CONTRIBUTIONS TO THE STUDY OF THE TRICHOPTERANS (INSECTA: TRICHOPTERA) FROM THE SUPERIOR CATCHMENT AREA OF BISTRIȚA RIVER

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Abstract. The research aim to compare the previous studies concerning trichopterans from the superior catchment area of Bistrița River (Eastern Carpathians) with the results of a research during from July 2005 to July 2006 when it was identified a number of 33 species from 8 families. The basic ecological indices (abundance, constance, dominance, cenotic affinity) have been made. The results of the present study shows that in the superior basin of Bistrița River dominant trichoptera species are *Potamophylax latipennis*, *Allogamus auricolis* and eudominant species are *Hydropsyche pellucidula, Brachycentrus subnubilus, Halesus radiatus.* The constant species – the ecological significance calculated by Dzuba index, with a frequency of 50.1-75%: *Rhyacophila obliterata, Hydropsyche pellucidula, Halesus radiatus, Stenophylax vibex.* From the 108 Trichoptera species mentioned in the literature for the entire basin of Bistrița River, a number of 33 species was identified in the superior catchment area, some of them different from the previously mentioned ones. Some of the previously mentioned taxa in the area of our study could not be found during our research: *Rhyacohila fasciata, Rhyacophila nubila, Rhyacophila philopotamoides, Rhyacophila confinium, Agapetus delicatulus, Psychomia pussila, Drusus discolor , D. trifidus* şi *D. Biguttatus* the gena Anabolia, Goera, Lithax, Silo, Apatania. Some species mentioned only in the middle bassin were founded during the research in the superior bassin also. Some species are mentioned for the first time in Moldavia area: *Baraeodes minutus, Hydropsyche contubernalis, Hydropsyche angustipennis, Drusus annulatus, Allogamus auricolis*.

Keywords: Trichoptera larvae, checklist, coenotic affinity, superior catchment area, Bistrița River.

Rezumat. Contribuții la studiul trichopterelor (Insecta: Trichoptera) din bazinul superior al Bistriței. Lucrarea se raportează la datele existente în studiile de specialitate publicate până în prezent privitoare la trichopterele din bazinul superior al Bistriței cu rezultatele obținute într-un studiu efectuat în perioada iulie 2005 - iulie 2006 când a fost identificat un număr de 33 de specii din 8 familii. La acestea s-au calculat indicii ecologici analitici şi indicele de afinitate cenotică Jaccard. Conform rezultatelor indicilor ecologici analitici calculați în bazinul superior al Bistriței speciile trichoptere dominante sunt: *Potamophylax latipennis, Allogamus auricolis;* eudominante: *Hydropsyche pellucidula, Brachycentrus subnubilus, Halesus radiatus.* Speciile constante (după indicele Dzuba), cu frecvență 50.1- 75% sunt: *Rhyacophila obliterata, Hydropsyche pellucidula, Halesus radiatus, Stenophylax vibex.*
Anterior acestui studiu 108 specii de trichoptere sunt menționate în literatură pentru bazinul Bistriței; unele nu au mai fost identificate în teren: *Rhyacophila fasciata, Rhyacophila nubila, Rhyacophila philopotamoides, Rhyacophila confinium, Agapetus delicatulus, Psychomia pussila, Drusus discolor , D. trifidus* şi *D. biguttatus* sau genurile Anabolia, Goera, Lithax, Silo, Apatania. Altele sunt menționate pentru prima dată în zona Moldovei: *Baraeodes minutus, Hydropsyche contubernalis, Hydropsyche angustipennis, Drusus annulatus, Allogamus auricollis.*

Cuvinte cheie: Larve de trichoptere, listă, afinitate cenotică, bazin superior, râul Bistrița.

Introduction

The recent references concerning trichopterans are poor in Romania, the last major published study being the checklist made by Ciubuc (1993). Although, the Romanian contribution in this domain on global level is remarkable, especially by the activity of Lazare Botoşăneanu whose previous studies (1957, 1961) concerning the trichopterans fauna including Bistrița River are frequently mentioned forward.

The data about trichoptera species from Bistrița River can be found in more complex studies such Motaş & Anghelescu (1939, 1944) on the macroinvertebrates and

fish and Botoşăneanu (1957, 1961) concerning trichoptera species, (Miron *et al.*, 1983), or trichopterans studies concerning mainly its middle bassin (Murgoci, 1953; Murgoci & Marcoci-Stoenescu, 1955; Ailenei, 2005).

Material and Methods

Bistrița River has 278.8 km in lenght and 7042 km^2 as surface of its total catchment area. In its middle basin is placed the dam of Izvoru Muntelui at 507 m altitude. The 10 sampling sites have been chosen on altitudinal criteria considering the main confluences and the heterogeneity of the substratum also: S1 – Săvineşti- Galu (Bistrița River); S2 – Neagra Broşteni River; S3 – Broşteni (Bistrița River); S4 – Ortoaia (Bistrița) ; S5 – Poiana Negri on Negrişoara Stream; S6 – Dorna Candreni (Dorna River); S7 – Ciocăneşti (Bistrița Aurie River); S8 – Exploatare (Bistrița Aurie River, 35 km upstream Iacobeni); S9 –Canalul Stream, S10 – Ştiol Lake (named also Izvoru Bistritei, it has 587 m^2 in surface, 2 m maximum deep and 40 m in length, it is situated at more than 1900 m in Rodna Mountains). The main characteristics of the analyzed tributaries are presented forward (Table 1).

Table 1. Main characteristics of the studied tributaries from the superior catchment area of Bistrița River.

Tributary	Length (km)	Slope ‰	Total surface (Km^2)	Average altitude (m)
Canalul Stream	5	58	9	
Negrişoara Stream	21	41	95	1177
Dorna River	53	17	608	1127
Neagra Broşteni River	41	19	356	1219

From each workstation we had 7 samples from different kinds of substrate or combinations deep-velocity of the water. The samples have been taken in May, July and September 2005 and July 2006 using the Surber sampler (mesh 0.500µm, sample surface 1/5 m²) and preserved in phormaldehide 5%. The trial and the identification of the benthic organisms were made with a binocular microscope. The abundance, dominance, constancy and Jaccard coefficient was calculated (Table 3).

Results and Discussion

In the superior catchment area of Bistrita River, during the time of the present research (May 2005-July 2006) it has been analysed a number of 406 larve from 34 species of 8 families (Table 2): Rhyacophilidae, Glossossomatidae, Hydropsychidae, Polycentropodidae, Brachycentridae, Limnephilidae, Bareidae and Sericostomatidae.

The dominant number of individuals are from the family of Limnephilidae – over 50% (214 larve) followed by Sericostomatidae 30%, Hydropsychidae 20%, Brachycentridae 11%, Rhyacophilidae 8%; the families Bareidae and Glossossomatidae are represented only by one inividual each by means 0.24 %.

Table 2. Trichoptera families identified in the superior catchment area of Bistrița River.

FAMILY	Nr.	%
Rhyacophilidae	33	8.128
Glossosomatidae	1	0.246
Polycentropodidae	1	0.246
Hydropsychidae	80	19.7
Brachycentridae	46	11.33
Limnephilidae	214	52.71
Bareidae	1	0.246
Sericostomatidae	30	7.389
Total	406	100

Table 3. Analytical ecological indices values of the trichoptera species collected from the superior catchment area of Bistrita River in May 2005 - July 2006 (A- Relative abundence; F- Frequency, C- Constance, D –Dominance).

Nr. crt.	Taxa	Total	Analytical ecological indices values			
			A (%)	D	F%	C
1	*Rhyacophila glareosa*	2	0.49	Subrecedent	11.11	Accidental
2	*Rhyacophila obliterata*	8	1.97	Recedent	55.55	Constant
3	*Rhyacophila polonica*	2	0.49	Subrecedent	22.22	Accidental
4	*Rhyacophila tristis*	2	0.49	Subrecedent	11.11	Accidental
5	*Rhyacophila dorsalis*	18	4.67	Subdominant	44.44	Accesory
6	*Glossosoma boltoni*	1	0.24	Subrecedent	11.11	Accidental
7	*Hydropsyche pellucidula*	64	15.76	Eudominant	66.66	Constant
8	*Hydropsyche instabilis*	4	0.98	Subrecedent	44.44	Accesory
8	*Hydropsyche contubernalis*	1	0.24	Subrecedent	11.11	Accidental
10	*Hydropsyche angustipennis*	4	0.98	Subrecedent	22.22	Accidental
11	*Neureclypsis bimaculata*	7	1.72	Recedent	11.11	Accidental
12	*Chimarra marginata*	1	0.24	Subrecedent	11.11	Accidental
13	*Brachycentrus montanus*	5	1.23	Recedent	11.11	Accidental
14	*Brachycentrus subnubilus*	41	10.09	Eudominant	11.11	Accidental
15	*Ecclsopteryx madida*	1	0.24	Subrecedent	11.11	Accidental
16	*Drusus annulatus*	5	1.23	Recedent	44.44	Accidental
17	*Hydatophilax infumatus*	2	0.49	Subrecedent	22.22	Accidental
18	*Grammotaulius nitidus*	5	1.23	Recedent	11.11	Accidental
19	*Mesophylax impunctatus*	2	0.49	Subrecedent	22.22	Accidental
20	*Melampophylax mucoreus*	1	0.24	Subrecedent	11.11	Accidental
21	*Potamophylax latipennis*	22	5.41	Dominant	11.11	Accidental
22	*Potamophylax cingulatus*	19	4.67	Subdominant	11.11	Accidental
23	*Potamophylax rotundipennis*	16	3.94	Subdominant	33.33	Accesory
24	*Halesus digitatus*	18	4.43	Subdominant	44.44	Accesory
25	*Halesus radiatus*	46	11.33	Eudominant	66.66	Constant
26	*Stenophylax vibex*	5	1.23	Recedent	55.55	Constant
27	*Stenophylax sequax*	16	3.94	Subdominant	22.22	Accidental
28	*Allogamus auricolis*	22	5.41	Dominant	22.22	Accidental
29	*Chaetopteryx villosa*	10	2.46	Subdominant	22.22	Accidental
30	*Notidobia ciliaris*	2	0.49	Subrecedent	11.11	Accidental
31	*Baraeodes minutus*	1	0.24	Subrecedent	11.11	Accidental
32	*Sericostoma personatum*	18	4.43	Subdominant	22.22	Accidental
33	*Oecismus monedula*	11	2.70	Subdominant	44.44	Accesory
	TOTAL	406	100			

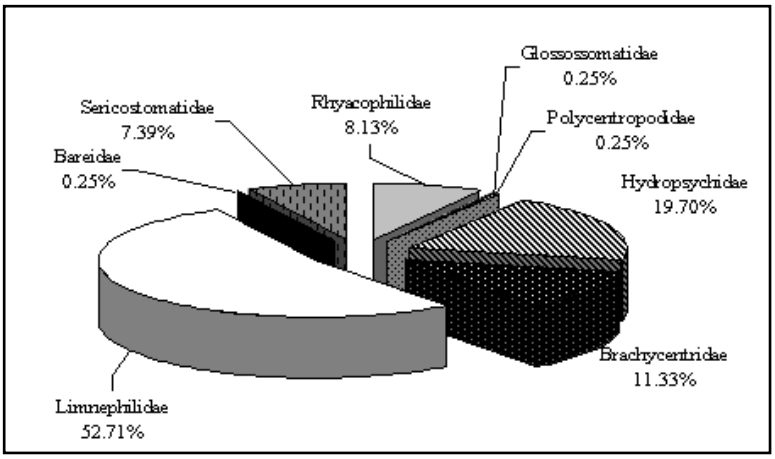

Figure 1. The percentage of trichoptera families identified by the present study in the superior catchment area of Bistrița River.

By their abundance (A= n/N X 100) and dominance (D = n/N X 100) there were found five groups. D1 Subrecedent species – under 1%: *Rhyacophila glareosa, Rhyacophila polonica, Rhyacophila tristis, Rhyacophila dorsalis, Glossosoma boltoni, Hydropsyche instabilis, Hydropsyche contubernalis, Hydropsyche angustipennis, Chimarra marginata, Ecclsopteryx madida, Hydatophilax infumatus, Mesophylax impunctatus, Melampophylax mucoreus, Notidobia ciliaris, Baraeodes minutus;* D2 recedent or sporadic species (1.1-2%): *Rhyacophila obliterata, Neureclypsis bimaculata, Brachycentrus montanus, Drusus annulatus, Stenophylax vibex, Grammotaulius nitidus*; D3 subdominant species (2.1-5%): *Potamophylax cingulatus, Potamophylax rotundipennis, Halesus digitatus, Stenophylax sequax, Chaetopteryx villosa, Sericostoma personatum, Oecismus monedula*; D4 dominant species (5.1-10%): *Potamophylax latipennis, Allogamus auricolis*; D5 eudominante species (over 10.1%): *Hydropsyche pellucidula, Brachycentrus subnubilus, Halesus radiatus.*

By frequence and constance it were evidentiated four groups. The frequency formula is F% = p/P X 100; constance of species represents the continuity in the biotop. Accidental species: (F between 1-25%): *Rhyacophila glareosa, Rhyacophila polonica, Rhyacophila tristis, Glossosoma boltoni, Hydropsyche contubernalis, Hydropsyche angustipennis, Neureclypsis bimaculata, Chimarra marginata, Brachycentrus montanus, Brachycentrus subnubilus, Ecclsopteryx madida, Drusus annulatus, Hydatophilax infumatus, Grammotaulius nitidus, Mesophylax impunctatus, Melampophylax mucoreus, Potamophylax latipennis, Potamophylax cingulatus, Stenophylax sequax, Allogamus auricolis, Chaetopteryx villosa, Notidobia ciliaris, Baraeodes minutus, Sericostoma personatum.* Accesory species (F between 25.1 – 50%): *Rhyacophila dorsalis, Hydropsyche instabilis, Potamophylax rotundipennis, Halesus digitatus, Oecismus monedula*. Constant species (F between 50.1- 75%): *Rhyacophila obliterata, Hydropsyche pellucidula, Halesus radiatus, Stenophylax vibex.* There are not euconstant species (F of 75.1-100%).

The literature mentioned 108 trichopteran species for the entire catchment area of the Bistrița River and only 32 species in the superior catchment area (Table 4). Some of them couldn't be identified in our research: *Rhyacohila fasciata* at Cârlibaba (Ciubuc, 1993) *Rhyacophila nubila* – Neagra Broşteni (Motaş & Anghelescu, 1944) *Rhyacophila philopotamoides* – Cîrlibaba (Ciubuc, 1993), *Rhyacophila confinium* – Lala (Ciubuc, 1993), *Apatania* sp. – Barnar (Motaş, Anghelescu, 1944), *Drusus discolor* Rambur, *D. trifidus* şi *D. biguttatus* Pict – the complex of springs from Gura Lalei-Şesuri (Ciubuc, 1993); the gena Anabolia, Goera, Lithax, Silo - registered in Prislop Passage, Borşa – Iacobeni Passage (Ciubuc, 1993) or Poiana Stampei (Botoşăneanu, 1961, 1967). We did not include in our research the area of Poiana Stampei, so we could not verify the presence of some species mentioned only there (Botoşăneanu, 1955, 1957, 1961): *Agapetus delicatulus* and *Psychomia pussila* Fab.

Some species mentioned only in the middle basin were founded during the research in the superior bassin also: *Glossossoma boltoni* Curt, *Hydropsyche pellucidula* Curt, *Brachicentrus subnubilus* Curt., *Halesus digitatus* Schrank. Some species are mentioned for the first time in Moldavia area: *Baraeodes minutus* L, *Hydropsyche contubernalis* McL., *Hydropsyche angustipennis* Curt; *Drusus annulatus* Steph; *Allogamus auricolis* Pict. Two larvae of *Rhyacophila glareosa* McL were found; this species presence was uncertain for Romania, the only one registration being made by Pongracz (Ciubuc, 1993).

Affinity – Jaccard coefficient (Table 5), revealed the maximum affinity (100%) between two communities. The first one composition: *Melampophilax mucoreus, Ecclysopteryx madida, Brachycentrus subnubilus* and *Rhyacophila glareosa*. This species association can be found in Bistrița Aurie (S7- Ciocănesti). The second one:

Brachycentrus montanus, Chimarra marginata, Neureclypsis bimaculata and *Rhyacophila tristis.* For the second association can be added in 50 % *Stenophyalax (Micropterna) sequax. Hydropsyche instabilis* and *Rhyacophila dorsalis* have also an affinity of 50%.

Potamophilax cingulatus, P. latipennis, Hydropsyche contubernalis and *Glossossoma boltoni* revealed the maximum affinity (100%) at Neagra Broşteni. Other species can be added to this association: *Halesus radiatus* şi *Rhyacophila sp* (having a cenotic affinity of 80% one to another); it can be added to this association in 70% *Halesus digitatus, Oecismus monedula* and *Drusus annulatus* also. *Baraeodes minutus* and *Grammotaulius nitidus* are found toegether in Dorna River at Ortoaia, having maximum affinity of 100%. Maximum affinity had also *Rhyacophila polonica* and *Allogamus auricollis.*

Conclusions

The results of the present study shows that in the superior basin of Bistriţa River dominant trichoptera species are *Potamophylax latipennis*, *Allogamus auricolis* and eudominant species are *Hydropsyche pellucidula, Brachycentrus subnubilus, Halesus radiatus.* The constant species – the ecological significance calculated by Dzuba index, with a frequency of 50.1-75%: *Rhyacophila obliterata, Hydropsyche pellucidula, Halesus radiatus, Stenophylax vibex.*

Affiniy index Jaccard (Fig. 2) revealed the maximum affinity (100%) between *Baraeodes minutus* and *Grammotaulius nitidus*, found toegether in Dorna River at Ortoaia, having maximum affinity 100%. Maximum affinity was found also at *Rhyacophila polonica* and *Allogamus auricollis*. It was also another case of maximum affinity between two groups. The first one composition: *Melampophylax mucoreus, Ecclysopteryx madida, Brachycentrus subnubilus* and *Rhyacophila glareosa*. This species association can be found in Bistriţa Aurie (S7 – Ciocănesti). The second one: *Brachycentrus montanus, Chimarra marginata, Neureclypsis bimaculata* and *Rhyacophila tristis.* For the second association can be added in 50 % *Stenophylax (Micropterna) sequax, Hydropsyche instabilis* and *Rhyacophila dorsalis* have also an affinity of 50%. *Potamophylax cingulatus, P. latipennis, Hydropsyche contubernalis* and *Glossossoma boltoni* revealed the maximum affinity (100%) at Neagra Broşteni. Other species can be added to this association: *Halesus radiatus* and Rhyacophila sp (having a cenotic affinity of 80% one to another); it can be added to this association in 70% *Halesus digitatus*, *Oecismus monedula* and *Drusus annulatus* also.

The literature mentioned 108 trichoptera species for the entire catchment area of Bistriţa River and only 32 species in the superior catchment area. Some of them couldn't be identified in our research: *Rhyacohila fasciata, Rhyacophila nubila, Rhyacophila philopotamoides, Rhyacophila confinium, Agapetus delicatulus, Psychomia pussila, Drusus discolor, D. trifidus* and *D. biguttatus* the gena Anabolia, Goera, Lithax, Silo, Apatania .

Some species mentioned only in the middle bassin were founded during the research in the superior basin also: *Glossossoma boltoni, Hydropsyche pellucidula, Brachycentrus subnubilus, Halesus digitatus*.

Some species are mentioned for the first time in Moldavia area: *Baraeodes minutus, Hydropsyche contubernalis*, *Hydropsyche angustipennis*, *Drusus annulatus*, *Allogamus auricollis.* Two larvae of *Rhyacophila glareosa* McL were found; this species presence was uncertain for Romania, the only one previous registration being made by Pongracz (Ciubuc, 1993).

Table 4. The compaired list of trichoptera species from the superior catchment area from the present study concerning only larvae and the previous studies mentioned in the literature (I- imago, N- nimph, L- larva) S1-Săvineşti – Galu (Bistriţa River); S2 - Neagra Broşteni River; S3- Broşteni (Bistriţa River); S4- Ortoaia (Bistriţa) ; S5 – Poiana Negri on Negrişoara Stream; S 6 – Dorna Candreni (Dorna River); S 7 – Ciocăneşti (Bistriţa Aurie River); S 8 – Exploatare (Bistriţa Aurie River, 35 km upstream Iacobeni); S9 –Canalul Stream, S10 – Ştiol Lake.

Nr.	Taxa	Present study	Previous studies (Authors)	Collecting sites and stage	Observations
1	2	3	4	5	6
	Fam. Rhyacophilidae				
1	*Rhyacophila glareosa* McL.	S9	Pongracz, S., 1914, *op.cit.* Ciubuc 1993	Rodna Mountains	Species signaled previously as incertain for Romania
2	*Rhyacophila obliterata* Mc L.	S1, S4, S6, S7 S8	Murgoci & Marcoci-Stoenescu, 1955 May, 1978 *op.cit.* Ciubuc 1993	Bistriţa River, Iapa, Steam, N Rodna Mountains, Cârlibaba, Borşa	Mentioned previoustly in the superior and middle catchment area
3	*Rhyacophila polonica* Mc L.	S8	Ciubuc,1993 Botoşăneanu, 1961	Rodna Mountains Cârlibaba, I; Borşa, I; Prislop, I; Izvoru Alb,I; Tofla, tributary of Dornişoara Stream , I.	Mentioned previoustly in the superior and middle catchment area
4	*Rhyacophila tristis* Pict.	S8	Ciubuc,1993	Paltinu Stream and its tributaries, Borşa-Fântâna, Borşa –Iacobeni passage; Putredu, Lala, Gura Lala-Ineu,	
5	*Rhyacophila* sp.	S2, S5, S6, S8, S9			
6	*Rhyacophila doehleri* Bots.	-	Ciubuc,1993	Rodna Mountains, Lala Lake, Bistriţa in Borşa – Iacobeni passage, Lala, Gura Lalei-Ineu	Not found in the present study
7	*Rhyacophila nubila* Zett.	-	Motaş & Anghelescu, 1944	Neagra Broşteni ,L	Not found in the present study
8	*Rhyacophila confinium* Bots.	-	Ciubuc,1993	Lala, Gura Lalei-Ineu	Not found in the present study
9	*Rhyacophila philopotamoides* McL.	-	May, 1978 *op.cit.* Ciubuc 1993	Rodna Mountains 10 km west from Cârlibaba, I; Borşa, I; Cârlibaba, I; Prislop, I; Borşa-Lala I;	Not found in the present study
10	*Rhyacophila flava* Klap.	-	Botoşăneanu, 1958, *op.cit.* Ciubuc,1993	Rodna Mountains , Lala Lake	Not found in the present study
	Fam. Glossossomatidae				
11	*Glossosoma boltoni* Curt.	S2	Murgoci & Marcoci-	Putna L, N, Borsec, N, Borsec, N; Grinţieş, L,	Mentioned before only in the middle

Nr.	Taxa	Present study	Previous studies (Authors)	Collecting sites and stage	Observations
1	2	3	4	5	6
			Stoenescu, 1955	Bistricioara, N; Bistrița – Hangu, N	catchment area of Bistrita River
12	*Glossossoma conformis* Neboiss	-	Pongracz, S., 1914, *op.cit.* Ciubuc 1993	Rodna Mountains	Not found in the present study
13	*Synafophora intermedia* Klap.	-	Botoşăneanu, 1955, 1957, 1961	Lala, N;	Not found in the present study
14	*Agapetus delicatulus* McL.	-	Botoşăneanu, 1957	Dorna, Doprnişoara and Teşnița; Poiana Stampei,	Not found in the present study
15	*Agapetus laniger* Pict.	-	Botoşăneanu,, 1957, 1961	Dorna at Poiana Stampei Bistrița in its middle catcment area	Not found in the present study
	Fam. Polycentropodidae				
16	*Neureclypsis bimaculata* L.	S8	Ciubuc, 1993	In Eastern Carpathians only at Miercurea Ciuc, Banat, Danube Delta	Not mentioned before in Moldavia
	Fam. Hydroptilidae				
17	*Hydroptila forcipata* McL.	-	Botoşăneanu, 1961	Pângărăciori, I; Bistrița la Pângărați , I; Bărnărel, I; Barnar I.	Not found in the present study
	Fam. Philopotamidae				
18	*Philopotamus montanus* Donovan	-	Botoşăneanu, 1961 Murgoci, 1960	Rodna Mountains, Lala, I; Bistrița in its middle catcment area	Mentioned previoustly in the superior and middle catchment area
19	*Philopotamus variegates* Scop.	-	Ciubuc,1993	Bistrița in Borşa-Iacobeni passage	Not found in the present study
20	*Wormaldia occipitalis* Pict.	-	May, 1978 *op.cit.* Ciubuc 1993	Rodna Mountains I	Not found in the present study
21	*Chimarra marginata* L.	S8			
	Fam. Hydropsychidae				
22	*Hydropsyche pellucidula* Curt.	S1, S2, S4, S5, S6, S7	Murgoci & Marcoci-Stoenescu, 1955 Botoşăneanu, 1961	Izvoru Muntelui, N, L, I; Bicaz, L; Răchițaş (tributary of Bistricioara), L; Bistrița: Hangu, N; Buhalnița L; Piatra Neamț, L; at the Ceahlău Mountain base N, I; Bistrița Pângărați I.	Previously registered only in the middle catchment area of Bistrita River
23	*Hydropsyche instabilis* Curt.	S2, S5, S8	Murgoci & Marcoci-Stoenescu, 1955	Izvoru Muntelui, N, L	Mentioned before only in the middle catchment area of Bistrita River
	Fam. Plycentropodidae				
24	*Polycentropus flavomaculatus* Curt.	-	Botoşăneanu, 1961	Negrişoara- Poiana Negri, I;Valea Dorna-Poiana Stampei, I.	Not found in the present study
25	*Psychomia pusilla* Fab.	-	Botoşăneanu, 1957,	Barnar- Gura Barnarului, I;	Not found in the present study

Nr.	Taxa	Present study	Previous studies (Authors)	Collecting sites and stage	Observations
1	2	3	4	5	6
			1961	Dorna-Poiana Stampei, I; Bancu-Coşna, I	
	Fam. Brachycentridae				
26	*Brachycentrus montanus* Klap.	S8	Motaş & Anghelescu, 1944	Barnar, L	
27	*Brachycentrus subnubilus* Curt.	S9	Murgoci & Marcoci-Stoenescu, 1955	Gârla Morii, Bistriţa, N	Mentioned before only in the middle catchment area of Bistrita River
	Fam. Limnephilidae				
28	*Apatania carpatica carpatica* Schmid.	-	Botoşăneanu, 1961 Ciubuc,1993	Holdiţa-Broşteni, Arşiţa Valley, upstream Broşteni, I Cârlibaba, I	Not found in the present study
29	*Drusus annulatus* Steph.	S2, S5, S8, S9	Botoşăneanu, 1954	Valea Ampoiului, Ariesul Mic	Not registerd before in Moldavia
30	*Drusus biguttatus* Pict.	-	Ciubuc,1993	The sprig complex in the passage Prislop – Borşa – Lala, I; Borşa – II, Putredul, I; Iacobeni, Cârlibaba	Not found in the present study
31	*Drusus discolor* Ramb.		Murgoci & Marcoci-Stoenescu, 1955 May, 1978 *op.cit.* Ciubuc 1993	Bărnărel, L; Lacul Lala, I	Not found in the present study
32	*Drusus trifidus* McL.	-	Ciubuc,1993	Rheocren source between Gura Lalei and Şesuri	Not found in the present study
33	*Ecclsopteryx madida* McL .	S9	Motaş & Anghelescu, 1944	Rodna Mountains	
34	*Limnephilus affinis* Curt.	-	Botoşăneanu, 1957, 1961	Lala, I; Gura Lalei, I	Not found in the present study
35	*Limnephilus coenosus* Curt.	-	Botoşăneanu, 1957,1961	Vatra Dornei, I;	Not found in the present study
36	*Limnephilus extricatus* McL.	-	Botoşăneanu, 1957,1961	Vatra Dornei, I; Prislop	Not found in the present study
37	*Glyphotaelius pellucidus* Retz.	-	Motaş & Anghelescu, 1944	Bărnărel, L; Cristişor (tributary of Neagra Stream), L; Jumălăţu (tributary of Neagra Stream), L, Ursu, L	Not found in the present study
38	*Nemotaulius punctatolineatus* Retz.	-	Motaş & Anghelescu, 1944	Tomnaticu (tributary of Barnar Stream), L	Not found in the present study
39	*Anabolia furcata* Brau.	-	Botoşăneanu, 1957,1961	Valea Dornişoara Stream, I; tributary of Teşna, I; Poiana Stampei, I;	Not found in the present study
40	*Anabolia laevis* Zett.	-	Ciubuc,1993	Poiana Stampei in Dornişoara, I; tributary of	Not found in the present study

Nr.	Taxa	Present study	Previous studies (Authors)	Collecting sites and stage	Observations
1	2	3	4	5	6
				Teşnei, I; Dorna,I.	
41	*Phacopteryx brevipennis* Curt.	-	Botoşăneanu, 1957,1961	Poiana Stampei, I	Not found in the present study
42	*Potamophylax latipennis* Curt.	S2	Botoşăneanu, 1961	Tarcau	Mentioned before only in the middle catchment area of Bistrita River
43	*Potamophylax cingulatus* Steph.	S2	Botoşăneanu, 1961	Tarcau	Mentioned before only in the middle catchment area of Bistrita River
44	*Potamophylax rotundipennis* Brau.	S2, S8, S9			
45	*Potamophylax* sp.	S2, S3, S8, S10			
46	*Mesophylax impunctatus* McL.	S 10			
47	*Melampophylax mucoreus* Hagen	S1			
48	*Halesus digitatus* Schrank	S2, S5, S6, S10	Botoşăneanu,1961 Murgoci, 1960	Bistriţa, Tarcău, L, I; Potoci, I; Lacu Roşu, I,	Bistriţa in its middle catcment area
49	*Halesus radiatus* Curt.	S2, S4, S5, S6, S8, S9, S10	Ciubuc, 1993	Banat, Western Carpathians	Not mentioned previoustly in Moldavia
50	*Stenophylax vibex* Curt	S1			
51	*Stenophylax sequax* McL	S8, S9	Ciubuc, 1993	Cheile Varghisului, Eastern Carpathians;	Not mentioned previoustly in Bistrita Basin
52	*Annitella lateroproducta* Bots.		Botoşăneanu, 1957,1961	Dorna la Poiana Stampei, I	Not found in the present study
53	*Allogamus auricolis Pict.*	S2, S5	Ghețeu *et al.*, 2005	Mentioned previoustly in Southern and Western Carpathians by Ciubuc	First registration in Moldavia
54	*Lithax niger* Hag		Murgoci & Marcoci-Stoenescu, 1955 Botoşăneanu, 1957,1961	Dorna la Poiana Stampei, I	Not found in the present study
55	*Sillo piceus* Brau.		Botoşăneanu, 1957,1961	Dorna la Poiana Stampei, I	Not found in the present study
56	*Sillo graellsi* Pict.		Ciubuc,1993	Prislop passage at Borşa – Prislop – Lala, I; Baia Borşa, I;	Not found in the present study
57	*Lasiocephala basalis* Kolenati		Botoşăneanu, 1961	Dornişoara la Poiana Stampei, I	Not found in the present study

Nr.	Taxa	Present study	Previous studies (Authors)	Collecting sites and stage	Observations
1	2	3	4	5	6
58	*Athripsodes commutatus* Rostock		Botoşăneanu, 1957,1961	Valea Dornei la Poiana Stampei, I	Not found in the present study
59	*Mystacides nigra* L	-	Botoşăneanu, 1957,1961	Teşnița, at Poiana Stampei, I	Not found in the present study
	Fam. Bareidae				
60	*Beraea pullata* Curt.	-	Ciubuc, 1993	Prislop passage - Borşa –Lala I; Putredu, rheocren stream between Gura Lala and Şesuri,	Not found in the present study
61	*Baraeodes minutus* L	S5			
62	*Notidobia ciliaris* L		Murgoci & Marcoci-Stoenescu, 1955	Bărnărel, L,N; Pântecaru, L; N; Neagra la Poiana Vinului, L	
	Fam. Sericostomatidae				
63	*Sericostoma personatum* Kirby& Spence	S2, S8	Ciubuc,1993	Maramureş, Bucovina	Not mentioned before in Bistrita Basin
64	*Oecismus monedula* Hagen	S2, S5, S8, S9	Ciubuc,1993	Maramureş, Bucovina	Not mentioned before in Bistrita Basin

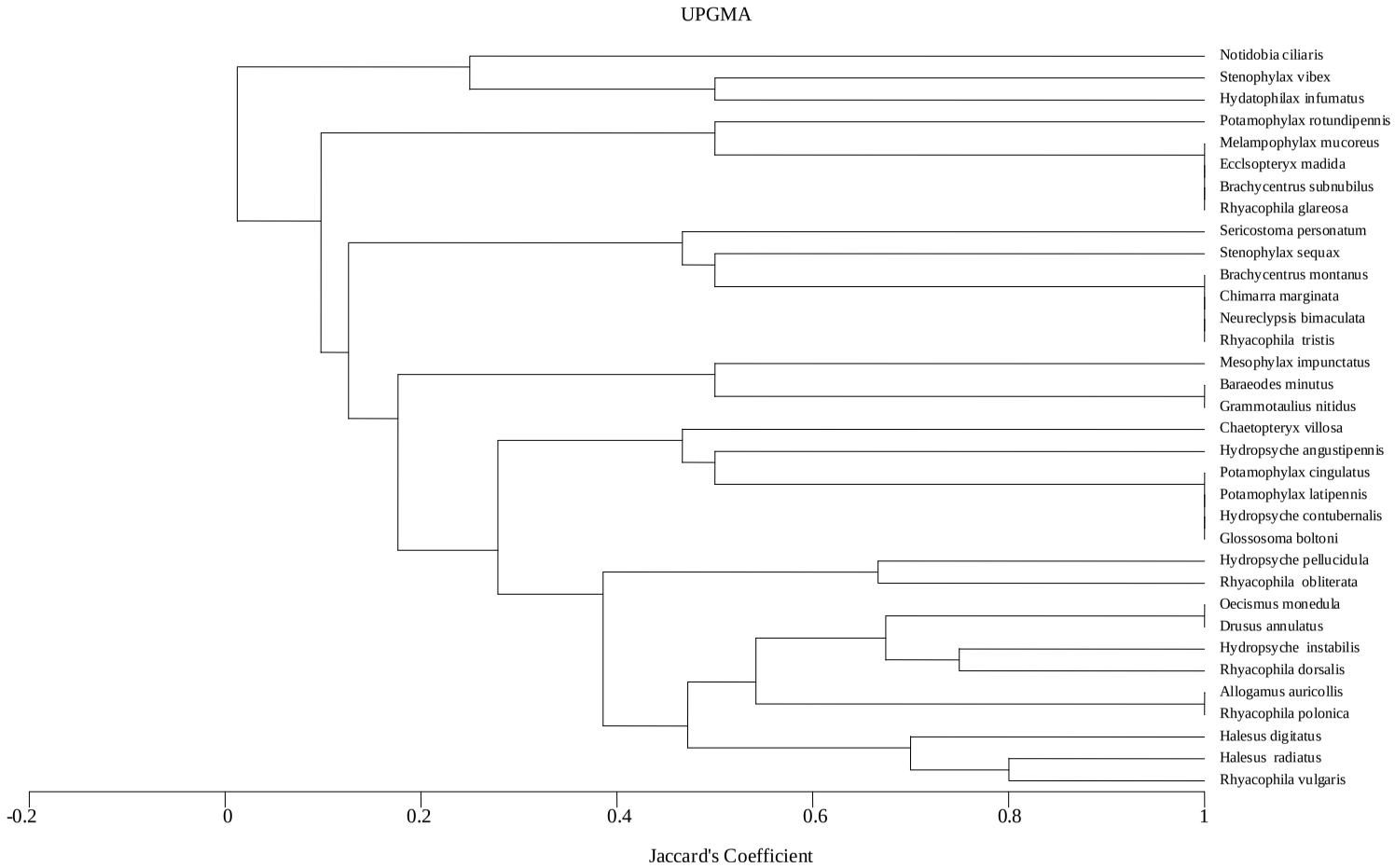

Figure 2. Jaccard Coefficient of coenotic affinity.

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