MUZEUL
JUDEȚEAN
ARGEȘ

ARGESIS
XXIV

STUDII ŞI COMUNICĂRI

SERIA
ŞTIINȚELE NATURII

PITEŞTI - 2016

MUZEUL JUDEŢEAN ARGEŞ

ARGESIS

Studii şi comunicări
Seria Ştiinţele Naturii
XXIV

EDITURA ORDESSOS
PITEŞTI
2016

ARGESIS
Series Science of Nature
Annals of the Argeş County Museum,
Piteşti

EDITED BY THE ARGEŞ COUNTY MUSEUM
WITH THE SUPPORT OF
THE ARGEŞ COUNTY COUNCIL
Editorial Office Address: Armand Călinescu Street, no. 44, 110047, Piteşti, Argeş County.
Phone/fax: 0248/212561; e-mail: argesis.naturale@gmail.com
PITEŞTI - ROMANIA

I. S. S. N. 1453 - 2182

ARGESIS
Seria Ştiinţele Naturii
Analele Muzeului Judeţean Argeş,
Piteşti

EDITAT DE MUZEUL JUDEŢEAN ARGEŞ
CU SPRIJINUL CONSILIULUI JUDEŢEAN ARGEŞ
Adresa redacţiei: Str. Armand Călinescu, nr. 44, 110047, Piteşti, judeţul Argeş.
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SUMMARY

Botany

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CUPRINS

Botanică

Zoologie

MUZEUL JUDEȚEAN ARGEȘ, PITEȘTI, ROMÂNIA
ARGESIS - *STUDII ŞI COMUNICĂRI - seria ŞTIINŢELE NATURII,* **TOM XXIV**, 2016

ASSESSING AND MAPPING PLANT SPECIES AND HABITATS FROM THE SPRINGS COMPLEX OF CORBII CIUNGI PROTECTED AREA

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ABSTRACT. The article highlights the plant species assessed from the springs complex within the Corbii Ciungi protected area, the distribution of the habitats specified in the Romanian law, and the future potential habitats that might develop if the anthropic impact either diminishes or disappears.

Keywords: plants, habitats, mapping, protected area, Corbii Ciungi.

REZUMAT. Evaluarea și cartarea speciilor și habitatelor din Aria Protejată Complexul de Izvoare de la Corbii Ciungi. Articolul evidențiază speciile de plante evaluate pe teritoriul ariei protejate Corbii Ciungi, distribuția habitatului evidențiat de legislația românească și habitatele potențiale, viitoare, care s-ar putea dezvolta dacă presiunea impactului antropic s-ar diminua sau ar dispărea.

Cuvinte cheie: plante, habitate, cartare, arie protejată, Corbii Ciungi.

INTRODUCTION

Evaluation of the biodiversity gives a better understanding of the impact of management actions and identifies many of the ways in which biodiversity is affected (VGDSE, 2004).

In 1959 (Botoşăneanu & Negrea, 1962) started a systematic study of springs and phreatic waters from the central area of the Romanian Plain and the scientists discovered a complex of rivulets, springs and wetlands in the Neajlov

River valley near the village of Corbii Ciungi. Following this study, the scientists developed a systematic faunistic and ecological approach in the area named after the closest settlement: Corbii Ciungi. In those years, human activities had just started to act upon the complex of springs, rivulets, wetlands and adjacent areas. The approach highlighted the high species diversity and the relict, rarely endemic, character of the species identified there. The studies continued in 70 springs and spring complexes within the Romanian Plain (Motaș et al., 1962). The springs complex of Corbii Ciungi was declared protected in 1966 and named Springs Complex of the Corbii Ciungi Natural Reserve. The Natural Reserve is defined as the springs complex which feeds two rivulets, each of 800-1000 m length. The rivulets comprise between them an area of about 90,000 sq.m. consisting of cultivated fields. The entire complex used to be easily recognised from a distance as an area totally hidden under woody vegetation of alder, willow, etc. within the completed deforested area of the plain. The vegetation was lush and diverse (comprising mosses, Hepaticae, Equisetaceae, ferns and hygrophilous phanerogams) in places where the spring water flooded and waterlogged the flat surfaces.

The floodplain woodland which sheltered the springs complex was made up of tall, vigorous trees and included woody species such as: *Salix fragilis* L., *Salix cinerea* L., *Alnus glutinosa* (L.) Gaertn., *Viburnum opulus* L., *Rhamnus frangula* f. *latifolia* Dipp., *Ligustrum vulgare* L., *Corylus avellana* L., *Euonymus verrucosus* Scop., *Cornus sanguinea* L., etc. The woodland had a high importance in maintaining the stenothermic biotopes of cool water, with their corresponding biocoenoses. In the absence of the forest that had been eradicated in former times, the presence of woody vegetation around the springs protected these biotopes against excessive insolation, of the impact of drying wind, and erosion following excessive precipitation. Bryophytes were present that are typical of cold springs and wetlands in forests, mosses: *Cratoneuron commutatum* (Hedw.) G. Roth and *Brachythecium rivulare* Schimp.; liverworts: *Aneura pinguis* (L.) and especially *Chiloscyphus polyanthus* (L.) and developed over larger areas than anywhere else on the Romanian Plain.

The springs complex is situated in Dâmbovița County at ca. 800 m distance from Neajlov River left bank (Fig. 1) at N: 44° 31' E: 25° 30'. Between the two rivulets and surrounding they are either cultivated fields (mainly of corn and wheat) or abandoned land.

The history of the natural reserve reflects a lack of real protection and its naturalness diminished with time, especially after 1989 (end of Communism in Romania) when the land was returned to its former owners (Negrea & Negrea, 1998-1999). The floodplain woodland lost all the adult trees and became dominated by immature trees and shrubs, in some areas being completely destroyed by cutting or burning.

An update of the study was made by Ciubuc in 2007. Other recent studies have been published regarding the ground beetle fauna (Lotrean, 2012) and

concluded that the ground beetle association of the present habitat was similar to that of the original riparian habitats of the protected area.

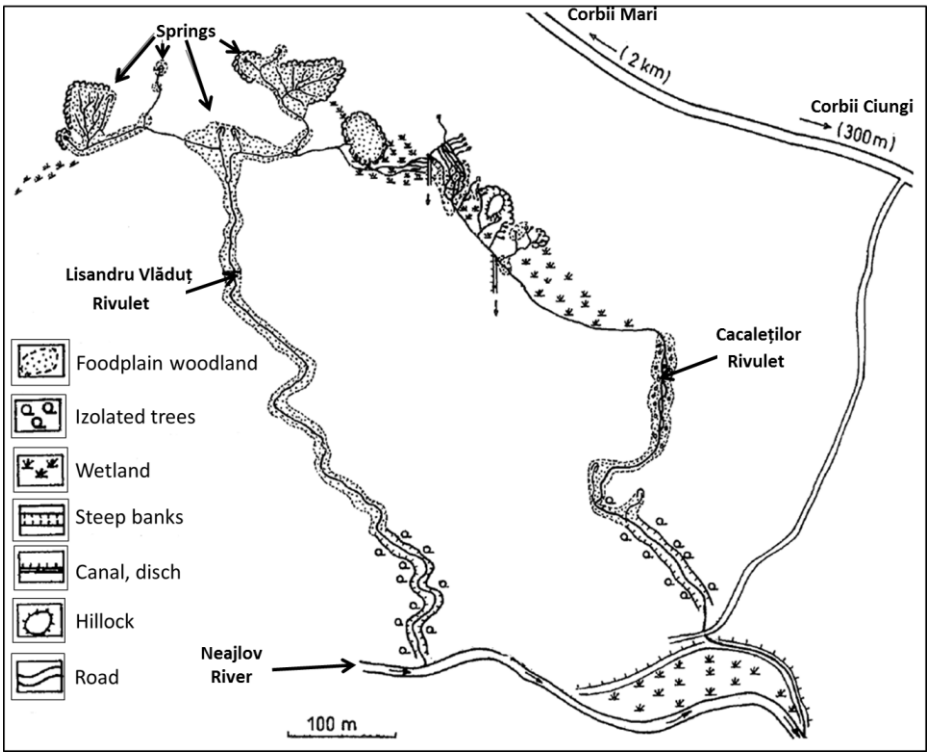

Figure 1 - Schematic representation of the Springs Complex of Corbii Ciungi (after Negrea & Negrea, 1998-1999).

MATERIALS AND METHODS

In 2012 the protected area Springs Complex of Corbii Ciungi still consisted of the two rivulets and an area defined as the small running waterbodies that are formed by water emerging at the soil surface (springs) near northern limit of the area studied. At these northern limits, there are small marshy microhabitats feeding the two rivulets that both discharge into the Neajlov River (Fig. 2).

Our study of 2012 combined an inventory of the vascular plants species and bryophytes within the Natural Reserve Springs Complex of Corbii Ciungi with a previous analysis of the literature describing the species recorded in previous years.

For mapping purposes, the data collected from field trips with GPSmap 76CSx were visualised on Google Earth.

For taxonomy and ecological characterization of the plant species we used Ciocârlan (Ciocârlan, 2009). For taxonomy of mosses we used Mohan (Mohan, 1998).

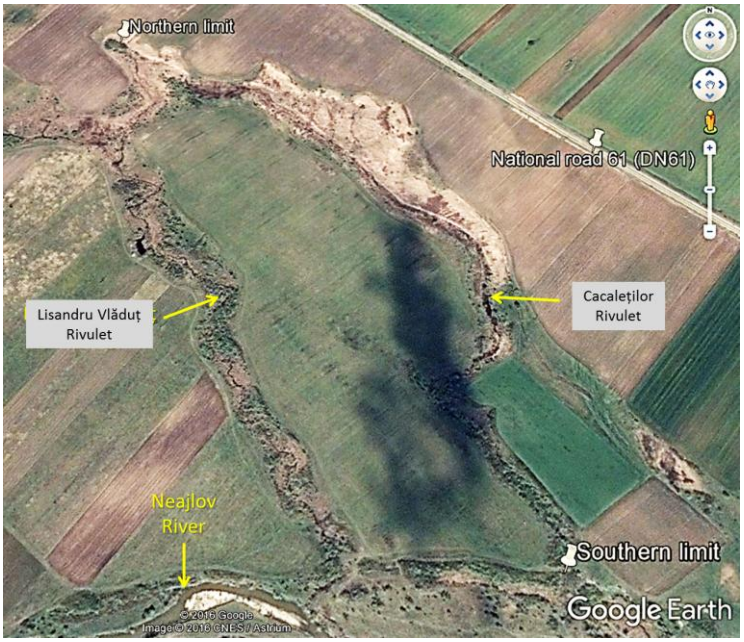

Figure 2 - Representation of the Springs Complex of Corbii Ciungi in 2012 (https://earth.google.com/).

RESULTS AND DISCUSSIONS

Species

In 2012 we added another 50 species to the total list recorded in previous studies (Tab. 1). These previous studies had not focused on accurate recording of all the plant species and therefore a comprehensive list of plant species does not exist. The bryophyte species included are mentioned in all studies conducted in the area (Tab. 2).

Table 1 - List of plant species identified on reservation territory.

No.	Family	Species	1961-1962	2007	2012
1.	Alismataceae	*Alisma plantago aquatica* L.		+	+
2.	Apiaceae (Umbelliferae)	*Daucus carota* L.		+	+
3.	Apiaceae (Umbelliferae)	*Eryngium campestre* L.			+
4.	Apiaceae (Umbelliferae)	*Oenanthe aquatica* (L.) Poir.	1-2	+	+
5.	Apiaceae (Umbelliferae)	*Aegopodium podagraria* L.		+	+
6.	Apiaceae (Umbelliferae)	*Berula erecta* (Huds.) Coville		+	+
7.	Apiaceae (Umbelliferae)	*Orlaya grandiflora* (L.) Hoffm.			+
8.	Apiaceae (Umbelliferae)	*Sium latifolium* L.	1-2	+	+

No.	Family	Species	1961-1962	2007	2012
9.	Aristolochiaceae	*Aristolochia clematitis* L.			+
10.	Aspleniaceae	*Thelypteris palustris* Schott	1-2	+	1-2
11.	Asteraceae (Compositae)	*Conyza canadensis* (L.) Cronquist		+	+
12.	Asteraceae (Compositae)	*Erigeron annuus* (L.) Pers.			+
13.	Asteraceae (Compositae)	*Eupatorium cannabinum* L.		+	+
14.	Asteraceae (Compositae)	*Xanthium strumarium* L.		+	+
15.	Asteraceae (Compositae)	*Achillea millefolium* L.		+	+
16.	Asteraceae (Compositae)	*Arctium lappa* L.			+
17.	Asteraceae (Compositae)	*Bidens cernua* L.		+	+
18.	Asteraceae (Compositae)	*Bidens tripartita* L.		+	+
19.	Asteraceae (Compositae)	*Centaurea cyanus* L.			+
20.	Asteraceae (Compositae)	*Cichorium intybus* L.			+
21.	Asteraceae (Compositae)	*Cirsium arvense* (L.) Scop.		+	+
22.	Asteraceae (Compositae)	*Cirsium vulgare* (Savi) Ten.			+
23.	Asteraceae (Compositae)	*Inula britannica* L.			+
24.	Asteraceae (Compositae)	*Pulicaria dysenterica* (L.) Bernh.		+	+
25.	Betulaceae	*Alnus glutinosa* (L.) Gaertn.	4	+	2
26.	Boraginaceae	*Anchusa officinalis* L.			+
27.	Boraginaceae	*Symphytum officinale* L. s. str.		+	+
28.	Brassicaceae (Cruciferae)	*Berteroa incana* (L.) DC.		+	+
29.	Brassicaceae (Cruciferae)	*Cardamine amara* L.	1-2		1
30.	Brassicaceae (Cruciferae)	*Cardaria draba* (L.) Desv.			+
31.	Brassicaceae (Cruciferae)	*Nasturtium officinale* W. T. Aiton		+	+
32.	Butomaceae	*Butomus umbellatus* L.		+	+
33.	Cannabaceae	*Humulus lupulus* L.		+	+
34.	Caprifoliaceae	*Sambucus ebulus* L.			+
35.	Caprifoliaceae	*Sambucus nigra* L.			+
36.	Caprifoliaceae	*Viburnum opulus* L.	+	+	+
37.	Celastraceae	*Euonymus verrucosus* Scop.	+	+	+
38.	Ceratophyllaceae	*Ceratophyllum submersum* L.		+	+
39.	Convolvulaceae	*Calystegia sepium* (L.) R. Br.		+	+
40.	Convolvulaceae	*Convolvulus arvensis* L.			+
41.	Cornaceae	*Cornus sanguinea* L.	+	+	+
42.	Corylaceae	*Corylus avellana* L.	+		+
43.	Cyperaceae	*Carex hirta* L.	+		+

No.	Family	Species	1961-1962	2007	2012
44.	Cyperaceae	*Carex pseudocyperus* L.	+		+
45.	Cyperaceae	*Carex vulpina* L.	+		+
46.	Cyperaceae	*Schoenoplectus lacustris* (L.) Palla	+	+	+
47.	Cyperaceae	*Scirpus sylvaticus* L.	+		+
48.	Dipsacaceae	*Cephalaria transylvanica* (L.) Roem. et Schult.			+
49.	Dipsacaceae	*Dipsacus fullonum* L.		+	+
50.	Dipsacaceae	*Dipsacus laciniatus* L.			+
51.	Equisetaceae	*Equisetum telmateia* Ehrh.	+	+	+
52.	Euphorbiaceae	*Euphorbia cyparissias* L.		+	+
53.	Fabaceae (Leguminosae)	*Amorpha fruticosa* L.			+
54.	Fabaceae (Leguminosae)	*Astragalus glycyphyllos* L.			+
55.	Fabaceae (Leguminosae)	*Coronilla varia* L.		+	+
56.	Fabaceae (Leguminosae)	*Lathyrus odoratus* L.			+
57.	Fabaceae (Leguminosae)	*Lathyrus sylvestris* L.		+	+
58.	Fabaceae (Leguminosae)	*Lotus corniculatus* L.		+	+
59.	Fabaceae (Leguminosae)	*Melilotus officinalis* (L.) Lam.		+	+
60.	Fabaceae (Leguminosae)	*Ononis spinosa* L.		+	+
61.	Fabaceae (Leguminosae)	*Robinia pseudoacacia* L.			+
62.	Fabaceae (Leguminosae)	*Vicia cracca* L.			+
63.	Fabaceae (Leguminosae)	*Vicia lutea* L.			+
64.	Fabaceae (Leguminosae)	*Trifolium fragiferum* L.		+	+
65.	Hydrocharitaceae	*Elodea canadensis* Michx.			+
66.	Hypericaceae	*Hypericum tetrapterum* Fr.		+	+
67.	Iridaceae	*Iris pseudacorus* L.			+
68.	Juncaceae	*Juncus conglomeratus* L. em. Leers	+		+
69.	Juncaceae	*Juncus effusus* L.		+	+
70.	Juncaceae	*Juncus articulatus* L. em Richt.	+		
71.	Lamiaceae (Labiatae)	*Lycopus europaeus* L.		+	+
72.	Lamiaceae (Labiatae)	*Mentha aquatica* L.		+	+
73.	Lamiaceae (Labiatae)	*Mentha longifolia* L.		+	+
74.	Lamiaceae (Labiatae)	*Origanum vulgare* L.			+
75.	Lamiaceae (Labiatae)	*Salvia nemorosa* L.			+
76.	Lamiaceae (Labiatae)	*Salvia pratensis* L.		+	+
77.	Lamiaceae (Labiatae)	*Scutellaria hastifolia* L.		+	+
78.	Lemnaceae	*Lemna minor* L.		+	+

No.	Family	Species	1961-1962	2007	2012
79.	Liliaceae	*Muscari comosum* (L.) Mill.			+
80.	Liliaceae	*Ornithogalum pyramidale* L.			+
81.	Lythraceae	*Lythrum salicaria* L.			+
82.	Moraceae	*Morus alba* L.			+
83.	Oleaceae	*Ligustrum vulgare* L.		+	+
84.	Onagraceae	*Epilobium palustre* L.			+
85.	Onagraceae	*Oenothera biennis* L.		+	+
86.	Orchidaceae	*Dactylorhiza maculata* (L.) Soó			+
87.	Plantaginaceae	*Plantago lanceolata* L.			+
88.	Poaceae	*Setaria viridis* (L.) Beauv.			+
89.	Poaceae (Gramineae)	*Agrostis stolonifera* L.		+	+
90.	Poaceae (Gramineae)	*Bromus arvensis* L.			+
91.	Poaceae (Gramineae)	*Bromus tectorum* L.			+
92.	Poaceae (Gramineae)	*Calamagrostis arundinacea* (L.) Roth		+	+
93.	Poaceae (Gramineae)	*Calamagrostis pseudophragmites* (Haller fil.) Koeler			+
94.	Poaceae (Gramineae)	*Dactylis glomerata* L.		+	+
95.	Poaceae (Gramineae)	*Phragmites australis* (Cav.) Steud.		+	1
96.	Poaceae (Gramineae)	*Echinochloa crus-galli* (L.) Beauv.			+
97.	Polygonaceae	*Polygonum bistorta* L.			+
98.	Polygonaceae	*Polygonum hydropiper* L.		+	+
99.	Polygonaceae	*Polygonum lapathifolium* L.			+
100.	Potamogetonaceae	*Potamogeton crispus* L.		+	+
101.	Potamogetonaceae	*Potamogeton natans* L.		+	+
102.	Potamogetonaceae	*Potamogeton pectinatus* L.		+	+
103.	Primulaceae	*Lysimachia nummularia* L.	+	+	+
104.	Primulaceae	*Lysimachia vulgaris* L.		+	+
105.	Ranunculaceae	*Clematis vitalba* L.		+	+
106.	Rosaceae	*Agrimonia eupatoria* L.		+	+
107.	Rosaceae	*Fragaria vesca* L.			+
108.	Rosaceae	*Potentilla reptans* L.		+	+
109.	Rosaceae	*Prunus spinosa* L.		+	1
110.	Rosaceae	*Rosa canina* L. s.l.		+	+
111.	Rosaceae	*Rubus caesius* L.		+	+
112.	Rubiaceae	*Galium aparine* L.			+

No.	Family	Species	1961-1962	2007	2012
113.	Rubiaceae	*Galium palustre* L.	+	+	+
114.	Rubiaceae	*Galium palustre* L. ssp. *elongatum* (C. Presl) Lange		+	+
115.	Rubiaceae	*Galium rubioides* L.		+	+
116.	Rubiaceae	*Galium verum* L.			+
117.	Salicaceae	*Populus alba* L.	1	+	+
118.	Salicaceae	*Salix alba* L.	1	+	+
119.	Salicaceae	*Salix caprea* L.		+	+
120.	Salicaceae	*Salix fragilis* L.	1	+	+
121.	Scrophulariaceae	*Gratiola officinalis* L.			+
122.	Scrophulariaceae	*Linaria vulgaris* Mill.		+	+
123.	Scrophulariaceae	*Scrophularia umbrosa* Dumort		+	+
124.	Scrophulariaceae	*Verbascum phoeniceum* L.			+
125.	Scrophulariaceae	*Verbascum phlomoides* L.			+
126.	Scrophulariaceae	*Veronica beccabunga* L.		+	+
127.	Solanaceae	*Solanum dulcamara* L.		+	+
128.	Sparganiaceae	*Sparganium erectum* L. em. Rchb.	+	+	+
129.	Typhaceae	*Typha angustifolia* L.		+	+
130.	Typhaceae	*Typha latifolia* L.			+
131.	Ulmaceae	*Ulmus minor* Mill.		+	+
132.	Urticaceae	*Urtica dioica* L.		+	+
133.	Valerianaceae	*Valeriana officinalis* L.			+

Table 2 - Bryophyte species present on the reserve territory.

Aneura pinguis (L.)	*Cratoneuron commutatum* (Hedw.) G. Roth
Brachythecium rivulare Schimp.	*Leucobryum glaucum* (Hedw.)
Chiloscyphus polyanthus (L.)	S*phagnum* spp.

Individuals of *Prunus spinosa* L. formed bands along the river/spring sides/margins, accompanied by *Euonymus verrucosus* Scop., *Rosa canina* L., *Cornus sanguinea* L., *Ligustrum vulgare* L., etc. Shrubby vegetation (*Salix alba* L., *Salix cinerea* L., *Alnus glutinosa* (L.) Gaertn., *Viburnum opulus* L. and other species) is scarce and shorter, forming woody curtains separating the wetter areas from surrounding cultivated fields.

We cannot now say that the floodplain woodland that formerly existed is visible from distance and today it is hard enough to distinguish the studied area

from the surrounding fields. The agricultural fields are used for planting corn and sunflower, but many of them are abandoned.

Most of the species from the area are xero-mesophilous (preferring dry to semi-dry places), emphasising the present arid nature of this area despite the presence in the immediate vicinity of the wetland area, rivulets and the Neajlov River. There is a massive development of *Daucus carota* L., a eurythermic (tolerant of a wide range of temperature), euryphotic (tolerant of a wide range of light intensities) and euryacid (tolerant of a wide range of pH) species. A mesophilous species with Mediterranean origins, *Dipsacus fullonum* L., appears in dense patches of individuals whose height often surpasses 2 m. These two species (together with others accompanying) confer a ruderal character to the study area.

Ciubuc (Ciubuc, 2007) does not mention *Corylus avellana* L., though we found two young individuals in 2012, one of them covered with hop (*Humulus lupulus* L.). The 2007 study also mentions that *Phragmites australis* (Cav.) Trin. ex Steud and *Typha angustifolia* L. covered more than 80%. In 2012 these species were less extensive, though still covering large areas in relatively humid locations on water margins. *P. australis* has a high biomass in depressions and within small patches formed in flat areas where the groundwater is closer to the surface. *Lysimachia nummularia* L. individuals are quite dense creeping on the soil surface. Three invasive species are present here: *Conyza canadensis* (L.) Cronquist (herbaceous annual), *Sambucus ebulus* L. (perennial herb) and *Amorpha fruticosa* L. (perennial shrubs). From the total list of species recorded here, only *Dactylorhiza maculata* (L.) Soó has conservation importance at national or international level (Oltean et al., 1994).

The species recorded in 2012 indicate a variety of soil types within different small areas, reflecting wetland, semi-arid and dry conditions.

Since the 1970s, this oasis of relict flora and fauna has been modified due to the influence of human activities. The main modification was brought about by deforestation around the complex of rivulets and floodplain woodland. Currently in the 2010s, a wide range of actions are modifying the biotopes and biocoenoses: intensive grazing, cutting of trees and shrubs, conversion of some sections of rivulets into hollows used by cattle for drinking, usage of water for irrigation, as well as cultivation of land between the two collector rivulets and around the wetland. By 2012, the floodplain woodland had almost been destroyed, with no surviving trees, whilst shrubs are quite rare, being most abundant in those parts of the wetlands that are less accessible to humans and domestic animals.

Most of the species recorded in the studied area require humid places for development and survival. Thus, 66.92% of the entire registered flora is mesophilous (growing on almost dry soils to dry-moist soils) or hygrophilous (growing on dry-moist soils to wet soils). These species root into the water or into wet soil. Some of the species are hydrophytes (hygrophilous) or hydro-hygrophyte, growing on soils that range from permanently wet to submerged, with the regeneration organs under water.

The percentage of xerophytic species (growing on dry soils) and xero-mesophytic (growing on dry to moist soils) is low (24.81%). These species grow near the agricultural fields, in the centre of the site (the high area between the rivulets) of the studied area and in the abandoned agricultural field surrounding Corbii Ciungi village.

The presence of many species that need water and of only a small number of species that prefer arid soils emphasises that the studied area is an "oasis" in the plain and near towns and rural areas.

Most of the species are herbaceous perennials, together with a few species of trees and shrubs. Assessing all the species recorded, most are common at the national level, with none defined as rare or occasional.

Habitats

The only habitat here specified by the Romanian Law 5/2000 is 7120 "Degraded raised bogs still capable of natural regeneration" (Fig. 3).

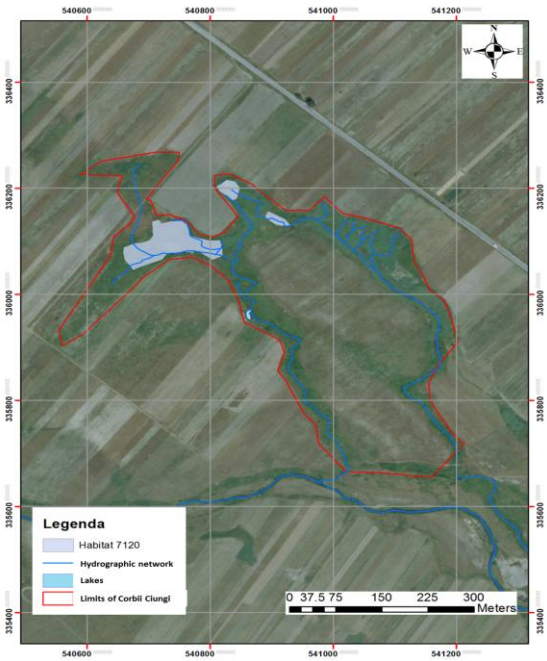

Figure 3 - Mapping 7120 Habitats of Corbii Ciungi.

This habitat type is described in Gafta and Mountford (Gafta & Mountford, 2008) as comprising raised bogs which have suffered a major perturbation of the natural hydrological regime of the peat layer. This perturbation has anthropogenic origins, leading to drying of the peatland surface and/or changes or disappearance of some species.

The vegetation of these disturbed peatlands usually contains, as main elements, species that are typical of active raised bogs (code 7110*) but the relative abundance of these species is different. Degraded raised bogs 7120 are not classified under specific vegetation associations, but only as degraded variants of the associations mentioned for habitat type 7110*.

The habitat area at Corbii Ciungi is small and could survive in wetlands where the access of humans and cattle is difficult or limited. Over the entire extent of the studied area, there are small fragments that might become valuable wetland habitats (considered here as "potential habitats"), but only if appropriate management actions are applied in the future and for the long term (Tab. 3).

Table 3 - The type of potential habitats from the Corbii Ciungi protected area (after Doniță et al., 2005).

Romanian habitat 3122 Ponto-pannonic scrubs with blackthorn (*Prunus spinosa*) and common hawthorn (*Crataegus monogyna*). **NATURA 2000:** 40A0* Subcontinental peri-Pannonic scrub. **EMERALD:** 31.8B1 Pannonic and sub-Pannonic thickets. **CORINE:** 31.8B3 South-eastern sub-Mediterranean. **PAL. HAB:** 31.8B131 Peri-Pannonic hawthorn-blackthorn scrub. **EUNIS:** F3.241 Central European subcontinental thickets. **Plant association:** *Pruno spinosae –Crataegetum* Soó (1927) 1931 (Syn.: *Prunetum moldavicae* Dihoru (1969) 1970, *Rubo caesii – Prunetum spinosae* Rațiu et Gergely 1979).
Conservation status: moderate, Emerald priority habitat.
Romanian habitat 4403 Danubian-pannonic forests of black alder (*Alnus glutinosa*) with *Iris pseudacorus*. **NATURA 2000: –** **EMERALD:** !44.9115 Eastern Carpathian alder swamp woods. **CORINE: –** **PAL. HAB:** 44.91151 Pre-Carpathian alder swamp woods. **EUNIS:** G1.4115 Eastern Carpathian *Alnus glutinosa* swamp woods. **Plant association:** *Carici acutiformi-Alnetum* (Dostal 1933) Soó 1963. **Type of ecosystems:** 9310 Floodplain woodland of black alder with *Carex-Iris pseudacorus.*
Conservation status: very high.
Romanian habitat 4405 Daco-getic forests of black poplar (*Populus nigra*) with *Rubus caesius*. **NATURA 2000:** 91E0*Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*). **EMERALD: –** **CORINE: –** **PAL. HAB:** 44.6612 Western Pontic white –black poplar galleries. **EUNIS:** G1.365 Central European poplar galleries. **Plant association:** S*alicetum albae-fragilis* Issler 1926 em. Soó 1957. **Type of ecosystems:** 9317 Floodplain woodland of black poplar with *Rubus caesius* and *Galium aparine*.
Conservation status: very high.

Romanian habitat 4406 Danubian-Pannonic forests of white poplar (*Populus alba*) with *Rubus caesius*. **NATURA 2000:** 92A0 *Salix alba* and *Populus alba* galleries. **EMERALD:** !44.66 Ponto-Sarmatic mixed poplar riverine forest. **CORINE: –** **PAL. HAB:** 44.6611 Western Pontic white poplar galleries. **EUNIS:** G1.365 Central European poplar galleries. **Plant association:** *Salicetum albae-fragilis* Issler 1926 em. Soó 1957. **Type of ecosystems:** 9617 Floodplain woodland of white poplar with *Rubus caesius-Galium aparine.* Conservation status: very high.
Romanian habitat 4407 Danubian forests of white willow (*Salix alba*) with *Rubus caesius*. **NATURA 2000:** 92A0 *Salix alba* and *Populus alba* galleries. **EMERALD:** !44.66 Ponto-Sarmatic mixed poplar riverine forest. **CORINE: –** **PAL. HAB:** 44162 Pontic willow galleries. **EUNIS:** G1.1142 Ponto-sarmatic steppe willow galleries. **Plant association:** *Salicetum albae-fragilis* Issler 1926 em. Soó 1957. **Type of ecosystems:** 9817 Floodplain woodland of willow with *Rubus caesius-Galium aparine.* Conservation status: high.
Romanian habitat 5305 Danubian communities with *Typha angustifolia* and *T. latifolia*. **NATURA 2000: –** **EMERALD:** 22.31 Euro-Siberian perennial amphibious communities. **CORINE:** 53.13 Reedmace (*Typha*) beds. **PAL. HAB:** 53.13 Reedmace beds. **EUNIS:** C3.231/232 *Typha latifolia/T. angustifolia* beds. **Plant association:** *Typhetum angustifoliae* Piggnati 1953, *Typhetum latifoliae* G. Lang.1973. Conservation status: low.

CONCLUSIONS

Shrubby vegetation at Corbii Ciungi is scarce and shorter, forming bands (as woody curtains) along the margins of the rivulets. The former floodplain woodland no longer exists today, and the single community of interest that is still present is the habitat 7120 Degraded raised bogs still capable of natural regeneration but on small areas.

Assessment of the species distinguishes small areas with different soil types, indicating wetlands, semi-arid and dry areas.

If the degree and intensity of the anthropic impact (deforestation and destruction by fire of the remnant shrubby vegetation, transformation of some sections of rivulets into hollows used by cattle for drinking, usage of the water for irrigation, etc.) continues, the area will be totally destroyed.

If the degree and intensity of the anthropic impact diminishes or disappears in the future, the fragments of potential habitats assessed in the area could develop and lead to the natural restoration of the "oasis" that formerly existed in the plain region and near towns and rural areas. Such future habitats will have high or very high conservation status.

Through their existence in the region and through their national and EU community interest, such restoration would bring more health and wealth to the people that now own the agricultural fields.

AKNOWLEDGEMENT

The study was financed by Romanian Academy trough project RO1567-IBB01/2012 and by POS-Environment through the project Research services for efficient management of Springs Complex of Corbii Ciungi protected area. The authors thank to O. J. Mountford for useful suggestions and English check.

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MUZEUL JUDEŢEAN ARGEŞ, PITEŞTI, ROMÂNIA
ARGESIS - *STUDII ŞI COMUNICĂRI - seria ŞTIINŢELE NATURII*, **TOM XXIV**, 2016

MEDICINAL PLANT DIVERSITY IN THE FLORA OF RÂIOSU AND BUDA MOUNTAINS

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ABSTRACT. In the paper we presented medicinal plants from Râiosu and Buda Mountains, Făgăraş Massif. Not surprisingly, the largest families contain the largest number of medicinal species. It is essential to make the complete inventory of the medicinal component of the flora of any mountain for conservation and sustainable use. This fact requires an efficient management of the two mountains where they vegetate.

Keywords: medicinal plant, flora biodiversity, Râiosu and Buda Mountains.

REZUMAT. Diversitatea plantelor medicinale din munţii Râiosu şi Buda, Masivul Făgăraş. În lucrare sunt prezentate speciile de plante medicinale, din munţii Râiosu şi Buda, Masivul Făgăraş. Deloc surprinzător, familiile cele mai mari conţin cel mai mare număr de specii medicinale. Este esenţial să se realizeze inventarul complet al plantelor medicinale din fiecare munte pentru conservarea şi folosirea lor pe termen lung. Acest fapt necesită un management eficient al celor doi munţi unde acestea vegetează.

Cuvinte cheie: plante medicinale, biodiversitatea florei, munţii Râiosu şi Buda.

INTRODUCTION

Râiosu and Buda Mountains has one of the richest flora biodiversity. Medicinal plants represent an important health and economic component of biodiversity. It is essential to make the complete inventory of the medicinal component of the flora of any mountain for conservation and sustainable use.

The conservation of the threatened and endangered medicinal species in the wild is indispensable. The complete inventory of the medicinal plant resources is a very hard work, but we hope that this will be the beginning.

MATERIALS AND METHODS

The study presents a part of the medicinal plants diversity analysis and determines their status in the wild for their conservation priorities.

It was given popular names, location in the studied area and medicinal properties and uses of the plants species (Ciocârlan V., 2009).

RESULTS AND DISCUSSIONS

An enumeration of these 83 medicinal plant species is presented with the current nomenclature, popular names and medicinal uses. This communication aims at emphasizing the importance of setting up conservation priorities, and sustained development of various medicinal plants of Făgăraş Massif.

The objective is to emphasize the importance of setting up conservation priorities and sustained development of various medicinal plants of Râiosu and Buda Mountains.

Lycopodiaceae

Huperzia selago (L.) Bernh. ex Schr. & C.F.P. Mart. - common in grassy places from subalpine and mountain region in Râiosu Mountain. Internal use for these affections: kidney stones, alcoholism, smoking, gallstones. External use: dermatitis, eczema, psoriasis, alopecia.

Lycopodium clavatum L. (wolf`s claw) - found in the forest edge, Râiosu River Valley. It has diuretic properties, antitumor, anti-rheumatic, combat hair loss and is effective against sweating. External use: dermatitis, eczema, burns, open sores, rheumatism, muscle cramps.

Equisetaceae

Equisetum arvense L. (horsetail) - common on valley Buda forest roadside. It has antiseptic, antimicrobial, diuretic, depurative properties, activate local circulation, rich in minerals strengthens bones and teeth, prevents atherosclerosis, has antacid effect in the stomach and healing. External use: eczema, abscess, epistaxis.

Ophioglossaceae

Botrychium lunaria (L.) Swartz (love grass) - seen at Buda Lake and in Râiosu Mountain, on the road to the Polița lui Voda. It has astringent and tonic properties and it heals wounds.

Aspleniaceae

Asplenium scolopendrium L. (deer's tongue) - it was seen in the Buda Valley. Internal is used as a tea to cure lung diseases, relieve cough, lowers fever, biliary dyskinesia efficiency. External is used to treat wounds quickly and efficiently, seborrhea, acne.

Aspidiaceae (Dryopteridaceae)

Dryopteris filix mas (L.) Schott (fern) - seen on the Buda Valley and river valley Râiosu. Internal is used to treat intestinal parasitosis.

Polypodiaceae

Polypodium vulgare L. (sweet fern) - it was seen in the forest along the Buda Valley and in the forest leading to the sheepfold of Râiosu Mountain. It has expectorant and mucosolvante properties.

Pinaceae

Abies alba Miller (fir) - met in Buda and Râiosu Mountains. It has antiseptic lung properties, cough, analgesic, expectorant, tonic properties.

Picea abies (L.) Karsten (pine) - met in Buda and Râiosu Mountains. It has antiseptic lung properties, cough, analgesic, expectorant, tonic properties. Nectar glands secretions of these trees are collected by bees. So, they are valued in apitherapy.

Pinus mugo Turra (juniper) - met in Buda and Râiosu Mountains, to alpine level. Juniper is indicated in cases of rheumatism, arthritis, osteoarthritis, osteoporosis, bronchitis, cystitis, kidney stones.

Pinus sylvestris L. (pine) - it was seen in the forest along the Buda Valley and in the forest leading to the sheepfold of Mount Râiosu. The pine is recognized for its bronchial disinfectant qualities, decongestant, anti-rheumatic, antiseptic, diuretic, anti-inflammatory, antimicrobial, sedative, calming.

Cupressaceae

Juniperus communis L. (juniper) - met in Buda and Râiosu Mountains. Juniper has diuretic, antiseptic, relaxing, sedative action.

Ranunculaceae

Ranunculus ficaria L. (pilework) - it was seen in the forest along the Buda Valley. Used against hemorrhoids, difficult digestion, allergies, acne, varicose veins. Leaves are use in salad only to the flowering plant. After flowering become toxic.

Papaveraceae

Chelidonium majus L. (celandine) - met on the Buda Valley and on the Râiosu River Valley. Herbal therapy is recommended to liver disease, in wound healing of skin diseases, in the treatment of warts, constipation, rheumatics.

Chenopodiaceae

Chenopodium bonus-henricus L. (shepherd spinach) - met to the sheepfold of Râiosu Mountain, to the marble quarry on the Buda Mountain. It has mineralized, vitaminizante, depurative, emollient and laxative properties.

Amaranthaceae

Amaranthus retroflexus L. - met on the Buda Valley. It plays an important role in the cardiovascular diseases treatment. It has anti-hemoragic, astringent, antioxidant role. Used in tumors eradicating and metastases growth reduced.

Polygonaceae

Polygonum bistorta L. - met on the Buda Lake. It has astringent, antiseptic and hemostatic effects. It is indicated for urinary incontinence, diarrhea, stomach pain, enteritis, hemorrhoids and thrush.

Rumex acetosella L. (rabbit watercress) - met on the subalpine meadows of the Buda Mountain. It has diuretic, anti-scorbutic and diaphoretic properties. Recommended in the treatment of dysentery, tuberculosis, hemorrhoids, kidney and urinary tract diseases.

Rumex alpinus L. - met in Râiosu and Buda Mountains. It has purgative, healing astringent, laxative properties. Also stimulates digestion.

Fagaceae

Fagus sylvatica L. (beech) - Buda Valley met. It is recommended in rheumatic fever, diarrhea, fermentation colitis, kidney stones, fluid retention, pulmonary emphysema, eczema, wounds and epilepsy.

Betulaceae

Alnus glutinosa (L.) Gaertner (alder) - Buda Valley met. Internal used as tea for stomach problems including bleeding, stomach pain, enteritis, fever. External is used for dermatological affections, stomatitis, ulcers, cuts, rheumatism.

Betula pendula Roth. (birch) - met on the Râiosu flagstone. It has diuretic, bacteriostatic, anti-inflammatory, perspiration action. It stimulates the gastric juice secretion, gall and digestive intestinal yeast. Treat warts.

Ulmaceae

Carpinus betulus L. (hornbeam) - Buda Valley met. Used in respiratory diseases, chronic sinusitis, irritable bowel syndrome, colitis, enterocolitis, liver failure.

Urticaceae

Urtica dioica L. (nettle) - seen on the Buda and Râiosu Mountains. It is indicated in rheumatic and metabolic diseases and kidney stones. It is anti-inflammatory, healing, hypoglycemic, anti-anemic.

Juglandaceae

Juglans regia L. (walnut) - Buda Valley met and in the forest to the Râiosu Mountain sheepfold. Walnut leaves had anti-inflammatory, antiseptic, astringent, diabetes, hypertension, antiperspirant, healing properties.

Grossulariaceae

Ribes uva-crispa L. (gooseberry) - Râiosu Mountain met. It has effects in rheumatic diseases, gout, heart diseases, regulates digestion, it is cleansing and laxative.

Crassulaceae

Sedum telephium L. - Buda Valley met. It has anti-inflammatory, hemostatic, antimicrobial, astringent, fortified, cytostatic, antitumor, healing effects.

Rosaceae

Alchemilla xanthochlora Rothm. (Lady`s Mantle) - met on the Buda and Râiosu mountains. Is antiseptic, anti-inflammatory, anti-hemoragic, antifungal.

Crataegus monogyna Jacq. (May bush) - Buda Valley met. It is acting sedative, antispasmodic, vasodilator, hipotensive.

Geum urbanum L. (bennet) - met near the Râiosu Mountain sheepfold. It is an herb prized as a natural remedy primarily on diseases of the stomach and intestines. It acts as a calming, healing, disinfectant, bactericide, astringent, helps blood to clot faster lighten pain.

Malus sylvestris (L.) Miller (wild apple) - met on the Buda Valley. It takes action on the circulatory system, hormonal system, digestive system, urinary system, osteoarticular system, on the skin.

Potentilla anserina L. (corkscrew) - met on the Buda and Râiosu mountains. It is used in the treatment of the stomach diseases, anemia, arthritis, bleeding and mouth diseases.

Potentilla erecta (L.) Rauschel (germander) - met on the Buda Mountain. It has astringent, antimicrobial, hemostatic, healing, anti-inflammatory, digestive action.

Prunus spinosa L. (blackthorn) - met in the forest on Buda Valley. It is used as a diuretic, sedative, slightly laxative, tonic, anti-diabetic, astringent, anti-asthmatic.

Rosa canina L. (brier) - met in the forest on Buda Valley. Due to its high natural vitamin it used as fortified. It is used to treat colds, the flu, as a general tonic and stimulant. Stimulate appetite and digestion.

Rubus caesius L. (blackberry) - met on the Buda Valley. It has astringent, antiseptic, anti-diarrheal, diuretic, anti-inflammatory actions.

Rubus idaeus L. (raspberry tree) - met to Râiosu Mountain sheepfold. It has astringent, anti-diarrheal, diuretic, cleansing, laxative action. It decreases gastric acidity.

Sanguisorba minor Scop. - met to Râiosu Mountain sheepfold. It has astringent, healing, hemostatic action. It is used in gastrointestinal and urinary disorders.

Sorbus aucuparia L. (rowan) - met in the forest on the Buda Valley. It is used as a diuretic, anti-tussive, hemostatic, anti-scorbutic.

Fabaceae

Lotus corniculatus L. - met on the Râiosu belt. It has antispasmodic, sedatives and has immunostimulatory effects. Have positive contributions in the fight against brain excitations, the states of stress, insomnia, nervous agitations,

depressive states and in some cardiovascular disorders or substance nervous disorders of the digestive system.

Medicago sativa L. (lucerne) - met on the Buda Mountain. It has hemostatic, anti-anemic, re-mineralizing properties.

Melilotus officinalis (L.) Pallas (melilot) - met on the Buda Valley. It has anti-coagulant, diuretic, anti-spasmodic, anti-inflammatory, sedative, astringent action. Regenerate liver tissue.

Trifolium pratense L. (red clover) - met in the Buda Mountain pastures. It is used in cases of cold or flu and gastrointestinal controlling pain.

Trifolium repens L. (shamrock) - met on Buda Valley. It has anti-viral, anti-bacterial, anti-asthmatics, anti-rheumatic effects.

Oxalidaceae

Oxalis acetosella L. (rabbit`s watercress) - met in the forest on Buda Valley. It is used in spring fatigue, vitamin deficiency, chronic liver disease, digestive disease, heavy metal poisoning.

Polygalaceae

Polygala vulgaris L. (bird`s eye) - met on Buda Mountain. Used in asthma treatment, arthritis, rheumatism, respiratory diseases.

Apiaceae

Angelica archangelica L. - met on Buda Valley near the brook. It is used in the stomach disorders, stimulating appetite, indigestion, cough, common could, bronchitis, thrombosis.

Carum carvi L. (cumin) - met on Buda Mountain. It is antiseptic, astringent, antimicrobial. It is highly recommended in digestive disorders.

Heracleum sphondylium L. (heracleum) - common Râiosu River Valley to the sheepfold. Used in renal failure, hypertension, epilepsy, anorexia, infertility, sexually transmitted diseases, impotence.

Hypericaceae (Guttiferae)

Hypericum perforatum L. (rattle) - met on Buda Valley. It is recommended for digestive disorders, fluid retention, hypertension, neurovegetative dystonia, panic attacks.

Violaceae

Viola tricolor L. (three stained brothers) - met on the Râiosu Mountain. It has anti-allergic action. It is used in bronchitis, cystitis, autoimmune disorders, rheumatic disorders, dermatitis, cardiac diseases and acne.

Brassicaceae (Cruciferae)

Capsella bursa-pastoris (L.) Medicus (shepherd`s purse) - met on Buda Valley. It has haemostatic, vasoconstrictor, antimicrobial, antibacterial, antifungal, antitumor action.

Cardamine pratensis L. - met on the Râiosu Mountain. It has antirheumatic, sedative properties. It stimulates the liver and kidney.

Isatis tinctoria L. - met on the Râiosu Mountain. It has antibacterial, antiviral, anticancer action. It is used to treat laryngitis, fever, hepatitis and encephalitis.

Salicaceae

Salix alba L. (willow) - met on the Buda Mountain. Used in rheumatic diseases, in fever, anxiety, insomnia combating. It has therapeutic action neuralgia, muscle pain, stomatitis.

Tiliaceae

Tilia cordata Mill. (linden) - met on the Râiosu River Valley. It is acting sedative, antispasmodic, diuretic. It is indicated in gallstones, in digestive disorders.

Cornaceae

Cornus mas L. (horn) - met on Buda Valley. Natural remedy for an upset stomach, stomach cramps, liver disease, eczema, intestinal worms, myopia.

Ericaceae

Rhododendron myrtifolium Scott et Kotschyi (mountain peony) - met in Buda and Râiosu mountains. It is used in liver diseases, respiratory diseases.

Vaccinium myrtillus L. (bilberry) - met on Buda Mountain, to Buda Lake. Used in urinary tract infections in liver disease, diabetes, circulatory diseases, rheumatic diseases.

Vaccinium vitis-idaea L. (cranberry) - met on Buda Mountain, to Buda Lake. It is anti-inflammatory, antiseptic, astringent, diuretic. It has maximum efficiency in treating uro-genital infections.

Primulaceae

Primula veris L. (primrose) - met on Buda Mountain. It is healing, expectorant. It is used to treat urinary stones, rheumatism, fever, flu, anemia, insomnia, laryngitis.

Asclepiadaceae

Vincetoxicum hirundinaria Medicus (milkweed) - met on Buda Valley. It has anti-helmintic, expectorant and diuretic qualities. Effective on skin diseases, wounds, cuts.

Rubiaceae

Galium odoratum (L.) Scop - met on Buda Mountain. It is used as a tonic for the heart and liver in treating the kidney, diseases of the pancreas, spleen, and in calming nerves, tachycardia, insomnia and heart rate regulation.

Galium verum L. - met on Buda Valley. It has diuretic, cleansing, astringent, healing, anti-inflammatory, sedative, calming, antispasmodic effect.

Oleaceae

Fraxinus excelsior L. (ash) - met on Buda Valley. It is recommended to treat rheumatism, poisoning, gout, diabetes, constipation, acne, intestinal worms, gastric and duodenal ulcers.

Ligustrum vulgare L. (wooden dog) - met on Râiosu Mountain. External is used to treat thrush, anginas, dermatitis, pressure sores, hemorrhoids, inflammation of the mouth, gynecological inflammation, stomatitis.

Caprifoliaceae

Sambucus nigra L. (elder) - met on Buda Valley. It has sudorific, diuretic, emollient, rheumatic, anti-nevralgic, laxative action.

Valerianaceae

Valeriana officinalis L. (valerian) - met on Buda Valley. It has sedative properties on the nervous system and antispasmodic action.

Boraginaceae

Anchusa officinalis L. (ox tongue) - met on Buda Mountain. It has diuretic, emollient, antibiotic, anti-inflammatory, healing, expectorant, digestive, analgesic qualities.

Pulmonaria officinalis L. (lungwort) - met on Buda Valley. Is acting emollient, anti-inflammatory, healing, analgesic, expectorant and antispasmodic.

Scrophulariaceae

Veronica officinalis L. - met on the Râiosu Mountain. It is used to treat digestive diseases, in the treatment of anemia, hypertension, bronchitis, rheumatism and gout, is the blood purifier.

Plantaginaceae

Plantago major L. (plantain) - met on Râiosu Mountain to the sheepfold. It is one of the oldest medicinal plants used by humans. It has bacterial and antiseptic effects, anti-inflammatory and healing, emollient, expectorant, anti bleeding.

Lamiaceae (Labiatae)

Lamium galeobdolon (L.) Nath. (yellow dead nettle) - met on Buda Valley. Mainly used in urinary tract diseases. It is used also in digestive disorders, skin rashes.

Salvia pratensis L. (field sage) - met on Buda Valley. Since ancient sage has fame as a panacea, considered one of the most powerful digestive and nerve tonic. Recommend as combat fatigue and debilitation nerve weakness, poor appetite, tiredness, depression, tremors and paralysis of limbs.

Thymus pulcherimus Schur (thyme) - met on Buda Mountain. It used to treat whooping cough, bronchitis, other respiratory diseases, in the treatment of anemia, in detoxification.

Asteraceae

Achillea millefolium L. (milfoil) - met on Râiosu Mountain to the sheepfold. It is an herb prized as a natural remedy for many conditions since ancient times. It is used in the treatment of stomach, intestine, bladder, gall bladder diseases. It is anti-inflammatory, disinfectant, expectorant, soothing gastric tissue regenerator.

Artemisia vulgaris L. (wormwood) - met on Buda Valley. Herb is effective in treatment of sleep disorders, neurosis, uterine colic. It is the best disinfectant.

Carduus kerneri Simonkai (thistle) - met on the Râiosu Mountain. It has hepato-protective action, toning, detoxifying, antioxidant, immune-stimulatory geriatric.

Cirsium arvense (L.) Scop. (pelamid) - met on Buda Mountain. It has tonic, diuretic, astringent, hepatic action.

Petasites hybridus (L.) P. Gaertner (butterbur) - met on Buda Valley and on Râiosu Mountain to the sheepfold. Used in treating asthma, cough, hypertension, rheumatic diseases, biliary diskynesia, migraine, hyperthyroidism, anxiety.

Taraxacum officinale Weber. (dandelion) - met on Buda Mountain. It is recommended in hepato-biliary disorders, in painful digestive disorders, liver failure, cholecystitis, biliary inflammation. Reduce gastric acidity, enhances dieresis, detoxifies the body, it helps to restore and maintain endocrine balance.

Tussilago farfara L. (coltsfoot) - met on Buda Valley. Preparations of leaves and flowers have emollient, tonic, antispasmodic, secretolytic, anti-inflammatory. It is used in respiratory diseases, in hepato-biliary dyspepsia, wound and skin ulcers.

Poaceae

Anthoxanthum odoratum L. (vernal grass) - met on Buda Mountains. It has a soothing effect on the body. Flowers are a cure for diseases of the liver and spleen. It regulates blood circulation and heart function.

CONCLUSIONS

Râiosu and Buda Mountains from Făgăraş Massif are home to many medicinal plants whose therapeutic effect has been known since ancient times.

It is important that these plants are known and protected, given the frequent increasingly of deforestation that occur in our mountains and overgrazing which is also a factor as harmful to flora and vegetation of our mountains.

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MUZEUL JUDEȚEAN ARGEȘ, PITEȘTI, ROMÂNIA
ARGESIS - *STUDII ŞI COMUNICĂRI* - *seria ŞTIINŢELE NATURII*, **TOM XXIV**, 2016

FAUNISTICAL DATA FROM TINCA AREA (BIHOR COUNTY, ROMANIA) DURING APRIL – NOVEMBER, 2016

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ABSTRACT. This paper presents faunistical, ethological and fenological aspects of insects and vertebrates from Tinca area (Bihor County, Romania) during April 1 - November 30, 2016.

Keywords: faunistical, fenological aspects, Tinca area.

REZUMAT. Date faunistice din zona Tinca (județul Bihor, România) în perioada aprilie - noiembrie 2016. Această lucrare prezintă aspecte faunistice, etologice şi fenologice ale insectelor şi vertebratelor din zona Tinca (județul Bihor, România) în perioada 1 aprilie - 30 noiembrie, 2016.

Cuvinte cheie: aspecte faunistice, fenologice, zona Tinca.

INTRODUCTION

Situated in the north-western part of Romania, having a temperate-continental climate, a rich and multiple vegetation, a vast drainage, Tinca area offers most favourable conditions for the existence of a multiple fauna.

Notes about the fauna of the insects and vertebrates from Tinca area were published by author in some books or scientific papers (Ilie, 2013-2016; Ilie & Marinescu, 2014).

MATERIALS AND METHODS

The observations were performed between April 1 and November 30, 2016, with binocular 8x25, completed with direct observations, effectuated during all the moments of the day: diurnal, crepuscular and nocturnal.

For the capture of insects were used the entomological net.

Were used different guides for the determination of species (Bruun et al., 1999; Cîrdei & Bulimar, 1965; Valenciuc, 2002).

RESULTS AND DISCUSSIONS

In the analyzed period were identified the following species:

Class Insecta

Order Odonata

- *Aeshna juncea* (Linnaeus, 1758):
  - One female specimen, September 3, Tinca. Species mentioned for the first time in area.
- *Anax imperator* Leach, 1815:
  - One female specimen, September 4, Râpa;
  - One female specimen, October 9, Tinca forest, t = 13 °C. Literature (Cîrdei & Bulimar, 1965) indicates the activity of this species till in September.
- *Anax parthenope* Sélys, 1839:
  - One male specimen, mentioned for the first time in area, September 1, Tinca.
- *Heminax ephippiger* Burmeister, 1839:
  - Two male specimens, September 9, Tinca forest.

  Migratory species, very rare at national level, mentioned for the first time in area. Now, the fauna of dragonflies from Tinca area includes 37 species.
- *Sympetrum striolatum* (Charpentier, 1840):
  - One female specimen, September 3, Tinca.

  Relatively common species in area.

Order Orthoptera

- *Mantis religiosa* (Linnaeus, 1758):
  - One male specimen (brown form), September 18, Tinca;
  - One female specimen (green form), October 24, Tinca, t = 18 °C;
  - One female specimen (green form), October 30, Tinca, t = 7 °C.

  Common species in area.

Order Coleoptera

- *Badister unipustulatus* Bonelli, 1813:
  - One male specimen, October 23, Tinca.

  Species mentioned for the first time in area.

Order Lepidoptera

- *Aglais io* (Linnaeus, 1758):
  - One specimen, October 31, Tinca, t = 10 °C;
  - One specimen, November 1, Tinca, t = 10 °C.

  Common species in area observed sometimes till in December, at 2-3 °C temperature (Ilie, 2013).

Order Diptera

- *Calliphora vomitoria* (Linnaeus, 1758):
  - Three specimens, Novembrer 13, Tinca, t = 2 °C, snow. It is surprisingly that this species resists at this temperature.
  Very common species in area.

Class Pisces

- *Esox lucius* Linnaeus, 1758:
  - One specimen who chase a juvenile water snake, *Natrix tessellata* (Laurenti, 1768), Tinca, Crişul Negru River, September 11.

Class Reptilia

- *Lissotriton vulgaris* (Linnaeus, 1758) syn. *Triturus vulgaris* Linnaeus, 1758:
  - One male specimen, September 11, Tinca.
- *Salamandra salamandra* Linnaeus, 1758:
  - One specimen, September 5, Tinca.
- *Podarcis muralis muralis* (Laurenti, 1768) syn. *Lacerta muralis muralis* Laurenti, 1768:
  - One male specimen, September 14, Tinca, L = 13 cm.
- *Natrix tessellata* (Laurenti, 1768):
  - Two specimens, Tinca, Crişul Negru River, September 10-12.

Class Aves

- *Tachybaptus ruficollis* Pallas, 1773:
  - Five specimens, November 3, Tinca, Crişul Negru River.
  Summer visitor, rare winter visitor.
- *Pelecanus onocrotalus* Linnaeus, 1758:
  - Two specimens, September 20, Tinca, Crişul Negru River;
  - Three specimens, September 11, Tinca, Crişul Negru River.
  Rare summer visitor in the area.
- *Phalacrocorax carbo sinensis* Show et Nod, 1798:
  - Five specimens, October 25, Tinca;
  - One specimen, October 30, Tinca, Crişul Negru River.
  Summer visitor, passage species or rare winter visitor in area.
- *Egretta garzetta* Linnaeus, 1758:
  - Two specimens, October 25, Tinca, Crişul Negru River.
- *Egretta alba* Linnaeus, 1758:
  - Two specimens, August 10, Tinca, Crişul Negru River;
  - Three specimens, November 13, Tinca, Crişul Negru River.
  Summer visitor or rare winter visitor in the area.

- *Ardea cinerea* Linnaeus, 1758:
  - One specimen, October 30, Tinca, Crişul Negru River.
  Summer visitor, rare winter visitor.
- *Anser anser* Linnaeus, 1758:
  - One flight with 8 specimens, September 11, Tinca;
  - One flight with 9 specimens, October 18, Tinca;
  - One flight with 120 specimens, October 25, Tinca;
  - One flight, with 230 specimens, October 29, Tinca.
- *Anser erythropus* Linnaeus, 1758:
  - One flight with 18 specimens, November 2, Tinca.
  Passage species in area.
- *Anas platyrhynchos* Linnaeus, 1758:
  - One female specimen with five ducklings, September 22, Tinca, Crişul Negru River;
  - One flight with 120 specimens, Tinca, Crişul Negru River.
  Sedentary species.
- *Anas acuta* Linnaeus, 1758:
  - One female specimen with two ducklings, September 3, Râpa, Crişul Negru River. It seems that this species becomes breeding in area but it is rarer. Also, the literature (Ciochia, 1992) mentions only yearly clutch at national level, this clutch being the second!
  - Two specimens, October 22, Tinca, Crişul Negru River.
  Rare summer visitor, passage or winter visitor in area.
- *Anas crecca* Linnaeus, 1758:
  - Four specimens, October 26, Tinca, Crişul Negru River.
  Passage species, winter visitor, more rare summer visitor.
- *Netta rufina* Pallas, 1773:
  - One male specimen, August 16, Tinca, Crişul Negru River.
  Summer visitor, rare winter visitor.
- *Aythya fuligula* Linnaeus, 1758:
  - Three female specimens, Tinca, Crişul Negru River, November 13.
  Winter visitor.
- *Aquila clanga* Pallas, 1773:
  - One juvenile specimen, September 27, Tinca.
  It is a surprising presence of this species in September because at national level was observed at the end of November and in winter. Also, the presence of the juvenile indicates the hypothesis of brooding in Romania, maybe even in area!
- *Buteo buteo* Linnaeus, 1758:
  - One female specimen having a black plumage on the dorsal part and on the abdomen with white spots, October 12, Tinca. Generally, this species has a brown colour, with white spots on abdomen. This observation corroborates the observation of Ilie (Ilie, 2016) who observed an entirely black specimen;

- One male specimen, November 12, Tinca.
Partial migratory species.

- *Buteo lagopus* Pontoppidan, 1763:
  - Five specimens, November 2, Tinca.
  Winter visitor in area.
- *Buteo rufinus* Cretzschmar, 1826:
  - One specimen, October 15, Tinca.
  Summer visitor or passage species.
- *Accipiter nisus* Linnaeus, 1758:
  - One male specimen, October 19, Tinca;
  - One female specimen, October 30, Tinca.
  Sedentary species, winter visitor.
- *Falco peregrinus* Linnaeus, 1758:
  - One specimen, Tinca, November 16.
  Sedentary or winter visitor.
- *Falco subbuteo* Linnaeus, 1758:
  - One specimen, August 14, Tinca forest.
  Summer visitor.
- *Falco vespertinus* Linnaeus, 1758:
  - Three male specimens, August 20, Tinca.
  Summer visitor.
- *Perdix perdix* Linnaeus, 1758:
  - One female specimen with four nestlings, November 2, Tinca. This is the third yearly generation, literature (Ciochia, 1992) indicates only one generation at national level.
  Sedentary species.
- *Phasianus colchicus* Linnaeus, 1758:
  - Much specimens in area.
  Sedentary species.
- *Grus grus* Linnaeus, 1758:
  - One flight with 46 specimens, November 6, Tinca.
  Passage species.
- *Gallinula chloropus* Linnaeus, 1758:
  - Two specimens, November 3, Tinca, Crişul Negru River.
  Summer visitor, rare winter visitor in area.
- *Haematopus ostralegus* Linnaeus, 1758:
  - Two specimens, September 21, Tinca, Crişul Negru River.
  Summer visitor.
- *Vanellus vanellus* Linnaeus, 1758:
  - Two specimens, November 6, Tinca.
  Summer visitor or passage species in area.
- *Scolopax rusticola* Linnaeus, 1758:
  - One specimen, October 31, Tinca, near Crişul Negru River.
  - One specimen, Tinca forest, November 15.

Passage species in area.

- *Lymnocryptes minimus* Brunnich, 1764:
  - One specimen, October 10, Tinca.
  Passage species, mentioned for the first time in area.
- *Recurvirostra avosetta* Linnaeus, 1758:
  - One specimen, July 20, Tinca, Crişul Negru River.
  Summer visitor, rarer in area.
- *Chlidonias niger* Linnaeus, 1758:
  - One specimen, April 3, Tinca, Crişul Negru River.
  Summer visitor.
- *Cuculus canorus* Linnaeus, 1758:
  - One specimen, September 13, Tinca (last observation of this year).
  Summer visitor.
- *Otus scops* Linnaeus, 1758:
  - One specimen, August 1, Tinca forest.
- *Athene noctua* Scopoli, 1769:
  - One pellet who contained fragments of a cranium, bones, hairs of *Apodemus agrarius* Pallas, 1778: November 6, Tinca. Other pellet was discovered on a jamb of a window from my personal house, September 12, Tinca. This pellet contained fragments and bones of *Mus musculus* Linnaeus, 1758.
  Sedentary species.
- *Bubo bubo* Linnaeus, 1758:
  - One specimen, October 15, Tinca forest;
  - One specimen partial white, October 10, Tinca.
  Sedentary species, rarer in area.
- *Strix uralensis* Pallas, 1773:
  - One specimen, October 26, Tinca.
  Sedentary species or winter visitor in area.
- *Strix aluco* Linnaeus, 1758:
  - Four specimens (rusty form), October 23, Tinca forest.
  Sedentary species.
- *Asio otus* Linnaeus, 1758:
  - One specimen observed in a nut tree, September 18-20, Tinca;
  - One winter colony having 1-16 specimens, October 27 - November 30, Tinca.
  Sedentary species.
- *Asio flammeus* Pontoppidan, 1763:
  - Two adults specimens and two juveniles, in a wheat field, September 17, Tinca. This is the first mention like breeding species in area; in this case it is the second clutch. Literature (Ciochia, 1992) mentioned the probability of a second clutch at national level, reality demonstrated in present.
  Winter visitor at national level, but, sometimes, even summer visitor rarely, breeding species.

- *Alcedo atthis* Linnaeus, 1758:
  - One specimen, October 30, Tinca, Crişul Negru River.
  - One specimen, November 3, Tinca, Crişul Negru River.

  Partial migratory species.
- *Merops apiaster* Linnaeus, 1758:
  - One specimen, October 17, Tinca. Summer visitor or passage species in area.
- *Coracias garrulus* Linnaeus, 1758:
  - One juvenile, September 2, Tinca forest. This is the second yearly generation. Literature (Ciochia, 1992) indicates one generation at national level.

  Summer visitor.
- *Upupa epops* Linnaeus, 1758:
  - One specimen, September 3, Tinca forest. Summer visitor.
- *Dendrocopos medius* Linnaeus, 1758:
  - Three specimens, October 10, Tinca forest.

  Sedentary species.
- *Dryocopus martius* Linnaeus, 1758:
  - One specimen flying, September 21, Tinca.

  Sedentary species.
- *Jynx torquilla* Linnaeus, 1758:
  - One specimen uttering alarm sounds, September 9, Tinca forest;
  - One specimen, September 18, Tinca forest.

  Summer visitor.
- *Motacilla alba* Linnaeus, 1758:
  - One specimen, September 20, Tinca.

  Summer visitor.
- *Hirundo daurica* Linnaeus, 1758:
  - One nest, September 2, Tinca.

  Summer visitor, very rare in area.
- *Oriolus oriolus* Linnaeus, 1758:
  - Two male specimens, September 28, Tinca;
  - Two male specimens, October 9, Tinca.

  Summer visitor.
- *Sturnus vulgaris* Linnaeus, 1758:
  - One flight with 200 specimens, September 28, Tinca.

  Partial migratory species.
- *Corvus corax* Linnaeus, 1758:
  - One specimen, November 2, Tinca.

  Sedentary species.
- *Hippolais icterina* Vieillot, 1817:
  - One specimen, October 26, Tinca.

  Summer visitor, this isolated specimen is probably from the northern Europe, being in migration.

- *Phoenicurus ochruros* Gmelin, 1789:
  - The fourth generation (two adults and three juveniles near the nest), September 22, Tinca. Literature (Ilie & Marinescu, 2014) specifies only three yearly generations in Tinca area and at national level;
  - One juvenile specimen and one male specimen, October 27, Tinca (last observations of this year).

  Summer visitor, sometimes rare winter visitor in the area.
- *Luscinia svecica* Linnaeus, 1758:
  - One specimen, November 13, Tinca.

  Passage species in area.
- *Turdus merula* Linnaeus, 1758:
  - One female specimen, October 30, Tinca Spa.

  Sedentary species.
- *Turdus philomelos* Brehm, 1831:
  - One male specimen, September 9, Tinca forest.

  Summer visitor.

  Partial migratory species.
- *Turdus pilaris* Linnaeus, 1758:
  - 58 specimens, November 10, Tinca.

  Winter visitor or passage species in area.
- *Parus cyanus* Linnaeus, 1758:
  - Three specimens, November 12, Tinca. Accidental species in Romania, rarely observed in winter, from the northern Europe. Species mentioned for the first time in area. This species was observed also by author in Craiova (Craioviţa lake), one specimen, January 11, 2000.
- *Aegithalos caudatus* Linnaeus, 1758:
  - Four specimens, October 22, Tinca.

  Sedentary species.
- *Remiz pendulinus* Linnaeus, 1758:
  - One nest, May 30, Tinca, Crişul Negru River.

  Partial migratory species.
- *Passer montanus* Linnaeus, 1758:
  - Two specimens who picked grapes, eating their contents, October 2, Tinca.
- *Pyrrhula pyrrhula* Linnaeus, 1758:
  - One male specimen, July 1, Tinca forest.

  Sedentary species.
- *Carduelis flammea* Linnaeus, 1758:
  - Two specimens, November 1, Tinca forest.

  Winter visitor in area.
- *Loxia curvirostra* Linnaeus, 1758:
  - One specimen, October 10, Tinca forest.

  Sedentary species.
- *Emberiza schoeniclus* Linnaeus, 1758:
  - Three specimens, November 5, Tinca.

Partial migratory species in area.

- *Emberiza melanocephala* Scopoli, 1769:
  - Two male specimens, August 12, Tinca.
  Summer visitor.

Class Mammalia

- *Ondatra zibethicus* (Linnaeus, 1766):
  - Much traces in mud, October 30, Crişul Negru River.
  Relatively rare species in area.
- *Crocidura leucodon* (Hermann, 1780):
  - One dead specimen, October 15, Tinca. This specimen was killed probably by a cat or other shrew.
- *Rhinolophus ferrumequinum* (Schreber, 1774):
  - One specimen observed flying in crepuscule, although the temperature was 2-3 °C, November 4, Tinca. Literature (Valenciuc, 2002) indicates hibernation at 4 °C. After this observation, the bat was not more observed flying in area.
- *Pippistrelus pippistrelus* Schreber, 1774:
  - One specimen, September 20, Tinca.
- *Canis aureus* (Linnaeus, 1785):
  - One specimen, November 5, Tinca forest.
- *Mustela nivalis* Linnaeus, 1766:
  - One excrement, L = 1.6 cm, l = 0.5 cm, September 10, Tinca Spa, near Crişul Negru River.
- *Martes foina* (Erxleben, 1777):
  - Three excrements (L = 8 cm, l = 1.5 cm), that were situated in three points, at 18-20 cm distance between they. This positioning could indicate marking of territory. The excrements contained only seeds and skins, even grains of maize. Literature (Murariu & Munteanu, 2005) indicates like food meat, eggs, insects and different fruits. The presence of grains of maize is a scientific novelty (Tinca, November 19, 2016).

CONCLUSIONS

During the analyzed period, in Tinca area, were observed 77 species belonging to five classes. Five species (*Lymnocryptes minimus*, *Hemianax ephippiger*, *Anax parthenope*, *Aeschna juncea*, *Badister unipustulatus*) are mentioned for the first time in area. Some species are rare in area (*Pelecanus onocrotalus*, *Aquila clanga*, *Lymnocryptes minimus*, *Anas acuta*, *Bubo bubo*, *Coracias garrulus*, *Hirundo daurica*, *Recurvirostra avosetta*, *Netta rufina*, *Anser erythropus*).

Were discovered supplementary generations at some birds (*Phoenicurus ochruros, Anas acuta, Coracias garrulus, Anas platyrhynchos, Perdix perdix, Asio flammeus*).

Were observed activities at reduced temperatures at some species (*Caliphora vomitoria, Rhinolophus ferrumequinum*).

One species (*Buteo buteo*) presented a chromatic variety.

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MUZEUL JUDEȚEAN ARGEȘ, PITEȘTI, ROMÂNIA
ARGESIS - *STUDII ŞI COMUNICĂRI - seria ŞTIINŢELE NATURII,* **TOM XXIV**, 2016

NEW ZOOLOGICAL DATA FROM TINCA AREA (BIHOR COUNTY, ROMANIA) DURING JANUARY 1 - SEPTEMBER 1, 2016

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ABSTRACT. In this paper some faunistical news, as well as ethological & fenological aspects of vertebrates and invertebrates fauna from Tinca area are presented (Bihor County, Romania) during January 1 - September 1, 2016.

Keywords: zoological data, fenological aspects, Tinca area.

REZUMAT. Noi date zoologice din zona Tinca (judeţul Bihor, România) în perioada 1 ianuarie - 1 septembrie, 2016. În această lucrare sunt prezentate unele noutăţi faunistice, aspecte etologice şi fenologice ale faunei de vertebrate şi nevertebrate din zona Tinca (judeţul Bihor, România) în perioada 1 ianuarie - 1 septembrie, 2016.

Cuvinte cheie: date zoologice, aspecte fenologice, zona Tinca.

INTRODUCTION

Tinca area is situated in the south-western part of Bihor County, belonging to the historical province Crişana, with a surface of 454 km^2, at the confluence of the Miersig Plain and the Holod Depression. The average altitude is 115 m, the climate is temperate/continental, moderate, having one particular nuance, is Pannonic.

From the hydrographical point of view, the analyzed territory belongs to the inferior limit of the Crişul Negru River, middle course.

The vegetation of the area belongs to the oak stage, having a predominant Central-European origin.

The forests are formed of the species belonging to the genus *Querqus*, isolated troops of beech tree, false acacia, hornbeam, maple tree, ash tree.

In the lawns of Tinca area were identified different leguminous plants, graminaceae, some compositae, etc.

Tinca village includes: Tinca, Gurbediu, Râpa, Belfir and Girişu Negru villages.

Notes about the vertebrates and invertebrates fauna from Tinca area were published by author in some books and scientific papers (Ilie, 2008, 2009; Ilie, 2013-2015).

MATERIALS AND METHODS

The observations were performed between January 1 and September 1, 2016, with binoculars 8x25 and 20x50 completed with direct observations, effectuated during all the moments of the day: diurnal, crepuscular and nocturnal.

For the determination of species different guides were used (Bruun et al., 1999; Ciochia, 1992; Cîrdei & Bulimar, 1965; Neacşu, 2006; Pârvu et al., 1985; Rákosy, 2013).

RESULTS AND DISCUSSIONS

In the analyzed period were identified the following species:

Subphylum Crustacea, Class Branchiopoda

- *Triops cancriformis* (Bosc, 1801) syn. *Apus cancriformis* Bosc, 1801:
  - One specimen living in a pool, Tinca forest, April 15, 2016. Species rarer in area, mentioned for the first time, length = 5 cm.

Class Arachnida, Infraorder Acari, Order Prostigmata

- *Aceria tristriata* (Nalepa, 1891):
  - Many galls on the lamina of walnut (*Juglans regia* Linnaeus, 1758), Tinca, May 26, 2016. The galls of this species are mentioned for the first time in the area and probably in Bihor County. This species is presented in Muntenia province (Neacşu, 2006).

Class Insecta

Order Odonata

- *Sympetrum fonscolombii* (Selys, 1840):
  - One female specimen, Tinca, August 13, 2016. Species mentioned for the first time in area. Migratory species, rare in Romania and Central Europe.

Order Hymenoptera

- *Apis mellifera* Linnaeus, 1758:
  - One specimen, Tinca, February 9, 2016, t = 15 °C;
  - One specimen, Tinca, February 17, 2016, t = 17 °C. The premature appearance of this species is determined by the raised temperatures (the flying period is March - October).

Order Coleoptera

- *Meloe proscarabaeus* Linnaeus, 1758:
  - One male specimen, March 11, 2016, Tinca, t = 12 °C;
  - One female specimen, March 20, 2016, Tinca, t = 10 °C.
- *Lucanus cervus* (Linnaeus, 1758):
  - Many specimens inside of Tinca village during June 2016. Very common species in area.
- *Melolontha melolontha* (Linnaeus, 1758):
  - One male specimen, March 28, 2016, t = 20 °C. The raised temperatures were determined premature appearance of this species (the flying period is the end of April - June).
- *Oryctes nasicornis* (Linnaeus, 1758):
  - One male specimen, Tinca, June 21, 2016. Relatively rare species in area.
- *Mononychus punctumalbum* (Herbst, 1784):
  - One female specimen, Tinca, May 23, 2016. Species mentioned for the first time in area.

Order Lepidoptera

- *Carcharodus alceae* (Esper, 1780):
  - One male specimen, Râpa, May 29, 2016. Relatively common species in area.
- *Iphiclides podalirius* (Linnaeus, 1758):
  - One specimen, Râpa, March, 4, 2016, t = 10 °C. The flying period is during the second half of April - September (Rákosy, 2013).
- *Papilio machaon* Linnaeus, 1758:
  - One specimen, Belfir, March 13, 2016, t = 12.5 °C. The flying period is similar to preceding species.
- *Pieris rapae* (Linnaeus, 1758):
  - One specimen, Râpa, March 6, 2016, t = 12 °C. Similar situation to preceding species;
  - One female specimen, belonging to ab. *lucifer* Avinoff, Tinca, August 21, 2016. This chromatic aberrant has grey-blackish wings, very rare in Romanian fauna.
- *Vanessa atalanta* (Linnaeus, 1758):
  - One specimen, March 6, 2016, Râpa, t = 12 °C. Literature (Rákosy, 2013) mentioned the flying period during April - August, but the raised temperatures registered were determined premature appearance of this species.
- *Aglais io* (Linnaeus, 1758) syn. *Inachis io* Linnaeus, 1758:
  - Two specimens, Râpa, March 8, 2016, t = 12 °C.
- *Nymphalis xanthomelas* (Esper, 1781):
  - One specimen, Tinca, May 30, 2016. Migratory species, mentioned for the first time in area. Rare, protected species (Rákosy, 2013).

- *Nymphalis vau-album* Denis & Schiffermuller, 1775:
  - One specimen, Tinca, June 10, 2016. Species mentioned for the first time in area. Very rare, protected species (Rákosy, 2013).
- *Apatura ilia* (Denis & Schiffermüller, 1775):
  - Many specimens observed at Râpa during May 2016. Relatively common species in area.
- *Minois dryas* (Scopoli, 1763):
  - One male specimen, Tinca, August 9, 2016. Common species in area.

Class Aves

- *Ciconia nigra* Linnaeus, 1758:
  - Two specimens, Tinca, April 26, 2016. Rarer, protected species.
- *Anser anser* Linnaeus, 1758:
  - One specimen, Tinca, April 29, 2016. Relatively common species in area.
- *Aquila pomarina* Brehm, 1831:
  - One male specimen inside Tinca village, July 24, 2016. It is surprisingly, the species prefers the areas near the forests.
- *Accipiter gentilis* Linnaeus, 1758:
  - Brooding in a nest with four eggs, Tinca, March 7, 2016, t = 11 °C. The relatively raised temperatures were determined premature brooding of this species. Generally, the brooding is from the end of March till the beginning of April (Ciochia, 1992).
- *Accipiter nisus* Linnaeus, 1758:
  - One male specimen who hunts swallows, Tinca, July 27, 2016. It is a surprising hunter because the scientific literature indicates like food the birds with more slow flight.
- *Falco tinnunculus* Linnaeus, 1758:
  - One female specimen, Tinca, August 17, 2016. Common species in area.
- *Apus melba* Linnaeus, 1758:
  - One flight with 30 specimens, Tinca, August 13, 2016. Rare species in area, summer visitor.
- *Lanius minor* Gmelin, 1788:
  - One pair, Râpa, May 29, 2016. Relatively common species in area.
- *Ficedula albicollis* Temminck, 1815:
  - Two male specimens, Tinca, June 13, 2016. Common species in area.
- *Ficedula hypoleuca* Pallas, 1764:
  - One male specimen, Tinca, May 7, 2016. Summer visitor, very rare species in Romania.
- *Coccothraustes coccothraustes* Linnaeus, 1758:
  - One specimen, Tinca, June 26, 2016. Common species in area.

CONCLUSIONS

During January 1 - September 1, 2016, in Tinca area were observed 29 species of invertebrates and vertebrates, belonging to four classes.

Some species are mentioned for the first time in area: *Aceria tristriata*, *Sympetrum fonscolombii*, *Nymphalis xanthomelas*, *Nymphalis vau-album*, *Mononychus punctum-album*, *Apus cancriformis*.

The premature warming of the weather in winter leads to some phenological changes of the fauna. For instance: *Apis mellifera*, *Melolontha melolontha*, *Iphiclides podalirius*, *Papilio machaon*, *Pieris rapae*, *Aglais io*, *Vanessa atalanta*, and the brooding of *Accipiter gentilis* were signalled more earlier than normally.

The number of butterfly' species identified in Tinca area becomes in this way 102 (Ilie, 2013).

Some species are rare or rarer in the area: *Sympetrum fonscolombii*, *Oryctes nasicornis*, *Nymphalis xanthomelas*, *Nymphalis vau-album*, *Apus cancriformis*, *Apus melba* and *Ciconia nigra*.

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MUZEUL JUDEŢEAN ARGEŞ, PITEŞTI, ROMÂNIA
ARGESIS - *STUDII ŞI COMUNICĂRI - seria ŞTIINŢELE NATURII,* **TOM XXIV**, 2016

THE MID - WINTER CENSUS 2013-2016 ABOUT THE ORNITHOFAUNA FROM THE TINCA AREA (BIHOR COUNTY, ROMANIA)

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ABSTRACT. In this work the results of the midwinter census 2013-2016 about the presence of the birds on the Crişul Negru River, around Tinca Spa, are presented. There were recorded 41 bird species that belong to 9 orders.

Keywords: ornithological census, Tinca area, ecological data.

REZUMAT. Recensământul de iarnă 2013-2016 asupra ornitofaunei din zona Tinca (judeţul Bihor, România). În această lucrare sunt prezentate rezultatele recensământului de iarnă 2013-2016 al păsărilor de pe râul Crişul Negru, din jurul staţiunii balneoclimaterice Tinca. S-au identificat 41 specii de păsări, aparţinând la 9 ordine.

Cuvinte cheie: recensământ ornitologic, zona Tinca, date ecologice.

INTRODUCTION

The winter census of the birds is coordinated at European level by Wetlands International and in Romania by Romanian Ornithological Society, proceeding in a second ten days of January in every year.

Data about the ornithofauna of the Tinca area were published in two books (Ilie, 2008, 2016).

Tinca area is located in the south-western part of Bihor County, at the confluence of the Miersig Plain and the Holod Depression, on the Crişul Negru river banks (the inferior limit of this river, middle train). The relief is hilly; the climate is temperate-continental, moderate. The vegetation belongs to the oak stage. The average altitude is 115 m (Berindei & Pop, 1972).

The bottom of Crişul Negru River is situated in the proximity of Tinca Spa. For prevent her inundation there were raised two little barrages situated at two opposite extremities of the Tinca Spa. The Crişul Negru River course was deviated, being created an “island” between the river and the part of water between the two barrages that became semi-stagnant.

This described area is the location where the censuses were performed and present a surface of 5 ha. The vegetation of semi-stagnant water has some characteristic species: rush, mace reed, sedge, poplar tree, willow tree, etc.

The park from the proximity of Tinca Spa present woody species like willow tree, chestnut tree, maple tree, poplar tree, ash tree, oak tree and pine tree.

MATERIALS AND METHODS

The observations were performed in 14-15 January 2013, 15 January 2014, 13-14 January 2015 and 14-15 January 2016 on the island near Tinca Spa.

There were observed the aquatic and the land birds, with binoculars 8 x 25 and 20 x 50, completed with direct observations.

For the determinations of species different guides were used (Bruun et al., 1999; Gooders & Lesaffre, 1998).

RESULTS AND DISCUSSIONS

In the analyzed period there were identified 41 species: 26 species (305 specimens) in 2013, 35 species (404 specimens) in 2014, 28 species (364 specimens) in 2015, and 31 species (420 specimens) in 2016.

These species belongs to the following orders (Tab. 1): Pelecaniformes (2 species, 4.87 %), Ciconiiformes (1 species, 2.43%), Anseriformes (3 species, 7.31%), Falconiformes (3 species, 7.31%), Galliformes (2 species, 4.87%), Columbiformes (1 species, 2.43%), Coraciiformes (1 species, 2.43%), Piciformes (4 species, 9.75%), Passeriformes (24 species, 58.53%).

Table 1 - Bird species identified in 2013-2016 at midwinter in Tinca area.

No.	Species	Number of specimens				Habitat type	Phenological category
		2013	2014	2015	2016		
1.	*Pelecanus onocrotalus* Linnaeus, 1758	-	-	-	3	Aq	SV, RW
2.	*Phalacrocorax carbo* (Linnaeus, 1758)	-	1	15	17	Am	SV, RW
3.	*Ardea cinerea* Linnaeus, 1758	2	2	1	1	Aq	SV, RW
4.	*Cygnus olor* (Gmelin, 1789)	-	-	-	11	Aq	PM

5.	*Anas platyrhynchos* Linnaeus, 1758	42	73	36	42	Am	S
6.	*Anas crecca* Linnaeus, 1758	-	2	-	-	Aq	SV, RW
7.	*Buteo buteo* (Linnaeus, 1758)	2	1	4	3	T	PM
8.	*Accipiter gentilis* (Linnaeus, 1758)	1	-	-	-	T	S
9.	*Accipiter nisus* (Linnaeus, 1758)	-	1	1	2	T	S, WV
10.	*Perdix perdix* (Linnaeus, 1758)	-	-	3	-	T	S
11.	*Phasianus colchicus* (Linnaeus, 1758)	1	4	3	3	T	S
12.	*Streptopelia decaocto* Frivaldzky, 1838	9	7	12	14	T	S
13.	*Alcedo atthis* (Linnaeus, 1758)	-	2	1	1	Am	PM
14.	*Picus viridis* Linnaeus, 1758	1	2	-	-	T	S
15.	*Dendrocopos major* (Linnaeus, 1758)	5	7	2	1	T	S
16.	*Dendrocopos syriacus* (Linnaeus, 1758)	-	1	-	-	T	S
17.	*Dendrocopos minor* (Linnaeus, 1758)	-	1	-	1	T	S
18.	*Motacilla cinerea* Tunstall, 1771	-	2	-	-	T	WV
19.	*Garrulus glandarius* (Linnaeus, 1758)	9	12	13	17	T	S
20.	*Pica pica* (Linnaeus, 1758)	5	9	10	19	T	S
21.	*Corvus frugilegus* Linnaeus, 1758	14	17	23	36	T	S
22.	*Corvus corone cornix* Linnaeus, 1758	3	4	5	2	T	S
23.	*Corvus corax* Linnaeus, 1758	-	-	-	1	T	S
24.	*Troglodytes troglodytes* (Linnaeus, 1758)	-	-	1	2	T	SV, RW
25.	*Regulus regulus* (Linnaeus, 1758)	-	3	-	-	T	WV
26.	*Erithacus rubecula* (Linnaeus, 1758)	1	2	1	1	T	SV, RW
27.	*Turdus merula* Linnaeus, 1758	2	4	3	5	T	S

28.	*Turdus pilaris* Linnaeus, 1758	2	5	12	10	T	WV
29.	*Parus palustris* Linnaeus, 1758	2	1	-	-	T	S
30.	*Parus caeruleus* Linnaeus, 1758	5	7	4	2	T	S
31.	*Parus major* Linnaeus, 1758	10	16	12	16	T	S
32.	*Aegithalos caudatus* (Linnaeus, 1758)	9	7	3	5	T	S
33.	*Sitta europaea* Linnaeus, 1758	-	1	2	3	T	S
34.	*Passer domesticus* (Linnaeus, 1758)	65	60	70	74	T	S
35.	*Passer montanus* (Linnaeus, 1758)	84	89	96	101	T	S
36.	*Fringilla coelebs* Linnaeus, 1758	4	6	3	6	T	PM
37.	*Fringilla montifringilla* Linnaeus, 1758	1	2	-	-	T	WV
38.	*Pyrrhula pyrrhula* (Linnaeus, 1758)	1	3	-	-	T	S
39.	*Coccothraustes coccothraustes* (Linnaeus, 1758)	-	1	2	3	T	S
40.	*Carduelis carduelis* (Linnaeus, 1758)	5	7	23	13	T	S
41.	*Emberiza citrinella* Linnaeus, 1758	20	12	3	5	T	S

Legend: Aq - aquatic, Am - amphibious, T - terrestrial; SV - summer visitor, WV - winter visitor, RW - rarely winter visitor, S - sedentary species, PM - partial migratory species.

From the habitat point of view (Fig. 1), predominate terrestrial species - 34 (82.93%), followed by aquatic species - 4 (9.76%) and amphibious species - 3 (7.32%).

From the phenological point of view (Fig. 2), it predominates sedentary species - 26 (63.41%), followed by summer visitor - 6 (14.63%), rarely winter species - 6 (14.63%), winter visitor species - 5 (12.01%) and partial migratory species - 4 (9.75%).

The protection status of the identified bird species indicates the existence of the following categories (Tab. 2).

After Birds Directive (2009/147/CE), 3 species belong to annex I, requiring special protection of habitats for secure the survival and the breed of those. Other 4 species belong to annex II/A, being able to hunted in the areas which is applied the directive and 7 species belong to annex II/B, being able to hunted only in the states of European Union for which they are mentioned.

Annex III/A includes species that requires special licence for sale both alive or dead birds and any part of produce obtained from bird, easy identification. The species of annex III/B, if captured those there were legally killed or illegal obtained, member states could allows on their territory the transport for sale, the sale, the supply for sale of alive or dead birds or any part or produce obtained from bird, easy identification.

Convention of Berna includes 19 species belonging to annex II, being strictly protected and 17 species from the annex III being protected.

Convention of Bonn refers to migratory species of wild animals and includes 1 species in annex I, being endangered migratory species, and 6 species who belongs to annex II, having need of international accords for their protection because present unfavourable protection statute.

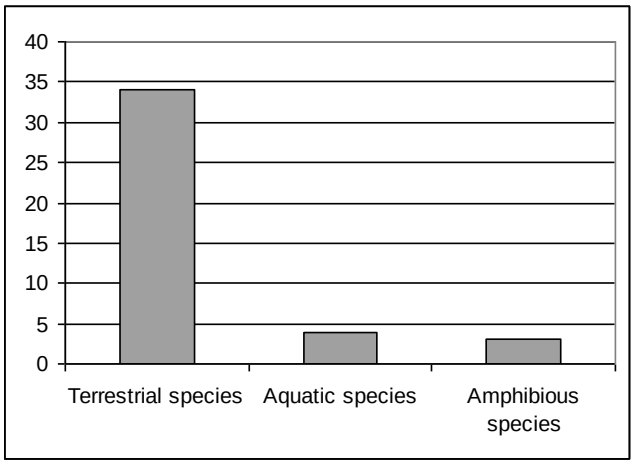

Figure 1 - The distribution of the bird species from the habitat point of view, in Tinca Spa.

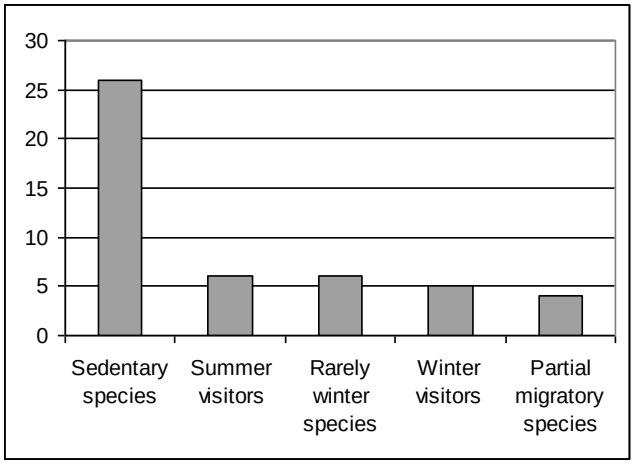

Figure 2 - The distribution of the identified bird species from the phenological point of view.

Table 2 - The protection status of the identified bird species from Tinca Spa during 2013 - 2016 midwinter census.

No.	Species	Birds Directive	Convention of Berna	Convention of Bonn
1.	*Pelecanus onocrotalus* Linnaeus, 1758	AI	AIII	AI, AII
2.	*Phalacrocorax carbo* (Linnaeus, 1758)		AIII	
3.	*Ardea cinerea* Linnaeus, 1758		AIII	
4.	*Cygnus olor* (Gmelin, 1789)	AII/B	AIII	AII
5.	*Anas platyrhynchos* Linnaeus, 1758	AII/A, AIII/A	AIII	AII
6.	*Anas crecca* Linnaeus, 1758	AII/A, AIII/B	AIII	AII
7.	*Buteo buteo* (Linnaeus, 1758)		AII	AII
8.	*Accipiter gentilis* (Linnaeus, 1758)		AII	AII
9.	*Accipiter nisus* (Linnaeus, 1758)		AII	AII
10.	*Perdix perdix* (Linnaeus, 1758)	AII/A, AIII/A	AIII	
11.	*Phasianus colchicus* (Linnaeus, 1758)	AII/A, AIII/A	AIII	
12.	*Streptopelia decaocto* Frivaldzky, 1838	AII/B	AIII	
13.	*Alcedo atthis* (Linnaeus, 1758)	AI	AII	
14.	*Picus viridis* Linnaeus, 1758		AII	
15.	*Dendrocopos major* (Linnaeus, 1758)		AII	
16.	*Dendrocopos syriacus* (Linnaeus, 1758)	AI	AII	
17.	*Dendrocopos minor* (Linnaeus, 1758)		AII	
18.	*Motacilla cinerea* Tunstall, 1771		AII	
19.	*Garrulus glandarius* (Linnaeus, 1758)	AII/B		
20.	*Pica pica* (Linnaeus, 1758)	AII/B		
21.	*Corvus frugilegus* Linnaeus, 1758	AII/B		

22.	*Corvus corone cornix* Linnaeus, 1758	AII/B		
23.	*Corvus corax* Linnaeus, 1758		AIII	
24.	*Troglodytes troglodytes* (Linnaeus, 1758)		AIII	
25.	*Regulus regulus* (Linnaeus, 1758)		AII	AII
26.	*Erithacus rubecula* (Linnaeus, 1758)		AII	
27.	*Turdus merula* Linnaeus, 1758	AII/B	AIII	
28.	*Turdus pilaris* Linnaeus, 1758	AII/B	AIII	
29.	*Parus palustris* Linnaeus, 1758		AII	
30.	*Parus caeruleus* Linnaeus, 1758		AII	
31.	*Parus major* Linnaeus, 1758		AII	
32.	*Aegithalos caudatus* (Linnaeus, 1758)		AII	
33.	*Sitta europaea* Linnaeus, 1758		AII	
34.	*Passer domesticus* (Linnaeus, 1758)			
35.	*Passer montanus* (Linnaeus, 1758)		AIII	
36.	*Fringilla coelebs* Linnaeus, 1758		AIII	
37.	*Fringilla montifringilla* Linnaeus, 1758		AIII	
38.	*Pyrrhula pyrrhula* (Linnaeus, 1758)		AIII	
39.	*Coccothraustes coccothraustes* (Linnaeus, 1758)		AII	
40.	*Carduelis carduelis* (Linnaeus, 1758)		AII	
41.	*Emberiza citrinella* Linnaeus, 1758		AII	

Legend: AI - annex I, AII - annex II, AII/A - annex II, part A, AII/B - annex II, part B, AIII - annex III, AIII/A - annex III, part A, AIII/B - annex III, part B.

CONCLUSIONS

The Midwinter census during 2013-2016, in Tinca area, emphasizes the presence of 41 bird species, majority terrestrial and sedentary species, belonging of different protection categories.

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MUZEUL JUDEȚEAN ARGEȘ, PITEȘTI, ROMÂNIA
ARGESIS - *STUDII ŞI COMUNICĂRI* - *seria ŞTIINŢELE NATURII*, **TOM XXIV**, 2016

DATA ON THE SPIDERS FAUNA (ARANEAE) FROM THE LEAOTA MOUNTAINS (ROMANIA)

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ABSTRACT. In this study is presented the results of the research on the spiders (Araneae) fauna from the Leaota Mountains. In the period May to September, 2016, were identified 78 species of spiders belonging to 17 families. The spiders species were grouped taking account of the biogeographical distribution and ecological preferences. From conservative point of view, two species, *Acantholycosa lignaria* (Clerck, 1757) and *Pardosa ferruginea* (C. L. Koch, 1870) are considered threatened species in some areas of the Carpathian chain.

Keywords: spiders, fauna, Leaota Mountains.

REZUMAT. Date asupra faunei de păianjeni (Araneae) din Munții Leaota (România). În acest studiu sunt prezentate rezultatele cercetării asupra faunei de păianjeni (Araneae) din Munții Leaota. În perioada mai - septembrie, 2016, au fost identificate 78 de specii de păianjeni aparținând la 17 familii. Speciile de păianjeni au fost grupate în funcție de distribuția biogeografică și de preferințele ecologice. Din punct de vedere conservativ, două specii, *Acantholycosa lignaria* (Clerck, 1757) și *Pardosa ferruginea* (C. L. Koch, 1870) sunt considerate specii periclitate, în unele zone ale lanțului carpatic.

Cuvinte cheie: păianjeni, fauna, Munții Leaota.

INTRODUCTION

In the specialized literature there were little information regarding to spiders fauna from the Leaota Mountains. One could make some assumptions about at the spiders species from the Leaota Mountains, starting with the existing data about these invertebrates from neighboring areas, especially the Bucegi and Piatra Craiului Mountains (Roșca, 1932; Fuhn & Niculescu-Burlacu, 1971; Sterghiu, 1985; Fuhn & Gherasim, 1995; Sterghiu & Dobre, 2003; Adam, 2006; Lotrean, 2006; Nae & Giurgincă, 2006).

Recently, in the period 2013-2015, in the Leaota Mountains, was realized a study about the invertebrate fauna from edaphic environment and from the subterranean superficial environment represented by several types of scree (Giurgincă et al., 2015; Popa & Dorobăţ, 2015; Nae & Dorobăţ, 2015 - unpublished data). On this occasion, 26 species of spiders was identified belonging to 9 families (Dorobăţ, 2016). Among the identified species, *Lessertinella kulczynskii* (Lessert, 1910) is mentioned for the first time in the Romanian fauna (Popa et al., 2015 - International Zoological Congress of Antipa Museum).

In 2016, a preliminary study over several groups of invertebrates from the Leaota Mountains was performed. This study pursued inventory of invertebrates species from different types of habitats, for drawing up the lists of species and for identification the protected ones, according to the national and European law. On this occasion, they were collected several species of spiders from the investigated habitats.

MATERIALS AND METHODS

The Leaota Mountains are located in the central south-eastern part of the Romania, to the eastern limit of the Meridional Carpathians (Fig. 1). Limits of the massif are: at the north and west the Dragoslavele-Bran Passage, to the south Subcarpaţii Ialomiţei and to the east the Bucegi Mountains. The Leaota Massif covers an area of approximately 336 km^2, which represents 2.24% of the Meridional Carpathians (Murătoreanu, 2009).

About three-quarters from the surface of the mountain is composed of crystalline schists, with compact appearance, less fragmented, with an average altitude of 1,262 m and slopes with gradients between 25 and 50% (Murătoreanu, 2009; Dorobăţ, 2016).

The average annual temperature ranges between 6 ^{o}C, at approximately 1,000 m altitude and 0 ^{o}C, at nearly 2,000 m height, with deviations from these values depending on exhibition. In the Leaota Mountains, the average temperature of the coldest month (January) vary between -8 ^{o}C, at heights of over 1,800 m and -4 ^{o}C, in the Dâmboviţei Valley, at the south-western extremity of the massif. The hottest months are July and August with average temperatures around 10 ^{o}C, on the main ridge and 18 ^{o}C, in the Dâmboviţa Valley (Murătoreanu, 2009).

The pluviometric regime (average annual values) varies with altitude, from less than 900 mm, in south of the region, to over 1,200 mm, at altitudes higher than 1,500 m. The lowest quantities of rainfall are recorded in January. These range between 50 mm, at altitudes lower than 1,000 m and 70 mm, to over 1,600 m height. The rainiest month is June. Rainfall recorded this month has values between 100 mm, in south-western extremity and over 160 mm, at altitudes higher than 1,400 m (Murătoreanu, 2009).

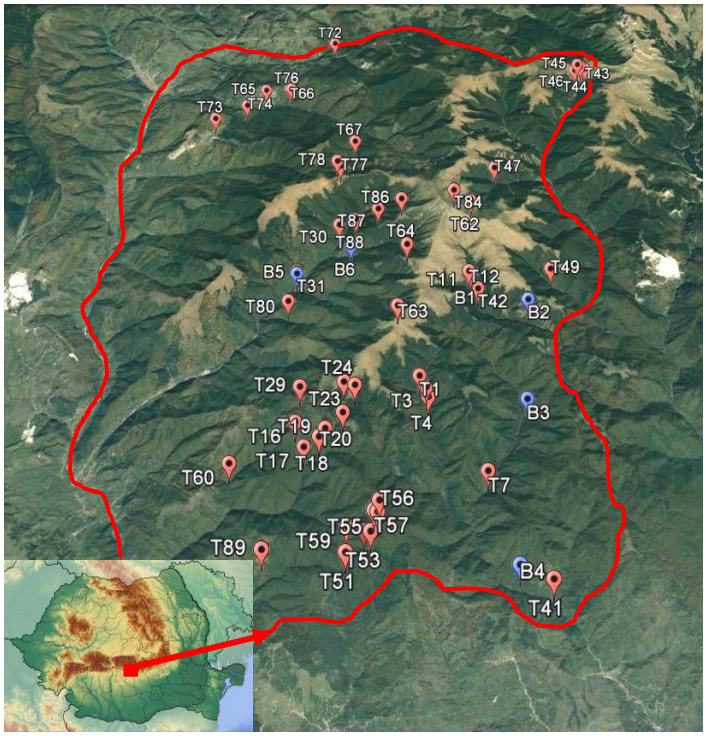

Figure 1 - The locating of the Leaota Mountains, transects (T) and pitfalls traps (B) (adapted from https://upload.wikimedia.org/wikipedia/commons/1/19/Romania_ location_map_ Topographic.png and Google Earth 2016).

The study was carried out in period May - September, 2016. Except for May, field data collection was done bimonthly. Capturing of the spiders was made concomitant with the collecting/identification to the others invertebrates species. Were used several collecting methods: cutting down from vegetation with entomological net, along a transect whit a length of about 100 m and a width of about 1-1.5 m; the prevailing of the material along of a transects with variable length, depending on the habitat and the land configuration; the length of transects was encompassed between 100 and 500 m and the width between of 10 to 20 m; the collecting was done directly, whit hand, whit tweezer or through suction, from the substrate: soil, boscage, from under rocks and tree stumps, on the plants, from under bark of the dead trees, on the surface of the rocks and from their cracks, etc.; pitfall traps (Barber traps - plastic cups of 500 ml with a height of 11.5 cm and an aperture of 9 cm, with 4% formaldehyde solution); in each collection station were placed three traps arranged in line at 10 m distance from each other; the traps remained in the ground between one and two months.

In the period May to September, traps were installed in six locations in the following types of habitats: spruce forest, spruce plantation, mixed forest (spruce

and beech) - in two locations, beech forest, riparian - the edge of mixed forest (selvage), spruce and beech (Fig. 1).

In the same time interval, May - September, 92 transects were realized, in 53 of these being identified the spiders species (Fig. 1), in the following types of habitats: spruce forest, spruce plantation, mixed forest (spruce and beech), mixed deciduous forest (beech, birch, poplar and very rarely fir and spruce), the edge of the mixed forest (spruce and beech), beech forest and the edge of the beech forest, riparian zone - edge of the mixed forest (spruce, beech and rare alder), riparian area (rare alder and beech), meadow/pasture, natural regeneration (birch and beech), the edge of the mixed forest (spruce and beech) - scree, deforestation (spruce forest). The altitude of the investigated habitats varied between 655 and 2,066 m.

For the determination of the spiders species the following sources were used: Fuhn & Niculescu-Burlacu, 1971; Sterghiu, 1985; Fuhn & Gherasim, 1995; Roberts, 1995 and online papers: Catalogue of the world spiders species published by Platnick (2014); www.araneae.unibe.ch.; https://wiki.arages.de/index.php.

RESULTS AND DISCUSSIONS

In the period May to September, 2016, in the Leaota Mountains, they were identified 78 species of spiders grouped into 17 families (Tab. 1), summing the 301 individuals. They were taken into consideration only adult specimens that have been determined up to species level.

Table 1 - List of the spiders species identified in the Leaota Mountains whit specifying the habitat from which the species were collected and its zoogeographical distribution.

No.	Taxon	S	SP	MSB	MD	EMF	EMF-Scree	BEF	R-EMF	R	M/P	NR	D	Sum	Distribution
	Class Arachnida														
	Order Araneae														
	Family Dysderidae														
1.	*Dysdera crocata* C. L. Koch, 1838					1		1						2	Cos.
	Family Theridiidae														
2.	*Asagena phalerata* (Panzer, 1801)						1				1			2	Pal.
3.	*Enoplognatha ovata* (Clerck, 1757)						1		1	1				3	Hol.
	Family Linyphiidae														
4.	*Agyneta rurestris* (C. L. Koch, 1836)		1			1								2	Pal.
5.	*Centromerus sellarius* (Simon, 1884)	2						1						3	Eu.

No.	Taxon	S	SP	MSB	MD	EMF	EMF-Scree	BEF	R-EMF	R	M/P	NR	D	Sum	Distribution
6.	*Centromerus sylvaticus* (Blackwall, 1841)				1			2						3	Hol.
7.	*Diplocephalus latifrons* (O. P.-Cambridge, 1863)	1		1										2	Eu.-Ru.
8.	*Diplostyla concolor* (Wider, 1834)							5	1					6	Hol.
9.	*Evansia merens* O. P.-Cambridge, 1900			1	1									2	Pal.
10.	*Lepthyphantes minutus* (Blackwall, 1833)	2		1										3	Hol.
11.	*Micrargus herbigradus* (Blackwall, 1854)	1		1	1			1						4	Pal.
12.	*Neriene emphana* (Walckenaer, 1841)				1		1			1				3	Pal.
13.	*Neriene montana* (Clerck, 1757)	1		2	3		1		1					8	Hol.
14.	*Neriene peltata* (Wider, 1834)						1		2					3	Pal.
15.	*Obscuriphantes obscurus* (Blackwall, 1841)	4		1										5	Pal.
16.	*Oedothorax fuscus* (Blackwall, 1834)								2					2	Eu.
17.	*Tenuiphantes alacris* (Blackwall, 1853)	3		1		1								5	Pal.
18.	*Tenuiphantes flavipes* (Blackwall, 1854)	1		4					1					6	Pal.
19.	*Tenuiphantes tenebricola* (Wider, 1834)	1		5				1						7	Pal.
20.	*Tenuiphantes zimmermanni* (Bertkau, 1890)	1		1							2			4	Eu.- Ru.
21.	*Tiso vagans* (Blackwall, 1834)										1			1	Eu.- Ru.- Mad.
	Family Tetragnathidae														
22.	*Pachygnatha degeeri* Sundevall, 1830					2					1			3	Pal.
23.	*Tetragnatha pinicola* L. Koch, 1870								2					2	Pal.
	Family Araneidae														
24.	*Aculepeira ceropegia* (Walckenaer, 1802)										2			2	Pal.
25.	*Araneus diadematus* Clerck, 1757			1		2			1		1	1		6	Hol.

No.	Taxon	S	SP	MSB	MD	EMF	EMF-Scree	BEF	R-EMF	R	M/P	NR	D	Sum	Distribution
26.	*Araniella cucurbitina* (Clerck, 1757)											2		2	Pal.
27.	*Argiope bruennichi* (Scopoli, 1772)								1		4			5	Pal.
28.	*Larinioides cornutus* (Clerck, 1757)	1							1					2	Hol.
29.	*Mangora acalypha* (Walckenaer, 1802)						1		1					2	Pal.
30.	*Parazygiella montana* (C.L. Koch, 1834)	1												1	Pal.
	Family Lycosidae														
31.	*Acantholycosa lignaria* (Clerck, 1757)		2											2	Pal.
32.	*Alopecosa pinetorum* (Thorell, 1856)					1								1	Pal.
33.	*Pardosa agrestis* (Westring, 1861)										1			1	Pal.
34.	*Pardosa alacris* (C. L. Koch, 1833)				3			7						10	Eu.- Ru.
35.	*Pardosa amentata* (Clerck, 1757)		1	1		1			4					7	Eu.- Ru.
36.	*Pardosa blanda* (C. L. Koch, 1833)										6			6	Pal.
37.	*Pardosa ferruginea* (L. Koch, 1870)	3												3	Pal.
38.	*Pardosa hortensis* (Thorell, 1872)		3						1	1				5	Pal.
39.	*Pardosa lugubris* (Walckenaer, 1802)		2	4				5	1					12	Pal.
40.	*Pardosa mixta* (Kulczyński, 1887)										1			1	Eu.-Turk.
41.	*Pardosa monticola* (Clerck, 1757)										7		1	8	Pal.
42.	*Pardosa palustris* (Linnaeus, 1758)										4			4	Hol.
43.	*Pardosa riparia* (C. L. Koch, 1833)		6							1				7	Pal.
44.	*Piratula knorri* (Scopoli, 1763)								2					2	Eu.
45.	*Trochosa terricola* Thorell, 1856					1		1	1		1			4	Hol.

No.	Taxon	S	SP	MSB	MD	EMF	EMF-Scree	BEF	R-EMF	R	M/P	NR	D	Sum	Distribution
46.	*Xerolycosa nemoralis* (Westring, 1861)		4											4	Pal.
	Family Agelenidae														
47.	*Agelena labyrinthica* (Clerck, 1757)								1					1	Pal.
48.	*Coelotes atropos* (Walckenaer, 1830)			1					1					2	Eu.
49.	*Coelotes terrestris* (Wider, 1834)	11	4	7				4		2				28	Pal.
50.	*Histopona torpida* (C. L. Koch, 1837)			1			1							2	Eu.- Ru.
51.	*Inermocoelotes inermis* (L. Koch, 1855)	2		1	2	1		1		2				9	Eu.
52.	*Tegenaria silvestris* L. Koch, 1872											1		1	Eu.- Ru.
	Family Cybaeidae														
53.	*Cybaeus angustiarum* L. Koch, 1868	1		3					1	1				6	Eu.- Azer.
	Family Hahniidae														
54.	*Cryphoeca silvicola* (C. L. Koch, 1834)	4		1										5	Pal.
	Family Dictynidae														
55.	*Cicurina cicur* (Fabricius, 1793)							1	2	1				4	Eu.-Cen. Asia
	Family Amaurobiidae														
56.	*Amaurobius ferox* (Walckenaer, 1830)							1						1	Hol.
57.	*Amaurobius similis* (Blackwall, 1861)								1					1	Hol.
58.	*Callobius claustrarius* (Hahn, 1833)			3					1	1				5	Pal.
	Family Liocranidae														
59.	*Apostenus fuscus* Westring, 1851							1	5					6	Eu.
	Family Clubionidae														
60.	*Clubiona comta* C. L. Koch, 1839			1					1	1				3	Eu.- Ru.- North Africa
61.	*Clubiona corticalis* (Walckenaer, 1802)	2		1				1						4	Eu.-Cen. Asia
62.	*Clubiona neglecta* O. P.-Cambridge, 1862								1					1	Pal.

No.	Taxon	S	SP	MSB	MD	EMF	EMF-Scree	BEF	R-EMF	R	M/P	NR	D	Sum	Distribution
63.	*Clubiona terrestris* Westring, 1851								1					1	Eu.
	Family Gnaphosidae														
64.	*Haplodrassus signifer* (C. L. Koch, 1839)										1		1	2	Hol.
65.	*Haplodrassus silvestris* (Blackwall, 1833)							3						3	Pal.
66.	*Zelotes apricorum* (L. Koch, 1876)								2					2	Eu.- Kaz.
67.	*Zelotes erebeus* (Thorell, 1871)		4						1					5	Eu.-Turk.
68.	*Zelotes latreillei* (Simon, 1878)								1					1	Pal.
	Family Philodromidae														
69.	*Philodromus aureolus* (Clerck, 1757)					1								1	Pal.
	Family Thomisidae														
70.	*Coriarachne depressa* (C. L. Koch, 1837)	2												2	Pal.
71.	*Misumena vatia* (Clerck, 1757)						3		1					4	Hol.
72.	*Xysticus erraticus* (Blackwall, 1834)							1				6		7	Eu.-Ru.
	Family Salticidae														
73.	*Evarcha falcata* (Clerck, 1757)						2		2					4	Pal.
74.	*Heliophanus tribulosus* Simon, 1868					1								1	Eu.-Kaz.
75.	*Pseudeuophrys erratica* (Walckenaer, 1826)						3	1			1			5	Pal. (introduced in USA)
76.	*Salticus scenicus* (Clerck, 1757)		1				1							2	Hol.
77.	*Sittiflor rupicola* (C. L. Koch, 1837)						1				2			3	Hol.
78.	*Sittipub pubescens* (Fabricius, 1775)						1							1	Pal. (introduced in USA)

Legend: S – spruce forest, SP – spruce plantation, MSB – mixed forest (spruce and beech), MD – mixed deciduous forest (beech, birch, poplar and very rarely fir and spruce), EMF – the edge of the mixed forest (spruce and beech), EMF-Scree – the edge of the mixed forest (spruce and beech) - scree, BEF – beech forest and the edge of the beech forest,

R-EMF – riparian area - the edge of the mixed forest (spruce and beech), R – riparian area (rare alder and beech), M/P – meadow/pasture, NR – natural regeneration (birch and beech), D – deforestation (spruce forest); Cos. – Cosmopolitan, Hol – Holarctic, Pal – Palearctic, Eu.-Ru.-North Africa – Europe, Russia, North Africa, Eu.-Ru.-Mad. – Europe, Russia, Madeira, Eu.-Ru. – Europe, Russia, Eu.-Cen.-Asia – Europe to Central Asia, Eu.-Kaz. – Europe to Kazakhstan, Eu.-Azer – Europe to Azerbaijan, Eu.-Turk. – Europe, Turkey, Eu. – European.

The most species belonged to the families Linyphiidae (23.0%) and Lycosidae (20.5%), followed by: Araneidae (8.9%), Salticidae (7.6%), Agelenidae (7.6%), Gnaphosidae (6.4%) and Clubionidae (5.1%). The other ten families had shares of less than 5% (Fig. 2). If we take into consideration the number of individuals from each family, most specimens belonged to the Lycosidae (25.5%) and Linyphiidae (22.9%) families, followed by: Agelenidae (14.2%), Araneidae (6.6%) and Salticidae (5.3%). The other families have registered a percentage of less than 5% (Fig. 2). Most specimens collected belonged to the following species: *Coelotes terrestris* (Wider, 1834) (9.3 %), *Pardosa lugubris* (Walckenaer, 1802) (3.9 %) and *Pardosa alacris* (C. L. Koch, 1833) (3.3 %).

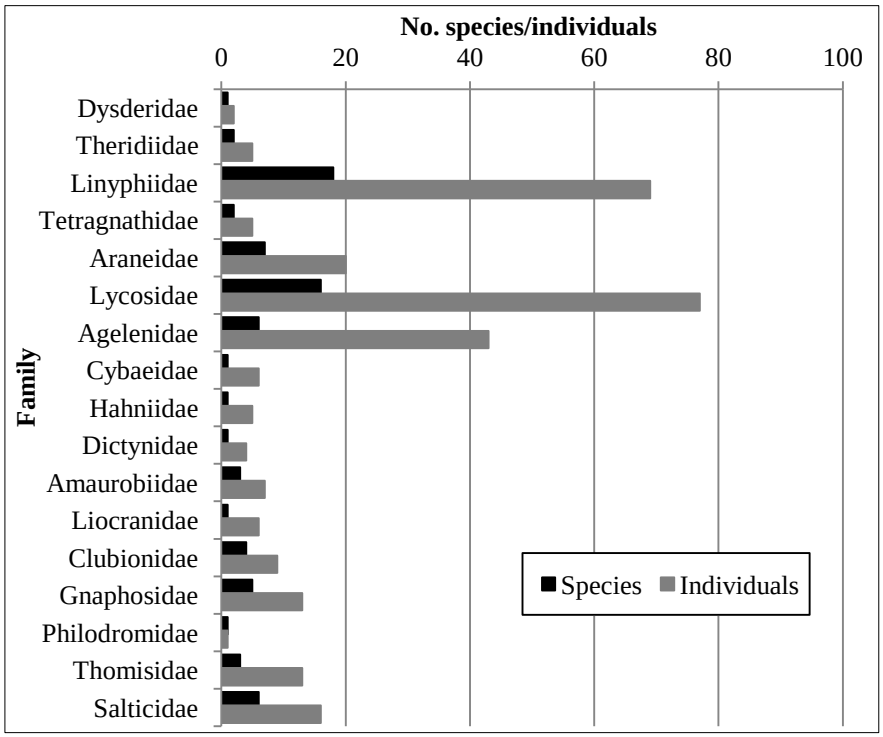

Figure 2 - The number of species and individuals in each family of spiders recorded in the Leaota Mountains.

Most species of spiders have been identified at the boundary between riparian and edge of the mixed forest (spruce and beech) (R-EMF, 39.7%). Smaller percentages were recorded at species from the mixed forest, spruce and beech (MSB, 28.2%), from the spruce forest (S, 24.3%) and from the beech forest and the edge of the beech forest (BEF, 23.0%). To the habitats mentioned above, we can add the spruce plantation (SP, 12.8%). In all of these habitats, pitfall traps were installed. For the habitats where the traps have not been installed, the number of identified spiders species, reported to the total number of species, varied between the 20.5% for the meadow/pasture (M/P) and 2.5% for the deforestation areas (D). The hierarchy previously established, with some small differences, is also preserved for the number of individuals identified in each habitat type. The habitats in which pitfall traps were installed had weightings between 9.3% (spruce plantation - SP) and almost 15% (R-EMF – riparian - the edge of the mixed forest, spruce and beech). A value of more than 10%, respectively 11.9%, was recorded for the meadow/pasture habitat (Fig. 3).

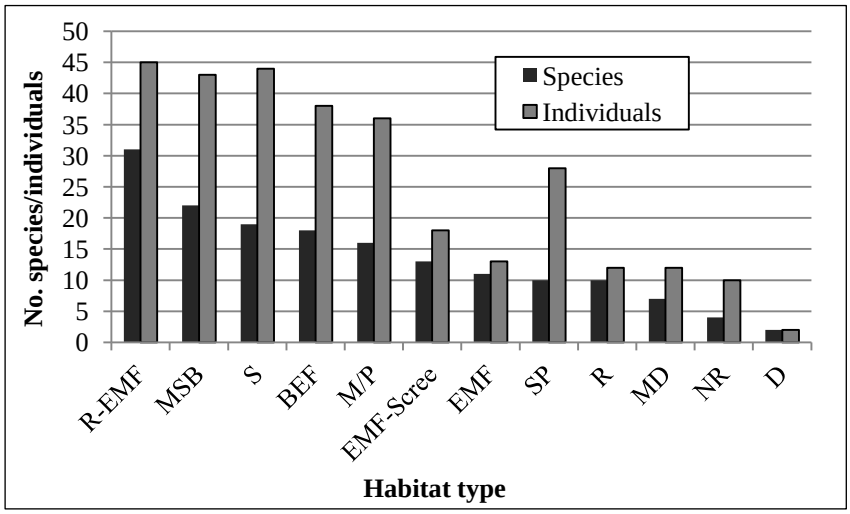

Figure 3 - The number of species and individuals of spiders identified in each type of studied habitat: R-EMF – riparian area - the edge of the mixed forest (spruce and beech), MSB – mixed forest (spruce and beech), S – spruce forest, BEF – beech forest and the edge of the beech forest, M/P – meadow/pasture, EMF-Scree – the edge of the mixed forest (spruce and beech) - scree, EMF – the edge of the mixed forest (spruce and beech), SP – spruce plantation, R – riparian area (rare alder and beech), MD – mixed deciduous forest (beech, birch, poplar and very rarely fir and spruce), NR – natural regeneration (birch and beech), D – deforestation area (spruce forest).

In accordance with their current spreading (Platnick, 2014), the all 78 species of spiders, identified in the Leaota Mountains, were classified into seven zoogeographical groups (Deltshev, 2005) (Fig. 4). We found the presence of a large number of Palearctic species (51.2%) followed the Holarctic species (19.2%)

and Siberian-European species (10.2%), together representing 80% of all identified species. The rest of the groups had weights less than 10%.

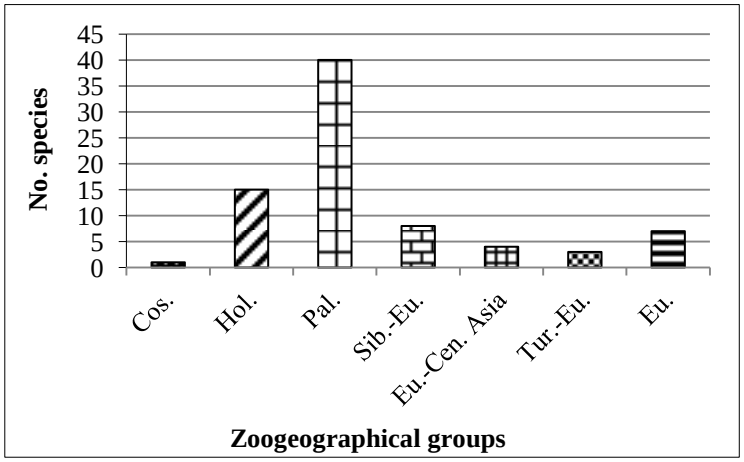

Figure 4 - Distribution of the identified spiders species, in the Leaota Mountains, taking into account of the zoogeographical groups (Cos. – Cosmopolitan, Hol – Holarctic, Pal – Palearctic, Sib.-Eu. – Siberian-European, Eu.- Cen.-Asian – European-Central Asian, Tur.-Eu. – Turanian-European, Eu – European).

Most of the identified species are found in various types of habitats and on different altitudes. Only a small number of species may be considered indicators for a particular type of habitat. *Pardosa ferruginea* (C. L. Koch, 1870) is considered a species with relatively small ecological amplitude, which prefer shady and relatively humid habitats. It is a mountainous and alpine species, usually found at higher altitudes of 1,000 m, in coniferous forests (*Picea abies* L. H. Karst.) and mountain pine thicket (*Pinus mugo* Turra) (Fuhn & Niculescu-Burlacu, 1971). In the Leaota Mountains, the species was found in the spruce forests on the Strunguliţa and Raciu Valleys, at over 1,300 m altitude, in the forests less affected by human impact, where it is relatively frequent. *Pardosa blanda* (C. L. Koch, 1833) is a mountain species, found from 1,000 m upwards. In the alpine area is present into the *Nardus stricta* L. associations. It is a species with relatively small ecological amplitude, which prefers the open and sunny places, with medium humidity (Fuhn & Niculescu-Burlacu, 1971). The species was identified on the Leaota and Romanescu peaks. *Piratula knorri* (Scopoli, 1763) is considered a relative rare species, very demanding with its habitat. It is a riparian species, encountered along the shaded torrents with gravel shores (Fuhn & Niculescu-Burlacu, 1971). The species was identified in the riparian area of the Frumușelu and Tâncava creeks, at about 1,000 m altitude.

Taking into account of the entire Carpathian chain, three species of spiders are classified into the following categories: endangered species, as *Acantholycosa lignaria* (Clerck, 1757), *Pardosa ferruginea* (C. L. Koch, 1870) and vulnerable one *Argiope bruennichi* (Scopoli, 1772) (Pawłowski, 2003). For Romania, these three

species are included in the "present but not threatened" category (Pawłowski, 2003). The *Acantholycosa lignaria* (Clerck, 1757) and *Pardosa ferruginea* (C. L. Koch, 1870) are considered the relict species (Pawłowski, 2003).

After Ján Kadlečík (Gajdoš, 2014), only *Pardosa ferruginea* (C. L. Koch, 1870) is included in the Near Threatened (NT) category, in the Carpathian Red List of spiders. The *Acantholycosa lignaria* (Clerck, 1757) is included in the endengered specis category only in the Czech Republic just like the *Heliophanus tribulosus* Simon, 1868 which is considered a vulnerable species. *Argiope bruennichi* (Scopoli, 1772) is not part of the threatened species category.

CONCLUSIONS

During the study, 78 species of spiders belonging to 17 families were identified. From these, only three spiders: *Pardosa ferruginea* (C. L. Koch, 1870), *Pardosa blanda* (C. L. Koch, 1833) and *Piratula knorri* (Scopoli, 1763) can be considered as indicator species for certain types of habitats. This situation is also reflected by the presence of a large number of species which have a wide spreading, present in several types of habitats. More than half of the identified species are Palearctic, followed by the Holarctic and Siberian-European ones.

From the conservative point of view, only two species of spiders, *Acantholycosa lignaria* (Clerck, 1757) and *Pardosa ferruginea* (C. L. Koch, 1870) are mentioned as being in danger in various areas (countries) of the Carpathian chain. In Romania, in Leaota Mountains, none of the identified species by us was classified into the category of protected species. If we consider the rapidity with which the natural habitats of the Carpathian Mountains disappear, in the absence of adequate measures, the situation may change, in the negative sense, very soon.

Considering that the study was not dedicated solely to spiders and the period during which it was done was short, relative to the size and to the heterogeneity of the investigated area, we can say that the study has a preliminary character. The data obtained from this study supplement the previously results, leaving open the list of spiders species from the Leaota Massif.

ACKNOWLEDGMENT

The field work was financed by Conservation Carpathia Foundation, under the contract "Biodiversity Baseline Survey Study on Leaota area", conducted in 2016. The theme of the article is according to the general framework of the project no. RO1567-IBB01/2016.

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MUZEUL JUDEȚEAN ARGEȘ, PITEȘTI, ROMÂNIA
ARGESIS - *STUDII ŞI COMUNICĂRI - seria ŞTIINŢELE NATURII,* **TOM XXIV**, 2016

ECOLOGICAL COMPARATIVE ANALYSIS BETWEEN MITE POPULATIONS FROM POLLUTED GRASSLAND ECOSYSTEMS FROM TRASCĂU MOUNTAINS

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ABSTRACT. Taking into account of the total metal load, an ecological comparative analysis between mite populations (Acari-Mesostigmata) from polluted grassland ecosystems was accomplished. In total 66 mite species were identified, grouped in 32 genera and 13 families. 15.2% from all identified mites are common species for all ecosystems. If we take into consideration the ecological requirements of the identified mite species, we observed that 21.2% were praticolous species, 21.2% were silvicolous ones and 19.7% were mixed species. The analyse of the dominance and constance classes revealed a high representation of recedent-subrecedent and accessory-accidental species. The Shannon diversity index, Simpson dominance and the equitability parameters indicated that in the ecosystems with low taxa diversity, there was a dominance of few species with individuals unequally distributed between grasslands.

Keywords: diversity, grassland, mite, soil.

REZUMAT. **Analiză ecologică comparativă între populațiile de acarieni din ecosisteme de pajiște poluate din Munții Trascău.** Ţinând cont de încărcătura totală de metale grele, s-a realizat o analiză ecologică comparativă între populaţiile de acarieni (Acari-Mesostigmata) din ecosisteme praticole poluate. S-au identificat, în total, 66 de specii de acarieni, grupaţi în 32 de genuri şi 13 familii. 15.2% din numărul total de taxoni îl reprezintă speciile comune pentru toate ecosistemele studiate. Dacă luăm în considerare cerinţele ecologice ale speciilor de acarieni identificate, observăm că 21.2% sunt specii praticole, 21.2% specii silvicole şi 19.7% specii mixte. Analiza claselor de dominanţă şi constanţă, a evidenţiat faptul că cea mai mare reprezentare au avut-o speciile recedente-subrecedente şi cele accesorii-accidentale. Indicii de diversitate (Shannon), de dominanţă (Simpson) şi de echitabilitate (Ewens-Caswell's V-statistic) au indicat faptul că în ecosistemele cu o diversitate specifică redusă, domină câteva specii, ai căror indivizi sunt inegal distribuiţi între pajiştile luate în analiză.

Cuvinte cheie: diversitate, pajişte, acarieni, sol.

INTRODUCTION

Research studies conducted in different types of ecosystems from Europe, as well from Romania, revealed that the soil mite populations were characterized by the characteristically structure, in correlations with environmental variables (soil temperature, humidity, pH, carbon, nitrogen, etc.) (Fenda & Ciceková, 2009; Huhta et al., 2012; Manu et al., 2013; Dirilgen et al., 2015).

In Europe ecological studies on soil invertebrates from grazed, overgrazed, natural and chemical fertilized grasslands, were made in Spain, Scotland, Switzerland, Netherland, Turkey, Austria and Germany (Cole et al., 2005; Seeber et al., 2005; Garcia et al., 2010; Onen & Koc, 2011; Wissuwa et al., 2012; Rashid et al., 2013; Vandegehuchte et al., 2015).

In Romania, studies concerning the soil fauna from grasslands, especially the predators mites (Acari - Mesostigmata) were few, highlighting the influence of fertilizers and heavy metals pollution on their structure (Huţu et al., 1991; Manu et al., 2016). Qualitative and quantitative studies upon the edaphic microarthropods fauna from some grassland ecosystems from Romania were made only in Moldavia Plain (Călugăr, 2006a, b).

Taking account of this context, the present paper wants to establish a comparative ecological analysis of the mites' populations from different levels of polluted grassland ecosystems from Trascău Mountains. The main objectives were: to establish the species diversity of each type of ecosystems, to identify the characteristically species for each investigated areas and to realize a comparative ecological analysis between structural parameter of the mite populations (numerical abundance, diversity, equitability, dominance and constance).

MATERIALS AND METHODS

The study was done in twelve grassland ecosystems, situated in the Trascău Mountains, Romania (Fig. 1). Taking account of the total heavy metal load (As; Cu; Ni; Mn; Pb and Zn), the twelve grasslands were grouped, as: low (ML = 1-1.75), medium (ML = 2.92 - 3.89) and high polluted areas (ML = 5.30 - 7.28) (Manu et al., 2016).

All the investigated areas were sub-steppic calciphilous grasslands, mainly characterised by xerophytes, hemicryptophytes and other perennial species, with a heterogeneous species composition. The dominant plant species were *Agrostis capillaries* L., *Nardus stricta* L., *Rumex acetosella* L. and *Trifolium pratense* L. The grasslands were situated at altitudes between 464 and 958 m, and on slopes between 20° - 35.48^o. The soil was mostly sandy (regosol, haplic-luvisol and eutric-cambisol), with pH from 4.52 to 5.85. (Manu et al., 2016).

The mite fauna was sampled in July and September, in 2013, by taking 25 cores to a depth of 10 cm, with a MacFadyen corer (5 cm diameter), at each of the twelve grassland sites. The 25 cores were located within a total of 2,500 sq.m. In total 300 soil samples were analysed. The samples were taken randomly. 961

Mesostigmata individuals were extracted from the 300 cores, comprising 66 species. The mites were extracted with a modified Berlese-Tullgren funnel, in ethyl alcohol clarified in lactic acid and identified to species level, using published actual identification keys. All species were deposited in the collection of the Institute of Biology-Bucharest, Romanian Academy.

After taxonomical identification, the numerical abundance (number of individuals) was the base for the quantification of some structural index as: numerical density (x/sq.m.); dominance (D %), constance (C %), Shannon diversity index (H'), Simpson dominance index (D) and diversity equitability index (Ewens-Caswell's V-statistic), using BioDiversityPro software.

The numerical density (ind./sq.m.) was calculated using the following formula (Botnariuc & Vădineanu, 1982): Ind./sq.m = (∑ no. of individuals/no. of samples) * $1m^2$/surface of the soil core; 1 m^2 = 10,000 cm^2; surface of the soil core = 20 cm^2.

The dominance was calculated using the formula: D = 100*n/N, where: n - number of individuals of one species from one sample; N - total number of individuals of all species from one sample. The dominance classes for the identified soil mites were: eudominant species with dominance over 10% (D5); dominant species with dominance between 5.1-10% (D4); subdominant species with dominance between 2.1 - 5% (D3); recedent species with dominance between 1.1 - 2% (D2) and subrecedent species with dominance under 1.1% (D1) (Engelmann, 1978).

The constancy was obtained using the formula: C = 100*pA/P, where: pA - number of samples with species A; P - total number of samples. The mite species were classified in four constancy classes: euconstant species having constancy of 75.1 - 100% (C4), constant species having constancy of 50.1 - 75% (C3), accessory species having constancy of 25.1 - 50% (C2) and accidental species having constancy of 1 - 25% (C1) (Selvin & Vacca, 2004).

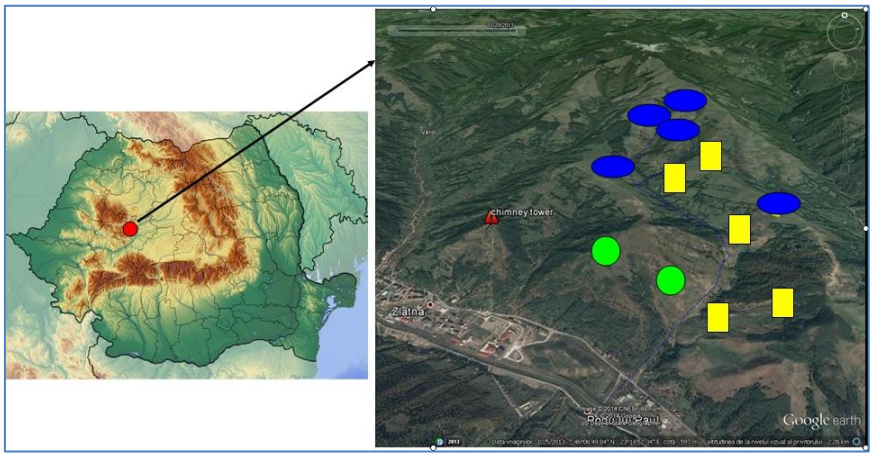

Figure 1 - Geographical characterisation of the investigated ecosystems (green circle = high polluted grasslands; yellow rectangle = medium polluted grasslands; blue oval = low polluted grasslands).

RESULTS AND DISCUSSIONS

In total 66 mite species were identified, with 19,220 individuals/square meter (ind./sq.m). These species were grouped in 32 genera and 13 families, with different percentage of representation: Parasitidae (9.09%), Ascidae (25.8%), Phytoseiidae (1.52%), Macrochelidae (3.04%), Eviphididae (1.52%), Laelapidae (25.8%), Pachylaelapidae (4.55%), Zerconidae (9.1%), Veigaidae (3.04%), Rhodacaridae (7.58%), Trachytidae (4.55%), Uropodidae (3.04%) and Oplitidae (1.52%) (Fig. 2).

The highest numerical abundance was obtained in low polluted grasslands (10,300 ind./sq.m), in comparison with high polluted areas (326 ind./sq.m.) or with medium polluted ecosystems (5,660 ind./sq.m.). Ten from identified mites are common species for all ecosystems, which represent 15.2% from the total number: *Lysigamasus misellus*, *Asca bicornis*, *Amblyseius* sp.; *Hypoaspis aculeifer*, *Hypoaspis karawaiewi*, *Hypoaspis vacua*, *Hypoaspis oblonga*, *Hypoaspis preasternalis*, *Rhodacarellus perspicuus* and *Rhodacarellus silesiacus* (Tab. 1).

The high polluted grasslands were characterized by the lowest species diversity (21 species) and by the highest dominance index (Tab. 2). Only three species were eudominant (*Asca bicornis*, *Hypoaspis aculeifer* and *Hypoaspis preasternalis*) and two were dominant (*Lysigamasus misellus* and *Rhodacarellus silesiacus*). The rest of them were recedent - subrecedent and accessory - accidental species (Tab. 1). Characteristically species for this group of ecosystems were: *Proctolaelaps pygmaeus*, *Hypoaspis angusta*, *Hypoaspis gracilis* and *Pachylaelaspis troglophilus* (Tab. 1).

In the medium polluted grasslands were obtained the highest diversity and equitability, being identified 44 mite species (Tab. 2). Only two eudominant mites and two euconstant were identified (*Asca bicornis* and *Hypoaspis preasternalis*). The characteristic species for this group of ecosystems were the majority from Ascidae, Zerconidae, Eviphididae and Trachytidae families, together with two species from Parasitidae (*Holoparasitus calcaratus* and *Pergamasus crassipes*), which represent 28.8% from the total number of identified mites (Tab. 1).

The low polluted grassland were identified 39 species from Mesostigmata order, from which three species were eudominant-euconstant (*Hypoaspis aculeifer*, *Hypoaspis oblonga* and *Hypoaspis preasternalis*) and two were dominant-constant (*Asca bicornis* and *Hypoaspis vacua*). 24.2 % from mite species were identified only in low polluted areas (Tab. 1). In the same time the lowest values of the equitability diversity index and the medium values of Shannon and Simpson dominance index were obtained (Tab. 2).

Making a comparison with the same type of ecosystems from Romania (meadows and pastures), where were identified 38 Mesostigmata species, we observed that our results from the medium and low polluted grasslands were similar with those (Călugăr, 2006b). The impact of heavy metal pollution affected the species diversity from the high polluted areas, where the value of this parameter was much lower.

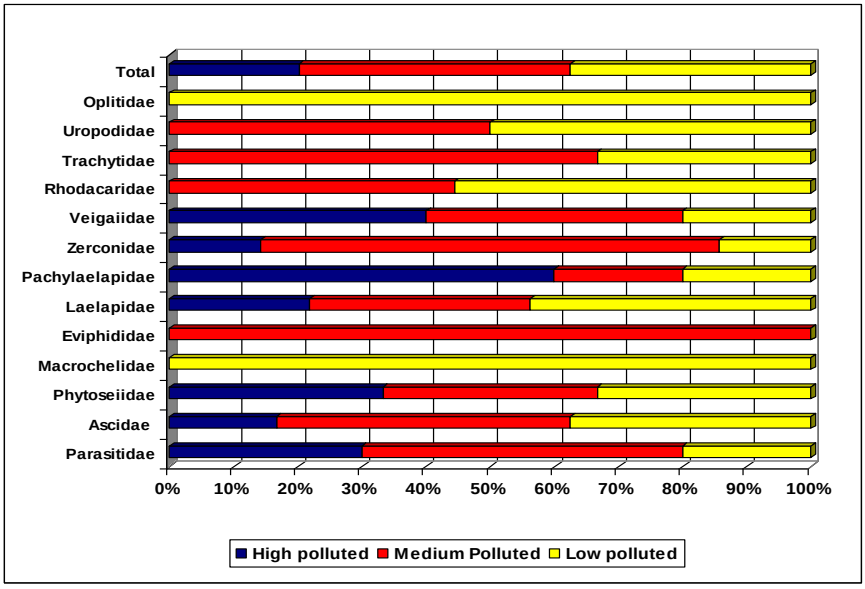

Figure 2 - The taxonomical spectrum of the soil mites from investigated grasslands.

Table 1- The structure parameters for soil mites populations (Acari-Mesostigmata) from investigated polluted grasslands (numerical abundance - ind./sq.m ± standard deviation; dominance - A% and constance - C %).

Taxa	High polluted grasslands			Medium polluted grasslands			Low polluted grasslands		
	ind/sq.m	A	C	ind/sq.m	A	C	ind/sq.m	A	C
Family Parasitidae									
Holoparasitus calcaratus (C. L.Koch, 1839)				100±0.57	1.76	12			
Lysigamasus misellus (Berlese, 1904)	180±1.25	5.52	8	200±1.4	2.46	20	200±0.7	1.94	28
Lysigamasus sp.	80± 0.62	2.45	8	40±0.23	0.70	4			
Pergamasus crassipes Berlese, 1906				600±43	1.06	8			
Vulgarogamasus kraepelini (Berlese, 1905)							20±0.2	0.19	4
Parasitus fimetorum (Berlese, 1904)	20±0.2	0.61	4	80±0.47	1.41	12			
Family Ascidae									
Antennoseius avius Karg, 1976				20±0.2	0.35	4			

Taxa	High polluted grasslands			Medium polluted grasslands			Low polluted grasslands		
	ind/sq.m	**A**	**C**	**ind/sq.m**	**A**	**C**	**ind/sq.m**	**A**	**C**
Antennoseius bacatus Athias-Henriot, 1961				60±0.33	1.06	12			
Arctoseius semiscissus (Berlese, 1892)				20±0.2	0.35	4	20±0.2	0.19	4
Asca bicornis (Canestrini and Fanzago, 1887)	440±3.39	13.50	20	900±2.25	15.85	76	540±1.03	5.24	64
Cheiroseius borealis (Berlese, 1904)				100±0.40	1.76	20			
Cheiroseius bryophilus Karg, 1969	40±0.27	1.23	8				100±0.5	0.97	16
Iphidonopsis pulvisculus (Berlese, 1921)							40±0.27	0.39	8
Iphidonopsis sp.							20±0.2	0.19	4
Iphidozercon gibbus Berlese, 1903				100±0.5	1.76	16			
Lasioseius berlesei (Oudemans, 1938)							20±0.2	0.19	4
Lasioseius sp.				20±0.2	0.35	4	120±0.43	1.17	24
Lasioseius youcefi Athais-Henriot, 1959				60±0.33	1.06	12			
Leioseius insignitis (Hirschmann, 1963)							40±0.27	0.39	8
Zerconopsis remiger (Kramer, 1876)				60±0.43	1.06	8	60±0.33	0.58	12
Gamasellodes bicolor (Berlese, 1918)	40±0.4	1.23	4	40±0.27	0.70	8			
Protogamasellus mica (Athias-Henriot, 1961)				120±1.2	2.11	4			
Proctolaelaps pygmaeus (Muller, 1860)	20±0.2	0.61	4						
Family Phytoseiidae									
Amblyseius sp.	20±0.2	0.61	4	100±0.5	1.76	16	60±0.33	0.58	12
Family Macrochelidae									
Geholaspis longispinosus Kramer, 1876							40±0.27	0.39	8
Macrocheles recki Bregetova & Koroleva 1960							80±0.37	0.78	16

Taxa	High polluted grasslands			Medium polluted grasslands			Low polluted grasslands		
	ind/sq.m	**A**	**C**	**ind/sq.m**	**A**	**C**	**ind/sq.m**	**A**	**C**
Family Eviphididae									
Eviphis ostrinus (C. L. Koch, 1836)				20±0.2	0.35	4			
Family Laelapidae									
Hypoaspis angusta Karg, 1965	40±0.4	1.23	4						
Hypoaspis claviger (Berlese, 1882)							60±0.3	0.58	12
Hypoaspis aculeifer (Canestrini, 1883)	1,160± 6.63	35.58	40	160±0.62	2.82	24	1,280± 8.67	12.43	24
Hypoaspis astronomica (C. L. Koch, 1839)				40±0.27	0.70	8	40±0.27	0.39	8
Hypoaspis austriaca (Sellnick, 1935)							20±0.2	0.19	4
Hypoaspis gracilis Meledjaeva,1963	60±0.33	1.84	12						
Hypoaspis karawaiewi (Berlese, 1903)	80±0.37	2.45	16	20±0.2	0.35	4	140±0.84	1.36	12
Hypoaspis miles (Berlese, 1882)				180±0.7	3.17	24	20±0.2	0.19	4
Hypospis sp. 1				80±0.37	1.41	16	180±0.49	1.75	32
Hypospis sp. 2				120±0.66	2.11	16	60±0.33	0.58	12
Hypoaspis vacua (Michael, 1891)	80±0.37	2.45	16	180±1.11	3.17	12	940±2.83	9.13	64
Hypoaspis oblonga (Halbert, 1915)	20±0.2	0.61	4	240±0.96	4.23	20	1,180± 2.30	11.46	80
Hypoaspis preasternalis (Wilmann, 1949)	600±1.63	18.40	44	1,000± 1.77	17.61	92	3,560± 3.06	34.56	100
Ololaelaps placentula (Berlese, 1887)				40±0.4	0.70	4	40±0.27	0.39	8
Ololaelaps veneta (Berlese, 1904)				120±0.72	2.11	12			
Ololealaps sellnicki Bregetova and Koroleva 1964							80±0.37	0.78	16
Androlaelaps casalis (Berlese, 1887)							20±0.2	0.19	4
Family Pachylaelapidae									
Pachylaelaps furcifer Oudemans, 1903	60±0.43	1.84	8	120±0.52	2.11	20			

Taxa	High polluted grasslands			Medium polluted grasslands			Low polluted grasslands		
	ind/sq.m	**A**	**C**	**ind/sq.m**	**A**	**C**	**ind/sq.m**	**A**	**C**
Pachylaelaps pectinifer (G. & R. Canestrini, 1881)	20±0.2	0.61	4				20±0,2	0.19	4
Pachylaelaspis troglophilus Halbert, 1915	40±0.27	1.23	8						
Family Zerconidae									
Parazercon radiatus (Berlese, 1910)							20±0.2	0.19	4
Prozercon kochi Sellnick, 1943				20±0.2	0.35	4			
Prozercon sellnicki Halaskova, 1963				100±0.57	1.76	12			
Zercon berlesei Sellnick, 1958				120±0.83	2.11	12			
Zercon hungaricus Sellnick, 1958				20±0.2	0.35	4			
Zercon triangularis (C. L. Koch, 1836)				40±0.4	0.70	4			
Family Veigaidae									
Veigaia exigua (Berlese, 1916)				100±0.57	1.76	12	40±0.4	0.39	4
Veigaia nemorensis (C. L. Koch, 1839)	60±0.43	1.84	8	60±0.33	1.06	12			
Family Rhodacaridae									
Rhodacarellus perspicuus Halaskova, 1958	20±0.2	0.61	4	80±0.36	1.41	16	160±0.62	1.55	24
Rhodacarellus silesiacus Willmann, 1953	180±0.9	5.52	20	100±0.5	1.76	16	380±1.05	3.69	48
Rhodacarus coronatus Berlese, 1921							40±0.27	0.39	8
Rhodacarus denticulatus Berlese, 1921				140±0.89	2.46	12	300±1.47	2.91	20
Rhodacarus roseus Oudemans, 1902				140±0.67	2.46	20	20±0.2	0.19	4
Family Trachytidae									
Trachytes aegrota (C. L. Koch, 1841)				100±0.57	1.76	12			

Taxa	High polluted grasslands			Medium polluted grasslands			Low polluted grasslands		
	ind/sq.m	**A**	**C**	**ind/sq.m**	**A**	**C**	**ind/sq.m**	**A**	**C**
Trachytes irenae Pecina, 1969				20±0.2	0.35	4			
Trachytes pauperior Berlese, 1914							40±0.27	0.39	8
Family Uropodidae									
Uropoda orbicularis (O. F. Muller, 1776)							80±0.37	0.78	16
Uropoda sp.				220±1.41	3.87	12			
Family Oplitidae									
Oplitis minutissima (Berlese, 1903)							220±0.86	2.14	28

If we take into consideration the ecological requirements of the identified mite species, we observed that 21.2% were praticolous species (*Lysigamasus misellus*, *Anntenoseius avius*, *Arctoseius semiscisus*, *Cheroseius borealis*, *Lasioseius berlesei*, *Zerconopsis remiger*, *Protogamasellus mica*, *Hypoaspis claviger*, *Hypoaspis miles*, *Hypoaspis vacua*, *Hypoaspis praesternalis* and *Rhodacarellus silesiacus*); 21.2% were silvicolous ones (as the species from Zerconidae, Trachytidae, Oplitidae families, as well as *Holoparasitus calcaratus*, *Cheroseius bryophilus*, *Macrocheles recki*, *Rhodacarus roseus*) and 19.7% were mixed species (identified in grasslands and forests as well) (Masan, 2003; Masan & Fenda, 2004; Gwiazdowicz, 2007; Salmane & Brumelis, 2010). It must be highlighted that were signalled species characteristically for impacted areas (as mine areas or derelict industrial lands), as: *Antennoseius bacatus*, *Iphidozercon gibbus*, *Lasioseius youcefi*, *Gamasellodes bicolor*, *Proctolaelaps pygmaeus*, *Rhodacarellus perspicuus* and *Rhodacarus denticulatus* (Gwiazdowicz, 2007; Kaczmarek et al., 2012).

Table 2 - The ecological index for mites' populations from investigated grasslands.

Index	High polluted grasslands	Medium polluted grasslands	Low polluted grasslands
Shannon diversity (H')	0.66	0.844	0.68
Simpson dominance (D)	0.21	0.07	0.17
Ewens-Caswell's V-statistic equitability	0.87	2.89	0.47

The presence of a high number of forestry species and of accessory-accidental ones in all three types of investigated areas showed us that on one hand the mesostigmatids were very mobile invertebrates, which migrated from the adjacent areas (deciduous forest ecosystems) and on the other hand that influence

of the unfavourable environmental conditions from the grasslands (dryness, soil pollution, etc.) on mites populations.

CONCLUSIONS

The study of the soil fauna (Acari - Mesostigmata) from the polluted grassland ecosystems, revealed a taxonomical spectrum formed by the 66 species belonging to 32 genera and 13 families. The abundance of the soil mites and also the number of the species was variable from a type of ecosystem to another in accordance with the total metal load.

In the taxonomic spectrum in all investigated ecosystems the Ascidae and Laelapidae families were best represented. The Shannon diversity index, Simpson dominance and the equitability parameters indicated that in the areas with low taxa diversity, there is a dominance of few taxa with individuals unequally distributed between plots.

As to the species autecological peculiarities, the faunistic list includes praticolous, forestry, as well as indicator mites for anthropic ecosystems. The analyse of the dominance and constance classes revealed a high representation of recedent-subrecedent and accessory-accidental species, especially in high polluted ecosystems. The lowest and medium polluted areas offered the better conditions of invertebrates' populations, in comparison with high polluted grasslands.

ACKNOWLEDGMENT

This study was carried out in the framework of the projects: RO1567-IBB01/2016 from Institute of Biology-Bucharest, Romanian Academy and no. 50/2012 (ASPABIR) - Priority Uefiscdi Partnerships. We thank to Simona Plumb and Rodica Iosif for their assistance in the lab and the field.

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MUZEUL JUDEȚEAN ARGEȘ, PITEȘTI, ROMÂNIA
ARGESIS - *STUDII ŞI COMUNICĂRI - seria ŞTIINŢELE NATURII,* **TOM XXIV**, 2016

THE CENSUS OF THE WATER BIRDS FROM THE DAM BASINS FROM THE ARGEŞ RIVER, BETWEEN VÂLCELE AND GOLEŞTI (JANUARY, 2015)

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ABSTRACT. In this paper is presented the condition of the birds observed on January 13, 2015, on the dam basins between Vâlcele and Goleşti, from the ROSPA0062 Lacurile de Acumulare de pe Argeş. The 42 identified species, which belong to 10 orders, numbered 16,907 individuals; 23 of them depend on water. Their repartition on the dam basins varied both on the surface of every basin and on the proportion of ice of each of them: for 20-70% frozen surface, it was stated, generally, that the larger the sheet of ice, the higher the number of species and individuals. *Anas platyrhynchos*, *Aythya ferina* and *Larus ridibundus* were the eudominant species and the Anseriformes and Charadriiformes were the overdominant orders. *Phalacrocorax pygmeus*, *Egretta alba*, *Cygnus cygnus*, *Aythya nyroca* and *Mergus albellus* are protected by the Annex I of the Birds Directive.

Keywords: birds, ROSPA0062, Argeş River, protection.

REZUMAT. **Recensământul păsărilor de apă de pe lacurile de acumulare de pe râul Argeş, dintre Vâlcele şi Goleşti (ianuarie, 2015).** În această lucrare, este prezentată situaţia păsărilor observate la data de 13 ianuarie 2015 pe lacurile de acumulare dintre Vâlcele şi Goleşti, din ROSPA0062 Lacurile de Acumulare de pe Argeş. Cele 42 de specii, care aparţin la 10 ordine, au numărat 16907 exemplare; 23 dintre acestea depind de zonele umede. Repartiţia lor pe lacurile de acumulare a variat atât în funcţie de suprafaţa fiecărui bazin, cât şi de suprafaţa îngheţată a fiecăruia dintre acestea: pentru 20-70% suprafaţă îngheţată, s-a constatat că, în general, cu cât este mai întinsă pătura de gheaţă, cu atât este mai mare numărul de specii şi de exemplare. *Anas platyrhynchos*, *Aythya ferina* şi *Larus ridibundus* au fost speciile eudominante iar Anseriformes şi Charadriiformes au fost ordinele eudominante. *Phalacrocorax pygmeus*, *Egretta alba*, *Cygnus cygnus*, *Aythya nyroca* şi *Mergus albellus* sunt protejate de Anexa I a Directivei Păsări.

Cuvinte cheie: păsări, ROSPA0062, râul Argeş, protecţie.

INTRODUCTION

The International Waterbird Census is a program that has as main aims the registering of the numbers of the water birds and the monitoring of the changes happened in their environment. It is organised, on an international level, by the Wetlands International, starting in 1967 and, on the national level, by the Romanian Ornithological Society, beginning in 1990. It takes place every year between 10 and 20 January.

In the Argeş County, the observations were performed on the dam basins from the middle and upper course of the Argeş River. As a consequence the reservoirs were declared to be Important Birds Area (IBA) and part of the Nature 2000 Network (named ROSPA0062 Lacurile de Acumulare de pe Argeş).

The first research-studies were occasional (Munteanu & Mătieş, 1983; Gava, 1997). The area was studied mainly after 2000 year (Gava et al., 2004a; Gava et al., 2004b; Mestecăneanu et al., 2005; Conete et al., 2009; Conete et al., 2010; Mestecăneanu et al., 2010; Conete, 2011; Mestecăneanu & Gava, 2015; etc.).

MATERIALS AND METHODS

The Argeş River springs from the Făgăraş Mountains and flows into the Danube River. It drains a part of the southern versant of the Făgăraş Mountains, Subcarpathian area, Getic Piedmont and Romanian Plain. The dam basins, which were constructed on the river after 1960, determined a strong change of the landscape and of the qualitative and quantitative structure of the avifauna. The water birds are attracted here in great number because of the quite adequate conditions of food and shelter. Also, the place of the area in the continuation of the Rucăr-Bran Corridor of migration is a good reason (Mătieş, 1969).

The vegetation is typical of the wetlands from the southern parts of Romania, with reedbeds (*Phragmites* sp., *Typha* sp.) and other typical plants (*Carex* sp., *Juncus* sp., *Salix* sp., *Alnus* sp., *Populus* sp. etc.).

The climate of the area is temperate-continental. The hilly influences are obvious. The annual average temperature of the air is 9 ^{o}C and the annual temperature of the water is between 6.4 ^{o}C, in the Argeş Gorges, and 9 ^{o}C, in Piteşti. The bridge of ice is formed in winters with accentuate continental aspect (Barco & Nedelcu, 1974).

Vâlcele (408 ha), Budeasa (412 ha), Bascov (162 ha), Piteşti (122 ha), and Goleşti (649 ha) were the researched dam basins (Fig. 1). In the day of observations, their surface, covered with ice, varied between 20 and 70%, the medium being 42% (Tab. 1).

The census was performed on January 13, 2015, between 9:00 and 15:00.

The water birds species and their strengths were registered and, complementary, the other observed species. The itinerary method was used and, as tools, a binocular and a terrestrial scope. The identification of the birds was based on the Hamlin Guide (Bruun et al., 1999).

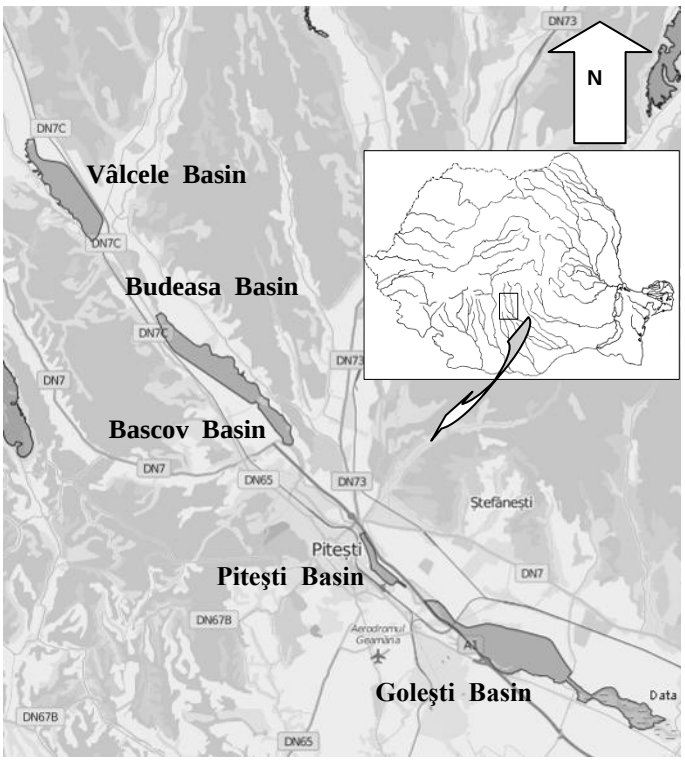

Figure 1 - The map of the area.
(by http://biodiversitate.mmediu.ro, modified).

RESULTS AND DISCUSSIONS

During the census, 42 species of birds (with 16,907 individuals) were recorded (Tab. 1). The species belong to 10 orders (Podicipediformes, Pelecaniformes, Ciconiiformes, Anseriformes, Falconiformes, Gruiformes, Charadriiformes, Columbiformes, Piciformes and Passeriformes). Anseriformes was the best represented as individuals (9,894) and Passeriformes was the best represented in regard to the number of species (15).

The Goleşti Dam Basin had the most individuals (9,293); the fewest individuals were observed on the Bascov Basin (123). By the number of species, the biggest one was registered on the Goleşti Basin (28), and the smallest one, on the Bascov Basin (9), too. 23 species depend on water. They had a comparable repartition on the basins (Tab. 2). The correlation between the number of these species and the whole surface of each dam basin was 0.61 (positive and moderately strong linear relationship) and the correlation between the strengths of these species and the whole surface of each dam basin was 0.44 (positive and fair degree of linear relationship). On the other hand, the correlation between the number of these species and the unfrozen surface of water of each dam basin was 0.28

(positive and fair degree of linear relationship) and the correlation between the strengths of these species and the unfrozen surface of water of each dam basin was -0.17 (negative and weak or no linear relationship). Furthermore, the correlation between the number of these species and the covered surface with ice of each dam basin was 0.57 (positive and moderately strong linear relationship) and the correlation between the strengths of these species and the covered surface with ice of each dam basin was 0.82 (positive and very strong linear relationship) (by Colton, 1974). These mean that, in the conditions of the year 2015: 1) generally, the number of the species dependent on wetlands and their strengths varied in direct proportion with the surface of the basins; 2) the number of the species dependent on wetlands and their strengths did not respond immediately to the change of the frozen surface of the basins, because they gathered on the water uncovered with ice; 3) for 20-70% frozen surface of the basins, the number of the species dependent on wetlands and their strengths were strongly influenced by the climate of the whole region, because the higher the frozen surface, the higher the number of species and individuals (the birds found refuge here as a result of the freezing of the small ponds and rivers from the entire area).

Table 1 - The birds identified on the dam basins from the ROSPA0062 Lacurile de Acumulare de pe Argeş their strengths and the category of dominance.

No.	Species	Dam basins					Absolute abundance	Category of dominance	Observations
		Goleşti	Piteşti	Bascov	Budeasa	Vâlcele			
	I. Podicipediformes								
1.	*Podiceps cristatus** (Linnaeus, 1758)	+				+	2	D1	
2.	*Tachybaptus ruficollis** (Pallas, 1764)	+	+	+	+	+	27	D1	Max. 9 ind./ Bascov, Budeasa
	II. Pelecaniformes								
3.	*Phalacrocorax carbo** (Linnaeus, 1758)		+	+	+	+	178	D1	Max. 138 ind./ Vâlcele
4.	*Phalacrocorax pygmeus** (Pallas, 1773)		+	+			14	D1	Each 7 ind.
	III. Ciconiiformes								
5.	*Egretta alba** (Linnaeus, 1758)	+				+	3	D1	Max. 2 ind./ Vâlcele
6.	*Ardea cinerea** Linnaeus, 1758		+		+	+	4	D1	Max. 2 ind./ Vâlcele
	IV. Anseriformes								
7.	*Cygnus olor** (Gmelin, 1789)	+	+		+	+	321	D2	Max. 196 ind./ Goleşti
8.	*Cygnus cygnus** (Linnaeus, 1758)		+				8	D1	

9.	*Anser albifrons** (Scopoli, 1769)	+					45	D1	
10.	*Anas platyrhynchos** Linnaeus, 1758	+	+		+	+	6,008	D5	Max. 3,900 ind./Goleşti
11.	*Anas strepera** Linnaeus, 1758	+					2	D1	
12.	*Anas penelope** Linnaeus, 1758	+					7	D1	
13.	*Anas crecca** Linnaeus, 1758	+			+	+	743	D3	Max. 600 ind./ Goleşti
14.	*Tadorna tadorna** (Linnaeus, 1758)	+					15	D1	
15.	*Aythya fuligula** (Linnaeus, 1758)	+	+			+	260	D2	Max. 210 ind./ Goleşti
16.	*Aythya ferina** (Linnaeus, 1758)	+	+		+	+	2,355	D5	Max. 1,250 ind./Goleşti
17.	*Aythya nyroca** (Güldenstädt, 1770)	+					2	D1	
18.	*Bucephala clangula** (Linnaeus, 1758)	+	+		+	+	122	D1	Max. 59 ind./ Vâlcele
19.	*Mergus albellus** Linnaeus, 1758	+			+		6	D1	Max. 4 ind./ Goleşti
	V. Falconiformes								
20.	*Buteo buteo* (Linnaeus, 1758)	+				+	2	D1	
21.	*Falco tinnunculus* (Linnaeus, 1758)	+					1	D1	
	VI. Gruiformes								
22.	*Fulica atra** (Linnaeus, 1758)	+	+	+	+		825	D3	Max. 520 ind./ Goleşti
	VII. Charadriiformes								
23.	*Larus argentatus* Pontoppidan, 1763*	+	+	+	+	+	1,417	D4	Max. 550 ind./ Budeasa
24.	*Larus canus** Linnaeus, 1758	+	+		+	+	1,245	D4	Max. 600 ind./ Piteşti
25.	*Larus ridibundus** Linnaeus, 1766	+	+	+		+	3,086	D5	Max. 1,550 ind./Goleşti
	VIII. Columbiformes								
26.	*Streptopelia decaocto* (Frivaldszky, 1838)		+				1	D1	
	IX. Piciformes								
27.	*Dendrocopos major* (Linnaeus, 1758)					+	1	D1	
	X. Passeriformes								
28.	*Anthus spinoletta* (Linnaeus, 1758)	+					2	D1	

29.	*Pica pica* (Linnaeus, 1758)	+	+	+	+		26	D1	Max. 10 ind./ Budeasa
30.	*Corvus monedula* Linnaeus, 1758		+				45	D1	
31.	*Corvus frugilegus* Linnaeus, 1758	+	+				61	D1	Max. 57 ind./Piteşti
32.	*Corvus corax* Linnaeus, 1758	+	+			+	4	D1	Max. 2 ind./ Goleşti
33.	*Parus caeruleus* Linnaeus, 1758		+		+	+	7	D1	Max. 3 ind./ Budeasa, Vâlcele
34.	*Parus major* Linnaeus, 1758		+	+			8	D1	Each 4 ind.
35.	*Sitta europaea* Linnaeus, 1758		+				1	D1	
36.	*Passer domesticus* (Linnaeus, 1758)				+		20	D1	
37.	*Passer montanus* (Linnaeus, 1758)				+		3	D1	
38.	*Fringilla coelebs* Linnaeus, 1758					+	11	D1	
39.	*Carduelis chloris* (Linnaeus, 1758)	+					2	D1	
40.	*Carduelis carduelis* (Linnaeus, 1758)	+	+				11	D1	Max. 6 ind./ Goleşti
41.	*Carduelis cannabina* (Linnaeus, 1758)			+	+		11	D1	Max. 8 ind./ Bascov
42.	*Emberiza citrinella* Linnaeus, 1758	+					5	D1	

Legend: * - species dependent on water; + - presence; D1 - subrecedent species, D2 - recedent species, D3 - subdominant species, D4 - dominant species, D5 - eudominant species; ind. - individual(s).

Table 2 - The distribution of species, their strengths and the percent of surface covered with sheet of ice on each dam basin and per total.

Parameter	**Goleşti Basin**	**Piteşti Basin**	**Bascov Basin**	**Budeasa Basin**	**Vâlcele Basin**	**All basins**
Number of species	28	23	9	17	19	42
Number of individuals	9,293	3,567	123	3,147	787	16,917
Number of species dependent on water	19	14	6	12	14	23
Number of individuals dependent on water	9,263	3,446	108	3,108	770	16,695
Percent of surface covered with sheet of ice	70	30	40	50	20	42

Depending on the dominance, 3 species (7.14%, *Anas platyrhynchos*, *Aythya ferina* and *Larus ridibundus*) were eudominant (D5), 2 species (4.76%, *Larus argentatus* ssp. *cachinnans/michahellis* and *Larus canus*) were dominant (D4), 2 species (4.76%, *Anas crecca* and *Fulica atra*) were subdominant (D3), 2 species (4.76%, *Cygnus olor* and *Aythya fuligula*) were recedent (D2) and 33 species (78.57%, *Podiceps cristatus*, *Phalacrocorax carbo*, *Anas strepera*, *Mergus albellus*, *Pica pica*, *Parus major*, *Carduelis carduelis*, etc.) were subrecedent (D1), (Tab. 1, Fig. 2).

From the eudominant species point of view, all the 3 species were the most abundant on the Goleşti Dam Basin. Each of them was not registered in observations: *Anas platyrhynchos* and *Aythya ferina*, on the Bascov Dam Basin, and *Larus ridibundus*, on the Budeasa Dam Basin (Tab. 1, Fig. 3).

For the whole area, according to the index of relation, the Anseriformes and Charadriiformes orders were overdominant (on the graphic, over the dominance axis - DA) and the other orders were complementary (on the graphic, below the static axis - SA), (Fig. 4).

For the Anseriformes order, *Anas platyrhynchos* and *Aythya ferina* were the overdominant species and the other species were the complementary species (Fig. 5).

Regarding the protected species by the Birds Directive (Directive 2009/147/CE), only 5 species are in the Annex I (11.62% - *Phalacrocorax pygmeus*, *Egretta alba*, *Cygnus cygnus*, *Aythya nyroca* and *Mergus albellus*). They are the subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution (Munteanu, 2004).

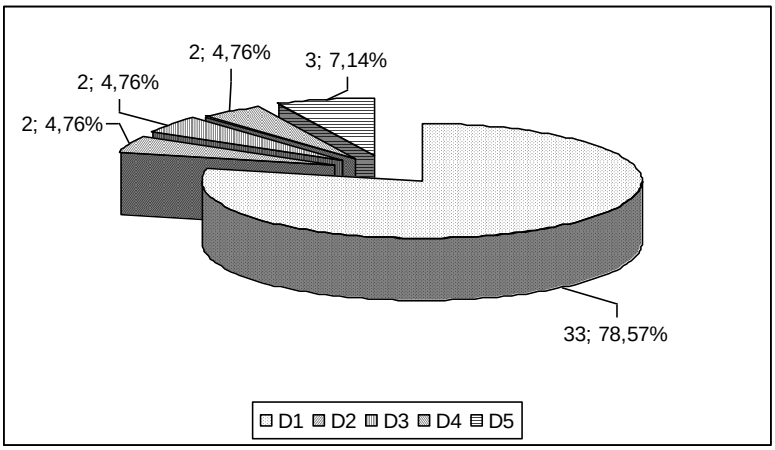

Figure 2 - The repartition of the species depending on the categories of dominance.

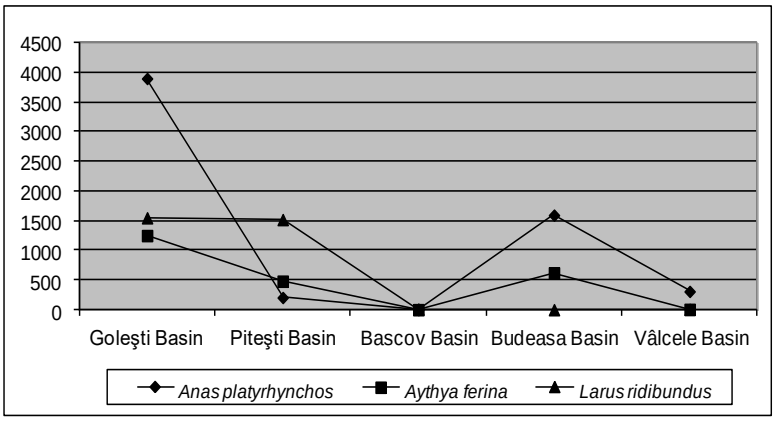

Figure 3 - The evolution of the eudominant species on each dam basin.

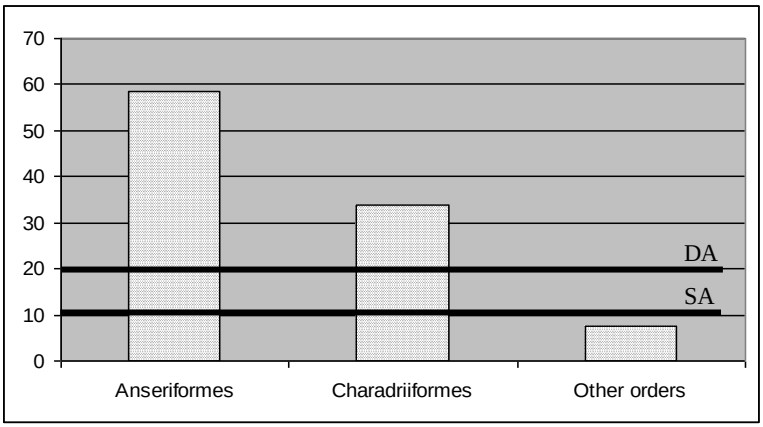

Figure 4 - The participation of the orders to the avicoenose formation by the index of relation.

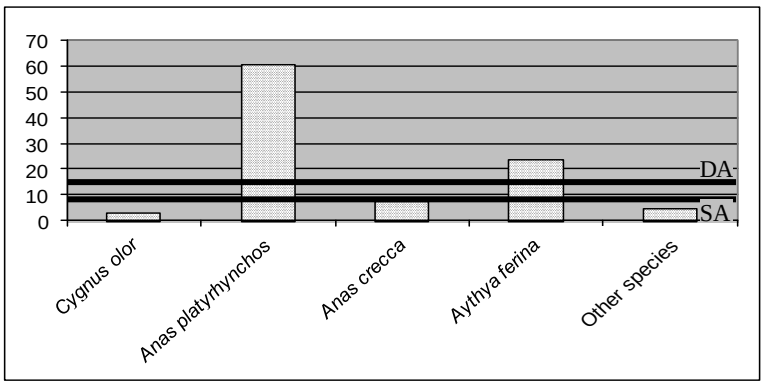

Figure 5 - The participation of the species to the formation of the Anseriformes coenose by the index of relation.

CONCLUSIONS

During the census, 42 species of birds that belong to 10 orders (with 16,907 individuals) were recorded.

The Goleşti Basin has the most individuals (9,293) and the biggest number of species (28); the fewest individuals (123) and the smallest number of species (9) were observed on the Bascov Basin.

Generally, the number of the species dependent on wetlands and their strengths varied in direct proportion with the surface of the basins.

The number of the species dependent on wetlands and their strengths did not respond immediately to the change of the frozen surface of the basins, because they gathered on the water uncovered with ice.

For 20-70% frozen surface of the basins, the number of the species dependent on wetlands and their strengths were strongly influenced by the climate of the whole region, because it was observed that the higher the frozen surface, the higher the number of species and individuals.

3 species (7.14%, *Anas platyrhynchos*, *Aythya ferina* and *Larus ridibundus*) were eudominant (D5); they were the most abundant on the Goleşti Dam Basin.

The Anseriformes and Charadriiformes orders were overdominant while the other orders were complementary.

For the Anseriformes order, *Anas platyrhynchos* and *Aythya ferina* were the overdominant species while the other species were complementary species.

Only 5 species are protected by the Annex I of the Birds Directive (11.62% - *Phalacrocorax pygmeus*, *Egretta alba*, *Cygnus cygnus*, *Aythya nyroca* and *Mergus albellus*).

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MUZEUL JUDEȚEAN ARGEȘ, PITEȘTI, ROMÂNIA
ARGESIS - *STUDII ŞI COMUNICĂRI* - *seria ŞTIINŢELE NATURII*, **TOM XXIV**, 2016

THE EVALUATION OF THE CONSERVATION STATUS FOR SOME BIRDS SPECIES FROM ROSPA0073 MĂCIN - NICULIŢEL

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ABSTRACT. In this paper is presented the current state of conservation for some species of birds, included in the Annex I of the Birds Directive, observed in the recent years in ROSPA0073 Măcin-Niculiţel. During the period of research-study, 19 species of birds of the 21 considered were observed, but it is also possible the presence of the other two: one, *Pelecanus crispus*, was seen in passage and the other, *Falco cherrug*, bred here in the last years. The majority have a favourable status of conservation, the rest having an unknown status, because of insufficient or inexistent concluding data. Also, other appreciations on the measures of conservation that it must be taken for assurance of a favourable future of these species are done. The most important of them are: the adequate management of the forests, the banning of the new wind farm building, the diminishing of rocks exploitation, the stopping of uncontrolled tourism, the practice of a traditional agriculture, the blocking of the poaching, the elimination of the pollution, etc.

Keywords: conservation state, Birds Directive, ROSPA0073 Măcin-Niculiţel.

REZUMAT. Evaluarea statutului de conservare pentru unele specii de păsări din ROSPA0073 Măcin - Niculiţel. În această lucrare, este prezentată starea actuală de conservare a unor specii de păsări incluse in Anexa I a Directivei Păsări, care au fost observate în anii recenţi în ROSPA0073 Măcin-Niculiţel. În perioada de studiu, din cele 21 de specii considerate, au fost observate 19, însă este posibilă şi prezenţa celorlalte două: prima, *Pelecanus crispus*, a fost observată în pasaj iar cealaltă, *Falco cherrug*, a cuibărit aici în ultimii ani. Majoritatea speciilor au un statut de conservare favorabil, restul având un statut necunoscut, din cauza datelor insuficiente sau neconcludente. Se fac, de asemenea, unele aprecieri privitoare la măsurile de conservare care trebuie luate pentru asigurarea unui viitor favorabil acestor specii de păsări. Dintre acestea, cele mai importante sunt: managementul adecvat al pădurilor, interzicerea construirii de noi ferme eoliene, diminuarea exploatărilor de rocă, oprirea turismului necontrolat, practicarea unei agriculturi tradiţionale, stoparea braconajului, eliminarea poluării etc.

Cuvinte cheie: stare de conservare, Directiva Păsări, ROSPA0073 Măcin-Niculiţel.

INTRODUCTION

The birds' conservation in sites designed by law is necessary to maintain the stability of the protected species populations and the high biodiversity, fact that is realisable through the conservation of the specific habitats for breeding, passage or wintering, using an adequate management against the damaging factors.

The data that this paper is based on were collected through the project „Studii pentru elaborarea Planului de Management integrat al PNMM prin revizuirea şi integrarea prescripţiilor de management pentru siturile Natura 2000 (SPA-ul Măcin - Niculiţel şi SCI-ul Munţii Măcinului) ce includ PNMM"/„Studies for the elaboration of the Integrated Management Plan of NPMM by reviewing and integrating management prescriptions for Natura 2000 sites (Măcin-Niculiţel SPA and Măcin Mountains SCI) including NPMM" (Contract no. 286/POS/August 29, 2011 between RNP Romsilva Administraţia Parcului Naţional Munţii Măcinului RA and S.C. Multidimension Research and Development S.R.L./S.C. Geosystems Romania S.R.L.).

21 species of birds were considered: *Pelecanus onocrotalus* Linnaeus, 1758, *Pelecanus crispus* Bruch, 1832, *Ciconia ciconia* (Linnaeus, 1758), *Ciconia nigra* (Linnaeus, 1758), *Aquila heliaca* Savigny, 1809, *Aquila clanga* (Pallas, 1811), *Hieraaetus pennatus* (Gmelin, 1788), *Circaetus gallicus* (Gmelin, 1788), *Buteo rufinus* (Cretzschmar, 1827), *Accipiter brevipes* (Severtzov, 1850), *Circus cyaneus* (Linnaeus, 1758), *Falco cherrug* Gray, 1834, *Falco columbarius* Linnaeus, 1758, *Burhinus oedicnemus* (Linnaeus, 1758), *Caprimulgus europaeus* Linnaeus, 1758, *Coracias garrulus* Linnaeus, 1758, *Dendrocopos syriacus* (Hemprich & Ehrenberg, 1833), *Dendrocopos medius* (Linnaeus, 1758), *Lullula arborea* (Linnaeus, 1758), *Oenanthe pleschanka* (Lepechin, 1770) and *Emberiza hortulana* Linnaeus, 1758. They are part of the Annex I of the Birds Directive (http://ec.europa.eu/environment/nature).

MATERIALS AND METHODS

ROSPA0073 Măcin - Niculiţel, where the research-study was performed, is located in the north-western part of Tulcea County, in Dobrudja. Its surface (67,361 ha) includes the Măcin Mountains and Niculiţel Hills. The maximum height is Ţuţuianu Peak (467 m) and the lowest, the Jijila Pond (0 m). The Măcin Mountains have two crests: Pricopan-Megina and Măcin, which are separated by the Greci Depression. The Niculiţel Hills are disposed in the eastern part of the area; their altitude is lower than that of the Măcin Mountains. The road DJ 222A divides almost in equal parts the two components.

The Danube flows close to the West, North and North-East borders. Other small rivers are: the Jijila, the Greci, the Taiţa, the Isaccea, the Luncaviţa (Fig. 1).

The excessive temperate-continental climate is characterised by very dry summers and very cold winters (-15 ^{o}C in January, 35 ^{o}C in July, 10-11 ^{o}C, the annual average temperature). The precipitations vary between 350 and 450

mm/year. The winds are intense and relatively constant and blow predominantly from North and North-East.

The vegetation is formed by species of steppe: *Agropyron repens* (L.), *Stipa pennata* L., *Chrysopogon gryllus* (L.) Trin., *Festuca* sp., *Andropogon* sp., *Thymus* sp., *Artemisia* sp., *Potentilla* sp., *Verbascum* sp., *Ononis spinosa* L., etc. and silvo-steppe: *Cotinus coggygria* (Scop.), *Crataegus monogyna* (Poir.) Mutel, *Prunus spinosa* L., *Quercus pedunculiflora* K. Koch, *Quercus pubescens* Willd., *Fagus sylvatica* L. - the last, in Valea Fagilor Reserve, etc.

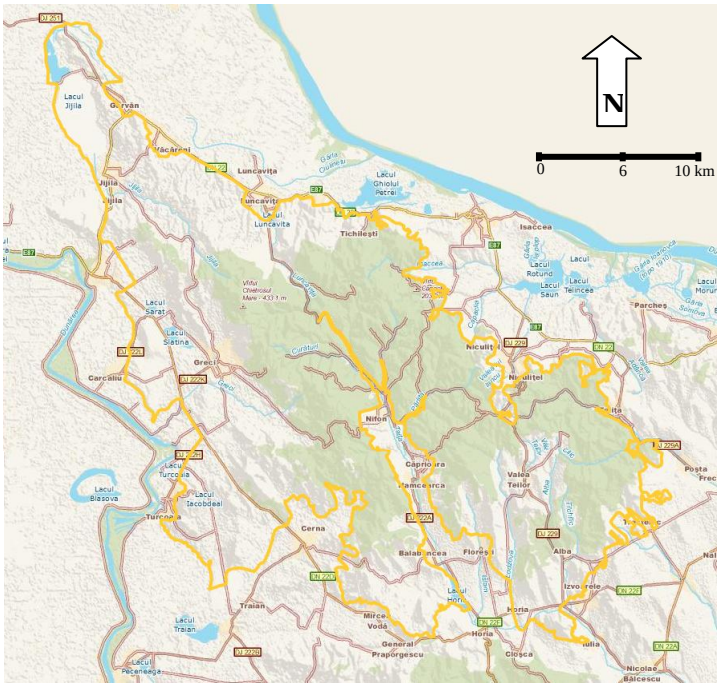

Figure 1 - The map of ROSPA0073 Măcin-Niculiţel
(bordered by orange line, cf. infonatura2000).

There are numerous species of animals, some of them being protected: *Lycaena dispar* (Haworth, 1802), *Lucanus cervus* (Linnaeus, 1758), *Osmoderma eremita* (Scopoli, 1763), *Morimus funereus* Mulsant, 1862, *Euphydryas maturna* (Linnaeus, 1758), *Bombina bombina* (Linnaeus, 1758), *Bufo bufo* (Linnaeus, 1758), *Testudo graeca* Linnaeus, 1758, *Elaphe quatuorlineata* (Lacepede, 1789), *Rhinolophus ferrumequinum* (Schreber, 1774), *Spermophilus citellus* (Linnaeus, 1766), *Mesocricetus newtoni* (Nehring, 1898), *Mustela eversmanii* Lesson, 1827, *Felis silvestris* Schreber, 1775, etc. Almost 200 species of birds were observed in the last decades in area. 56 of them are also protected: *Ciconia ciconia* (Linnaeus, 1758), *Accipiter brevipes* (Severtzov, 1850), *Aquila pomarina* C. L. Brehm, 1831, *Buteo rufinus* (Cretzschmar, 1827), *Circus pygargus* (Linnaeus, 1758), *Falco peregrinus* Tunstall, 1771, *Falco cherrug* Gray, 1834, *Burhinus oedicnemus*

(Linnaeus, 1758), *Coracias garrulus* Linnaeus, 1758, *Dendrocopos leucotos* (Bechstein, 1803), *Picus canus* Gmelin, 1788, *Lullula arborea* (Linnaeus, 1758), *Anthus campestris* (Linnaeus, 1758), *Sylvia nisoria* (Bechstein, 1795), *Oenanthe pleschanka* (Lepechin, 1770), *Ficedula albicollis* (Temminck 1815), *Lanius minor* Gmelin, 1788, *Emberiza hortulana* Linnaeus, 1758, etc. (cf. infonatura2000).

The understanding of the conservation status of a species at the level of a protected area can be done following some attributes that define a favourable state of conservation (Tab. 1). They are related to a value of reference (Tab. 2), conformable to a general evaluation matrix (https://circabc.europa.eu/).

The data were gathered between March, 2012 and July, 2013. Minimum 20 hours of field observations were performed every month. Some observations were done in January - October 2012, too. Two methods were applied: the transect method and the method of the fixed points of observations. Also, occasional observations were added. Binoculars and spotting scopes were used and the locations were registered with GPS receivers.

Table 1 - The attributes used in the evaluation process of the conservation status.

Attributes	**Objectives**	**Acceptable limits of the reference value**
The distribution of the species inside the area	The maintaining of a favourable area of distribution for the target species	- The distribution of the species in the area in 2011 is considered value of reference
The size of the population	The maintaining of a favourable value for the population size	- The population mentioned in the standard form of the area is considered value of reference
The species habitat	The maintaining of a habitat quality	- The habitat quality at the moment of this study (2011) is considered value of reference
The trend of evolution	The insurance of a favourable trend for species inside the area	There are considered: - the threats on the species - the threats on the habitat integrity of the species - existing measures of conservation

Table 2 - The general matrix for the evaluation of the conservation status of the species at the level of the protected area.

Parameter	**Conservation Status**			
	Favourable ("green")	**Unfavourable - Inadequate ("amber")**	**Unfavourable - Bad ("red")**	***Unknown (insufficient information to make an assessment)***
Local distribution (the distribution of	Stable (Loss and extension in balance) or increasing AND	Any other combination	Large decline: Equivalent to a loss of more than 1% per year within period specified	*No or insufficient reliable information*

the species inside the area)	not smaller than the "favourable reference range"		OR more than 10% below favourable reference range	*available*
Population	Population(s) not lower than "favourable reference population" AND reproduction, mortality and age structure not deviating from normal (if data available)	Any other combination	Large decline: Equivalent to a loss of more than 1% per year within period specified AND below "favourable reference population" OR More than 25% below favourable reference population OR Reproduction, mortality and age structure strongly deviating from normal (if data available)	*No or insufficient reliable information available*
Species habitat	Area of habitat is sufficiently large (and stable or increasing) AND habitat quality is suitable for the long term survival of the species	Any other combination	Area of habitat is clearly not sufficiently large to ensure the long term survival of the species OR Habitat quality is bad, clearly not allowing long term survival of the species	*No or insufficient reliable information available*
Future prospects (as regards to population, range and habitat availability)	Main pressures and threats to the species not significant; species will remain viable on the long-term	Any other combination	Severe influence of pressures and threats to the species; very bad prospects for its future, long-term viability at risk	*No or insufficient reliable information available*
Overall assessment of the conservation status	All "green" OR three "green" and one "unknown"	One or more "amber" but no "red"	One or more "red"	Two or more "unknown" combined with green or all "unknown"

RESULTS AND DISCUSSIONS

During the period of the research-study, 19 species of the 21 investigated were observed. They are: *Pelecanus onocrotalus, Ciconia ciconia, Ciconia nigra,*

Aquila heliaca, *Aquila clanga*, *Hieraaetus pennatus*, *Circaetus gallicus*, *Buteo rufinus*, *Accipiter brevipes*, *Circus cyaneus*, *Falco columbarius*, *Burhinus oedicnemus*, *Caprimulgus europaeus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Lullula arborea*, *Oenanthe pleschanka*, and *Emberiza hortulana*. *Pelecanus crispus* and *Falco cherrug* were not observed but they were recorded in the area in the recent years. We considered that 13 species (*Pelecanus onocrotalus*, *Ciconia ciconia*, *Ciconia nigra*, *Hieraaetus pennatus*, *Buteo rufinus*, *Accipiter brevipes*, *Burhinus oedicnemus*, *Coracias garrulus*, *Dendrocopos syriacus*, *Dendrocopos medius*, *Lullula arborea*, *Oenanthe pleschanka*, and *Emberiza hortulana*) have a favourable status and 8 species (*Pelecanus crispus*, *Aquila heliaca*, *Aquila clanga*, *Circaetus gallicus*, *Circus cyaneus*, *Falco cherrug*, *Falco columbarius*, *Caprimulgus europaeus*) have an unknown status (Tab. 3 - 23).

Table 3 - The matrix for the evaluation of the conservation state of the White Pelican (*Pelecanus onocrotalus*).

Parameter	Indicator	Comments
Local distribution	"green"	It is not breeding in the area, but it was observed many times in flight and on the Rachelu Lake from vicinity.
Population	"unknown"	Insufficient data. 101 individuals in April 2013 and 64 individuals in June 2013 seen in flight over the area. Other evaluations: 1,500-2,500 individuals in migration (cf. Natura 2000 Standard Form), 4,361 individuals in migration (Râioasa Peak) between August and October, 2006 (Pap, 2007).
Habitat of species	"green"	The habitat does not allow the breeding in the area, but it does not present any problem for transit.
Perspectives	"green"	The species has favourable perspectives. Its strengths depend mainly on the protection offered in the breeding quarters from Danube Delta, protection that, currently, is assured.
The evaluation of the conservation status	"green"	FAVOURABLE STATUS

Table 4 - The matrix for the evaluation of the conservation state of the Dalmatian Pelican (*Pelecanus crispus*).

Parameter	Indicator	Comments
Local distribution	"unknown"	It is not breeding in the area and it was not observed flying over it.
Population	"unknown"	Inexistent concluding data. Probably, it moves over the area, but in small number. Previous evaluations: 25-40 individuals in migration (cf. Natura 2000 Standard Form), 2 individuals in migration (Râioasa Peak) between August and October, 2006 (Pap, 2007).
Habitat of species	"green"	The habitat does not allows the breeding of the species, but it not presents any problem for migration.

Perspectives	"green"	The strengths of the species depend on the protection from the breeding quarters from Danube Delta, protection that currently is assured.
The evaluation of the conservation status	"unknown"	UNKNOWN STATUS

Table 5 - The matrix for the evaluation of the conservation state of the White Stork (*Ciconia ciconia*).

Parameter	Indicator	Comments
Local distribution	"green"	The species breeds in many localities from the area and its vicinity. The open lands, with herbs, and the cultivated ones are places of feeding, both in the breeding and passage times.
Population	"green"	22 active nests and one inactive were recorded (Mestecăneanu et al., 2014). An estimation of the individuals passing over the area did not have been performed. Other evaluations: 14-16 breeding pairs and 30,000-40,000 individuals in migration (cf. Natura 2000 Standard Form), 38,800 individuals in migration (Râioasa Peak) between August and October, 2006 (Pap, 2007).
Habitat of species	"green"	The habitat is favourable for breeding and feeding.
Perspectives	"green"	The species breeds mainly on the concrete pylons of the low voltage lines, with the risk of electrocution, especially for the chicks. If nests are mounted on metal supports and all electrical connections of the power lines are isolated, the prospects are favourable.
The evaluation of the conservation status	"green"	FAVOURABLE STATUS

Table 6 - The matrix for the evaluation of the conservation state of the Black Stork (*Ciconia nigra*).

Parameter	Indicator	Comments
Local distribution	"green"	Perhaps, the species is breeding here, some individuals being observed in summer. Also, in migration some birds fly over the area and, probably, stop here for rest and food.
Population	"unknown"	It is expected the presence of at least one breeding pair in area or in its immediate neighbourhood. An estimation of the individuals passing over the area did not have been performed. Other evaluations: 800-1,000 individuals in migration (cf. Natura 2000 Standard Form), 476 individuals in migration (Râioasa Peak) between August and October, 2006 (Pap, 2007).
Habitat of species	"green"	The habitat is favourable for breeding and feeding.
Perspectives	"green"	The perspectives are favourable if the standing crop is managed in conformity with the species requests (the maintaining of the forest peace and the preservation

		of the old trees, necessary for the installation of the nests) and, also, if the soil and water are not polluted.
The evaluation of the conservation status	"green"	FAVOURABLE STATUS

Table 7 - The matrix for the evaluation of the conservation state of the Imperial Eagle (*Aquila heliaca*).

Parameter	Indicator	Comments
Local distribution	"unknown"	The species was observed between Rachelu and Revărsarea.
Population	"unknown"	Perhaps, no breeding pair in the area; the individuals that were seen here in the recent years are, most likely, migratory birds or birds that do not breed here. Observed in September, 2012. Other evaluations: 4-10 individuals in migration (cf. Natura 2000 Standard Form), 2 individuals in migration (Râioasa Peak) between August and October, 2006 (Pap, 2007).
Habitat of species	"green"	The habitat is favourable for breeding and feeding.
Perspectives	"green"	Because of the tendency of the youth to disperse in search of new territories, the species is expected to reoccupy in the future (with favourable habitat and protection) the breeding area.
The evaluation of the conservation status	"unknown"	UNKNOWN STATUS

Table 8 - The matrix for the evaluation of the conservation state of the Greater Spotted Eagle (*Aquila clanga*).

Parameter	Indicator	Comments
Local distribution	"unknown"	The species was observed between Rachelu and Revărsarea.
Population	"unknown"	The breeding population is most likely zero. Insufficient data. The individuals observed here in the last years are migratory birds or winter visitors. Other evaluations: 4-10 individuals in migration (cf. Natura 2000 Standard Form), 2 individuals in migration (Râioasa Peak) between August and October, 2006 (Pap, 2007).
Habitat of species	"green"	The habitat is favourable for breeding and feeding.
Perspectives	"green"	Because of the efficient measures of protection, adopted at European, national and local levels, it is expected that the species will reoccupy the ancient breeding area and, consequently, will be seen more frequent in passage and in winter. In the future, it is possible even the breeding in the area.
The evaluation of the conservation status	"unknown"	UNKNOWN STATUS

Table 9 - The matrix for the evaluation of the conservation state of the Booted Eagle (*Hieraaetus pennatus*).

Parameter	Indicator	Comments
Local distribution	"green"	The species was seen inside the park, both in the forested area (of breeding) and in the open one (of feeding), from Măcin-Greci-Cerna and Hamcearca-Valea Teilor.
Population	"green"	The breeding population is estimated at 10-12 pairs. Other evaluations: 10-14 breeding pairs and 50-80 individuals in migration (cf. Natura 2000 Standard Form), 49 individuals in migration (Râioasa Peak) between August and October, 2006; also, 6-8 breeding pairs in the Munţii Măcinului National Park (Pap, 2007).
Habitat of species	"green"	The habitat provides food (ground-squirrels and other small rodents) for the breeding population but, because some birds eat outside the area (as it was observed, for instance, near Cerna), it is necessary the keeping of the current terrain employments (pastures, crops).
Perspectives	"green"	Through the maintaining of the conservation/exploitation status of the woods and open areas at least at the present level, the species has favourable perspective. However, the disposing of wind farms within the park has negative effects on the birds (collisions, the restraining of the feeding areas, etc.).
The evaluation of the conservation status	"green"	FAVOURABLE STATUS

Table 10 - The matrix for the evaluation of the conservation state of the Short-toed Eagle (*Circaetus gallicus*).

Parameter	Indicator	Comments
Local distribution	"unknown"	It breeds in forests and it feeds mainly in the open areas (pastures, rocky places, crops, etc.). Insufficient concluding data.
Population	"unknown"	The species was rarely observed (in April and June), mainly because of its quite timid behaviour. Minim two breeding pairs, but below the previous estimations of 10-14 pairs (cf. Natura 2000 Standard Form) and 5-7 pairs in the Munţii Măcinului National Park (Pap, 2007). Other estimations: 80-120 individuals in migration (cf. Natura 2000 Standard Form) and 81 individuals in migration (Râioasa Peak) between August and October, 2006 (Pap, 2007).
Habitat of species	"green"	The habitat is quite large and its quality allows the surviving of the species on long term.

Perspectives	"green"	The perspectives are favourable, but the placing of wind farms within the park has negative effects on the birds (collisions, the restraining of the feeding areas, etc.).
The evaluation of the conservation status	"unknown"	UNKNOWN STATUS

Table 11 - The matrix for the evaluation of the conservation state of the Long-legged Buzzard (*Buteo rufinus*).

Parameter	Indicator	Comments
Local distribution	"green"	The species is distributed mainly in the south-west part of the area, across the Luncaviţa-Horia line.
Population	"unknown"	The population is 15-18 pairs or a bit more. Other evaluations: 20-26 breeding pairs and 40-60 individuals in migration (cf. Natura 2000 Standard Form), 20-25 breeding pairs in the Munţii Măcinului National Park and 21 individuals in migration (Râioasa Peak) between August and October, 2006 (Pap, 2007).
Habitat of species	"green"	The habitat is favourable for the species, the proof being its recent spreading in the area. This fulfils the requirements for nesting (cliffs, tall and old trees and even pylons of the lines of high voltage) and feeding (open steppe or agricultural crops).
Perspectives	"green"	The perspectives are very good, if the rock exploitations and the disturbance of the nesting places are stopped and the organic agriculture is practiced.
The evaluation of the conservation status	"green"	FAVOURABLE STATUS

Table 12 - The matrix for the evaluation of the conservation state of the Levant Sparrowhawk (*Accipiter brevipes*).

Parameter	Indicator	Comments
Local distribution	"green"	The species was identified in the breeding time only in the south-west part of the area, over the Luncaviţa-Horia line. In other parts, insufficiently studied, it is probably present, but in small number.
Population	"green"	The whole population is estimated at 8-12 breeding pairs or a bit more. Other evaluations: 20-30 breeding pairs and 15-20 individuals in migration (cf. Natura 2000 Standard Form), 10-15 breeding pairs in the Munţii Măcinului National Park and 65 individuals in migration (Râioasa Peak) between August and October, 2006 (Pap, 2007).
Habitat of species	"green"	The habitat is favourable, mainly the one from the foothills, where the forest, composed by short trees and bushes, intercalates with the grassland.

Perspectives	"green"	The perspectives are favourable, because at the moment there are not important pressures and disturbing factors that endanger the future of species in the area.
The evaluation of the conservation status	"green"	FAVOURABLE STATUS

Table 13 - The matrix for the evaluation of the conservation state of the Hen Harrier (*Circus cyaneus*).

Parameter	Indicator	Comments
Local distribution	"unknown"	The species was observed in many points of the park, particularly during the migration. It searches the food over the steppe, humid areas and cultivated terrains.
Population	"unknown"	It is hardly to estimate the number of individuals that winter here, because it varies from year to year depending on the climate; it was rather small (bellow 10 individuals) but in warmer winters, it certainly grows. Other evaluations: 30-50 individuals in winter and 30-60 individuals in migration (cf. Natura 2000 Standard Form), and 68 individuals in migration (Râioasa Peak) between August and October, 2006 (Pap, 2007).
Habitat of species	"green"	The habitat is favourable for feeding and resting.
Perspectives	"green"	The perspectives are favourable, because the species can find here the habitat it needs.
The evaluation of the conservation status	"unknown"	UNKNOWN STATUS

Table 14 - The matrix for the evaluation of the conservation state of the Saker Falcon (*Falco cherrug*).

Parameter	Indicator	Comments
Local distribution	"unknown"	The species was not observed within the area.
Population	"unknown"	Probably, it does not breed in the present in the park. It was checked for nests the rocky places and few pylons of high voltage lines. No aerial presence anywhere. Previous estimations: 3-5 breeding pairs and 2-10 individuals in migration (cf. Natura 2000 Standard Form), and 2-3 breeding pairs in the Munţii Măcinului National Park and 1 individual in migration (Râioasa Peak) between August and October, 2006 (Pap, 2007).
Habitat of species	"green"	The habitat has the necessary conditions for breeding (rockeries, big trees, high voltage lines) and feeding (rodents, mainly European ground squirrel).
Perspectives	"green"	The perspectives are favourable for few breeding pairs; in order to have a steady population in the area, the species must recover within and around the protected area.

The evaluation of the conservation status	"unknown"	UNKNOWN STATUS

Table 15 - The matrix for the evaluation of the conservation state of the Merlin (*Falco columbarius*).

Parameter	Indicator	Comments
Local distribution	"unknown"	The species was seen once in the area.
Population	"unknown"	It is relatively rare (1 individual, observed at January 24, 2012). In March (2012 and 2013), in six days of field observations, it was not spotted. Previous estimations: 30-50 wintering individuals and 2-10 individuals in migration (cf. Natura 2000 Standard Form), and 3 individuals in passage (Râioasa Peak) between August and October, 2006 (Pap, 2007).
Habitat of species	"green"	The quality of the habitat permits its abiding in winter.
Perspectives	"green"	The perspectives are favourable, because, generally, the territories of feeding and resting are peaceful and the food requirements (especially birds) are fulfilled.
The evaluation of the conservation status	"unknown"	UNKNOWN STATUS

Table 16 - The matrix for the evaluation of the conservation state of the Stone Curlew (*Burhinus oedicnemus*).

Parameter	Indicator	Comments
Local distribution	"unknown"	The species was observed on the pastures from Greci and between Cerna and Mircea Vodă.
Population	"green"	The population is relatively small. The most individuals were noted near Greci: 3 individuals on June 24, 2012 and 2 individuals on April 22, 2013), the estimated strength being 1-3 pairs/km^2 in favourable habitat that means a total of 6-9 pairs or a bit more. Other evaluations: 50-80 breeding pairs (cf. Natura 2000 Standard Form), and 11 breeding pairs between May and June, 2006 (Pap, 2007).
Habitat of species	"green"	The quality of the habitat allows the breeding, but only in small territories. The human derange (the shepherd, the pastoral beekeeping) can be one of the causes.
Perspectives	"green"	The perspectives are favourable, if the anthropogenic pressure is limited.
The evaluation of the conservation status	"green"	FAVOURABLE STATUS

Table 17 - The matrix for the evaluation of the conservation state of the European Nightjar (*Caprimulgus europaeus*).

Parameter	Indicator	Comments
Local distribution	"unknown"	The species was observed at the forest skirt from Greci. Certainly, the area of spreading is larger than it is known.
Population	"unknown"	Incomplete data. Precedent evaluation: 150-200 breeding pairs (cf. Natura 2000 Standard Form).
Habitat of species	"green"	The rare woods, margins and orchards constitute the usual habitat of the species.
Perspectives	"green"	As long as the forested areas are maintained, prospects are favourable.
The evaluation of the conservation status	"unknown"	UNKNOWN STATUS

Table 18 - The matrix for the evaluation of the conservation state of the Roller (*Coracias garrulus*).

Parameter	Indicator	Comments
Local distribution	"green"	The species was seen mainly in the west of the area.
Population	"unknown"	In the favourable habitats, 2-3 pairs/km^2 and a total of 50-80 pairs or more. Previous evaluations: 160-240 breeding pairs (cf. Natura 2000 Standard Form) and 1 individual between August and October, 2006 (Pap, 2007).
Habitat of species	"green"	The quality of the habitat allows the surviving of the species on long term.
Perspectives	"green"	There is no significant influence of the main anthropogenic pressure and disturbing factors that threats the future of the species in the area.
The evaluation of the conservation status	"green"	FAVOURABLE STATUS

Table 19 - The matrix for the evaluation of the conservation state of the Syrian Woodpecker (*Dendrocopos syriacus*).

Parameter	Indicator	Comments
Local distribution	"green"	The species was observed in few places from Greci and Rachelu-Revărsarea.
Population	"unknown"	Insufficient concluding data. Previous evaluation: 80-100 breeding pairs (cf. Natura 2000 Standard Form).
Habitat of species	"green"	The quality of the habitat (rare forests, orchards) allows the surviving on long term of the species.
Perspectives	"green"	The species can be threat by the deforestation, the cutting of the orchards, the using of the pesticides, etc. Currently, there are not major pressures to diminish the strengths and the distribution of the species.
The evaluation of the conservation status	"green"	FAVOURABLE STATUS

Table 20 - The matrix for the evaluation of the conservation state of the Middle Spotted Woodpecker (*Dendrocopos medius*).

Parameter	Indicator	Comments
Local distribution	"green"	The species was observed in the deciduous forests from the area.
Population	"unknown"	Ca. 0.7-1 pair/10 ha in the favourable places. Precedent evaluation: 400-600 breeding pairs (cf. Natura 2000 Standard Form). 2 individuals were observed during August-October, 2006 (Pap, 2007).
Habitat of species	"green"	The quality of the habitat allows the surviving on long term of the species.
Perspectives	"green"	The species can be threat by the deforestation, the using of the pesticides, etc. Currently, there are not major pressures to diminish the strengths and the distribution of the species.
The evaluation of the conservation status	"green"	FAVOURABLE STATUS

Table 21 - The matrix for the evaluation of the conservation state of the Woodlark (*Lullula arborea*).

Parameter	Indicator	Comments
Local distribution	"green"	The species was observed at margins, clearings, crops and grasslands.
Population	"unknown"	In characteristic habitat, ca. 3 pairs/10 ha, that mains a total of 500-800 breeding pairs. Other evaluations: 800-1,400 breeding pairs and 15,000-20,000 individuals in migration (cf. Natura 2000 Standard Form); 20 individuals were observed between August and October, 2006 (Pap, 2007).
Habitat of species	"green"	The habitat is big enough and its quality allows the surviving on long term of the species.
Perspectives	"green"	The future of the species can be menaced by the pesticide use but, currently, there are not major pressures to diminish their number and its distribution.
The evaluation of the conservation status	"green"	FAVOURABLE STATUS

Table 22 - The matrix for the evaluation of the conservation state of the Pied Wheatear (*Oenanthe pleschanka*).

Parameter	Indicator	Comments
Local distribution	"green"	The species was observed in two places: Cavalu Peak and Caramalău Peak.
Population	"unknown"	Ca. 10-15 breeding pairs, probably more. Other evaluations: 100-150 breeding pairs (cf. Natura 2000 Standard Form).

Habitat of species	"green"	The habitat is big enough and its quality allows the surviving on long term of the species.
Perspectives	"green"	The species responds to the human derange and pesticide use but, currently, there are not major pressures to diminish the strengths and the distribution of the species.
The evaluation of the conservation status	"green"	FAVOURABLE STATUS

Table 23 - The matrix for the evaluation of the conservation state of the Ortolan Bunting (*Emberiza hortulana*).

Parameter	Indicator	Comments
Local distribution	"green"	The species was observed in few places: the rare forest with scrubs from Măcin-Greci-Cerna area and the forest skirt at Hamcearca.
Population	"unknown"	In 2013, 10 individuals were registered. Insufficient data, but, probably, 50-100 breeding pairs. Previous evaluations: 250-400 individuals in winter (cf. Natura 2000 Standard Form).
Habitat of species	"green"	The habitat is big enough and its quality allows the surviving on long term of the species.
Perspectives	"green"	There is not a significant influence of the main pressures and disturbing factors that endanger the future of the species in the area.
The evaluation of the conservation status	"green"	FAVOURABLE STATUS

General measures for the species conservation:

- The achieving of new cores of strict protection for the most important species from the area, without any type of human intervention in nature, except the situations of urgency;
- An adequate forestry management, with the maintaining of the old and hollow trees;
- The banning of new wind farm buildings;
- The diminishing of the stone exploitation;
- The stopping of uncontrolled tourism;
- The practice of a traditional agriculture inside and outside the area (on the limitrophe terrains);
- The limitation of the spreading of invasive species;
- The elimination of the poaching;
- The prevention of the pollution;
- The periodical monitoring of the conservation state for species and habitats;
- The information of the local communities and visitors regarding the importance of the area, etc.

Particular measures for the species conservation:

- The installing of nesting platforms in vicinity of the area, the combating of poaching (for *Pelecanus onocrotalus* and *Pelecanus crispus*);
- The placing of artificial platforms for the nests from the top of the pylons of low voltage lines and the electrical isolation of the wires (for *Ciconia ciconia*);
- The guarding of the nests, the keeping of the peace inside the forests and wetlands, the banning of the trees cutting in the breeding places, the electrical isolation of the low voltage wires (for *Ciconia nigra*);
- The maintaining of old trees and the diminishing of the human derange, mainly hunting (for *Aquila heliaca*);
- The keeping of old forests and wetlands, the isolation against the electrocution of the high voltage lines, the stopping of the poaching (for *Aquila clanga*);
- The sustainable management of the woods, the stopping of the poaching, the practice of an extensive agriculture (for *Hieraaetus pennatus* and *Circaetus gallicus*);
- The conserving of the steppe, the encouraging of the traditional agriculture, the banning of the stone exploitation in the breeding places (for *Buteo rufinus*);
- The keeping in good conditions of the forested habitats and the maintaining of silence near the nests (for *Accipiter brevipes*);
- The restoration of the humid areas, the elimination of the pesticides used in agriculture, the banning of the poaching (for *Circus cyaneus*);
- The forbidding of the poaching (including the illegal capturing of falcons and eggs taking), the stopping of the habitats degradation, the practice of agriculture on ecological bases, the placing of artificial nests (for *Falco cherrug*);
- The preservation of the favourable habitats, the practice of the agriculture without pesticides (for *Falco columbarius*);
- The preservation of the pastures, the practice of the agriculture without pesticides (for *Burhinus oedicnemus*);
- The avoiding of the pesticides use, the sustainable utilization of the pastures and forests (for *Caprimulgus europaeus*);
- The preservation of the existing habitats, with hollows trees and slide banks, the avoiding of pesticide, the banning of poaching (for *Coracias garrulus*);
- The sustainable management of the forests, the preservation of the old fruiters in orchards, the seeding of trees in localities (for *Dendrocopos syriacus*);
- The preservation in good conditions of the forests (especially of oak and hornbeam), the keeping of quietness in the breeding areas (for *Dendrocopos medius*);
-The maintaining of the quality of the favourable habitats (margins, clearings, crops and grasslands), the elimination of the pollution (for *Lullula arborea*);
- The prohibition of the derange in the breeding grounds, the practice of the organic agriculture (for *Oenanthe pleschanka*);
- The banning of poaching, the preservation in good conditions of the favourable habitats, the practice of a friendly agriculture in relation to the environment (for *Emberiza hortulana*), etc.

CONCLUSIONS

Generally, the situation of the protected species of birds from ROSPA0073 Măcin-Niculiţel is favourable. However, 8 species of the 21 researched have an unknown status, because of the insufficient or inexistent concluding data.

2 species (*Pelecanus crispus* and *Falco cherrug*) were not observed during the study, but they were recorded here in the recent years.

The future of the species in the area is correlated to the measures of conservation. The most important of them are: an adequate forestry management, the banning of new wind farm buildings, the diminishing of the stone exploitation, the stopping of unattended tourism, the practice of a traditional agriculture inside the area, the limitation of the spreading of invasive species, the restoration of the humid areas, the elimination of the poaching, the prevention of the pollution, the isolation against the electrocution of the voltage lines, the periodical monitoring of the conservation state for species and habitats, and the information of the local communities and visitors regarding the importance of the area for the fauna, flora, habitats, and geology.

AKNOWLEDGEMENT

We thank to Dorin Damoc and Ioana Cobzaru for their support in some field activities.

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