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# THE REPRODUCTION BIOLOGY OF BLACK-CROWNED NIGHT HERON AT LAKE POYRAZLAR (SAKARYA, TURKEY)

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**Abstract.** Lake Poyrazlar located in the northeast of Turkey is an important reproduction area for Black-crowned Night Heron. The research was carried out during March – December 2005. The adult individuals arriving in this area as of the beginning of April, migrate to the South in November after bringing up the chicks. The area in which 130 mates incubate, constitutes 0.6–1 % of the lake. Nesting area in the lake is 4000 $m^2$. It was found out that the first eggs of about 31 gr. hatch at the end of a three-weeks period (21–22 days). The most important problems of the species in the region are illegal hunting, getting wood from small numbers of flood-plains and people using the surroundings of the lake as picnic and camping areas.

**Key words:** Turkey, Black-crowned Night Heron, *Nycticorax nycticorax*, ecology, breeding.

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**Биология размножения кваквы на озере Пойразлар (Сакария, Турция). - А. Узун, М.А. Табур. - Беркут. 15 (1-2). 2006.** - Оз. Пойразлар, расположенное на северо-востоке Турции, является важным местом гнездования кваквы. Исследования проводились в марте – декабре 2005 г. Взрослые птицы появляются на этой территории в начале апреля, отлетают на юг в ноябре. На участке в 4000 $м^2$, который составляет 0,6–1 % площади озера, гнездится 130 пар кваквы. В кладках от 2 до 5 яиц, как правило 3–4. Вес свежих яиц 24–35 г, в среднем 31 г. Насиживание продолжалось 21–22 дня. Температура инкубации составляла в среднем 39 ºС. Наибольшую опасность в это время представляли сороки, поедавшие яйца в оставленных без присмотра гнездах. Из 35 находившихся под контролем яиц птенцы вылупились в 24, 5 съели сороки, 6 оказались неоплодотворенными или эмбрион погиб. Успешность размножения в 10 гнездах составила 68 %. Основные угрозы виду в регионе – нелегальная охота, разрушение местообитаний и рекреация.

## INTRODUCTION

Black-crowned Night Heron (*Nycticorax nycticorax*) and Little Egret (*Egretta garzetta*) has an extensive global distribution that includes Europe, Africa, Asia and Australasia (Cramp, Simmons, 1977). Black-crowned Night Heron, which can be observed in almost all regions of Anatolia, migrates during summers in Turkey (Heinzel et al., 1995).

The reproduction period of the Night Heron was observed during the research time in Lake Poyrazlar (NE Turkey). There is no detailed study on this subject in revised literature in Turkey. Therefore, the aim of this research is to determine the breeding biology of Black-crowned Night Heron and to contribute to ornithological studies of birds of Turkey. Furthermore, the data obtained as a result of the observation will be used as a comparison criterion for the issue of the affects of climatic changes on the breeding of bird.

## METHODS

The research was carried out during March – December 2005. All data related to the reproduction period of the species were collected during the visits made to the research area in periods of 2–3 days. The number of the nests was determined by counting one by one. 10 nests from different parts of the area and the eggs in such nests were selected as samples. During the growth process; weights and lengths of the beaks, wings, legs as well as body temperatures of the chicks in the nests were measured. Electronic scales were used for the measurement of mass; electronic thermometer for the measurement of body temperature and metre for the measurement of their length.

Thermometer was hanged near the nest in order to measure the incubation temperature. The nest was left in order to let the bird incubate again and the temperature of nest was controlled in approximately one hour. Body temperature of the juvenile individuals were measured underarm. All the data related to the nests, measurements and observations were collected by rowing in the lake and individual behaviours were observed from a distance of 30–40 m with binoculars. In the research, dimensions of the nests and growth process of the juvenile was also photographed. The indiviuals were not disturbed during the research and the eggs and chicks were tried to be kept warm especially in rainy and cold weather. Measurements of individiuals were collected during the warmest hours of the day by taking the above mentioned problem of keeping warm into consideration.

## RESULTS

Black-crowned Night Heron arrived in the reproduction area between the first and third weeks of April. The number of the individuals arriving first was counted to be approximately 40–60. In the observation period, the number of individuals reached to 250–300 in total.

The mates arriving first incubated during the period starting from 16–18 April. In the last 10–15 days, the mates carried out activities such as courting, nesting and laying eggs. This period contiuned until the first week of May in the area because of the ones arriving late. The activity of hatching of all eggs continued until the end of May (Table 1).

It was defined that feet of adults which are monogamous turned into pinkish orange during the courting period. However, the males were observed to be fairly aggressive, active and noisy all the time. Besides, after the mates matches the nesting process started immediately and both of the mates took part in this process. The bowl-shaped nests which were made from dried willow twigs had an average depth of 6–7 cm and 36–37 cm in diameter. The nests were made by superposing twigs, which looked neither good nor strong. In relation to this data, it was defined that the indi-

Table 1

Reproduction period of Black-crowned Night Heron at Lake Poyrazlar
Репродуктивный период кваквы на оз. Пойразлар

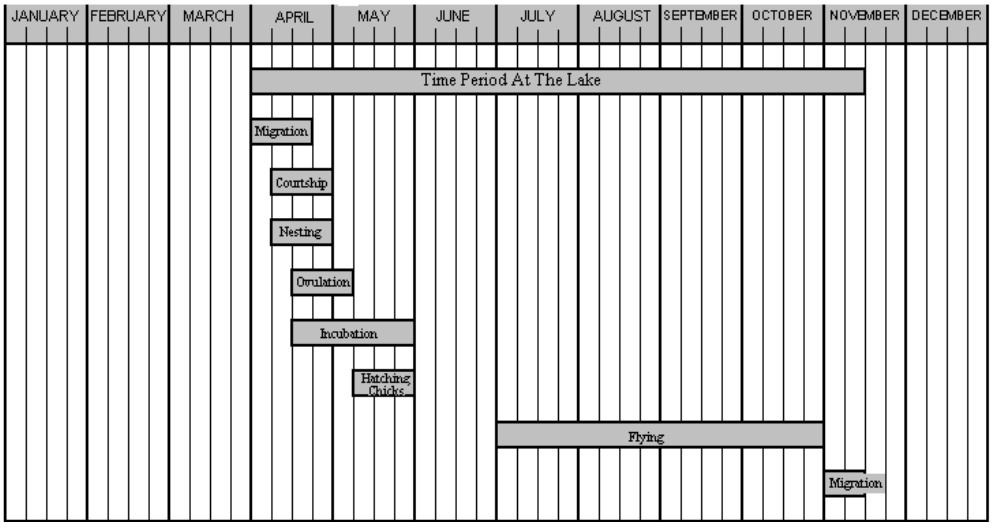

Table 2

Growth of chicks of Black-crowned Night Heron at Lake Poyrazlar
Рост птенцов кваквы на оз. Пойразлар

| Day | 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 17 | 19 | 21 | 45–50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight (gr) | 32.5 | 80.9 | 143.6 | 189.3 | 210.8 | 258.5 | 300.2 | 340.8 | 398.3 | 420.1 | Leaving From Nest | Flying |
| Wing (cm) | 4.0 | 6.7 | 9.0 | 12.5 | 14.0 | 17.5 | 23.5 | 26.5 | 29.8 | 31.0 | | |
| Leg (cm) | 5.0 | 9.7 | 12.5 | 15.4 | 17.0 | 19.7 | 24.0 | 27.5 | 29.0 | 29.0 | | |
| Lenght (cm) | 15.0 | 23.2 | 31.0 | 37.5 | 43.0 | 48.0 | 55.0 | 56.0 | 59.0 | 61.0 | | |
| Bill (cm) | 1.3 | 2.3 | 2.8 | 3.2 | 3.5 | 3.8 | 4.3 | 4.5 | 4.7 | 5.0 | | |

viduals were not good nest makers and the nests could easily be collapsed after incubation. The number of the nests on willow trees (*Salix* sp.) and their height were defined to be changable. The nests on the crotches of willow trees were placed in a distance of about 1 m. to each other which mean that in the area, which was covered with willow trees, there was a nest in each square metre. Height of the nests above the water level started from 1 m. and changed depending on the type of the plant. The females shed feather to the bottom of the nest in order to make it soft before laying the eggs. After choosing the mates, the period of laying eggs started. Birds copulate in or around the nest. The process of laying eggs took about 5–6 days. Number of the eggs in nests might be 2–5, usually 3–4 ones. The weight of the eggs was found out to be between 24–35 gr., the average weight was about 31 gr.

Both of the mates incubated, but females incubated for a longer time. It was also recorded that the female fixed the eggs and changed her position once in every 2–3 hours in cold weather and hourly in hot weather. The females got more and more devoted to the nests during the incubation period. The nest was rarely left by the mates. Eggs were hatch at the end of 21–22 days at a temperature of around 39 ºC. The most important danger for the species cames from Magpie (*Pica pica*), which eat the eggs when the nests were left by incubated individuals.

The eggs were hatched during the period beginning from the 2nd–3rd days and juvenile individuals opened their eyes. The chicks with yellow eyes made a sound like “vicjk”. The light brown feather like hair changed within 6–7 days. The change started on the backs and then on the wings. The body and the legs were green while the feet were yellowish. All the toes were palmated in the beginning, however at the end of the first two weeks only the outer toes remained palmated. In the same way, different values of body temperature were defined. It was observed that the body temperature increasing in parallel with the growing feather differ between 35,0 ºC – 40,1 ºC. However, 39 ± 1 °C was the most common value which was measured within this period.

The most functional organs of the chicks were beaks and claws. Beaks were not only important for feeding and defending but also for clinging, climbing and roaming on branches. Claws were also very long and useful. The lower cartilagous beak had a pouch

that could expend. The chicks, which emit a bad smell, reacted by vomitting when they were disturbed. Both of the mates were responsible for feeding the chicks. But, the females were more sensitive in feeding. The chicks were fed with fishes, lizards, snakes and worms.

During the investigation period, 10 nests with 35 eggs were observed. Only 24 eggs were hatched. 5 eggs were eaten by magpies and 6 were considered to be infertile or having another reason for not hatching.

Reproduction rate in 10 nests was about 68 % and there was a loss in the proportion of 22 %. Considering that the average number of eggs in one nest was 3. 260–270 chicks out of 390 eggs – which was a rate of 68 % – were included in the population. This constitutes an important feature in terms of the protection of this species and natural richness. However it was observed that all the chicks could not survive until the migration period. The number of the young individuals counted during the migration period in the area was 190. As the species was exposed to predators and reptiles and drowned in water, there was a loss of 70–80 individuals. Consequently, accepting that the number of the young individuals coming out of 390 eggs and leaving the area in the migration period was 190, the reproduction rate of Black-crowned Night Heron in Lake Poyrazlar was approximately 48 %.

Development and growth period of the chicks were observed once in two days and the changes on one wing length, beak and leg length and body mass were recorded (Table 2). Increase in the body mass starting from the first day was almost same until the 19$^{th}$ day, which was the last day of measurement. Within this period, the daily increase in weight was 20.4 gr. and the weight increased 1.5– 2 times in the first weeks while it decreased in the porportion of 1/7–10 of total mass afterwards. The chicks, which were about 32,5 gr. when they were hatched, weighted 420.1 gr. at the end of 19 days.

There was also an increase of 1.4 cm in wing length, 1.2 cm in leg length, 0.1 cm in beak length and 2.4 cm in length. Although there was a rapid increase in length, leg length and beak length in the first 10 days, this rapid increase was observed in the length of wings later. The reason was considered to be the feather growing on the wings starting from the 6$^{th}$ – 7$^{th}$ days. The wing length was even longer than the leg length in the last week (Table 2). As a result, the most rapid increase was observed within the first 10 days. At the end of this period, the chicks roosted in and around the nests and they perched on the branches after the 21$^{st}$ day; that is to say, they left the nests.

The temperature in the incubation was measured to be 39 ºC on average by putting thermometres in the nests. However the body temperatures of the chicks were observed to be changing between 35,0 ºC and 40,1ºC and it was also observed during the period beginning from the first day that the body temperatures were changing while the chicks grew up as the new chicks had not grown enough feather to keep the body temperature. The average temperature was accepted as 39 ±1 °C as a result of the measurement made under wings.

The chicks, roaming on the branches at the end of 3 weeks, fly beginning from the 6$^{th}$ – 7$^{th}$ weeks. They fly short distances and between branches in the beginning. They perch on the branches most of the time and they are not active during the day time except for feeding. This is the characteristic of the species, which feeds at night and does not like rivalry.

## DISCUSSION

The research revealed that Lake Poyrazlar was an important reproduction area in terms of Turkish population of Black-crowned Night Heron. This species with the protection status of A.3 (under danger) according to Kiziroğlu (1989), ranges over almost all regions of Turkey. Although Black-crowned Night Heron, which is summer migrant at Lake Poyrazlar, is protected from time to time in various countries, the species is not under danger. The dangers supposed to be caused by human beings are prevented as the species is not economically valuable and the eggs are not eaten. However, it is known that they are shot when they cause harm to agriculture and fishing. For ex-

ample, it is known that approximately 1300 birds were shot in a year in 9 states of the USA. DTT used in fighting against pests also endangers Black-crowned Night Herons as it does to many other living creatures. The decrease in the total population of the species in 1960s was considered to be the result of this situation; therefore, the species was taken under protection. The population, which had decreased to 4000 in Malaysia in 1965, increased to 12.000 in 1986 after the precautions taken (Del Hoyo et al., 1992).

The morphological, behavioural and nutritional characteristics of the species were defined in a similar way to those of Turan (1990), Heinzel et al. (1995) and Del Hoyo et al. (1992). However some differences in terms of the length and incubation period of the species were also explained. The average length was measured to be 58–65 cm by Heinzel et al. (1995), 56–65 cm by Del Hoyo et al. (1992). Length of the chicks was measured until the 19$^{th}$ day at the latest. As the chicks left the nest and roamed on branches, it was not possible to measure their lengths after the 19$^{th}$ day. The species observed to be about 61 cm in length on the 19$^{th}$ day were considered to be longer when they became mature.

Turan (1990), Del Hoyo et al. (1992) defined the incubation period to be 21–22 days; however, according to Zhu Xi et al. (2005), the period was determined to be 23,5 day.

The species was considered to be monogamous. This was proved by the data acquired in the research. Although the female and male incubated together, the female stayed longer in incubation and the male stayed around the nest. The mates were also very close to each other during this period and the female was faithful to the nest and chicks. Their faithfulness increased during the incubation period. However the Black-crowned Night Herons were not good at nesting. The bowl-shaped nests made of dried willow twigs were very simple as the chicks roost on the branches after 21–24 days or leave the nests early. The abandoned nests got destroyed quite easily and the remaining nests might be used by Little Egret and Squacco Heron (*Ardeola ralloides*) in the same area later on.

The lake, an important reproduction place for the Black-crowned Night Heron, confronts many anthropogenic and natural dangers. The most important problems are illegal hunting, getting wood from small numbers of floodplains and people using the surroundings of the lake as picnic and camping areas. After the privatization of the surroundings of the lake in the last two years, the reproduction area was exposed to anthropogenic effects more and more. As the entrance to the picnic area is not free of charge, more people visit the area, which is far from the picnic areas and this destroys the balance of nature.

154 bird species take shelter in the Lake Poyrazlar (Uzun, 2004). It is both a valuable wetland and an important reproduction area especially for Black-crowned Night Heron in terms of ornithology. Population density of the species increases by 48 % in the area every year. The lake and its surroundings with two different protection status should be taken into consideration in a different way especially in terms of heron species; and more precautions related to the reproduction period should be taken so that the lake will gain a richer ornithological structure and will be very effective in the promotion of the area.

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