

## Frog vs. lizard: an unusual feeding behavior in the Levantine Marsh Frog, *Pelophylax bedriagae* from Cyprus

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*Pelophylax bedriagae* is one of the species that emerged from the deconstruction of the *Rana ridibunda* "umbrella" that masked for decades eastern Mediterranean water frogs (Mertens & Wermuth 1960). The water frogs of Cyprus followed the taxonomic destiny of their adjacent mainland peers that were previously classified as *R. levantina* (Schneider et al. 1992, Böhme & Wiedl 1994) and later as *P. bedriagae* (Frost et al. 2006, Lymberakis et al. 2007). Recently the Cypriot populations were distinguished from the other eastern Mediterranean lineages, and the new endemic species *P. cypriensis* was described (Plötner et al. 2012), although its status is debated (Poulakakis et al. 2013).

*Pelophylax bedriagae* distribution expands from Egypt to western Turkey (where its populations seems to decline, Baskale & Kaya 2012), including the Levant and the eastern Greek islands; it has been introduced to Malta and Belgium (Sciberras & Schembri 2006, Holsbeek et al. 2008, Papenfuss et al. 2009). It is the only water frog inhabiting Cyprus where it can be found in most types of water bodies (Göçmen et al. 2008). *Rana* and *Pelophylax* frogs of the broader region (Balkans and Middle East) are considered generalist predators that feed on a wide variety of arthropods, where insects (namely Coleoptera, Diptera, Hymenoptera, Heteroptera and Orthoptera) and other invertebrates (Araneae, Chilopoda and Gastropoda) represent the main prey groups (Cogălniceanu et al. 2000, Çiçek & Mermer 2006, 2007, Sas et al. 2009, Çiçek 2011). Occasionally vertebrate prey items, such as salamanders, frogs, fish and even small mammals have been reported (Tyler 1958, Ruchin & Ryzhov 2002, Covaciu-Marcov et al. 2005, Çiçek & Mermer 2006).

The Cyprus populations of *P. bedriagae* have adopted the general feeding pattern of the species (Atatür & Göçmen 2001, Cicort-Lucaciu et al. 2013)

according to which adult frogs prey mainly on terrestrial and aquatic invertebrates with Hymenoptera, Coleoptera, Diptera and Araneae being the most abundant (Farquhar & Downie 1999). They have also been observed enhancing their diet with the introduced Mosquito Fish (*Gambusia holbrooki*, Baier et al. 2009). In an extraordinary case an adult individual choked to death trying to consume a bird nestling that was over half of its size (Baier et al. 2009).

An unusual incident of predation on a lizard was recorded and photographed on 17 July 2012, at 02:00 pm. While electrofishing for a fish survey in the Maroulena stream tributary of the Serrachis River (35° 0'34.43"N, 33° 9'0.52"E), we captured an adult male frog that held in its mouth a live Troodos Lizard (*Phoenicolacerta troodica*, Fig. 1). Apparently the frog had caught the lizard earlier and was totally submerged on the stream bottom. We immediately released the frog and the lizard on the water surface and observed the following previously unrecorded behaviour; the lizard started to thrash vigorously to escape, but the frog continued to grasp it firmly and after a while submerged once more, without relaxing its jaws.

The consumption of vertebrate prey of aquatic origin, such as other amphibians or fish, is not a rarity among Palearctic water frogs, as mentioned above. However, we presume the predation on highly cursorial strictly terrestrial vertebrates, like lacertid lizards, is a rare event. Though other frog genera, like the genus *Ceratophrys*, are notorious for preying on vertebrates, including lizards (Duellman & Lizana 1994, Chávez et al. 2011), this feeding behaviour represents a deviation from the typical foraging repertoire of *Pelophylax* and *Rana* species. *Phoenicolacerta troodica* is a swift runner and a skilful climber (Clark 1973), and thus it is unlikely that the frog captured it on land. A possible explanation is that the lizard fell into the wa-



**Figure 1.** An adult male *Pelophylax bedriagae* holds in his jaws a live *Phoenicolacerta troodica*, which is thrashing, trying to escape (Maroulena stream, central Cyprus).

ter, and this event set up an unexpected encounter between the two animals, permitting the frog to take advantage of that chance. Troodos lizards are frequent at wetlands and dams reservoirs (Göçmen et al. 1996) and may even swim when they fall into the water (Baier et al. 2009). This is the first documented case of predation on a lizard by *P. bedriagae*, and, to the best of our knowledge, it has not been reported within the genus *Pelophylax* before.

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