

## First record of *Epomis circumscriptus* (Duftschmid, 1812) (Carabidae: Chlaeniini) from the eastern Dead Sea area, Jordan

ZOHAR YANAI<sup>1</sup>, NOA TRUSKANOV<sup>1</sup>, AVITAL GASITH<sup>1</sup> & GIL WIZEN<sup>1,2\*</sup>

<sup>1</sup>Tel Aviv University, George S. Wise Faculty of Life Sciences, Department of Zoology,  
Tel Aviv, 6997801 Israel

<sup>2</sup>Faculty of Forestry, University of Toronto, Toronto, ON M5S 3B3 Canada

\*Corresponding author: wizenrop@gmail.com

### ABSTRACT

*Epomis circumscriptus* (Duftschmid, 1812) attacking the Middle East tree frog is recorded from Moab, Jordan (eastern Dead Sea area) for the first time. This new record expands the known range of this species in the Middle East.

KEYWORDS: Carabidae, *Epomis*, ground beetles, Dead Sea, new record, Hylidae, anuran, predation.

### INTRODUCTION

The genus *Epomis* Bonelli, 1810 (Carabidae: Chlaeniini) contains about 20 species, distributed mainly in the Afrotropical and Oriental regions (Kryzhanovskij 1983). Five species are known from the Palearctic Region (Kirschenhofer 2003), two occur in Europe. *Epomis dejeani* Dejean et Boisduval, 1830 is recorded in south-eastern Europe (Kirschenhofer 2003), while *Epomis circumscriptus* (Duftschmid, 1812) is widely distributed throughout southern Europe from Portugal in the west to as far as Ukraine and Turkey in the east, and also extends eastward into central-west Asia and southward to North Africa (Kirschenhofer 2003). The Palearctic catalogue of Coleoptera (Löbl and Smetana 2003) does not list *Epomis* as occurring in the Middle East, even though *E. dejeani* appears on the checklist of ground beetles of Israel compiled by Bodenheimer (1937). The two species were recently reported mainly from the northern and central parts of Israel, nevertheless their distribution range also extends southward to the Central Negev region and Arava Valley (Elron *et al.* 2007; Wizen and Gasith 2011a; Wizen *et al.* 2012). So far neither of the species was recorded east of the Dead Sea Valley. Recently the senior and second authors found *E. circumscriptus* in the eastern Dead Sea area, a new record in Jordan that expands the known distribution range of *E. circumscriptus* in the Middle East.

### OBSERVATIONS AND CONCLUSIONS

Wadi Hassa is located in Moab Mountains, east Dead Sea Area, Kingdom of Jordan (30°59'44.22"N 35°37'11.51"E). It is a perennial stream that flows westward

to the Dead Sea, upon sandstone and limestone. In this arid area (100–250 mm annual rainfall) the stream corridor forms an oasis that sustains diverse fauna and flora in cool, moist habitats (Ravek and Shmida 2000). The stream is characterized by clear water dominated by riffle habitat (Fig. 1). The riparian vegetation is dominated by oleander (*Nerium oleander* L., Apocynaceae), and to a smaller extent tamarisk (*Tamarix* sp., Tamaricaceae), date palm (*Phoenix dactylifera* L., Arecaceae), giant reed (*Arundo donax* L., Poaceae) and maidenhair fern (*Adiantum capillus-veneris* L., Pteridaceae).

In May 2014, while visiting Wadi Hassa, the senior and second authors observed a specimen of the Middle East tree frog (*Hyla savignyi* Audoin, Hylidae) carrying a larva of *E. circumscriptus*. The *H. savignyi* specimen caught attention by somewhat unusual behavior on the ground close to the water. Upon close inspection, a medium-sized carabid larva was detected attached to the amphibian's lower left jaw area. The stressed tree frog (perhaps also disturbed by the observers) tried to escape and climbed a nearby branch, where it was photographed (Fig. 2).

The larva was removed from the tree frog and photographed (Fig. 3), and was subsequently identified as a third-instar larva of *E. circumscriptus*.

Previous studies reported that adult *Epomis* beetles can occasionally prey on Amphibia (Wizen and Gasith 2011a), whereas their larvae feed exclusively on amphibians and display a unique luring behavior in order to attract their prey



Fig. 1: Wadi Hassa. Oleander bushes aside a running desert stream. (photo Z. Yanai)



**Fig. 2:** *E. circumscriptus* attached to *H. savignyi*. (photo Z. Yanai)



**Fig. 3:** *E. circumscriptus* third-instar larva, after detachment. (photo Z. Yanai)

(Elron *et al.* 2007; Wizen and Gasith 2011*b*). Moreover, larval mandible morphology correlates with this lifestyle, featuring two curved ‘hooks’, a modification for grasping onto the amphibian skin (Brandmayr *et al.* 2010; Wizen and Gasith 2011*b*). Because of their special food requirements, *Epomis* species are naturally found in the vicinity of water bodies where amphibians co-occur and breed (Brandmayr and Algieri 2000; Wizen *et al.* 2012).

Aside from extending the knowledge of *E. circumscriptus* distribution in the Middle East, the new record underscores the fact that *E. circumscriptus* inhabits oases in arid environments (a single adult was previously collected in the Negev Desert, Israel, by light traps; Chikatunov *et al.* 2006). This new finding motivates additional and more extensive study of this unique carabid beetle, questioning the regional co-occurrence with the second Middle Eastern species, *E. dejeani*, in arid areas.

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