

Complex Research of Ornithofauna in the Kur-Araz Plain of Azerbaijan

Narmina Abel Gizi Sadigova*

Department of Bioecology, Faculty of Ecology and Soil Science, Baku State University, Baku, Azerbaijan

Abstract

The nesting birds have been poorly studied in the anthropogenic Kur-Araz plain of Azerbaijan. The first researches about ornithofauna investigation aren't favourable to the international standard. In this connection the ornithofauna of the Kur-Araz plain has been investigated and the nesting birds' bioecological indications have been analysed over 13 parameters. The ornithological characters of the zone are analyzed, a theoretical and practical importance is evaluated, and this assumes a great importance for realization of the tactical measures preparation to protect biological diversity.

Keywords

Nesting Birds, Ecological Evaluation Parameters, Complex Bioecological Indicators

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1. Introduction

The first researches about ornithofauna in this region don't correspond to modern international standard [1, 20, 22, 26]. G. T. Mustafayev [10] tried to diminish this fraction [12]. There were many mistakes about Azerbaijan birds in the catalogue [27].

Mustafayev [17] dedicated separate articles to abolishment of the same mistakes. Besides, the scientific mistakes in the works published about Azerbaijan avifauna were abolished in the latest reference [8, 9, 11, 23]. In connection with this, was studied the results of some investigation about the state of avifauna of various regions [6, 7, 18, 19, 21].

The Kur-Araz plain is a main region of Central Azerbaijan. It occupies a western part of the Kur-Araz plain: in the east-from the Caspian sea till Gazakh in the west. A climate of this region is arid and moderate- arid subtropical. The main natural landscapes are sea and alluvial-proluvial and proluvial-delluvial plains. There are ephemeras, saline, wormwood, steppe and meadow plants, but mixed grass and

shrubs in the other places. The marshy plants (reed, cane, marijuana, tamarix, etc.) and plant cover created as a result of the anthropogenic succession of the Tugay forest are main biocenosis.

2. Materials and Methods

After 2013 the field researches were performed and the stationary research places were Kurdamir, Ujar and Goychay regions of the Kur-Araz plain. A main method is "Ecological landscape analysis conception of the fauna" [9, 24]. The birds' synanthrope level and fodder character were given according to the original scales [2, 3, 4, 11]. A require for the vivid investigation of the birds in the nature was fulfilled.

Isakov [5] gave an ornithofauna investigation level by the five score system due to four criteria and ten parameters. Last years Sadigova and Mustafayev [24] offered to work on the basis of 14 parameters in the birds' bioecology due to the 100-score evaluation method. So, Isakov brought an objective method for the birds' fauna investigation level, but Mustafayev gave an objective method for assessment of the

* Corresponding author
E-mail address: bioekologiya.kafedراس@mail.ru

bioecological researches. These methods were applied by us.

The scientists were in expedition of the Kurdamir and Barda regions of the Kur-Araz plain for 38 times. 257 working-days were expended on it. 208 days of them were spent on observations and monitoring, the rest days on the daily excursions.

Fourteen parameters characterizing each sort have been selected. It was investigated 67 regional parameters (table 1).

The researches were performed in the nature include the birds' concrete biotope, attitude towards men, landscape-use character, nest condition (open, covered), sociology, synanthrope level, daily activity, how to look for food, how and where to take it from, the predatory birds' attack their hunts, feeding success, studying of their hunts' alarm signal and other behavior rules. To study eggs and nestlings serves having a knowledge of the birds productivity and development type.

The mathematic collected by the stationary and route methods have been applied to this ornithogeographic region with the multiparametric complex ecological assessment principle. A response to 67 indications including in 14 parameters in each sort of the nesting birds life was prepared.

Table 1. Ecological evaluation parameters.

	Parameters	Structural parts
1	Fauna types	4-8
2	Fauna forming factors	3
3	Macrostructure of sorts	2
4	Seasonal dynamics of fauna	3
5	Number category	3
6	Biotopes	4-8
7	Biotope-use character	2
8	Nest condition	3
9	Synanthrope level	5
10	Development types	3
11	Daily activity	3
12	Sociology	4
13	Feeding condition	6-11
14	Forage character	3-9
Sum	14 parameters	48-67

An areal of the sorts was taken from monograph [25].

3. Results and Discussion

At present approximately 10% of the natural landscapes remained in the Kur-Araz plain [13, 14], but the most parts were modified and wholly transformed. The winter pastures and haylands are dominant landscapes. There are irrigated farming areas too (field, fruit gardens, vineyards, forest zone, etc.). Widening of the residential area seriously affected the ornithofauna.

At the same time the innovations existed in a direction of the

ornithofauna richness. Instead of the semidesert and steppe plains, an intensive development of the villages, settlements and towns and expansion of the irrigated agrarian farming attracted dendrophilia, phanerobiotic, polybiotic, even petrophilia groups of the birds. For example, such birds as a pigeon and black thrill were bred only in winter, but ordinary and long-winged urban swallows at the migration time, but now they expand and breed. An investigation of the main indices in each sort is required to have a knowledge of present quality and quantity indications of ornithofauna.

The transpalearctic species are more for the fauna type (41.3%), the Mediterranean Sea type is in the middle position (29.8%), the European type is in the third place (22.3%). The sorts concerning the other types are little (6.6%). Polytypical species are 79.3%, monotypical ones are 20.7%. An amount of the sedentary sorts is equal to a quantity of the visitors for breeding (49.6 and 50.4%). But the rare birds dominate with the quantity categories (56.2%). We see its main reason in forests cutting, drainage of the stagnant waters and lakes, natural landscapes of the monocultural farming replacement, large application of the pesticides for this (table 2).

The biotope groups of the birds can approve this. Limonodophilia birds settle down on the bank of the lakes, canals and boggy cane jungles, such areas are in a form of little stripes and islets and this can be a reason for the birds' rarity. The same words can be concerned the dendrophilia birds. While an initial fauna of the Kur-Araz plain is oreophilia, now the species including in the group are little (15.7%). The polybiotic sorts are ordinary or multi-numbered.

The synanthrope species aren't also rare. The synanthrope level of the birds in the region is higher than in some others regions (24.8%). Most of the sorts (93.4%) use from the breeding landscapes (table 3).

The landscape diversity and mosaic settlement of the birds in the region intensify a colonial living. Such birds form 29%. Most of them are obligate.

Table 2. Complex ecological evaluation of the nesting birds in the Kur-Araz plain.

Fauna types	Number of species	%
Transpalearctic	50	41.3
Mediterranean Sea	36	29.8
European Type	27	22.3
Other types	8	6.6

Macrostructure of species	Number of species	%
Monotypical	25	20.7
Polytypical	96	79.3

Seasonal dynamics of fauna	Number of species	%
Sedentary species	60	49.6
Propagating visitors	61	50.4

Quantity categories	Number of species	%
Multi-numbered species	16	13.2
Simple-numbered species	37	30.6
Rare species	68	56.2

Sociology	Number of species	%
Separate nest	86	71.1
Transition to colony	8	6.6
Colony facultative	11	9.1
Colony obligate	16	13.2

Development type	Number of species	%
Nidifugous	22	18.2
Nidicolous	89	73.5
Middle position	10	8.3

Daily activity	Number of species	%
Day birds	103	85.1
Night birds	8	6.6
Mediterranean Sea birds	10	8.3

Seed –places	Number of species	%
From ground	32	26.4
From ground and water	8	6.6
From ground and bush	10	8.3
From ground and air	10	8.3
From ground, tree and air	3	2.5
From ground, tree and bush	2	1.6
From tree	6	5.0
From tree and bush	5	4.1
From bush	6	5.0
From water	8	6.6
From water and bush	1	0.8
From air	8	6.6
From air and water	6	5.0

Over biotopes	Number of species	%
Limnodophilia	47	38.8
Dendrophilia	20	16.5
Chameobiotic	14	11.6
Oreophlia	19	15.7
Residential area	5	4.2
Polybiotic	16	13.2

Synanthrope level	Number of species	%
Not Synanthrope	91	75.2
Slightly Synanthrope	12	9.9
Half Synanthrope	6	5.0
Incomplete Synanthrope	5	4.1
Complete Synanthrope	7	5.8

Landscape use character	Number of species	%
Thoroughly user	113	93.4
Only breeder	8	6.6

Nest condition	Number of species	%
In open condition	87	71.9
In closed condition	25	20.7
Mediterranean position	9	7.4

Feed character	Number of species	%
Phytophagous	16	13.2
Zoophagous	91	75.2
From them:		
General zoophagous	15	12.4
Entomophagous	64	52.9
Predatory	7	5.8
Icthiophagous	14	11.6
Polyphagous	14	11.6

Table 3. Complex bioecological indicators of nesting birds in the Kur-Araz plain (fragment).

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	<i>Podiceps ruficollis capensis</i>	TR	Pt	S	Rs	Lm	Mu	Oc	SN	Ns	Nf	Db	W	Z
2.	<i>P. nigricollis nigricollis</i>	TR	Pt	S	Rs	Lm	Mu	Oc	SN	Ns	Nf	Db	W	Z
3.	<i>P. cristatus cristatus</i>	TR	Pt	S	Rs	Lm	Mu	Oc	SN	Ns	Nf	Db	W	Z
4.	<i>Pelecanus crispus</i>	MS	Mt	S	Rs	Lm	Mu	Oc	Tc	Ns	Nc	Db	W	I
5.	<i>Phalacrocorax pygmaeus</i>	MS	Mt	S	Rs	Lm	Mu	Oc	Co	Ns	Nc	Nb	W	I
6.	<i>Ixobrychus miutus minutus</i>	EU	Pt	NE	Rs	Lm	Mu	Oc	SN	Ns	Nc	Nb	W	Z
7.	<i>Nycticorax nycticorax nycticorax</i>	MS	Pt	NE	Rs	Lm	Mu	Oc	Co	Ns	Nc	Nb	W	I
8.	<i>Ardeola ralloides</i>	MS	Mt	NE	Rs	Lm	Mu	Oc	Co	Ns	Nc	Nb	W	Z
9.	<i>Bubulcus ibis ibis</i>	MS	Pt	NE	Rs	Lm	Mu	Oc	Co	Ns	Nc	Db	G	En
10.	<i>Egretta alba alba</i>	TR	Pt	S	Rs	Lm	Mu	Oc	SN	Ns	Nc	Db	W	I
11.	<i>E. qarzetta qarzetta</i>	MS	Pt	S	Rs	Lm	Mu	Oc	Co	Ns	Nc	Nb	W	I
12.	<i>Ardea cinerea cinerea</i>	TR	Pt	S	Ss	Lm	Mu	Oc	SN	Ns	Nc	Db	W,G	Z
13.	<i>A. purpurea purpurea</i>	MS	Pt	NE	Rs	Lm	Mu	Oc	SN	Ns	Nc	Db	W,G	Z
14.	<i>Platalea leucorodia leucorodia</i>	TR	Pt	NE	Rs	Lm	Mu	Oc	Co	Ns	Nc	Nb	W	Z
15.	<i>Plegadis falcinellus</i>	TR	Mt	NE	Rs	Lm	Mu	Oc	Co	Ns	Nc	Db	W	Z
16.	<i>Ciconia ciconia ciconia</i>	EU	Pt	NE	Rs	Pt	Mu	Oc	SN	Is	Nc	Db	G	Z
17.	<i>Anser anser</i>	TR	Mt	S	Rs	Lm	Mu	Oc	SN	Ns	Nf	Db	G	Z
18.	<i>Tadorna ferruginea</i>	TR	Mt	S	Rs	Lm	Mu	Cc	SN	Ns	Nf	Nb	G,W	Z
19.	<i>T. tadorna</i>	TR	Mt	S	Rs	Lm	Mu	Cc	SN	Ns	Nf	Nb	G,W	Z
20.	<i>Anas platyrhynchos platyrhynchos</i>	EU	Pt	NE	Rs	Lm	Mu	Oc	SN	Ns	Nf	Db	G,W	Ph
21.	<i>A. anqustrirostris</i>	TR	Mt	S	Rs	Lm	Mu	Oc	SN	Ns	Nf	Db	W	Ph
22.	<i>Netta rufina</i>	MS	Mt	S	Rs	Lm	Mu	Oc	SN	Ns	Nf	Db	W	Ph

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
23.	<i>Aytya niroca</i>	TR	Mt	S	Rs	Lm	Mu	Oc	SN	Ns	Nf	Db	W	Ph
24.	<i>Circus aeruginosus aeruginosus</i>	TR	Pt	S	Rs	Lm	Mu	Oc	SN	Ns	Nc	Db	G,K	Pr
25.	<i>Accipiter nisus nisus</i>	TR	Pt	S	Rs	De	Mu	Oc	SN	Ns	Nc	Db	A,G,K	Pr
26.	<i>Haliatus albicilla albicilla</i>	TR	Pt	S	Rs	De	Ne	Oc	SN	Ns	Nc	Db	W,G	Pr
27.	<i>Falco naumanni</i>	Mo	Mt	NE	Ss	Pb	Mu	Cc	Cf	Ss	Nc	Db	G	En

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
28.	<i>F. tinnunculus tinnunculus</i>	Sb	Pt	S	Ss	Pb	Mu	Cc	SN	Ss	Nc	Db	G	Pr
29.	<i>Francolinus francolinus fraecalinus</i>	Afr	Pt	S	Rs	Or	Mu	Oc	SN	Ns	Nf	Db	G	Ph
30.	<i>Coturnix coturnix coturnix</i>	TR	Pt	NE	Rs	Or	Mu	Oc	SN	Ns	Nf	Db	G	Ph
31.	<i>Rallus aquaticus aquaticus</i>	EU	Pt	S	Rs	Lm	Mu	Oc	SN	Ns	Mip	Nb	K	En
32.	<i>Gallinula chloropus chloropus</i>	EU	Pt	S	Rs	Lm	Mu	Oc	SN	Ns	Mip	Nb	B,G	En
33.	<i>Porphyrio porphyrio seistanicus</i>	MS	Pt	S	Ss	Lm	Mu	Oc	SN	Ns	Mip	Nb	B,W	Ph
34.	<i>Fulica atra atra</i>	TR	Pt	S	Rs	Lm	Mu	Oc	SN	Ns	Mip	Nb	G,W	Ph
35.	<i>Burhinus oedienemus oedienemus</i>	MS	Pt	NE	Rs	Or	Mu	Oc	SN	Ns	Nf	Nb	G	En
36.	<i>Charadrius dubius curonicus</i>	TR	Pt	NE	Rs	Lm	Mu	Oc	SN	Ns	Nf	Db	G	En
37.	<i>Vanellus vanellus</i>	MS	Mt	S	Rs	Lm	Mu	Oc	SN	Ns	Nf	Db	G	En
38.	<i>Vanellochetus leucoura</i>	MS	Mt	NE	Rs	Lm	Mu	Oc	Tc	Ns	Nf	Db	G	En
39.	<i>Himantopus himantopus himantopus</i>	Mo	Pt	NE	Rs	Lm	Mu	Oc	Tc	Ns	Nf	Db	G,W	En
40.	<i>Tringa ochropus</i>	TR	Mt	NE	Rs	Lm	Mu	Oc	SN	Ns	Nf	Db	G	En
41.	<i>T. qlareola</i>	TR	Mt	NE	Rs	Lm	Mu	Oc	Tc	Ns	Nf	Db	G	En
42.	<i>T. totanus totanus</i>	TR	Pt	S	Rs	Lm	Mu	Oc	Tc	Ns	Nf	Db	G	En
43.	<i>Glareola pratincola pratincola</i>	MS	Pt	NE	Ss	Lm	Mu	Oc	Co	Ns	Nf	Db	G,A	En
44.	<i>Chlidonias niger niger</i>	TR	Pt	NE	Rs	Lm	Mu	Oc	Co	Ns	Mip	Db	W,A	En
45.	<i>Ch. Leucopterus</i>	EU	Mt	NE	Rs	Lm	Mu	Oc	Cf	Ns	Mip	Db	W,A	En
46.	<i>Ch. Hybrida hybrida</i>	TR	Pt	NE	Rs	Lm	Mu	Oc	Cf	Ns	Mip	Db	W,A	En
47.	<i>Sterna sandvicensis sandvicensis</i>	TR	Pt	NE	Rs	Lm	Mu	Oc	Co	Ns	Mip	Db	W,A	En
48.	<i>S. hirundo hirundo</i>	TR	Pt	NE	Rs	Lm	Mu	Oc	Cf	Ns	Mip	Db	W,A	En
49.	<i>S. albifrons albifrons</i>	EU	Pt	NE	Rs	Lm	Mu	Oc	Cf	Ns	Mip	Db	W,A	En
50.	<i>Pterocles orientalis orientalis</i>	MS	Pt	S	Rs	Or	Mu	Oc	SN	Ns	Nf	Db	G	Ph

TR-Transpaleartic; MS-Mediterranean Sea; EU-European; Mo-Mongolian; Tb-Tibetan; Mt-Monotypical; Pt-Polytypical; S-Sedentary; Pr-Propagating; Rs-Rare species; Ss- Simple-numbered species; Lm-Limonodophilia; Pt-Petrophilia; De-Dendrophilia; Ch-Chameobiotic; Or-Oreophlia; Pb-Polybiotic; NE-Nesting; Mu-Multilateral using; Oc-Open condition; Cc-Closed condition; Mp-Mediterranean position; SN-Separate nest; Tc-Transition to colony; Cf-Colony facultative; Co-Colony obligate; Ns- Not Synanthrope; Ss-Slightly Synanthrope; Hs-Half Synanthrope; Is-Incomplete Synanthrope; Cs-Complete Synanthrope; Nf-Nidifugous; Nc- Nidicolous; Mip-Middle position; Db-Day birds; Nb-Night birds; G-From ground; A-From air; B- From bush; W- From water; Z-Zoophagous; I-Ichtiophagous; En- Entomophagous; P- Polyphagous; Pr- Predatory; Ph-Phytophagous

4. Conclusion

Generally the colonial bird sorts (54 species) are 22.3% in Azerbaijan. The bird sorts building a nest under the open condition are more, it is 71.9% in here. The sorts building a nest in the closed condition and taking a middle position are 28.1%. The groups for the development type is approximately so: nidicolous -73.5%, nidifugous and taking middle position are 26.5%. The day birds are dominators for the daily activity (85.1%). The birds created 14 groups for the seed places. The sorts taking seeds from ground are 26.4%. But feeding in connection with the ground is 58.7%. An amount of the birds joining in other groups is little.

The zoophagous prevail for the food peculiarity (75.2%). More of them are entomophagous (52.9%). Phytophagous (13.2%) and polyphagous (11.6%) take the second place.

The anthropogenic landscapes which are created instead of the natural landscapes in the Kur-Araz plain established some ecosystems: pasture, haylands, irrigation sowing area, fruit gardens, plantations, residential areas. This gave a compound character to the simple structure of ornithofauna in the Kur-Araz region.

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