

Horvath's rock lizard, *Iberolacerta horvathi* (Méhely, 1904), feeding on a scorpion in Slovenia

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Lacertids lizards can consume almost all orders of Arthropoda, some Gastropoda and even several small vertebrates or plant material (Arnold, 1987; Van Damme, 1999; Carretero, 2004). However, the general diet of small mainland lacertids is mostly restricted to arthropods belonging to the groups Insecta and Arachnida (Arnold, 1987; Arnold and Ovenden, 2002). Prey consumption by lacertids depends on different factors such as prey availability (Arnold, 1987; Capula and Luiselli, 1994), season (Diaz and Carrascal, 1993), size of the lizard (adults are able to consume larger prey than juveniles, Carretero, 2004), sex (larger-headed males may consume larger prey compared to females, Herrel, 1999), predation risk (Hawlena and Pérez-Mellado, 2009) and species (Vervaijen, Van Damme and Herrel, 2002; Carretero, 2004).

The species of the genus *Iberolacerta* are local endemics confined to small isolated areas in southern Europe, where they inhabit exposed rock surfaces with very sparse vegetation in woody areas as well as rocks above the forest line (Arnold, 1987). *Iberolacerta horvathi* (Méhely, 1904) is endemic to mountainous areas of southern Austria, north-eastern Italy, north- and south-western Slovenia, and western Croatia (Tiedemann, 1997). The diet of *I. horvathi* has been characterized as insectivorous and largely consists of insects (Collembola, Plecoptera, Orthoptera, Hemiptera, Neuroptera, Coleoptera, Hymenoptera, Diptera, Lepidoptera) and to a lesser degree of Aranea, Opiliones, Myriapoda and Isopoda (Arnold, 1987; De Luca, 1992; Richard and Lapini, 1993). Predation of scorpions (Scorpiones) by *I. horvathi* has only been

reported once, by means of a single remnant in the stomach content of an individual among a sample of 31 lizards from Italy (Richard and Lapini, 1993).

In Slovenia, four scorpion species have so far been reported, all belonging to the genus *Euscorpis* (Euscorpidae) (Scherabon et al., 2000; Fet, Kuntner and Sket, 2001). The distribution of these species in Slovenia is mainly defined by climatic features, the most common in the country being *E. gamma* Caporiacco, 1950 (Fet, Kuntner and Sket, 2001). This scorpion occupies mountainous areas with high humidity where it can be found under stones, bark and logs, mostly in forests of various types (Fet, Kuntner and Sket, 2001). *Euscorpis gamma* has been reported from Austria, Croatia, Italy and Slovenia (Scherabon et al., 2000), which corresponds largely with the distribution of *I. horvathi*. Here, we report on the rare case of *I. horvathi* preying on a scorpion (first time for Slovenia) and describe the behaviour of a lacertid preying upon this unusually large and dangerous prey item.

Field observations were made on 4th May 2008, in a mixed forest near Podblica on the Jelovica plateau, north-western Slovenia (46.2572°N, 14.1973°E). At approximately 10:40 am the second author observed and photographed an adult male *I. horvathi* preying on a female of *E. gamma* (Fig. 1) at a rocky clearing on the side of a road. The lizard was first observed holding the already dead scorpion by the cephalothorax and first part of mesosoma, while moving with the prey in its jaws and chewing it. Afterwards, the lizard moved with the scorpion inside a rock crevice to appear after few seconds on the other side, holding the scorpion by the middle part of the first left leg. Subsequently, the lizard found a resting position on a rock with the scorpions' leg in its jaws, while the rest of the scorpions' body laid on the rock below the head of the lizard (Fig. 1C). After a period of apparent basking up to three minutes, clouds covered the sun, after which the lizard retreated in the rock crevice together with its prey and did not come out again.

Adult lacertids are capable to eat larger and potentially dangerous prey items such as scorpions and at least South

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Figure 1. Adult male Horvath's Rock lizard, *Iberolacerta horvathi*, (A and B) holding the female scorpion, *Euscorpis gamma*, in the area of cephalothorax and first part of mesosoma, (C) holding the scorpion on the pincer and (D) holding the scorpion on the pincer and moving to the crevice. Photos: Tomi Trilar.

African species (*Nucras intertexta* and *N. tessellata*; Branch, 1998) are said to consume substantial amounts of such prey types. However, scorpions represent only a minor part of the diet of European lacertids (Richard and Lapini, 1993; Carretero, 2004) apart from several insular populations (Castilla, Herrel and Gosa, 2008). As scorpions are more difficult to handle due to their defensive behaviour when attacked, they represent one of the most difficult prey items to be subdued by a small lacertid lizard. Behavioural experiments which compared the responses of two closely related species of *Podarcis* (originating from the Spanish mainland and a dry volcanic island) when exposed to scorpions showed tendency of mainland lizards to flee or ignore the potential prey item (Castilla, Herrel and Gosa, 2008). However, insular lizards did consider scorpions as potential prey and significantly predated on these while facing the risk of been predated themselves (Castilla, Herrel and Gosa, 2009). In our case, *I. horvathi* inhabits a mainland area where the density of *E. gamma* is low (pers. observation) and consequently, encounter rates

between *I. horvathi* and scorpions are expected to be low. In turn, abundance of other more common lacertid prey is high (unpublished results) and, thus, it is reasonable to assume that lizards would avoid a relatively large and potentially dangerous food item.

Feeding behaviour on natural prey items is rarely observed in lacertids due to the need of intensive fieldwork, and specific data for *I. horvathi* are largely lacking. In other lizard species, the foraging repertoire when attacking scorpions often included vigorous shaking of the prey clutched in the jaws, and the throwing of prey from the mouth (O'Connell and Formanowicz, 1998). In our case, chewing of an already dead scorpion was observed but we have no evidence the lizard killed the scorpion and scavenging cannot be ruled out. Whatever the case, this feeding behaviour provides another interesting example of the adaptability of the foraging behaviour in lacertid lizards.

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