Dalmatolacerta oxycephala (Squamata: Lacertidae) eating a stink bug on the island of Cres, Croatia, along with other ecological notes

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INTRODUCTION

The distribution of *Dalmatolacerta oxycephala* (SCHLEGEL, 1839), the Sharp-snouted Rock Lizard, is restricted to the east Adriatic coastal area from southern Croatia through southern Bosnia**,** Herzegovina**,** and Montenegro to northern Albania (BISCHOFF, 1984; ŠUNJE et al., 2015; SPEYBROECK et al., 2016). In 2006, a population in Osor on the island of Cres was reported (TÓTH et al., 2006); the first observation was made by Tóth on 26 April 2005 as three individuals were photographed (Tóth pers. com.**,** 2016). This northwestern expansion, by approx. 200 km, has almost certainly been caused by an anthropogenic introduction. Currently the herpetofauna of the islands Cres and Lošinj and the adjacent islets are surveyed regularly (TÓTH et al., 2017).

OBSERVATIONS

On 14-15 August 2016 I visited the old town of Osor, situated on the southwestern coast of the island Cres in Croatia, to observe *Dalmatolacerta oxycephala*. This species was most commonly seen on the old walls of Osor. The lizards were active throughout the entire day and proved to be not particularly shy, even during the afternoon of 14 August which was hot with air temperatures of 30-31ºC. However, in these high temperatures the lizards were usually observed in shaded parts of the walls.

On 14 August at 13:25-13:30 one adult *D. oxycephala* was observed eating an insect on the town square of Osor (coordinates 44° 41'37" N, 14° 23'34" E, altitude 3 m above sea level). But after a few seconds the lizard ran into a small crevice in the shade. From there I could see that the lizard chewed and swallowed the insect, but I was unable to photograph the final part of ingestion. The photo shows that the insect was an imago of a green species of stink bug (or shield bug) of the family Pentatomidae (Hemiptera). Unfortunately, it proved impossible to identify it to species or genus level (det. Aukema, pers. com.**,** 2016, Damgaard pers. com.**,** 2016). According to ALDRICH (1988) stink bugs of Pentatomidae have highly developed dorsal abdominal scent glands and metathoracic scent glands. One important function of the scent glands is to serve as a defense against predators such as lizards. Thus, it is noteworthy that *D. oxycephala* was recorded eating a stink bug. These feeding habits may not be unusual for *D. oxycephala*.

DIET

HENLE (1985) investigated 15 faecal samples of *D. oxycephala* from Otok Katić near Buljarica in Montenegro. Remains of Coleoptera (beetles) were most common. Moreover Isopoda, Dermaptera, Hemiptera (in his paper called Rhynchota, which is an old name for

Adult *Dalmatolacerta oxycephala* eating a stink bug of the family Pentatomidae in the old town of Osor on 14 August 2016.

Photo: Henrik Bringsøe.

that order), Hymenoptera, Lepidoptera (larva) and Diptera were found. As to the true bugs, Hemiptera, it is mentioned that there were three pieces of bug, though only identified to order level. However, HENLE (1985) mentioned that most of the faecal mass proved unidentifiable. Summarizing the diet of *D. oxycephala* on the Croatian island Vis, GRBAC et al. (1998) reported that *D. oxycephala* mainly eats Coleoptera and to a lesser extent Hymenoptera, Araneae and Homoptera. Previously bugs of Homoptera (though not comprising Pentatomidae) were ranked as suborder of the order Hemiptera, nevertheless, it is not considered to be monophyletic (VON DOHLEN & MORAN, 1995).

An unusual prey item was observed by WIEDEMANN (1909) who saw a *D. oxycephala* with a scorpion in its mouth as it was running into a rock crevice. The scorpion was described as “medium-sized”, but no further details were provided. I find it likely that it belonged to the genus *Euscorpius,* which comprises comparatively small and fairly harmless scorpions as they are the most common species within the geographical range of *D. oxycephala* (KALTSAS et al., 2008). An even more peculiar case was reported by ZIMIĆ & JELIĆ (2014) who observed a large centipede of the species *Scolopendra cingulata* attacking and killing an adult *D. oxycephala*. The authors speculated that either the centipede had directly attacked the lizard or the lizard had unsuccessfully attacked the centipede. Nevertheless, it is assumed that the lizard had underestimated the power of the centipede.

A picture emerges of *D. oxycephala* eating a wide variety of invertebrates, even some which are often avoided by small and medium-sized lacertids (centipedes, scorpions and bugs). Fruit is also eaten, e.g., RICHTER & RICHTER (1991) observed *D. oxycephala* eating overripe grapes in a monastery garden on the island Mljet in southern Croatia.

OTHER OBSERVATIONS

During my search I found *D. oxycephala* to be common throughout Osor. I saw roughly 25-30 individuals. Apparently it is now well-established there. This contrasts with the

observations of SÄMANN & ZAUNER (2010) who saw only six or seven adults (plus some juveniles) on each of two observation days in May 2009 and June 2010 respectively.
I also searched for lizards on the natural rock formations just outside Osor, but only found *Podarcis melisellensis*. A narrow channel (8-11 m wide) separates Cres from the nearby island of Lošinj. As I investigated the wall towards the channel on the Lošinj side, I also only found *P. melisellensis*. My observations agree with SÄMANN & ZAUNER (2010) and ŠUNJE et al. (2015) who were also unsuccessful as they searched for *D. oxycephala* outside the old walls of Osor. Considering that the habitats of *D. oxycephala* generally consist of larger rock formations with deep crevices and man-made walls, often dry and lacking vegetation (BISCHOFF, 1984; HENLE, 1985; ŠUNJE et al., 2015), it is an open question whether this species will ever manage to spread from Osor into the surrounding natural habitats or to Lošinj.

According to BISCHOFF (1984) *D. oxycephala* is a very shy lizard. This statement contradicts my personal observations as I often went close to these lizards in Osor, despite the high air temperatures. In a number of cases (about 50% as a rough estimate) I could carefully move to a distance of approx. 80-100 cm in order to photograph them. Schweiger (pers. com., 2016) confirms that *D. oxycephala* is not at all shy at Osor and that the same trend is seen at the city wall of Kotor, and slightly less pronounced at the city wall of Dubrovnik (In den Bosch, pers. com., 2019), whereas the lizards are very shy in wild habitats away from humans. Apparently this species may readily get used to the presence of many people and exhibit minimal skittishness.
It is worth noting that the Sharp-snouted Rock Lizard itself also serves as prey for other organisms. E.g. on 14 August I photographed one semi-adult *Hierophis gemonensis* with a total length estimated to 60 cm in a wall inhabited by *D. oxycephala*. Some tongue-flicking was noticed and the snake was probably hunting *D. oxycephala* as prey. The location was approx. 50 m southwest of the town square of Osor (see above).

SUMMARY

During a visit to Osor on the island Cres, Croatia, in mid August 2016 I photographed one adult *Dalmatolacerta oxycephala* eating a stink bug of the (family Pentatomidae). Judging from the pertinent literature it is concluded that *D. oxycephala* eats a wide variety of invertebrates, including scorpions, beetles and possibly even centipedes. Ripe fruit is also eaten. *D. oxycephala* is comfortable with humans at Osor and in other habitats visited frequently by people, whereas it proves very shy in other habitats. At Osor one *Hierophis gemonensis* was apparently hunting *D. oxycephala* in a wall.

SAMENVATTING

Tijdens een bezoek in augustus 2016 aan de stad Osor op het eiland Cres (Kroatië) fotografeerde ik een volwassen *Dalmatolacerta oxycephala* die een stinkwants at uit de familie Pentatomidae. De literatuur over *D. oxycephala* geeft aan dat de soort allerlei voedsel tot zich neemt, vooral kleinere ongewervelden zoals schorpioenen, kevers, wantsachtigen en mogelijk zelfs grote duizendpoten. Ook rijp fruit staat op het menu. Op plekken waar regelmatig mensen komen, is deze hagedis weinig schuw; voelt zich daarentegen sneller verstoord op andere plaatsen. Te Osor bleek dat de soort waarschijnlijk ook zelf een prooi is want ik zag de slang *Hierophis gemonensis* achter deze hagedis aangaan in een muur.

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