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## A new case of predation on *Bufo spinosus* by a carabid larva

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**Key words:** *Epomis*, Iberian Peninsula, predation, role reversal, toad.

**RESUMEN:** Se describe un nuevo caso de depredación de larvas del género *Epomis* sobre *Bufo spinosus*. Este tipo de interacción fue observada por primera vez entre *Epomis circumscriptus* y un adulto de *Bufo spinosus* en la cuenca del río Daró (Girona, nordeste de España) en 2017. En esta nota se confirma que este comportamiento de las larvas de *Epomis* no es un hecho único y aislado.

Predation of amphibians by larvae of carabids is an interesting predatory behavior recently described (Wizen & Gasith, 2011). Since the first description in 2011 there have been some additional observations that indicate that the phenomenon is not exceptional and is worldwide wide-

pread (Escoriza *et al.*, 2017; Scholtz & Ralston, 2017; Kulkarni *et al.*, 2020). In this note we reported a new case of predation of a carabid larva on a postmetamorphic *Bufo spinosus* Daudin, 1803. This observation was conducted at June 2015 in Tarazona (northern Spain; 41.96° N, -1.76° W). At this mo-



**Figure 1:** Metamorphic of *Bufo spinosus* parasitized by an *Epomis* larva (Tarazona, northeastern Spain).

**Figura 1:** Metamórfico de *Bufo spinosus* parasitado por una larva de *Epomis* (Tarazona, nordeste de España).

ment recently metamorphosed toads were massively dispersing from an artificial water reservoir.

Among dozens of non-predated specimens, we found a single metamorphic spe-

cimen of *Bufo spinosus* of 15 mm snouth-urostyle length with 5.2 mm carabid larva was attached (Figure 1). The carabid larva was feeding on the skin and as it can be seen in Figure 1, causing a deep wound in the gular region of the toad. The carabid larva was manually removed and preserved in alcohol for its posterior identification, confirming that this larva also belonged to the genus *Epomis* (Kirschenhofer, 2003). In the same area we found several adults of *Alytes obstetricans* (Laurenti, 1768), *Lissotriton helveticus* (Razoumovsky, 1789), and *Triturus marmoratus* (Latreille, 1800), but none of them showed an attached *Epomis* larva.

This observation adds an additional record of this little known “reversal role predatory behavior” (Wizen & Gasith, 2011) of carabid larvae, being the first description of predation on recently metamorphosed *Bufo spinosus*. The increasing number of observations of this behavior suggests that it could be relatively widespread, but that it had gone unnoticed until recently. Future research has to determine if these carabid larvae selectively prey on *Bufo spinosus* and do not attack other amphibians or is simply an opportunistic effect, caused by the greater abundance of this species of toad.

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