

**THE AVIFAUNA FROM VÂLCELE, BUDEASA, BASCOV, PITEȘTI
AND GOLEȘTI BASINS OBSERVED IN THE PREVERNAL
SEASON IN 2013**

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ABSTRACT. The avifauna of the Vâlcele, Budeasa, Bascov, Pitești, and Golești basins from the protected area ROSPA0062 - Lacurile de acumulare de pe Argeș observed during the prevernal season in 2013 was composed by 71 species that belong to 13 orders. Concerning the species, the best represented was Passeriformes (34 species) and concerning the individuals, the best represented was Anseriformes (2929 individuals). *Aythya fuligula* (Linnaeus, 1758), *Aythya ferina* (Linnaeus, 1758), and *Fulica atra* Linnaeus, 1758 were eudominant, they summing together over half of the total number of observed individuals (58.79%). Anseriformes was overdominant, Gruiformes and Passeriformes were dominant and the other orders were complementary. In the annex I of Birds Directive are included 9 species – *Phalacrocorax pygmeus* (Pallas, 1773), *Egretta garzetta* (Linnaeus, 1766), *Egretta alba* (Linnaeus, 1758), *Ardea purpurea* Linnaeus, 1766, *Circus aeruginosus* (Linnaeus, 1758), *Recurvirostra avosetta* Linnaeus, 1758, *Chlidonias hybridus* (Pallas, 1811), *Sterna hirundo* Linnaeus, 1758, and *Ficedula albicollis* (Temminck, 1815). In the paper there are also made some other considerations on the birds' ecology (monthly dynamics, constancy, dominance, Dzuba index of ecological signification, etc.).

Key words: avifauna, Lacurile de acumulare de pe Argeș, Special Protected Area, Nature 2000 network.

REZUMAT. Avifauna lacurilor de acumulare Vâlcele, Budeasa, Bascov, Pitești și Golești observată în sezonul prevernal al anului 2013. Avifauna celor cinci lacuri de acumulare (Vâlcele, Budeasa, Bascov, Pitești și Golești) din aria protejată ROSPA0062 - Lacurile de acumulare de pe Argeș, observată în sezonul prevernal al anului 2013, a cuprins 71 de specii care aparțin la 13 ordine, cel mai bogat în specii fiind Passeriformes (cu 34 de specii) iar cel mai bogat în exemplare, Anseriformes (cu 2929 exemplare). Speciile *Aythya fuligula* (Linnaeus, 1758), *Aythya ferina* (Linnaeus, 1758) și *Fulica atra* Linnaeus, 1758 au fost eudominante, totalizând împreună peste jumătate din numărul total de exemplare observate (58,79%). Ordinul Anseriformes a fost supradominant, ordinele Gruiformes și Passeriformes au fost dominante iar celelalte ordine au fost complementare. În Anexa I a Directivei Păsări, sunt incluse 9 specii – *Phalacrocorax pygmeus* (Pallas, 1773), *Egretta garzetta* (Linnaeus, 1766), *Egretta alba* (Linnaeus, 1758), *Ardea purpurea* Linnaeus, 1766, *Circus aeruginosus* (Linnaeus, 1758), *Recurvirostra avosetta* Linnaeus, 1758,

Chlidonias hybridus (Pallas, 1811), *Sterna hirundo* Linnaeus, 1758 și *Ficedula albicollis* (Temminck, 1815). În lucrare se fac și alte considerații privitoare la ecologia speciilor de păsări (dinamică lunară, constanță, dominantă, indice de semnificație ecologică Dzuba etc.).

Cuvinte cheie: avifaună, Lacurile de acumulare de pe Argeș, Arie de Protecție Specială, rețeaua Natura 2000.

INTRODUCTION

The avifauna of the basins from the Argeș River, included in the protected area ROSPA0062 - Lacurile de acumulare de pe Argeș, is the object of researches since the '60s, when they were built (Mătieș, 1969; Munteanu & Mătieș, 1983). After 1995, it was more intensely studied: in the beginning, the Midwinter Census, co-ordinated, initially at the national level by the Romanian Ornithological Society and lately by the Romanian Ornithological Society and the Association for Birds and Nature Protection "Milvus Group", was performed every year (Gava, 1997; Gava et al., 2004a; Mestecăneanu et al., 2010 etc.); by 2001, the avifauna of the whole year had systematically been studied, the results of the researches being published in a series of articles (Gava et al., 2004b; Mestecăneanu et al., 2003; 2004; Conete et al., 2006; 2010; 2012 etc.) and in a PhD thesis (Conete, 2011), too.

This paper shows a part of the results of the research-studies performed in the area in 2013. They are a continuation of the works carried out here until now.

MATERIAL AND METHOD

From upstream to downstream the basins where the research-studies on the birds were performed were: Vâlcele (408 ha), Budeasa (412 ha), Bascov (162 ha), Pitești (122 ha), and Golești (649 ha). They appertain to the upper and middle course of the Argeș River (Fig. 1) and are situated between the Cotmeana Platform, in the West, the Argeș Platform, in the North, the Cândești Platform, in the East, and the Pitești High Plain (part of the Romanian Plain), in the South. Together with the Zigoneni basin, these dam lakes form the ROSPA0062 - Lacurile de acumulare de pe Argeș, Special Protected Area and part of the Nature 2000 network.

The vegetation of the basins is influenced by the process of silting. It is disposed on variable surfaces depending on the basin and is typical of wetland areas, primarily with reed bed, bulrush, alder, and willow. The vegetation from adjacent hilly areas includes broad leaf forests (beech, hornbeam, diverse species of oak, etc.) and, rarely, artificial coniferous forests. There are orchards, too. The meadows are covered with crops (cereals, fodder, green goods, etc.). In the vicinity of each basin there are various roads which connect the settlements.

The fauna is characteristic for Muntenia.

The climate is temperate with hilly influence. The annual average air temperature is about 9 °C, while the annual average water temperature of the Argeș River is 1-2 °C lower (Barco & Nedelcu, 1974).

Regarding the methods of field work, the itinerary method was used in combination to one of the fixed point of observations. Between 10 and 20 of every month, one day field trip was affected on all basins. The same track on one bank of the basins was used every time, as it was the most favourable for the observation of water birds. Visual and auditory observations were used for identification of the birds from the basins and from the nearby areas. Binoculars (10x50), a spotting scope (14-45x50) and a photo device (42x optical zoom) were used.

The scientific nomenclature and classification of the birds are compatible with the Hamlin Guide (Bruun et al., 1999).



Figure 1 - The partial map of Argeș River.

RESULTS AND DISCUSSIONS

In the prevernal season (March, April) 2013, 71 species of birds (18.58% of all species identified in Romania) and 4713 individuals were observed on the basins Vâlcele, Budeasa, Bascov, Pitești, and Golești (Tab. 1). They belong to 13 orders. Concerning the species, the best represented was Passeriformes (34 species) and concerning the individuals, the best represented was Anseriformes (2929 individuals).

The Golești Basin had the biggest number of species (44) and individuals (2923). The smallest number of species (14) registered the avifauna of Bascov Basin and the smallest number of individuals (285) registered the avifauna of Budeasa Basin (Tab. 1). As noted on other occasions, too (Mestecăneanu et al., 2010; Conete et al., 2012, etc.), this situation depends on more factors: the surface and the depth of each basin, the position on the course of the river, the vegetation and the anthropogenetic pressure. The Golești Basin has the biggest surface of

them. This surface, that generates a relative assurance, permits to more species having more individuals to stay here, despite poaching. Its downstream position on the Argeş River (on the route of the Rucăr-Bran corridor of migration) also facilitates the translation of the birds between the great courses of water from proximity (Olt, Danube, Ialomița). Although Pitești has the smallest surface of them, it has the most favourable rapport between the surface and number of species/individuals. An explanation for this can be the fact that the habitat is varied, caused by its higher process of silting. Also, the close vicinity with Pitești city, which at a first glance can be considered negative, can protect the birds, because the shooting is impossible here. On the Bascov Basin found in the vicinity, a similar situation could have been found, but the kayakers' training here constitutes an intense derange for the birds. Budeasa and Vâlcele basins are visited by hunters, too. Their typical vegetation of water is poor and it is present upstream. Not much can be said about the depth of the water as a proper study does not exist but it is obvious that a basin with water of variable depth is more attractive for the species than one with a constant depth.

Table 1 - The distribution of the species depending on basin and month and their general number.

No.	Species	Vâlcele Basin	Budeasa Basin	Bascov Basin	Pitești Basin	Golești Basin	March	April	Period
1.	<i>Podiceps cristatus</i> (Linnaeus, 1758)	*	*			*	*	*	109
2.	<i>Podiceps nigricollis</i> Brehm C.L., 1831	*				*		*	10
3.	<i>Tachybaptus ruficollis</i> (Pallas, 1764)	*		*			*		6
4.	<i>Phalacrocorax carbo</i> (Linnaeus, 1758)	*	*		*	*	*	*	64
5.	<i>Phalacrocorax pygmeus</i> (Pallas, 1773)					*	*		35
6.	<i>Egretta garzetta</i> (Linnaeus, 1766)					*		*	11
7.	<i>Egretta alba</i> (Linnaeus, 1758)	*	*			*	*	*	22
8.	<i>Ardea cinerea</i> Linnaeus, 1758	*	*			*	*	*	18
9.	<i>Ardea purpurea</i> Linnaeus, 1766				*		*		1
10.	<i>Cygnus olor</i> (Gmelin, 1789)		*		*	*	*	*	59

Continues.

Table 1 - Continuation.

No.	Species	Vâlcele Basin	Budeasa Basin	Bascov Basin	Pitești Basin	Golești Basin	March	April	Period
11.	<i>Anas platyrhynchos</i> Linnaeus, 1758	*	*	*	*	*	*	*	381
12.	<i>Anas penelope</i> Linnaeus, 1758		*	*		*	*	*	44
13.	<i>Anas querquedula</i> Linnaeus, 1758				*	*	*	*	41
14.	<i>Anas crecca</i> Linnaeus, 1758	*			*	*	*	*	207
15.	<i>Anas clypeata</i> Linnaeus, 1758	*			*			*	13
16.	<i>Aythya fuligula</i> (Linnaeus, 1758)	*	*		*	*	*	*	1420
17.	<i>Aythya ferina</i> (Linnaeus, 1758)		*	*	*	*	*	*	743
18.	<i>Bucephala clangula</i> (Linnaeus, 1758)	*				*	*		21
19.	<i>Buteo buteo</i> (Linnaeus, 1758)	*				*	*	*	2
20.	<i>Circus aeruginosus</i> (Linnaeus, 1758)		*			*		*	2
21.	<i>Falco tinnunculus</i> Linnaeus, 1758					*	*	*	3
22.	<i>Phasianus colchicus</i> Linnaeus, 1758	*			*		*	*	2
23.	<i>Gallinula chloropus</i> (Linnaeus, 1758)				*			*	1
24.	<i>Fulica atra</i> Linnaeus, 1758	*	*	*	*	*	*	*	608
25.	<i>Vanellus vanellus</i> Linnaeus, 1758					*	*		1
26.	<i>Charadrius dubius</i> Scopoli, 1786	*				*	*	*	5
27.	<i>Actitis hypoleucos</i> Linnaeus, 1758	*	*		*			*	3
28.	<i>Tringa ochropus</i> Linnaeus, 1758					*		*	2
29.	<i>Recurvirostra avosetta</i> Linnaeus, 1758					*		*	7

Continues.

Table 1 - Continuation.

No.	Species	Vâlcele Basin	Budeasa Basin	Bascov Basin	Pitești Basin	Golești Basin	March	April	Period
30.	<i>Larus argentatus</i> <i>cachinnans/michahellis</i> Pontoppidan, 1763	*	*	*	*	*	*	*	203
31.	<i>Larus ridibundus</i> Linnaeus, 1766	*	*	*	*	*	*	*	130
32.	<i>Chlidonias hybridus</i> (Pallas, 1811)	*						*	4
33.	<i>Sterna hirundo</i> Linnaeus, 1758					*		*	2
34.	<i>Streptopelia decaocto</i> (Frisvaldszky, 1838)				*		*	*	5
35.	<i>Apus apus</i> (Linnaeus, 1758)				*			*	5
36.	<i>Upupa epops</i> Linnaeus, 1758	*				*	*	*	4
37.	<i>Jynx torquilla</i> Linnaeus, 1758				*			*	1
38.	<i>Alauda arvensis</i> Linnaeus, 1758					*	*	*	5
39.	<i>Hirundo rustica</i> Linnaeus, 1758	*	*	*		*		*	12
40.	<i>Anthus trivialis</i> (Linnaeus, 1758)					*		*	8
41.	<i>Anthus spinoletta</i> (Linnaeus, 1758)	*	*		*		*		3
42.	<i>Motacilla flava</i> Linnaeus, 1758	*			*	*		*	17
43.	<i>Motacilla alba</i> Linnaeus, 1758	*	*	*	*	*	*	*	75
44.	<i>Lanius excubitor</i> Linnaeus, 1758	*						*	2
45.	<i>Sturnus vulgaris</i> Linnaeus, 1758	*			*	*	*	*	86
46.	<i>Pica pica</i> (Linnaeus, 1758)	*	*	*	*	*	*	*	84
47.	<i>Corvus monedula</i> Linnaeus, 1758				*	*	*	*	41
48.	<i>Corvus frugilegus</i> Linnaeus, 1758					*	*	*	69

Continues.

Table 1 - Continuation.

No.	Species	Vâlcele Basin	Budeasa Basin	Bascov Basin	Pitești Basin	Golești Basin	March	April	Period
49.	<i>Corvus corone cornix</i> Linnaeus, 1758				*	*	*	*	3
50.	<i>Corvus corax</i> Linnaeus, 1758			*		*	*	*	3
51.	<i>Locustella luscinioides</i> (Savi, 1824)				*			*	2
52.	<i>Acrocephalus palustris</i> (Bechstein, 1798)				*			*	1
53.	<i>Acrocephalus scirpaceus</i> (Hermann, 1804)				*			*	1
54.	<i>Sylvia atricapilla</i> (Linnaeus, 1758)				*			*	2
55.	<i>Sylvia curruca</i> (Linnaeus, 1758)		*	*	*			*	17
56.	<i>Ficedula albicollis</i> (Temminck, 1815)				*			*	1
57.	<i>Oenanthe oenanthe</i> (Linnaeus, 1758)					*		*	1
58.	<i>Saxicola torquata</i> (Linnaeus), 1766	*						*	1
59.	<i>Erithacus rubecula</i> (Linnaeus, 1758)				*		*		1
60.	<i>Luscinia megarhynchos</i> (Brehm, C.L., 1831)			*	*			*	4
61.	<i>Turdus merula</i> Linnaeus, 1758				*		*		1
62.	<i>Turdus philomelos</i> Brehm, C.L., 1831				*		*		2
63.	<i>Parus major</i> Linnaeus, 1758				*		*		2
64.	<i>Passer domesticus</i> (Linnaeus, 1758)		*	*	*	*	*	*	42
65.	<i>Passer montanus</i> (Linnaeus, 1758)	*						*	3
66.	<i>Carduelis chloris</i> (Linnaeus, 1758)	*			*	*		*	6
67.	<i>Carduelis carduelis</i> (Linnaeus, 1758)		*			*	*	*	9
68.	<i>Carduelis cannabina</i> (Linnaeus, 1758)					*		*	2

Continues.

Table 1 - Continuation.

No.	Species	Vâlcele Basin	Budeasa Basin	Bascov Basin	Pitești Basin	Golești Basin	March	April	Period
69.	<i>Emberiza schoeniclus</i> Linnaeus, 1758				*			*	3
70.	<i>Miliaria calandra</i> (Linnaeus, 1758)					*	*	*	5
71.	<i>Emberiza citrinella</i> Linnaeus, 1758	*					*		4
Number of species		31	21	14	39	44	42	60	71
Number of individuals		628	285	317	560	2923	3494	1219	4713

Legend: * - the occurrence.

The species with the most important numbers were *Aythya fuligula*, *Aythya ferina*, and *Fulica atra* (Tab. 2). They sum together 58.79% of all observed individuals. It is obvious that in the prevernal season the Golești Basin was the most favorable for all these species and mainly for *Aythya fuligula* (1259 individuals), which instead had 0 individuals on Bascov Basin. The numbers of *Aythya ferina* increased from upstream (0 individuals on Vâlcele Basin) to downstream (460 individuals on Golești Basin). *Fulica atra* varied between 12 individuals (on Budeasa Basin) and 208 individuals (on Golești Basin) and, considering the number from the Bascov Basin, it seems to be least sensible to the water sport impact.

Regarding the monthly variation of all species and individuals we observe that they are in inverse correlation: the increase of the number of species from the period of migration for many birds is accompanied by the decrease of the number of individuals (Tab. 3). The monthly distribution of numbers for *Aythya fuligula*, *Aythya ferina*, and *Fulica atra* varied similarly. It shows how the majority of their individuals (that wintered or passed here) moved to places of breeding from North.

Table 2 - The distribution on basins for *Aythya fuligula*, *Aythya ferina*, and *Fulica atra*.

Species	Vâlcele Basin	Budeasa Basin	Bascov Basin	Pitești Basin	Golești Basin
<i>Aythya fuligula</i>	83	54	0	24	1259
<i>Aythya ferina</i>	0	13	80	190	460
<i>Fulica atra</i>	134	12	173	81	208

Table 3 - The monthly distribution of numbers for *Aythya fuligula*, *Aythya ferina*, and *Fulica atra*.

Species	March	April	Prevernal
<i>Aythya fuligula</i>	1122	298	1420
<i>Aythya ferina</i>	674	69	743
<i>Fulica atra</i>	519	89	608

There is not much to say about the constancy and Dzuba index of ecological significance (because only two sample were drawn), but regarding the dominance it is noticeable that 3 species (4.23%, *Aythya fuligula*, *Aythya ferina*, and *Fulica atra*) were eudominant, 1 species (1.41%, *Anas platyrhynchos*) was dominant, 4 species (5.63%, *Podiceps cristatus*, *Anas crecca*, *Larus argentatus cachinnans/michahellis*, and *Larus ridibundus*) were subdominant, 6 species (8.45%, *Phalacrocorax carbo*, *Cygnus olor*, *Motacilla alba*, *Sturnus vulgaris*, *Pica pica*, and *Corvus frugilegus*) were recedent and 57 species (80.28%, *Podiceps nigricollis*, *Phalacrocorax pygmeus*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Circus aeruginosus*, *Recurvirostra avosetta*, *Chlidonias hybridus*, *Sterna hirundo*, etc.) were subrecedent (Tab. 4, Fig. 2).

Table 4 – The categories of constancy, dominance, and Dzuba index for the observed birds.

No.	Species	Category of constancy	Category of dominance	Category of Dzuba index
1.	<i>Podiceps cristatus</i>	C4	D3	W3
2.	<i>Podiceps nigricollis</i>	C2	D1	W2
3.	<i>Tachybaptus ruficollis</i>	C2	D1	W1
4.	<i>Phalacrocorax carbo</i>	C4	D2	W3
5.	<i>Phalacrocorax pygmeus</i>	C2	D1	W2
6.	<i>Egretta garzetta</i>	C2	D1	W2
7.	<i>Egretta alba</i>	C4	D1	W2
8.	<i>Ardea cinerea</i>	C4	D1	W2
9.	<i>Ardea purpurea</i>	C2	D1	W1
10.	<i>Cygnus olor</i>	C4	D2	W3
11.	<i>Anas platyrhynchos</i>	C4	D4	W4
12.	<i>Anas penelope</i>	C4	D1	W2
13.	<i>Anas querquedula</i>	C4	D1	W2
14.	<i>Anas crecca</i>	C4	D3	W3
15.	<i>Anas clypeata</i>	C2	D1	W2
16.	<i>Aythya fuligula</i>	C4	D5	W5
17.	<i>Aythya ferina</i>	C4	D5	W5
18.	<i>Bucephala clangula</i>	C2	D1	W2
19.	<i>Buteo buteo</i>	C4	D1	W1
20.	<i>Circus aeruginosus</i>	C2	D1	W1
21.	<i>Falco tinnunculus</i>	C4	D1	W1
22.	<i>Phasianus colchicus</i>	C4	D1	W1
23.	<i>Gallinula chloropus</i>	C2	D1	W1
24.	<i>Fulica atra</i>	C4	D5	W5
25.	<i>Vanellus vanellus</i>	C2	D1	W1

Continues.

Table 4 - Continuation.

No.	Species	Category of constancy	Category of dominance	Category of Dzuba index
26.	<i>Charadrius dubius</i>	C4	D1	W2
27.	<i>Actitis hypoleucos</i>	C2	D1	W1
28.	<i>Tringa ochropus</i>	C2	D1	W1
29.	<i>Recurvirostra avosetta</i>	C2	D1	W1
30.	<i>Larus argentatus</i> <i>cachinnans/michahellis</i>	C4	D3	W3
31.	<i>Larus ridibundus</i>	C4	D3	W3
32.	<i>Chlidonias hybridus</i>	C2	D1	W1
33.	<i>Sterna hirundo</i>	C2	D1	W1
34.	<i>Streptopelia decaocto</i>	C4	D1	W2
35.	<i>Apus apus</i>	C2	D1	W1
36.	<i>Upupa epops</i>	C4	D1	W1
37.	<i>Jynx torquilla</i>	C2	D1	W1
38.	<i>Alauda arvensis</i>	C4	D1	W2
39.	<i>Hirundo rustica</i>	C2	D1	W2
40.	<i>Anthus trivialis</i>	C2	D1	W1
41.	<i>Anthus spinoletta</i>	C2	D1	W1
42.	<i>Motacilla flava</i>	C2	D1	W2
43.	<i>Motacilla alba</i>	C4	D2	W3
44.	<i>Lanius excubitor</i>	C2	D1	W1
45.	<i>Sturnus vulgaris</i>	C4	D2	W3
46.	<i>Pica pica</i>	C4	D2	W3
47.	<i>Corvus monedula</i>	C4	D1	W2
48.	<i>Corvus frugilegus</i>	C4	D2	W3
49.	<i>Corvus corone cornix</i>	C4	D1	W1
50.	<i>Corvus corax</i>	C4	D1	W1
51.	<i>Locustella luscinioides</i>	C2	D1	W1
52.	<i>Acrocephalus palustris</i>	C2	D1	W1
53.	<i>Acrocephalus scirpaceus</i>	C2	D1	W1
54.	<i>Sylvia atricapilla</i>	C2	D1	W1
55.	<i>Sylvia curruca</i>	C2	D1	W2
56.	<i>Ficedula albicollis</i>	C2	D1	W1
57.	<i>Oenanthe oenanthe</i>	C2	D1	W1
58.	<i>Saxicola torquata</i>	C2	D1	W1
59.	<i>Erithacus rubecula</i>	C2	D1	W1
60.	<i>Luscinia megarhynchos</i>	C2	D1	W1

Continues.

Table 4 - Continuation.

No.	Species	Category of constancy	Category of dominance	Category of Dzuba index
61.	<i>Turdus merula</i>	C2	D1	W1
62.	<i>Turdus philomelos</i>	C2	D1	W1
63.	<i>Parus major</i>	C2	D1	W1
64.	<i>Passer domesticus</i>	C4	D1	W2
65.	<i>Passer montanus</i>	C2	D1	W1
66.	<i>Carduelis chloris</i>	C2	D1	W1
67.	<i>Carduelis carduelis</i>	C4	D1	W2
68.	<i>Carduelis cannabina</i>	C2	D1	W1
69.	<i>Emberiza schoeniclus</i>	C2	D1	W1
70.	<i>Miliaria calandra</i>	C4	D1	W2
71.	<i>Emberiza citrinella</i>	C2	D1	W1

Legend: C1 – accidental species, C2 – accessory species, C3 – constant species, C4 – euconstant species, D1, W1 – subrecent species, D2, W2 – recent species, D3, W3 – subdominant species, D4, W4 – dominant species, D5, W5 – eudominant species.

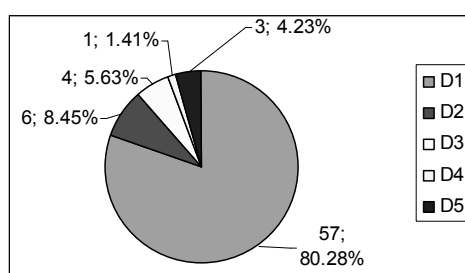


Figure 2 - The birds' distribution by the categories of dominance.

According to the index of relation, the dynamics of the orders show that the Anseriformes was permanently overdominant. Passeriformes was overdominant order, too (only in April), in March being dominant. Dominant were: in April - Podicipediformes, in March and April - Gruiformes, in April - Charadriiformes, and in March - Passeriformes. Otherwise, the orders were complementary (Tab. 5, Fig. 3).

Table 5 - The value of the index of relation for the orders of birds identified in the area.

Order	March	April	Prevernal
Podicipediformes	0.85	7.79	2.65
Pelecaniformes	1.43	4.01	2.10
Ciconiiformes	0.25	3.52	1.10
Anseriformes	66.42	49.87	62.14
Gruiformes	14.85	7.38	12.92
Charadriiformes	7.46	7.87	7.57
Passeriformes	8.47	18.21	10.99
Other orders	0.22	1.31	0.50

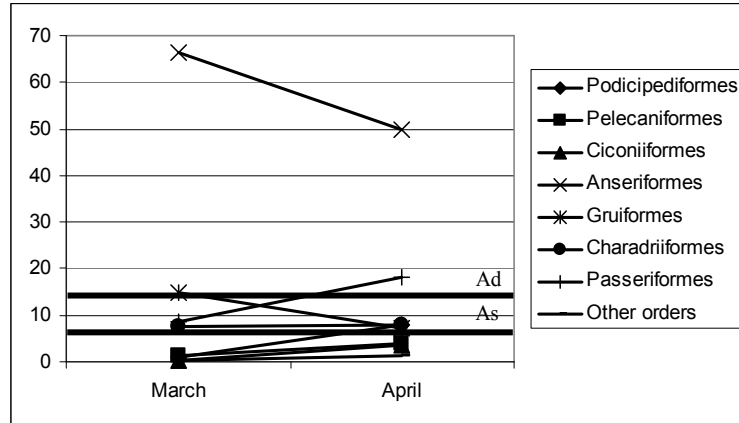


Figure 3 - The monthly dynamics of the orders according to the index of relation.

For the whole area, Anseriformes was the only overdominant order. Gruiformes, Charadriiformes, and Passeriformes were in the group of dominant order and the other orders (Falconiformes, Galliformes, Columbiformes, Apodiformes, Coraciiformes, and Piciformes) were complementary (Tab. 5, Fig. 4).

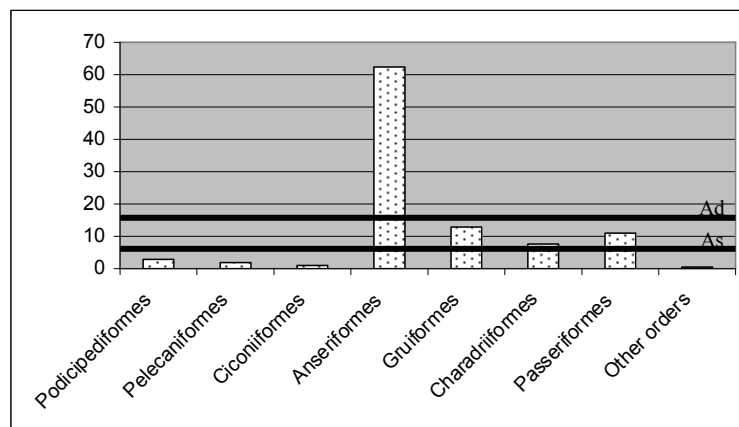


Figure 4 - The participation of the orders to the avicoenosis of the prevernal season.

According to the Bray-Curtis index, the biggest similarity was established between Pitești and Bascov avicoenosis; a good similarity was established between Budeasa and Vâlcele avicoenosis, too (Tab. 6, Fig. 5).

According to the Jaccard index, the biggest similarity was established between Bascov and Budeasa avicoenosis; a smaller similarity was established between Golești and Vâlcele avicoenosis, too (Tab. 7, Fig. 6).

The surface and the depth of every basin, the position on the course of the river, the vegetation and the anthropogenetic pressure explain the similarity between the avicoenosis of the basins.

Table 6 - The similarity matrix (by Bray-Curtis) between the avicoenosis of the basins.

Similarity matrix	Vâlcele Basin	Budeasa Basin	Bascov Basin	Pitești Basin	Golești Basin
Vâlcele Basin	*	44.46	36.40	30.80	23.20
Budeasa Basin	*	*	23.58	26.03	14.83
Bascov Basin	*	*	*	46.97	19.19
Pitești Basin	*	*	*	*	26.35
Golești Basin	*	*	*	*	*

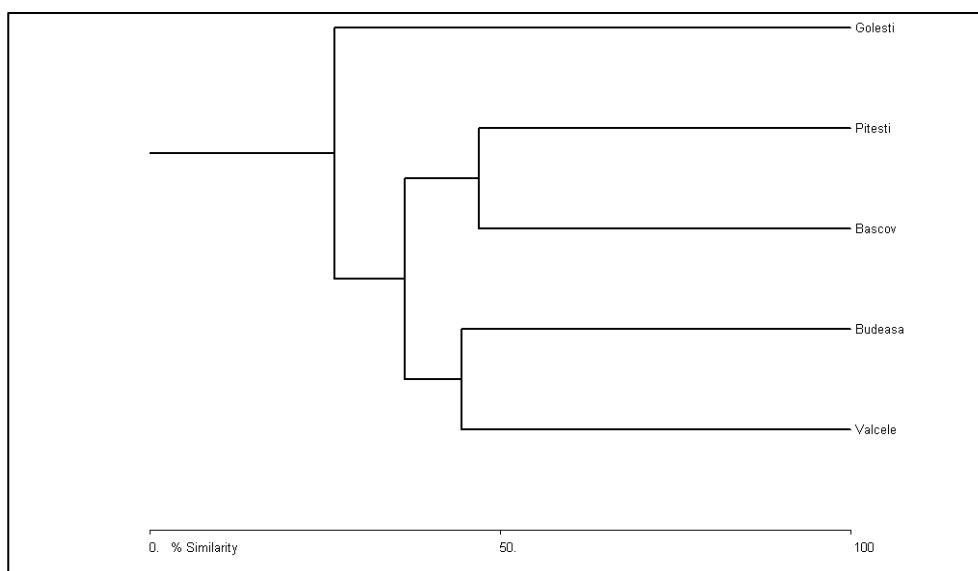


Figure 5 - The Bray-Curtis Cluster Analysis (Single Link).

Table 7 - The similarity matrix (by Jaccard) between the avicoenosis of the basins.

Similarity matrix	Vâlcele Basin	Budeasa Basin	Bascov Basin	Pitești Basin	Golești Basin
Vâlcele Basin	*	36.84	21.62	29.62	38.88
Budeasa Basin	*	*	45.83	30.43	38.29
Bascov Basin	*	*	*	23.25	23.40
Pitești Basin	*	*	*	*	27.69
Golești Basin	*	*	*	*	*

It is noticeable that Bray-Curtis index is based on the presence/absence of the species in the samples and on their number of individuals and Jaccard index is based only on the presence/absence of the respective species in the samples.

9 species of birds (12.67% of all: *Phalacrocorax pygmeus*, *Egretta garzetta*, *Egretta alba*, *Ardea purpurea*, *Circus aeruginosus*, *Recurvirostra avosetta*, *Chlidonias hybridus*, *Sterna hirundo*, and *Ficedula albicollis*) are included in the annex I of the Birds Directive. These species shall be the subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution (<http://eur-lex.europa.eu/>).

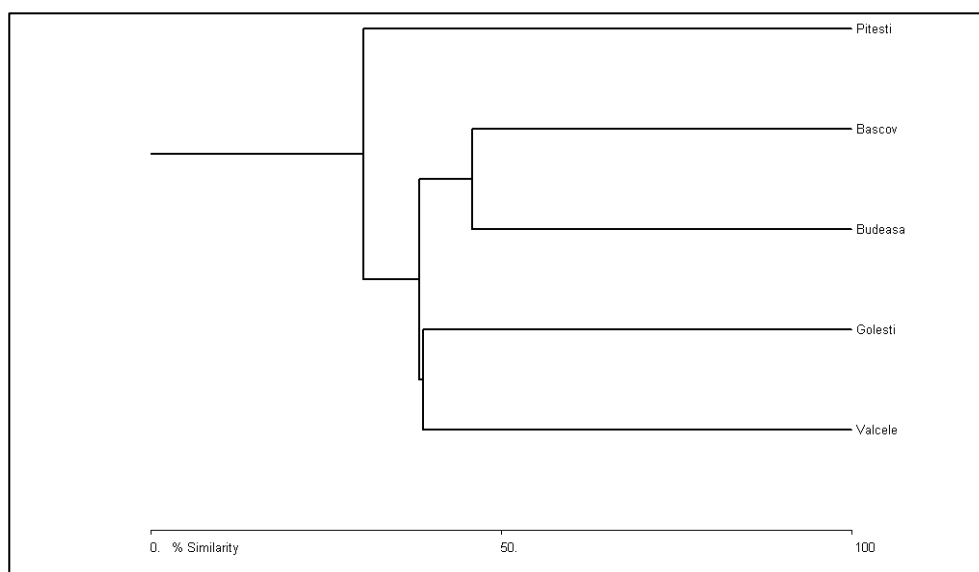


Figure 6 - The Jaccard Cluster Analysis (Single Link).

CONCLUSIONS

- 71 species of birds (18.58% of all species identified in Romania) represented by 4713 individuals were observed on the basins Vâlcele, Budeasa, Bascov, Pitești, and Golești in the prevernal season (March, April) 2013;
- the Golești Basin had the biggest number of species (44) and individuals (2923); the smallest number of species (14) registered the avifauna of Bascov Basin and the smallest number of individuals (285) registered the avifauna of Budeasa Basin;
- 3 species (4.23%, *Aythya fuligula*, *Aythya ferina*, and *Fulica atra*) were eudominant, 1 species (1.41%, *Anas platyrhynchos*) was dominant, 4 species (5.63%) were subdominant, 6 species (8.45%) were recedent and 57 species (80.28%) were subrecedent;
- the eudominant species sum together 58.79% of all observed individuals;
- the Golești Basin is the most favorable for Anseriformes;
- the migration of the birds from the prevernal season was astonishing, the increase of the number of species from March to April being accompanied by the decrease of the individuals;
- Anseriformes was permanently overdominant;

- according to the Bray-Curtis index, the biggest similarity was established between Pitești and Bascov avicoenosis and according to the Jaccard index, the biggest similarity was established between Bascov and Budeasa avicoenosis;
- the difference between the avifauna of the basins is strongly influenced by the surface and the depth of each basin, the position on the course of the river, the vegetation and the anthropogenetic pressure;
- 9 species of birds (12.67% of all observed species in the prevernal season in 2013) are included in the annex I of the Birds Directive.

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