

PRELIMINARY DATA ON THE ARACHNID FAUNA FROM THE TRIVALE FOREST

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Abstract. This paper presents an inventory of the epigeic fauna from the forest Trivale and some of its structural features. The paper has a preliminary character because some of the arachnids collected during one year does not represent the total number of the species which populated the researched area and does not answer all the questions that the study of this group asks. As a result of the study of the arachnid fauna from the forest Trivale 61 species and 19 families were identified. *Eurocoelotes falciger* (KULCZYNSKI, 1897), *Trichoncus hackmani* (MILLIDGE, 1955), *Centromerus albidus* (SIMON, 1929), are rare species for Romania. Regarding the number of the individuals we can say that the lycosid, gnaphosid and linyphiid species are dominant. Regarding the number of the species of each family we can say that the Linyphiidae are in the first place, followed by Lycosidae and Gnaphosidae. The zoogeographical analysis indicates the domination of the species which are widely spread, in the first place being the Palearctic elements followed by the Holarctic ones. In the same context well represented are the species being spread in a smaller area, especially the European ones. The presence of a single species having limited spreading must be mentioned. This species is *Eurocoelotes falciger*, a South-Eastern European species. The ratio between sexes is approximately 1:1. The 10% difference favourable to males could be considered normal, because they have a bigger mobility, especially the lycosid species.

Key words: faunistics, araneae, spiders, Trivale forest.

Rezumat. Date preliminare asupra faunei de aranee din pădurea Trivale. Lucrarea de față prezintă un inventar al faunei epigeice de aranee din pădurea Trivale și câteva dintre particularitățile structurale ale acesteia. Lucrarea are un caracter preliminar, deoarece aranele colectate în cursul unui an nu reprezintă toate speciile care populează aria investigată și nici nu răspunde la toate problemele pe care le ridică studiul acestui grup. În urma studiului realizat asupra arachnofaunei pădurii Trivale au fost identificate 61 de specii grupate în 19 familii. Dintre speciile colectate *Eurocoelotes falciger*, *Trichoncus hackmani* și *Centromerus albidus* sunt specii rare pentru fauna României. Din punct de vedere al numărului de indivizi, dominante sunt speciile de lycoside urmate de gnaphoside și linyphiide. Situația se inversează în ceea ce privește numărul de specii din fiecare familie unde pe primul loc apar linyphiidele, urmate de lycoside și gnaphoside. Analiza zoogeografică a arătat dominanța speciilor care au o răspândire largă, pe primul loc situându-se elementele palearctice urmate de cele holarctice. Tot în acest context, bine reprezentate sunt și speciile cu o arie de răspândire mai mică, în special cele europene. Trebuie menționată prezența unei singure specii cu răspândire mai restrânsă, *Eurocoelotes falciger*, specie sud-est europeană. Raportul dintre sexe este de aproape 1:1 diferența de 10 % în favoarea masculilor poate fi considerată normală, datorită mobilității mai mari a acestora, mai ales în cazul lycosidelor.

Cuvinte cheie: faună, araneae, păianjeni, pădurea Trivale.

INTRODUCTION

The faunistic research has an important role for the elaboration of the management plans, the preservation of biodiversity, especially in the zone where the anthropic impact is strong. The considerations represent the basis of this paper which tries to present an inventory of the epigeic fauna of spiders from the Trivale forest and some of its specific structural features. The paper has a preliminary character because the spiders collected during one year do not represent all the species which populate the researched area and does not solve all the problems regarding the study of this group. There are not data regarding the arachnid fauna of this area. Little information about the adjacent area of the arachnid fauna could be found in the papers of some authors (FHUN & NICULESCU-BURLACU, 1971, STERGHIU C., 1985), a reason for which the study is expected to present the first step towards the systematic study of arachnid fauna from the middle basin of the river Argeș. During the research the faunistic, qualitative aspect, more than the quantitative one was mainly followed.

MATERIAL AND METHOD

It belongs to a great forest unit of the middle Arges basin, being placed in the Getic Piedmont (Cotmeana's Piedmont), in the North West of Pitesti City. It lies in the region of the low hillocks of the terraces situated on the right side of the Arges River and Bascov River, from Valea Ursului, to the South of Pitesti. The ground varies from flat to rough. Its altitude is comprised between 290 metres (Arges'waterside) and 430 metres in Plaiul Foi. The floristic composition of the forest is not uniform on the entire surface. In the South-East there is a flat ground (The Proper Trivale Forest), the shrub being formed by species of *Quercus polycarpa* L., *Q. petraea* (MATT.) LIEBL., *Q. dalechampii* TEN., with few trees of *Q. frainetto* TEN. and *Q. x pseudodalechampii*. In the highest part of the territory, the forest is formed by the following species: *Quercus petraea*, *Q. polycarpa*, while in the southern side, few samples of *Quercus frainetto* and some samples of *Quercus cerris* L. can be found. The undershrub is represented by the following species: *Crataegus monogyna* JACQ., *Ligustrum vulgare* L., *Rosa canina* L. The species *Poa nemoralis* L. is mixed with *Carex brizoides* L., *Campamula abietina* GRISEB., *Dactylis glomerata* L., *Genista tinctoria* L., *Veronica chamaedrys* L. etc. (ALEXIU V., 2005, POPESCU A., 1966).

The climate is temperate-continental with no excessive manifestation of the climatic factors because of the piedmontan hills around. The average annual temperatures are comprised between 7°C and 10°C. The precipitations vary between 700 and 1000 mm/year.

For our research we chose a zone covered with *Q. petraea* because the most part of the forest surface is covered with this species and other accompanying species.

The method of pitfall traps was used for the collection of the material. It is a frequent used method to capture the invertebrates which have an intense activity on the soil. This method is successful both quantitatively and qualitatively, because the effort made to capture is reduced in comparison with other methods (GREENSLADE, P. J. M., 1964, MUFF P., 2006, UETZ G. & UNZICKER J., 1976). There were used 500 ml plastic tumbler having 11.5 cm height and 9 cm wide. The 9 traps used were placed in a square shape at 10 m distance one from another in order to avoid the interferences. A solution of formaldehyde 4% (1/4 of tumbler) was used as a preserving liquid. A plastic funnel was introduced in each trap. It was placed with the small opening downward in order to stop the spiders to get out. This was necessary because the arachnids are very mobile. A little tin plate was placed 5 cm above the every trap in order to avoid the penetration of the rain water and impurities. The emptyings were effected once two weeks between the 1TH of April and the 10TH December 2003. The obtained material was sorted in the lab. It was determined and preserved in ethylic alcohol 70%.

RESULTS AND DISCUSSIONS

After collecting, sorting and determination the arachnologic material 732 individuals were obtained. 564 of them were identified as species and 168 were identified as genera because the species was impossible to be identified when individuals were youthful or deteriorated. For this paper only individuals determined as species were taken into consideration.

For the faunistic viewpoint the studied arachnologic material is represented by 61 species grouped in 19 families (Table 1).

Table 1. The list of the species of arachnids collected in Trivale Forest with data regarding the geographic spreading
Table 1. Lista speciilor de aranee colectate în pădurea Trivale, cu date despre răspândirea geografică

Species	Male	Female	Youthful	Spread
ATYPIDAE				
<i>Atypus affinis</i> (EICHWALD, 1830)	1	0	0	Britain to Ukraine, North Africa
<i>Atypus piceus</i> (SULZER, 1776)	1	0	0	Europe to Moldova, Iran
DICTYNIDAE				
<i>Cicurina cicur</i> (FABRICIUS, 1793)	23	1	0	Europe to Central Asia
CORINNIDAE				
<i>Phrurolithus festivus</i> (C. L. KOCH, 1835)	4	2	0	Palaearctic
AMAUROBIIDAE				
<i>Amaurobius ferox</i> (WALCKENAER, 1830)	17	8	2	Holarctic
<i>Eurocoelotes falciger</i> (KULCZYNSKI, 1897)	16	2	5	Sud-Eastern Europe
<i>Eurocoelotes inermis</i> (L. KOCH, 1855)	0	1	4	Europe
SEGESTRIIDAE				
<i>Segestria senoculata</i> (LINNAEUS, 1758)	0	1	0	Palaearctic
DYSDERIDAE				
<i>Dysdera crocata</i> (C. L. KOCH, 1838)	1	1	0	Cosmopolit
<i>Dysdera erythrina</i> (WALCKENAER, 1802)	6	6	0	Europe to Georgia
<i>Harpactea rubicunda</i> (C. L. KOCH, 1838)	7	8	2	Europe to Georgia
ZORIDAE				
<i>Zora spinimana</i> (SUNDEVALL, 1833)	0	1	0	Palaearctic
GNAPHOSIDAE				
<i>Drassyllus pusillus</i> (C. L. KOCH, 1833)	1	1	0	Palaearctic
<i>Drassyllus villicus</i> (THORELL, 1875)	4	3	3	Europe
<i>Haplodrassus silvestris</i> (BLACKWALL, 1833)	7	10	4	Europe
<i>Zelotes apricorum</i> (L. KOCH, 1876)	13	7	2	Europe to Kazakhstan
<i>Zelotes erebeus</i> (THORELL, 1871)	16	12	0	Europe to Georgia
<i>Zelotes subterraneus</i> (C. L. KOCH, 1833)	1	1	0	Palaearctic
CLUBIONIDAE				
<i>Clubiona comta</i> (C. L. KOCH, 1839)	0	1	0	Europe, Russia, North Africa
<i>Clubiona terrestris</i> (WESTRING, 1851)	0	1	0	Europe
LIOCRANIDAE				
<i>Agroeca brunnea</i> (BLACKWALL, 1833)	1	0	0	Europe, Russia
THOMISIDAE				
<i>Ozyptila praticola</i> (C. L. KOCH, 1837)	7	4	0	Holarctic
<i>Xysticus cristatus</i> (CLERCK, 1757)	0	1	0	Palaearctic
<i>Xysticus erraticus</i> (BLACKWALL, 1834)	0	1	0	Europe, Russia

<i>Xysticus lanio</i> (C. L. KOCH, 1835)	1	0	0	Paelearctic
<i>Xysticus luctator</i> (L. KOCH, 1870)	14	6	3	Paelearctic
SALTICIDAE				
<i>Evarcha falcata</i> (CLERCK, 1757)	0	2	0	Paelearctic
LYCOSIDAE				
<i>Arctosa lutetiana</i> (SIMON, 1876)	39	6	11	Europe, Russia
<i>Pardosa alacris</i> (C. L. KOCH, 1833)	17	55	6	Europe
<i>Pardosa amentata</i> (CLERCK, 1757)	0	2	0	Europe, Russia
<i>Pardosa bifasciata</i> (C. L. KOCH, 1834)	0	1	0	Paelearctic
<i>Pardosa lugubris</i> (WALCKENAER, 1802)	3	27	0	Paelearctic
<i>Pardosa monticola</i> (CLERCK, 1757)	0	1	0	Paelearctic
<i>Pardosa paludicola</i> (CLERCK, 1757)	0	1	0	Paelearctic
<i>Pirata piraticus</i> (CLERCK, 1757)	0	1	0	Holarctic
<i>Trochosa ruricola</i> (DE GEER, 1778)	2	0	2	Holarctic, Bermunde
<i>Trochosa spinipalpis</i> (F. O. P.-CAMBRIDGE, 1895)	1	0	0	Paelearctic
<i>Trochosa terricola</i> (THORELL, 1856)	28	11	7	Holarctic
PISAUROIDAE				
<i>Pisaura mirabilis</i> (CLERCK, 1757)	1	1	0	Paelearctic
AGELENIDAE				
<i>Histopona torpida</i> (C. L. KOCH, 1837)	0	1	0	Europe, Russia
MIMETIDAE				
<i>Ero furcata</i> (VILLERS, 1789)	1	1	0	Paelearctic
THERIDIIDAE				
<i>Robertus arundineti</i> (O. P.-CAMBRIDGE, 1871)	2	1	0	Paelearctic
<i>Robertus lividus</i> (BLACKWALL, 1836)	5	1	0	Holarctic
ARANEIDAE				
<i>Gibbaranea bituberculata</i> (WALCKENAER, 1802)	0	1	0	Paelearctic
LINYPHIIDAE				
<i>Centromerus aequalis</i> (C. L. KOCH, 1841)	0	1	0	Europe
<i>Centromerus albidus</i> (SIMON, 1929)	1	2	0	Europe
<i>Centromerus sylvaticus</i> (BLACKWALL, 1841)	2	1	0	Holarctic
<i>Dicymbium nigrum</i> (BLACKWALL, 1834)	0	1	0	Paelearctic
<i>Diplostyla concolor</i> (WIDER, 1834)	25	16	0	Holarctic
<i>Micrargus apertus</i> (O. P.-CAMBRIDGE, 1871)	1	0	0	Paelearctic
<i>Micrargus herbigradus</i> (BLACKWALL, 1854)	1	0	0	Paelearctic
<i>Micrargus subaequalis</i> (WESTRING, 1851)	2	0	0	Paelearctic
<i>Microneta viaria</i> (BLACKWALL, 1841)	4	3	0	Holarctic
<i>Pallidiphantes pallidus</i> (O. P.-CAMBRIDGE, 1871)	4	4	0	Paelearctic
<i>Tenuiphantes flavipes</i> (BLACKWALL, 1854)	1	0	0	Paelearctic
<i>Tenuiphantes menzei</i> (KULCZYNSKI, 1887)	2	0	0	Paelearctic
<i>Tenuiphantes tenebricola</i> (WIDER, 1834)	1	0	0	Paelearctic
<i>Tenuiphantes zimmermanni</i> (BERTKAU, 1890)	0	3	0	Europe, Russia
<i>Trichoncus affinis</i> (KULCZYNSKI, 1894)	0	3	0	Paelearctic
<i>Trichoncus hackmani</i> (MILLIDGE, 1955)	0	1	0	Central, Northern Europe
<i>Walckenaeria furcillata</i> (MENGE, 1869)	1	1	0	Paelearctic

After the analysis of this table some faunistic and zoogeographical observations regarding the arachnids fauna of the studied zone can be made.

From the faunistic viewpoint we mentioned the presence of the species *Eurocoelotes falciger* (KULCZYNSKI, 1897), a South-Eastern European species which is abundant in certain forest habitats is rarely quoted for the fauna of our country (NICULESCU-BURLACU F., 1968). *Trichoncus hackmani* (MILLIDGE, 1955) is another relatively rare Romanian species. It was firstly mentioned as a new species for Romania's fauna in 2005 (URAK I., 2005). *Centromerus albidus* (SIMON, 1929), a species which prefers forest biocoenosis, especially the beech forests. Some authors quoted it in cavemicolous medium too (DUMITRESCU & GEORGESCU, 1980).

Regarding the number of species (Fig. 1), the dominant families are represented by the following: Linyphiidae (27.87%), and Lycosidae (18.03%), followed by Gnaphosidae (9.84%) and Thomisidae (8.20%), the other families having a percentage less than 5%: Amaurobiidae (4.92%), Dysderidae (4.92%), Atypidae (3.28%), Clubionidae (3.28%), Dictynidae, Corinnidae, Segestriidae, Zoridae, Liocranidae, Salticidae, Pisauridae, Agelenidae and Mimetidae (each 1.64%).

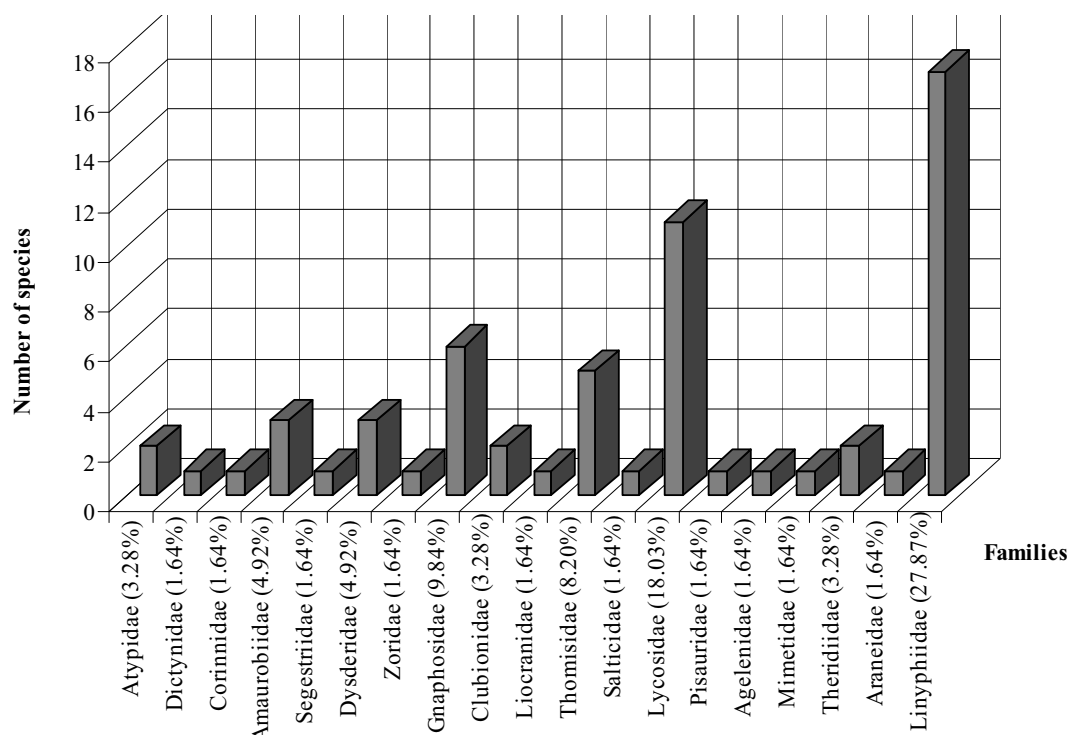


Figure 1. The distribution depending on families of the arachnids collected in forest Trivale (in parenthesis the percentage, as number of species for each family).

Figura 1. Distribuția pe familii a araneelor colectate în pădurea Trivale în funcție de numărul de specii din fiecare familie (în paranteză procentul ca număr de specii pentru fiecare familie).

From a quantitative viewpoint, as relative abundance (Fig. 2), supradominant are species of families Lycosidae (39.18%), followed by Gnaphosidae (15.07%), Linyphiidae (14.36%) and Amaurobiidae (9.75%). Dominant are families Thomisidae (6.56%) and Dytynidae (4.26%). Subdominant, having a small number of individuals, are the families: Theridiidae (1.60%), Corinnidae (1.06%), Atypidae, Clubionidae, Salticidae, Pisauridae, Mimetidae (each 0.35%), followed by Segestriidae, Zoridae, Liocranidae, Agelenidae, Araneidae (each 0.18%). The following rule was considered when the families were classified: for complementary (subdominant) species are found under the axis A_S , between axis dominant species and above the axis A_D supradominant. The static axis $A_S = 5.26$ and the axis of dominance $A_D = 10.52$

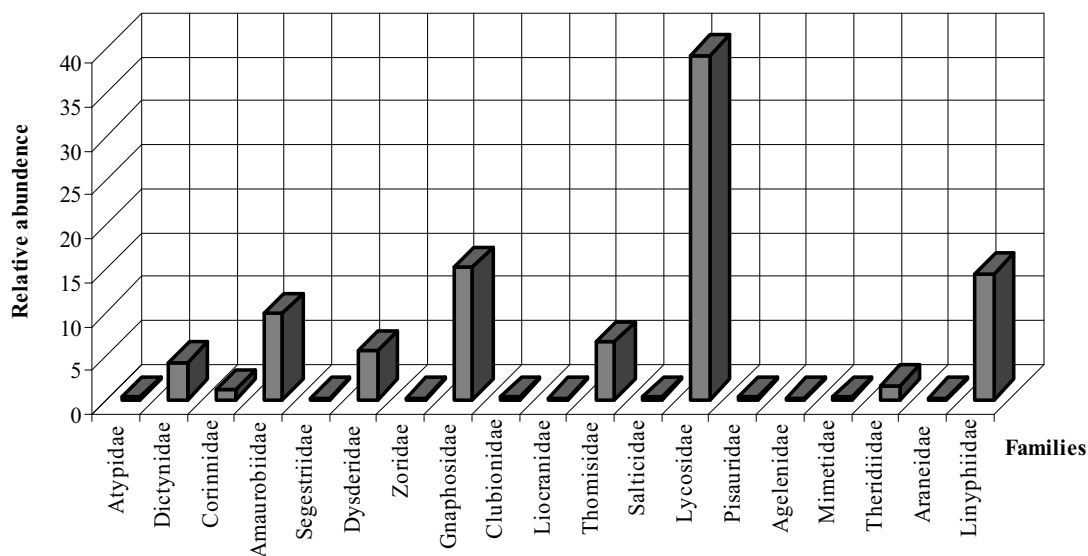


Figure 2. The distribution on families of arachnids collected in the forest Trivale depending on the relative abundance of species from each family (in parenthesis number of individuals of each family).

Figura 2. Distribuția pe familii a araneelor colectate în pădurea Trivale în funcție de abundența relativă a speciilor din fiecare familie (în paranteză numărul de indivizi din fiecare familie).

In concordance with their geographical distribution the 61 species were grouped into 9 zoogeographical categories and two chorological complexes (Fig. 3). The best represented complex is that which groups the species having a wide spread (COS+HOL + PAL+WPA+ECA+EUS+ETU = 78.69%). This chorological complex is dominated by the Palearctic species (45.90%), especially lycosid and linyphiid species, followed by those Holarctic (14.75%) and Euro-Siberian (9.84%).

The complex of the European species (21.31%, EUR+EEU) is dominated by the species which are spread all over Europe. In this chorological complex we have an only South-Eastern European species *Eurocoelotes falciger* a species seen in Romania and Bulgaria (LAZAROV et al, 2001, DIMITROV, 2002).

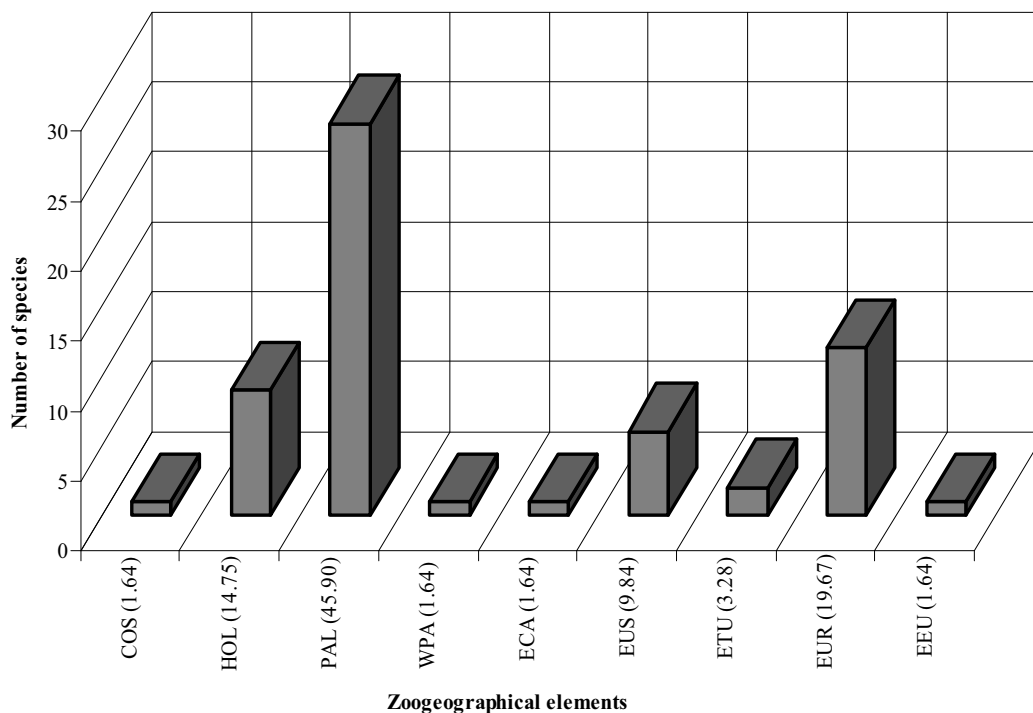


Figure 3. Zoogeographical distribution of the species of arachnids collected in the forest Trivale: COS – Cosmopolit, HOL – Holarctic, PAL – Palearctic, WPA – West Palearctic, ECA – Europeo-Centralasiatic, EUS – Europeo-Siberian, ETU – Europeo-Turanian, EUR – European, EEU – East-European (in parenthesis the percentage weight of each category).

Figura 3. Distribuția zoogeografică a speciilor de aranee colectate din pădurea Trivale: COS – Cosmopolit, HOL – Holarctic, PAL – Palearctic, WPA – Vest Palearctic, ECA – Europeo-Centralasiatic, EUS – Europeo-Siberian, ETU – Europeo-Turanian, EUR – European, EEU – Est European (în paranteză ponderea procentuală a fiecărei categorii).

The latest observation regards the ratio between the two sexes (Fig. 4). As it could be observed the ratio between males and females is almost 1:1. The 10% of difference favourable to males could be considered normal, because of that the probability for them to be captured is higher in comparison with the females, especially lycosid species. Although the number of youthful individuals was bigger, we considered only those individuals that could be precisely determined as belonging to certain species.

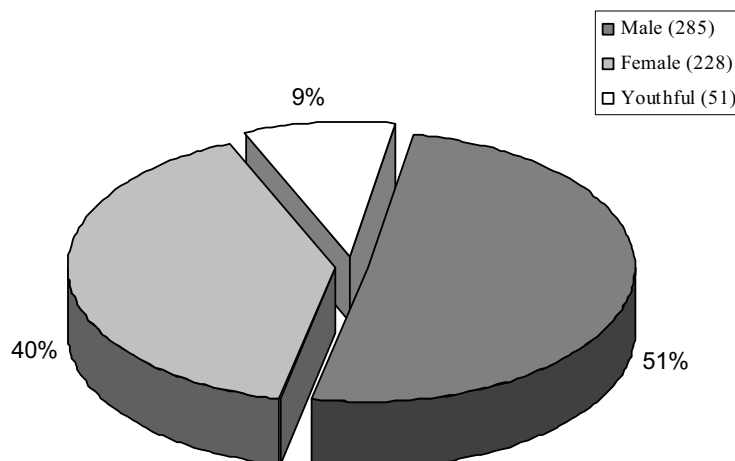


Figure 4. The ratio among the males, female and juvenili.

Figura 4. Raportul dintre masculi, femele și juvenili.

CONCLUSIONS

This paper represents the first step towards a methodical study of the fauna of arachnids from the middle basin of the river Argeş. It could be registered in the category called "list of capture". Because such studies have never been performed in this area, we could say that it helps the completion of data regarding the spreading of the arachnids in Romania, because all the collected species could be considered to be a first time appearance in the studied area.

There were identified 61 species grouped into 19 families. Only 3 species of those 61 could be considered rare for the Romanian fauna: *Eurocoelotes falciger*, *Trichoncus hackmani* and *Centromerus albidus*. From a number of individuals viewpoint and the number of species we found out that the dominant families are Lycosidae, Linyphiidae and Gnaphosidae.

From the analyses of the zoogeographic data we ascertained the presence of a big number of wide spread species, dominant being the Palearctic species followed by holarctic species. In the same context, the species with a small area of spreading are also well represented, especially the European ones. We mentioned the presence of a single species having a limited area of spreading: *Eurocoelotes falciger* South-Eastern European species.

Due to the method used the majority of the species are active right next to the soil or on the soil. There are also arboreal species which reach the soil when they move from one tree to another. The pitfall traps method, which are interception traps, permit the capture of bigger number males because the probability of capture increases as the insects mobility increases. It could be observed that the ratio between sexes is approximately 1:1. The 10% difference is acceptable for ecological research.

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