

New records and rediscovery of some snakes from Gökçeada (Imbros), Turkey

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Abstract. In this study, we rediscovered some snake species after quite a long time during the fieldwork in 2014 and 2015 on Gökçeada (Imbros). *Natrix tessellata* (Laurenti, 1768), which was found in Kaleköy, and *Elaphe sauromates* (Pallas, 1811), which was detected and photographed around the Education and Resting Association, Ministry of Justice, Republic of Turkey in the vicinity of Şirinköy, were new records for the island's snake fauna. All specimens except *E. sauromates* (Pallas, 1811), were found dead in the field. Morphological features of *N. tessellata* were examined in detail and results were compared with previous studies. Locality information and measurable and countable features of the other specimens are given.

Key words: Reptilia, Snakes, new record, rediscovery, Imbros, Gökçeada, Turkey.

Introduction

Gökçeada mainly consist of volcanic rocks and covers an area of 285.5 km² (Seçmen & Leblebici 1977). The island, which is the westernmost part of Turkey and which is situated in the mouth of the Gulf of Saros, is the richest island of the Aegean Sea in terms of freshwater resources. The island is ranked 4th island of the world from the point of plenty of freshwater sources in the world (Kahraman 2006).

Early herpetological studies on the island were made by Başoğlu & Baran (1980) and Baran (1981). In following years Baran (1981), Broggi (1999) and Bulut (2010) reported new records for the Gökçeada herpetofauna. More recent studies also showed its importance and biodiversity (Bulut et al. 2011, Parlak & Tok 2011, Tok et al. 2011, Parlak & Tok 2013, Tok et al. 2013, Tok et al. 2014a, Tok et al. 2014b, Habiboğlu et al. 2016, Tok et al. 2016).

According to the death of a child which was bitten by a snake, it was thought that the ottoman viper, *Montivipera xanthina* (Gray, 1849) could occur on the island (Broggi 1999). It was also reported that *M. xanthina* (Gray, 1849) has been seen around Eşelek Village, but could not be caught (Bulut 2010).

Eight snake species were recently observed on the island during fieldworks; *Xerotyphlops vermicularis*, *Zamenis situla*, *Dolichophis caspius*, *Platyceps najadum*, *Eryx jaculus*, *Natrix natrix*, *Malpolon insignitus*, *Montivipera xanthina* (Başoğlu & Baran 1980, Baran 1981, Broggi 1999, Bulut 2010).

The aim of this study is to present the morphological data of two snake species that had not been discovered before, one snake species that was assumed to be present but never had been caught and some other snake species that recently were found after a long time.

Materials and Methods

During the fieldworks conducted in March-April 2014 and in March-April-June 2015, dead snake specimens from various regions of the island found by an instructor and island residents were sent to Çanakkale Onsekiz Mart University, Department of Biology. The specimens were photographed where they were found and brought to the laboratory in 70% alcohol. In the laboratory some morphological measurements were taken using a digital caliper with an accuracy of 0.01 mm and measuring tape for total body length. Ventrals were counted according to Dowling's method (1951). Snout-Vent

Length (SVL), Tail Length (TL), some other pholidotic features and localities are given below (Fig. 1). *Elaphe sauromates* (Pallas, 1811) was found by a staff member of the Ministry of Justice, Republic of Turkey, and released after being photographed. Therefore, morphological measurements and pholidotic data of this specimen are not available.

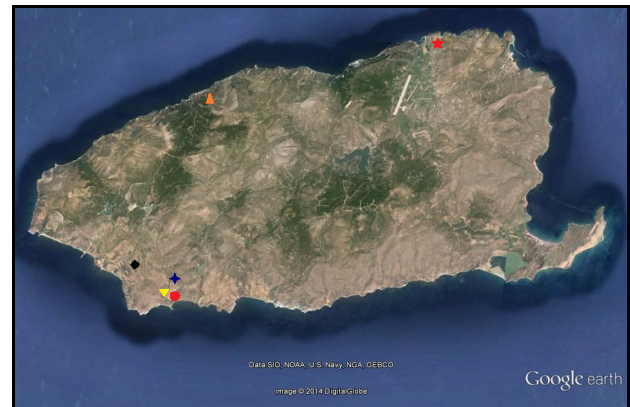


Figure 1. Localities of the snake specimens found on Gökçeada (Imbros). Red star: *Natrix tessellata* (Laurenti, 1768); Red circle: *Montivipera xanthina* (Gray, 1849); Yellow triangle: *Elaphe sauromates* (Pallas, 1811); Blue star: *Eryx jaculus* (L., 1758); Orange triangle: *Zamenis situla* (L., 1758); Black square: *Platyceps najadum* (Eichwald, 1831).

Results

As a result of the studies, *Zamenis situla* (Linnaeus, 1758) was found again on the island 16 years after Broggi (1999) found the species (Fig. 2; A1-2). The other species, *Platyceps najadum* (Eichwald, 1831) and *Eryx jaculus* (Linnaeus, 1758) which were also found dead during this study, were found 2014/2015 in a study including the Aegean Islands (Baran 1981) (Fig. 2; B1-2-3-4, C1-2). Also *Montivipera xanthina* (Gray, 1849) a species from which Broggi (1999) thought it could occur on the island, and was seen but was not caught around Eşelek Village by Bulut (2010), was found dead in the vicinity of Şirinköy Village (Fig. 2; E1-2). Furthermore, *Natrix tessellata* (Laurenti, 1768) which was found dead in Kaleköy Village (Fig. 2; D1 and 2), *Montivipera xanthina* (Gray, 1849) and *Elaphe sauromates* (Pallas, 1811) which were observed alive around Şirinköy Village, were recorded for the first time in this study (Fig. 2).



Figure 2. Snake specimens found on Gökçeada (Imbros). A1-2: *Zamenis situla*; B1-2-3-4: *Platyceps najadum*; C1-2: *Eryx jaculus*; D1-2: *Natrix tessellata*; E1-2: *Montivipera xanthina*; F: *Elaphe sauromates*

Table 1. The measurements and pholidotic features of the specimens.

Characters	<i>Zamenis situla</i>	<i>Eryx jaculus</i>	<i>Platyceps najadum</i>	<i>Montivipera xanthina</i>
Preocularia	1/1	-	2/2	-
Postocularia	2/2	-	2/2	-
Supralabialia	8/8	10/9	10/10	10/10
Rows of Dorsal scales at midbody	27	42	19	23
Ventralia	241	175	220	161
Anale	1/1	-	1/1	1
Subcaudalia	-	28	128	33
Snout-Vent Length (mm)	775	411	733	864
Tail Length (mm)	116	58	331	79
Pleus Length (mm)	18.80	-	16.75	-
Pleus Width (mm)	9.76	-	8.38	-
Rostrum Height (mm)	2.42	2.58	-	4.33
Rostrum Width (mm)	5.14	5.67	-	5.36

Table 2. Comparison of the pholidotic features of the *Natrix tessellata* specimen in current study with those given by Mutlu (2013), Dinçaslan (2005) and Baran (1976) (Extreme values were given).

Characters	Current Study	Mutlu et al. (2013) Lake Eğirdir	Mutlu et al. (2013) Lake Gölhisar	Dinçaslan (2005) Lake District	Baran (1976) Turkey
n	1	5	3	93	206
Preocularia	3-3	2-3	3-3	2-3	2-4
Postocularia	4-4	4-5	3-5	3-4	3-6
Supralabialia	8-8	8-9	8-9	7-9	7-9
Sublabialia	8-9	10-11	10	9-11	9-11
Temporalia	3	3	3	3-4	3-5
Gularia	3	4-5	3-5	3-6	-
Rows of Dorsal scales at mid-body	19	19	19	19	19
Ventralia	170	168-174	168-176	165-185	158-179
Subcaudalia	61	50-73	57-70	51-74	53-78
Analia	2	2	2	2	2

Some morphological measurements and pholidotic features are given in Table 1. *Natrix tessellata* (Laurenti, 1768), which was recorded for the first time on the island, was compared with previous studies on mainland populations (Baran 1976, Dinçaslan 2005, Mutlu et al. 2013) and no differences were found (Table 2). On the other hand, *Montivipera xanthina* (Gray, 1849), which was found dead and its body parts were mostly shattered, was examined in detail and some morphological differences were found. Due to having a limited amount of specimens, molecular methods should be necessary to clarify taxonomical status of both island and mainland populations.

Discussion

Although herpetological studies on Gökçeada have been increased in recent years, the species could not be found for a long time. As mentioned by Régnier et al. (2009) and Clavero et al. (2009), there are several factors affecting island species. Limited distribution, low population size as well as human activities (agriculture, animal husbandry, urbanization, etc.) are major factors on populations. In our opinion that could be the reason that the species could not be found for many years.

Additionally, interviews with islanders in previous studies showed that they believe all snakes are very venomous. As a consequence, the death of snakes and snake-like animals (legless lizard such as *Pseudopus apodus*) is predominantly caused by humans (Tok et al. 2011). Therefore, it is

necessary to increase awareness and to educate the islanders about the importance of wildlife and ecology of the island (Hartel et al. 2009). Islands, with their fragile ecological environment, have a high extinction rate. It is well-known that when people invade an island, the extinction rate increases to the maximum value (Primack 2012).

Furthermore, some of the dead specimens [*Eryx jaculus* (Linnaeus, 1758), *Platyceps najadum* (Eichwald, 1831), *Zamenis situla* (Linnaeus, 1758), *Natrix tessellata* (Laurenti, 1768)] were found on highways close to their habitats. Therefore, we suggest that for new highway construction plans ecological bridges should be taken into account and preventive measurements for habitat fragmentation and habitat loss should be taken into consideration as mentioned in previous reports (Trombulak & Frissell 2000, Lesbarrères et al. 2004, Puky et al. 2007).

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