

Ecological studies on the cicada populations (Homoptera, Auchenorrhyncha) in the "Cheile Turzii" Nature Reserve, Romania

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Rezumat

Studii ecologice asupra populațiilor de cicadine din rezervația naturală "Cheile Turzii", România

Lucrarea de față reprezintă un studiu faunistico-ecologic asupra populațiilor de cicadine din Cheile Turzii. Au fost identificate un număr total de 94 de specii, ceea ce reprezintă o faună extrem de bogată pentru o suprafață atât de restrânsă. S-a constatat că populațiile de cicadine din zona studiată sunt reprezentate preponderent de specii cu limite extrem de înguste ale valenței ecologice. Specia care domină ecosistemele din Cheile Turzii este *Turrutus socialis* (FL.). În ecosistemele forestiere din Cheile Turzii predomină speciile arbustive și arboricole, precum și cele higrofile, iar în pajiști predomină speciile xerotermofile.

Majoritatea speciilor de cicadine care trăiesc în Cheile Turzii sunt polifage, ceea ce este în contradicție cu valența ecologică îngustă, ceea ce demonstrează că factorii limitativi sunt abiotici.

Cele mai asemănătoare ecosisteme din punct de vedere al comunităților de cicadine sunt zăvoiușii, localizat pe ambele maluri ale râului Hășdate și pădurea de amestec, localizată la ieșire din Chei.

Abstract

This work represents a faunistic and ecological study on the cicada populations from the "Cheile Turzii" Nature Reserve, Romania. 94 cicada species were identified, which means a very rich fauna reported at such small area. In the studied area the cicada populations are represented mainly by species with narrow ecological valence. The species that dominate the "Cheile Turzii" area are *Turrutus socialis* (FL.). The sylvan ecosystems are predominantly represented by shrubbery, arboricolous and also by the hygrophilous species. In the meadows the xerothermophilous species are predominant.

The great majority of the cicada species that live in the "Cheile Turzii" area are polyphagous. This fact is in contradiction with their narrow ecological valence and which demonstrate that the limiting factors are the abiotic ones.

The most resembling ecosystems are the coppice located on the Hășdate riverbanks and the mixed forest located on the way out from the gorges.

Key words: ecological studies, abundance, dominance, ecological valence, ecological similarity

Introduction

"Cheile Turzii" is a north-eastern extension of the Trascău Mountains, located in a hilly area in the north-western part of Romania (POP 1969). The gorges are the result of the erosion of the Hășdate River in the Jurassic limestone, and have a length of approximately 3.5 km (Fig. 1).

Aside from the Jurassic limestone, here there also are cretaceous layers and pyroclastites. From a geomorphologic point of view, the relief is varied, which determines a great diversity of habitats, and a great ecological diversity. The variety of the ecological factors brings about great floristic and fauna diversity.

Until now, in our country there have never been

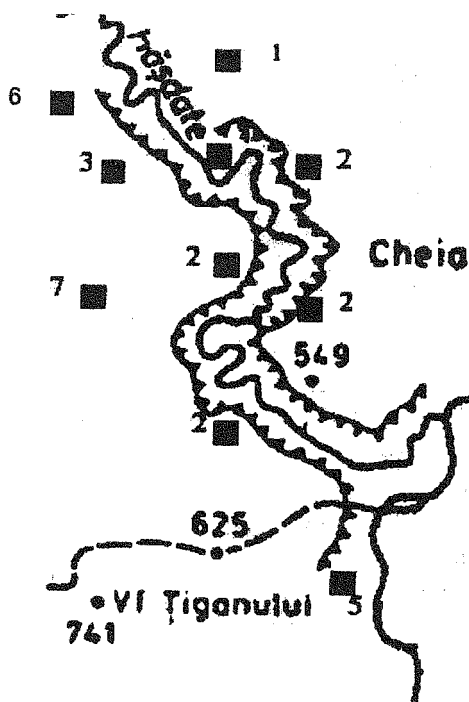


Fig. 1. The "Cheile Turzii" area with sampling sites

conducted studies on cicada in this area, and this determined us to perform studies of fauna, biology and ecology.

In the "Cheile Turzii", we collected biological material from the following stations:

1. Pine forest – it is actually a 70 years old coniferous plantation, located at the lower region of the Mischiu forest, NYÁRÁDY (1930) on the right slope of the gorges. The dominant wooden species are *Pinus nigra*, *Pinus sylvestris* and *Picea excelsa*. The herbaceous layer is weak represented, and the litter layer is very thick.
2. Coppice – located on both sides of the Hășdate River, it also covers the abrupt slopes that flank the riverbanks. The coppice is made up of some important vegetal associations, As. *Salici-Populetum* (Tx. 1931) MEYER-DRUS, BECHET (1980) with a trees layer of approximately 20 m in height, with species such as: *Populus nigra*, *Acer pseudoplatanus*, *Fraxinus excelsior*, and shrubs like: *Salix alba*, *Salix purpurea*, *Spirea ulmifolia*, *Alnus glutinosa*, *Alnus incana*, *Crataegus monogyna*. The herbaceous layer is represented by *Cherophyllum aromaticum*, *Anthriscus sylvestris*, *Rubus caesius*, *Brachypodium sylvaticum*, *Astragalus glycyphyllos*, association As. *Lolio – Potentilletum anserinae* Knapp 1946 located on the humide side of the Hășdate River in the form of clusters, BECHET (1980), association As. *Lolio – Plantaginetum majoris* (LINKOLA, 1921), located on more elevated grounds, and association As. *Calamagrostietum arundinaceae* Soó, 1960, on the abrupt slopes of the valley (BECHET 1980).
3. Oak forest – located on an inclined slope with

southern aspect. The forest is composed of young trees, between 10 and 12 m high. The association that characterises this station is *Quercus petrae – Carpinetum* Soó and POCS, 1957 (BECHET 1980). The soil layer is very thin, the shrubs are represented by *Crataegus monogyna*, *Acer tataricum*, *Cornus mas*, *Ligustrum vulgare*, and the herbaceous layer is composed of *Convallaria majalis*, *Brachypodium sylvaticum*, *Dactylis glomerata*, *Stelaria holostea*, *Asarum europaeum*, *Galeobdolon luteum*.

4. Mixed forest – located on the Right Bank of the Hășdate River, on the way out from the gorges towards the Tourist Complex. The forest is mainly composed of oak, hornbeam, maple, and alder. The herbaceous layer is well developed, the soil is rich and the humidity is high.

5. A pasture called "Coasta Țâțalii" – is located at the entrance of the gorges from Petrești village, and has western aspect. This pasture is made up on a very thin layer of soil, pierced here and there by underlying limestone bedrock. In the herbaceous layer, the characteristic association is *Avenastretum decori* DOMIN, 1932, BECHET (1980). The pasture lacks any wooden vegetation, with the exception of the shrubs located on the upper region: *Crataegus monogyna*, *Prunus spinosa*.

6. Steppe meadow called "Povârnișul lui Pop" – located at the foot of the plateau on the left slope of the gorges. It has an inclination of 45°, southern aspect, the layer of soil is thin and underneath there are blocks of pyroclastites. The composition of the herbaceous layer proves the steppe-like thermophyllous character of this meadow: *Stipa pulcherrima*, *Botriochloa ischaemum*, *Brachypodium pinnatum*. The shrubs that are located on the upper part of the meadow are represented by *Cornus mas* and *Prunus tenella*. We have also taken quantitative samples from these shrubs.

7. Meadow on plateau on the left slope – located at an altitude of 706 m and an inclination of 4-8°. The underlying limestone rocks pierce the thin soil layer. The sunstroke is high, during summer the temperature at the soil level is often above 30° C and the humidity is very low. In the herbaceous layer we found a great floral associations diversity, located on limited areas: As. *Stipetum pulcherrimae calcicolum* POP and HODIȘAN, 1960 (BECHET 1980), located on the edge of the "Marginea Ercsei" plateau (NYÁRÁDY 1939), As. *Stipetum joannis calcicolum* POP, CSÜRÖS et al. 1964 (BECHET 1980), situated on the upper part of the ridge, the herbaceous layer is represented by *Carex humilis*, *Potentilla arenaria*, *Alyssum alyssoides*, *Stipa joannis*, *Inula ulmifolia*; As. *Caricetum humilis transsylvanicum* ZALYAMY, 1939 (BECHET 1980) on the edge and on the upper part of the plateau, and asso-

ciation *Carici humilis - Brachypodietum pinnati transsylvanicum* Soó, 1942 (BECHEZ 1980) located on the upper region of the plateau, in the form of small clusters.

Material and method

From the biotopes mentioned above we have taken quantitative and qualitative biological samples using the entomological net for the herbaceous layer and shrubbery, and the umbrella net for the tree canopies. The sampling of biological material was performed between May and September 1999, once a month. The collected biological material was preserved in alcohol 80 % and identified in the laboratory using specific literature OSSIANNILSSON (1978, 1982); RIBAUT (1936, 1952); GIUSTINA (1989). In this paper we present the ecological results of our studies.

We used the following ecological indices: relative abundance, numeric dominance and the ecological similarity index Morisita.

Results and Discussions

In the ecosystems from Cheile Turzii we have identified a number of 94 cicada species. This proves to be a rich fauna, if we compare it to the total number of species that is known in Romania until now, 410 species approximately, CANTOREANU (1970).

The 94 species are differently distributed in the 7 ecosystems that were studied (Table 1).

The highest number of species (51 species) has been recorded in the meadow on the plateau of the left slope of the gorges. In the same area we also

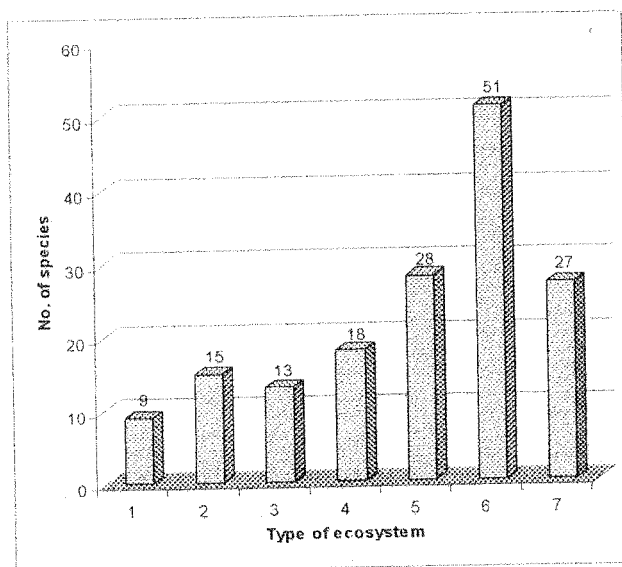


Fig. 2. Distribution of the cicada species in different types of ecosystems: 1 - pine forest, 2 - mixed forest, 3 - oak forest, 4 - coppice, 5 - meadow "Povârnişul lui Pop", 6 - meadow on plateau on the left slope, 7 - pasture "Coasta Tâţâlii".

recorded the highest number of individuals (917 individuals). This is a proof that in this ecosystem there is the highest ecological diversity for cicada. A high ecological diversity is also recorded in the meadow on "Povârnişul lui Pop" (28 species) and in the pasture on the "Coasta Tâţâlii" (27 species). The ecological diversity is lower in the closed ecosystems (forests). Of these closed ecosystems, the coppice contains the highest number of cicada species (18 species), followed by the mixed forest with 15 species, and the oak forest with 13 species. The lowest number of species and individuals has been recorded in the pine forest (Fig. 2). By analysing the previous data, we can observe that in the "Cheile Turzii" gorges the cicada prefer open ecosystems, the meadows. Of these ecosystems, the one with the highest population is the meadow from the plateau of the left slope of the gorges, because here there is a very high concentration of vegetal associations on restricted areas, microhabitats that belong to the herbaceous layer.

The lower ecological diversity in the other two types of open ecosystems is due to the monotony of the herbaceous layer and the shrubs, since here it is found only one or, at most, two vegetal associations, the abiotic conditions resembling, nonetheless, the ones on the plateau.

The cicada fauna is less represented in the forests of Cheile Turzii. The majority of species lives in the herbaceous layer, and this is very weakly represented in these forests. In the coppice, the ecological diversity is higher, because here both the herbaceous layer and the shrubs are better developed. In the pine forest the herbaceous layer is very scarce, and the density of the trees is very high. The trophic basis, which is specific to the cicada species, is weakly represented here. Generally, coniferous forests are not the preferred ecosystems for the cicada communities (CANTOREANU 1992).

After the analysis of the ecological valence of the species, it can be observed that the stenobiont and stenotope species are predominant in the studied area (60%). This demonstrates that the cicada species that live in the Cheile Turzii area have high ecological standards (Fig. 3).

Concerning the ecological preferences of the cicada species, it can be observed (Fig. 4) that the majority of the species inhabit the open ecosystems, the meadows (78%), and a low percentage (22 %) lives in forests. This situation is due to the fact that the majority of the species that live in the studied area are xerothermophilous, preferring mostly ecosystems with high temperatures and low humidity.

The majority of the sylvan cicada species are extremely exigent to the humidity, such as: *Cicadella viridis* (L.), *Erythria montandoni* (Put.), *Eupteryx*

Table 1

The cicada species identified in the "Cheile Turzii" area with the number of individuals in different types of ecosystems

Species	Pine forest	R.A. %	Mixed forest	R.A. %	Oak forest	R.A. %	Coppice	R.A. %	PP meadow	R.A. %	Plateau meadow	R.A. %	Pasture	R.A. %	Total no. of individuals	D %
<i>Pentastiridius pallens</i> (Germ.)									1	0.394					1	0.0616
<i>Stenocranus major</i> (Kbm.)					3	6.522									3	0.1848
<i>Eurysa lineata</i> (Perr.)					1	2.174									1	0.0616
<i>Metropsis mayri</i> Fieb.											1	0.109	1	0.36	2	0.1232
<i>Laodelphax striatellus</i> (Fall.)			1	1.299							5	0.546			6	0.370
<i>Mutrodelphax aubei</i> (Perr.)	1	0.1									2	0.218			3	0.184
<i>Xanthodelphax flaveolus</i> (Fl.)											2	0.218			2	0.1232
<i>Javesella pellucida</i> (F.)											1	0.109			1	0.0616
<i>Javesella dubia</i> (Kbm.)							1	2.632							1	0.0616
<i>Ribautodelphax albostrigatus</i> (Fieb.)													4	1.439	4	0.2465
<i>Ribautodelphax angulosus</i> (Rib.)													1	0.36	1	0.0616
<i>Dictyophara europaea</i> (L.)					1	2.174									1	0.0616
<i>Tettigometra griseola</i> Fieb.					1	2.174									1	0.0616
<i>Issus coleoptratus</i> (F.)	2	0.2							3	1.181	12	1.31	1	0.36	18	1.1091
<i>Issus muscaeformis</i> (Schrk.)							1	2.632	1	0.394					2	0.1232
<i>Agalmatum flavescens</i> (Oliv.)											3	0.328			3	0.1848
<i>Trypetimorpha fenestrata</i> Costa									52	20.47					52	3.2039
<i>Cercopis sanguinolenta</i> (Scop.)							2	5.263	9	3.543	14	1.528	15	5.396	40	2.4646
<i>Lepronyia coleoptrata</i> (L.)									89	33.86	6	0.655	10	3.597	105	6.470
<i>Neophilaenus albipennis</i> (F.)											5	0.546			5	0.3081
<i>Neophilaenus campestris</i> (Fall.)			1	1.299					9	3.543	57	6.223	12	4.317	79	4.8675
<i>Neophilaenus exclamatoris</i> (Thnb.)													2	0.719	2	0.1232
<i>Neophilaenus minor</i> (Kbm.)									2	0.787					2	0.1232
<i>Aphrophora alni</i> (Fall.)			4	5.195	19	41.3	5	13.16	12	4.724	5	0.546			45	2.7726
<i>Philaenus spumarius</i> (L.)							2	5.263	2	0.787	23	2.511	3	1.079	30	1.8484
<i>Centrotus cornutus</i> (L.)									1	0.394					1	0.0616
<i>Utopia trivialis</i> Germ.											3	0.328			3	0.1848
<i>Pediopsis tiliae</i> (Germ.)			1	1.299			1	2.632							2	0.1232
<i>Anaceratagalla venosa</i> (Fourcr.)											14	1.528			14	0.8626
<i>Anaceratagalla ribauti</i> (Oss.)									1	0.394	4	0.437			5	0.3081
<i>Eupelix cuspidata</i> (F.)											2	0.218			2	0.1232
<i>Aphrodes bicinctus</i> (Schrk.)							1	2.632					2	0.719	3	0.1848
<i>Planaphrodes trifasciatus</i> (Fourcr.)											2	0.218	3	1.079	5	0.3081
<i>Cicadella viridis</i> (L.)			1	1.299			1	2.632							2	0.1232
<i>Erythria montandoni</i> (Put.)	1	0.1			1	2.174									2	0.1232
<i>Emeljanoviana moliculla</i> (Boh.)									1	0.394	7	0.764	20	7.194	28	1.7252
<i>Forcipata forcipata</i> (Fl.)	1	0.1													1	0.0616
<i>Empoasca vitis</i> (Gothe)			5	6.494			1	2.632							6	0.370
<i>Chlorita viridula</i> (Fall.)	1	0.1	1	1.299							2	0.218	20	7.194	24	1.4787
<i>Edwardsiana flavescens</i> (F.)					7	15.22	1	2.632							8	0.4929
<i>Eupteryx aurata</i> (L.)			42	54.55	1	2.174	12	31.58							55	3.3888
<i>Eupteryx alticola</i> ? (Rib.)							4	10.53							4	0.2465
<i>Eupteryx curtisii</i> Fl.							1	2.632							1	0.0616
<i>Eupteryx immaculatifrons</i> (Kbm.)			10	12.99											10	0.6161
<i>Eupteryx notata</i> Curt.													1	0.36	1	0.0616
<i>Eupteryx stachydearum</i> (Hardy)	1	0.1	6	7.792							4	0.437			7	0.4313
<i>Abnetoidia alneti</i> (Dahlb.)							1	2.632							5	0.3081
<i>Zyginidia pulvula</i> (Boh.)			1	1.299			1	2.632					5	1.799	5	0.3081
<i>Zygina</i> sp.															2	0.1232
<i>Arboridia parvula</i> (Boh.)									17	6.693	2	0.218			19	1.1707
<i>Arboridia velata</i> (Rib.)					2	4.348									2	0.1232
<i>Balclutha punctata</i> (F.)	1	0.1					1	2.632			6	0.655	2	0.719	10	0.6161
<i>Balclutha rhenana</i> Wagn.			1	1.299	2	4.348					7	0.764			10	0.6161
<i>Macrostelus maculosus</i> (Then)													1	0.36	1	0.0616
<i>Macrostelus laevis</i> (Rib.)											1	0.109			1	0.0616
<i>Deltocephalus pulicaris</i> (Fall.)	1	0.1									2	0.218			3	0.1848
<i>Doranra horvathi</i> Wagn.											3	0.328			3	0.1848
<i>Doranra exilis</i> Horv.											3	0.328			3	0.1848
<i>Doranra impudica</i> Horv.									1	0.394	31	3.384	60	21.58	92	5.6685
<i>Doranra stylata</i> (Boh.)											1	0.109			1	0.0616
<i>Lamproleptis nitidulus</i> (F.)			1	1.299											1	0.0616
<i>Allygidius (Dicerallygus) mayri</i> (Kbm.)									3	1.181					3	0.1848
<i>Graphoceraus ventralis</i> (Fall.)											44	4.803			44	2.711
<i>Phlepsius intricatus</i> (H.S.)									4	1.575					4	0.2465
<i>Rhopalopyx vitripennis</i> (Fl.)									1	0.394	21	2.293	9	3.237	31	1.910
<i>Mocydia crocea</i> (H.S.)			1	1.299	3	6.522			1	0.394	8	0.873	9	3.237	22	1.3555
<i>Mocydoptis longicauda</i> Remane													2	0.719	2	0.1232
<i>Spaudoletix subfuscus</i> (Fall.)	1	0.1			2	4.348	1	2.632							4	0.2465
<i>Athysanus argentiarius</i> Metcalf											3	0.328			3	0.1848
<i>Handianus flavovarius</i> (H.S.)											7	0.764			7	0.4313
<i>Handianus limonit</i> Emel.									3	1.181					3	0.1848
<i>Limotettix striola</i> (Fall.)											1	0.109			1	0.0616
<i>Euscelis incisus</i> (Kbm.)									1	0.394	11	1.201	1	0.36	13	0.801
<i>Euscelis</i> sp.													5	1.799	5	0.3081
<i>Streptonus confinis</i> (Reuter)											1	0.109			1	0.0616
<i>Artanus interstitialis</i> (Germ.)											3	0.328			3	0.1848
<i>Selenocephalus obsoletus</i> (Germ.)									1	0.394					1	0.0616
<i>Arocephalus languidus</i> (Fl.)									1	0.394					1	0.0616
<i>Arocephalus longiceps</i> (Kbm.)									1	0.394					1	0.0616
<i>Psammotettix aliemus</i> (Dahlb.)											1	0.109			1	0.0616
<i>Psammotettix cephalotes</i> (H.S.)											89	9.716	12	4.317	101	6.223
<i>Psammotettix confinis</i> (Dahlb.)											2	0.218			2	0.1232
<i>Errastunus ocellaris</i> (Fall.)											3	0.328			3	0.1848
<i>Turrinus socialis</i> (Fl.)											465	50.76	50	17.99	515	31.731
<i>Jassargus obtusivalvis</i> (Kbm.)							1	2.632			1	0.109	21	7.554	23	1.4171

Species	Pine forest	R.A. %	Mixed forest	R.A. %	Oak forest	R.A. %	Coppice	R.A. %	PP meadow	R.A. %	Plateau meadow	R.A. %	Pasture	R.A. %	Total no. of individuals	D %
<i>Jassargus replens</i> (Fieb.)					3	6.522			17	6.693	1	0.109			21	1.2939
<i>Jassargus alpinus</i> (Then.)											2	0.218			2	0.1232
<i>Mendraus paxillus</i> (Fieb.)											2	0.218			2	0.1232
<i>Verdanus abdominalis</i> (F.)											14	1.528			14	0.8626
<i>Verdanus nigrifrons</i> (Kbn)									7	2.756	6	0.655	6	2.158	19	1.1707
<i>Rhoanans hypochlorus</i> (Fieb.)									4	1.575					4	0.2465
<i>Enantiocephalus cornutus</i> (H.S.)			1	1.299											1	0.0616
<i>Mocuellus collinus</i> (Boh.)											2	0.218			2	0.1232
<i>Mocuellus quadricornis</i> Dlab.									12	4.724					12	0.7394
Number of species	9		15		13		18		28		51		27			
Number of individuals	10		77		46		38		257		917		278		1623	

R.A. % = relative abundance

D% = dominance

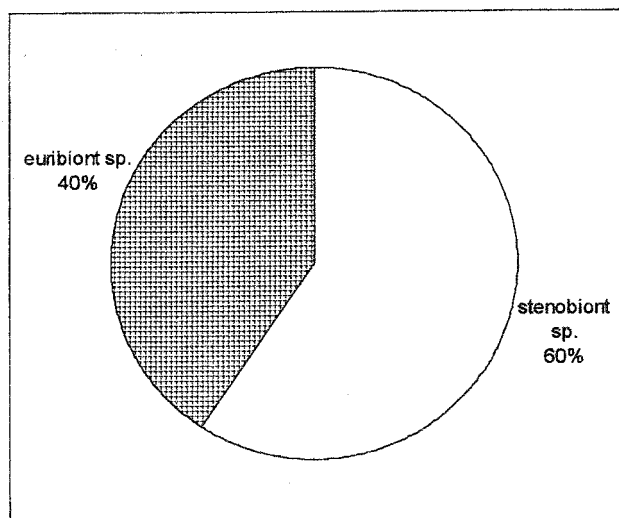


Fig. 3. Ecological valence of the cicada species from the studied area

aurata (L.), *Eupteryx stachydearum* (HARDY), and other species like sylvan ones, live only in the shrubbery and arborescent layer: *Pediopsis tiliae* (GERM.), *Empoasca vitis* (GOTHE), *Zygina* sp.

The ecological parameters used to characterize the cicada communities in Cheile Turzii are the relative abundance, dominance, and the index of ecological similarity Morisita.

Regarding the relative abundance of the species, the situation in the ecosystems stands as follows. In the pine forest, the species with the highest relative abundance is *Issus coleoptratus* (F.) (0.2%). *Eupteryx aurata* (L.) is the species with the highest relative abundance in the mixed forest (54.5%) and in the cop-

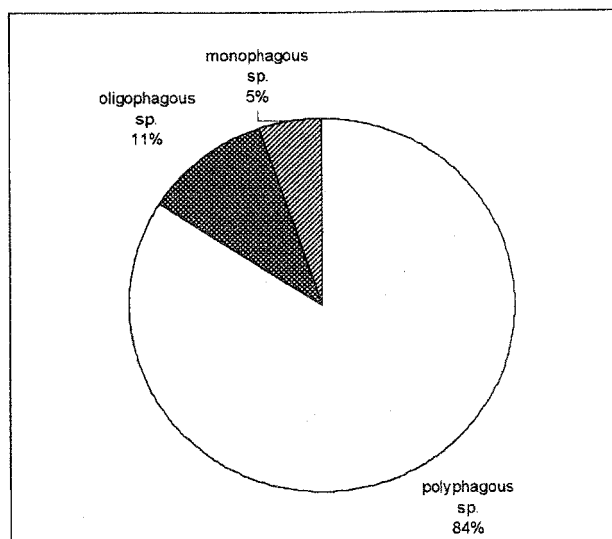


Fig. 4. Trophic specialisation of the cicada species from the Cheile Turzii area

pice (31.7%). This species is well represented in these two ecosystems because of the high humidity. In the oak forest, the most abundant species is *Aphrophora alni* (FALL.) (41.3%). In the open ecosystems, the species with the highest relative abundance are *Lepyronia coleoptrata* (L.) (33.0%), *Trypetimorpha fenestrata* COSTA (20.5%) in the meadow on "Povârnişul lui Pop", and *Turrutus socialis* (FL.) (50.8%) in the pasture on "Coasta Țâțâlii".

An interesting fact is the presence in the studied area of *Trypetimorpha fenestrata* COSTA, with such a high abundance. This species has been recorded by CANTOREANU (1967) with a low abundance (13 indi-

Table 2

Values of the ecological similarity index Morisita

Ecosystem	Pine forest	Mixed forest	Oak forest	Coppice	Povirnisul Pop meadow	Plateu meadow	"Coasta Țâțâlii" pasture
Pine forest		0.05309263	0.05947137	0.07428062	0.02442469	0.02633802	0.137196
Mixed forest			0.13425042	0.82697196	0.01206883	0.00470402	0.00903764
Oak forest				0.41922796	0.1310623	0.0136329	0.01404154
Coppice					0.05916376	0.01596824	0.05176072
Povirnisul Pop meadow						0.02827056	0.12913163
Plateu meadow							0.5734626
"Coasta Tatalii" pasture							

viduals) in the "Gârboave" forest near the Galați city. HUANG et al. (1993), claim that the trophic basis of this species is not known, but CANTOREANU (1967) states that its host is *Artemisia* sp. We have collected this species from *Stipa*, *Andropogon*, *Botriochloa*, but we have not observed that it actually feeds on these plants. Probably "Cheile Turzii" is an area that resembles this species' habitats origin from Western Europe, and where the environmental factors are closest to the optimum.

The dominance index shows that *Turrutus socialis* (Fl.) (31.73%) is the dominant species in the cicada communities in the studied area. It is a praticalous species that feeds exclusively on Poaceae (REMANE 1987) (quoted by SCHEMENZ 1996), and can be found in various biotopes, from xeric to humid and very humid. We have also found this species on the superior course of the "Someșul Cald" River, also in open biotopes (meadows, pastures), but with a lower dominance, POPA et al., (1999). Slightly higher values of the dominance index have been recorded for the following species: *Lepyronia coleoptrata* (L.) (6.46%) and *Psammotettix cephalotes* (H.S.) (6.23%). Both species are praticalous and xerothermophylous.

The index of ecological similarity Morisita (Table 2) shows that the ecosystems from Cheile Turzii are very different concerning the cicada communities and the result is their specific diversity. The most similar ecosystems (0.82) are the coppice, located in the valley of the gorges, and the mixed forest, located in the terminal section of the gorges, being in fact a continuation of the coppice. For this reason, the abiotic conditions in the two ecosystems are alike approximately, which is also reflected in the structure of the cicada communities.

We have also analyzed the trophic spectrum of the species that live in the "Cheile Turzii" area. It can be observed in Fig. 5 that the majority of the species (84%) are poliphagous, feeding on monocotyles as well as dicotyles. The species with a narrower trophic spectrum are less represented, the oligophagous species (11%) feed exclusively on plants belonging to the family Poaceae, and the monophagous species (5%) represented by *Stenocranus major* (KBM.), *Pediopsis tiliae* (GERM.), *Balclutha rhenana* WAGN., *Mocydiopsis longicauda* Remane, *Mendrausus pauxillus* (FIEB.) feed either on certain species of Poaceae or on certain tree species. This distribution of the trophic spectrum is in contradiction with the ecological valence of the species. This aspect signifies that the limiting ecological factors are not represented by food, but by abiotic conditions, especially temperature and humidity.

Conclusions

1. In the "Cheile Turzii" area we have identified a total number of 94 species of cicada, which represents a very abundant fauna, in relation to the studied area. We have recorded the highest number of species in the meadow of the plateau on the left slope of the gorges (51 species), and the lowest number in a pine forest (9 species).

2. The cicada communities from Cheile Turzii are mainly represented (60 %) by stenobiont and stenotope species, which proves that these species have narrow limits of their ecological valence.

3. In the studied area, the cicada communities prefer open ecosystems (meadows, pastures) (78%).

4. The relative abundance calculated on types of ecosystems shows that, in forests and coppices, the species that inhabit the shrubbery and tree layer are more abundant than those that live in the herbaceous layer, and also the higrophylous species, while in meadows and pastures the xerothermophylous species are more abundant.

5. The dominance index shows that *Turrutus socialis* (Fl.) is the species that numerically dominates the cicada communities in the "Cheile Turzii" area, this being a species with wide ecological valences.

6. The index of ecological similarity Morisita proves that the ecosystems that are the most similar in the "Cheile Turzii" area are the coppice situated along the valley of the gorges and the mixed forest located on the way out from the gorges. All the other ecosystems are very diverse from the ecological point of view, which is also reflected in the cicada communities.

7. Regarding the trophic spectrum, the majority of the species (84 %) are poliphagous, which suggests that the limitation of some stenotope and stenobiont species to certain ecosystems is not determined by food, but by other factors, probably by temperature, humidity and the degree of insolation.

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