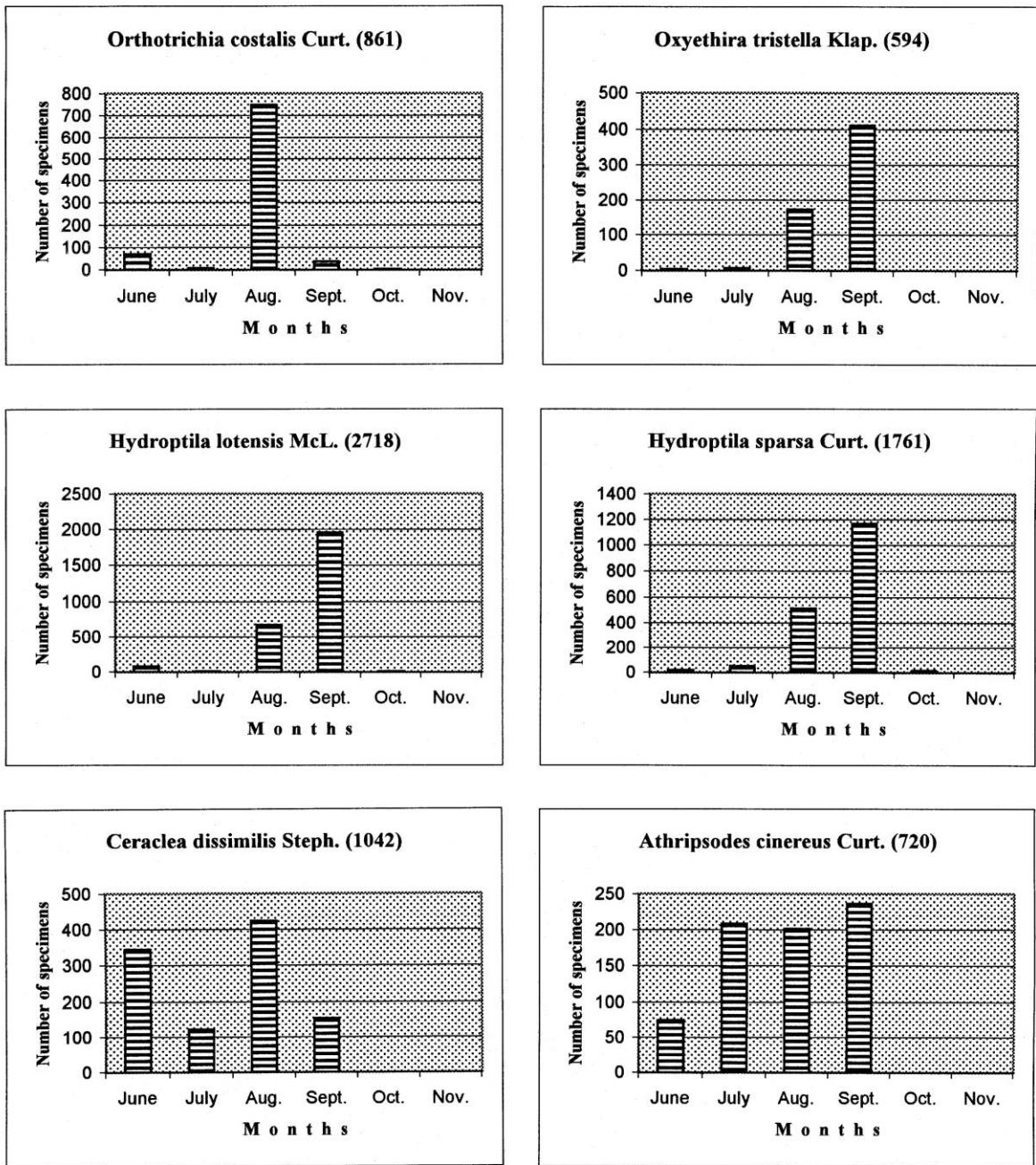


Figure 4. Activity graph of six caddisfly species in Túrístváandi, 1994. The total number of specimens collected by the light trap is shown in brackets.

### 3. Transformation of Trichoptera communities

Trichoptera communities change both in time and from one region to the other. River Tisa has a relatively rich caddisfly community along its upper section, containing many species characteristic of only this region of larger rivers (see Uherkovich, Nógrádi 1997). The circumstances are more favourable for many species: higher velocity, soluted oxygen content, the material of the bed (gravel), and less pollution. After 30 km the bed material changes into sand and mud, and the velocity drops considerably. River Szamos brings heavily polluted water, therefore below its mouth the fauna of River Tisa is impoverished. Other studies (Botos et al. 1990) also show that the lowland sections of larger rivers have poor aquatic - e. g. caddisfly - communities.

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