

Male *Rana temporaria* in amplexus with a clutch

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Abstract. A male *Rana temporaria* was observed in amplexus with a clutch for at least seven hours in April 2007, at a pond complex near Miercurea-Ciuc, Eastern Carpathians, Romania. This behavior is similar to the clutch-piracy described recently in a Pyrenean population of this species, and predicted to be widespread. This is the first record of this behavior outside the Pyrenees. Further studies are needed on the extent of this behavior in Romanian *R. temporaria* populations.

Key words: *Rana temporaria*, amplexus, clutch

Rana temporaria is an explosive breeder (Wells 1977) and the operational sex ratio of this species is often strongly male-biased (Elmberg 1990). Therefore the evolution of male strategies is expected that increase their breeding success. Multiple paternity of a single brood was found by Laurila & Seppa (1998), and post-mating clutch piracy has been described in a Pyrenean *R. temporaria* population as the first case of this behavior recorded in vertebrates (Vieites et al. 2004). Males in the studied population were actively searching for freshly laid clutches and fertilizing them. Up to 84% of the clutches were fertilized by 1-16 males in this way. Males spent 35-387 seconds fertilizing a clutch.

In 2007, we studied the breeding of *R. temporaria* and *R. arvalis* near Delnița-Ciuc (fig.1) in a set of 29

potential breeding habitats, most of them temporary ponds with a tussocky sedge vegetation, with an area of 500-2000 m² and a maximum depth of 30-100 cm. The population is estimated at 2200 adult *R. temporaria* and 2600 adult *R. arvalis* (Demeter & Benkő in press). The breeding of *R. temporaria* was observed between March 22nd and April 11th, and peaked between March 27th and April 3rd.

On April 5th at 13:50 a male was observed clasping a clutch near the edge of a pond (fig.2a), in a water depth of 10 cm, three other clutches were observed in close proximity. At 20:40, the male was observed in the same position together with five males that hid away at the disturbance (fig.2b). The male in amplexus with the clutch did not desert it even when touched with the hand, only sinking slightly, as males in normal amplexus

do. Based on the position, body size and the lack of body pattern we assume that it was the same individual. The next visit to the site was made on April 9th when two males were observed near the clutches but none were seen displaying a similar behavior.

Only very few *R. temporaria* clutches were deposited in this habitat, 16 counted on April 5th and 41 on April 17th, as opposed to 275 *R. arvalis* clutches. A similar dominance of *R. arvalis* in this pond was observed in 2005 (Demeter & Mara 2006, Demeter & Mara unpublished data). In most of the studied ponds where reproduction took place the ratio between the clutch numbers of the two species was balanced.

This observation is similar to the clutch piracy behavior described by Vieites et al. (2004), but in our case the time spent at the clutch was much longer : at least seven hours vs. a maximum of six minutes in the cited study. Normal amplexus can last from hours to days, until the clutch is deposited by the female (Vieites et al. 2004).

Based on paternity analysis and other genetic studies (Laurila & Seppa 1998), Vieites et al. (2004) suggested that clutch piracy could be frequent throughout the distribution area of *R. temporaria*. Our observation may be interpreted as an example of clutch piracy but further studies are needed on the presence of this behavior in Romania.

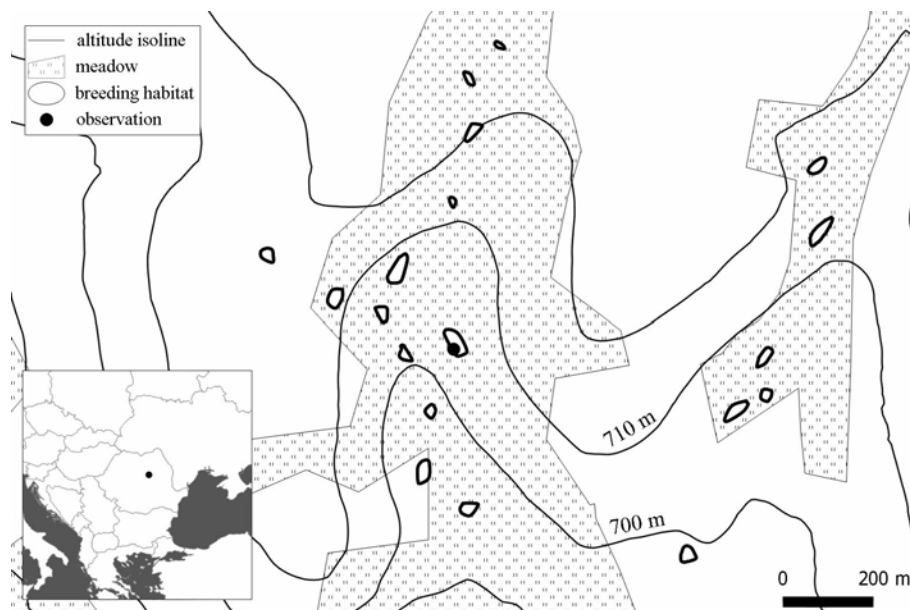


Figure no.1 Location of the observation.



Figure no.2. Male *Rana temporaria* in amplexus with a clutch.
(*a*: photo made on April 5 2007, 13:55; *b*: photo made on April 5 2007, 20:41.)

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