NATURA MONTENEGRINA, Podgorica, 9(3):649-653

THE DYNAMICS OF *Rana temporaria temporaria* Linné, 1758 EGG-LAYING UNDER THE ACTION OF ANTHROPOGENIC PRESSURE

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Key words:
anthropogenic pressure, egg-laying, *Rana temporaria temporaria*.

SYNOPSIS

Human activity sometimes irreversibly alters the habitat of many species of animals. This is also the case in the Birnova forest area, Iasi, Romania, where in the recent years we have observed fewer places for egg laying and a smaller number and volume of spawn of the species *Rana temporaria temporaria.*

INTRODUCTION

Birnova Forest is one of the largest forests around the city of Iasi, Romania and is directly connected to the sub-Carpathian forest. The heights at which the forest extends range from 900 - 120m. At the edge of the forest, in the region near Iasi, the geological and paleontological reservation Repedea is located and it extends over 47 hectares. Over the years, numerous paleontological, litho and biostratigraphic, sedimentological and geochemical studies have been conducted here. Research has led to a deeper knowledge of the reserves by adding the intrinsic geological and paleontological value and the scientific importance generated by the flora and fauna of the region, giving it the right to be called a complex reserve.

In recent years, due to restitution of land and deforestation, wildlife areas suffered a powerful transformation under human actions. Regardless how much man wants to protect the environment his actions put a strong pressure on it, fact which is reflected in the behavior of plant and animal species.

Forest fauna is diverse in Birnova consisting of superior vertebrate species (boar, deer, wolves) and also inferior (reptiles, amphibians anuri), out of which also *Rana temporaria temporaria*.

MATERIAL AND METHODS

The spawn of *Rana temporaria temporaia* comes from the ponds and lakes in the Birnova forest, in the village Pietrarie, Iasi, Romania and were observed and collected between the years 1993/1994 and 2010.

The collection was made from the waters of lakes and ponds in which eggs were laid and their development was done in a laboratory in non-chlorine water that came from a channel. Spawn development was done in glass vessels of 10 and 20 l at the temperature of the laboratory. Embryonic development stages were assessed following the tables of TAYLOR and KOLLROSS (1946).

After observations the remaining larvae were released into the collection places.

RESULTS AND DISCUSSION

The Birnova forest and forest edge offer a proper place for the development of the species *Rana temporaria temporaria*, which prefers low temperatures and dryness (Grasse, 1986). For breeding, this species uses the ponds and lakes from the forest edge. Between 1993 and 1994, in the area where the research was effected, there were a total of three large ponds and four smaller ponds, which never dried out throughout the year.

The spawn of *Rana temporaria temporaria* collected in the years of study 1993, 1994 and 2010 varied in number, and the researchers observed a decrease in their number and size (Table 1).

Year	1993	1994	2010
Pontes	25	26	2

Table 1: Number of *Rana temporaria temporaria* pontes.

Thus in 1993 and 1994 the number of spawns was greater compared with 2010. Spawns had the characteristics described in the literature, about 1000 eggs, the size of a pea (Fuhn, 1960; Hourdry & Beaumont, 1985; Rugh, 1951; Savage, 1961).

The environment in which eggs were collected was clean and there were no residues of tourist activities. The land had no traces of hydro processing or other type of construction (Fig. 1).

Figure 1: Birnova forest, ponds for collection of *Rana temporaria temporaria* pontes, 1993/1994.

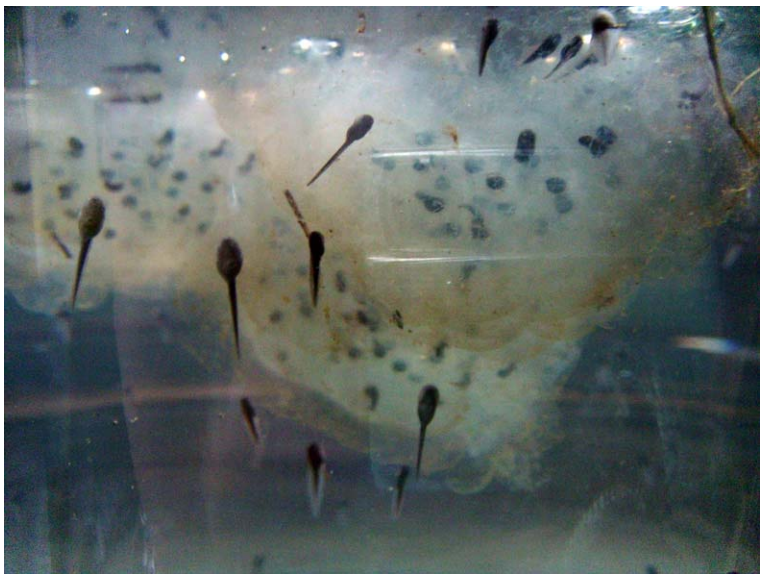
With the retrocession of land, at the edge of the forest structures, dams and hydraulic structures appeared, significant areas were cleared, fact which determined the arrangement of water surfaces to change. Of the existing ponds in the forest only two remain, and they have a small volume. Tourists passing through leave traces in the form of more or less degradable debris (bottles, plastic bags, food scraps) (Fig. 2 a, b)

Figure 2: Residues from tourists at the edge of the forest.

Spawns collected in 2010 were fewer and consist of a smaller number of eggs (about 200) (Fig. 3a, b).

Figure 3: Birnova forest, ponds for collection of *Rana temporaria temporaria* pontes, 2010.

Regarding fecundity, it develops normally, hatching takes place on time and larval development has all the stages of the tables of Taylor and Kollross. I have not observed individuals that are born malformed or for which the metamorphosis is extended or stops at some stages (Fig. 4 a, b).



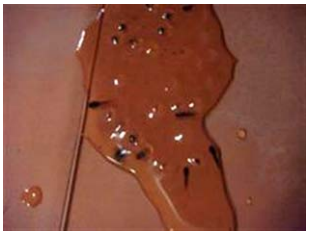


Figure 4: *A) Rana temporaria temporaria* spawn and B) leftover ponte after hatching.

After observing their development the larvae were released in the ponds from which they had been collected, in order to try to maintain the number of animals.

CONCLUSION

Human activity sometimes irreversibly alters the habitat of many species of animals. This is also the case in the Birnova forest area, Iasi, Romania, where in the

recent years we have observed fewer places for egg laying and a smaller number and volume of spawn of the species *Rana temporaria temporaria.*

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Original research article
Received: 25 July 2010.