ZooNotes
www.zoonotes.bio.uni-plovdiv.bg
ISSN 1313-9916
2009 (1 – 6)

ZooNotes

Електронно списание за кратки научни статии и съобщения

Университетско издателство “Паисий Хилендарски”
Plovdiv University Press “Paisii Hilendarski”

www.zoonotes.bio.uni-plovdiv.bg
ISSN 1313-9916

ZooNotes

2009

Университетско издателство “Паисий Хилендарски”
Plovdiv University Press “Paisii Hilendarski”

ZooNotes 2009 (includes ZooNotes 1 – 6)
www.zoonotes.bio.uni-plovdiv.bg
ISSN 1313-9916

ZooNotes е електронно списание, в което се отпечатват кратки научни статии и съобщения (до 4 страници) от български автори, или отнасящи се за фауната на България. Статиите са в областта на таксономията, фаунистиката, зоогеографията, екологията и палеонтологията на животните.

ZooNotes is peer-reviewed, open access, electronic journal in which short scientific reports (up to 4 pages) are quickly published by Bulgarian researchers, or papers of foreign authors concerning the Bulgarian fauna. The papers are in the fields of taxonomy, faunistics, zoogeography, paleontology and animal ecology.

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Plovdiv University Press “Paisii Hilendarski”

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www.zoonotes.bio.uni-plovdiv.bg
ISSN 1313-9916

Видовете от Ctenophorinae (Diptera: Tipulidae) във фауната на България

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The species of Ctenophorinae (Diptera: Tipulidae) in the fauna of Bulgaria

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Abstract. List of the species of Ctenophorinae subfamily, known from Bulgaria is given, including *Ctenophora elegans* Meigen, 1818, species reported for Bulgaria, but not presented in Fauna Europaea and Catalogue of the Craneflies of the World for the country. *Ctenophora flaveolata* (Fabricius, 1794) is reported for the first time to the fauna of Bulgaria.

Key words: Tipulidae, Ctenophorinae, Bulgaria.

В Западна Палеарктика подсемейство Ctenophorinae е познато с 14 вида: род *Ctenophora* – 10, *Dictenidia* – 1, *Tanyptera* – 2 и *Protoctenidia* – 1 (Oosterbroek *et al.* 2006, Oosterbroek 2007). За фауната на България досега са съобщени 5 вида, които са включени в работата на Попов (1999). В тук представения списък за тези видове са дадени: валидните имена, литературен източник, имена с които са съобщавани за България (ако те се отличават от валидните) и известните находища. *Ctenophora flaveolata* (Fabricius, 1794) се съобщава за първи път за българската фауна.

Ctenophora (Cnemoncosis) fastuosa Loew, 1871
Theowald & Oosterbroek 1986: 2; Попов 1999: 34.
Находище: не е посочено.

Ctenophora (Ctenophora) flaveolata (Fabricius, 1794)
Фиг. 1 [Fig. 1]
Изследван материал: 1 ♀: етикет: Rhodope Mts., Hrabrino Village, 10.04.2006, leg. Bechev.
Нов вид за фауната на България.

Accepted: 14 May 2009
Published: 31 May 2009
Университетско издателство "Паисий Хилендарски"
Plovdiv University Press "Paisii Hilendarski"

Фиг. 1. *Ctenophora flaveolata*, женски, с. Храбрино.
[Fig. 1. *Ctenophora flaveolata*, female, v. Hrabrino.]

Ctenophora (Ctenophora) elegans Meigen 1818
Неделков 1912: 182; Попов 1999: 34.
Находище: Враца (Неделков 1912).
Видът не е включен за България във Fauna Europaea (Oosterbroek 2006) и Catalogue of the Craneflies of the World (Oosterbroek 2009).

Ctenophora (Cnemoncosis) ornata Meigen, 1818
Неделков 1912: 182; *Ctenophora ornata* Wiedemann 1818: Theowald & Oosterbroek 1986: 2; Попов 1999: 34.
Находище: Средна гора (Неделков 1912).

Dictenidia bimaculata (Linnaeus, 1761)
Неделков 1912: 182; Theowald & Oosterbroek 1986: 2; Попов 1999: 34.
Находище: Средна гора, между Ихтиман и Поибрене (Неделков 1912).

Taniptera atrata (Linnaeus, 1758)
Ctenophora atrata L.: Йоакимов 1899: 877; *Xiphura atrata* L.: Неделков 1912: 182
Taniptera atrata Linnaeus, 1758; Попов 1999: 34.
Находища: Рила, Рилски манастир (Йоакимов 1899); Софийско поле (Неделков 1912).
В Западна Палеарктика е разпространен подвидът *Taniptera atrata atrata.*

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ZooNotes 2: 1-2 (2009)
www.zoonotes.bio.uni-plovdiv.bg
ISSN 1313-9916

First record of *Bolitophila japonica* (Diptera: Bolitophilidae) for continental Asia

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Abstract. *Bolitophila (Bolitophila) japonica* (Okada, 1934) is reported for the first time for continental Asia in Nepal. This is also the first record of Bolitophilidae for the Himalayas.

Key words: Bolitophilidae, Bolitophila japonica, Nepal.

Introduction. *Bolitophila (Bolitophila) japonica* (Okada, 1934) was described from Japan (Hokkaido and Shikoku Islands) and holotype was redescribed by Ševčik & Papp (2004). The male terminalia of this species are different from all hitherto known species of *Bolitophila* in having a large dark L-shaped process of the gonostylus. Outside of Japan *B. japonica* was recorded only from Taiwan (Ševčik & Papp 2004). Studying the material collected from the author in Nepal, this species was registred for the first time in continental Asia.

The type material and other specimens of *B. japonica* was reared from the fungi of the genera *Hypholoma*, *Flammula* and *Pholiota* (Okada 1934, Okada 1939, Goto 1988). The larva and pupa were described by Goto (1988).

Material and methods. Determination of the material from Nepal is based on the structure of the male terminalia (Fig. 1), studied in glycerol after maceration in warm 10 % potassium hydroxide. The examined specimens were compared with a specimen from Taiwan, determined by Jan Ševčik and Laszlo Papp, who also studied the holotype of *Bolitophila japonica.*

Material examined

Bolitophila (Bolitophila) japonica (Okada, 1934)

Bolitophilella japonica Okada, 1934: 16, fig. 1; *Bolitophila (Bolitophila) japonica* (Okada 1934): Ševčik & Papp 2004: 57, figs 3-4.

New locality: Nepal: Parvat, Ghorepani, 2860 m, in Rhododendron forest, 13.10.2006, leg. D. Bechev, 3 ♂ (in alcohol, in author's collection).

Note: General coloration by the specimens from Nepal is yellowish, excluding head, indistinct longitudinal stripes on the mesoscutum, abdominal segment VIII and terminalia brown. The holotype have general coloration brownish grey (Ševčik & Papp 2004).

Material for comparison: Taiwan: Taichung Hsien, Anmashan Mts, UV light traps, 2090–2550 m, April 5–6, 2003, M. Földvári, L. Papp, Ch.-M. Fu & H.-R. Tzuoo, No. 23, 1 ♂ (in Hungarian Natural History Museum, Budapest).

Discusion. Family Bolitophilidae is known from 20 species in the Nearctic, 44 in the Palaearctic and 3 in the Oriental Region (Bechev, unpublished data). The existing of

Accepted: 15 May 2009
Published: 1 June 2009
Университетско издателство "Паисий Хилендарски"
Plovdiv University Press "Paisii Hilendarski"

Bolitophila japonica in Nepal is an indicator for a probable distribution area of this species in the Southeast Palaearctic and northeastern continental parts of the Oriental Region.

Fig. 1. *Bolitophila japonica* – male terminalia, dorsal view, tergite IX is not visible (specimen from Nepal, microphotography).

Acknowledgements. I thank the authorities of University of Plovdiv and Universiry Fund – Plovdiv for the financial support of the expedition in Nepal, and Dr. Laszlo Papp (Hungarian Natural History Museum, Budapest) for the loan of the Taiwanese specimen of *Bolitophila japonica.*

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www.zoonotes.bio.uni-plovdiv.bg
ISSN 1313-9916

Night-active aphid parasitoids (Hymenoptera: Aphidiidae) from Bulgaria

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Abstract. Seven species of Aphidiidae (Hymenoptera) are collected with light trap. The trap was situated in Parvenets Village (Plovdiv District, Bulgaria) near by crops.

Key words: *Aphidiidae*, Bulgaria, parasitoid.

Introduction. The family *Aphidiidae* includes more than 55 genera and about 400 known species (Stary 1988). Sixty three species from twenty one genera are known to the fauna of Bulgaria (Todorov 2008).

Material and methods. The light trap was situated in Parvenets Village (Plovdiv District) near by crops. The trap (Fig. 1) collected materials in the period 01.05-01.09.2004. The electric lamp of the trap was 75 W. It worked every night between 20.00-08.00 h.

The materials were collected every 15 days. Insects were captured with exhauster and put in to plastic boxes. The killing of parasitoids was conducted with the means of ethylacetate.

Fig. 1. Light trap.

Faunistic list.

Ephedrus cerasicola (Starý, 1962): 11.06-07.07.2004, 1♀
Ephedrus sp.: 15.07-07.08.2004, 1♀
Diaeretiella rapae (M'Intosh, 1855): 11.06-07.07.2004, 1♀
Aphidius ervi (Haliday, 1834): 11.06-07.07.2004, 1♀
Praon volucre (Haliday, 1833): 07.07-05.08.2004, 1♀

Accepted: 21 June 2009
Published: 16 July 2009
Университетско издателство "Паисий Хилендарски"
Plovdiv University Press "Paisii Hilendarski"

Aphidius sp.: 07.07-05.08.2004, 1♀
Praon sp.: 07.07-05.08.2004, 4♀.

Discussion

This is the first study of night activity of afidiids in Europe. All collected specimens were found in the periods between July to August, when the air temperature during the night is higher.

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www.zoonotes.bio.uni-plovdiv.bg
ISSN 1313-9916

A contribution to the knowledge of the trophic spectrum of the Common toad (*Bufo bufo* L., 1758) (Amphibia: Anura) from Bulgaria

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Abstract. During our study we identified 500 prey items in 20 prey categories in the trophic spectrum of *Bufo bufo* with average number of prey items per stomach 25.00. The most important prey taxon is Formicidae (70.20%), followed by Coleoptera (especially Carabidae – 11.40%), as well as non-insect invertebrates (Isopoda, Gastropoda, Arachnida) which also play significant role. The estimated trophic niche breadth is low – 1.96.
Key words: *Bufo bufo*, trophic spectrum, niche breadth, Plovdiv, Bulgaria.

Introduction. Some species of the Bulgarian batrachofauna are still poorly studied concerning their trophic spectrum and feeding ecology (Mollov *et al.* 2006). The Common toad (*Bufo bufo* Linnaeus, 1758) is the largest anuran species occurring in Bulgaria and its trophic spectrum is very poorly known. Partial data about the throphic spectrum of the species in Bulgaria can be found in the works of Kovachev (1912), Buresh & Tsonkov (1942), Angelov (1960) and Beshkov & Nanev (2002). Currently there is only one specialized study on the diet of the Common toad, conducted in Bulgaria (Angelov & Batschwarov 1972).

The aim of the current study is to supplement the knowledge about the trophic spectrum and feeding ecology of the Common toad (*Bufo bufo*) in Bulgaria.

Material and Methods. We examined 8 stomachs of adult specimens of the Common toad (*Bufo bufo*), preserved in 70% alcohol and kept in the herpetological collection of the Department of Zoology at the University of Plovdiv, Bulgaria. The material was collected in 27.V.1967 from the urban park "Otdih i kultura" (former "Ostrova" Area) near the Rowing Channel in Plovdiv City (South Bulgaria), UTM LG16.

The stomachs were dissected in Petri dishes and the stomach contents were analyzed by means of binocular microscope. The prey taxa were identified to the lowest possible taxon, based on its degree of composition. The systematic of the identified invertebrate taxa follows Fauna Europaea (2007).

We classified each prey item as either terrestrial or aquatic on the basis of the habitats in which it typically occurs.

Sampling adequacy was determined using Lehner`s formula (Lehner 1996):

$$Q = 1 - \frac{N_1}{I},$$

Accepted: 21 July 2009
Published: 26 July 2009
Университетско издателство "Паисий Хилендарски"
Plovdiv University Press "Paisii Hilendarski"

rising from 0 to 1, where N_1 is the number of the food components occurring only once, and I is the total number of the food components.

The diversity of the diet (niche breadth) was calculated, using the reciprocal value of the Simpson's diversity index (Magurran 1986):

$$S = \frac{1}{\sum p_i^2},$$

where: S – trophic niche breadth; P_i – proportion of food component i.

To determine the level of the food specialization we used the index of dominance of Berger-Parker (d), calculated by the following formula (Magurran 1988):

$$d = \frac{n_i \max}{N},$$

where: N – the number of all recorded food components (taxa); $n_i$max – the number of the specimens form taxon i (the most numerous taxon in the diet). The Berger-Parker index (d) varies between 1/N and 1. A value closer to 1 means a higher specialization in the choice of food; a value closer to 1/N is typical for a species that is a general feeder (polyphage).

The results were statistically processed using descriptive statistics with the software package "Statistica 7.0" (StatSoft Inc. 2004). For the calculations of Simpson's diversity index and the Berger-Parker index we used the computer software "Bio-DAP" (Thomas & Clay 2000).

Results. The analyzed stomach contents of total 8 stomachs of *Bufo bufo* contained 500 prey items, divided in 20 prey categories. The average number of prey items per stomach is 25.00 (SD=77.81). The sampling adequacy is considered sufficient - 0.70.

Table 1 presents the qualitative and quantitative proportion and frequency of occurrence of the trophic spectrum of *Bufo bufo*.

The predominated food type in the diet of the Common toad is insects (94.4%). The most numerous prey taxon is the Formicidae family (70.20%) from the Hymenoptera order (71.20%), followed by Carabidae family (11.40%) from the Coleoptera order (21.00%). The Berger-Parker index showed considerably high value - 0.70 (Table 1). From the non-insect invertebrates the Isopoda order shows the highest value (4.20%).

Most of the recorded prey taxa are classified as terrestrial (99.00%).

Unidentified insects in this study usually consisted of a wings, legs, or body segments, which may indicate that either the toad was unable to capture the entire prey item or the remaining portion of the prey item was not detected because it had passed through the digestive system at a different rate.

Because of the fact that the material was collected only in one season it is impossible to analyze the seasonal variations of the trophic spectrum.

Discussion. According to Angelov & Batschwarov (1972) the predominated prey taxon in the Common toad's diet is Carabidae (22.95%), respectively Coleoptera (36.36%) followed by Formicidae (19.67%), respectively Hymenoptera (27.27%). The trophic niche breadth calculated from the data of the same authors is 9.13 and the Berger-Parker index is 0.36. Based on that data and due to the fact that the study of Angelov & Batschwarov (1972) is based only on the contents of 6 stomachs Mollov *et al.* (2006) concluded that *Bufo bufo* is probably a polyphage. Our study showed much lower value of the trophic niche – 1.96 and much higher value of the Berger-Parker – 0.70, which indicates that, depending on the season, there might be a slight preference to the ants as a food source.

The most important prey category - the ants (Formicidae) and the beetles (Coleoptera), being consumed frequently by the Common toad, are basic food most probably due to the abundance of this food and the wide range of habitats where it could be found.

Table 1. *Results from the food niche study of the diet of Bufo bufo (n=8).*
Legend: *n – number of prey items; n % - numeric proportion (percentage proportion from the total number of prey items); f % - frequency of occurrence (percentage proportion of the frogs that consumed the prey taxon).*

Prey taxa	n	n %	f %
Mollusca (Gastropoda)	2	0.40	25.00
Arachnida (Aranei)	3	0.60	37.50
Crustacea (Isopoda, Oniscidea)	21	4.20	25.00
Entognatha: Collembola	2	0.40	12.50
Insecta			
Hemiptera: Heteroptera	2	0.40	12.50
Hemiptera: Auchenorrhyncha (larvae)	1	0.20	12.50
Hymenoptera (undet.)	1	0.20	12.50
Apoidea	1	0.20	12.50
Formicidae	351	70.20	62.50
Proctotrupoidea Proctotrupdae	4	0.80	25.00
Diptera (Nematocera)	1	0.20	12.50
Diptera (larvae)	5	1.00	12.50
Coleoptera (undet.)	3	0.60	25.00
Carabidae	57	11.40	87.50
Chrysomelidae	19	3.80	50.00
Coccinellidae	1	0.20	12.50
Curculionidae	10	2.00	50.00
Scarabaeoidea	5	1.00	37.50
Staphylinidae	10	2.00	62.50
pebbles, soil, sand	1	0.20	12.50
Sampling adequacy		**0.70**	
Berger-Parker index		**0.70**	
1/Simpson		**1.96**	

The diet of the Common toad is consisted with almost only terrestrial prey. Aquatic preys probably become accessible when the puddles dry out or in puddles with an extremely low water level. According to Buresh & Tsonkov (1942) this species forages primarily at night and is very well adapted to hunt in terrestrial biotopes. Considering the fact that ants are the most preferred prey type by the Common toad it is possible that this species hunts during the day as well, especially in the spring season.

From some of the stomachs we obtained little pebbles and soil. Their presence in the trophic spectrum should be considered as accidental, because they are probably being digested with the captured insects.

Other authors report only partial data about the trophic spectrum of the Common toad, without any quantative values. According to Kovatchev (1912) the Common toad feeds on “worms, slugs, beetles, ants, spiders and centipedes”. Buresh & Tsonkov (1942) report based on the feces from two specimens that the Common toad feeds mainly on Coleopterans, especially form the Carabidae, Scarabeidae, Curculionidae, Tenebrionidae and Chrysomelidae families, as well as earth worms. During an entomological study of the urban park “Otdih i kultura” in Plovdiv City, Angelov (1960) reported that he found in the stomach contents of *Bufo bufo* “a large number of insects, especially Carabidae”. Beshkov & Nanev (2002) reported that “the main food source of the Common toad are insects – ants

and beetles, but also centipedes, spiders, collembolans, earth worms, slugs and snails and sometimes even small snakes, mice and rodents".

In our opinion further studies on the trophic spectrum of *Bufo bufo*, based on large number of studied specimens and conducted during several seasons, are needed in order to determine the variations in the diet, the food specialization of the species as well as its niche breadth.

Conclusions. 1. During our study we identified 500 prey items in 20 prey categories in the trophic spectrum of *Bufo bufo* with average number of prey items per stomach 25.00.

2. The most important prey taxon is Formicidae (70.20%). Other important prey animals are Coleoptera (especially Carabidae – 11.40%), as well as non-insect invertebrates (Isopoda, Gastropoda, Arachnida) which also play significant role.

3. The Common toad hunts primarily at night, but it is possible that the hunting may be occurring during the day as well, especially in the spring season.

4. The toads consume almost only terrestrial prey and aquatic preys probably become accessible only when the puddles dry out or with extreme low water level.

5. The estimated trophic niche breadth is low – 1.96.

Acknowledgements. The authors would like to express their sincerest gratitude to Dr. Atanas Donev (University of Plovdiv, Department of Zoology) for the given collection of stomachs used in the current study.

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ZooNotes 5: 1-2 (2009)
www.zoonotes.bio.uni-plovdiv.bg
ISSN 1313-9916

A record of Horned viper *Vipera ammodytes* (L.) in the diet of the Stone marten *Martes foina* (Erxl.) (Mammalia: Mustelidae) in Bulgaria

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Abstract. Among undigested prey remains in Stone marten's *Martes foina* (Erxl.) faeces (n=47), collected in Sakar Mountain (near Sladun Village) a single lower jaw from a Horned viper (*Vipera ammodytes*) was found. The rest of taxa registered in the Rock marten's diet among the faecas were: Insceta indet., *Lacerta* sp., *Pseudopus apodus*, Aves indet., *Dryomis nitedula*, *Sylvaemus* sp., *Arvicola terrestris*, *Microtus* sp., and fruits of *Rosa* sp., *Rubus* sp., and *Pyrus* sp. The percent frequency of the main prey groups in the faeces were as follows: Mammalia (n=35, 74.5%), Aves (n=16, 34.0%), Reptilia (n=4, 8.5%), Insecta (n=4, 8.5%), and fruits (n=5, 10.6%).

Key words: venomous snake, mustelid, trophic spectrum.

Introduction. The trophic spectrum of the mustelids (Mammalia: Mustelidae) includes a variety of animal and plant species (Macdonald & Barret, 1993). Being very fast and agile animals it is not unusual that some of the species catch and eat highly venomous preys as spiders, scorpions, insects and snakes. Even though such prey is typical for some carnivores from this family like the African honey badgers (Begg, 2006) it is not often recorded in the diets of the European mustelids (Macdonald & Barret, 1993).
As a whole the reptiles lack or take a little part of the Stone marten's *Martes foina* (Erxleben, 1777) diet in various regions of Europe (Lode, 1994) and Bulgaria (Popov & Sedefchev, 2003, Vasileva *et al.*, 2005). Here we report an interesting case of remains of one of the few venomous snakes in Bulgaria found in its diet.

Material and methods. Faeces of Stone marten (*Martes foina*) deposited in a small limestone cave hole (total number = 47) were collected in Sakar Mountain (Bulgaria) near Sladun Village (UTM MG 53)on 30.04.2006. They were stored in plastic bags for further investigation in the laboratory. The prey items were separated by softening of the faeces with 70% ethanol. The material was identified using comparative collections of bones, hairs and fruit seeds. The minimal number of specimens and the percent frequency of each given prey group in the faeces was considered for this study.

Accepted: 26 July 2009
Published: 3 August 2009
Университетско издателство "Паисий Хилендарски"
Plovdiv University Press "Paisii Hilendarski"

Results and Discussion. Among all prey items a single lower left jaw with teeth from a Horned viper *Vipera ammodytes* (Linnaeus, 1758) was found. Knowing that the Stone marten sometimes uses carcass as a food source (Posluszny *et al.,* 2007), it is not sure if the venomous snake really was killed and eaten. But considering the season of the faces collection, when the weather is still relatively cold and the reptiles are not very active being slow and becoming an easy prey for the predators, it is possible that the Horned viper was actually killed and eaten.

The rest of the prey taxa found in the Stone marten's diet among the faecas were (minimal number of individuals/fruits is represented in brackets): Insecta indet. (4), *Lacerta* sp. (1), *Pseudopus apodus* (Pallas, 1775) (1), Aves indet. (2), *Dryomis nitedula* (Pallas, 1778) (1), *Sylvaemus* sp. (1), *Arvicola terrestris* (Linnaeus, 1758) (1), *Microtus* sp. (5), fruits of *Rosa* sp. (2), *Rubus* sp. (1) and *Pyrus* sp. (1). The species *P. apodus*, *V. ammodytes*, *D. nitedula* and *A. terrestris* were new records for the food spectrum of the Stone marten in Bulgaria.

The percent frequency of the main prey groups in the faeces were as follows: Mammalia (n=35, 74.5%), Aves (n=16, 34.0%), Reptilia (n=4, 8.5%), Insecta (n=4, 8.5%), and fruits (n=5, 10.6%).

Acknowledgements. We thank to Dr. Vassil Popov (Institute of Zoology, BAS) for identification of *Dryomis nitedula*, and to Nedko Nedyalkov for the support.

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ZooNotes 6: 1-3 (2009)
www.zoonotes.bio.uni-plovdiv.bg
ISSN 1313-9916

A New Locality of the Italian Wall Lizard *Podarcis siculus* (Rafinesque-Schmaltz, 1810) from Turkey

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Abstract. The current paper reviews the current distribution of the Italian Wall Lizard (*Podarcis siculus*) in Turkey. A new locality at Güzelyalı Belediyesi Resort, south-west of Mudanya City in the country is reported.

Key words: *Podarcis siculus hieroglyphicus*, new locality, Turkey.

The Italian Wall Lizard, *Podarcis siculus* (Rafinesque-Schmaltz, 1810) ranges throughout Italy south of the Alps, including on Sicily, Sardinia, and many other islands in the Tyrrhenian Sea, in extreme southern Switzerland, Corsica (France), and along the Adriatic coastal area from southwestern Slovenia, through western and southern Croatia and extreme southern Bosnia Herzegovina to Montenegro. It also occurs as isolated introduced populations in southern France, the Iberian Peninsula (Spain and Portugal), Menorca in the Balearic Islands (Spain), on both sides of the Bosphorus in Turkey, Ile La Galite (Tunisia), and Isola di Lampedusa (Italy). It has been also introduced to a number of sites in the United States, and may have been introduced to Libya and Tunisia. It ranges from sea level up to 2000 m a.s.l. (Isailovic et al. 2006).

The subspecies *Podarcis siculus hieroglyphicus* lives only in Turkey and was described by Berthold (1842), and its terra typica is Istanbul. After its discovery in Istanbul only few studies report new localities of this subspecies (Bodenheimer 1944, Başoğlu & Baran 1977, Çevik 1999). Since then, only recently, the subspecies' distribution in this area is studied more thoroughly by Uğurtaş et al. 2000, Hür et al. 2008 and Stenicka et al. 2008 (Fig. 1).

During a field trip along the south coast of Marmara Sea a new locality of *Podarcis siculus hieroglyphicus* was discovered (Fig. 1). On 27 August 2007 at Güzelyalı Belediyesi Resort, south-west of Mudanya City (N40°21'52.82", E28°54'29.21", 2 m a.s.l.) a subadult specimen was observed and photographed (Fig. 2). The lizard was observed in a garden of a restaurant in the urban part of the resort next to the beach itself. The lizard showed high agility and good climbing skills similar to the green lizard (*Lacerta viridis*).

As pointed out by some authors (Başoğlu & Baran 1977, Uğurtaş et al. 2000) the presence of *Podarcis siculus* in Istanbul and the Marmara region is interesting because it may have been brought to Turkey accidentally by people or trade ships. It seems that the Italian Wall lizard has some good colonizing abilities and its distribution in the Marmara region continues to grow even in rural and urban areas. It may be considered to be a successful invasive species that can pose a potential threat of displacing native lizard populations.

Accepted: 18 October 2009
Published: 20 October 2009
Университетско издателство "Паисий Хилендарски"
Plovdiv University Press "Paisii Hilendarski"

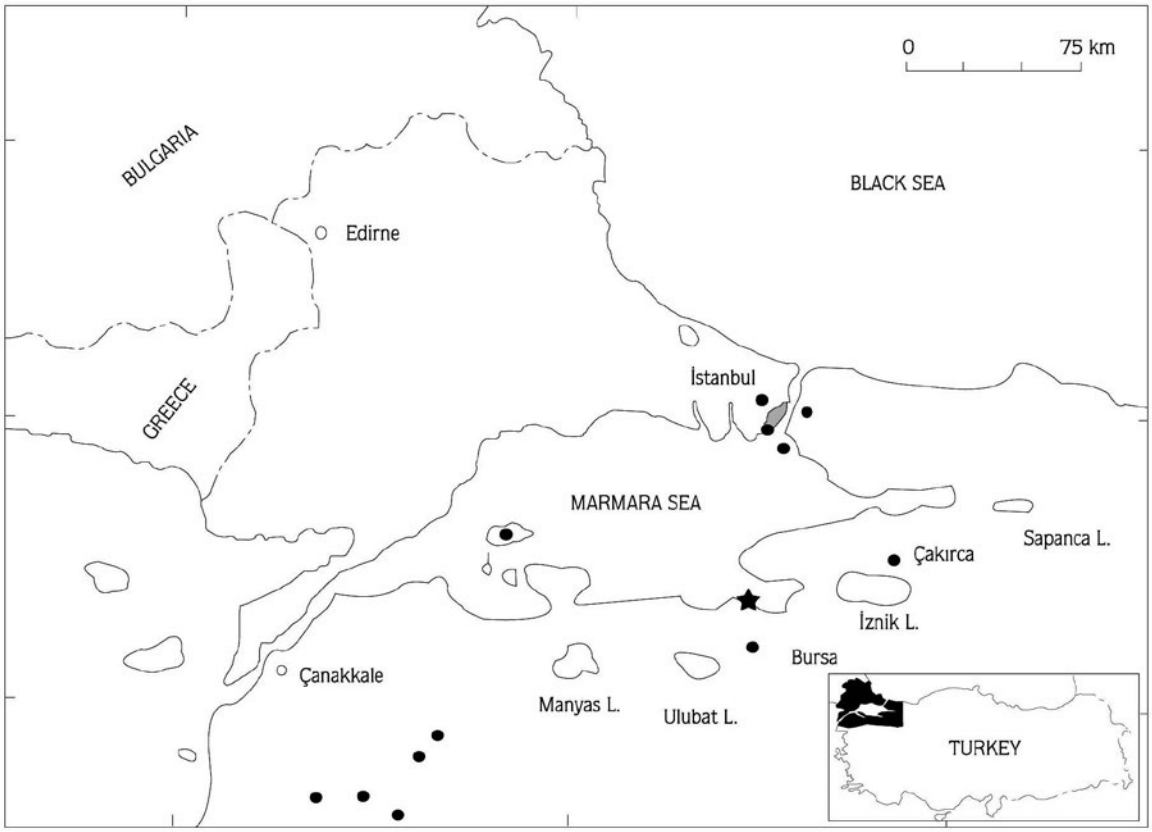

Fig. 1. Current distribution of *Podarcis siculus hieroglyphicus* in Turkey (after Uğurtaş et al. 2000, with supplements). Legend: ● – known localities; ★ - the new locality (explanations are in the text).

Fig. 2. Photo of the discovered specimen of *Podarcis siculus hieroglyphicus.* Photo: I. Mollov.

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