Prey items taken by *Podarcis siculus hieroglyphicus* (BERTHOLD, 1842)

The Italian Wall Lizard, *Podarcis siculus* (RAFINESQUE-SCHMALTZ, 1810) ranges throughout Italy, France, Slovenia, Croatia and Bosnia-Herzegovina. In isolated, introduced populations, it also occurs in Spain, Portugal, Turkey, and Tunisia (ISAILOVIĆ et al. 2009). Type locality of the exclusively Turkish subspecies *Podarcis siculus hieroglyphicus* (BERTHOLD, 1842) is Istanbul. However, only a few studies report additional localities for the subspecies (BODENHEIMER 1944; BAŞOĞLU & BARAN 1977; ÇEVIK 1999). Recently, the distribution of the subspecies *hieroglyphicus* in the Bursa region was studied more thoroughly by UĞURTAŞ et al. (2000) and HÜR et al. (2008). During a field trip along the southern coast of the Marmara Sea, a new locality for *P. s. hieroglyphicus* was discovered when a subadult specimen was observed and photographed by MOLLOV (2009) on 27 August, 2007, in the vicinity of Güzelyalı, southwest of Mudanya City.

The composition of the prey in Italian Wall Lizards, *Podarcis siculus* (RAFINESQUE-SCHMALTZ, 1810), inhabiting a coastal dune in Central Italy was studied by RUGERIO (1994). This study included an analysis of the fecal pellets of 31 lizards (24 males and 7 females) captured in February and March. The analysis showed that the numerical proportions of prey items were 8% Gastropoda, 9% Arachnida, 48% Isopoda, 23% Insecta, and 12% others. In all, 90% of the prey items were flightless. MELLADO & CORTI (1993) examined the food habits of *P. siculus* inhabiting the western Mediterranean (the islands of the Tuscan Archipelago and Menorca). The samples of lizards from the first location showed that about 75 % of the diet included Isopoda, insect larvae, Amphipoda, Diptera and Dermaptera. The sample from the second location revealed a diet including chiefly Isopoda, Areneae and Amphipoda. In 1966, a study on the feeding biology of *P. siculus* introduced to Long Island, New York, USA, identified 436 prey items in 96 lizards (BURKE et al. 2002). The study showed that the diet included 43.3% Homoptera, 17% Coleoptera and 12.6% Isopoda. Other preys were consumed at rates of 3% and less. A case report of cannibalistic behavior in the Italian Wall Lizard *P. siculus campestris* DE BETTA, 1857 includes a photograph of an adult male Italian Wall Lizard preying on a young conspecific (GRANO et al. 2011).

The purpose of this study was to add information about the food habits of *P. s. hieroglyphicus* as sporadically acquired from individuals of different size and sex at different seasons, from a location in northwestern Turkey through analysis of stomach contents. The specimens used in this study (19 males and 6 females) were collected between April and October 2010 at Dikkaldırım, in the vicinity of the city of Bursa (Turkey). These samples were collected from 08:00 h to 11:00 h based on the assumption that the lizards feed regularly during this period and the food ingested in the morning is not yet in an advanced stage of digestion. The lizards collected were anesthetized with ether in glass containers, labeled, and frozen at -20 °C. The prey items obtained from each specimen by dissection were stored in 10 cc bottles containing 70% ethanol.

Based on the number of prey items, the maximum quantity of food per individual was eaten in May and August. The number and taxonomic category of the prey items is shown for each lizard specimen, along with the date of capture (Table 1).

The digestive tract contents of *P. s. hieroglyphicus*, with regard to the number of food items, the number of lizard stomachs containing different types of prey and the percentages of lizard containing particular prey types are shown in Table 2. Many insect prey fragments were found in the guts of the dissected specimens. However, most of these prey items were digested to such an extent that they could not reliably be classified at order level. These items were added to the category ‘unidentified insect material’.

In total, 141 prey items (115, if the unidentified fragments are not considered) were found in 25 lizard digestive tracts, accounting for an average of 5.6 (4.6) animals of prey per lizard. The numerical preferences for certain prey taxonomic groups based on 25 lizard specimens and 141 prey

Table 1: Number of prey items according to taxonomic category as found in 25 adult individuals of *Podarcis siculus hieroglyphicus* (BERTHOLD, 1842) collected from April until October, at Dikkaldırım near Bursa (Turkey). M - male, F - female.

ID	Collection number	Sex	Month in 2010	Arachnida	(Insecta total)	Pieces of undetermined insects	Orthoptera	Blattodea	Heteroptera	Hemiptera	Coleoptera varia	*Carabus* sp.	Hymenoptera varia	*Formica* sp.	Collembola	Lepidoptera	Neuroptera Myrmeleontidae	*Oniscus* (Malacostraca, Isopoda)	Gastropoda
1	1095	M	April		(2)								1	1					
2	1096	F	April		(4)	3							1						
3	1097	M	April		(13)								12	1					1
4	1098	F	April		(1)								1						
5	1099	M	April		(3)										3				
6	1100	M	April															1	
7	1101	F	May	1	(11)		1				10								
8	1102	M	May																
9	1103	M	May		(9)	5					3		1						
10	1116	M	May	1	(4)			1		1	2								
11	1117	F	June		(1)	1													
12	1118	M	June		(5)	2					2					1		3	
13	1119	M	June		(5)	5													
14	1120	M	July															2	
15	1121	M	August		(5)	3							2					1	
16	1122	M	August	8	(3)						1	1		1					
17	1123	M	September															5	
18	1124	M	September	1	(7)					1			4	2					
19	1125	M	September		(26)						24			1			1		
20	1126	M	September		(1)				1									1	
21	1127	M	October		(3)	3													
22	1128	F	October															1	
23	1129	F	October		(7)	3					2		2						
24	1130	M	October		(1)	1													
25	1131	M	October		(4)				2		2								
Σ				11	(115)	26	1	1	3	2	46	1	24	6	3	1	1	14	1

Table 2: Composition of the digestive tract contents of 25 adult *Podarcis siculus hieroglyphicus* (BERTHOLD, 1842) collected from April until October at Dikkaldırım near Bursa (Turkey).

Prey taxon	Number of food items	Number of lizards containing this prey type	Proportion of lizards (%) containing this prey type
Arachnida (Arthropoda)	11	4	16.0
Pieces of unidentified insect material	26	9	36.0
Orthoptera	1	1	4.0
Blattodea	1	1	4.0
Heteroptera	3	2	8.0
Hemiptera	2	2	8.0
Coleoptera varia	46	8	32.0
Carabus sp.	1	1	4.0
Hymenoptera varia	24	8	32.0
Formica sp.	6	5	20.0
Collembola	3	1	4.0
Lepidoptera	1	1	4.0
Neuroptera Myrmeleontidae	1	1	4.0
Malacostraca (Arthropoda) Isopoda *Oniscus* sp.	14	7	28.0
Gastropoda (Mollusca)	1	1	4.0

items were the following: Unidentified insects were found in nine lizards (36%), Coleoptera and Hymenoptera (*Formica* excluded) in eight, each (32%), *Oniscus* sp. (Isopoda) in seven (28%), *Formica* sp. (Hymenoptera) in five (20%), Arachnida in four (16%), Heteroptera and Hemiptera in two, each (8%), Orthoptera, Blattodea, *Carabus* sp. (Coleoptera), Collembola, Lepidoptera, Myrmeleontidae and Gastropoda in a single lizard specimen, each (4%).

The lizards analyzed primarily consumed insects. Out of 141 prey items, 47 represented Coleoptera, 30 Hymenoptera, 26 undetermined insect parts, 13 seven other insect orders, all together forming 81% of the prey taxonomic spectrum, whereas Malacostraca (*Oniscus* sp.) contributed 10%, Arachnida 8%, and Gastropoda only 1% to the spectrum.

REFERENCES: BAŞOĞLU, M. & BARAN, İ. (1977): Türkiye sürüngenleri kisim. I. Kaplumbaga ve kertenkeleler.- Ege Üniversitesi fen Fakültesi – Kitaplar Serisi, Bornova-İzmir (İlker Matbaası); 76: I-VI, 1-272. [Turkish reptiles. Part I. Turtles and lizards]. BERTHOLD, A. (1842): Über verschiedene neue oder seltene Amphibienarten.- Abhandlungen der Gesellschaft der Wissenschaften zu Göttingen; Göttingen; 8: 48-72. BODENHEIMER, F. (1944): Introduction into the knowledge of the Amphibia and Reptilia of Turkey.- Revue de la Faculté des Sciences de l'Université d'Istanbul, Istanbul; (Sér. B Sciences Naturelles); 9 (1): 1-104. BURKE, L. R. & MERCURIO, R. J. (2002): Food habits of a New York population of Italian Wall Lizards, *Podarcis sicula* (Reptilia, Lacertidae).- The American Midland Naturalist, Notre Dame, Ind.; 147: 368-375. ÇEVIK, İ. E. (1999) Taxonomic status of the lizard species living in Turkish Thrace (Lacertilia: Anguidae, Lacertidae, Scincidae).- Turkish Journal of Zoology, Ankara; 23: 23-35. [In Turkish with English summary]. GRANO, M. & CATTANEO, C. & CATTENEO, A. (2011): A case of cannibalism in *Podarcis siculus campestris* DE BETTA, 1857 (Reptilia, Lacertidae).- Biodiversity Journal, Palermo; 2 (3): 151-152. [web publication at < http://wwwbiodiversityjournal.com >]. HÜR, H. & UĞURTAŞ, İ. H. & İŞBILIR, A. (2008): The amphibian and reptile species of Kazdağı National Park.- Turkish Journal of Zoology, Ankara; 32: 359-362. ISAILOVIĆ, J. C. & VOGRIN, M. & CORTI, C. & MELLADO, V. P. & SÁ SOUSA, P. V. CHEYLAN, M. & PLEGUEZUELOS, J. & SINDACO, R. & ROMANO, A. & AVÇI, A (2009): *Podarcis siculus*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.1. [web document at < www.iucnredlist.org >, downloaded on 15 March 2012]. MELLADO, V. P. & CORTI, C. (1993): Dietary adaptations and herbivory in lacertid lizards of the genus *Podarcis* from western Mediterranean islands (Reptilia: Sauria).- Bonner Zoologische Beiträge, Bonn; 193-220. MOLLOV, I. (2009): A new locality of the Italian Wall Lizard *Podarcis siculus* (RAFINESQUE-SCHMALTZ, 1810) from Turkey.- ZooNotes, Plovdiv; 6: 1-3. [web publication at http://nature.uni-plovdiv.bg/index.php?option=com_content&view=article&id=302&Itemid=146]. RUGIERO, L. (1994): Food habits of the Ruin Lizard, *Podarcis sicula* (RAFINESQUE-SCHMALTZ, 1810), from a coastal dune in Central Italy (Squamata: Sauria: Lacertidae).- Herpetezoa, Wien; 7 (1/2): 71-73. UĞURTAŞ, İ. H. & YILDIRIMHAN, H. S. & ÖZ, M. (2000): Two new localities for *Lacerta sicula hieroglyphica* BERTHOLD, 1842 (Reptilia, Lacertidae).- Turkish Journal of Zoology, Ankara; 24: 253-256.

KEYWORDS: Reptilia: Squamata: Sauria: Lacertidae: *Podarcis siculus hieroglyphicus*, prey, feeding ecology, Bursa, Turkey

SUBMITTED: April 16, 2012

AUTHORS: Reyhane Arslan (corresponding author, < reyhane@uludag.edu.tr >), Uludağ Universi - ty, Vocational School of Yenişehir İbrahim Orhan, 16900, Bursa, Turkey; İsmail H. Uğurtaş < hakki@ uludag.edu.tr >, F. Naci Altunel < altunel@uludag. edu.tr >, Uludağ University, Faculty of Arts and Sci- ence, Department of Biology, 16059, Bursa, Turkey