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THE FOOD BASIS OF ROOKS (CORVUS FRUGILEGUS L. 1758), WINTERING IN THE NATURE RESERVE AT MÁRTÉLY AND SASÉR

I. STERBETZ
Hungarian Institute of Ornithology
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Abstract

The paper wants to establish the mass ratio of the rooks, wintering in the two nature reserves lying in the flood plain of the Tisza Dead-Arm at Hódmezővásárhely, as well as the composition, quantity of their dominant-subdominant food and finally the energy coming from their consumed food. As a final conclusion, it demonstrates that the bulk of the winter food basis consists of the seeds of weeds and of agricultural cultivated plants, otherwise beling lost. The wintering rook mass induces, therefore, no agrarian problem. They only show some damage in case of those remaining for hatching.

Introduction

In the neighbourhood of Hódmezővásárhely, in the flood plain of the Tisza, two considerable nature reserves were created: at the right riverside Sasér of 10 ha extent, at the left riverside the ten km long extending Mártély of 2260 ha. The environment, birds, mammals, and fishes of these nature reserves, which are characteristic nature conservation areas of the Tisza flood plain, are treated in detail in my quoted papers (STERBETZ 1972, 1975). In the high forest stand *(Salicetum albae fragilis)* of both areas, at its *Populus* sp. level, many hundred thousands of rooks (*Corvus frugilegus* L. 1758 assemble from late Autumn till early Spring. A considerable part of the wintering crowd passes in Spring, only a hatching population of fluctuating number remains in Sasér, the mass ratio of which I treated in a separate paper (STERBETZ, 1977). The organic-matter mass of the daily food demand of these winter crowds can be expressed in tons. For the nature conservancy, agricultural and wild-fowl economic practice it is desirable to know the quantitative and qualitative formation of this, the action-radius, daily activity of birds, and the character of the fostering areas. I endeavoured to answer all these question in the framework of a 10-year long environmental cycle.

Materials and Methods

I began investigating in the winter of 1968/1969 and later have developed my investigation into a 10-year programme in the months November-December-January-February. I strove to assess the birds, as possible, arriving at the sleeping-place or streaming from there, counting them from the dike of the river. From the mean value of observations I calculated the average individual number, falling on 1 month, then I used the 10-year average of these, for starting-point of further calculations. In

order to express the living weight of the bird mass (biomass), I have calculated with 500 g/ind. (This value was calculated, by weighing the individuals collected for the investigation of the gastric content).

For calculating the ratio of the different food sorts, and for investigating into the gastric content, I have collected monthly ten individuals. Thus, I could evaluate altogether four hundred individuals during ten years. By reason of this, the average weight of the daily consumed food of a bird is 45 g, according to a very careful calculation, evaluating it rather low. At the evaluation, I took only into consideration the dominant-subdominant food sorts that can be expressed in percentage, as well. The other, very many-sided but only occasional food sorts, presenting themselves but in traces, have no practical importance from the point of view of outlining the food basis.

To establishing the quantity of pure energy, originating from the single food sorts, the starch value, generally used in the agricultural practice, gave the basic point of departure (starch value = the number that informs us of the full energetic effect of the single food sorts. It expresses, with how much isolated starch the 1000 g of the components of the food exert an identical nutritious effect). The starch value of the appreciable food sorts is contained in Table 1. 1 starch value is equal to 2356 calories (BAITNER 1976). In order to avoid high numbers, further on we shall calculate with megacalorie (one thousandth of this). Thus, 1000 g starch value = 2.356 megacalories.

Table 1. *Starch value of 1000 g of the evaluated food sorts*

Zea mays grains	726 g
Triticum vulgare seeds	700 g
Oryza sativa seeds	800 g
Setaria sp. seeds	572 g
Segetal weed-seeds	733 g
Micromammalia sp.	760 g
Insecta sp.	190 g

I could not hold birds in a closed place. I could, therefore, not attempt, to observe the digestive process in a laboratory. Thus, I could not evaluate the further effects of excretion and must be content with characterizing the consumed food.

I have attempted to establish the action-radius of the birds looking for a fostering area, by following by car the birds, flocking out and returning home, in the morning and in the evening. In the last year of observation, I draw a parallel between the morning flight, resp. the return to the sleeping-place and the measurable light quantity. For measuring light, I used a photometer of Lunasix-type, suitable to establish a photographic exposure time from 1/4000 sec. till 8 hours. The index-numbers of this instrument could simply be converted into lux values by means of a given Table. With this simple but very exact method, the limiting values of the beginning and end of the daily activity were expressed in lux.

Results

It turns out of the data of Table 2 that the number of wintering rooks continuously increases in the forests of the flood plains of the Tisza from November. In January it reaches its culmination but in February quickly decreases, as a result

Table 2. *Formation of mass-ratios (average individual number)*

Year	XI	XII	I	II
1968/1969	30.000	140.000	150,000	20.000
1969/1970	30.000	150.000	170.000	10.000
1970/1971	40.000	150.000	160,000	10.000
1971/1972	20.000	120.000	140.000	5.000
1972/1973	40.000	140.000	200.000	5.000
1973/1974	40.000	160.000	250.000	6.000
1974/1975	40.000	150.000	230.000	5.000
1975/1976	50.000	140.000	200.000	7.000
1976/1977	30.000	120.000	160.000	6.000
1977/1978	20.000	90.000	100.000	6.000
Average:	34.000	136.000	176.000	8.000

Table 3. *Formation of the biomass of rooks*

	Ind.	kg
XI	34.000	17.000
XII	136.000	68.000
I	176.000	88.000
II	8.000	4.000

Table 4. *Formation of the daily food*

Food	XI		XII		I		II	
	p.c.	kg	p.c.	kg	p.c.	kg	p.c.	kg
Zea mays grain	62	948	60	3.672	60	4.752	50	180
Oryza sativa seed	10	153	22	1.346	20	1.584	30	108
Triticum sp. seed	6	93	6	367	10	792	5	18
Setaria sp. seed	15	229	10	613	7	554	12	43
„Ruderalia" seed	3	46	—	—	2	158	2	8
Mammalia sp.	3	46	2	122	1	80	1	3
Insecta sp.	1	15	—	—	—	—	—	—
Total:	100	1.530	100	6,120	100	7.920	100	360

Table 5. *Daily food, expresses in starch value*

Food	XI	XII	I	II
	kg	kg	kg	kg
Zea mays grain	692	2.680	3.469	131
Oryza sativa seed	126	1,103	1.299	89
Triticum sp. seed	65	256	554	13
Setaria sp. seed	130	349	316	24
„Ruderalia" seed	33	—	115	5
Mammalia	35	93	61	2
Insecta	3	—	—	—
Total:	1.084	4.481	5.814	264

of removing the nesting place. In Table 3, the biomass of the average quantities is shown. Table 4 records the daily food-needs of rooks. The same can be seen in Table 5, expressed in starch value. In Table 6, the megacalorie-amount is given, calculated from starch values.

The action-radius of rooks is between 5 and 60 km. The upper limit may be much

Table 6. *Quantity of the obtained megacalorie*

	Megacalorie/day	Megacalorie/month
XI	2.554	6.620
XII	10.557	327.267
I	13.697	424.607
II	622	17.416
Total:		845.910

more extended but I could not follow longer than this the packs that ascertainably flew from sleeping places at the Tisza. Over forty km, the observation always took place in a snowy weather.

The character of the area of nourishment is always determined by the demonsrated food sorts. The weed-seeds, demonstrated in high number, originate from rice-fields in a considerable percentage. The various small mammals may originate first of all from lucerne fields and grassy steppes.

On the basis of the mean values of photometry, the morning swarming of rooks begins at 44 lux-values. They reach the far away feeding areas between 88 and 350 lux. The evening return already begins at about 700 lux value and the last packs reach their sleeping-place between 44 and 22 lux.

Conclusion

It is proved by the thought-provoking high numbers that the crowds of rooks, wintering in the investigated sleeping-places demand a huge quantity of food. It is striking, how low the ratio of animal food sorts is in addition to the values of the seeds of dominant and subdominant cultivated plants and the comparatively also considerable weed-seed values. This may certainly be explained with the considerable agrochemicalization. Because of the maize combines, working with a high loss of grain, the Zea mays grains, remaining in the stubble fields, prevail as dominant food during the whole winter. The Oryza and Setaria values of the rice-fields in the neighbourhood of the nature reserve form the subdominant food. The seeds of Triticum, which takes place among the cultivated plants, cannot be qualified as an induced damage, either, because in such a late period it can only originate from the neighbourhood of stacks, farm-buildings. That is to say, every planted seed would perish without the intervention of birds, as well. The large rook concentration only becomes dangerous in the vicinity of nesting places from Spring, when the feeding birds damage the cultivated plants and the progeny of the protected or huntable animals.

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A mártélyi és saséri természetvédelmi területeken telelő vetési varjak (Corvus frugilegus L.) táplálékbázisa

STERBETZ I.
Magyar Madártani Intézet Budapest

Kivonat

A tanulmány a Tisza hullámterében levő két hódmezővásárhelyi természetvédelmi területen telelő vetési varjak tömegviszonyait és dominans-subdominans táplálékuk összetételét, mennyiségét végül az elfogyasztott táplálékból származó energiát kívánja megállapítani. Végkövetkeztetésként kimutatja, hogy a téli táplálékbázis zöme egyébként veszendőbe menő mezőgazdasági kultúrnövények magvaiból és gyommagvakból áll. Ezért a telelő varjútömeg nem okoz agrárproblémákat. Kártételük csak a költés céljából visszamaradók esetében mutatkozik.

ОСНОВА КОРМА ГРАЧЕЙ CORVUS FRUGILEUS L. ЗИМУЮЩИХ В ЗАПОВЕДНИКАХ МАРТЕЙ И ШАШЕР

И. ШТЕРБЕЦ
Институт Птицеводства Венгрии, Будапешт

Резюме

Работа имеет целью установление количества и состава доминантно-субдоминантного корма зимующих на территории двух заповедников г. Ходмезёвашархей (в пойме р. Тисы), а также количество получаемой с кормом энергии. В качестве конечного вывода указывается, что основной зимний корм грачей состоит в основном из теряемого при посеве зерна культурных растений и зерна сорняков, а потому зимняя масса грачей не причиняет аграрного ущерба. Ущебр наблюдается лишь от остающихся для вывода птенцов грачей.

Ishrana gačaca (Corvus frugilegus L.) na zaštićenom području Mártély i Sasér

STERBETZ I.
Ornitološki institut Budapest

Abstrakt

U radu se prikazuju jata gačaca koja zimuju na dva zaštićena područja na deonicama plavnog regiona Tise u okolini Hódmezővásárhely-a. Prikazuje se sastav i količina dominantne i subdominantne hrane, kao i energetska vrednost korišćene hrane. Utvrdjeno je da osnovu zimske ishrane čine semena kulturnih i korovskih biljaka koje su i inače kao rasute neiskorišćene. S toga jata gačaca na zimovanju ne prouzrokuju štete u poljoprivredi. štetu pričinjavaju samo one ptice koje ostaju radi gneždjenja.