Notes on egg-laying, clutch size and hatchling feeding of *Emys orbicularis* in the Kharkiv region, Ukraine

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*Emys orbicularis* was studied 1999–2004 in the Kharkiv region of Ukraine. There, it inhabits oxbows, main riverbeds, springs, swamps, and artificial ponds. Egg-laying takes place at the end of May to the middle of July. The majority of nesting sites are situated on sandy terraces of rivers, on south-facing slopes with steppe-meadow vegetation. The most frequent clutch size is 9–11 eggs but it varies from 6–22 eggs (maximum for Ukraine). Hatchlings migrate to permanent water bodies in autumn or the next spring following terrestrial hibernation. Post-mortem examination of migrating hatchlings in spring revealed the presence of terrestrial insect remains in their digestive tracts.

Key words: *Emys orbicularis*, clutch size, hatchling, Ukraine.

Introduction

Data on reproduction of *Emys orbicularis* (L., 1758) are rather abundant, also for the Ukrainian part of the distribution range (survey in FRITZ, 2001). But in northeastern Ukraine, the European pond turtle has not been investigated yet, except for a few observations made by RUDYK (1975) and data on a single population in the Kharkiv region (LYAMZIN, 1993). My work was conducted to provide new information and to obtain more data on reproduction in my study region. In addition, during my work some new interesting data concerning early life stages of *E. orbicularis* were obtained.

Material and methods

Investigations were carried out in 1999–2004 in the Kharkiv region of Ukraine (between 48°34' and 50°27' N and 34°48' and 38°05' E). Turtles were watched in nature; gravid females were caught during migrations to the nesting sites and kept in the laboratory.

To determine the beginning and intensity of egg-laying, turtle tracks on sandy earth-roads or ploughed strips between water body and nesting site were counted. Gravidity of females was determined by palpation through groin holes. Oviposition in captivity was induced by oxytocin injection. Turtles and eggs were measured by callipers, and weighed by laboratory balances.

For the investigation of feeding by migrating hatchlings, dead specimens were collected along the migration route and dissected. In addition, *Emys orbicularis* specimens in the collection of the Museum of Nature at V. N. Karazin Kharkiv National University (MNK KNU) were studied.

Results and discussion

The earliest date of egg-laying by the European
pond turtle was registered as 24 May 2002 in the south of the Kharkiv region. On 1 km of earth road, which was situated between the river and nesting sites, tracks of seven turtles were observed. According to LYAMZIN (1993), egg-laying in the Balakleya district of the Kharkiv region lasted from 8 June 1992 to 12 July 1992, with a first peak on 17–21 June 1992 and a somewhat less pronounced second peak on 11 July 1992 (data of 50 females). Within these limits, oviposition was recorded on 1 July 1967, 15 June 1969 (RUDYK, 1975); in July 1969, on 18 June 1977 (MNKKNU collection); 1 June 2000, 5–11 June 2001, 30–31 May 2002, 2–3 June 2002, 11 June 2002, 13 June 2002, 6 June 2003, 8–10 June 2003, 13 June 2003, 15 June 2003, 6–7 June 2004, 13 June 2004, 14–18 June 2004, and 28 June 2004. One case of laying a single egg without a nest was recorded on 8 July 2001. The long egg-laying period and the two peaks in one season suggest the production of a second clutch. However, this is not yet confirmed by observations.

Nesting sites are situated in open places in coniferous forest (on sandy terraces of river valleys), on roadsides, and in dry meadows on slopes of river valleys, which are exposed to the south, southeast, or southwest.

Usually, migration and oviposition occur from 16.00 h until 21.00 h. However, I observed females that left the water in the first half of the day, then stopped their migration and buried themselves in dense grass or hid themselves under low branches of trees until evening.

Clutch size in the Kharkiv region varies from 6–22 eggs; the most frequent egg number in a clutch is 9–11 (LYAMZIN, 1993, n = 6; Zinenko, unpubl. data, n = 28). A female from the reserve “Russkii Orchik” (near the village of Zarechnoe, Zachepilovka district, Kharkiv region, on the Ori’ river, Dnieper basin), laid 22 eggs in captivity. This represents the record clutch size for Ukraine. Maximum carapace length of the female was 190 mm, maximum carapace width 155 mm, height 80 mm. Eggs were 30–37 mm in length and 18–24 mm in width, and the average mass of one egg was 7.42 g (6.65–7.93 g). The previously mentioned maximum clutch size of Emys orbicularis in Ukraine varies, according to different authors, between 16 and 20 eggs (Pashchenko, 1955; TARASHCHUK, 1959; SCHISHERBAK, 1966; KOTENKO & FEDORCHENKO, 1993; KARMSHEV, 1999; KOTENKO, 2000); however, clutches of 22 (Drobenkov, 1999) and 23 eggs (MITRUS & ZEMANEK, 2000) are known from other northern parts of the species’ range. I observed in my study region an intensive destruction of nests by predators shortly after egg-laying.


Post-mortem examination of three hatchlings with carapace lengths of 25–27 mm that had died during their spring migration revealed the presence of insect remains in their digestive tracts. The following insects were identified: Coleoptera: Bembidion sp. (imago), Cantharoida (larva), Cericyon sp. (imago), Ophonus sp. (imago), Phyllothreta sp. (imago); Diptera: Nematocera (larva). The dead turtles were found between 30 April and 1 May 2002 in the flood-plain, about 500 m from the nesting sites. Between the collecting place and nesting site there are only temporary water bodies (small streams, puddles). The presence of terrestrial insects in the stomachs of these hatchlings and the absence of permanent water bodies, where turtles could live and hibernate, on their migration route indicate that hatchlings begin to feed while still wandering to their permanent aquatic habitats. It is known that E. orbicularis cannot swallow their prey out of water (Fritz & Günther, 1996). Thus, the hatchlings probably stop for a short time in small temporary water bodies and feed on terrestrial insects, which have fallen in there.

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