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FLORISTIC STUDIES UPON THE FOLIOSE AND FRUTICOSE LICHENS IN RÂŞCA VALLEY (CLUJ COUNTY)

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Abstract: A first inventory of the foliose and fruticose lichens in Râşca Valley (Cluj department) is made, a number of 31 species being identified – 19 corticolous, 6 tericolous, 3 lignicolous and 3 saxicolous. Were found 3 rare species (*Cladonia cornuta, Ramalina fastigiata, Usnea florida)* according to the chorology of lichens in central Europe.

The lichen species were characterised using the ecological indexes (light, humidity, temperature and chemical reaction of the substrate) published by Ellenberg et al. (1992) and Wirth (1995) and the geographical elements. The predominant categories are moderate photophilous (61,29%), xero-mesophilous (45,16%), micro-mesothermal (45,15%) and acidophilous (71%). Predominate also the boreal-mediterranean geographical elements (30%) and the *Parmelia* (54,83%) and *Caldonia* (22,58%) type bioforms.

Keywords: lichens, fruticose, foliose, lichenflora, ecological analysis, geographical elements, bioforms.

Introduction

The commune Râşca is situated in the south-western part of Cluj district, at the foot of Gilău Mountains (12), Râşca rivulet – 19 km long - beeing tributary to Someşul Cald river. The upper part of the Rîşca rivulet is located at 1040 m altitude, descending at 810 m in the lower part, to the confluence with rivulet Strîmba [7, 16].

The studied area has a piedmont and low mountain climate, with relative high precipitations (800 – 1000 mm/year). The woody vegetation, according to Pop and Hodişan (1980) is composed mainly by mixed *Picea abies* and *Fagus sylvatica* forests.

Material and Methods

The foliose and fruticose lichens were collected and determined during the summer and autumn of 2003. We have used for the identification of the lichen species several works [1, 2, 3, 5, 6, 10, 13, 15, 17, 18, 19, 20], the nomenclature was wstablished according to [14, 8, 11]. The lichens ecological preferences toward light (Fig. 1), humidity (Fig. 2), temperature (Fig. 3) and the chemical reaction of the substrate (Fig. 4) were analysed, using the indicator values of Ellenberg et al. [4] and Wirth [14].

Results and Discussion

The present paper records 31 foliose and fruticose lichen species, belonging to Eumycota, Ascomycotina, Discomycetes. The high majority of the identified lichens belong to order Lecanorales (27), the best represented family is *Parmeliaceae* with 11 genras and 12 species.

The analysis of the substrate preferences indicates the predominance of corticolous lichens (19 species), followed by tericolous (5), saxicolous (4) and lignicolous (3). Regarding the chorology of those species in Central Europe, 15 are considered rare and 16 common.

Concerning the ecological preferences of the identified specise towards light (Fig. 1) the majority are moderate photophilous (61,29%), followed by photophilous (16,12%) and photo-

sciaphilous – moderate photophilous (9,67%). Less represented are the categories: photo-sciaphilous (6,45%), moderate sciaphilous (3,22%) and strong photophilous (3,22%).

Systematic arrangement

Class ASCOMYCOTINA	
Ord. LECANORALES	18. *Melanelia stygia* (L.) Essl.
Fam. CLADONIACEAE	19. *Parmelia sulcata* Taylor
1.*Cladonia chlorophaea* (Flörke ex Sommerf.) Spreng.	20. *Parmelina tiliacea* (Nyl.) W.L. Culb.& C.F. Culb.
2 *C. coniocraea* (Flörke.) Spreng	21. *Parmeliopsis ambigua* (Wulfen.) Nyl.
3. ***C. cornuta*** (L.) Hoffm.	22. *Pseudevernia furfuracea* (L.) Zopf
4. *C. digitata* (L.) Hoffm.	23. *Xanthoparmelia conspersa* (Ach.) Hale
5. *C. fimbriata* (L.) Fr.	Fam. RAMALINACEAE
6. *C. gracilis* (L.) Wild.	24. ***Ramalina fastigiata*** (Pers.) Ach.
7. *C. pyxidata* (L.) Hoffm.	25. *R. pollinaria* (Westr.) Ach.
8. *C. subulata* (L.) Weber ex F.H.Wigg.	Fam. USNEACEAE
Fam. PHYSCIACEAE	26. ***Usnea florida*** (L.) Weber ex F.H.Wigg.
9. *Physcia aipolia* (Ehrh. Ex Humb.) Fürnr.	27. *U. hirta* (L.) Weber ex F.H.Wigg.
10. *Ph. stellaris* (L.) Nyl.	Ord. Peltigerales
11.*Phaeophyscia orbicularis* (Neck.) Moberg	Fam. Peltigeraceae
Fam. PARMELIACEAE	28. *Peltigera rufescens* (Weiss.) Humb.
12. *Cetraria hepatizon* (Ach.) Vain.	Ord. TELOSCHISTALES
13. *Evernia prunastri* (L.) Ach.	Fam.TELOSCHISTACEAE
14. *Flavoparmelia caperata* (L.) Hale	29. *Xanthoria fallax* (Hepp.) Arnold
15. *Hypogymnia physodes* (L.) Nyl.	30. *Xanthoria parietina* (L.) Th. Fr.
16. *H. tubulosa* (Schaer.) Hav.	31.*X.polycarpa* (Hoffm.)Th.Fr.exRiber
17. *Hypotrachyna revoluta* (Flörke.) Hale	

Note: ***underlined are the 3 species rarest in Central Europe.***

Table 1: ***Repartition of the species in relation with the chorology and the preferences toward the substrate***

The chorology of species in Central Europe	**Substrate**				**Total**
	Corticolous	**Lignicolous**	**Tericolous**	**Saxicolous**	
Common	17	3	5	3	28
Rare	2	-	1	-	3
Total	19	3	6	3	31

The humidity regime (Figure 2) indicates the predominance of the xero-mesophilous (45,16%); there are equl percents of mesophilous and euryhygrous species (19,35% each) and very few xeromesophilous – mesophilous, hygrophilous and mesohygrophilous (3,22% each).

The temperature figure (Figure 3) indicate the dominance of micro-mesothermal species (45,15%); a significant percent of microthermal species (25,18%) is also present. Less represented are the moderate termophilous (9,67%) and cryophilous (3,22%).

The spectrum of the chemical characteristics of the substrate (Figure 4) indicate that the identified species can be separted in two main groups :

- the first group, predominant (71%), is formed by strong acidophilous, acidophilous, acidophilous – moderate acidophilous and moderate acidophilous lichens; they are lignicolous – developped on rotten wood, corticolous - living on thitidoma of birch and rowan tree and tericolous species developped on soil rich in humus;

- the second group (25%) consists of the subneutrophilous and neutrophilous species, developped on willow rhitidoma or on calcareous soil.

One species is euryionic.

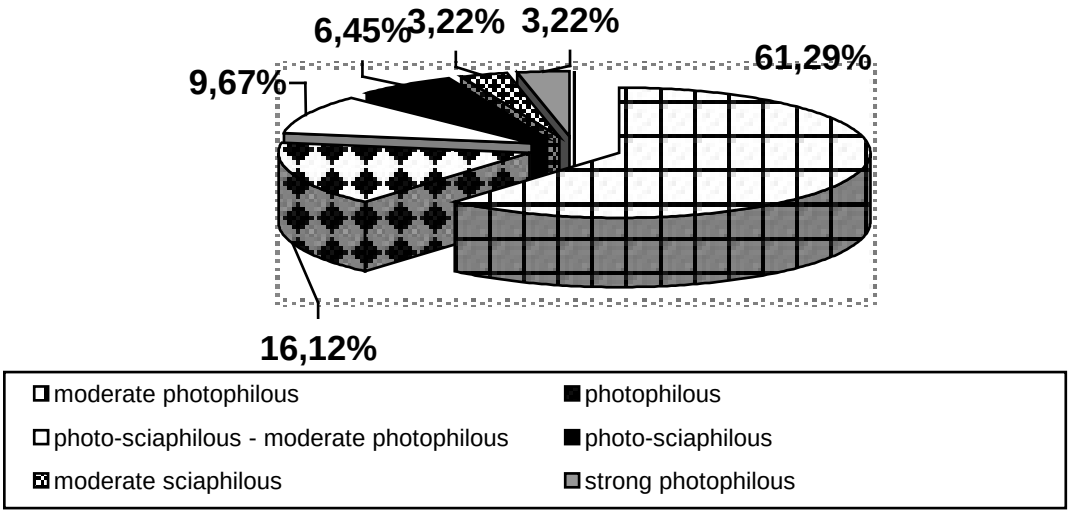

Fig. 1: Percentual distribution of the species in relation with the preferences toward light

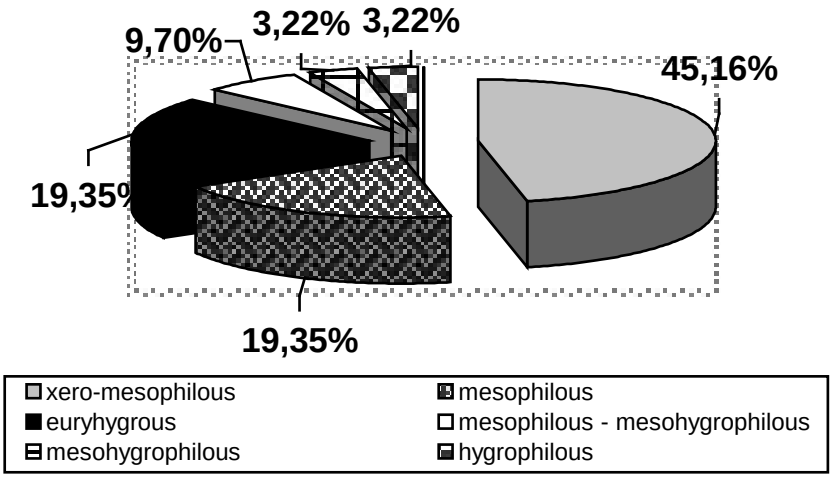

Fig. 2: Percentual distribution of the species in relation with the preferences toward humidity

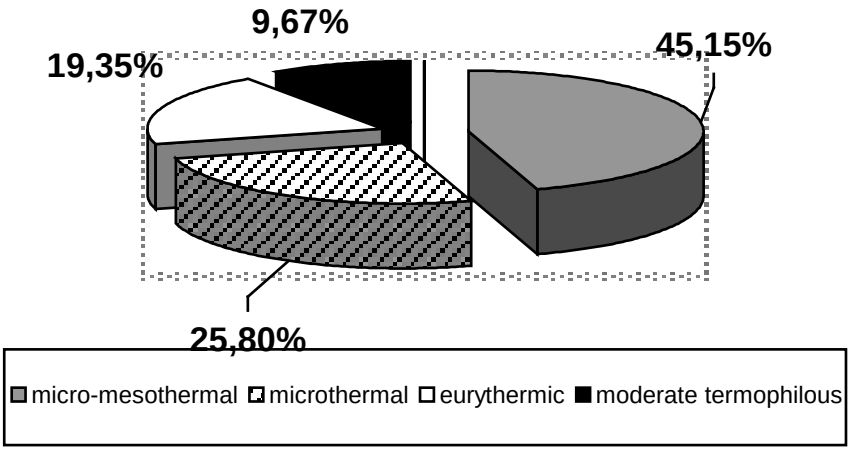

Fig. 3: Percentual distribution of the species in relation with the preferences toward temperature

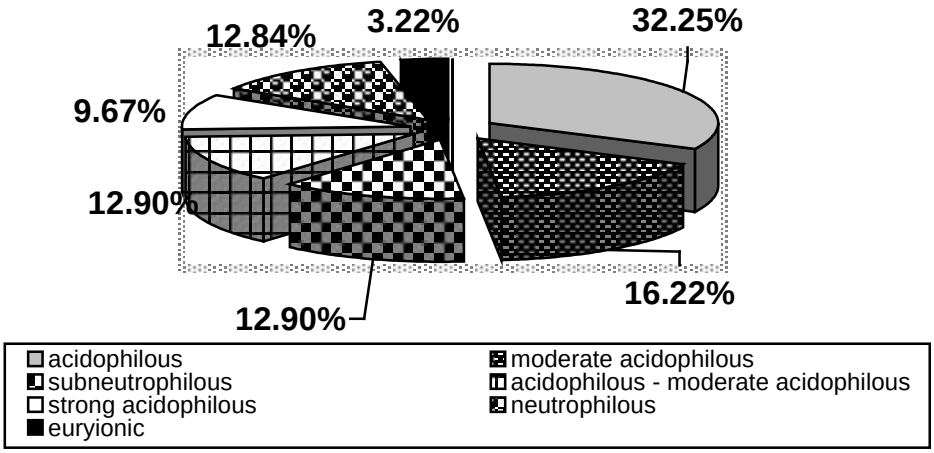

Fig. 4: Percentual distribution of the species in relation with the preferences toward chemical reaction of the substrate.

The analysis of the geographical elements spectra (Tab. 2) reveals the predominance the boreal-mediterranean species (9), 5 species beeing arcto-mediterranean, the other are less represented.

Table 2: The distribution of species in relation with the geographical elements

*Geographical element**	*Number of species*
Arkt-med	**5**
Arkt-smed-mo	1
(Arkt) bor-med	1
(Arkt) bor-mieur-mo	1
(Arkt) bor-h'mo	1
Arkt-h'mo/alp	1
Bor-med	**9**
Bor-med-mo	1
Bor-med-(mo)	2
Bor-mieur (med-mo)	1
Bor-smed (med)	1
Bor-smed-h'mo (med-mo)	1
Mieur	1
Mieur (subatl) med	1
Mieur-med	1
Mieur-smed-mo	1
(S'bor) mieur-med	2
TOTAL	**31**

***The shortcuts used for the geographical elements are coresponding to Wirth, V., (14).**

The analysis of the bioforms (Table 3) reveals the predominance of the *Parmelia* type (17 species), followed by the *Cladonia* type (7 species), the other categories having low representation.

Table 3: The species distribution in relation with the bioform type

Bioforms	***Number of species***
Ch Ce	1
Ch Cl	**7**
H E Ra	3
H E Pa	**17**
H Pe	1
H E Us	2
TOTAL	31

Conclusions

The inventory developed upon the fruticose and foliose lichens in Rîşca Valley revealed the existence of 31 species.

Were found 3 rare species according to the chorology of lichens in central Europe: *Cladonia cornuta*, *Ramalina fastigiata* and *Usnea florida*.

The lichen species were characterised using the ecological indexes (light, humidity, temperature and chemical reaction of the substrate) published by *Ellenberg* et al. (1992) and *Wirth* (1995), the geographical elements and the bioforms

Regarding the preferences toward the substrate, the great number of the corticolous species (61,3 %) is the consequence of the presence of large surfaces covered with trees in the studied area.

The predominance of the moderate photophilous species is the result of the predominance of the corticolus lichens, developed mainly on the trunks and branches of isolated trees. In this category are included, also, some tericolous species developed on the soil at the basis of tree trunks.

The analysis of the temperature figure reveals a larger number of micro-mesothermal lichens, specific feature for the low mountain climate, characteristic for the studied area. The presence of a a significant percent of microthermal species (25,18%) is the consequence of the cold air currents, coming from the high areas of the Gilau Mountains. The three moderate termophilous species were identified on the trunks of sheltered trees, on sunny expositions.

The presence of a large number of corticolus lichens determinate also the predominance of the xero-mesophilous species.

The pH of the substrate (mainly the bark of trees) determine the predominance of acidophilous species, developed on acid bark or on rotten wood.

As a result of the geographical position and altitude of the studied area, the dominant geographical element is boreal-mediterranean, interfered with arcto-mediterranenan species.

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STUDII FLORISTICE ASUPRA LICHENILOR FOLIACEI ŞI FRUTICULOŞI DE PE VALEA RÂŞCA (JUD. CLUJ).

(Rezumat)

Comuna Râşca este situată în partea de sud-vest a judeţului Cluj, la poalele Munţilor Gilău, pârâul Râşca, cu o lungime de 19 km, este afluent al Someşuluii Cald. Inventarul floristic al lichenilor foliacei şi fruticuloşi de pe Valea Râşca include un număr de 31 de specii: 19 corticoli, 6 tericoli, 3 lignicoli şi 3 saxicoli. Am identificat un număr de 3 specii considerate rare conform corologiei lichenilor în Europa centrală: *Cladonia cornuta, Ramalina fastigiata, Usnea florida.*

Pentru analiza comportamentului ecologic al lichenilor identificaţi am utilizat valorile indicilor ecologici (lumină, umiditate, temperatură, reacţia chimică a substratului) după Ellenberg et al. (1992) şi Wirth (1995). Categoriile care predomină sunt moderat fotofile (61,29%), xero-mezofile (45,16%), micro-mezoterme (45,15%) şi acidofile (71%). În privinţa elementelor fitogeografice sunt majoritare speciile boreal mediteraneene (30%), iar în privinţa bioformelor predomină lichenii hemicriptofiţi de tip *Parmelia* (54,83%) şi cei camefiţi de tip *Cladonia* (22,58%)