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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).

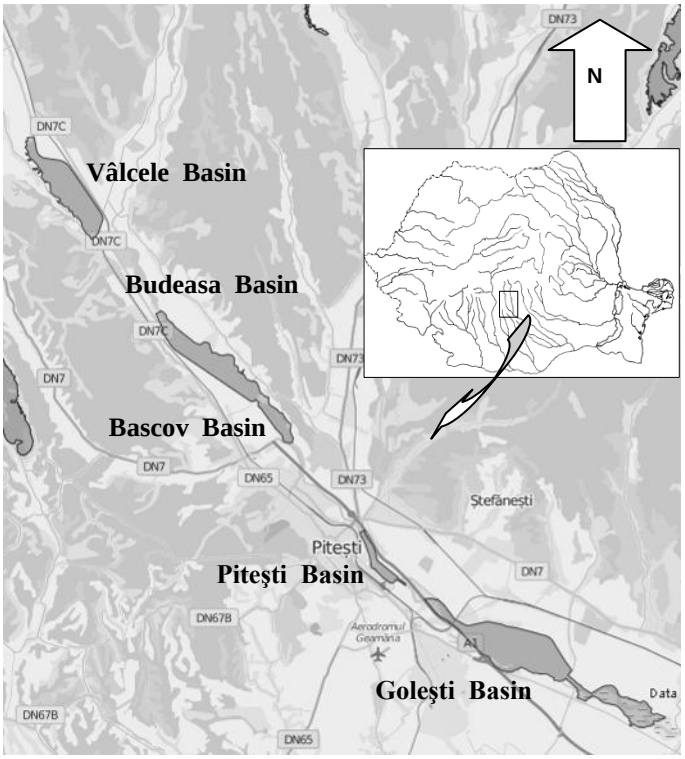

Figure 1 - The map of the area.
(by http://biodiversitate.mmediu.ro, modified).

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).

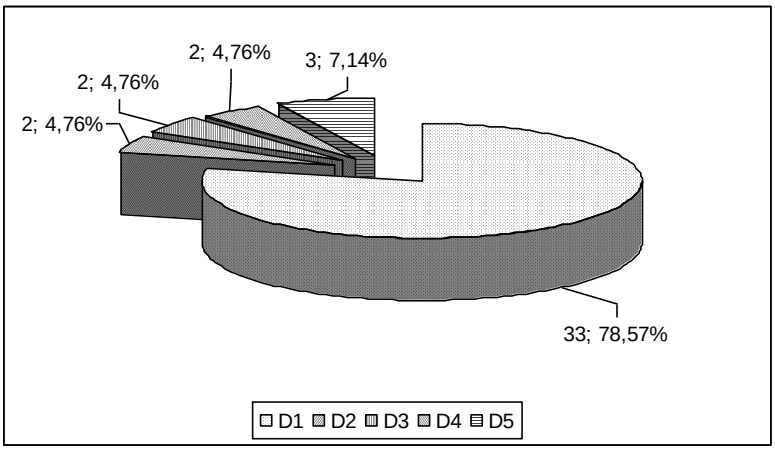

Figure 2 - The repartition of the species depending on the categories of dominance.

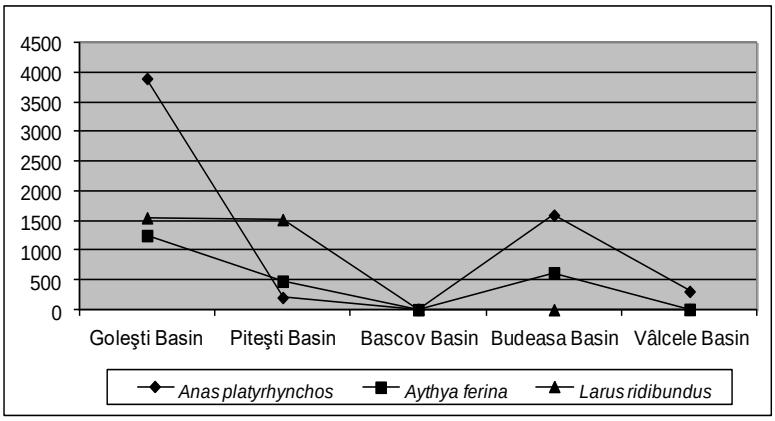

Figure 3 - The evolution of the eudominant species on each dam basin.

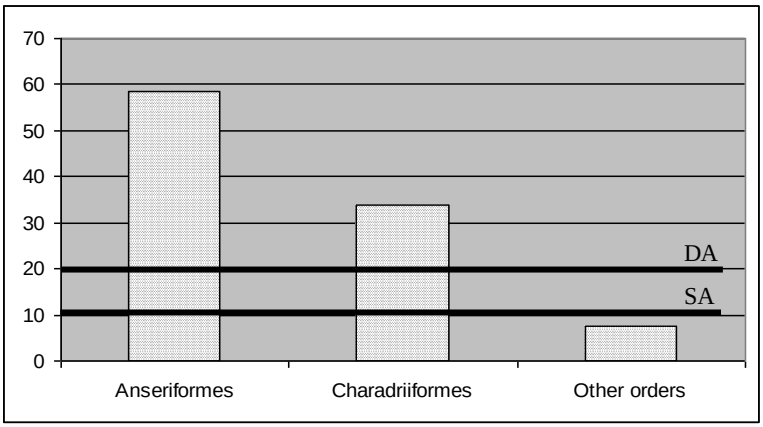

Figure 4 - The participation of the orders to the avicoenose formation by the index of relation.

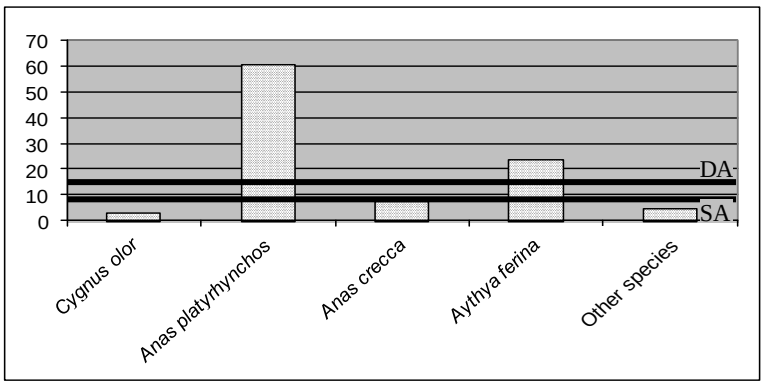

Figure 5 - The participation of the species to the formation of the Anseriformes coenose by the index of relation.

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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