

Geographical Distributions and Taxonomical States of *Telescopus fallax* (Fleischman, 1831) and *Vipera barani* Böhme-Joger, 1983

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Abstract: Taxonomical states and the distribution of 40 *Telescopus fallax* specimens collected from various regions of Turkey over the past 35 years were evaluated. Information relating to a female *Vipera barani* and its 2 male juveniles, which were collected 35 km south of the provincial capital Adapazarı is presented. Biological information regarding the latter species is provided for the first time.

Key Words: *Telescopus fallax*, *Vipera barani*, distribution, taxonomy.

***Telescopus fallax* (Fleischman, 1831) ve *Vipera barani*'nin Böhme-Joger, 1983 Coğrafik Dağılımları ve Taksonomik Durumları**

Özet: Son 35 yılda Türkiye'nin değişik bölgelerinden temin edilen 40 *Telescopus fallax* türü örneğinin taksonomik durumu ile yayılışları değerlendirilmiştir. Adapazarı il merkezinin 35 km güneyinden temin edilen *Vipera barani* türüne ait bir dişi örnek ile bunun doğurduğu iki erkek yavrusu hakkında saptanan bilgiler sunulmuştur. Adı geçen tür hakkındaki biyolojik bilgiler ilk olarak ortaya çıkarılmıştır.

Anahtar Sözcükler: *Telescopus fallax*, *Vipera barani*, dağılım, taksonomi.

Introduction

Very few specimens have been examined in various studies conducted to provide information regarding *Telescopus fallax* and *Vipera barani*; 2 of the species distributed in Turkey (Boettger, 1888; Werner, 1902, 1903, 1919; Venzmer, 1919, 1922; Bird, 1936; Bodenheimer, 1944; Mertens, 1952, 1953; Başoğlu and Baran, 1980; Baran, 1982; Teynie, 1991; Baran et al., 1992; Baran et al., 1994; Baran and Atatür, 1998). In an attempt to revise the snake species in Turkey, Baran conducted a study (1976) in which he compared the specimens he had collected with previous ones. A large number of specimens were examined in Baran's study, in which *T. fallax* was divided into 3 subspecies. However, the collection of specimens belonging to this species takes a very long time, as is the case with most species of

snakes. Therefore, the number of specimens in our collection has increased substantially since Baran's study in 1976. The objective of the present study was to determine the taxonomic states of the 40 new *T. fallax* specimens collected from 33 different localities in Turkey over the past 35 years and to reveal the areas of distribution of its subspecies in a more reliable way. Moreover, a new female specimen of *V. barani* Böhme-Joger, 1983, which has been described from Turkey in recent years, was newly collected from south-west of its known area of distribution. We think that biological observation pertaining to this specimen, which gave birth to 2 juveniles with normal patterns in the terrarium where it was being kept, will help researchers in their future studies, because there is hardly any biological information on *V. barani*.

Materials and Methods

Following Baran (1976), pholidosis, colour and pattern characteristics as well as body measurements of *T. fallax* specimens obtained from different localities in Turkey were examined to clarify the taxonomical features of the species at subspecies level. Pholidosis characteristics refer to the number of plates and scales and the interrelation between them. The ventral plates in our specimens were counted using Dowling's system (1951). Body measurements such as head + body length and tail length were used. All of our specimens have been given ZDEU (Zoology Department, Ege University) codes and are stored in the collections of the Ege University, Faculty of Science, Department of Biology and the Dokuz Eylül University, Faculty of Education, Department of Biology.

The Turkish subspecies of *T. fallax* were differentiated from each other according to the numbers of ventral plates, anal plates and dorsal maculations (Baran, 1976; Başoğlu and Baran, 1980). Comparisons of these characters obtained from our *T. fallax* material were tested using the Kolmogorov-Smirnov 2 sample test.

Material Lists

Telescopus fallax fallax (Fleischmann, 1831)

Material: n: 25 (4♂♂, 1♂ s.ad., 2♂♂ juv., 11♀♀, 1♀ s.ad., 6♀♀ juv.)

ZDEU 7/1966. ♂juv, İncekum, Antalya, 06.02.1966, A. Şengün; ZDEU 51/1973. ♀, Sultan Farm, İstanbul, 15.12.1973, İ. Baran; ZDEU 86/1975. ♀, Alanya, 14.04.1975, H. Sipahioğlu; ZDEU 267/1975. ♀, İskenderun, 02.10.1975, A. Budak; ZDEU 17/1977. ♀, Anamuryum, Anamur, 06.02.1976, İ. Baran; ZDEU 25/1984. Tarsus, 02.04.1984 M. Öz; ZDEU 60/1984. ♀, Ula, Muğla, 09.04.1984, İ. Baran; ZDEU 177/1985. ♀ juv., Torbalı, İzmir, 30.08.1985, Y. Kumlutaş; ZDEU 41/1986. ♀juv., Kuruçay, Burdur, 17.07.1986, A. Budak; ZDEU 13/1990. ♀, Datça, 12.05.1990; ZDEU 27/1990. ♀, Kaynaklar, Buca, 06.04.1990, İ. Baran; ZDEU 96/1990. ♀, Bozdağ, Datça, 22.08.1990, U. Peker; ZDEU 34/1991. ♀ juv., near Bafa Lake, 06.04.1991; ZDEU 362/1991. 1 ♂s.ad., 2 ♂juv., Çandır, Köyceğiz, 28.03.1991, İ. Baran; ZDEU 363/1991. ♀juv., Kaynaklar, Buca, 22.05.1991, İ. Baran; ZDEU 364/1991. ♂juv., Dalyan, Köyceğiz, 14.04.1991, İ. Baran; ZDEU 365/1991. ♂, Çandır, Köyceğiz, 16.11.1991, İ. Baran; ZDEU 366/1991. ♂, Sancibeli,

Köyceğiz, 14.13.1991, İ. Baran; ZDEU 367/1991. ♀, Ekincik, Köyceğiz, 17.04.1991, İ. Baran; ZDEU 100/1993. ♀, Bozkurt, Denizli, 01.09.1993, Ö. Eser; ZDEU 123/1993. ♀juv., Belevi Village, Selçuk, İzmir, 01.04.1993, İ. Baran; ZDEU 191/1994. ♂, Ulupınar Village, Kemer, Antalya, 01.05.1994; ZDEU 141/1999. ♀s.ad., between Gülnar and Aydıncık, 20.05.1999, İ. Baran; ZDEU 87/2002. ♀juv., Fethiye, 28.06.2003, Ç. Ilgaz.

Telescopus fallax iberus (Eichwald, 1831)

Material: n: 10 (3♂♂, 6♀♀, 1♀s.ad.)

ZDEU 244/1957. ♀, Artvin, 08.1954, M. Başoğlu; ZDEU 134/1989. ♀, Kolay, Bafra, 30.06.1989, İ. Yılmaz, Y. Kumlutaş; ZDEU 125/1990. 1♂, 2-4♀♀, Meke Saltpan, Karapınar, Konya, 01.06.1990, İ. Baran; ZDEU 80/1995. ♀juv., Bor, Niğde, 11.1995, A. Karataş; ZDEU 203/1996. ♂, Şavşat, Artvin, 28.08.1996; ZDEU 93/2001. ♂, between Midyat and İdil, Mardin, 04.05.2001, İ. Baran, Y. Kumlutaş, Ç. Ilgaz, A. Avcı; ZDEU 158/2002. ♀, Borçka, Artvin 17.02.2002.

Telescopus fallax syriacus Boettger, 1880

Material: n: 3 (1♂s.ad., 2♀♀ juv.)

ZDEU 82/1977. ♀, Birecik, Şanlıurfa, 27.04.1977, İ. Baran; ZDEU 61/2001. ♀juv., between Adıyaman and Kahta, 28.04.2001, İ. Baran, Y. Kumlutaş, Ç. Ilgaz, A. Avcı; ZDEU 78/2001. ♂s.ad., Ceylanpınar, Şanlıurfa, 03.05.2001, İ. Baran, Y. Kumlutaş, Ç. Ilgaz, A. Avcı.

Vipera barani Böhme-Joger, 1983

Material: n: 3 (1♀, 2 ♂juv.)

ZDEU 56/2003. 1♀, 2-3 ♂juv., Göktepe slope, Geyve, Adapazarı, 19.08.2003, O.C. Arslan.

Results and Conclusion

Telescopus fallax fallax (Fleischmann, 1831)

We considered it would be beneficial to determine different pholidosis characteristics in the 25 specimens collected from 24 different localities. The number of preoculars was 2-2 on both sides, except for a single specimen having 1-1. Baran (1976) recorded the number of preoculars as 2-2 in 147 specimens from 4 subspecies of *T. fallax*. It was interesting to observe that there were 2 preoculars on the sides of the head in only one of the specimens, although the number of these preoculars is

quite consistent. Baran (1976) also mentioned the presence of a loreal plate under the preocular extending to the edge of the eye. In a female specimen of ours, which was collected from the Anamurium remains outside the town of Anamur, the single preocular becomes pointed while extending downwards and prevents the loreal plate from contacting the edge of the eye. Such an arrangement of the preocular plate was encountered for the first time in the *T. fallax* material. The number of the temporal plates in a female specimen from Köyceğiz, Ekincik was 3-4 on both sides of the head. This arrangement was also encountered for the first time in the *T. fallax* specimens. Anal plates were usually double, but were segmented in only 1 specimen collected from near İstanbul; however, this segment line starting from the top did not reach the loose edge of the plate. Postocular plates always number 2 on both sides. The number of dorsal scales counted between the 90th and 100th ventral plates was always 19 for each row. The number of maculations on the dorsum and the flanks displayed a great variation. While the number of these maculations varied between 36 and 64 in *T. f. fallax*, it was seen to be greater than that in the following 2 subspecies. Other pholidosis features and morphometric measurements related to specimens of *T. f. fallax* are given in Table 1.

Baran (1976) recorded the maximum value of ventral and subcaudal plates as 222 and 78, respectively.

Our specimens were generally collected from under stones in rocky-stony areas with sparse vegetation.

Telescopus fallax iberus (Eichwald, 1831)

In our material, a female specimen collected from Meke Saltpan was found to have 3 postocular plates on

the right side of the head only. This is rarely seen in this subspecies as the usual number of these plates is 2-2 (Baran, 1976). The number of the temporal plates in a specimen from Artvin was 1-2 on each side of the head, while 3 specimens from Meke Saltpan had 3 anterior temporals whereas the number of posterior temporals varied between 3 and 5. Thus, the number of temporal plates in the specimens from Meke Saltpan was shown for the first time to be different from the values given by Baran (1976). The number of dorsal scales in a row between the 90th and the 100th ventral plates was found to be 21 in one specimen only, but 19 in the others, as reported previously by Baran (1976). As also stated by Baran (1976), the anal plates were single in 8 specimens (80%) and double in the other 2 (20%). The presence of double anal plates has been reported as rare by Baran (1976). Other pholidosis features and morphometric measurements related to specimens of *T. f. iberus* are given in Table 2.

The number of maculations on the dorsum and flanks of the body was slightly lower (min: 32 max: 48) than those of *T. f. fallax*. The characteristics of the area inhabited by this subspecies are similar to those for *T. f. fallax* presented before.

Telescopus fallax syriacus Boettger, 1880

All specimens have 2 postocular plates on both sides. The specimen collected from the province of Adiyaman has 17 dorsal scales in a row between the 90th and the 100th ventral plates. Baran (1976) stated that the number of dorsal scales for this subspecies was usually 19, rarely 21. The number of ventral plates varied between 186 and 197 with a mean of 192.0. These values presented for the subspecies are clearly higher

Table 1. Some pholidosis features and morphometrics obtained from the specimens of *T. fallax fallax* (N: Number of specimens, Min: Minimum value, Max: Maximum value, SD: Standard deviation, SE: Standard error of the mean).

Characters	N	Mean	Min.	Max.	SD	SE
Supralabial plates	24	8.08	8.00	9.00	0.28	0.06
Sublabial plates	24	11.13	10.00	12.00	0.45	0.09
Ventral plates	24	217.80	201.00	225.00	6.30	1.29
Subcaudal plates	22	68.73	56.00	83.00	6.83	1.46
Anal plates	24	1.92	1.00	2.00	0.28	0.06
Head + body length (mm)	13	563.00	343.00	880.00	142.16	39.43
Tail length (mm)	12	107.17	67.00	172.00	30.50	8.81

Table 2. Some pholidosis features and morphometrics obtained from the specimens of *T. fallax iberus*.

Characters	N	Mean	Min.	Max.	SD	SE
Supralabial plates	10	8.30	7.00	9.00	0.67	0.21
Sublabial plates	10	10.60	9.00	11.00	0.70	0.22
Ventral plates	10	206.80	200.00	213.00	4.69	1.48
Subcaudal plates	10	60.20	56.00	66.00	3.58	1.13
Head + body length (mm)	9	408.44	263.00	537.00	83.14	27.71
Tail length (mm)	9	76.67	46.00	103.00	16.32	5.44

than those provided by Baran (1976), who reported the number of ventrals between 169 and 189. Anal plates are single in the specimen from Adiyaman and double in the other 2.

T. f. syriacus is distinguished from the other 2 subspecies in that it has fewer maculations on the dorsum. However, although this was clearly observed in the specimens from the Ceylanpinar (26) and Birecik (24) region, the other specimen from Adiyaman had almost as many dorsal maculations as did *T. f. fallax* (46). However the number of dorsal scales and higher number of ventral and dorsal spots call for a detailed examination of a greater number of specimens from the Adiyaman region. Other pholidosis features and morphometric measurements related to specimens of *T. f. syriacus* are given in Table 3.

The numbers of ventral plates, anal plates and maculations on the dorsum that show differences among subspecies of *T. fallax* were tested using the Kolmogorov-Smirnov 2 sample test. Statistically significant pairwise differences among the subspecies of *T. fallax* are listed in Table 4.

Vipera barani Böhme-Joger, 1983

On 09.08.2003, 21 years after the first description of the species, an adult female was collected by Okan Can Arslan in the province of Adapazarı (Figure 1). The female specimen, collected at an altitude of 1100 m, was later sent to us by this research assistant. After its arrival at our faculty on 15.09.2003, the adult female specimen was kept in a terrarium for some time. A *Mus musculus* was given as food and was poisoned to death by the snake but not eaten. Grasshoppers, crickets and some

Table 3. Some pholidosis features and morphometrics obtained from the specimens of *T. fallax syriacus*.

Characters	N	Mean	Min.	Max.	SD	SE
Supralabial plates	3	8.00	8.00	8.00	0.00	0.00
Sublabial plates	3	10.33	10.00	11.00	0.58	0.33
Subcaudal plates	3	54.33	51.00	57.00	3.06	1.76
Head + body length (mm)	3	268.00	218.00	367.00	85.74	49.50
Tail length (mm)	3	47.67	36.00	70.00	19.35	11.17

Table 4. Statistically significant differences (asterisks) among the subspecies of *Telescopus fallax* according to the Kolmogorov-Smirnov 2 sample test (P < 0.05).

Comparison	Number of ventral plates	Number of anal plates	Number of maculations on dorsum
<i>T. f. fallax</i> – <i>T. f. iberus</i>	*	*	*
<i>T. f. fallax</i> – <i>T. f. syriacus</i>	*		*
<i>T. f. iberus</i> – <i>T. f. syriacus</i>	*		

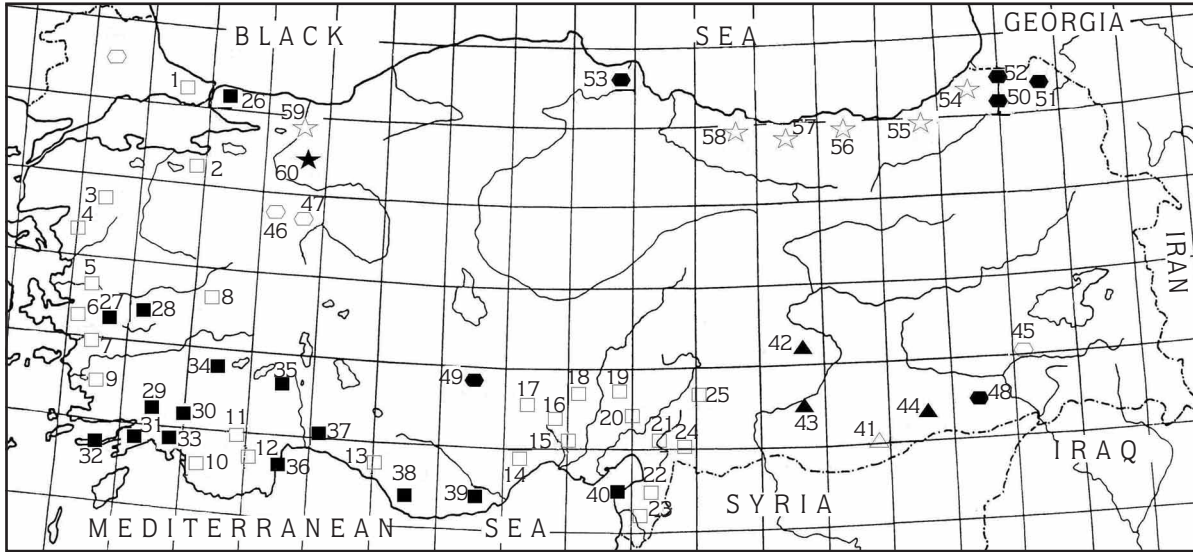


Figure 1. The localities in which *Telescopus fallax* and *Vipera barani* were encountered in Turkey. ■ *Telescopus fallax*, ● *T. f. iberus*, ▲ *T. f. syriacus*, ★ *Vipera barani*. The empty symbols are old localities. 1- Bebek-Istanbul, 2- Bursa, 3- Savaştepe-Balıkesir, 4- Kınık-Izmir, 5-Bornova-Izmir, 6- Izmir, 7- Efes-Izmir, 8- Kürkçü-Uşak, 9- Milet-Aydın, 10- Xanthus ruins-Muğla, 11- Elmali-Antalya, 12- Çıtlıkara-Antalya, 13- Alanya-Antalya, 14- Ercel Village-Mersin, 15- Tarsus-Mersin, 16- Gülek-Mersin, 17- Bolkar Mountain-Uluışla-Niğde, 18- Brücek-Adana, 19- Kozan-Adana, 20- Değirmendere Village-Kadirli-Adana, 21- Amanos Mountains-Hatay, 22- Amik-Hatay, 23- Büyüknehir-Hatay, 24- Zincirlihöyük-Gaziantep, 25- Kahramanmaraş, 26 - Sultan Farm-Istanbul, 27 - Buca-Izmir, 28 - Torbalı-Izmir, 29 - Ula-Muğla, 30 - Köyceğiz-Muğla, 31 - Dalyan-Muğla, 32 - Datça-Muğla, 33 - Fethiye-Muğla, 34 - Bozkurt-Denizli, 35 - Burdur, 36 - Kemer-Antalya, 37 - İncekum-Antalya, 38 - Anamurium-Anamur-Antalya, 39 - between Gülnar and Aydınlık, 40 - İskenderun-Hatay, 41 - Siirt, 42 - Eskişehir, 43 - Bozdağ-Eskişehir, 44 - Artvin, 45 - Borçka-Artvin, 46 - Şavşat-Artvin, 47 - Kolay-Bafra-Samsun, 48 - between Midyat and İdil, 49 - Meke-Karapınar-Konya, 50 - Curcupta Village-Tektek Mountain-Şanlıurfa, 51 - Birecik-Şanlıurfa, 52 - Ceylanpınar-Şanlıurfa, 53 - between Adıyaman and Kahta, 54 - Artvin, 55 - Rize, 56 - Trabzon, 57 - Giresun, 58 - Ordu, 59 - Adapazarı, 60 - Geyve-Adapazarı.

mealworms were also placed in the terrarium to feed the snake, which did not eat any of them. A few days later, on 30.09.2003, the snake gave birth to 2 juveniles. One of them was born in a membrane, which was removed by the authors to release the juvenile. Having refused to eat anything offered it, the adult female died on 12.10.2003. A week later, the juvenile that had been born in a membrane also died. About 3 days after the deaths of the mother and one of the juveniles, the remaining juvenile specimen had to be fixed by our team as we failed to provide any live food, such as mealworms, for the juvenile. The juvenile born in a membrane had a birth weight of 6.05 g while the other one weighed 7.03 g at birth. The pholidosis features and morphometric measurements obtained from the specimens of *V. barani* are given in Table 5.

Colour and pattern characteristics of our specimens were quite interesting. The body colour of our female was totally black (Figure 2). However, supralabials were

yellowish-white with white blotches. These blotches were smaller in the front of the supralabials. Similar white blotches presented sublabials, but were not as remarkable as in the upper labials. A single small blotch was present at the edges of the rostrum near the tip. Whitish spots of different sizes were present below the head. White spots were remarkable at the edges of the ventral plates located behind the neck. These spots disappeared toward the mid-body. The posterior part of the ventral was black. The ground colour of the ventral tail was black with sparse whitish spots. The tip of the tail was pinkish-yellow. The 2 juveniles had normal patterns. The ground colour of the head was greyish-brown. Black blotches on top of the head were not remarkable. The blotches on the flank of the head were similar to those of the female specimen. Moreover, the edges of the supraoculars, canthals and apicals were white. The ground colour of the dorsum was greyish-brown with black maculations in a longitudinal row, some of which joined together to form a zigzag band (Figure 3). Sparse

Table 5. Pholidosis features and morphometric measurements obtained from the specimens of *Vipera barani*. (left - right).

Characters	ZDEU 56/2003.1♀	ZDEU 56/2003. 2♂ juv.	ZDEU 56/2003. 3♂ juv.
Apical plates	2	2	2
Canthal plates	2-2	2-2	2-2
Loreal plates	5-5	5-5	6-5
Supralabial plates	9-9	9-9	10-9
Sublabial plates	11-11	11-11	13-11
Number of scales around the eyes	11-13	11-11	12-12
Ventral plates	145	139	139
Subcaudal plates	33	42	38
Head + body length (mm)	503	170	170
Tail length (mm)	62	29	29



Figure 2. Adult female specimen of *Vipera barani*, from Geyve, Sakarya.

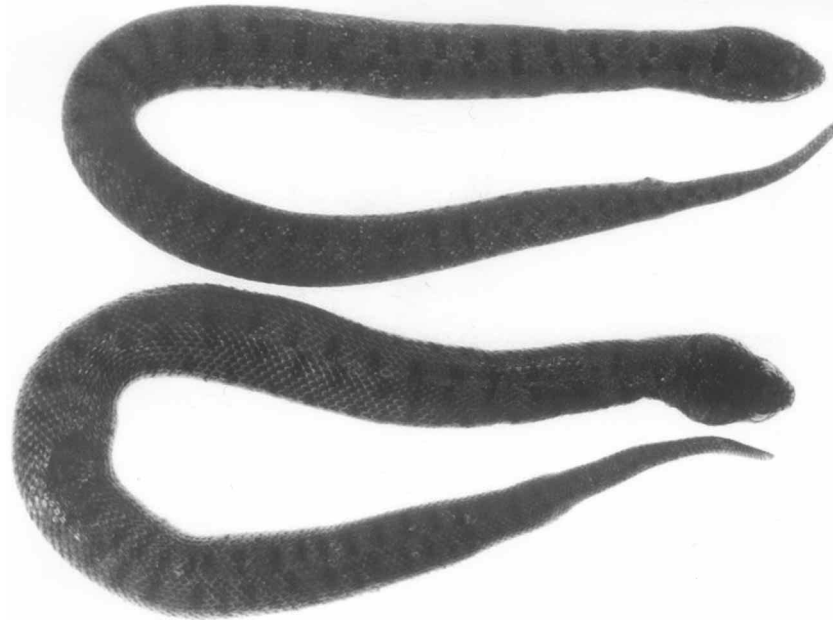
whitish spots were present below the head. Whitish spots at the edges of the ventral plates were sparse and continued to the end of body. The tip of the tail was yellowish-pink. This pattern observed in the juveniles was very similar to that of the female described from Ardeşen by Franzen and Hecks (2000).

Based on the fact that the *V. barani* was collected from a new locality 35 km south of Adapazarı, and considering the results obtained from studies on this subject that have been carried out so far (Böhme and Joger, 1983; Joger et al., 1997; Franzen and Hecks, 2000; Baran et al., 2001; Avcı et al., 2004), it has been realised that the snake species in question is distributed in the northern regions of Anatolia (Figure 1). We were informed that 4 specimens confiscated at the İpsala border crossing had been caught from the Silifke region

in the Taurus Mountains (Joger et al., 1997; Baran et al., 2001). Although the area mentioned above was carefully searched by our team, no new specimens were encountered, which led us to think that the presence of *V. barani* is very doubtful in this region.

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Figure 3. Juvenile male specimens of *Vipera barani*.

References

- Avcı, A., Üzüm, N. and Olgun, K. 2004. A new record of *Vipera barani* Böhme-Joger, 1983 (Reptilia, Viperidae) from North-Eastern Anatolia, Turkey. Russian Journal of Herpetology, 11: 77-79.
- Baran, İ. 1976. Türkiye Yılanlarının Taksonomik Revizyonu ve Coğrafi Dağılımları, TBTA Yayınları No. 309, T.B.A.G. Seri No. 9, Ankara, S. 1-177.
- Baran, İ. 1982. Zur Taxonomie der Schlangen in Südos-und Ost-Anatolien. Spixiana, 5: 51-59.
- Baran, İ., Yılmaz, İ., Kete, R., Kumlutaş, Y. and Durmuş, H. 1992. Batı ve Orta Karadeniz Bölgesinin herpetofaunası. Doğa-Tr. J. of Zoology, 16: 275-288.
- Baran, İ., Kumlutaş, Y., Kaska, Y. and Türkozan, O. 1994. Research on the amphibia, reptilia and mammalia species of the Köyceğiz-Dalyan Special Protected Area. Tr. J. of Zoology, 18: 203-219.
- Baran, İ. and Atatür, M.K. 1998. Turkish Herpetofauna (Amphibians and Reptiles). Republic of Turkey, Ministry of Environment, Ankara, 214 pp.
- Baran, İ., Joger, U., Kutrup, B. and 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.
- Başoğlu, M. and Baran, İ. 1980. Türkiye Sürüngenleri. Kısım II. Yılanlar. Ege Üniv. Fen Fak. Kitaplar Serisi, 81: 1-218.
- Bird, C.G. 1936. The distribution of reptiles and amphibians in Asiatic Turkey, with notes on a collection from vilayets of Adana, Gaziantep and Malatya. Ann. Mag. Nat. Hist. London, (10) 18: 257-281.
- Bodenheimer, F.S. 1944. Introduction into the knowledge of the amphibia and reptilia of Turkey. İstanbul Üniv. Fen Fak. Mecmuası, Seri B, 9: 1-78.
- Boettger, O. 1888. Verzeichnis der von Herrn E. Von Oertzen aus Griechenland Kleinasien Mitgebrachten Batrachier und Reptilien. Sitz. Ber. Preuß. Akad. Wiss. Berlin, 5: 139-186.
- Böhme, W. and Joger, U. 1983. Eine neue Art des *Vipera berus*-Komplexes aus der Türkei. Amphibia-Reptilia, 4: 265-271.
- Dowling, H.G. 1951. A proposed standard of counting ventrals in snakes. Brit. J. Herpet. London, 1-5: 97-99.
- Franzen, M. and Heckes, U. 2000. *Vipera barani* Böhme-Joger, 1983 aus demöstlichen Pontus Gebirge, Türkei: Differentialmerkmale, verbreitung, habitate. (Reptilia, Serpentes, Viperidae). Spixiana, 23: 61-70.
- Joger, U., Lenk, P., Baran, İ., Böhme, W., Ziegler, T., Heidrich, P. and Wink, M. 1997. The phylogenetic position of *Vipera barani* and *V. nikolskii* within the *Vipera berus* complex. In: W. Böhme, W. Bischoff, T. Ziegler (Eds), Herpetologia Bannensis, 185-194, Bonn.
- Mertens, R. 1952. Amphibien und reptilien aus der Türkei. İstanbul Üniversitesi Fen Fakültesi Mecmuası, Seri B, 17: 41-75.
- Mertens, R. 1953. Weiteres zur kenntnis der herpetofauna der Asiatischen Türkei. İstanbul Üniversitesi Fen Fakültesi Mecmuası, Seri B, 18: 373-375.
- Teynie, A. 1991. Observations herpetologiques en Turquie Zeme Partie. Bull. Soc. Herp. Fr., 58: 20-29.

Venzmer, G. 1919. Zur schlangenfauna Süd-Kleinasiens, speziell des cilicischen Taurus. Arch. Naturgesch. Berlin, 83: 95-122.

Venzmer, G. 1922. Neues verzeichnis der amphibien und reptilien von Kleinasien. Zool. Jb. 46: 43-60.

Werner, F. 1902. Die reptilien und amphibienfauna von Kleinasien Sb. Akad. Wiss. Wien, Math. Nat. Kl., 111: 57-1121.

Werner, F. 1903. Über reptilien und batrachier aus West Asien (Anatolien und Persien). Zoologischer Jahrbücher, 19: 329-346.

Werner, F. 1919. Reptilien und amphibien aus dem Amanus-Gebirge. Arch. Naturgesch. 85. Jahrg. Abt. A, S: 130-141.