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BIRD ASSEMBLAGE OF VRBJE POND DURING SIX YEARS

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Abstract. Studies were carried out on the Vrbje pond between 1993 and 1998 in Lower Savinja valley, Central Slovenia. Numbers of breeding species (only Non-Passeriformes were taken into account) were estimated only on the base of found nests or on the base of observed females with fledglings. 10 breeding species were noted on the pond as a whole. Densities of waterbirds assemblages varied between 14.1 and 31.9 pairs/10 ha. The greatest density was reached by Little Grebe (up to 10.4 pairs/10 ha). The bulk of breeding assemblage is comprised of two species, i. e. Little Grebe and Coot. The number of breeding Little Grebe increased ($r_S = 0.49$) and number of Coot decreased ($r_S = –0.37$) during the study, whereas the differences was not significant (in both cases: $n = 6$, $P > 0.05$).

Key words: Savinja river, fauna, waterbirds, number, population density.

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Население птиц пруда Врбйе на протяжении 6 лет. - М. Вогрин. - Беркут. 13 (1). 2004. - Исследования проведены в 1993–1998 гг. в нижнем течении р. Савинья (Центральная Словения). Численность гнездящихся видов (принимались во внимание только неворобьиные) определялась по находкам гнезд или по встречам самок с птенцами. Всего на пруду обнаружено 10 гнездящихся видов. Плотность населения колебалась от 14,1 до 31,9 пар/10 га. Наибольшей плотности достигала малая поганка (до 10,4 пар/10 га). Основу гнездового населения пруда составляли два вида: малая поганка и лысуха. За время исследований численность малой поганки увеличивалась ($r_S = 0.49$), лысухи – уменьшалась ($r_S = –0.37$), но различия статистически недостоверны (в обоих случаях: $n = 6$, $P > 0.05$).

INTRODUCTION

Regulation of Savinja river (in the end of the XIX century) and drainage of marshy and flood area of Lower Savinja valley have caused many natural habitats of various birds species to decline. Lower Savinja valley is today one of the most intensively agriculture area in Slovenia. Consequently, quite a number of birds searching for food, shelter, and nesting site has been observed at newly created habitats, e.g. fish pond and reservoir (Vogrin, 1996). Vrbje pond is especially important area in Savinja valley for waterbirds according to previous research (Vogrin, 1996).

The aim of this work was therefore to characterize the assemblage of breeding waterbirds at the pond Vrbje during six years.

STUDY AREA

In Lower Savinja valley (Central Slovenia) which is intensive agriculture area only a few wetlands have been preserved. On of such remains is Vrbje pond, man-made water body, south from the town Žalec, near to the Savinja river. The pond is full of immersed (*Typha latifolia*, *T. angustifolia*) and floating vegetation (*Potamogeton crispus*, *P. natans*, *P. spicatum*, *Myriophyllum spicatum*, *Elodea canadensis*) and it covers 13.5 ha. Pond was intended for fish rearing and it was discharged once a year (autumn/spring) for about 3 to 5 months. The surrounding landscape was dominated by intensive, arable agriculture, meadows and river Savinja. The pond is well known from the point of view of its wintering avifauna (Vogrin, 1996) and in fact has recorded the greatest density of wintering *Fulica atra* and *Gallinula chloropus* in Slovenia (Vogrin 1997a). For detailed description of the study area see Vogrin (1996).

METHODS

The data for the study were collected for six breeding seasons, in the years 1993–1998. Numbers of pairs of Great Crested Grebe (*Podiceps cristatus*), Little Grebe (*Tachybaptus ruficollis*), Coot (*Fulica atra*) and Common

Moorhen (*Gallinula chloropus*) were estimated only on the base of found nests or on the base of observed females with fledglings (all other species). Only the nest with eggs, egg shells or youngs were treated as nests (see also e. g. Goc, 1986).

Searching for nests were carried out 1–3 times in a breeding season (May – July). In most years breeding being delayed by unfavourable environmental conditions, that is, the absence of water till May or even mid June. Nests were detected by observing the incubating parents from a car parked on the banks (open water), vegetation were penetrated by wading (at least two times in the season), which made it possible to detect all nests without much damage to the vegetation. Additional censuses were carried out at least 10 times during breeding season.

I censused all waterbirds (i. e. Podicipediformes, Ciconiiformes, Anseriformes, Gruiformes and Charadriiformes), Passeriformes (e. g. *Acrocephalus palustris*) which where breed on the bank of the pond or in the vegetation in the pond were not taken into account in this work.

The densities of species were calculated by dividing the number of nests/pairs by the area of the pond. Statistical analyses were carried out using the SPSS 8.0 statistical package and according to Sokal and Rohlf (1995).

RESULTS AND DISSCUSION

A total of 10 bird species were found to breed in the Vrbje pond in 1993–1998 (Table). The Little Grebe and Coot attained a very high level of density and formed more than a half of the number of pairs in the assemblages. Their great quantitative predominance over the remaining species seems to be a characteristic feature of ponds (e. g. Kalbe, 1981). The highest density between nesting birds rich Little Grebe in 1998.

The densities of waterbirds varied between 14.1 pairs/10 ha (1995) and 31.9 pairs/10 ha (1998), however the differences between years was not significant (Kruskal-Wallis test, Chi-square = 3.99, df = 5, $P > 0.05$). On the other hand the differences between number of pairs was highly significant (Chi-square = 19.48, df = 5, $P < 0.005$).

The density of breeding birds computed for the Vrbje pond is high in comparison with study from e. g. Trnka (1995), almost the same as result from Mackowicz and Krajewski (1993) and much lower then result obtained by Kot (1986) in eastern Poland. However on the fishpond complex near Siedlce breeding also some colonial waterbirds, e. g. Black-headed Gull (*Larus ridibundus*), which contribute a huge numbers of pairs. If we excluded this species, the density (without Passeriformes) is almost the same as in my study area.

Very interesting is also densities of particular bird species. The number of Little Grebe was exceptionally high at the end of study and their density is still increasing, but the differences is not significant ($r_S = 0.49$, $P > 0.05$, $n = 6$). Nevertheless, this density is still lower then densities obtained in some other localities in Central Europe (e. g. Dvorak et al., 1993; Gorman, 1997).

Great Crested Grebe that breeds here outside of its concentrated distribution in Slovenia (Geister, 1995) has a high density (in the first period of study) if we compared their density with other areas (e. g. Lawniczak, 1982; Jermaczek, Jermaczek, 1987; Kupczyk, 1987; Vogrin, 1989; Mackowicz, Krajewski, 1993; Trnka, 1995; Witkowski et al., 1995). After Kauppinen (1993) and Hudec (1975) on Finland and in Moravia Great Crested Grebe seems to be associated with stands of *Phragmites australis*, where it also almost exclusively nest and have better breeding success (Moskal, Marszalek, 1986). These conclusions were not agreed with results from Goc (1986), Vogrin (1989) and this study. Moreover, breeding success, measured in my study area as a fledged chick per territorial pair (see also Vogrin, 2002, 2003) was high what could mean that breeding success of Great Crested Grebe is not related to particular vegetation.

Densities of Coot during the study was very stable ($r_S = –0.37$, $P > 0.05$, $n = 6$). Their den-

Species and their density (pairs/10 ha) of bird assemblages on Vrbje pond between 1993–1998

Виды и их плотность (пар/10 га) населения птиц на пруду Врбйе в 1993–1998

Species	1993	1994	1995	1996	1997	1998
Tachybaptus ruficollis	5.2	2.2	4.4	3.0	5.2	10.4
Podiceps cristatus	5.2	1.5	2.2	1.5	–	2.2
P. nigricollis	–	–	–	–	–	0.7
Ixobrychus minutus	–	0.7	–	–	–	–
Anas platyrhynchos	2.2	1.5	1.5	1.5	1.5	2.2
A. querquedula	–	–	–	–	0.7	–
Fulica atra	5.9	5.9	4.4	4.4	3.7	5.9
Gallinula chloropus	0.7	2.2	3.0	2.2	–	2.2
Vanellus vanellus	–	0.7	–	–	2.2	4.4
Charadrius dubius	–	–	–	–	1.5	3.0
Total	19.3	14.8	15.5	12.6	14.8	31.9

sity was similar (Jermaczek, Jermaczek 1987; Kupczyk, 1987; Jedraszko-Dabrowska, Debinska, 1993; Mackowicz, Krajewski 1993) or much lower then elsewhere in Central Europe (Cempulik, 1985; Kot, 1986; Jedraszko-Dabrowska, Debinska, 1993).

Very low breeding density during the whole study was discovered at Common Moorhen, density discovered on Vrbje pond was in general, however the same as on the e. g. lake Swarzedzkie (Kupczyk, 1987) and on the Puste Ulany ponds (Trnka, 1995). In Europe, the highest densities of Moorhens have been noted in small, highly eutrophic bodies of water and on industrial reservoirs with a higher representation of *Typha* spp. (e. g. Cempulik, 1985, 1993).

The waterfowl density correlated positively with relative plant cover and negatively with lake area and water depth (Kauppinen, 1993) and for some species also with abundancy of fish stocks (pers. obs.) and abundance of invertebrates (Nummi, Poysa 1995). The vegetation coverage indicates biological production. Besides being utilised as food, vegetation also acts as substrate for invertebrates used for food (Kirby, 1992). Aquatic invertebrates are the main food of many aquatic bird species (e. g. Cramp, Simmons 1980; Nummi, Poysa, 1995) and an important source of protein during egg laying and for young birds (Krull, 1970; Cramp, Simmons, 1980; Gardarsson, Einarsson, 1997). On fish ponds where are fish rearing presents (e. g. Vrbje pond) competition between waterfowl and fish for invertebrates may be an important factor influencing densities of some species (Pykal, Janda, 1994; Vogrin, 1994). On Vrbje pond Common Moorhen, which is the most weakness bird between waterfowl, is one of such example. The low breeding density of Common Moorhen could be also because of relative great density of Coot which is dominating competitor (e. g. Cramp, Simmons, 1980), however the relationship was not significant ($r_S = –0.64$, $P > 0.05$, $n = 5$). Nevertheless, the small sample sizes in this study mean that the power of statistical test was low. I must pointed out that low breeding density is not due difficulty of census Common Moorhen (see Dombrowski et al., 1993; Vogrin 1999), since number of breeding pairs was estimated on number of nests.

During the last years, fishpond were regularly drought during the spring. This partial spring drying positively influenced breeding of the Little Ringed Plover (*Charadrius dubius*) and the Lapwing (*Vanellus vanellus*) (see

Table and Vogrin, 1997b), but negatively on the other waterbirds and amphibians (Vogrin, 1996; pers. obs.).

Data about breeding of the Black-necked Grebe (*Podiceps nigricollis*) and the Garganey (*Anas querquedula*) are new for this part of the country (see Geister, 1995). Both species are very rare and only occasionally breeders in Slovenia.

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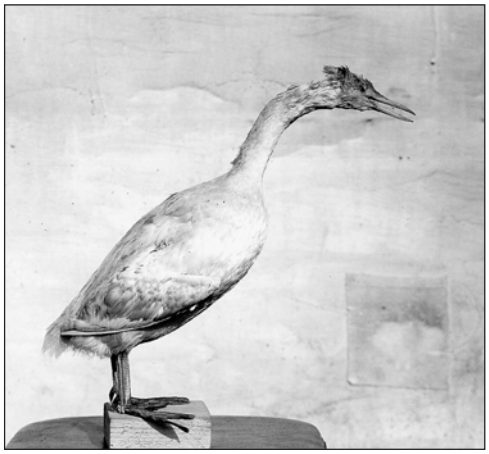
ЧОМГА–АЛЬБИНОС В КОЛЛЕКЦИИ ЛЮБИТЕЛЯ

Albino of the Great Crested Grebe in collection of an amateur. - N.P. Knysh. - Berkut. 13 (1). 2004. - The bird was bagged in Sumy region (North-East Ukraine) late in 1980s. It has aberrant coloration of plumage: white with light fawn tint. [Russian].

В небольшой таксидермической коллекции М.Л. Андрусенко – жителя с. Коротченково Шосткинского р-на Сумской обл., хранится кустарно изготовленное чучело чомги (*Podiceps cristatus*) аберрантной окраски (фото). Все оперение птицы очень светлое – белое с легким рыжеватым оттенком, интенсивность которого наибольшая на голове (верх головы буроватый, щеки и горло рыжеватые) и кроющих перьях крыла. Клюв и цевки ног желтовато-буроватые, пальцы оливково-серые. По словам владельца чучела, птица была добыта в конце 1980-х гг. в сезон осенней охоты на пойменном озере Хотинь близ с. Тимановка Шосткинского р-на. Держалась она несколько в стороне от стайки из 7 чомг.

Чомги-альбиносы и раньше попадали в поле зрения натуралистов. Например, они есть в фондах Государственного Дарвиновского музея (г. Москва), где хранится значительное число аномально окрашенных птиц, относящихся к 68 видам (Муцетони, 1987).



Чомга аберрантной окраски.
Great Crested Grebe with aberrant coloration.

ЛИТЕРАТУРА

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