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# Evaluation of The Reptilian Fauna in Amasya Province, Turkey with New Locality Records

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**Abstract**

The present study investigated the reptilian fauna in Amasya Province, Turkey. Reptile species were identified from collections made during field studies or recorded in literature, with some new locality records obtained. Field studies were undertaken over two consecutive years (2016 and 2017). Two lacertid species, one skink species, two colubrid species and one viper species were officially recorded for the first time or their information was updated. In addition to species locality records, chorotypical and habitat selection were also assessed and the International Union for Conservation of Nature Red List of Threatened Species criteria included. Data on the distribution and locality information for each taxon is also provided. Our findings demonstrate that Amasya might be an ecotone zone between the Mediterranean, Caucasian, and European ecosystems. Although there are some concerns for the sustainable dynamics of reptilian fauna, relatively rich and different European nature information system habitat types provide basic survival conditions for reptilian fauna in the province.

## 1. INTRODUCTION

Turkey is the only country that almost entirely includes three of the world's 34 biodiversity hotspots: the Caucasus, Irano-Anatolian, and Mediterranean [1]. In the Palearctic realm, reptiles are represented by approximately 3,095 native species [2].
Owing to Turkey's unique tectonic history and its location within the Asian, European, and African continents, it contains various vegetation types, different types of geological structures, and different climatic conditions; therefore, it has a rich biological diversity. Anatolia is both a natural bridge and a barrier between Asia and Europe because of its unique geographical position. Turkey, which is at the intersection of fauna elements with many different origins, has the potential to contain nearly 129 reptile species [3-6], which is almost as rich as the entire European continent [7].

To date, there have been two main approaches for investigating reptile groups in Turkey undertaken by foreign or Turkish researchers. The first approach is to focus on the distribution of any specific species or group of species to evaluate mostly morphological examinations [8-13], ecological niche modeling [14-16], phylogeographical [17-19], or ecological studies [20-22]. The second approach is to undertake detailed surveys on the distribution of reptilian fauna in specific regions [23-25] or provinces [26-28].

Several herpetological studies have been undertaken in the Amasya Province [29-32]. However, these were not directly focused on the reptilian fauna of Amasya. A total of 15 reptile species have been

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recorded along the borders of Amasya Province from previous studies. Therefore, an overall reptilian assessment is lacking in this province. Thus, the objectives of the present study were to investigate the reptilian fauna in Amasya, and undertake chorotypical and European nature information system (EUNIS) habitat type assessments to determine species distributions.

## 2. MATERIAL AND METHODS

Field studies were performed within the borders of Amasya Province, which covers an area of 5,628 km$^2$, and is between 34°57′06″ and 36°31′53″ E longitudes and 41°04′54″ and 40°16′16″ N latitudes (Figure 1).

A total of 148 reptilian specimens were captured/observed between March 2016 and September 2017 during field studies. These specimens were identified based on the literature [3-5]. Most of the specimens were released after identification. The coordinates of all sampling points were recorded with a GPS (Garmin Etrex e-30) in UTM format. Capture methods varied depending on whether the species was aquatic or terrestrial. Aquatic species were caught by hand or a scoop net, and terrestrial species were captured by hand or with a net. Some individuals, especially the lizards, were transferred to the laboratory for identification from their pholidosis characteristics. Species conservation status was determined based on the criteria of International Union for Conservation of Nature Red List of Threatened Species (IUCN), the Bern Convention on the Conservation of European Wildlife and Natural Habitats (BERN), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Zoogeographical assessments were conducted by considering the origin of species by classifying them into major chorotypes based on the methodology described by Vigna Taglianti et al. [33] and Sindaco et al. [6]. Additionally, major habitat preferences were evaluated in terms of the European Nature Information System (EUNIS) Habitat Classification (2004) [34].

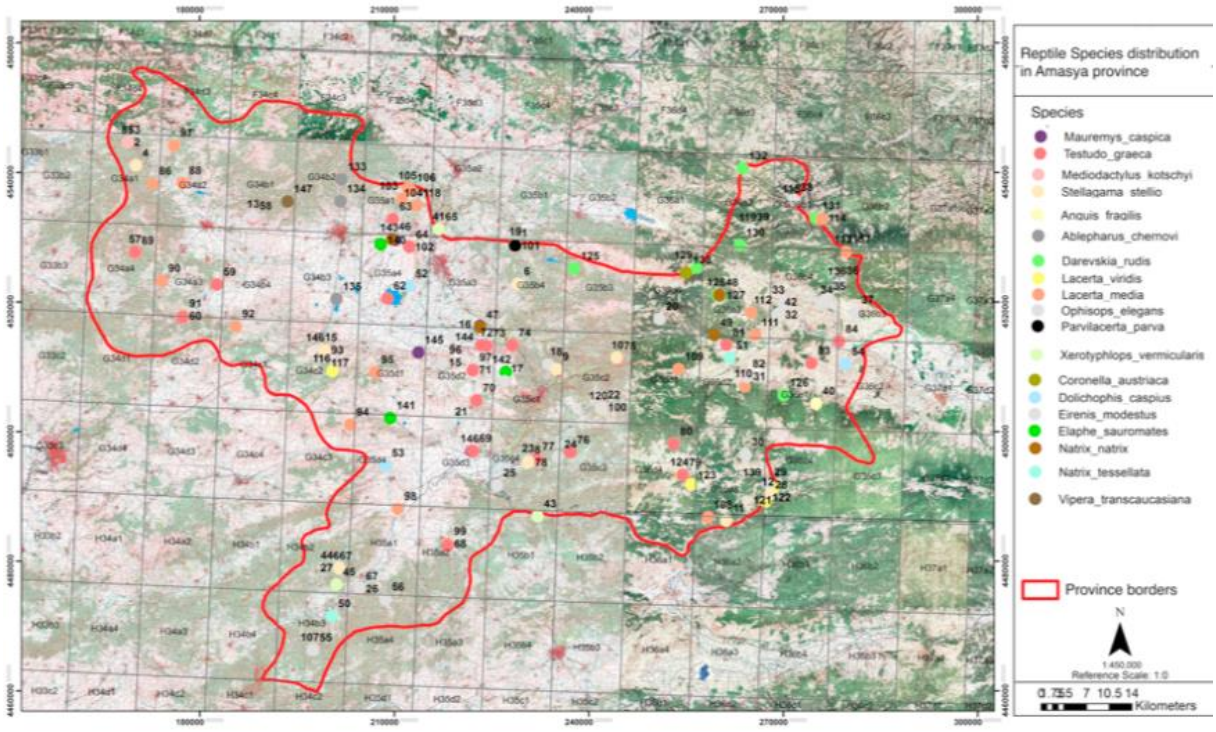


***Figure 1.*** *Reptile Species Distribution in Amasya Province (in 1:450000 scale)*
*Map of localities listed in the text. Corresponding numbers are shown in Appendix 1.*

## 3. RESULTS

Based on the results from the present study, high-density population levels were observed in *Ophisops*

*elegans*, *Lacerta media*, and *Testudo graeca*. To date, of the 22 species recorded in the province, 90.9% of the reptile species are Least Concern (LC), one of them is Vulnerable (VU, *T. graeca*), and one is Near Threatened (NT, *Vipera transcaucasiana*) based on the IUCN Red List data [35] (Table 1). Here, we also evaluated the reptilian fauna in Amasya Province based on chorotypes and EUNIS habitat classification with results as follows:

i) Chorotype: Herpetological examination of Amasya showed that the species in this area are arranged into 10 major chorotypes for reptiles, based on the classification by Vigna Taglianti et al. [33] and Sindaco et al. [6] (Table 1). The most common chorotype in the area is Turano-Mediterranean (six species), followed by E. Mediterranean and SW-Asiatic (four species each), European (two species), and E. European, Ponto-Caucasian Endemic, Armeno–Anatolian Endemic, Armeno–E Anatolian Endemic, Centralasiatic–Europeo-Mediterranean, and Centralasiatic–European (one species for each) (Figure 2).

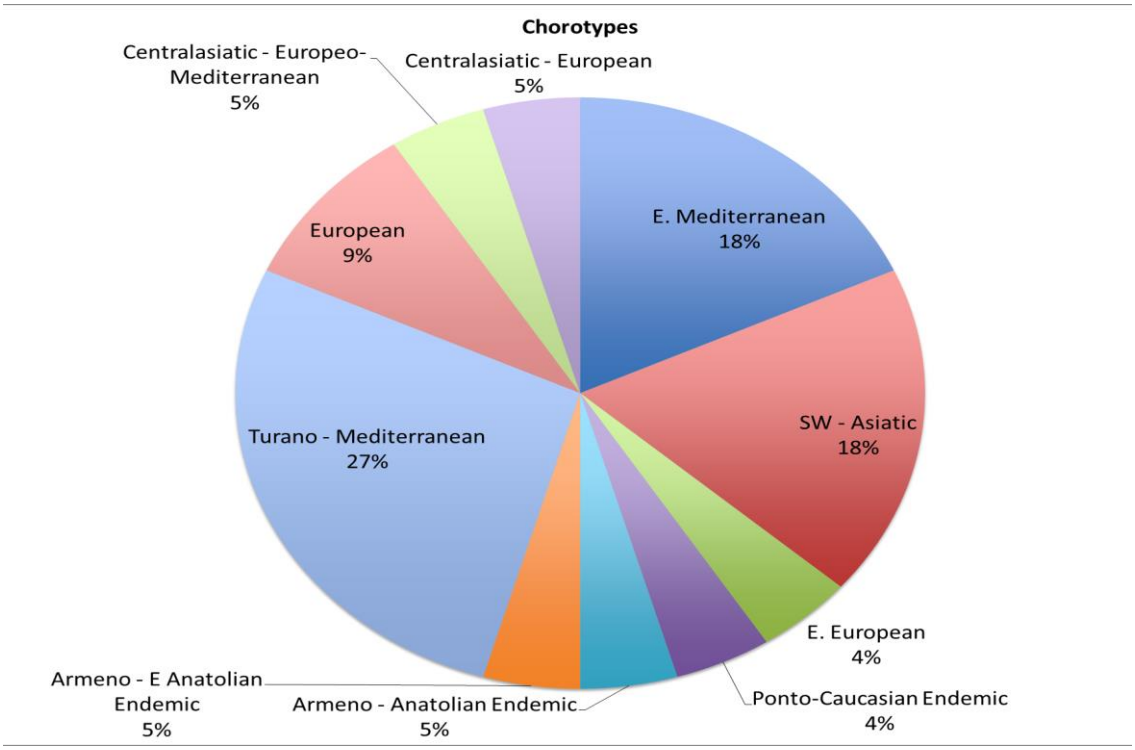


***Figure 2.*** *Chorotypes of the reptiles found in Amasya Province*

ii) EUNIS Habitat Classification: Although it is known that visiting sampling localities requires more time to detect the microhabitat selection by reptiles, we examined the main habitat preferences of these species. This regional assessment was undertaken based on the EUNIS Habitat Classification (2004) (Table 1). A total of 19 observed species were recorded from the 17 major EUNIS Habitats (the full names of habitat types are shown in Appendix 2).

***Table 1.*** *Reptile species of Amasya Province*

| **Family** | **Species** | **Common name** | **IUCN** | **CITES** | **BERN** | **Observation point** | **Chorotypes** | **EUNIS** | **Literature** |
|---|---|---|---|---|---|---|---|---|---|
| Geoemydidae | *Mauremys caspica* | Caspian turtle | LC | - | App - II | 144 – 147 | Turano - Mediterranean | C2 | Schweiger, 1994. |
| Testudinidae | *Testudo graeca* | Mediterranean Spur-thighed tortoise | VU | App - II | App - II | 57 – 84 | Turano - Mediterranean | E1&H5&FB3 | Türkozanet al. 2010 |
| Agamidae | *Stellagama stellio* | Starred agama | LC | - | App - II | 1 – 9 | E. Mediterranean | A1 | Baran et al, 1992 |
| Gekkonidae | *Mediodactylus kotschyi* | Kotschyi's gecko | LC | - | App - II | 10 | E. Mediterranean | J1.1 | Baran et al, 1992 |
| Anguidae | *Anguis fragilis* | Slowworm | LC | - | App - III | 40 | European | F.4 | Başoğlu, Baran, 1977 |
| Anguidae | *Pseudopus apodus* | European Glass lizard | LC | - | App - II | Literature | Turano - Mediterranean | can not evaluated | Başoğlu, Baran, 1977 |
| Lacertidae | *Darevskia rudis* | Spiny-tailed lizard | LC | - | App - III | 126 – 133 | Ponto-Caucasian Endemic | E2 & A1 | Böhme & Budak, 1977 |
| Lacertidae | *Lacerta viridis* | Green lizard | LC | - | App - II | 117 – 125 | E. European | E3 | The present study |
| Lacertidae | *Lacerta media* | Three-lined lizard | LC | - | App - III | 85 – 116 | SW - Asiatic | E3&D2,1 | The present study |
| Lacertidae | *Ophisops elegans* | Snake-eyed lizard | LC | - | App - II | 12 – 39 | E. Mediterranean | E1& H5 | Baran et al, 1992 |
| Lacertidae | *Parvilacerta parva* | Dwarf lizard | LC | - | App - II | 11 | Armeno – Anatolian Endemic | E2,5 | Baran et al, 1992 |
| Scincidae | *Ablepharus chernovi* | Chernov's Skink | LC | - | App - III | 134 – 138 | Armeno – E. Anatolian Endemic | E5.4&FB | This study |
| Typhlopidae | *Xerotyphlops vermicularis* | Blind snake | LC | - | App - III | 41 – 45 | Turano - Mediterranean | E1 | Başoğlu, Baran 1998, Bodenheimer 1944 |
| Colubridae | *Coronella austriaca* | Smooth snake | LC | - | App - II | 139 – 140 | European | G1 | The present study |
| Colubridae | *Dolichophis caspius* | Caspian whip snake | LC | - | App - III | 52 – 54 | Turano - Mediterranean | I1 | Baran et al, 1992 |
| Colubridae | *Dolichophis schmidti* | Schmidt's whip snake | LC | - | App - III | Literature | SW - Asiatic | can not evaluated | Başoğlu, Baran 1998, Göçmen et al. 2013 |

***Table 1.*** *Reptile species of Amasya Province* (continued)

| **Family** | **Species** | **Common name** | **IUCN** | **CITES** | **BERN** | **Observation point** | **Chorotypes** | **EUNIS** | **Literature** |
|---|---|---|---|---|---|---|---|---|---|
| Colubridae | *Eirenis modestus* | Anatolian dwarf racer | LC | - | App - III | 55 – 56 | SW - Asiatic | E7 | Başoğlu, Baran 1998, Göçmen et al. 2013 |
| Colubridae | *Elaphe sauromates* | East-Four-Lined rat snake | LC | | App - III | 141 – 143 | Turano - Mediterranean | I1 | The present study |
| Colubridae | *Natrix natrix* | Grass snake | LC | - | App - III | 46 – 49 | Centralasiatic - Europeo-Mediterranean | C1.1 &C2 | Baran et al, 1992 |
| Colubridae | *Natrix tessellata* | Dice snake | LC | - | App - II | 50 – 51 | Centralasiatic - European | C1.1 | Baran et al, 1992 |
| Colubridae | *Zamenis hohenackeri* | Transcaucasian rat snake | LC | - | App - III | Literature | SW - Asiatic | can not evaluated | Bodenheimer 1944, Başoğlu, Baran 1998 |
| Viperidae | *Vipera transcaucasiana* | Transcaucasian Long-nosed Viper | NT | - | App - II | 148 | E. Mediterranean | E5.4 | The present study |

*Mauremys caspica* (Gmelin, 1774)

It was firstly recorded in Amasya by Schweiger in 1994, but the localities were not certain [36]. Here we announced the exact localities of the species from Çayır (Merzifon), Eraslan (Suluova) and Yıldızköy (city center) villages. Although the species IUCN status is "LC" (Least Concerned), exploring the new populations of the species is important because landscape alteration, pollution and intensification of water management threat over this species [37].

*Testudo graeca* Linnaeus 1758

Specimens of this species were seen often, with miscellaneous inland habitats with very sparse vegetation providing suitable conditions for them.

*Mediodactylus kotschyi* (Steindachner, 1870)

Baran et al. [29] recorded *M. kotschyi* from Amasya city center. In the present study, we found this species in abandoned buildings in Kutluca village (Gümüşhacıköy).

*Stellagama stellio* (Linnaeus, 1758)

Consistent with previous records [29], we observed *S. stellio* in new localities containing rocky habitats, such as Ziyaret (city center), Çengelkıyı (city center), İlyas (city center), Çiğdemlik (city center), and Alan (Göynücek), Eğribük (Suluova), Bayat (Merzifon), and Güvenözü (Gümüşhacıköy) villages.

*Anguis fragilis* Linnaeus, 1758

The slowworm is narrowly localized in the eastern part of the province. Especially, shrub heathland habitats are suitable for them. The bush residues play a shelter role in the beginning of spring for this species. Agricultural activities that start with spring season cause an important loss of its microhabitats by removing these bush residues.

*Ablepharus chernovi* Darevsky, 1953

This slow worm lizard was localized to the eastern part of the province, especially in shrub heathland habitats. Bush residues provide shelter during the beginning of spring for this species. Agricultural activities that begin during the spring season cause important losses of these microhabitats by removal of these bush residues.

*Darevskia rudis* (Bedriaga, 1886)

This species was found in mesic grasslands and rocky habitats, especially in the northern part of the province as recorded previously [38].

*Lacerta viridis* (Laurenti, 1768)

*L. viridis* was officially recorded for the first time within the borders of Amasya Province and was observed in various locations in grasslands (especially bushes).

*Lacerta media* Lantz & Cyrén, 1920

When the species distribution was examined, records of *L. media* were updated from various locations in Amasya and was considered a subspecies previously described by Baran et al. [29].

*Ophisops elegans* Ménétries, 1832

This species was the most abundant reptile in the province and usually inhabited miscellaneous inland habitats containing very sparse vegetation.

*Parvilacerta parva* (Boulenger, 1887)

This species inhabited upland steppe areas with sparse vegetation and stony substrates. We only recorded it in the east section where the altitude (> 1,000 m asl) was higher than that of the province average (411 m asl).

*Xerotyphlops vermicularis* (Merrem, 1820)

Bodenheimer [31] recorded *X. vermicularis* in Amasya 73 years ago. We re-discovered this blind snake species in Karayakup and Gökçeli (Göynücek) and in Kızoğlu (city center) villages in Amasya.

*Coronella austriaca* Laurenti, 1768

*C. austriaca* is usually found in moorland, rocky coastlines, open woodland (deciduous, coniferous, and mixed) and scrubland, hedgerows, woodland edges, and heathland and was recorded in two locations for the first time during the present study. One specimen was captured in Kavaloluğu village (Taşova), which contains coniferous open woodlands and the other was recorded from Umuk village (city center) where heathlands are located.

*Elaphe sauromates* (Pallas, 1811)

*E. sauromates* was another snake species collected, which was the first recording in Amasya. The specimens were recorded in Gökçebağ (Merzifon) and Bağlarüstü (city center) villages. Although the species is non-venomous and is beneficial to farmers owing to their rodent hunting ability, individuals have been killed in the past because of misbelief surrounding them in agricultural areas.

*Eirenis modestus* Martin, 1838

The specimens of this species were found under stones in sparsely wooded grasslands. Our records contribute to an increase in the province level information provided by previous studies regarding this species [30].

*Dolichophis caspius* (Gmelin, 1789)

*D. caspius* was recorded in agricultural areas, close to Umutlu village (Taşova) and Yedikır (Suluova). The morphology of the specimens were the same as that from other records. The previous record of this species in Amasya was from Doğantepe village [29].

*Natrix natrix* (Linnaeus, 1758)

The morphological characters of the examined specimens of this species were the same as that contained in the literature. The biotopes of this snake species are oligotrophic lakes and ponds.

*Natrix tessellata* (Laurenti, 1768)

Although this species is widespread within Turkey, records from the central and inner Black Sea region are still lacking, even if it was emphasized in the study by Baran et al. [29]. We detected the species only in two localities. Therefore, focus on this area is essential.

*Vipera transcaucasiana* Boulenger, 1913

*V. transcaucasiana* was recorded for the first time in Amasya. Mülder [39] reviewed the distribution of this species in Anatolia. Therefore, this locality record contributes to filling the gaps between Tokat and Samsun.

One lizard (*Pseudopus apodus* (Pallas, 1775)) and two snake species (*Dolichophis schmidti* (Nikolsky, 1909)) and *Zamenis hohenackeri* (Strauch, 1873)) shown in Table 1 were recorded in the Amasya Province in previous studies [29,30]; however, we did not obtain any samples of these species during the present study.

## 4. CONCLUSION

Faunistic studies in Turkey are mostly associated with the revision of a species or genus [8-22]. However, detailed faunistic studies that include reptiles in a province have been increasing over the last two decades [23-28, 40]. Unfortunately, there is no faunistic study that comprises only those fauna found in Amasya Province. To date, the most detailed study involving this location has been conducted in 30 different localities in the Western and Central Black Sea region [29-32].
The chorotype assessment provides information to obtain reliable biodiversity data [33]. Additionally, Amasya is located in the valley between Yeşilırmak and the Middle Black Sea (Canik) Mountains. Yeşilırmak River is an important factor for the formation of biodiversity from inner Anatolia. Owing to these geographical patterns, Amasya can be considered a transition zone between Central, Northern, and Eastern Anatolia, and possesses various zoogeographical elements, which contribute to the biodiversity of Anatolia [41].

When the contribution from the Turano-Mediterranean (27%) and E. Mediterranean (18%) elements to the province's reptile fauna are considered, Amasya is an ecotone between Mediterranean, Caucasian, and European ecosystems. This province comprises 16.4% of all reptile species in Turkey. Additionally, the origins of these species are from 10 different geographies based on chorotyping.

Based on EUNIS habitat types, the preferred habitat for reptiles in Amasya is dry grasslands (three species). Grassland-based habitats (as a total of six different habitat types) are the most suitable habitats for reptiles in Amasya (35.3%). Moreover, nine EUNIS major habitats hosted only one reptile species. Therefore, there is a relatively rich habitat diversity for reptiles throughout Amasya Province.

In conclusion, the present study is the first long-term study of reptiles in Amasya. A total of 22 reptile species records were evaluated. *Lacerta* species (*L. media* and *L. viridis*) and *Ablepharus chernovi* records were updated based on their subspecies/species status. *C. austriaca* and *E. sauromates*, have wide geographical distribution throughout Turkey; however, official records were provided in the present study. Because the geographical distribution of the nose-horned viper (*V. transcaucasiana*) is in North Anatolia, the locality record in the given geography will contribute to the actual species distribution map. Conversely, it was determined that the presence of some species referenced by previous literature in the city was doubtful and some species showed wider distributions than previously thought. For this reason, the findings from the present study will be a useful guide for future studies on the conservation studies of these reptiles and their usage of the sustainable areas in the province.

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## CONFLICTS OF INTEREST

No conflict of interest was declared by the authors.

## REFERENCES

[1] Mittermeier, R.A., Gil, P.R., Hoffmann, M., Pilgrim, J., Brooks, T., Mittelmeier, C.G., Lamoreux, J., da Fonseca, G.A.B., "Hotspots Revisited. Earth's Biologically Richest and Most Endangered Terrestrial Ecoregions", Cemex, SA, Agrupación Sierra Madre, SC, (2004).

[2] Uetz, P., http://www.reptile-database.org/db-info/diversity.html, updated, (2015).

[3] Başoğlu, M. & Baran, İ., "Türkiye Sürüngenleri Kısım I: Kaplumbağa ve Kertenkeleler", İlker Matbaası. İzmir, (1977).

[4] Başoğlu, M. & Baran, İ., "Türkiye Sürüngenleri Kısım II: Yılanlar", Ege Üniversitesi Basımevi, İzmir, (1998).

[5] Baran, İ., Ilgaz, Ç., Avcı, A., Kumlutaş, Y., Olgun, K., "Türkiye Amfibi ve Sürüngenleri", TÜBİTAK Popüler Bilim Kitapları, (2012).

[6] Sindaco, R., Venchi, A., Carpaneto, G.M., Bologna, M.A., "The reptiles of Anatolia: a checklist and zoogeographical analysis". Biogeographia, 21, 441-554, (2000).

[7] Gasc J. P., Cabela A., Crnobrnja-Isailovic J., Dolmen D., Grossenbacher K., Haffner P., Lescure J., Martens H., Martínez Rica J.P., Maurin H., Oliveira M.E., Sofianidou T.S., Veith M. & Zuiderwijk A., "Atlas of Amphibians and Reptiles in Europe". Collection Patrimoines Naturels, 29, Societas Europaea Herpetologica, Muséum National d'Histoire Naturelle & Service du Petrimone Naturel. Paris,(1997).

[8] Eiselt, J., Baran, İ.: "Ergebnisse zoologischer Sammelreisen in der Türkei: Viperidae. Annalen des Naturhistorischen Museums", Wien 74: 357-369, (1970).

[9] Baran İ., Kumlutaş Y., Ilgaz Ç., Iret F. "Geographical distributions and taxonomical states of *Telescopus fallax* (Fleischman, 1831) and *Vipera barani* Böhme and Joger, 1983" Turkish Journal of Zoology, 29: 217–224, (2005).

[10] Cevik, E., Başkale, E., Kaya, U., Turgay, F. "Taxonomic status of some *Lacerta danfordi* (Günther, 1876) populations", 13 (2), Russian Journal of Herpetology, 89-92, (2006).

[11] Avcı A., Ilgaz Ç., Baskaya S., Baran İ., Kumlutas Y. "Contribution to the distribution and morphology of *Pelias darevskii* (Vedmederja, Orlov et Tuniyev 1986) (Reptilia: Squamata: Viperidae) in northeastern Anatolia". Russian Journal of Herpetology, 17: 1–7, (2010).

[12] Afsar, M., Çiçek, K., Dinçarslan, Y.E., Ayaz, D., Tok, C.V. : "New record localities of five snake species in Turkey". Herpetozoa 25 (3/4): 179-183, (2013).

[13] Göçmen B., Mebert K., Iğci N., Akman B., Yıldız M. Z., Oğuz M. A., Altın Ç. "New locality records for four rare species of vipers (Reptilia: Viperidae) in Turkey" Zoology in the Middle East, 60: 306–313, (2014).

[14] Fattahi, R., Ficetola, G.F., Rastegar-Pouyani, N., Avci, A., Kumlutas, Y., Ilgaz C. & Yousefkhani, S.S.H. "Modelling the potential distribution of the Bridled Skink, *Trachylepis vittata* (Olivier, 1804) in the Middle East", Zoology in the Middle East, 60:3, 208-216, (2014).

[15] Gul, S. "Potential Distribution Modeling and Morphology of *Pelias barani* (Böhme and Joger, 1983) in Turkey", Asian Herpetological Research, 6(3): 206–212, (2015).

[16] Afsar, M., Cicek, K., Tayhan, Y. and Tok, C.V., "New records of Eurasian Blind Snake, *Xerotyphlops vermicularis* (Merrem, 1820) from the Black Sea region of Turkey and its updated distribution", Biharean Biologist 10 (2): 98-103, (2016).

[17] Kornilios, P., Ilgaz, C., Kumlutas, Y., Giokas, S., Fraguedakis-Tsolis, S., Chondropoulos, B.: "The role of Anatolian refugia in herpetofaunal diversity: an mtDNA analysis of *Typhlops vermicularis* Merrem, 1820 (Squamata, Typhlopidae)" Amphibia-Reptilia 32: 351–363, (2011).

[18] Kapli P., Botoni D., Ilgaz Ç., Kumlutaş Y., Avcı A., Rastegar- Pouyani N., Fathinia B., Lymberakis P., Ahmadzadeh F., Poulakakis N. "Molecular phylogeny and historical biogeography of the Anatolian lizard *Apathya* (Squamata, Lacertidae)". Molecular Phylogenetics and Evolution, 66: 992–1001, (2013).

[19] Sindaco R., Panagiotis K., Roberto S., Petros L. "Taxonomic reassessment of *Blanus strauchi* (Bedriaga, 1884) (Squamata: Amphisbaenia: Blanidae), with the description of a new species from south-east Anatolia (Turkey)" Zootaxa, 3795: 311–326, (2014).

[20] Cicek, K., Tok, C.V., Hayretdag, S., Ayaz, D., "Data on the Food Composition of European Glass Lizard, *Pseudopus apodus* (Pallas, 1775) (Squamata: Anguidae) from Çanakkale (Western Anatolia, Turkey)", Acta Zoologica Bulgarica, 66 (3), 433-436, (2014).

[21] Gocmen, B., Mulder, J., Karis, M., Oguz, M.A., "The poorly known Anatolian Meadow Viper, *Vipera anatolica*: new morphological and ecological data", Herpetologica Romanica 8, 1-10, (2014).

[22] Jablonski, D., Zerzan, D., Cicek, K., "Scorpions as a prey for Ottoman viper, *Montivipera xanthina*: the first record from southwestern Anatolia, Turkey", Biharean Biologist 9 (1): 78-79, (2015).

[23] Kumlutaş Y. "Karadeniz Bölgesi *Lacerta viridis* (Sauria: Lacertidae) populasyonları üzerinde taksonomik araştırmalar" [in Turkish] Turkish Journal of Zoology, 20: 223-247, (1996).

[24] Katılmış, Y., Urhan, R., Kaska, Y., Ekiz, A.N., Başkale, E. : "Honaz Dağı Milli Parkı (Denizli)'nın Herpetofaunası". pp. 548-551. In: Türkiye Dağları I. Ulusal Sempozyumu, Ilgaz Dağı, 25-27 June 2002,in Turkish, (2002).

[25] Kumlutas, Y., Öz, M., Durmus, H., Tunç, M. R., Özdemir, A., & Dusen, S.: "On some lizard species of the Western Taurus Range". Turkish Journal of Zoology, *28*, 225–236, (2004).

[26] Baran, İ., Kumlutaş, Y., Olgun, K., Ilgaz, Ç., Kaska, Y.: "The herpetofauna of the vicinity of Silifke" Turkish Journal of Zoology 25: 245– 249, (2001).

[27] Tok, C.V., Çiçek, K.: "Amphibians and reptiles in the Province of Çanakkale (Marmara Region, Turkey) (Amphibia; Reptilia)" Herpetozoa 27 (1/2): 65-76, (2014).

[28] Kumlutas, Y., Ilgaz, C., Yakar, O., "Herpetofauna of Karabük Province", Acta Biologica Turcica, 30 (4), 102-107, (2017).

[29] Baran, İ., Yılmaz, İ., Kete, R., Kumlutaş, Y., Durmuş, H., "Batı ve Orta Karadeniz Bölgesinin Herpetofaunası", Turkish Journal of Zoology, (16), 275 – 288, (1992).

[30] Göçmen, B., İğci, N., Akman, B., Oğuz M.A., "New Locality Records of Snakes (Ophidia: Colubridae: Dolichophis, Eirenis) in Eastern Anatolia", North-Western Journal of Zoology 9 (2): 276-283, (2013).

[31] Bodenheimer, F. S. "Introduction into the knowledge of the Amphibia and Reptilia of Turkey", - Istanbul Üniv. Fen Fakültesi Mecmuası, Ser. B, 9: 1-78, (1944).

[32] Türkozan, O., Kiremit, F., Parham, J.F., Olgun, K., Taşkavak, E., "A quantitative reassessment of morphology-based taxonomic schemes for Turkish tortoises (*Testudo graeca*)", Amphibia – Reptilia, 31: 69-83, (2010).

[33] Vigna Taglianti, A., Audisia, P., Biondi, M., Bologna, M.A., Carpaneto, G.M., De Biase, A., Fattorini, S., Piattelia, E., Sindaco, R., Venchi, A. and Zapporoli, M. "A proposal for a chorotype classification of the Near East fauna, in the framework of the Western Palearctic region", Biogeographia, 20: 31–59, (1999).

[34] Davies, C.E., Moss, D., Hill, M.O., "EUNIS Habitat Classification Revised 2004", European Topic Centre on Nature Protection and Biodiversity, Paris, (2004).

[35] IUCN. "The IUCN Red List of Threatened Species", Version 2017-3. Online http://www.iucnredlist.org. Downloaded on 22 December, (2017).

[36] Schweiger, M., Erganzende Bemerkungen zur Verbreitung von Mauremys caspica (Gmelin, 1774) in Kleinasien. Herpetozoa, Wien 7(1/2):67–70, (1994).

[37] Vamberger, M., Stuckas, H., Ayaz, D., Gracia, E., Aloufi, A.A., Els, J., Mazanaeva, L.F., Kami, H.G., Fritz, U., "Conservation genetics and phylogeography of the poorly known Middle Eastern terrapin *Mauremys caspica* (Testudines: Geoemydidae)", Organisms Diversity & Evolution, 13: 77, (2013).

[38] Böhme, W., Budak, A., "Über die rudis-Gruppe des *Lacerta saxicola* Komplexes in der Türkei, II (Reptilia: Sauria: Lacertidae)". Salamandra, 13, 3/4, 141-149 Frankfurt, (1977).

[39] Mülder, J., "A review of the distribution of Vipera ammodytes transcaucasiana Boulenger, 1913 (Serpentes: Viperidae) in Turkey", Biharean Biologist, 11 (1): 23-26, (2017).

[40] Sevgili, H., Karataş, A., Candan, O., "Biodiversity in Urban environments of Ordu City and Nearby Areas: Mammals, Birds, Reptiles and Amphibians", Hacettepe Journal of Biology and Chemistry, 44 (1), 47–63, (2016).

[41] Venchi A., Sindaco R. "Annotated checklist of the reptiles of the Mediterranean countries, with keys to species identification, Part 2 – Snakes (Reptilia, Serpentes)". Annali del Museo civico di storia naturale., 98: 259-364, (2006).

***Appendix 1*** *Station numbers and coordinates*

| Station Numbers | UTM Zone | N | E |
|---|---|---|---|
| 1 | 36T | 741931 | 4508647 |
| 2 | 36T | 710696 | 4475899 |
| 3 | 36T | 734968 | 4521449 |
| 4 | 36T | 706139 | 4509138 |
| 5 | 37T | 261224 | 4486189 |
| 6 | 37T | 267764 | 4490089 |
| 7 | 36T | 738651 | 4494183 |
| 8 | 36T | 751257 | 4511106 |
| 9 | 36T | 675210 | 4535659 |
| 10 | 36T | 673665 | 4539144 |
| 11 | 36T | 734357 | 4527366 |
| 12 | 36T | 740626 | 4509365 |
| 13 | 37T | 250924 | 4517259 |
| 14 | 37T | 281113 | 4518124 |
| 15 | 36T | 693733 | 4528842 |
| 16 | 37T | 265031 | 4531046 |
| 17 | 37T | 269288 | 4517922 |
| 18 | 37T | 276045 | 4519802 |
| 19 | 37T | 278731 | 4522703 |
| 20 | 37T | 264408 | 4508320 |
| 21 | 37T | 264183 | 4496391 |
| 22 | 36T | 710696 | 4475899 |
| 23 | 36T | 714017 | 4472878 |
| 24 | 36T | 706139 | 4509138 |
| 25 | 37T | 267649 | 4491657 |
| 26 | 37T | 267764 | 4490089 |
| 27 | 37T | 271683 | 4535433 |
| 28 | 36T | 724346 | 4508426 |
| 29 | 36T | 738651 | 4494183 |
| 30 | 36T | 743173 | 4495057 |
| 31 | 36T | 749307 | 4503204 |
| 32 | 36T | 734170 | 4506215 |
| 33 | 36T | 734108 | 4490052 |
| 34 | 36T | 740626 | 4509365 |
| 35 | 37T | 270186 | 4519678 |
| 36 | 37T | 276702 | 4520282 |
| 37 | 36T | 726004 | 4498957 |
| 38 | 36T | 739031 | 4512911 |
| 39 | 36T | 722125 | 4529154 |
| 40 | 37T | 275098 | 4504235 |
| 41 | 37T | 269288 | 4517922 |
| 42 | 36T | 710245 | 4473170 |
| 43 | 36T | 710696 | 4475899 |
| 44 | 36T | 740590 | 4485865 |
| 45 | 36T | 722341 | 4529101 |
| 46 | 36T | 715808 | 4526922 |
| 47 | 37T | 259449 | 4514805 |
| 48 | 36T | 729784 | 4514622 |
| 49 | 37T | 260301 | 4520902 |
| 50 | 36T | 710055 | 4468340 |
| 51 | 37T | 261793 | 4511142 |
| 52 | 37T | 279705 | 4510485 |
| 53 | 36T | 716542 | 4492259 |
| 54 | 36T | 718583 | 4519997 |
| 55 | 36T | 707546 | 4463015 |
| 56 | 36T | 718124 | 4471546 |
| 57 | 36T | 745033 | 4496089 |
| 58 | 36T | 739719 | 4494808 |
| 59 | 37T | 274371 | 4510453 |
| 60 | 36T | 715124 | 4517847 |
| 61 | 36T | 693733 | 4528842 |
| 62 | 37T | 264408 | 4508320 |
| 63 | 36T | 710696 | 4475899 |
| 64 | 36T | 714017 | 4472878 |
| 65 | 36T | 727153 | 4480466 |
| 66 | 36T | 706139 | 4509138 |
| 67 | 36T | 718064 | 4525944 |
| 68 | 36T | 715272 | 4529997 |
| 69 | 37T | 278664 | 4513850 |
| 70 | 36T | 722341 | 4529101 |
| 71 | 36T | 731043 | 4511642 |
| 72 | 36T | 729128 | 4507707 |
| 73 | 36T | 729912 | 4503142 |
| 74 | 36T | 729855 | 4495250 |
| 75 | 36T | 738651 | 4494183 |
| 76 | 37T | 254383 | 4493248 |
| 77 | 37T | 253083 | 4497970 |
| 78 | 36T | 751257 | 4511106 |
| 79 | 36T | 734918 | 4511960 |
| 80 | 37T | 261314 | 4513259 |
| 81 | 36T | 683991 | 4512862 |
| 82 | 36T | 688793 | 4518103 |
| 83 | 36T | 675901 | 4522253 |
| 84 | 36T | 730186 | 4511661 |
| 85 | 37T | 264137 | 4506898 |

| Station Numbers | UTM Zone | N | E |
|---|---|---|---|
| 86 | 36T | 673665 | 4539144 |
| 87 | 36T | 680824 | 4539123 |
| 88 | 36T | 682696 | 4533500 |
| 89 | 37T | 279692 | 4527654 |
| 90 | 36T | 707546 | 4463015 |
| 91 | 36T | 727153 | 4480466 |
| 92 | 36T | 734357 | 4527366 |
| 93 | 36T | 692333 | 4512136 |
| 94 | 36T | 706139 | 4509138 |
| 95 | 36T | 710890 | 4498097 |
| 96 | 36T | 718765 | 4532465 |
| 97 | 36T | 717286 | 4535054 |
| 98 | 36T | 718064 | 4525944 |
| 99 | 37T | 261224 | 4486189 |
| 100 | 37T | 258474 | 4486654 |
| 101 | 37T | 276036 | 4532683 |
| 102 | 37T | 271683 | 4535433 |
| 103 | 36T | 724346 | 4508426 |
| 104 | 36T | 729128 | 4507707 |
| 105 | 36T | 749307 | 4503204 |
| 106 | 37T | 253879 | 4509470 |
| 107 | 37T | 265083 | 4518223 |
| 108 | 36T | 683991 | 4512862 |
| 109 | 36T | 680480 | 4517913 |
| 110 | 36T | 675901 | 4522253 |
| 111 | 36T | 677937 | 4533035 |
| 112 | 37T | 265702 | 4514784 |
| 113 | 36T | 714276 | 4506208 |
| 114 | 36T | 717698 | 4534770 |
| 115 | 36T | 713808 | 4493353 |
| 116 | 36T | 716498 | 4533394 |
| 117 | 37T | 265031 | 4531046 |
| 118 | 36T | 706139 | 4509138 |
| 119 | 36T | 707551 | 4506117 |
| 120 | 36T | 718765 | 4532465 |
| 121 | 37T | 255814 | 4491827 |
| 122 | 37T | 254383 | 4493248 |
| 123 | 36T | 749307 | 4503204 |
| 124 | 37T | 268547 | 4491292 |
| 125 | 37T | 267331 | 4489127 |
| 126 | 37T | 260301 | 4520902 |
| 127 | 36T | 677500 | 4541017 |
| 128 | 37T | 275020 | 4532853 |

| Station Numbers | UTM Zone | N | E |
|---|---|---|---|
| 129 | 37T | 262754 | 4529226 |
| 130 | 37T | 263328 | 4528702 |
| 131 | 37T | 270077 | 4505519 |
| 132 | 36T | 743703 | 4524445 |
| 133 | 37T | 259850 | 4521019 |
| 134 | 36T | 706921 | 4535700 |
| 135 | 37T | 275020 | 4532853 |
| 136 | 37T | 269288 | 4517922 |
| 137 | 37T | 278731 | 4522703 |
| 138 | 37T | 279692 | 4527654 |
| 139 | 36T | 761913 | 4529693 |
| 140 | 37T | 267649 | 4491657 |
| 141 | 36T | 713676 | 4526129 |
| 142 | 36T | 734255 | 4507785 |
| 143 | 36T | 716967 | 4499504 |
| 144 | 36T | 715808 | 4526922 |
| 145 | 36T | 720598 | 4509876 |
| 146 | 36T | 729855 | 4495250 |
| 147 | 36T | 729784 | 4514622 |
| 148 | 36T | 698882 | 4531729 |

***Appendix 2.*** *Major EUNIS Habitats for reptile species in Amasya province*

| Species | EUNIS Code | EUNIS Habitat Name |
|---|---|---|
| *Stellagama stellio* | A1 | Littoral rock and other hard substrata |
| *Ophisops elegans* | E1& H5 | Dry grasslands &Miscellaneous inland habitats with very sparse or no vegetation |
| *Mediodactylus kotschyi* | J1.1 | Residential buildings of city and town centres |
| *Parvilacerta parva* | E2,5 | Meadows of the steppe zone |
| *Anguis fragilis* | F.4 | Temperate shrub heathland |
| *Xerotyphlops vermicularis* | E1 | Dry grasslands |
| *Natrix natrix* | C1.1 &C2 | Permanent oligotrophic lakes, ponds and pools &Surface running waters |
| *Natrix tessellata* | C1.1 | Permanent oligotrophic lakes, ponds and pools |
| *Dolichophis caspius* | I1 | Arable land and market gardens |
| *Eirenis modestus* | E7 | Sparsely wooded grasslands |
| *Testudo graeca* | E1&H5&FB3 | Dry grasslands &Miscellaneous inland habitats with very sparse or no vegetation &Shrub plantations for ornamental purposes or for fruit other then vineyards |
| *Lacerta media* | E3&D2,1 | Valley mires &Seasonally wet and wet grasslands |
| *Lacerta viridis* | E3 | Seasonally wet and wet grasslands |
| *Darevskia rudis* | E2 & A1 | Mesic grasslands & Littoral rock and other hard substrata |
| *Ablepharus chernovi* | E5.4&FB | Moist or wet tall-herb and fern fringes and meadows&Shrub Plantations |
| *Coronella austriaca* | G1 | Broadleaved deciduous woodland |
| *Elaphe sauromates* | I1 | Arable land and market gardens |
| *Mauremys caspica* | C2 | Surface running waters |
| *Vipera transcaucasiana* | E5.4 | Moist or wet tall-herb and fern fringes and meadows |