

## A review of the distribution of *Vipera ammodytes transcaucasiana* Boulenger, 1913 (Serpentes: Viperidae) in Turkey

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**Abstract.** A thorough source search has been conducted, resulting in an up-to-date distribution map of the Transcaucasian Nose-horned Viper, *Vipera ammodytes transcaucasiana* in Anatolia. The result leads to the recognition of three distribution clusters along the northern parts of Anatolia.

**Key words:** Transcaucasian Nose-horned Viper, Anatolia, distribution, zoogeography.

### Introduction

The Nose-horned Viper, *Vipera ammodytes* s.l. has a natural distribution from Italy to Georgia. Animals east of the Bosphorus are morphologically different and belong to the taxon *transcaucasiana*.

This taxon was described by Boulenger in 1913 on the basis of three specimens from Borzomi, Georgia. Derjugin (1901) had found it prior to the subspecies' description within the contemporary Anatolian border at Bortschcha (Borçka), which would later prove as the first record from Anatolia. Subsequent records were published scattered over Anatolia, but mainly along the Black Sea coast.

Several authors assigned the taxon full species status (Obst 1983, Nilson et al. 1999, Mallow et al. 2003), but Heckes et al. (2005), Garrigues (2005) and Tomovic (2006) refrained from this. In a study on the molecular phylogeography Ursenbacher et al. (2008) remained cautious about the species status as the taxon groups well within the southeastern clade of *ammodytes*. In this study all Asiatic specimens, i.e. east of the Bosphorus, are assigned to the taxon *transcaucasiana*, in contrast to some authors who used *meredionalis* for the more western records.

The principle objective of this study was to compile and present the contemporary known distribution of the species in Anatolia, the Asiatic part of Turkey, based on reliable sources.

### Material and methods

A thorough literature research concerning the distributional data in Anatolia was conducted in order to compile an up-to-date distribution map. The sources varied from more than a century old records up to recent publications and includes own observations. A few data were taken from reliable online sources or personal communication with researchers. The majority of the records is from the last three decades. The map used for presenting the records includes the province borders for a better interpretation of the localities.

The open-source geographic information system application QGIS was used to view, edit, analyse and present the gathered data and to produce a conservatively estimated range map.

### Results

The literature search and other sources resulted in a map on which all confirmed locations are presented (Fig. 1). A total

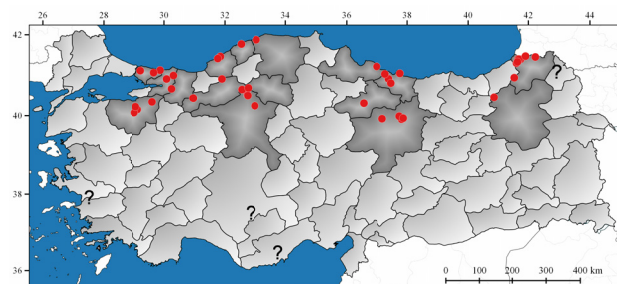


Figure 1. Distribution records of *Vipera ammodytes transcaucasiana* in Anatolia. Provinces from which records are known are visualized in dark grey. Question marks indicate doubtful or badly documented localities. Records are derived from: Afsar et al. (2013), Akkaya & Uğurtaş (2012), Arkan et al. (2003), Baran (1976), Baran (1978), Baran et al. (2001), Biella (1983), Bruno (1995), Eiselt & Baran (1970), Franzen & Heckes (2000), Göçmen et al. (2015), Joger (1984), Kumlutaş et al. (1998), Kutrup (1999, 2001), Mulder (1995), Nilson et al. (1988), Regamey (in litt. 2015), Schweiger (in litt.), Teynié (1987, 1991), Tok & Kumlutaş (1996), AdaMerOs Herptil Türkiye (web), Ursenbacher (2007), Werner (1904, 1905) and Westrin (2016, in litt.).

of 44 relatively well documented locations was identified. Table 1 shows the records and associated sources per province. The distribution of the Transcaucasian Nose-horned Viper within the boundaries of Anatolia as compiled in this study is depicted in Figure 1 as point locations and inhabited provinces.

This viper occurs along the Black Sea: from the Bosphorus in Istanbul in the west to the Georgian border in Artvin in the east. From the coastal provinces Düzce, Sinop, Giresun, Trabzon and Rize no records are known. Inland the species occurs southwards at least as far as 39°54'N in the province of Sivas. Other southern records are from the provinces of Bursa and Ankara.

### Discussion

The distributional data of the Nose-horned Viper in Anatolia has been scattered and a considerable extension of data became available recently. A critical overview of all available data has not been published before.

Although several records were published even long ago, many of them are often overlooked by authors during the compilation of range maps. Even recent publications, e.g. Tomovic (2006), Phelps (2010) and the IUCN Red List species

Table 1. Localities and sources of records per province.

Province	Source	Locality
İstanbul	Werner (1904, 1905)	Polnischen Tschiflik=near Beykoz (Polonezköy)
İstanbul	Teynié (1987)	Teke
İstanbul	Nilson et al. (1988)	Ağva
Kocaeli	Baran et al. (2001)	Akçakese
Kocaeli	Nilson et al. (1988)	Kaynarca
Sakarya	Akkaya & Uğurtaş (2012)	Sapanca-Adapazarı
Bursa	Yılmaz (Turkherptil)	Uludağ
Bursa	Akkaya & Uğurtaş (2012)	Uludağ Kaplıkaya Valley, S of Bursa
Bursa	Güler (Turkherptil)	Bursa
Bursa	Baran (1976)	Kirazlıyayla-Uludağ
Bolu	Schweiger (web)	Sünnet Gölü
Bolu	Demirsoy (Turkherptil)	Yedigöller
Karabük	Schweiger (2015, in litt.)	near Karabük
Ankara	Afsar et al. (2013)	Süleler, Kızılcahamam
Ankara	Erbas (Turkherptil)	Çubuk
Ankara	Erbas (Turkherptil)	Aksak, Çukurca, Kızılcahamam
Ankara	Göçmen et al. (2014)	Çukurca village, Kızılcahamam
Cankırı	Göçmen et al. (2015)	Yoncalı
Zonguldak	Nilson et al. (1988)	east of Zonguldak
Zonguldak	Nilson et al. (1988)	west of Zonguldak
Bartın	Westrin (2016, in litt.)	Amasra
Bartın	Güler (Turkherptil)	Avara
Kastamonu	Nilson et al. (1988)	Cide
Kastamonu	Schweiger (2015, in litt.)	between Ilgaz and Tosya
Tokat	Baran (1978)	Gediğaz Köyü
Samsun	Afsar et al. (2013)	Terme
Ordu	Kumlutaş et al. (1998)	Saraycik
Ordu	Göçmen (in litt)	İslamdağ
Ordu	Franzen & Heckes (2000)	20 km N of Aybastı
Ordu	Arıkan et al. (2003)	Perşembe
Sivas	Mulder (1995)	Köse Dağ (N of Zara)
Sivas	Göçmen et al. (2015)	Başbüyük yaylası
Sivas	Eiselt & Baran (1970)	Köse Dağ near Zara
Sivas	Teynié (1991)	Köse Dağ (Zara N)
Erzurum	Bruno (1985)	Maden
Artvin	Derjugin (1901)	Bortchcha=Borçka
Artvin	Çelik (Turkherptil)	Sarıgöl
Artvin	Kutrup (1999)	Erenköy
Artvin	Mulder (1995)	Borçka N
Artvin	Biella (1983)	Civan
Artvin	Ursenbacher et al. (2007)	Aralık
Artvin	Regamey (Facebook, in litt.)	north of Borçka
Artvin	Schweiger (2015, in litt.)	Aralık (region of Camili in Mebert et al., 2014)
Artvin	Göçmen et al. (2014)	Meydancık, Şavşat

range map (2015) lack important parts of the distribution and are partly incorrect.

Başoğlu & Baran (1980) recorded only two records: Borçka and Köse Dağ Zara Sivas, though there was at least a Tokat record published by Baran himself two years earlier (see further below). Baran assigned the West-Anatolian records to the taxon *meridionalis*, but of those only three records were mapped (overlooking several earlier published records) and of which two of them have not been confirmed yet (see further below).

Based on available data the distribution can be seen as disjunct and from west to east two conspicuous distributional gaps are present, resulting in three record clusters of records. The three clusters, consisting of records relatively nearby

each other, are presented as polygons in Figure 2. The westernmost cluster is separated from the central one by about 240 kilometers. The provinces Sinop, Çorum, Amasya, Kırıkkale, Tokat and main parts of Kastamonu and Samsun are void of records. The IUCN species range map interestingly, lacking many well-known localities, explicitly shows the area of Çorum province as part of the distribution, but no records from there are known by the author. The easternmost cluster, adjoining the Georgian records, is separated from the central cluster by at least 260 kilometers. The gap includes the provinces Giresun, Trabzon, Gümüşhane, Bayburt, Erzincan and Rize. Whether these gaps are representing the real distribution or just information deficiency is difficult to determine. The regions seem suitable to the habi-

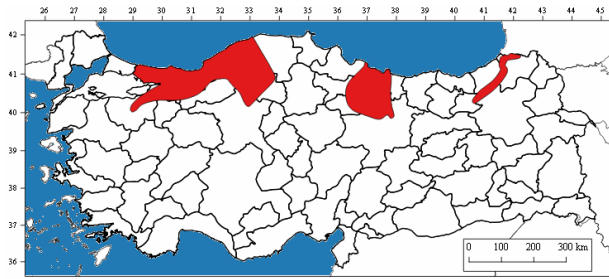


Figure 2. Conservatively composed range map of *Vipera ammodytes transcaucasiana* in Turkey.

tat needs.

From the province of Tokat only one record is known. This locality is given as Gediağzı Köyü by Baran (1978), matching the locality Gediağzı çiftliği southeast of the city of Tokat. The only record from the province of Erzurum is derived from the caption to a photograph in a book about vipers (Bruno 1985).

Next to above mentioned distribution, some records are known from far beyond the well-known distribution. An observation in 'Kars territory' by H. Billing was communicated to and subsequently published by Nilson & Andrén (1986). At that time Kars province included the contemporary provinces Iğdır and Ardahan. Ardahan would have the highest chance of occurrence, but no proof has been published up to now. An excuvia apparently was collected in 1965 by M. Erbstösser 70 km south of Izmir 'in the mountains near Kuşadası' (translated from German) and inserted in the collection of Otto Stemmler (Eiselt & Baran, 1970). Radspieler & Schweiger (1990) mentioned information from a man called Tobolak in Selçuk about the occurrence in the neighbourhood of Selçuk, which is near Kuşadası. No further proof has been published yet.

There are a few unproven records from southwestern Anatolia. A specimen labeled "Cilicia - southern slopes of the Taurus Mountains" (translated from German) was bought in 1895 from H. Rolle and incorporated in the collection of the Natural History Museum in Vienna under number 13200 (Schwarz 1936). A highly doubtful sighting (commented by Franzen & Schmidtler, 1993) has been given by Manteuffel (1993) at Kargıcak, 40 km inland from Silifke. Next to above mentioned Cilicia and Kuşadası localities 'Güney Silifke' (South Silifke) is mentioned by Joger (1984), referring to Bodenheimer (1944) and Başoğlu & Baran (1980). In the quoted Bodenheimer publication there is explicitly no locality mentioned under the name Güney Silifke. Silifke is a coastal city with south of it only sea. Probably Güney Silifke was erroneously derived from the locality 'Güney Toroslar' in Başoğlu & Baran (1980), which in its turn refers to the above mentioned 'Cilicia' specimen. This doubtful part of the range is being cited regularly and un-commented, e.g. Sindaco et al. (2000) mention the province of İçel (now Mersin) in which Silifke is situated.

Also mentioned by Schwarz (1936) was an observation of *Vipera ammodytes* 'south of Konya' by mammologist G. Neuhäuser. The region 'south of Konya' coincides with the assumed find by a Turkish professional snake collector Sevki (Nilson et al. 1988). The presumed find by Garzoni at Gaziantep (Göçmen et al. 2015) is very improbable.

Besides Europe and Georgia, extralimital records of *Vipera ammodytes* outside Anatolia, like Syria/Lebanon (Boettger 1880, Boulenger 1896 & 1913, Eiselt & Baran 1970, Mertens & Wermuth 1960, Uetz & Hošek 2015) or Iran (Minton et al. 1970, Tuck 1974, Joger 1984, Stümpel & Joger 2009) and even Turkmenia/Uzbekistan (Minton et al. 1970) have to be disclaimed. See for instance Müller (1931), Werner (1939), Haas (1951), Joger (1984) and Martens (1997). Armenia is sometimes indicated as included within the distribution, but no convincing proof is known (T. Tadevosyan, pers. comm. 2015). Supposedly Azerbaijan-originated records need confirmation according to Tuniyev et al. (2009).

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