

New distributional data on *Vipera (berus) barani* from Western and Northeastern Anatolia

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Ever again, it is surprising how time changes the perception of vertebrate species even in relatively well structured and widely inhabited country and regions. The recognition, rediscovery, description and finally the accumulation of new records to realize the wide distribution of the endemic Baran's Viper or Baran's Adder, *Vipera barani* (Böhme & Joger 1984), in Turkey is such a case. Morphological and genetic methods showed its close proximity to *V. berus nikolskii* and together with *V. berus bosniensis* and the alpine clade of *V. berus* they form the group of "southern relicts" of *V. berus* (Joger et al., 2007). Herein, we demonstrate the quick history and the current knowledge of the countrywide distribution of Baran's Adder, supplemented by several new records.

Werner (1914) was the first to mention the existence of an adder-like (*Vipera berus*) viper in Turkey with a patterned specimen resembling this species collected by Bodemeyer senior in the Sapanca area, province Sakarya, about 100 km southeast of Istanbul. This specimen was deposited at the Natural History Museum of Vienna, but was subsequently lost. Subsequently, Bodemeyer's son reported of another specimen found, but not preserved, from the same area (Bodemeyer, 1927). The locality of these two specimens can be traced back to the northern versant of the Gökdağ mountain range, just south of Sapanca (Franzen & Heckes, 2000). An unverified third-source report of Baran's Adder (labelled as *V. aspis balcanica*) from 1912, cit. in Bodenheimer (1944),

may indicate the historical occurrence at Anadoluhissar near Istanbul. It took almost 70 years for the next signs of the presence of an adder-like viper in Turkey, when Böhme & Joger (1984) described *Vipera barani* based on the only specimen of three melanistic vipers provided by K. Gutsche, which were sampled by locals in 1981 north of Adapazarı, province Sakarya. The terra typica given as 60 km north of Adapazarı must be wrong, as such distance would place the holotype far into the Black Sea. However, there are various forested hills in the 40 km stretch between Adapazarı and the Black Sea coast, which possibly can provide suitable habitats for populations of *V. barani*. It required more than 10 years for the next publications about new *V. (berus) barani* findings, as one normal coloured and three melanistic specimens were confiscated from a private snake collector by the Turkish customs authorities (Joger et al., 1997). Their origin indicated as Silifke, Province Mersin, was doubted by Baran et al. (2001, 2005), as such location in southern Anatolia represents an unsuitable hot and dry region for adder-like vipers. It may have been intentionally labelled wrong by the snake collector for his personal use (to disguise his activities, protecting his locality from other collectors).

Around the same period, a first specimen of *V. (berus) barani* (erroneously labelled as *Vipera pontica*) from northeastern Turkey was published by Baran et al. (1997) and Baran & Atatür (1998) from the humid Black Sea region near Çamlıhemşin, Firtina Valley, Rize province. Up to now, numerous new accounts from the Black Sea versant of northeastern Turkey between Terme, Samsun prov. and Ardeşen, Rize prov., followed as full publication in print (Franzen & Heckes, 2000; Kutrup, 2003; Avci et al., 2004; David & Vogel, 2010; Kumlutas et al., 2013; Mebert et al., 2014, 2015; Gül 2015) or as photographic and text documents online (e.g., turkherptil.org, and J. Mulder in kingsnake.com/viperidae/account/baran.htm). The

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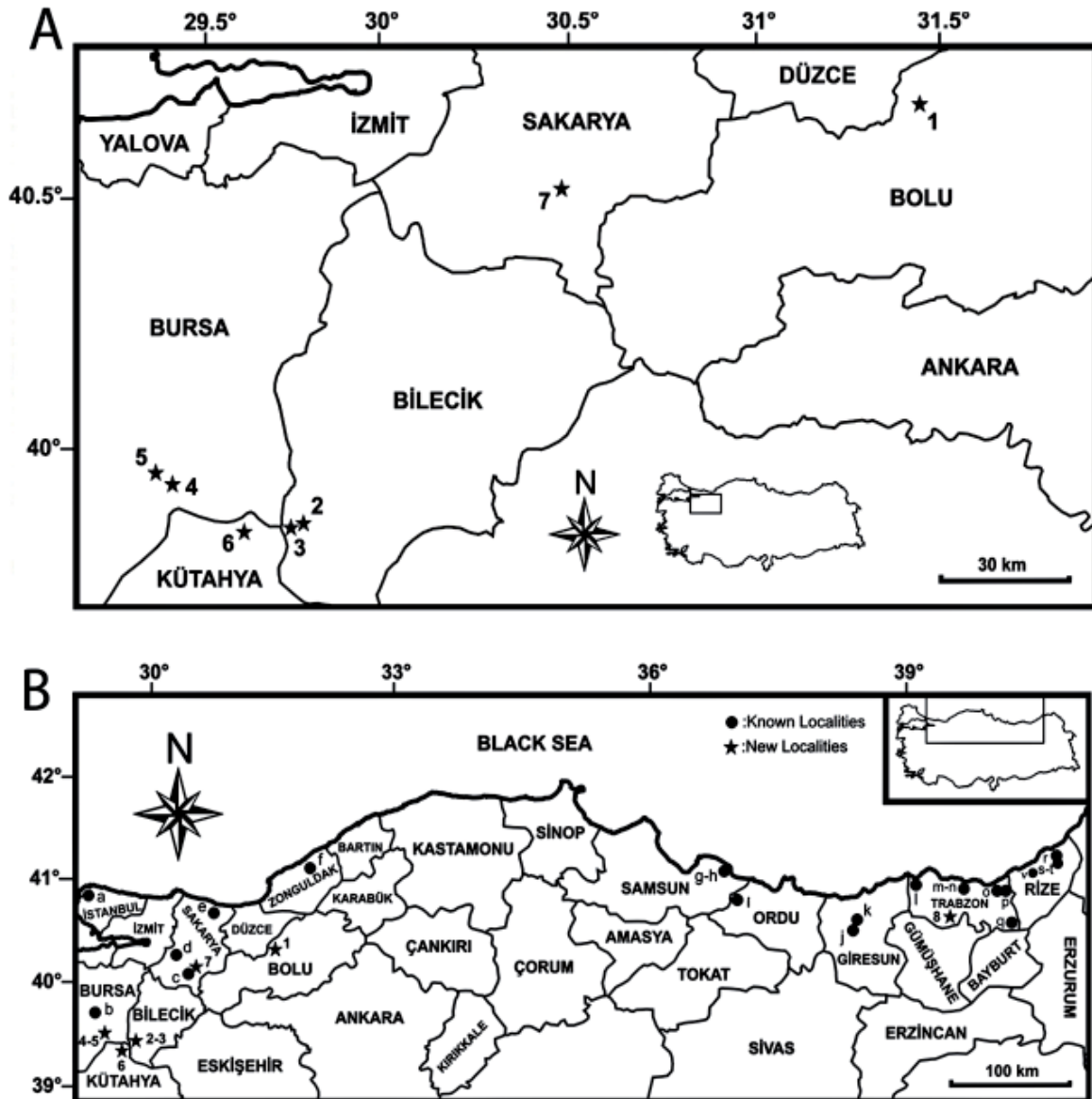


Figure 1. Distribution of Baran's Adder [*Vipera (berus) barani*] in Turkey. Some records may be displaced by up to a few km, if no exact locality information has been given in respective references or cross-validation with habitat was insufficient. Provinces pertinent to each listed locality are labeled in the map.

A: New localities from Western Anatolia: (1) Ömerler, Bolu Merkez; (2) Sofular Plateau, Camiliyayla, Bozüyük; (3) Kömürsu Plateau, Camiliyayla, Bozüyük; (4) Sarıçayır Plateau, Çayyaka, İnegöl; (5) Boğazova Plateau, Çayyaka, İnegöl; (6) Fındık Plateau, Durabey, Domaniç; (7) Kuru, Geyve; and (8, in Fig. 1B) Altındere, Maçka, from Northeastern Anatolia.

B: All currently known localities. (a) Anadoluhisar, Beykoz (Bodenheimer, 1944), labeled as *V. aspis balcanica*, not confirmed, but description and historic habitat would fit for Baran's Adder; (b) Uludağ National Park (2011, posted on www.uludak.com and www.turkherptil.org); (c) Geyve (Arikan et al., 2005; Baran et al., 2005); (d) Gökdağ mountain range, south of Sapanca (Werner, 1914; Franzen & Heckes, 2000); (e) holotype from 40-60 km north of Adapazari (Böhme & Joger 1983), no further information, so the locality in the map was set by us to a suitable habitat; (f) Kozluk, Zonguldak (Kumluçtas et al., 2013) (g) Gölyazi, Terme (David & Vogel, 2010; Geniez, 2015); (h) Gölyazi, Terme (in 2002, Geniez & Teynié, pers. comm.); (i) south İkizce (Avcı et al., 2004; depicted in David & Vogel, 2010); (j) Yaylacık, Dereli (in 2000, John Mulder, pers. comm.); (k) Alancık, Dereli (Franzen & Heckes, 2000); (l) Camlık, Vakfikebir (Kutrup, 2003); (m) Cinarlı, Yomra (Kutrup, 2003); (n) Yomra (in 2000, posted in turkherptil.org); (o) Sugeldi, Hayrat (Kutrup, 2003); Ballica, Of (Kutrup, 2003); (q) Arpaözü Plateau, Caykara (Baran et al., 2001); (r) Köprüköy, Ardeşen (Mebert et al., 2014, 2015); (s) Duygulu-Çamlıhemşin, Ardeşen (Baran et al., 1997, 2001); (t) Hoşdere, Ardeşen (Franzen & Heckes, 2000; John Mulder, pers. comm.); (v) Çayeli, Rize (Gül, 2015), with Gül's 2015 most northeastern mapped locality was taken from Baran et al. (2001), and likely represents the "*V. pontica*" (hybrid of *V. kaznakovi* x *V. ammodytes*) collected by Max. Pissié near Chorokhi, Artvin (Zinenko et al. 2013), now deposited at a museum in Darmstadt, Germany, as HLMD RA-2891, but more clarity pending further investigations.).



Figure 2. New western records of Baran's Adder [*Vipera (berus) barani*]. A, B, and C: Two ♂ and habitat from Ömerler, Bolu Merkez, province Bolu; D: One ♀ from Sofular Plateau, Camiliyayla, Bozüyük, province Bilecik; E and F: One ♂ and habitat from Sarıçayır Plateau, Çayyaka, İnegöl, province Bursa.

new records spanned a wide elevation range from near sea-level (e.g. near Gölyazi, Terme, Samsun province David & Vogel, 2010; Geniez, 2015) to ca. 2000 m a.s.l. (Arpaözü Plateau, Caykara, Trabzon prov., in Baran et al., 2001).

First new records from the northwestern Turkey were published by Baran et al. (2005) and Kumlutas et al. (2013), with a recent online photographic documentation from a far-western locality within Uludağ National Park, province Bursa, (İsmet Senturk, Şamil Ordu in



Figure 3. New western and northeastern records of Baran's Adder [*Vipera (berus) barani*]. A: One ♂ from Boğazova Plateau, Çayyaka, İnegöl, province Bursa; B and C: One ♂ and habitat from Fındık Plateau, Durabey, Domaniç, province Kütahya; D: One ♂, Hoşdere, Ardeşen, Rize province (see also Mebert *et al.*, 2015); E and F: One ♀ and habitat, Altındere, Maçka, province Trabzon.

<http://www.uludak.com/761/dagcilar-uludag-da-baran-engeregi-yakaladi.html> and turkherptil.org).

We follow up herein with new locations of *V. (berus) barani*, seven from northwestern Turkey,

including three new province records and the current southernmost locality, and one from the northeast, that confirms the much wider range of this enigmatic viper than was known only a few years ago (Fig. 1). Basic

Table 1. Metric and meristic characters of examined specimens of *Vipera (berus) barani* from northwestern Turkey.

Specimen No. and Sex	1 ♂	2 ♂	3 ♀	4 ♂	5 ♂
Locality	Ömerler, Bolu Merkez, Bolu		Camiliyayla, Bozüyük, Bilecik	Çayyaka, İnegöl, Bursa	Safa, Domaniç, Kütahya
Colour pattern	melanistic, white lips	melanistic, black lips	dark gray	light gray	melanistic, white lips
SVL (mm)	434	556	269	455	451
TL (mm)	81	99	42	84	85
Rostral width (mm)	3.24	4.39	2.28	3.54	3.79
Rostral height (mm)	3.46	4.54	3.08	3.97	4.09
Head width (mm)	14.07	18.95	11.72	14.73	15.46
Head length (mm)	21.01	23.12	14.33	20.06	19.11
Head depth (mm)	7.81	9.56	6.61	7.57	6.98
Distance between the nostrils	4.99	5.37	3.46	4.53	4.55
Dorsal scale rows (mid-body)	21	22	21	21	21
Ventrals	144	145	147	144	142
Intercanths+intersupraoculars	34	28	30	31	25
Subcaudals (L/R)	43/43+1	43/43+1	33/33+1	42/42+1	43/43+1
Supralabials (L/R)	9/10	9/9	9/9	9/10	9/9
Sublabials (L/R)	10/11	11/11	10/10	10/10	12/12
Circumoculars (L/R)	11/11	12/13	10/10	9/10	10/10
Scale rows between eye and supralabials (L/R)	1/1	1/1	1/1	1/1	1/1
Loreals (L/R)	4/4	5/5	4/4	4/5	4/4
Apical scales/contacting rostral	2/2	2/2	2/2	2/2	2/2
Total number of scales in contact with rostral	6	6	6	6	6

morphological data are given for several of the new western specimens.

1) Two ♂ (Fig. 2 A, B), Ömerler, Bolu Merkez, province Bolu, GPS: 40°41'N, 31°26'E, 846 m a.s.l., 14.v.2015, leg. B. Göçmen, Ç. Orhan and M. Çakmak, air temperature: 19 °C, both specimens melanistic, one with white spotted black labials, the other with completely black labials. Habitat mixed forest with Black Pine (*Pinus nigra*) and Beech (*Fagus sylvatica*), found in a natural clearing within the forest (Fig. 2 C).

2) One ♀ (Fig. 2 D), Sofular Plateau, north of Camiliyayla, Bozüyük, province Bilecik, GPS: 39°51'N, 29°46'E, 1469 m a.s.l., 15.v.2015, leg. B. Göçmen, air temperature 15 °C, a subadult specimen with a dark gray dorsal color and transversal black bars. Habitat is mixed forest with fir (*Abies bornmulleriana*) and Black Pine (*Pinus nigra*).

3) One, sex unknown, Kömürsu Plateau, north of Camiliyayla, Bozüyük, province Bilecik, GPS: 39°51'N, 29°44'E, 1683 m a.s.l., 22.iv.2014, photographed in situ by Yıldız Konca (see turkherptil.org, but erroneously labeled as province Bursa), a melanistic specimen. Habitat is mixed forest with fir (*Abies bornmulleriana*) and Black Pine (*Pinus nigra*).

4) One ♂ (Fig. 2 E, F), Sarıçayır Plateau, south of Çayyaka, İnegöl, province Bursa, GPS: 39°56'N, 29°26'E, 1316 m a.s.l., 17.v.2015, leg. B. Göçmen, A. Adakul, U. Tunç and S. Özen, air temperature 18 °C, an adult specimen with a light gray dorsal color. Habitat is mixed with hornbeam (*Carpinus betulus*) and Hazelnut (*Coryllus avellana*).

5) One (Fig. 3 A), ♂, Boğazova Plateau, south of Çayyaka, İnegöl, province Bursa, GPS: 39°56'N, 29°24'E, 1232 m a.s.l., same specimen photographed in

situ by Fevzi Yapıcı (see turkherptil.org), which escaped before measurements could be taken, a melanistic specimen. Habitat is mixed with hornbeam (*Carpinus betulus*) and Black Pine (*Pinus nigra*).

6) One ♂ (Fig. 3 B, C), Fındık Plateau, north of Durabey, Domaniç, province Kütahya, GPS: 39°50'N, 29°38'E, 1143 m a.s.l., 23.v.2015, leg. B. Göçmen, A. Adakul, U. Tunç, and S. Özen, air temperature 19 °C, a melanistic adult specimen. Habitat is mixed with hornbeam (*Carpinus betulus*) and Black Pine (*Pinus nigra*) near a water bed.

7) Two melanistic specimens, sex unknown (photos posted by Ümit Malkoçoğlu on turkherptil.org), from Koru, Geyve, Sakarya province, GPS: 40°30'N, 30°27'E, 1188 m a.s.l., 02.vi.2013 and 25.v.2013, leg. Ümit Malkoçoğlu.

8) One ♀ (Fig. 3 E), Altındere, Maçka, province Trabzon, GPS: 40°43'N, 39°38'E, 940 m a.s.l., 05.vi.2012, leg. K. Mebert. A light brown specimen with transversal bars. Habitat is a wall at the end of an erosional field between rock slides and pastures (Fig. 2 F). This animal was released after data recording at its point of capture.

All new specimens lack enlarged cephalic plates, which is normally exhibited in the nominate form of *V. berus*, but apparently uncommon among Baran's Adder. However, some geographic variation within *V. (berus) barani* is visible, as the western specimens exhibit all a yellowish green tail tip, whereas northeastern populations from Rize province yield orangish tail tips. These differences indicate that Baran's Adder maybe partitioned into geographic units. However, this requires support of a comprehensive study to better understand the geographic variation, in particular samples from the northern provinces with missing records, including Bartın, Karabük, Kastamonu Çankırı, Çorum, Amasya, Sinop, as far as central Samsun.

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References

Avcı, A., Üzüm, N., Olgun, K. (2004): A new record of *Vipera barani* Böhme & Joger, 1983 (Reptilia, Viperidae) from north-eastern Anatolia, Turkey. *Russian Journal of Herpetology, Moscow* **11**(1): 77–79.

- Baran, I., Atatür, M.K. (1998): Turkish Herpetofauna (Amphibians and Reptiles). T.C. Çevre Bakanlıđı, Ankara (Ministry of Environment).
- Baran, I., Tosunođlu, M., Kaya, M., Kumlutaş, Y. (1997): On the herpetofauna of the vicinity of Çamlıhemşin. *Turkish Journal of Zoology* **21**: 409–416.
- Baran, I., Joger, U., Kutrup, B., Türkozan, O. (2001): On new specimens of *Vipera barani* Böhme & Joger, 1983, from northeastern Anatolia, and implications for the validity of *Vipera pontica* Billing, Nilson & Sattler, 1990 (Reptilia, Viperidae). *Zoology in the Middle East* **23**: 47–53.
- Baran, I., Tok, C.V., Ilgaz, Ç., Kaska, Y., Olgun, K., Türkozan, O., İret, F. (2004): On two herpetological collections made in east Anatolia (Turkey). *Herpetozoa* **16**: 99–114.
- Baran, I., Kumlutaş, Y., Ilgaz, C., İret, F. (2005): Geographical distributions and taxonomical states of *Telescopus fallax* (Fleischman, 1831) and *Vipera barani* Böhme & Joger, 1983. *Turkish Journal of Zoology* **29**: 217–224.
- Bodemeyer, B. v. (1927): Ueber meine Entomologischen Reisen. Nach Kleinasien (1911), Ost-Sibirien, Schilka und Amur (1912), Tunis, Oasis Gafsa, Khroumerie (1913) und Iran, das Elbursgebirge (1914). **Band 1** Kleinasien. Alfred Kernen Verlag, Stuttgart, Germany.
- Bodenheimer, F.S. (1944): Introduction into the Knowledge of the Amphibia and Reptilia of Turkey. Review of the Faculty of Science, University of İstanbul Série B. **9**: 1–78.
- Böhme, W., Joger, U. (1984): Eine neue Art des *Vipera berus*-Komplexes aus der Türkei. *Amphibia-Reptilia* **4**, 265–271.
- David, P., Vogel, G. (2010): Terralog - Giftschlangen Europas, Nord- Zentral- und Westasiens. Edition Chimaira, Frankfurt am Main, Germany.
- Franzen, M., Heckes, U. (2000): *Vipera barani* Böhme & Joger 1983 aus dem östlichen Pontus-Gebirge, Türkei: Differentialmerkmale, Verbreitung, Habitate. *Spixiana* **23**, 61–70.
- Geniez, P. (2015): Serpents d'Europe, d'Afrique du Nord et du Moyen-Orient. Delauchaux et Niestlé SA, Paris.
- Gül, S. (2015). Potential distribution modeling and morphology of *Pelias barani* (Böhme and Joger, 1983) in Turkey. *Asian Herpetological Research*, **6**(3): 206–212.
- Joger, U., Lenk, P., Baran, I., Böhme, W., Ziegler, T., Heidrich, P., Wink, M. (1997): The phylogenetic position of *Vipera barani* and *V. nikolskii* within the *Vipera berus* complex. In: Böhme, W., Bischoff, W., Ziegler, T., Eds., *Herpetologica Bonnensis*: 185–194, Bonn.
- Joger, U., Fritz, U., Guicking, D., Kalyabina-Hauf, S., Nagy, Z.T., Wink, M. (2007): Phylogeography of western Palaearctic reptiles – spatial and temporal speciation patterns. *Zoologischer Anzeiger* **246**: 293–313.
- Kumlutaş, Y., Sözen, M., Ilgaz, Ç. (2013): New record of the rare *Vipera barani* Böhme & Joger, 1983. *Herpetozoa* **25**(3/4): 183–188.
- Kutrup, B. (2003): The identification of new specimens of *Vipera* from Trabzon, Turkey with affinities to *Vipera barani* and *V. pontica*. *Herpetological Review* **43**(1) : 28–31.
- Mebert, K., Iğci, N., Göçmen, B., Ursenbacher, S. (2014): Vipern der Nordost-Türkei: Genfluss und Umweltfaktoren zwischen

den Taxa des *Vipera barani-kaznakovi-darevskii*-Komplexes. *elaphe* **49**: 58–67.

- Mebert, K., Göcmen, B., İğci, N., Oğuz, M.A., Karış, M., Ursenbacher, S. (2015): New records and search for contact zones among parapatric vipers in the genus *Vipera* (*barani*, *kaznakovi*, *darevskii*, *erivanensis*), *Montivipera* (*wagneri*, *raddei*), and *Macrovipera* (*lebetina*) in northeastern Anatolia. *The Herpetological Bulletin* **133**: 13–22.
- Werner, F. (1914): Zur Herpetologie der Türkei. *Zoologischer Anzeiger* **43**: 497–499.
- Zinenko, O., Stümpel, N., Mazanaeva, L.F., Shiryayev, K., Nilson, G., Orlov, N.L., Tuniyev, B.S., Ananjeva, N.B., Murphy, R., Joger, U. (2013): The puzzling phylogeny of the *Vipera kaznakovi*-complex. In: Programme & Abstracts, 17th European Congress of Herpetology (SEH), 20–27 August 2013, Veszprém, Hungary. Abstract p. 197.