

SEXES SHARE DURING INCUBATION IN URBAN PEREGRINES BREEDING IN WARSAW, POLAND

Lukasz Rejt

Abstract. During three years (2000–2002) incubating Peregrines was monitored by video cameras placed in nest boxes. In 2000 and 2002 the infrared lamps made possible day-and-night observations. Additional observations were collected in 2001 only during daylight. Female incubated during about 70 % of the day, while male only about 25%. The hen's share in incubation was about 93 % at the beginning of laying, then decreased to 77 % after laying the third egg and were stable to the end of incubation. The hen incubated during all nights. Male relieved female at the nest mainly in the morning, with a peak around 3⁰⁰–6⁰⁰ and afternoon between 12⁰⁰ and 15⁰⁰; female relieved male before the afternoon (at the 7⁰⁰–9⁰⁰) and in the evening (15⁰⁰–17⁰⁰).

Key words: Peregrine Falcon, *Falco peregrinus*, Warsaw, incubation, sexes share.

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Участь статей в інкубації у міських сапсанів у Варшаві, Польща. - Л. Рейт. - Беркут. 11 (2). 2002. - Протягом гніздового періоду 2000 та 2002 рр. проведено цілодобовий моніторинг гнізда варшавських сапсанів. Зібраний матеріал доповнено у 2001 р. даними з цілоденних спостережень. Самка проводила близько 70 % інкубації, самець лише близько 25 %. Участь самки у насиджуванні на початку інкубаційного періоду сягала 93 % пізніше знизилась до 77 % після відкладання третього яйця. Вночі на яйцях сиділа лише самка. Самець міняв самку на гнізді вранці (біля 3⁰⁰–6⁰⁰ та пополудні (між 12⁰⁰ та 15⁰⁰). Самка міняла самця між 7⁰⁰–9⁰⁰ та ввечері (15⁰⁰–17⁰⁰).

INTRODUCTION

The Peregrine Falcon (*Falco peregrinus*) is a cosmopolitan species (e. g. del Hoyo, 1994). In Western Palearctic it is known from the tropics to the high Arctic (Cramp, 1980). In several European countries, more and more Peregrines have adjusted to urban conditions, as has been the case in other parts of the species' range (e. g. Cade, Bird, 1990, Cade et al., 1996). Nowadays, Peregrines occur in several mainland towns, amongst other in Rome (Ranazziá 1995), Berlin (Müller, 1989; Sömmer 1989), Prague (Peške, 1997), Plzen (Hruška et al., 2000), and also in Brighton, Swansea, Liverpool, Dublin and a number of other English and Irish cities (e. g. Roberts, 1999; Ratcliffe, 2000).

The regular wintering of the Peregrine Falcon in Warsaw has been recorded since the mid-19th century (Taczanowski, 1882). After the last war a pair probably nested in the devastated city centre (Luniak et al., 1964). However, the species disappeared from Warsaw in the 1950s and also from the whole of Poland as a result of DDT contamination (Mizera,

Sielicki, 1995). The falcons appeared again in the city centre in 1998 and have bred every year since then, doing so successfully for first time in 2000. Female was released in 1996 in her first year, the origin and exact age of male was unknown. He was probably reintroduced in Poland or Germany two-three years earlier than the female (Luniak, Rejt, 2001). Both birds had an individual ring code what made possible to recognize them. The Warsaw pair has been one of the 3–8 recently recorded breeding pairs of Peregrines in Poland (Sielicki, Sielicki, 1999; own data).

Recently in dozen of Peregrines nests all over the world video cameras have been placed. It is also possible to follow the falcons nesting in web sites*. However the results of only few such observation have been published so far (e.g. Schneider, Wilden, 1994; Rejt, 2001). The long-time data collected from the same pair of Peregrines gave an extraordinary ability for studying the variability of breeding parameters. Pattern of whole day activity as

* See <http://www.nbpc.co.uk/links.htm#WEBC>, for instance.



well as sexes role during incubation seemed to be amongst the most interesting topics because of lacking such detailed studies in wild. Present study tried to fill the gap in knowledge on the free-living Peregrines.

MATERIAL AND METHODS

Study was carried out in Warsaw, Poland (21°E 5°23'N). Between 1999 and 2002 Peregrines laid here complete clutches every year. Falcons bred in nest boxes placed on highest buildings within the city centre. In 1999, 2000, and 2002 they occupied the Palace of Culture (185,5 m above the ground), in 2001 Peregrines nested on Warsaw Financial Centre skyscraper (at 145 m). During three years (2000–2002) incubating Peregrines was monitored by video cameras placed in nest boxes. In 2000 and 2002 the infrared lamps made possible day-and-night observations (during 32 and 14 days, respectively). The additional material in 2001 was collected only during daylight, i. e. between 5⁰⁰ and 19⁰⁰ (8 days; summer time). It was possible to follow a fate of all eggs, assess the time spent on eggs by particular sex, relief pattern.

RESULTS

Intervals between laying the consecutive eggs

According to observation from video camera intervals between laying the consecutive eggs were between one (1st and 2nd egg in 2000) and three days (2nd and 3rd 2000, 3rd and 4th in 2002).

In most cases eggs were laying in two-day intervals (Table).



Fig. 1. The sexes share in incubation of consecutive egg. Data from continuous day-and-night monitoring in 2000 (00) and 2002 (02). F – female, M – male.

Рис. 1. Участь статей в інкубації послідовно відкладених яєць.

Time spent incubating by male and female

In 2000 female's share in incubation exceeded 76 %. She spent 72,5 % of the day incubating while tiercel — only 22,1 %. Observations in 2002 shown similar pattern. In 2000 and 2002 (pooled) female had spent daily in average 1067,6 minutes incubating (74,1 % of the day, 75,5 % of incubation) while male only 346 minutes (24 % and 24,5 %, respectively). In 2000 eggs were not covered during in average 78,3 min. per day (i. e. 5,4 % of the day) while in 2002 – 26 minutes/day (1,9 % of the day).

In 2001 (only daylight observations) female were seen on the nest in average by 469 minutes daily (69,2 % of incubation, 55,8 % of the day) while tiercel – 209 minutes (24,9 %

Dates of laying the particular egg. N – number of eggs in clutch, E1–E4 – the laying date of consecutive egg, in brackets the assessed date of laying. H – the date of first chick's hatching. Дати відкладання окремих яєць.

Year	N	E1	E2	E3	E4	H
2000	4	10.03	11.03	14.03	16.03	18.04
2001	4	6.03	(8.03)	(10.03)	(12.03)	14.04
2002	4	3.03	5.03	7.03	10.03	11.04

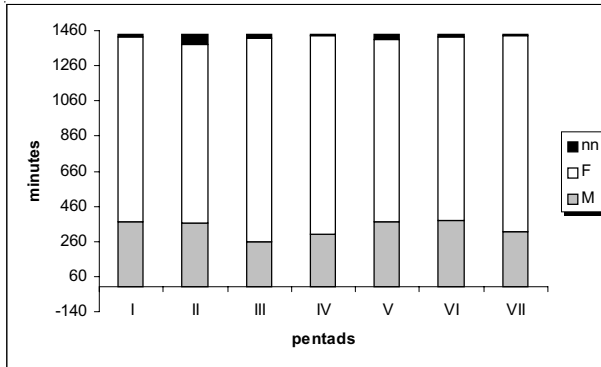


Fig. 2. Incubation during the seven pentads after clutch completing (2000 and 2001 pooled data). F – female, M – male, nn – bird of undetermined sex.

Рис. 2. Інкубація протягом семи пентад після закінчення кладки.

of the day). Eggs were then uncovered in average 162,2 minutes (19,3 % of the day).

Time spent incubating as a function of breeding stage

It was stated from day-and-night observations that at the beginning of the incubation (just before and after laying the first egg) female's share in incubation took about 93 %, decreased to 77 % after laying the third egg and were stable to the end of incubation. Dif-

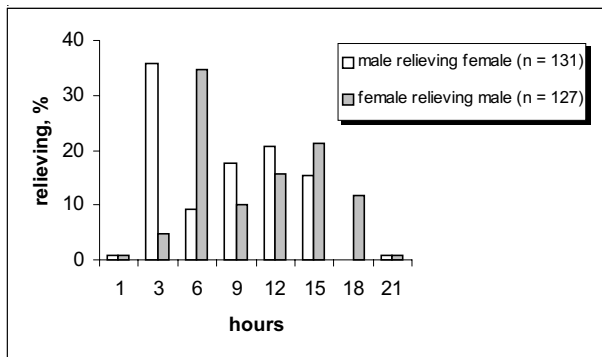


Fig. 3. Relief pattern thorough the day in 3-hours intervals (pooled data from 2000 and 2002).

Рис. 3. Характер зміни птахів на гнізді у 3-годинні інтервали протягом всього дня (разом за 2000 і 2002 рр.).

ferences between two years were as equal as 10 % (Fig. 1).

When the clutch was completed incubation performed by tiercel was the most frequent at the first pentads (324–419 min.) and between fifth–sixth ones (371–386 min.). It decreased in the middle (229–275 min.) and the end (312–317 min.) of this period. Female's participation in this period of incubation showed similar pattern in both studied years — reversed to obtained for the male (Fig. 2).

When the last egg was laid the parents' absence varied in consecutive pentads (Fig. 2). In 2000 the longest gap in incubation (58 min.) was at second pentad then decreased (to 3 min. at fifth pentad). In 2002 was observed reverse pattern – at fifth pentad occurred the longest gap in incubation (59 min.).

Nest relief

In both years when the continuous observations were performed the relief pattern was found to be similar. The hen incubated during all nights. Male relieved female at the nest mainly in the morning, with a peak around 3⁰⁰–6⁰⁰ and afternoon between 12⁰⁰ and 15⁰⁰; female relieved male before the afternoon (at the 7⁰⁰–9⁰⁰) and in the evening (15⁰⁰–17⁰⁰). Additional data collected in 2001 during the daylight showed also two-peak pattern for male — he relieved the hen most frequent between 6⁰⁰ and 8⁰⁰ and 14⁰⁰–17⁰⁰ (Fig. 3).

DISCUSSION

The intervals between laying the consecutive eggs in Peregrines normally lasted 48 hours (e. g. Fischer, 1977; Ratcliffe, 2000). Data collected in Warsaw did not



contrary above data. Three days long gap (found between third and fourth egg in 2002) was also observed in other cases, also in captivity (e. g. Fischer, 1977; Ratcliffe, 2000).

It is commonly known that incubation does not usually begin until the third egg is laid, or sometimes even later (e. g. Ratcliffe, 2000). Chicks in Warsaw hatched 33 (in 2000 and 2002) and 32 days (in 2001) after laying the last, fourth egg (Table). These findings shows that similar to other Peregrines the Warsaw pair started incubation after the clutch completing. However results obtained in Warsaw showed that at the beginning of laying female spent on eggs about 30 % of the day. It was also found that time spent incubating increased during the subsequent egg laying. Female's share in time spent on the nest was significant higher just after beginning of laying (about 90 %) in comparison to incubation after clutch completing (about 70 %). Eggs are vulnerable on temperature changes in the end of incubation but before the embryo development could be uncover for a long time. It could low the differences in age of nestlings as it is known also for other asynchronous species (e. g. Newton, 1979; Village, 1990). Thank this chicks from at least two first eggs hatch on the same day.

Male was present on nest very rare at the beginning of incubation period. He incubated some dozen minutes during two first eggs laying to about 4 hours just before the clutch completing. Later his participation was stable – about 5 hours/day. It is known that male participation in incubation usually reached 25 % – 50 % of daytime (especially in the middle of this period), and decreased but share varied greatly between individuals (Ratcliffe, 2000). Results obtained during present study did not contrary this. According to literature the tiercel was also never found to incubate at night. Data obtained in Warsaw concurs also with above statement. Continuous observations let also to state that incomplete clutches was covered by female at night as it was suggested by Ratcliffe (2000).

It was found that mean duration of the time

when eggs were uncovered differed between seasons. In 2000 and 2002 reached only some percent of the day (5,5 % and 1,9 %, respectively) while in 2001 was almost 20 %. The reason of such significant difference could be a nest-box placement. In both 2000 and 2002 seasons Peregrine nested in box situated inside the building, with western direction. In 2001 falcons occupied a wooden nest-box standing on the skyscraper's roof in all-day-sun. Probably temperature inside the boxes was different – higher on the roof than inside the building. It could let adults to leave eggs uncovered longer in 2001.

Data concerning the relief in Warsaw pair showed a two-peak pattern. Generally, female was relieved by tiercel in the morning after all-night incubation and roles changed after her returning at the morning. Male relieved female second time in afternoon and was leaving the nest at the evening when the hen started her all-night incubation. However the daily number of relieves varied, so changes on nest had place also in different hours than mentioned above. Differences between seasons in time of morning relieving could be connected with lack of data collected early morning (before 5⁰⁰) in 2001.

Study conducted in Warsaw gave an occasion for detailed observation on incubation in Peregrines. Data collected enriched the present knowledge about falcons' behaviour at this period. Additional observation on wild birds more and more commonly breeding in Europe could finally verified the results obtained. Especially studies on urban pairs could provide interesting data comparative to presented work.

ACKNOWLEDGMENTS

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О НАХОДКЕ БЕРКУТА В КРИНИЧАНСКОМ РАЙОНЕ ДНЕПРОПЕТРОВСКОЙ ОБЛАСТИ

About a record of the Golden Eagle in Krynychky district of Dnipropetrovsk region. - V.V. Kotsyuruba. - Berkut. 11 (2). 2002. - This species was not registered formerly for the area of Kryvorizhskiy basin. A shot young male was found in a steppe ravine near the village of Vysoke 24.10.1998. Its measurements are given. [Russian].

Залеты беркута (*Aquila chrysaetos*) на территории степной зоны наблюдаются крайне редко, для Криворожья и прилегающих районов они в предыдущие годы не отмечались. Во время обследования степной балки к юго-востоку от с. Высокое Криничанского р-на Днепропетровской обл. 24.10.1998 г. найден труп молодого самца, подстреленного браконьерами.

Птица была доставлена на кафедру зоологии Криворожского педуниверситета и обмерена. Вес – 4,480 кг. Размеры (мм): L – 856, A – 598, 2A – 1752, P1 – 132, Cul – 24, C – 347, Cul – 43. Изготовлена коллекционная тушка и отправлена в фонды Зоологического музея НАН Украины.

Данный факт указывает на возможность залетов беркута в центральную часть Правобережной Степи и позволяет включить его в список редких залетных видов птиц Криворожья.

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