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Results of the work of bird ringing camp on Dukla Pass in 1964-1965

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Stimulated by the encouraging effects of the first four years of work of the Baltic Operation (further BO), a group of biology students of the J. Piłsudski University in Warsaw, with financial support from the ZSP (Polish Students Organization), launched (HERMAN 1964) similar project at the lowest (500 m. a.s.l.) point of the Carpathian Range: the Dukla Pass [$49^0$25'N-$21^0$41'E]. Like in BO, our focus was mainly on ringing and measuring (with the BO methods – BUSSE *&* KANIA 1970) birds caught with mist-nets; we also performed visual observations of passage, but unfortunately the retrieved documentation relevant to this aspect of our work has proven too fragmentary to draw any reasonable conclusions beyond some superficial generalized impressions. Graduation of the organizers and withdrawal of funding precluded continuation of the work beyond three seasons (spring and autumn 1964, spring 1965), while first full-time jobs overwhelmed the eagerness to calculate statistics and prepare scatter diagrams, so the data collected between March 1964 and June 1965 had been shelved and, to all intents and purposes, forgotten. They have been "unearthed" recently and found to be worth better fate than to fill cellars or attics under thickening layers of dust, and – as it seems to be the last moment when the reliable elaboration can yet be done, as the 50th anniversary offered the most appropriate occasion, a year ago I (none of the remaining members of the team having any longer been interested in active ornithological research) decided to perform the task of putting some of the results before the scientific community in usable (enabling further comparative studies) form. Let's begin with the outline of the expectations that prompted us to launch the project [as we saw them ***at that time***: this is essentially – with few "cosmetic" modifications – a translation of the respective part from the unfinished preliminary draft of my report written in 1965]**.**

"**The aims.**

The general aims of the work may be framed into four main groups:

1. Clarification of the role of Dukla Pass as a bird migration route;
2. Comparison of the parameters (phenology, species composition, intensity, *&c.*) of migration through the Pass with those observed at the sea-shore (on the Baltic Operation camps), *i.e.* some degree of generalization of the BO results;
3. Providing a supplementary point of reference for evaluation – with somewhat more precision than it would be possible on the BO alone – of so-called 'easterly route', *i.e.* migration of some species and/or some individuals of other species, in the "atypical" direction: to the south-east;
4. Gathering data on morphology (esp. biometry of flight apparatus) and condition (as measured by amount of subcutaneal fat).

Ad 1. In the literature we can frequently meet the opinion (usually quoted without reference to any concrete data) that Moravian Gate and Dukla Pass are the main passages for birds migrating from the northern and north-eastern Europe towards the Pannonian Basin, Balkans and further to the Mediterranean area and Africa, as well – still more so as a result of the shape of Carpathian Range – as for those hurrying in spring in the opposite direction. Testing this hypothesis, providing data for its confirmation or rejection, was the first and initially dominating goal of our work, the more so that it is a question of primary theoretical importance, closely related to such problems as the role of mountains as barriers hampering migratory movements of birds, or the old (but still far from final solution) dispute as to whether migrants follow some narrowly delimited tracks or travel across the 'broad front'.

Ad 2. Six years of work of the BO has provided many exceedingly interesting data (as well in terms of absolute numbers as of amplitude and periodicity of fluctuations) on the phenology, intensity and speed of migration, species composition, proportions of sex and age classes, *&c.* of birds migrating along the southern coasts of the Baltic Sea. The question emerges if the conclusions drawn from these data are valid for the bird migrations in general, or are they true only in reference to the populations travelling through the BO camps, and/or to the (climatic, topographic, *&c.*) conditions prevailing there. Clarification of the similarities and differences between the patterns observed at BO and those on the Dukla Pass would – beyond the obvious direct scientific importance – hopefully help to elucidate, to certain extent, some general questions like the influence of local environmental or geographical circumstances on the parameters of migration.

Ad 3. It is well known fact that the majority of European birds fly in autumn in south-western direction, as well as that others (*Oriolus oriolus*, *Ficedula parva*, *&c.*) do not follow this rule and go to the south-east. Moreover, several species show internal variability in this respect: western populations migrate to SW, eastern ones to SE – for many of them the geographical borderline runs through (*Motacilla alba*, *Muscicapa striata &c.*) or close to (*e.g. Ciconia ciconia*) Poland. Last not least, even from the populations moving typically southwestwards some [?groups of] individuals follow the southeastern route (*e.g.* as much as *ca.* 5% of the recoveries of Swedish and Finnish *Erithacus rubecula* come from Turkey, Lebanon or Syria). Studies on this phenomenon are of great importance for elucidation of several aspects of the general theory of bird migration, *e.g.* verification of such popular hypotheses as the interpretation of present tracks of passage as the reflection of old paths of dispersal, or that changes in migrational tendencies are just nowadays especially rapid (what, in turn, might be one of the 'by-products' of human activity).

Ad 4. The value of morphological (especially biometrical) data in migration studies has been amply demonstrated in BO: not only the knowledge of the range of variability within and among the respective categories often enables exact species, sex and age determination when otherwise it is very difficult or unreliable, but comparison and statistical evaluation of wing-and tail length or wing-formula enables to discriminate between, and – with more or less precision – identify the geographical origin of, successive waves of passage; weight of body and amount of subcutaneal fat give information as to the condition (reserves of energy), *&c.* So, morphological data for the birds migrating through the Dukla Pass are not only desirable for their 'independent' scientific value, but also (mainly!) as comparative material for those gathered by BO on the Baltic Coast and other workers at various points of avian migration routes".

So much on the aims as seen in mid-sixties. Of course since that time as well the Baltic Operation as other Polish and foreign projects provided a large amount of new data, many publications appeared with novel ideas and novel evaluations, so now the "state of the art" is already much different – but nevertheless the results of the "Dukla Pass Project" seem worth some attention. Again, at the beginning, as seen by us immediately after the spring 1965 "campaign".

"**The results** obtained hitherto.

The ornithological camp on Dukla Pass ran during three migrational seasons: spring (31 III – 25 IV) and autumn (3-8 IX, 1-6 X) 1964 and spring (1-13 V) 1965 [some additional data have been gathered also during 'private' excursions by individual members of the team 20 IV and 19-25 VI 1965]; personal problems of participants made it impossible to work uninterruptedly throughout the autumn 1964, whereas the withdrawal of financial support by ZSP coerced resignation from the continuation beyond spring 1965. Nevertheless some preliminary conclusions can be formulated.

1. As long as the area remains under snow cover, *i.e.* up to *ca.* 20 IV, there is no appreciable passage across Dukla Pass; later some birds appear, but only in May, *i.e.* only for the latest arriving species, we can speak of the distinct migration. Thus, the (admittedly not conclusive) results of our work failed to support the concept of Dukla Pass as one of the main tracks of passage across the Carpathian Range in early spring; later in spring, as well as in autumn, the intensity of migration is greater, but very short time of observation on but a single camp does not allow to reliably conclude if Dukla Pass is the point where a narrow route crosses the mountains, or is it but an indistinguished section of the 'broad front'.

2. Some differences in relation to BO became evident, mainly in species composition, daily activity, dates of passage of main waves, as well as the morphological characteristics of sampled populations what, hopefully, could help in interpretation of the respective disparities between the BO camps.

3. Of special interest are the collected data on those species not or but rarely met on Baltic Coast (*Picus canus*, *Ficedula albicollis &c.*).

Quantitative achievements – 306 birds caught in spring 1964, 400 in autumn, and 220 in spring 1965 – look, at the first glance, very modest. Several circumstances may be set forth to explain these relatively low numbers: as mentioned above, in spring the intensity of migration remains very low before May, and in 1964 the camp worked only to 25 IV; on the other hand, in autumn and in spring 1965 only (respectively) 12 and 13 'ringing days' with (on the average) but 12 nets strongly limited our chances to achieve more spectacular results.

Lack of experience in work in mountainous environment, as well as small (usually 1 or 2 persons at a time) crew working in very hard conditions also must have influenced the efficiency of our activities. Nevertheless, a comparison of our results from, *e.g.*, autumn 1964 with those achieved in the same season by one of the best BO camps allows to expect – with obvious resrvations – that in the following years the effects of work on Dukla Pass would not be much inferior to those at the BO:
DP: 8 working days, 12 nets, 400 birds caught = on the average *ca.* 4 birds/net/day;
Hel: *ca.* 40 working days, *ca.* 40 nets, *ca.* 4000 birds – *ca*. 2.5 birds/net/day".
[According to the material available now to me, the numbers must be somewhat corrected: altogether 872 birds (not counting 129 retraps but including 23 recoveries from previous seasons) caught: 262 in spring 1964, 380 (213 in September, 167 in October) in autumn, and 230 in spring 1965; the camp worked for 6 days in September and 6 in October, so:
DP: 12 working days, 12 nets, 380 birds caught = on the average *ca.* 2.6 birds/net/day;
Hel: *ca.* 40 working days, *ca.* 40 nets, *ca.* 4000 birds – *ca*. 2.5 birds/net/day".
The sources of the discrepancies are not exactly understandable to me: most probably some conceptual differences (*e.g.* inclusion/exclusion of retraps and incomplete – arrival and departure – working days), supplemented with some simple counting errors, are involved; however, they do not seriously change the main conclusions].

It is not my aim to present here any comprehensive elaboration of the material gathered during the work of the Dukla Pass camp, I wish only to make it accessible to further workers who may find interesting to compare it with their own or other results (like those of *Actio Carpathica* operating since 1998 in close proximity – *ca.* 15 km. air line – to the place of our "ancient" activity). So, I am completing the task with presentation of the data in form of summarizing tables – if somebody needs additional explanation or more detailed informations, please feel free to contact me and I will do my best to help as far as the recovered documentation (or my memory…) allows.

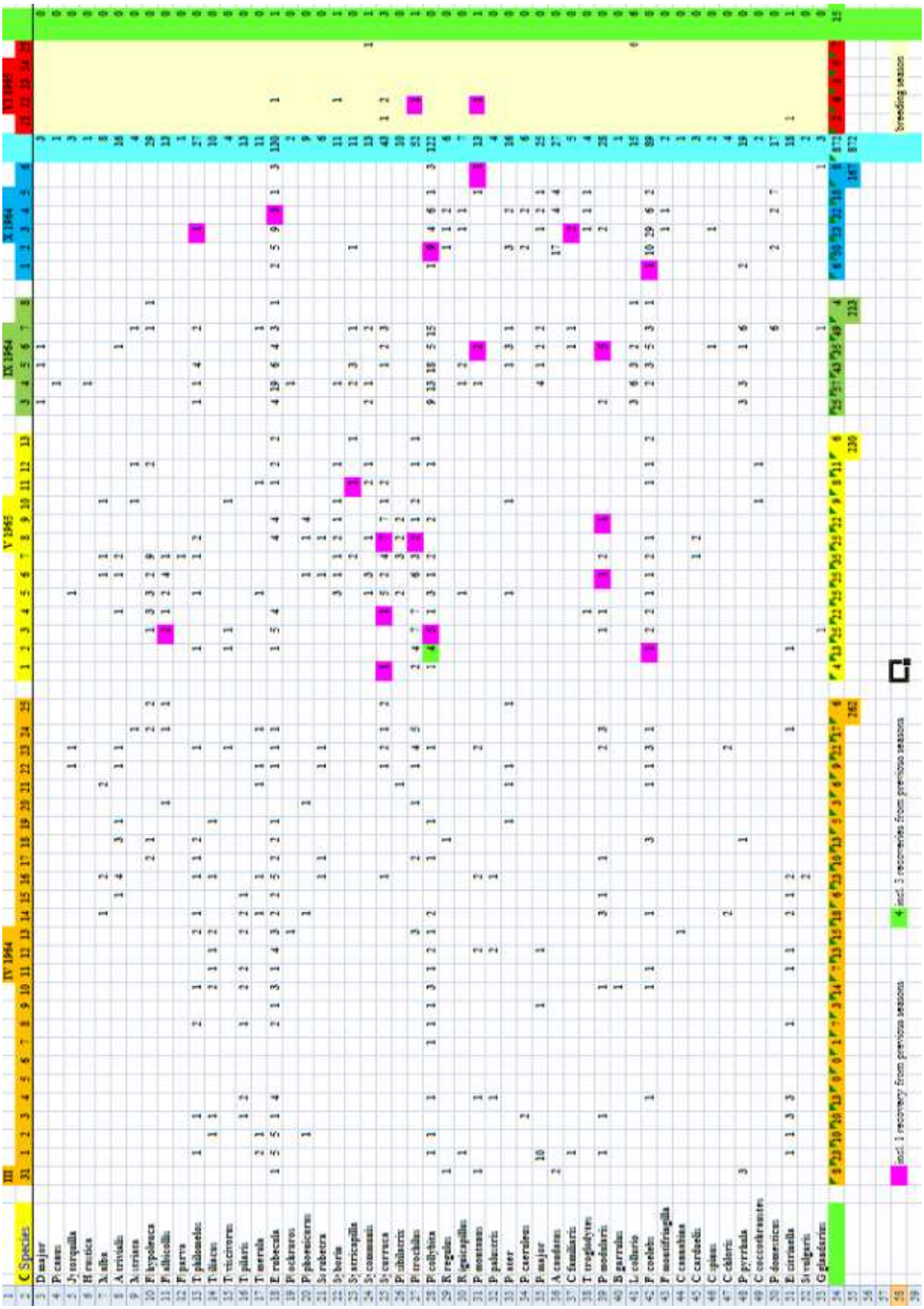
Explanations to tables 2.- 3. [table 1. rather self-evident]:

General:
black minuscules – actual values;
red minuscules – simple (not standardized) indices;
GREEN MAJUSCULES – VALUES STANDARDIZED AS % OF WING LENGTH.
Values:
w [or W] – wing length
t [or tl] – tail length
1p [or 1l] – distance between tips of remicle (1. primary) and longest primary cover
k – Kipp's index (distance between tips of longest primary and outermost secondary – KIPP 1959)
a – „qualitative" index of wing-pointedness [HOŁYŃSKI 1965]*
e – „quantitative" index of wing-pointedness [HOŁYŃSKI 1965]
l – index of elongation [BUSSE 1967]
h – weight
Em –emargination (last primary with emarginated outer web)
♂ col [in *Ficedula hypoleuca*] – male plumage type [DROST 1936]
Statistics:
M – mean
m – standard error of mean [σ/√N]
σ – standard deviation
N – number of measured birds

* modified by addition of columns B4 and B5 (placement of 4. and 5. primaries) in Table 2 of HOŁYŃSKI 1965:

Placement	B4	B5	Placement	B4	B5
x=6	0.0	0.0	7>x>8	1.0	0.0
6>x>7	0.0	0.0	x=8	1.5	0.5
x=7	0.5	0.0	8>x	2.0	1.0

Tab. 1.
Migration dynamics according to daily catching numbers (retraps excluded)



Tab. 2.
Mean values of morphometric data

Genus	Species	N	Wing	Tail-lo	TL	11.	k	K	a	e	E	l	L	Weigh	Fat	Ema	Bill	Tarsus
Picoides	*major*	3	136,33	91,67	67,23											7,00	25,00	25,00
Picus	*canus*	1	144,00	96,00	66,67												35,00	29,00
Jynx	*torquilla*	3	90,00	72,00	79,95	-9,00	22,00	24,18	8,50	42,67	47,38	45,33	50,36	34,05		4,00	15,50	22,00
Hirundo	*rustica*	1	115,00	80,00	69,57				10,00	136,00	118,26	136,00	118,26		4,00	0,00		
Motacilla	*alba*	8	88,75	88,13	99,31	-10,00	26,00	29,90	8,50	54,67	62,13	55,33	62,88	21,66	1,11	5,00	13,40	24,10
Anthus	*trivialis*	16	88,88	62,88	70,77	-9,90	24,50	27,71	8,77	53,53	60,09	53,67	60,24	23,13	2,00		13,09	22,00
Muscicapa	*striata*	4	85,25	59,00	69,11	1,75	26,00	29,19	7,50	46,75	54,83	55,25	65,07		2,75	5,00	12,00	19,00
Ficedula	*hypoleuca*	28	79,00	52,86	66,91	2,82	22,95	29,11	6,60	36,55	46,06	47,45	59,80	12,71	2,83	4,96		
Ficedula	*albicollis*	13	81,15	51,46	63,38	2,08	24,27	29,80	7,35	44,31	54,62	53,23	65,64	13,70	1,94	5,00	9,67	17,00
Ficedula	*parva*	1	69,00	52,00	75,36	2,00	18,00	26,09	5,50	27,00	39,13	41,00	59,42		0,00			
Turdus	*pilaris*	12	142,00	101,25	71,31	-13,27			7,45	80,25	56,71	90,00	63,59	103,75	3,00		19,58	33,17
Turdus	*iliacus*	10	118,20	79,00	66,84	-12,00			7,40	65,67	55,40	74,56	62,91	62,94	3,00		18,30	30,10
Turdus	*philomelos*	27	116,56	81,52	69,97	-8,76	31,40	27,25	7,15	61,22	52,63	69,74	59,94	71,18	1,37	5,00	18,68	32,18
Turdus	*viscivorus*	4	154,50	111,25	72,02	-11,00	46,33	41,64	7,17	85,00	55,38	93,00	60,61	107,00		5,33	22,00	34,00
Turdus	*merula*	11	125,55	100,82	80,33	-4,38	25,00	20,03	3,13	24,25	19,29	52,75	41,87	84,00	1,50	6,00	23,14	33,29
Erithacus	*rubecula*	130	71,55	58,45	81,71	9,28	12,22	17,17	0,67	3,66	5,11	30,74	43,01	16,32	1,74	6,00		
Phoenicurus	*phoenicurus*	9	79,00	58,67	74,32	5,00	19,00	24,37	5,42	25,50	32,16	42,17	53,14	16,20	2,50	5,00	12,17	22,50
Phoenicurus	*ochruros*	2	81,50	61,00	74,80	8,00			3,25	12,00	14,75	31,00	38,00	18,00	1,50	6,00	11,50	23,00
Saxicola	*rubetra*	6	76,33	46,17	60,53	0,83	16,00	22,23	7,00	31,83	41,49	37,50	48,92	16,40	2,29	5,00	12,00	22,25
Sylvia	*atricapilla*	11	74,64	62,18	83,33	2,90	19,25	25,68	6,90	29,10	38,84	40,30	53,79		1,83		11,75	21,25
Sylvia	*borin*	12	79,58	59,83	75,21	-4,25	22,55	28,40	9,21	47,58	59,89	49,42	62,24		2,47		11,00	21,00
Sylvia	*communis*	13	72,92	65,00	89,14	-2,00	17,14	23,21	7,77	24,45	33,32	27,00	36,76		3,39	5,00	11,33	21,33
Sylvia	*curruca*	45	65,64	56,41	85,84	3,18	13,47	20,50	6,60	19,59	29,83	26,16	39,83	11,57	1,98		10,50	20,17
Phylloscopus	*sibilatrix*	10	75,20	50,00	66,53	-3,30	21,00	27,95	7,95	42,40	56,42	48,00	63,85		2,82	5,00	12,50	20,00
Phylloscopus	*trochilus*	68	66,21	50,97	77,00	4,09	15,09	22,87	6,26	24,25	36,61	35,23	53,23	9,28	1,94	5,02	10,06	19,65
Phylloscopus	*collybita*	102	59,20	48,54	82,05	5,60	10,06	17,07	3,25	7,54	12,62	21,40	36,05		1,27	5,99	9,63	19,35
Regulus	*regulus*	6	52,50	38,67	73,65	5,50			1,42	4,50	8,56	21,83	41,55	5,10	2,33	6,00	9,50	16,75
Regulus	*ignicapillus*	7	52,86	40,57	76,77	6,57	10,00	19,23	1,14	4,29	8,06	20,57	38,87	5,00	2,57	6,00	9,75	17,25
Parus	*caeruleus*	6	66,67	53,67	80,52	7,83			0,83	1,50	2,27	21,17	31,72	10,50	2,29	7,00	8,50	16,50
Parus	*ater*	16	62,69	46,44	74,06	8,50	11,00	17,61	1,33	3,87	6,13	23,73	37,89	9,85	2,06			
Parus	*major*	27	75,00	62,64	83,29	9,67			0,33	-0,05	-0,04	28,05	37,32	17,51	1,79			
Parus	*palustris*	4	66,50	55,50	83,47	10,75			-1,25	-4,75	-7,11	21,75	32,79	11,82	1,40		9,50	16,75
Parus	*montanus*	12	64,67	55,83	86,37	10,90	9,00	14,52	-1,30	-5,44	-10,02	21,56	33,56	10,73	1,75		9,36	16,93
Aegithalos	*caudatus*	27	64,00	90,48	141,37	9,18	12,25	19,52	0,04	-3,55	-5,59	27,09	42,55	9,60	1,63			
Certhia	*familiaris*	5	65,00	62,20	95,71	9,00			0,90	4,20	6,50	27,40	42,19	10,40	2,00	6,00	15,50	15,00
Troglodytes	*troglodytes*	4	48,75	32,25	66,24	9,50	5,00	10,52	1,38	1,25	2,61	12,75	26,18		1,25		11,00	23,00
Prunella	*modularis*	26	68,23	58,23	85,33	0,19	12,00	17,43	4,23	12,77	18,55	22,85	33,45	20,86	1,74	5,80		
Bombycilla	*garrulus*	1	113,00	61,00	53,98	-11,00			9,00	84,00	74,34	86,00	76,11	57,00	1,00			
Lanius	*collurio*	15	91,13	75,67	83,02	3,54			7,37	45,92	50,22	57,77	63,20		2,64		13,92	23,83
Passer	*domesticus*	7	75,57	52,00	69,56				8,75	42,00	56,63	43,33	58,46		2,43	5,00	12,60	19,20
Pyrrhula	*pyrrhula*	18	89,72	67,28	74,69	-10,00			5,47	30,44	33,83	38,81	43,14	32,60	1,21	5,92	11,58	18,25
Coccothraustes	*coccothraustes*	2	106,50	61,00	57,01		32,50	30,61	8,00	62,00	58,21	64,00	60,10		3,00	5,00	22,00	
Fringilla	*coelebs*	84	86,38	66,01	76,39	-9,91	21,33	24,13	6,26	34,75	40,41	41,13	47,71	21,63	2,34			
Fringilla	*montifringilla*	2	88,00	64,00	72,67				7,25	45,00	50,98	48,00	54,45		3,00	6,00		
Carduelis	*carduelis*	3	78,33	50,00	63,89		23,00	29,66	8,33	47,33	60,44	49,33	62,94		3,00	5,00		
Carduelis	*chloris*	4	86,50	53,50	61,87	-9,25			8,00	59,75	69,15	62,25	72,01	25,93	1,00		13,50	18,50
Carduelis	*spinus*	2	70,00	43,50	62,14				9,00	52,00	74,29	52,00	74,29		1,00			
Carduelis	*cannabina*	1	82,00	53,00	64,63	-8			9,50	56,00	68,29	56,00	68,29	21,0	3			
Sturnus	*vulgaris*	2	131,50	62,50	47,53	-15,00			10,00	110,50	84,02	110,50	84,02	77,50	3,00			
Garrulus	*glandarius*	3	181,67	154,33	85,01	30,00	42,00	22,46	-3,00	-29,50	-16,88	72,50	38,98					

Tab. 3.
Statistical parameters of biometrical data of some species separately calculated for sexes, ages, or seasons

	w	t	T	l	l.	k	K	a	e	E	l	L	h	Fat	Em	Bill	Tars	♂col
Ficedula hypoleuca																		
	♀																	
M	77,88	52,63	67,59	2,57	22,71	29,23	6,63	35,38	45,43	45,63	58,60	11,90	3,00	5,00	11,00	16,00		
m	0,40	0,75	1,00	0,30	0,84	1,07	0,08	0,42	0,50	0,38	0,58		0,27	0,00				
σ	1,13	2,13	2,83	0,79	2,21	2,83	0,23	1,19	1,41	1,06	1,63		0,76	0,00				
N	8	8	8	7	7	7,00	8	8	8	8	8	1	8	8	1	1		
	♂																	
M	79,45	52,95	66,64	2,90	23,08	29,04	6,60	37,00	46,31	48,14	60,28	12,85	2,84	4,95	10,17	17,50	4,94	
m	0,31	0,60	0,66	0,35	0,45	0,52	0,07	0,55	0,62	0,69	0,78	0,31	0,26	0,05	0,31	0,22	0,33	
σ	1,39	2,68	2,97	1,61	1,61	1,89	0,34	2,51	2,75	3,18	3,48	0,76	1,12	0,22	0,75	0,55	1,39	
N	20	20	20	21	13	13	21	21	20	21	20	6	19	20	6	6	18	
Ficedula albicollis																		
	♀																	
M	81,00	53,60	66,16	3,20	24,00	29,64	7,10	42,00	51,88	51,20	63,24	13,40	1,60	5	8	17		
m	0,55	0,68	0,44	0,37	0,77	0,98	0,29	1,48	1,99	1,69	2,23		0,40					
σ	1,22	1,52	0,98	0,84	1,73	2,19	0,65	3,32	4,46	3,77	4,98		0,89					
N	5	5	5	5	5	5	5	5	5	5	5	1	5	1	1	1		
	♂																	
M	81,25	50,13	61,63	1,29	24,50	29,93	7,50	45,75	56,33	54,50	67,14	14,00	2,13	5,00	10,50	17,00		
m	1,30	3,17	3,25	0,84	1,00	1,00	0,33	2,38	2,98	3,00	4,08		0,80	0,00	1,00	2,00		
σ	3,66	8,97	9,19	2,23	2,45	2,45	0,93	6,74	8,44	8,49	11,55		2,25	0,00	1,41	2,83		
N	8	8	8	7	6	6	8	8	8	8	8	1	8	3	2	2		
Turdus philomelos																		
	IV 1964																	
M	117,00	80,08	68,50	-9,08			7,27	61,10	52,43	69,70	59,78	71,35	2,22		18,81	32,27		
m	1,00	1,11	1,08	0,29			0,19	1,47	1,07	1,76	1,14	1,32	0,43		0,34	0,34		
σ	3,61	3,99	3,91	1,00			0,65	4,65	3,39	5,56	3,62	4,77	1,30		1,22	1,24		
N	13	13	13	12			11	10	10	10	10	13	9		13	13		
	IX 1964																	
M	117,13	82,25	70,20	-8,29			7,21	64,14	54,74	73,86	63,05		0,50	5,00	17,00	31,00		
m	0,64	1,60	1,12	0,47			0,29	2,69	2,20	2,53	2,13		0,34	0,00				
σ	1,81	4,53	3,17	1,25			0,76	7,13	5,81	6,69	5,64		0,84	0,00				
N	8	8	8	7			7	7	7	7	7		6	7	1	1		
	V 1965																	
M	115,20	83,60	72,56	-8,40	31,40	27,25	6,90	59,60	51,76	66,00	57,29		0,50	5,00				
m	1,11	1,33	0,56	0,68	0,93	0,68	0,29	1,12	1,17	1,22	0,86		0,50	0,00				
σ	2,49	2,97	1,26	1,52	2,07	1,51	0,65	2,51	2,61	2,74	1,93		0,71	0,00				
N	5	5	5	5	5	5	5	5	5	5	5		2	5				
Turdus merula																		
	♀																	
M	124,50	101,33	81,38	-3,67	29,00	23,39	2,83	20,00	16,10	48,00	38,51	82,00	1,67	6,00	23,00	32,00		
m	0,81	1,96	1,39	0,88			0,44	2,52	2,23	0,58	0,12	3,54	0,33	0,00	0,58	1,15		
σ	1,97	4,80	3,41	1,53			0,76	4,36	3,86	1,00	0,21	7,07	0,58	0,00	1,00	2,00		
N	6	6	6	3	1	1	3	3	3	3	3	4	3	2	3	3		
	♂																	
M	126,80	100,20	79,07	-4,80	21,00	16,67	3,30	26,80	21,20	55,60	43,89	86,67	1,33	6,00	23,25	34,25		
m	1,32	1,98	1,88	3,07	0,00	0,00	0,34	2,18	1,91	1,03	1,21	3,28	0,88		0,85	0,85		
σ	2,95	4,44	4,20	6,87			0,76	4,87	4,28	2,30	2,69	5,69	1,53		1,71	1,71		
N	5	5	5	5	1	1	5	5	5	5	5	3	3	1	4	4		

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	w	t	T	l l.	k	K	a	e	E	l	L	h	Fat	Em	Bill	Tars	♂col
	Erithacus rubecula																
	IV 1964																
M	71,61	57,30	80,04	9,12			0,57	3,66	5,09	31,46	44,08	16,33	2,50		11,79	25,07	
m	0,29	0,36	0,43	0,20			0,10	0,38	0,53	0,55	0,74	0,22	0,19		0,12	0,15	
σ	1,97	2,43	2,88	1,31			0,63	2,46	3,42	3,51	4,77	1,44	1,30		0,83	1,01	
N	46	46	46	43			42	41	41	41	41	42	46		46	46	
	IX 1964																
M	71,49	58,59	81,97	8,97			0,79	5,00	7,00	31,69	44,30	16,00	0,57	6,00			
m	0,29	0,37	0,42	0,28			0,10	0,37	0,51	0,54	0,72		0,15	0,00			
σ	1,77	2,27	2,54	1,59			0,57	2,18	3,05	3,21	4,23		1,05	0,00			
N	37	37	37	33			35	35	35	35	35	1	46	22			
	X 1964																
M	71,91	59,43	82,66	10,00			0,72	2,96	4,11	29,48	41,01		1,76	6,00			
m	0,38	0,37	0,38	0,34			0,10	0,38	0,54	0,57	0,82		0,23	0,00			
σ	1,83	1,78	1,83	1,65			0,50	1,82	2,57	2,73	3,95		1,13	0,00			
N	23	23	23	23			23	23	23	23	23		25	21			
	V 1965																
M	71,17	59,50	83,59	9,29	12,22	17,17	0,61	2,30	3,25	29,26	41,12		2,41	6,00			
m	0,30	0,50	0,45	0,32	0,23	0,34	0,13	0,56	0,80	0,49	0,70		0,24	0,00			
σ	1,49	2,43	2,19	1,55	1,09	1,62	0,60	2,70	3,82	2,36	3,33		1,25	0,00			
N	24	24	24	24	23	23	23	23	23	23	23		27	24			
	Phoenicurus phoenicurus																
	♀																
M	78,00	59,67	76,48	6,00	18,00	22,96	6,50	30,00	37,50	44,00	55,00		2,33	5,00			
m	1,00	1,45	1,23	0,58	1,00	1,71							1,20	0,00			
σ	1,73	2,52	2,14	1,00	1,41	2,42							2,08	0,00			
N	3	3	3	3	2	2	1	1	1	1	1		3	3			
	♂																
M	80,33	59,00	73,49	4,67	19,00	23,95	5,40	26,20	32,72	42,60	53,10	16,20	2,83	5,00	12,17	22,50	
m	0,67	0,82	1,39	0,56	1,15	1,46	0,51	1,32	1,85	0,93	0,84	1,60	0,65	0,00	0,17	0,29	
σ	1,63	2,00	3,42	1,37	2,00	2,52	1,14	2,95	4,13	2,07	1,88	2,26	1,60	0,00	0,29	0,50	
N	6	6	6	6	3	3	5	5	5	5	5	2	6	3	3	3	
	Saxicola rubetra																
	V 1965 ♀																
M	72,00	46,00	63,90	1,00	16,00	22,23	6,75	24,00	33,36	29,00	40,32		3,50	5,00			
m	1,00	0,00	0,89	2,00	0,00	0,31	0,25	1,00	1,85	2,00	3,34		0,50	0,00			
σ	1,41	0,00	1,26	2,83	0,00	0,44	0,35	1,41	2,62	2,83	4,72		0,71	0,00			
N	2	2	2	2	2	2	2	2	2	2	2		2	2			
	IV 1964 ♂																
M	78,50	46,25	58,84	0,75			7,13	35,75	45,56	41,75	53,23	16,40	1,80		12,00	22,25	
m	0,96	2,25	2,17	0,63			0,31	2,95	3,84	3,71	4,89	0,34	0,58		0,41	0,25	
σ	1,91	4,50	4,34	1,26			0,63	5,91	7,69	7,41	9,78	0,68	1,30		0,82	0,50	
N	4	4	4	4			4	4	4	4	4	4	5		4	4	

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	w	t	T	l l.	k	K	a	e	E	l	L	h	Fat	Em	Bill	Tars	♂col
	Sylvia atricapilla																
	♀																
M	74,50	61,25	82,19	2,25	18,00	24,66	7,00	26,25	35,25	36,25	48,68		2,50		11,00	20,50	
m	0,65	1,25	1,11	0,63			0,20	1,11	1,60	1,11	1,65		0,50		0,00	0,50	
σ	1,29	2,50	2,23	1,26			0,41	2,22	3,19	2,22	3,29		1,00		0,00	0,71	
N	4	4	4	4	1	1	4	4	4	4	4		4		2	2	
	♂																
M	74,33	62,33	83,90	3,40	19,67	25,89	6,90	31,60	42,20	44,00	58,77		2,00	5,00	12,50	22,00	
m	0,84	0,42	1,01	0,60	0,33	0,61	0,29	3,50	4,48	4,04	5,13		0,68	0,00	0,50	1,00	
σ	2,07	1,03	2,47	1,34	0,58	1,06	0,65	7,83	10,02	9,03	11,48		1,67	0,00	0,71	1,41	
N	6	6	6	5	3	3	5	5	5	5	5		6	5	2	2	
	Sylvia communis																
	♀																
M	71,67	63,33	88,41	-1,75	16,50	22,77	8,00	23,60	32,66	25,20	34,85		3,20	5,00	11,50	21,00	
m	0,99	0,92	1,20	0,75	1,50	2,23	0,32	1,47	2,27	1,20	1,85		0,49	0,00	0,50	0,00	
σ	2,42	2,25	2,95	1,50	2,12	3,15	0,71	3,29	5,07	2,68	4,14		1,10	0,00	0,71	0,00	
N	6	6	6	4	2	2	5	5	5	5	5		5	3	2	2	
	♂																
M	74,00	66,43	89,77	-2,17	17,40	23,38	7,58	25,17	33,86	28,50	38,35		3,57	5,00	11,00	22,00	
m	0,38	0,75	0,91	1,17	0,40	0,50	0,42	1,90	2,59	1,31	1,81		0,30	0,00			
σ	1,00	1,99	2,42	2,86	0,89	1,11	1,02	4,67	6,35	3,21	4,43		0,79	0,00			
N	7	7	7	6	5	5	6	6	6	6	6		7	5	1	1	
	Sylvia curruca																
	IV 1964																
M	66,43	55,00	82,83	3,43			6,64	20,71	31,23	27,57	41,55	11,57	2,00		10,50	20,17	
m	0,97	1,13	1,51	0,84			0,28	0,87	1,39	0,90	1,46	0,30	0,62		0,43	0,17	
σ	2,57	3,00	3,99	2,23			0,75	2,29	3,69	2,37	3,87	0,81	1,63		1,05	0,41	
N	7	7	7	7			7	7	7	7	7	7	7		6	6	
	IX 1964																
M	64,83	56,33	86,94	2,40			6,50	19,00	29,22	25,80	39,66		1,40	5,00			
m	0,75	0,42	1,06	0,51			0,16	1,38	2,33	1,32	2,38		0,68	0,00			
σ	1,83	1,03	2,59	1,14			0,35	3,08	5,20	2,95	5,31		1,52	0,00			
N	6	6	6	5			5	5	5	5	5		5	6			
	V 1965																
M	65,63	56,74	86,30	3,25	13,47	20,50	6,61	19,44	29,63	25,91	39,48		2,07				
m	0,28	0,38	0,43	0,29	0,28	0,38	0,10	0,54	0,83	0,53	0,81		0,21				
σ	1,56	2,13	2,39	1,65	1,57	2,14	0,59	3,05	4,69	3,01	4,56		1,17				
N	32	31	31	32	32	32	32	32	32	32	32		30				

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	w	t	T	l l.	k	K	a	e	E	l	L	h	Fat	Em	Bill	Tars	♂ col
	Phylloscopus trochilus																
	IV 1964																
M	68,25	51,88	75,99	4,33			6,19	25,00	36,60	36,00	52,75	9,28	1,75	6,00	10,00	19,69	
m	0,67	0,72	0,63	0,32			0,10	0,95	1,26	0,79	1,03	0,32	0,24		0,18	0,15	
σ	2,67	2,90	2,52	1,23			0,40	3,79	5,05	3,14	4,10	1,11	1,07		0,73	0,60	
N	16	16	16	15			16	16	16	16	16	12	20	1	16	16	
	IX 1964																
M	64,81	50,13	77,38	3,87			6,20	25,00	38,69	36,73	56,91		2,50	5,00			
m	0,66	0,74	1,05	0,34			0,17	0,97	1,25	1,01	1,24		0,42	0,00			
σ	2,64	2,94	4,18	1,30			0,65	3,74	4,83	3,92	4,79		1,56	0,00			
N	16	16	16	15			15	15	15	15	15		14	15			
	V 1965																
M	65,92	50,94	77,28	4,09	15,09	22,87	6,32	23,56	35,70	34,21	51,82		1,87	5,00			
m	0,46	0,46	0,41	0,18	0,21	0,29	0,08	0,55	0,77	0,66	0,87		0,13	0,00			
σ	2,74	2,76	2,44	1,07	1,24	1,69	0,44	3,21	4,51	3,87	5,10		0,94	0,00			
N	36	36	36	35	34	34	34	34	34	34	34	0	53	33			
	Phylloscopus collybita																
	IX 1964																
M	58,56	47,86	81,74	3,29	7,75	13,20	21,27	36,32	5,46	9,31				0,79	6,00		
m	0,39	0,37	0,31	0,07	0,26	0,41	0,34	0,52	0,14	0,24				0,13	0,00		
σ	3,02	2,83	2,35	0,53	1,87	2,94	2,47	3,72	1,04	1,71				1,00	0,00		
N	59	59	59	52	52	52	52	52	52	52				57	57		
	X 1964																
M	61,17	51,04	83,44	2,57	4,86	7,92	19,68	32,21	5,86	9,57				1,83	6,00		
m	0,43	0,42	0,32	0,24	0,71	1,17	0,56	0,82	0,27	0,42				0,14	0,00		
σ	2,10	2,07	1,57	1,15	3,33	5,47	2,64	3,86	1,25	1,98				0,70	0,00		
N	24	24	24	22	22	22	22	22	22	22				24	22		
	V 1965																
M	58,78	47,58	81,21	4,00	10,26	16,96	23,84	40,03	5,63	9,46	10,06	17,07		1,83	5,35		
m	0,84	0,67	0,53	0,27	0,91	1,52	1,05	1,67	0,21	0,37	0,31	0,50		0,25	0,60		
σ	3,57	2,93	2,23	1,17	3,97	6,43	4,60	7,08	0,90	1,54	1,30	2,04		1,19	2,68		
N	18	19	18	19	19	18	19	18	19	17	18	17		23	20		
	Regulus regulus																
	♀																
M	51,75	38,00	73,44	5,25			1,38	4,25	8,21	21,25	41,04	4,60	2,25	6,00			
m	0,25	1,08	2,11	0,63			0,24	0,95	1,82	2,59	4,92	0,00	0,48	0,00			
σ	0,50	2,16	4,22	1,26			0,48	1,89	3,63	5,19	9,84		0,96	0,00			
N	4	4	4	4			4	4	4	4	4	1	4	3			
	♂																
M	54,00	40,00	74,07	6,00			1,50	5,00	9,26	23,00	42,59	5,60	2,50	6,00			
m	0,00	1,00	1,85	0,00			0,00	1,00	1,85	3,00	5,56		0,50				
σ	0,00	1,41	2,62	0,00			0,00	1,41	2,62	4,24	7,86		0,71				
N	2	2	2	2			2	2	2	2	2	1	2	1			

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	w	t	T	l l.	k	K	a	e	E	l	L	h	Fat	Em	Bill	Tars	♂col
	Parus ater																
	IV 1964																
M	61,00	41,75	68,48	9,00			1,75	5,75	9,34	24,25	39,81	9,85	2,50		10,50	17,75	
m	0,91	0,75	1,50	0,41			0,75	1,80	2,85	1,60	2,84		0,87				
σ	1,83	1,50	3,00	0,82			1,50	3,59	5,71	3,20	5,67	1,20	1,73		0,58	0,96	
N	4	4	4	4			4	4	4	4	4	2	4		4	4	
	IX 1964																
M	64,20	47,80	74,44	7,80			1,88	5,75	8,92	26,75	41,56		1,00	6,00			
m	0,58	0,80	0,84	0,37			0,55	0,85	1,26	1,80	2,41		0,71	0,00			
σ	1,30	1,79	1,87	0,84			1,11	1,71	2,53	3,59	4,82		1,41	0,00			
N	5	5	5	5			4	4	4	4	4		4	5			
	X 1964																
M	62,60	48,20	77,03	8,40			0,40	0,40	0,57	22,00	35,11		2,00				
m	0,87	0,37	0,80	0,60			0,40	1,21	1,94	0,84	0,99		0,26				
σ	1,95	0,84	1,78	1,34			0,89	2,70	4,34	1,87	2,22		0,63				
N	5	5	5	5			5	5	5	5	5		6				
	V 1965																
M	62,50	48,00	76,81	9,50	11,00	17,61	1,75	5,00	8,04	21,00	33,66		3,50	6,50			
m	1,50	1,00	0,24	0,50	0,00	0,42	0,25	1,00	1,79	1,00	2,41		0,50	0,50			
σ	2,12	1,41	0,34	0,71	0,00	0,60	0,35	1,41	2,54	1,41	3,41		0,71	0,71			
N	2	2	2	2	2	2	2	2	2	2	2		2	2			
	Parus major																
	IV 1964																
M	75,42	61,18	81,20	10,00			0,50	-1,00	-1,33	29,33	38,50	17,51	2,38		11,59	20,29	
m	0,54	0,62	0,70	0,31			0,31	1,46	1,91	1,41	1,74	0,46	0,27				
σ	1,88	2,04	2,33	0,82			0,82	3,58	4,68	3,44	4,26	1,66	0,96		0,83	1,10	
N	12	11	11	7			7	6	6	6	6	13	13		11	12	
	IX 1964																
M	74,36	63,71	85,12	9,50			0,25	0,50	0,66	28,10	37,71		1,17		12,50	20,50	
m	0,51	1,04	1,24	0,34			0,19	0,86	1,16	1,16	1,35		0,30				
σ	1,69	2,75	3,28	1,08			0,59	2,72	3,66	3,67	4,26		1,03		0,71	2,12	
N	11	7	7	10			10	10	10	10	10		12		2	2	
	X 1964																
M	75,50	64,75	85,83	9,50			0,25	0,00	0,13	26,00	34,59		1,75				
m	1,19	1,03	2,03	0,65			0,43	2,27	3,07	2,12	3,40		0,48				
σ	2,38	2,06	4,06	1,29			0,87	4,55	6,14	4,24	6,80		0,96				
N	4	4	4	4			4	4	4	4	4		4				
	♀																
M	73,92	61,78	83,25	10,20			0,35	0,78	1,11	27,44	37,11	17,10	2,08		11,50	19,92	
m	0,36	0,81	1,16	0,20			0,20	1,10	1,50	1,24	1,70	0,41	0,34				
σ	1,24	2,44	3,47	0,63			0,63	3,31	4,49	3,71	5,11	0,92	1,16		0,77	0,66	
N	12	9	9	10			10	9	9	9	9	5	12		6	6	
	♂																
M	76,15	63,09	82,75	9,00			0,44	-0,11	-0,15	28,33	37,01	18,44	1,77		11,93	20,63	
m	0,46	0,72	1,08	0,33			0,27	1,07	1,40	1,19	1,50	0,24	0,30				
σ	1,68	2,39	3,59	1,00			0,81	3,22	4,19	3,57	4,49	0,64	1,09		0,93	1,41	
N	13	11	11	9			9	9	9	9	9	7	13		7	8	

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	w	t	T	l	k	K	a	e	E	l	L	h	Fat	Em	Bill	Tars	♂col
	Aegithalos caudatus																
	31 III 1964																
M	65,00	86,00	132,31									9,60			7,00	17,50	
m	0,00	1,00	1,54									0,10			0,00	0,00	
σ	0,00	1,41	2,18									0,14			0,00	0,00	
N	2	2	2									2			2	2	
	X 1964																
M	63,92	90,84	142,10	9,18	12,25	19,52	0,04	-3,55	-5,59	27,09	42,55		1,63				
m	0,34	0,68	0,61	0,25	0,25	0,27	0,12	0,44	0,69	0,49	0,68		0,14				
σ	1,68	3,40	3,04	1,18	0,50	0,55	0,56	2,04	3,23	2,29	3,20		0,74				
N	25	25	25	22	4	4	23	22	22	22	22		27				
	Prunella modularis																
	IV 1964																
M	67,83	56,83	83,80	0,31			4,13	12,58	18,18	22,75	33,47	20,86	2,27		11,92	21,00	
m	0,58	0,77	1,03	0,36			0,18	0,69	1,06	1,05	1,65	0,46	0,34				
σ	1,99	2,66	3,57	1,32			0,61	2,39	3,51	3,62	5,47	1,65	1,33		0,90	1,04	
N	12	12	12	13			12	12	11	12	11	13	15		12	12	
	IX 1964																
M	68,57	58,00	84,57	0,29	11,00	15,94	4,29	13,86	20,21	24,43	35,64		0,57	5,80	13,00	20,67	
m	0,57	1,00	1,17	0,57			0,15	1,08	1,55	0,87	1,27		0,20	0,20			
σ	1,51	2,65	3,10	1,50			0,39	2,85	4,11	2,30	3,36		0,53	0,45	1,00	1,53	
N	7	7	7	7	1	1	7	7	7	7	7		7	5	3	3	
	X 1964																
M	68,00	58,50	86,02	-0,50			4,50	13,00	19,08	22,00	32,34		2,00	6,00			
m	1,00	1,50	0,94	0,50			0,00	2,00	2,66	1,00	1,00		0,58	0,00			
σ	1,41	2,12	1,33	0,71			0,00	2,83	3,76	1,41	1,41		1,00				
N	2	2	2	2			2	2	2	2	2		3	1			
	V 1965																
M	68,80	61,80	89,81	0,00	12,20	17,73	4,30	11,60	16,85	21,20	30,81		1,70	5,75			
m	0,58	1,07	0,97	0,55	0,37	0,49	0,20	0,81	1,16	1,07	1,50		0,45	0,25			
σ	1,30	2,39	2,17	1,22	0,84	1,10	0,45	1,82	2,58	2,39	3,35		1,42	0,50			
N	5	5	5	5	5	5	5	5	5	5	5		10	4			
	i																
M	65,00	57,14	84,03	0,00	12,00	17,65	4,35	13,62	20,05	23,62	34,78	21,70	1,64	6,00			
m	0,43	0,71	0,84	0,31	1,00	1,47	0,09	0,72	1,01	1,10	1,56	1,20	0,36	0,00			
σ	1,62	2,66	3,16	1,18	1,41	2,08	0,32	2,60	3,65	3,97	5,62	1,70	1,34	0,00			
N	14	14	14	14	2	2	13	13	13	13	13	2	14	7			
	a																
M	68,38	59,31	86,72	0,46	12,00	17,32	4,12	11,54	16,90	21,85	31,96	20,65	2,25	5,50			
m	0,49	0,85	1,05	0,35	0,41	0,50	0,17	0,45	0,72	0,41	0,61	0,65	0,43	0,29			
σ	1,76	3,07	3,80	1,27	0,82	1,00	0,62	1,61	2,60	1,46	2,20	1,85	1,48	0,58			
N	13	13	13	13	4	4	13	13	13	13	13	8	12	4			
	Pyrrhula pyrrhula																
	♀																
M	91,60	68,80	75,12	-10,00			5,10	28,60	31,14	37,40	40,70	32,60	2,80	6,00	11,63	18,13	
m	0,93	0,80	0,70	0,71			0,48	2,54	2,48	3,80	3,78	2,22	0,66	0,00	0,47	0,52	
σ	2,07	1,79	1,57	1,41			1,08	5,68	5,54	8,50	8,45	3,85	1,48		0,95	1,03	
N	5	5	5	4			5	5	5	5	5	3	5	1	4	4	
	♂																
M	89,88	67,11	74,09				5,50	32,43	35,93	40,14	44,48		0,50	5,88	11,50	18,50	
m	1,04	1,21	0,66				0,19	1,04	1,12	1,10	1,22		0,33	0,13	0,50	0,50	
σ	2,95	3,62	1,87				0,50	2,76	2,96	2,91	3,24		0,93	0,35	0,71	0,71	
N	8	9	8				7	7	7	7	7		8	8	2	2	

Tab. 3 (ctd.)

	w	t	T	l	l.	k	K	a	e	E	l	L	h	Fat	Em	Bill	Tars	♂col
	Fringilla coelebs																	
	IV 1964																	
M	84,45	61,18	72,40	-9,91				6,27					21,63	2,83		12,55	18,55	
m	0,99	1,22	0,81	0,28				0,16					0,69	0,27		0,21	0,31	
σ	3,30	4,05	2,68	0,94				0,52					2,37	0,94		0,69	1,04	
N	11	11	11	11				11					12	12		11	11	
	IX 1964																	
M	86,93	65,07	74,88					6,36						0,62	5,77	13,00	18,50	
m	0,73	0,93	0,99					0,15						0,21	0,12	0,00	0,50	
σ	2,73	3,47	3,71					0,50						0,77	0,44	0,00	0,71	
N	14	14	14					11						13	13	2	2	
	X 1964																	
M	86,23	67,04	77,73					6,29	34,79	40,49	40,98	47,57		2,88				
m	0,52	0,52	0,29					0,09	0,55	0,56	0,65	0,66		0,12				
σ	3,59	3,59	1,98					0,63	3,78	3,82	4,43	4,49		0,87				
N	47	47	47					47	47	46	47	46		50				
	V 1965																	
M	88,08	67,50	76,61		21,33	24,13		6,04	34,62	40,10	41,69	48,24		1,58	6,00			
m	1,26	1,27	0,76		0,79	0,69		0,22	1,11	0,82	1,56	1,51		0,40	0,00			
σ	4,38	4,40	2,63		2,74	2,29		0,80	4,01	2,84	5,63	5,22		1,38	0,00			
N	12	12	12		12	11		13	13	12	13	12		12	12			
	♀ i																	
M	83,00	64,00	77,11					6,31	32,64	39,36	37,91	45,73		2,46		13,00	18,50	
m	0,44	0,47	0,39					0,11	0,79	0,89	0,61	0,73		0,37				
σ	1,58	1,68	1,40					0,38	2,62	2,94	2,02	2,42		1,33		0,00	0,71	
N	13	13	13					13	11	11	11	11		13		2	2	
	♀ a																	
M	82,25	63,50	77,21					5,78	32,86	40,84	40,00	49,04		2,89				
m	0,75	0,68	0,66					0,25	0,86	1,15	1,23	2,05		0,42				
σ	2,12	1,93	1,87					0,75	2,27	2,81	3,27	5,02		1,27				
N	8	8	8					9	7	6	7	6		9				
	♂ i																	
M	87,91	67,44	76,71		21,00	23,58		6,53	35,36	40,31	40,59	46,16		1,94				
m	0,31	0,58	0,59		1,00	0,59		0,09	0,73	0,85	0,78	0,91		0,20				
σ	1,75	3,27	3,34		1,41	0,84		0,50	3,43	4,01	3,66	4,29		1,12				
N	32	32	32		2	2		29	22	22	22	22		31				
	♂ a																	
M	90,93	71,00	78,08		23,20	25,37		6,19	38,00	41,76	45,85	50,36		2,71				
m	0,44	0,58	0,47		0,86	0,86		0,17	1,04	1,15	1,21	1,25		0,32				
σ	1,64	2,18	1,77		1,92	1,93		0,63	3,76	4,14	4,38	4,50		1,20				
N	14	14	14		5	5		13	13	13	13	13		14				

We did not attempt any special faunistic survey of the area, but all species observed have been recorded and the list below presents a summary of these observations:

1. *Ciconia ciconia* — Passage 13, 14, 17 IV 1964; feeding on meadow 21 and 25 1964
2. *Ciconia nigra* — Wheeling over the forest 7 V 1965
3. *Anser anser* — Passage 1 IV 1964 [obs. not sure]
4. *Aquila pomarina* — Wheeling over entire area 8, 12, 14-25 IV and all the autumn season 1964. 20 IV 1965 nest found in the fir-dominated part of the reserve, 1 V looked empty, 13 V excrements below and adults always thereabout, 19 VI egg with almost "full-grown" embryo broken under the tree, during the next days a parent bird continues to sit on nest (incubating another egg?).
5. *Buteo buteo* — In spring 1964 always present, probably nesting in the vicinity; observed also throughout the autumn season; in spring 1965 nest found almost exactly where it was suspected a year earlier.
6. *Accipiter gentilis* — 1 ex. observed 29 and 30 III 1964.
7. *Accipiter nisus* — 4 X 1964 one flying →SW; 10 V 1964 one near the camp.
8. *Falco tinnunculus* — 8, 9, 10, 15 and 17 IV 1964 and throughout the spring 1965 seen in the area; 6 IX 1964 passing →SW.
9. *Tetrastes bonasia* — 11 and 12 V 1965 one (probably the same) seen.
10. *Coturnix coturnix* — 19-25 VI 1965 one calls on meadow near the reserve, and 20 VI also another one behind the stream.
11. *Grus grus* — Flocks passing →NE 11 (66 ex.) and 16 (31) IV 1964; 100 →SE 2 X 1964.
12. *Crex crex* — 19-25 VI 1965 one calling on the meadow near reserve, another on that near the camp.
13. *Vanellus vanellus* — 28 III, 2 IV (12→S), 11 IV (20→SE) passing flocks.
14. *Scolopax rusticola* — 23 VI (1) and 24 VI (2) "snoring" in the forest behind reserve.
15. *Larus ridibundus* — 2 IV 1964 two flying →S.
16. *Columba oenas* — Probably observed 15 and 16 IV 1964 and 20 IV 1965.
17. *Columba palumbus* — Frequently seen during all seasons; apparently migrating 2 (2) 3(1) 10 (12) and 21 (1) IV 1964, as well as 6 (2) and 7 (9) IX 1964.
18. *Streptopelia turtur* — In spring 1964 the first observed 23 IV, thereafter rather common in forests. 23 and 25 VI 1965 5-6 ex. feeding on fields. Not seen in autumn.
19. *Cuculus canorus* — Common on spring from 21 IV 1964; not observed in autumn.
20. *Caprimulgus europaeus* — Once seen (20 IV 1964 – J. CZAJA).
21. *Upupa epops* — Observed 2, 17 and 22 IV 1964 as well as 20 IV 1965, and heard 4, 8, 11, and 13 V 1965.
22. *Apus apus* — 21 (2) and 23 (6) VI 1965.
23. *Dryocopus martius* — 23 IV 1964 and 11 V 1965.
24. *Picoides major* — In all forests, not numerous.
25. *Picoides minor* — 3 and 11 V 1965.
26. *Picus viridis* — Not observed in autumn, otherwise regularly seen but not numerous.
27. *Picus canus* — In all seasons, more numerous than *P. viridis*.
28. *Jynx torquilla* — Rather numerous in spring and summer; first seen 13 IV 1964.
29. *Alauda arvensis* — In all seasons – locals and migrants. Passage difficult to precise (many locals), probably ends in early IV (1964). In IX none, 4-5 X very slight (4ex.).
30. *Lullula arborea* — Rare on passage: 4 (uncertain), 10 and 12 IV single birds →N.
31. *Galerida cristata* — 31 III 1964 →N 1, 1; →S 1, 1; 1 IV →N 1, 2; 5 IV →N 1.
32. *Hirundo rustica* — From 15 IV 1964 rather numerous local and migrating; last seen 4 X.
33. *Delichon urbica* — 2-3 nesting pairs; otherwise not numerous migrating in autumn 1964 and spring 1965.
34. *Garrulus glandarius* — Rather common in all seasons. Passage weak (25 ex.) in spring 1964, only →S or SW ("vertical" migration?).
35. *Pica pica* — 2-3 nesting pairs, rather numerous in winter 1963/64.
36. *Corvus corax* — In all seasons except summer. Between 31 III and 17 IV 1964 altogether 11 ex. – 31 III (1), 1 (1), 10 (1), 12 (1), 13 (1) 14 (1) 16 (4) and 17 IV (1) – all flying →N or NE; later 20 (3) and 21 IV (1) all →S-SW; in spring 1965 numerous (up to 11 together), mainly →N.
37. *Corvus corone cornix* — Numerous all the year; passage weak.

38. *Corvus frugilegusx* — Observed (one by one) throughout IV 1964; passage (altogether 25) only →S-SW (vertical migration?).
39. *Coloeus monedula* — Numerous throughout the year. In spring 1964 passage observed 29 III-3 IV, altogether 72 ex., all but one →S-SW; in autumn 4-5 X 1964 (36 ex.)
40. *Nucifraga caryocatactes* — Observed in various forests 4 IX 1964, 8, 11, 13 V, 21, 22, 23, 24 VI 1965.
41. *Parus caeruleus* — Rarely seen, not in the breeding season.
42. *Parus major* — Somewhat more comon. In the breeding season seen several times.
43. *Parus ater* — Most numerous tit, in every forest.
44. *Parus montanus* — Rather common, some also in the breeding time.
45. *Parus palustris* — Together with *P. montanus*, but less numerous.
46. *Aegithalos caudatus* — Sporadically in spring ad autumn. Passage observed once: 1 IV 1964 (2→N).
47. *Sitta europaea* — Non-numerous in forests: observed 29 III 1964, 8, 11, 13 V 1965.
48. *Certhia familiars* — Uncommon in spring and autumn.
49. *Troglodytes troglodytes* — Numerous, especially during the breeding season in the fir-dominated part of the reserve.
50. *Muscicapa striata* — Uncommon on passage; not observed in summer.
51. *Ficedula hypoleuca* — Non numerous (in autumn rare) on passage.
52. *Ficedula albicollis* — On spring migration almost as numerous as *F hypoleuca*, otherwise not observed.
53. *Ficedula parva* — One caught 7 V 1965.
54. *Saxicola rubetra* — Very common on fields and meadows. First in 1964 13 IV.
55. *Saxicola torquata* — One observed 2 IV 1964.
56. *Oenanthe oenanthe* — Not rare during spring migration from 11 IV 1964 (1 observed 30 III). In the breeding season 1 pair.
57. *Phoenicurus phoenicurus* — Not numerous on spring migration, observed from the beginning of our work (29 III 1964).
58. *Phoenicurus ochruros* — Breeding (*ca.* 10 or more pairs) in the village; present from the beginning (29 III 1964).
59. *Luscinia luscinia* — Not quite sure observations: one 13 V, several ex. 23 and 24 VI 1965.
60. *Erithacus rubecula* — Rather common on migration and in the breeding season.
61. *Turdus viscivorus* — Several pairs in forests.
62. *Turdus pilaris* — Very numerous (flocks of 500-1000 ex.) during spring migration time (up to *ca.* 20 IV), later singly; in autumn not observed.
63. *Turdus philomelos* — In all seasons (migrating and breeding).
64. *Turdus iliacus* — In the migration time (2-18 IV 1964) nomadizing in rather great numbers with flocks of fieldfares.
65. *Turdus merula* — In all seasons (migrating and breeding), but less numerous than *T. philomelos.*
66. *Phylloscopus trochilus* — Common in all seasons (migrating and breeding); first appearance 13 IV, in autumn only in IX. In spring abundantly feeding on willow catkins.
67. *Phylloscopus collybita* — In all seasons (migrating and breeding), still more numerous than *P. trochilus*, also abundant at catkins. First observed 1 IV, still present in X.
68. *Phylloscopus sibilatrix* — Not numerous as migrant (from 21 IV), rather common in breeding season.
69. *Sylvia borin* — Not numerous, recorded between 5 V and 4 IX.
70. *Sylvia atricapilla* — Not numerous. Somewhat uncertain observation 17 IV, but then only from 7 V to 3 X.
71. *Sylvia communis* — Numerous in breeding season (recorded from 5 V to 7 IX).
72. *Sylvia curruca* — Common in all seasons (migrating and breeding); first 16 IV, last 7 IX. In spring numerous at catkins.
73. *Regulus regulus* — Not numerous during migration, not noted in breeding season.
74. *Regulus ignicapillus* — Like *R. regulus*.
75. *Prunella modularis* — In all seasons (migrating and breeding).
76. *Motacilla alba* — During spring migration feeding in masses on fields and roads; several pairs observed in breeding season.
77. *Motacilla cinerea* — 19 VI 1965 some birds (a family?) observed at a streamlet.
78. *Anthus trivialis* — From 10 IV (one observation 3 IV) to 7 IX; migrating and breeding.
79. *Anthus pratensis* — Observed 11, 18, 19 (group of 6 feeding on field) IV and 4 X 1964.
80. *Bombycilla garrulus* — Caught 10 IV 1964, uncerain observation 5 X 1964.
81. *Lanius excubitor* — 1 and 2 IV 1964 one on telephone wires.
82. *Lanius collurio* — Rather common in breeding season.

83. *Sturnus vulgaris*	In all seasons, migrating and numerously breeding in village. Weak passage between 30 III and 15 IV, abundant on 7 IX 1964.
84. *Emberiza citrinella*	In all seasons (migrating and breeding).
85. *Petronia petronia*	20 and 21 IV 1964 one observed (J. CZAJA).
86. *Passer domesticus*	Common in the village.
87. *Passer montanus*	Like *P. domesticus*.
88. *Fringilla coelebs*	Common in breeding season; spring migration rather abundant before 2 IV, weak between 8 and 13 IV; in autumn rather intensive in IX, still more so 2-4 X, weak 5-6 X – peak probably in late IX. Passage strikingly irregular: sometimes (2 X) only one "wave" (10-20 minutes) a day, then nothing; usually the "peak" at 9-10 a.m., but sometimes (2 X) at 4 p.m.; 4 X (very cold!?) a "return" (→N) wave.
89. *Fringilla montifringilla*	In spring 1964 rather numerous at the beginning of IV (last sure on 11 IV, and uncertain observation 14 IV); in autumn not uncommon in X.
90. *Carduelis cannabina*	Not numerous but in all seasons – breeding and migrating.
91. *Carduelis spinus*	Not numerous either as migrant or breeding (some observed 22-23 VI 1965).
92. *Carduelis carduelis*	Up to *ca.* 15 pairs breeding in the village and in SE-corner of the reserve.
93. *Carduelis chloris*	Some breeding here and there.
94. *Serinus serinus*	2-3 pairs in the village. First observed *ca*. 15 IV.
95. *Pyrrhula pyrrhula*	Rather numerous in winter and early spring; in breeding season some seen 22-23 VI 1965.
96. *Coccothraustes coccothraustes*	Observed 14 and 17 IV 1964 (but both observations somewhat uncertain); caught 10 and 12 V 1965.

At the end it must be emphasised that, albeit I am the only author of the paper, it presents the results of the work done by five of us, so I would like to express my sincere gratitude to Ewa HERMAN (now TURYN), Jadwiga KACZYŃSKA (now MACHALSKA) Joanna CZAJA (whom, unfortunately, I have not been able to "locate" and contact) and Krzysztof MACHALSKI!

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