

Overwintering of brown frog tadpoles in suburban Vienna: comments on PINTAR (2000) (Anura: Ranidae)

Überwinterung von Braunfrosch-Kaulquappen am Stadtrand von Wien:
Anmerkungen zu PINTAR (2000)
(Anura: Ranidae)

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KURZFASSUNG

PINTAR (2000) berichtete über die Überwinterung von *Rana temporaria* LINNAEUS, 1758 Larven in einem von Quellwasser durchflossenen Tümpel am westlichen Stadtrand von Wien. Wir bestätigen diese Beobachtung, identifizieren die Kaulquappen jedoch als *Rana dalmatina* BONAPARTE, 1840. Unkontrolliertes Fangen und Freilassen der Kaulquappen durch Menschen könnte dieses Vorkommen beeinflussen haben.

ABSTRACT

PINTAR (2000) reported overwintering in larvae of *Rana temporaria* LINNAEUS, 1758 in a spring-fed pool at the western outskirts of Vienna. We provide independent confirmation of this observation, but identify the tadpoles as *Rana dalmatina* BONAPARTE, 1840. Haphazard capture and release by humans may have influenced the tadpole population at this site.

KEY WORDS

Amphibia, Anura, Ranidae; *Rana dalmatina*, *Rana temporaria*, tadpoles, overwintering, ecology, life history; Vienna, Austria

INTRODUCTION

PINTAR (2000) reported overwintering of *Rana temporaria* LINNAEUS, 1758 larvae in a spring-water fed pool at the western outskirts of Vienna. We independently observed these tadpoles, though less regularly than PINTAR. Most of our findings confirm the facts presented by PINTAR, but we disagree on the species identification.

Here, we document our observations

on frog spawn and tadpoles at this pool, which is close to a site where we have been studying embryonic and larval development of syntopic *Rana dalmatina* BONAPARTE, 1840 and *R. temporaria* since 1995 (BAUMGARTNER et al. 1996, 1997; GOLLMANN et al. 1999; unpubl. data), and discuss a potential scenario of overwintering of these tadpoles.

MATERIALS AND METHODS

The spring-water fed pool on "Salzwiese" meadow has been described in detail by PINTAR (2000). We visited this site occasionally during the past years; since 1997 we counted brown frog clutches at the end of the spawning period. After observing

tadpoles in the pool in January 1998 we caught tadpoles on 22 February 1998, to photograph them and to measure body length and total length with plastic calipers; tadpoles were released into the pool immediately after measuring.

Table 1: Records of frog spawn clumps at the study site.
Tab. 1: Beobachtungen von Froschlaichballen im untersuchten Tümpel..

Date / Datum	Frog spawn clumps observed / Beobachtete Froschlaichballen
24 April 1997	ca. 15 <i>R. dalmatina</i>
24 April 1998	Remnants of 5 <i>R. dalmatina</i> clutches / Reste von 5 <i>R. dalmatina</i> Gelegen
6 April 1999	ca. 20 <i>R. dalmatina</i> ; 2 <i>R. temporaria</i>
26 March 2000	9 <i>R. dalmatina</i> ; 2 <i>R. temporaria</i>

RESULTS

Brown frogs spawned regularly in the pool (table 1). *Rana dalmatina* was the dominant species in all years of observation, but at least in 1999 and 2000 a few *R. temporaria* clutches were also laid at this site. On 24 April 1998, recently hatched tadpoles of *R. dalmatina* were also found.

Several tadpoles and an adult male *R. temporaria* were observed in the pool on 18 and 27 January 1998. On 22 February 1998, we measured 10°C water temperature. Eleven tadpoles were collected and measured (table 2) and - according to their gross morphological features - determined

as *R. dalmatina*; some had damaged tail tips (fig. 1).

On 31 October 1999, *Rana* tadpoles immediately before metamorphosis as well as others with rather short hindlegs were seen. On 14 January 2001, no tadpoles were found, but several fishes were present in the pool (one *Carassius* sp. of ca. 12 cm total length and at least two smaller individuals of another taxon); the filamentous algae that had covered much of the water body in the previous winter were greatly reduced, *Chara* sp. were restricted to the uppermost quarter of the pool, while a large part of its bottom was bare.

DISCUSSION

Our results confirm PINTAR's (2000) report of overwintering tadpoles; the differences in observed numbers and sizes of tadpoles lie within the variation expected for data collection under field conditions. Determination of brown frogs is notoriously difficult in several stages of develop-

ment; tadpole characters such as pigmentation patterns and size of the tail fin show both intraspecific variation and phenotypic plasticity.

Nevertheless, the rather high tail fins with large dark spots visible on the photograph (fig. 1) appear sufficiently convincing

Table 2: Body length, total length and developmental stage of 11 larvae of *R. dalmatina* on 22 February 1998.
Tab. 2: Körperlänge, Gesamtlänge und Entwicklungsstadium von 11 *R. dalmatina* Larven am 22. Februar 1998.

Body length / Körperlänge (mm)	Total length / Gesamtlänge (mm)	Stage / Stadium (GOSNER 1960)
13	32	40
13	42	40
14	33	37
13	42	40
12	42	40
11	32	38
13	31	40
11	36	38
11	41	40
12	42	41
11	40	40

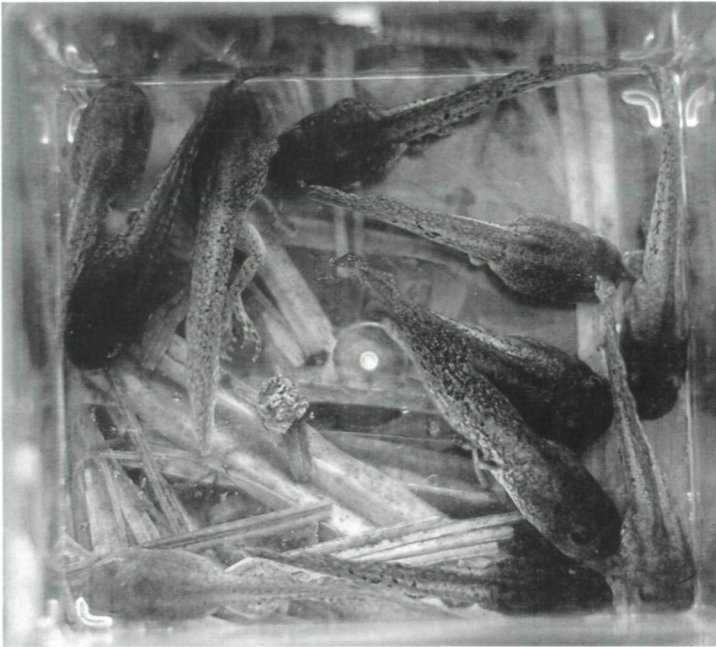


Fig. 1: Tadpoles of *Rana dalmatina*; Salzwiese, Vienna, 22 February 1998. Photograph: C. BAUMGARTNER.

Abb. 1: Springfroschlarven; Salzwiese, Wien, 22. Februar 1998. Photo: C. BAUMGARTNER.

to uphold the species determination *R. dalmatina* noted in the field. PINTAR (2000) did not mention any reasons for assigning the tadpoles to *R. temporaria*.

To the best of our knowledge, overwintering of *R. dalmatina* larvae has not been reported so far (GÜNTHER et al. 1996). Mainly *R. dalmatina* had been spawning at this pool, and this species shows slower embryonic and larval development than *R. temporaria*, particularly under cold conditions (RIIS 1991; BAUMGARTNER et al. 1996). These facts also make it plausible that tadpoles present at this site in winter 1997/98 were *R. dalmatina*.

Although we cannot exclude the possibility of late spawning surmised by PINTAR (2000), we want to mention another possible reason for retarded development,

namely haphazard manipulation of tadpoles by humans. The pool is close to a housing estate, in view of a much used footpath, and children with nets and buckets hunting for tadpoles or fish are often seen at pools and streams in the neighbourhood in spring and summer. Perhaps the tadpoles found in winter 1997/98 and in October 1999 had spent part of their lives in captivity under conditions unfavourable to growth, before being released into the pool. The recent introduction of fish into the pool underscores the likelihood of human interference. To control for possible introductions, we suggest that growth and development of tadpoles should be monitored in at least bi-weekly intervals after hatching for the documentation of overwintering.

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