

THE MIDWINTER WATERBIRD CENSUS FROM THE BASINS VÂLCELE, BUDEASA, BASCOV, PITEȘTI AND GOLEȘTI FROM THE ARGEȘ RIVER (JANUARY 2013)

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Abstract

*In this paper, the authors show the results of the midwinter waterbird census performed on the basins Vâlcele, Budeasa, Bascov, Pitești and Golești from the ROSPA 0062 The Basins of the Argeș River. 45 bird species belonging to 12 orders were observed. Passeriformes (15 species) and Anseriformes (13 species) were the richest orders by the number of species. Unlike other years (when the Golești basin was in the first position), the biggest numbers of individuals was noted on Pitești Basin. The local conditions of depth, surface, and speed of water for every basin determined the size of the unfrozen surface of water necessary for the waterbirds. Their numbers were determined by the anthropogenic pressure, food supply, places for rest, too. The highest Jaccard similarity was between Vâlcele and Budeasa ornithocoenoses and the highest Bray-Curtis similarity was between Pitești and Budeasa ornithocoenoses. *Anas platyrhynchos* and *Fulica atra* were the eudominant species. The Anseriformes and Charadriiformes orders were overdominant and, into the Anseriformes order, *Anas platyrhynchos* and *Aythya ferina* were the overdominant species. *Gavia arctica*, *Phalacrocorax pygmeus*, *Egretta alba*, *Cygnus cygnus*, *Mergus albellus* and *Alcedo atthis* are in the Annex I of the Birds Directive.*

Keywords: waterbird census, Argeș River, Romania.

1. INTRODUCTION

The midwinter waterbird census is the only important programme fixed on the evaluation of the winter waterbirds population size from Romania. Another aim is to monitor the changes happened on long term in the numbers of the birds coenoses. It was organised worldwide by the Wetlands International beginning with 1967, while nationally it was organised by the Romanian Ornithological Society starting with 1990. In the Argeș County, the programme was centred on the reservoirs from the middle and upper hydrographic basin of the Argeș River.

The count takes place every year between 10 and 20 January.

2. MATERIAL AND METHOD

The Argeș River is an important tributary of the Danube from its downstream course. It has the sources under the Negoiu and Moldoveanu Peaks from the Făgăraș Mountains and crosses a varied relief from the mountain one to the plain one. The building of the basins (that happened in the second half of the XX century) determined a strong change of the landscape that led to important modify of the qualitative and quantitative structure of the avifauna. As a result, many species of water birds reach big numbers mainly while they are in passage and in the winter.

The vegetation of the basins is characteristic for the wetlands from the south of the Romania (*Phragmites*, *Typha*, *Carex*, *Juncus*, *Salix*, *Alnus*, *Populus* etc.) because of their increased process of silting.

The climate in the area is temperate with hilly continental features. The annual temperature of the air varies around 9 °C and the annual temperature of the water fluctuates between 6.4 °C, in the Argeș Gorges, and 9 °C, at Pitești. In some winters (generally at the beginning of the January) the bridge of ice is formed due to the continental stressed influence (Barco & Nedelcu, 1974).

The census were performed on the following basins: Golești (649 ha), Pitești (122 ha), Bascov (162 ha), Budeasa (412 ha) and Vâlcele (408 ha) - parts component of the Nature 2000 site and of the Important Bird Area “ROSPA 0062 The Basins of the Argeș River” (figure 1). The itinerary method was used. On January 12, 2013, the birds were counted walking over one bank of every basin. The species were identified visually, with the scope and binoculars, and auditory.

3. RESULTS AND DISCUSSIONS

During the midwinter waterbird census performed on January 12, 2013, on the basins Golești, Pitești, Bascov, Budeasa and Vâlcele, 45 birds species (11.78% of all species identified in Romania, Munteanu, 1998) were registered. They sum 14783 individuals (table 1). The temperatures of the air, lower than the ones of the previously year (Gava et al., 2012), had as effect a smaller number of individuals. The identified species belong to 12 orders (63.15% of all orders identified in Romania, Munteanu, 1998); the richest in species are Passeriformes (15 species) and Anseriformes (13 species) and the richest in individuals are Anseriformes (9500 individuals) and Charadriiformes (2841 individuals). The least represented were Gaviiformes and Coraciiformes (each with 1 species, respectively, 1 individual) (table 2). Gaviiformes was represented by a family – Gaviidae, Podicipediformes by a family – Podicipedidae, Pelecaniformes by a family – Phalacrocoracidae, Ciconiiformes by a family – Ardeidae, Anseriformes by a family – Anatidae, Falconiformes by 2 families – Accipitridae and Falconidae, Galliformes by a family – Phasianidae, Gruiformes by a family – Rallidae, Charadriiformes by 2 families – Scolopacidae and Laridae, Columbiformes by a family – Columbidae, Coraciiformes by a family – Alcedinidae, and Passeriformes by 6 families – Corvidae, Troglodytidae, Turdidae, Paridae, Fringillidae, and Emberizidae (Bruun et al., 1999).

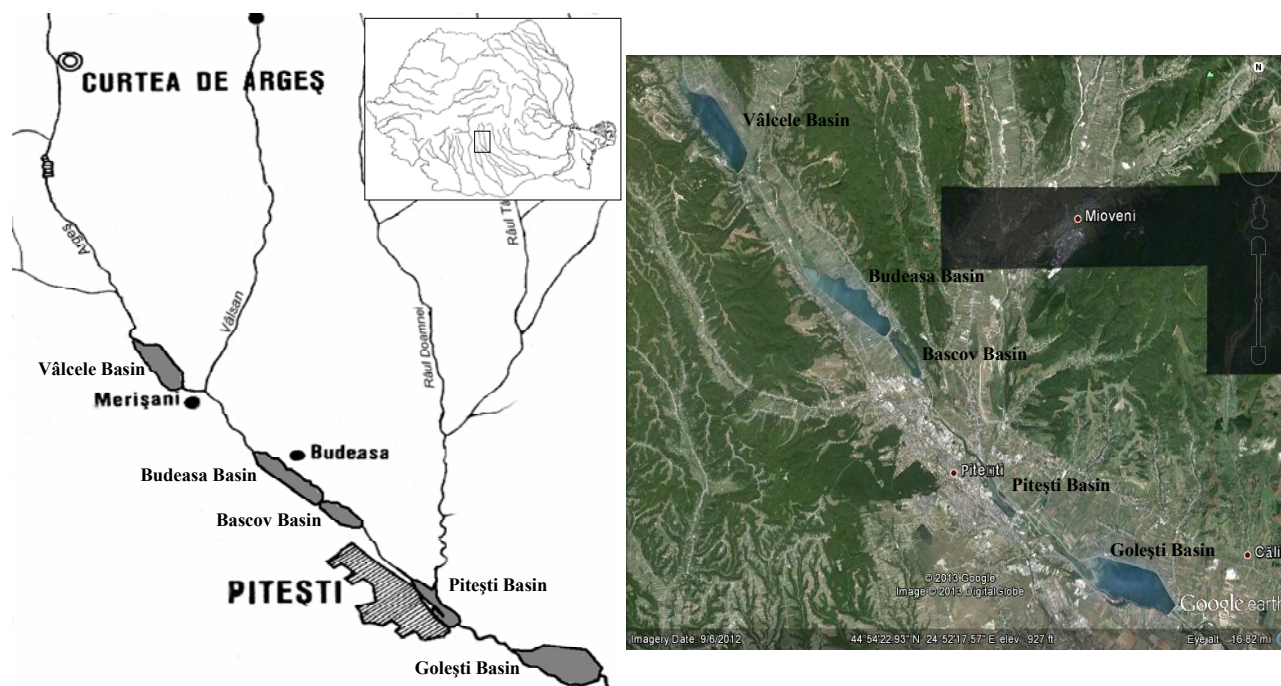


Figure 1. The map of the area (Google Earth view, on the right side).

Phalacrocorax carbo, *Cygnus olor*, *Fulica atra*, and *Larus argentatus* were the species observed on all five basins. They had the largest ecological valences of all registered species.

Regarding the dominance, *Anas platyrhynchos* and *Fulica atra* were the eudominant species. This means 4.44% of all species. *Cygnus olor*, *Anas crecca*, *Aythya ferina*, *Larus argentatus*, and *Larus*

ridibundus (11.11%) were the dominant species. There were 3 subdominant species (*Phalacrocorax carbo*, *Aythya fuligula* and *Larus canus*, 6.67%) and 35 subrecent species (77.78%). There were not recent species recorded (figure 2).

Table 1. The birds species observed on the basins; numbers, dominance and status of conservation according to the Birds Directive.

No.	Species	Válcele Basin	Budeasa Basin	Bascov Basin	Pitești Basin	Golești Basin	All basins	Dominance	Category of dominance	Birds Directive
1.	<i>Gavia arctica</i>				1		1	0.01	D1	AI
2.	<i>Tachybaptus ruficollis</i>	52		25	5	2	84	0.57	D1	
3.	<i>Phalacrocorax carbo</i>	25	300	26	25	17	393	2.66	D3	
4.	<i>Phalacrocorax pygmeus</i>				77		77	0.52	D1	AI
5.	<i>Egretta alba</i>		2			1	3	0.02	D1	AI
6.	<i>Ardea cinerea</i>	7		1	2		10	0.07	D1	
7.	<i>Cygnus olor</i>	48	279	2	513	9	851	5.76	D4	AII/B
8.	<i>Cygnus cygnus</i>	25	12		9		46	0.31	D1	AI
9.	<i>Anser albifrons</i>					8	8	0.05	D1	AII/B, AIII/B
10.	<i>Anas platyrhynchos</i>	410	1250		2269	1230	5159	34.90	D5	AII/A, AIII/A
11.	<i>Anas penelope</i>	13	52		8	20	93	0.63	D1	AII/A, AIII/B
12.	<i>Anas crecca</i>	150	240		710	100	1200	8.12	D4	AII/A, AIII/B
13.	<i>Anas clypeata</i>		17				17	0.11	D1	AII/A, AIII/B
14.	<i>Tadorna tadorna</i>				14		14	0.09	D1	
15.	<i>Netta rufina</i>	16					16	0.11	D1	AII/B
16.	<i>Aythya fuligula</i>	43	190		322		555	3.75	D3	AII/A, AIII/B
17.	<i>Aythya ferina</i>	79	800		565		1444	9.77	D4	AII/A, AIII/B
18.	<i>Bucephala clangula</i>	35	50		4	3	92	0.62	D1	AII/B
19.	<i>Mergus albellus</i>	3	2				5	0.03	D1	AI
20.	<i>Buteo buteo</i>	3			2	4	9	0.06	D1	
21.	<i>Falco tinnunculus</i>					2	2	0.01	D1	
22.	<i>Phasianus colchicus</i>	5			1		6	0.04	D1	AII/A, AIII/A
23.	<i>Gallinula chloropus</i>				5		5	0.03	D1	AII/B
24.	<i>Fulica atra</i>	200	600	20	680	50	1550	10.49	D5	AII/A, AIII/B
25.	<i>Tringa ochropus</i>		1				1	0.01	D1	
26.	<i>Larus argentatus</i>	55	310	40	159	300	864	5.84	D4	AII/B
27.	<i>Larus canus</i>		50	25	630		705	4.77	D3	AII/B
28.	<i>Larus ridibundus</i>		300	55	885	31	1271	8.60	D4	AII/B
29.	<i>Streptopelia decaocto</i>				18		18	0.12	D1	AII/B
30.	<i>Alcedo atthis</i>				1		1	0.01	D1	AI
31.	<i>Pica pica</i>		7		4	19	30	0.20	D1	AII/B
32.	<i>Corvus monedula</i>				11	11	22	0.15	D1	AII/B
33.	<i>Corvus frugilegus</i>				20	4	24	0.16	D1	AII/B
34.	<i>Corvus corone cornix</i>				3	6	9	0.06	D1	AII/B
35.	<i>Corvus corax</i>	1		4	6	20	31	0.21	D1	
36.	<i>Troglodytes troglodytes</i>				1		1	0.01	D1	
37.	<i>Turdus pilaris</i>					12	12	0.08	D1	AII/B
38.	<i>Parus caeruleus</i>				8		8	0.05	D1	
39.	<i>Parus major</i>				5		5	0.03	D1	
40.	<i>Fringilla coelebs</i>				16		16	0.11	D1	
41.	<i>Carduelis chloris</i>				9		9	0.06	D1	
42.	<i>Carduelis spinus</i>				2		2	0.01	D1	
43.	<i>Carduelis cannabina</i>	40					40	0.27	D1	
44.	<i>Emberiza schoeniclus</i>	2			3		5	0.03	D1	
45.	<i>Emberiza citrinella</i>		12		50	7	69	0.47	D1	
Number of individuals		1212	4474	198	7043	1856	14783			

Number of species	20	19	9	36	21	45			
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Legend:

D1 – subrecedent species, D2 – recedent species, D3 – subdominant species, D4 – dominant species, D5 – eudominant species; AI – Annex I; AII/A – Annex II, part A; AII/B – Annex II, part B; AIII/A – Annex III, part A; AIII/B – Annex III, part B.

Table 2. The number of species, respectively of individuals, according to the orders.

No.	Order	Number of species	Number of individuals
1	Gaviiformes	1	1
2	Podicipediformes	1	84
3	Pelecaniformes	2	470
4	Ciconiiformes	2	13
5	Anseriformes	13	9500
6	Falconiformes	2	11
7	Galliformes	1	6
8	Gruiformes	2	1555
9	Charadriiformes	4	2841
10	Columbiformes	1	18
11	Coraciiformes	1	1
12	Passeriformes	15	283

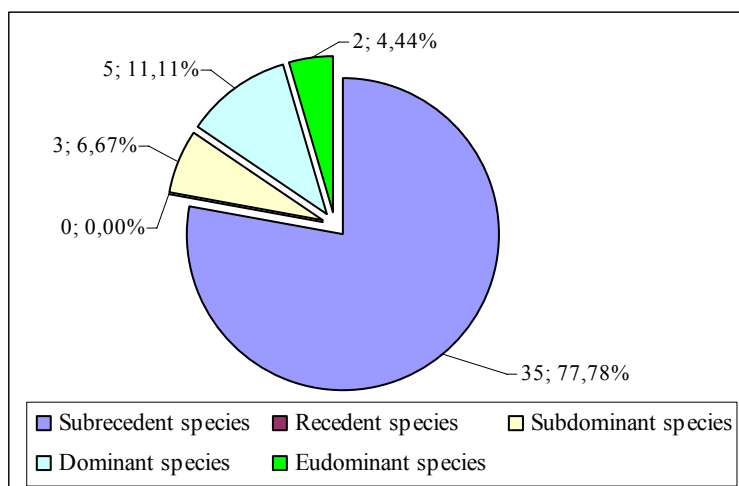


Figure 2. The species distribution according to their category of dominance.

Anas platyrhynchos and *Fulica atra* had the biggest number of individuals (2269, respectively 680) on the Pitești Basin. The Budeasa Basin was favourable for both species while the Golești Basin was favourable only for *Anas platyrhynchos*. The Vâlcele Basin was less favourable than the Budeasa Basin and the Bascov Basin was unfavourable for both species (figure 3).

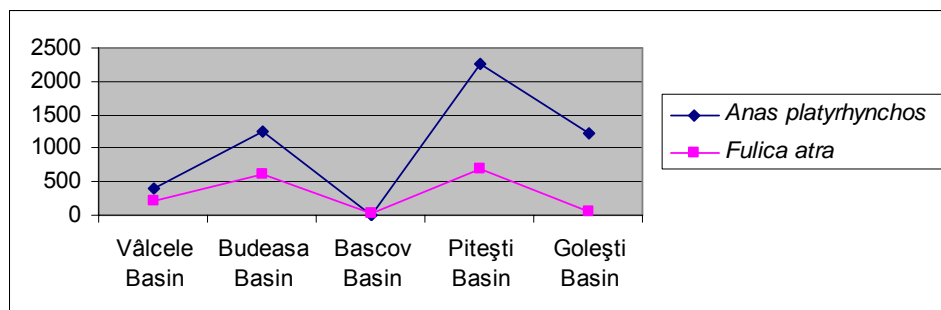


Figure 3. The numbers variation of *Anas platyrhynchos* and *Fulica atra* for every basin.

Unlike other years (Gava et al., 2004, Mestecăneanu et al., 2010, Gava et al., 2012), the biggest numbers of all individuals was noted on Pitești Basin (7043). The Golești Basin had only 1856

individuals (other years being the first in top, habitually with over 5000 individuals). Budeasa Basin had a lot of individuals, too. As usually, the Bascov Basin had the least number of individuals (198). Regarding the number of species, the situation was almost identical. The difference is that the Vâlcele Basin had more species than Budeasa Basin. The first – Golești Basin (36 species) and the latest – Bascov Basin (9 species) (table 1). As long as the temperatures conditions are relatively the same for all the basins, the explanation of this situation takes into account the local conditions of depth, surface, and speed of water (that determine the size of the unfrozen surface of water) and also by the anthropogenic pressure (hunting and poaching) for every basin. The food supply and the places of rest can influence the number of birds, too.

Concerning the ornithological similarity of the basins, we noticed that, by the Jaccard index, the highest similarity was between Vâlcele and Budeasa and the lowest between Golești and Bascov (table 3, figure 4). By Bray-Curtis index, the highest similarity was between Pitești and Budeasa and the lowest between Pitești and Bascov (table 4, figure 5). The highest similarities confirm the results from 2000 – 2010 period (Mestecăneanu et al., 2010). We mention that the 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.

Table 3. The Jaccard similarity matrix.

Similarity	Vâlcele Basin	Budeasa Basin	Bascov Basin	Pitești Basin	Golești Basin
Vâlcele Basin	*	44.44	31.81	43.58	36.66
Budeasa Basin	*	*	27.27	37.5	42.85
Bascov Basin	*	*	*	25	30.43
Pitești Basin	*	*	*	*	42.5
Golești Basin	*	*	*	*	*

Jaccard Cluster Analysis (Single Link)

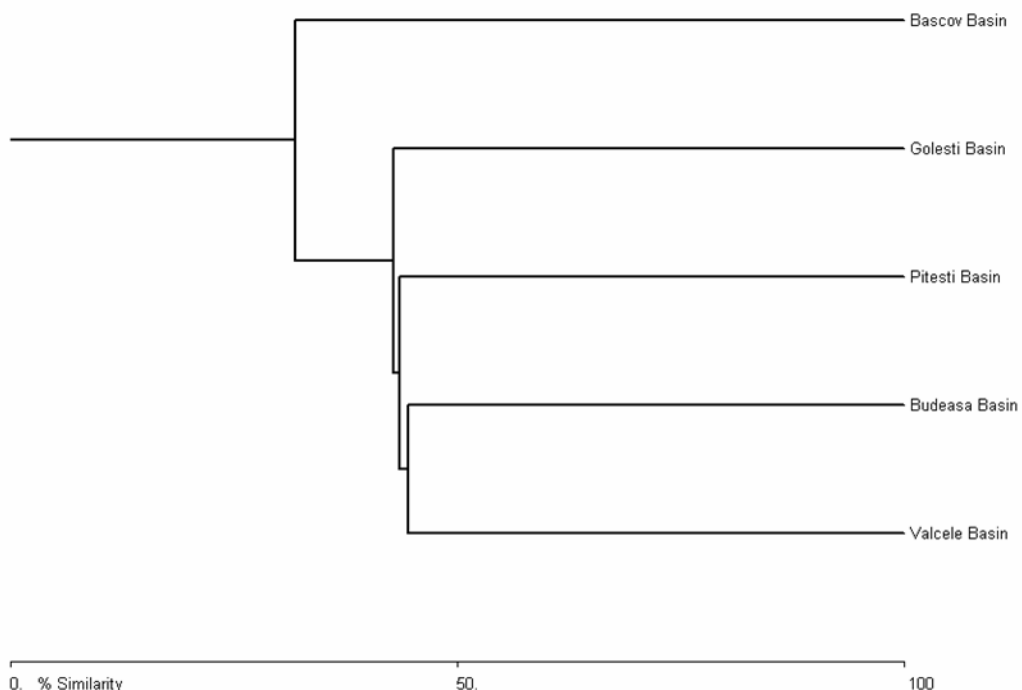


Figure 4. The Jaccard similarity dendrogram.

According to the index of relation, the Anseriformes and Charadriiformes orders were overdominant, Gruiformes was dominant and the other orders (Gaviiformes, Podicipediformes, Pelecaniformes, Ciconiiformes, Falconiformes, Galliformes, Columbiformes, Coraciiformes and Passeriformes) were

complementary. The static axis is 8.33 and the dominance axis is 16.66 (figure 6). The Anseriformes order was clearly overdominant, fact observed with other occasions, too. It is noticeable that, depending on the year, Charadriiformes and Gruiformes vary from overdominant order to complementary order and the other orders are permanently complementary (Gava et al., 2004, Gava et al., 2012).

Table 4. The Bray-Curtis similarity matrix.

Similarity	Vâlcele Basin	Budeasa Basin	Bascov Basin	Pitești Basin	Golești Basin
Vâlcele Basin	*	37.70	16.17	25.29	43.22
Budeasa Basin	*	*	7.19	64.16	56.08
Bascov Basin	*	*	*	4.88	11.29
Pitești Basin	*	*	*	*	36.99
Golești Basin	*	*	*	*	*

Bray-Curtis Cluster Analysis (Single Link)

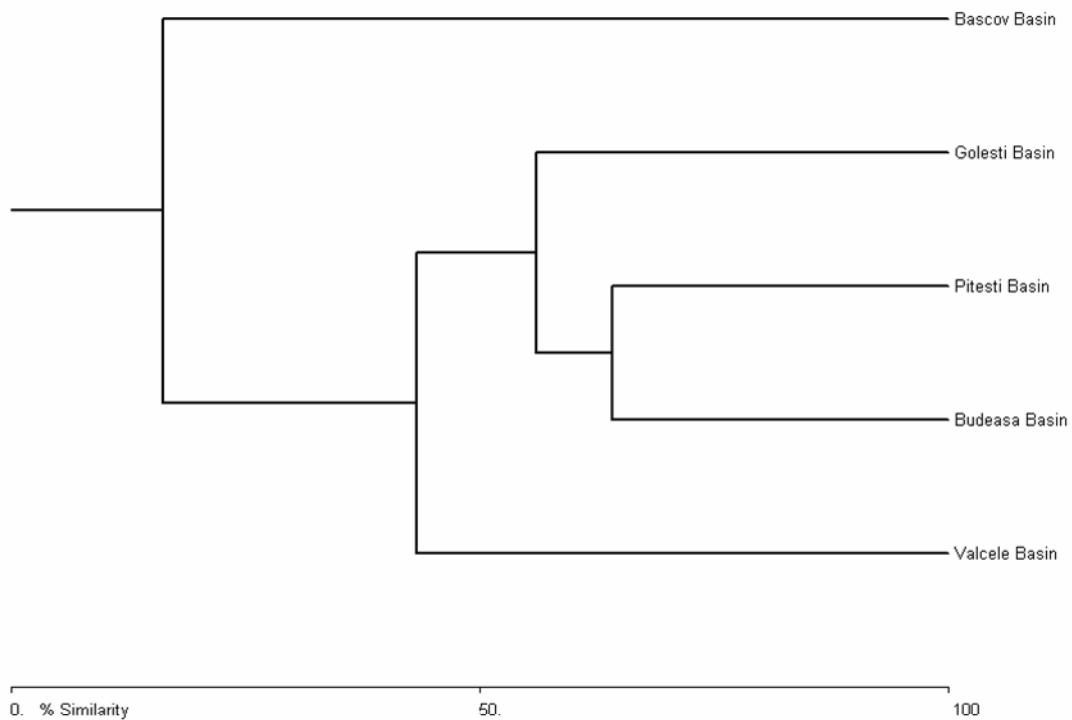


Figure 5. The Bray-Curtis similarity dendrogram.

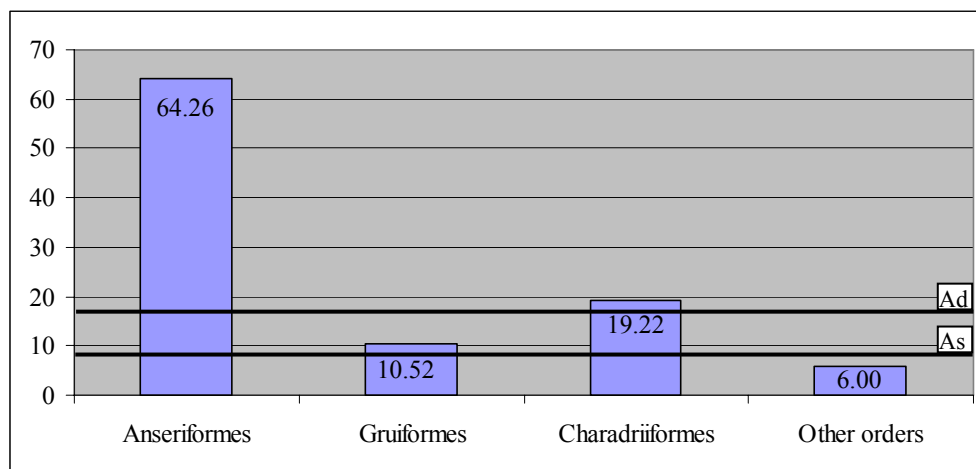


Figure 6. The global participation of the orders to the bird coenoses observed on the basins.

The species situation for the Anseriformes: *Anas platyrhynchos* and *Aythya ferina* – overdominant species, *Cygnus olor* and *Anas crecca* – dominant species, *Aythya fuligula* while the rest are complementary species. In this case, the static axis is 7.69 and the dominance axis is 15.38 (figure 7). Like in the other years, *Anas platyrhynchos* had the biggest number of all species; it is overdominant. We mention that, generally, two species, *Aythya ferina* and *Anas crecca*, are dominant while the other are complementary species (Mestecăneanu et al., 2010, Gava et al., 2012).

Gavia arctica, *Phalacrocorax pygmeus*, *Egretta alba*, *Cygnus cygnus*, *Mergus albellus* and *Alcedo atthis* are in the Annex I of the Birds Directive (table 1). They are the subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution (<http://ec.europa.eu>).

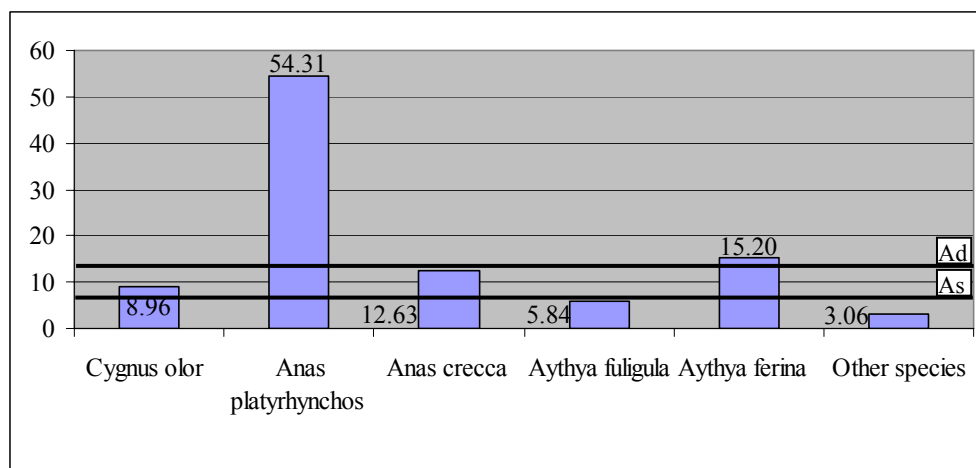


Figure 7. The global participation of the species to the Anseriformes coenoses observed on the basins.

4. CONCLUSIONS

- During the midwinter waterbird census performed on January 12, 2013, on the basins Golești, Pitești, Bascov, Budeasa and Vâlcele, 45 bird species and 14783 individuals were registered;
- The identified species belong to 12 orders; the most numerous are the Passeriformes (15 species) and the Anseriformes (13 species) while the richest in number of individuals are Anseriformes (9500) and Charadriiformes (2841);
- *Phalacrocorax carbo*, *Cygnus olor*, *Fulica atra*, and *Larus argentatus* were the species with the largest ecological valence;
- *Anas platyrhynchos* and *Fulica atra* (4.44%) were the eudominant species, *Cygnus olor*, *Anas crecca*, *Aythya ferina*, *Larus argentatus*, and *Larus ridibundus* (11.11%) were the dominant species, *Phalacrocorax carbo*, *Aythya fuligula* and *Larus canus* (6.67%) were the subdominant species; 35 species (77.78%) were subrecedent; there were not recedent species recorded;
- The biggest numbers of all individuals was recorded on Pitești Basin (7043); as usually, the Bascov Basin had the least number of individuals;
- The highest Jaccard similarity was between Vâlcele and Budeasa and the lowest between Golești and Bascov; the highest Bray-Curtis similarity was between Pitești and Budeasa and the lowest between Pitești and Bascov;
- The Anseriformes and Charadriiformes orders were overdominant, Gruiformes was dominant and the other orders were complementary;
- For the Anseriformes order, *Anas platyrhynchos* and *Aythya ferina* were the overdominant species, *Cygnus olor* and *Anas crecca*, the dominant species, *Aythya fuligula* and the rest, the complementary species;

- Only 6 species (*Gavia arctica*, *Phalacrocorax pygmeus*, *Egretta alba*, *Cygnus cygnus*, *Mergus albellus* and *Alcedo atthis*) are in the Annex I of the Birds Directive.

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