

SUPPLEMENTAL INFORMATION

**CRITICALLY ENDANGERED DAREVSKY'S VIPER: INCISIVE
DISTRIBUTION DISCOVERIES AND TAXONOMIC CONSIDERATIONS**

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The authors formatted this document with small margins to reduce the number of pages and maximize visibility of the maps, which are presented in a horizontal layout. To enable full-page maps, their legends usually follow on the top of the next page.

Photo vouchers of Darevsky's Vipers for most localities are placed in folders accessible upon request to the senior author. Alternatively, a 3D-landscape satellite screenshot from a GoogleEarth view is used with a pin maker for the record, where no specimen photo was available, but the locality record has been deemed credible based on expertise of the provider and montane grassland (e.g., alpine and subalpine meadows) habitat, plus verified records of steppe vipers in the greater surrounding < 50 km. For records from literature that combined multiple specimens into one location, we either show one representative photo or none, if such was not available.

While the coordinates herein are open and free to be used, we, or at least the lead author, would certainly appreciate to be contacted for using coordinates in modelling and related studies with a biogeographic content. It is an issue of respect, as the effort to obtain the massive data set and evaluation of each one has taken years of strenuous and disciplined work.

LOCALITY LIST

Methods - Much of the following methodological description is drawn or modified from Mebert et al. (2025a) and provided here in an abbreviated context.

We compiled a list of all locality data of the Darevsky's Viper *Vipera darevskii* (*sensu lato*), which consists of the traditional eastern "darevskii" group, and the "sakoi" group from 100s of km farther west. Information originates from a variety of sources, including literature records, museum vouchers and their published accounts (e.g., GBIF), low resolution distribution maps (overlaid on Google Earth Pro), personal data transfer generously shared by naturalists, biologists, hikers, etc., and observations submitted to a variety of online databases such as Facebook groups, www.iNaturalist.org, www.observation.org, and ultimately our own unpublished records. Some adjustments of apparently dislocated or imprecise distribution points from mainly older maps were explained and provided with nearby habitat-fitting coordinates, as explained in each respective account. We took efforts to voucher each locality, either by a photograph, a museum specimen, an illustration, or a credible literature record. For online photo and literature records we usually contacted respective authors/photographers to obtain more precise locality information (primarily coordinates), and in a few cases used an existing site description and habitat photograph to better geolocate the locality.

A few unvouchered, yet credible/plausible, observations have been included if one of the following is applicable: a) they are made by a known expert of vipers; b) the description of the snake fits a viper (e.g., a combination including characteristics, such as short tail, stout body, color pattern, slow moving, etc.) to distinguish against a multitude of sympatric viper-imitating snakes; c) geography, elevation, aspect, and other habitat features correlate with habitats of regionally known Darevsky's Viper sites; and d) they are usually not more than 10 km away from the nearest, confirmed conspecific locality.

Usually, a locality represents a single individual, but could also include several specimens observed within 1 km radius from the given coordinates. Alternatively, a polygon is drawn for several specimens spread across larger areas, but with no specimen being > 1 km distant from another one. For polygons, we provide coordinates of their centers with the outlines between two polygons exceeding 1 km distance. Furthermore, administrative names and borders for listed localities are based primarily on Google Earth Pro, even though they sometimes differ in relation to other digital maps, and are not always up-to-date due to modifications of names and border positions. Some border differences between our locality information retrieved from Google Earth Pro and locality placement in our digital maps drawn with the software QGIS can exist as well, yet the given locality coordinates remain the same and represent the relevant source, as they are independent from political borders and their changes. Locality names are associated to the closest settlement, or mountain/peak/hill/valley name provided by the following sources, single or combined: literature, pers. comm., Google Maps, Wikimapia, Mapcarta, OpenStreetMaps, peakery.com,

peakvisor.com. More details of data acquisitions and evaluations have been provided in the Supplemental Information file of Mebert et al. (2025a).

Recorded localities are listed as one of three main categories:

- **New:** if their localities have not been previously published in a peer-reviewed journal and usually are at ≥ 1.0 km distant from an already known locality/coordinates. A new locality might be based on a photograph with sufficient quality for an accurate identification. The authenticity of such a photograph and the pertinent locality information was confirmed by us through contacting the photographer/associate.
- **Corrected:** relates to published records that contained substantially erroneous geographic information.
- **Refined:** refers to published data, including online repositories with mapped geographic information, primarily iNaturalist, Reptile Database, turkherptil.org, Flickr but also Herpmapper, GBIF.org and others (e.g., Durso et al. 2021) for which new information through contact with the author or published data evaluation permits a more precise geographic localization.

The listings generally follow the format: category, locality/political names, followed by the names for the 2nd/1st largest administrative division (depending on the country either district, county, rayon/province, or region), coordinates, n (number of specimens), elevations given as a.s.l. m elevation (meters above sea level), date of the finding (if a finding relates to a literature record without further precision, than that finding was evidently before that publication or the oldest in a series of publications), source (collector, respectively leg., literature, online, pers. comm. or pers. data transfer, photographer, museum voucher), remarks, and Field-ID in **red** and **bold** to facilitate retrieving individual data linked to our database, including KMZ-markers for Google Earth, xcel spreadsheet entries, and voucher photos/drawings or Google Earth locality screenshots. Latter Photo credits are given in the figure legends. Turkish terms used herein like Dag, Daglari means Mountain, Mountains, Massif, and Tepesi means hill or peak. For easy cross-referring of listed locality information with distribution maps, corresponding maps from the main article are appended at the bottom of this Supplemental Informationm but in horizontal format for enlarged view to see more details.

Darevsky's Viper (*Vipera d. darevskii* and *V. d. sakoi*)

Distribution of the Darevsky's Viper is shown in Figure 1 of the main article. Sako's Viper *Vipera sakoi* (Tuniyev et al. 2018) is regarded as synonymous to *V. darevskii*, provisionally classified as a subspecies and named the Western Darevsky's Viper (*V. d. sakoi*), as detailed in the main article and indicated by Freitas et al. (2020). Six new localities are added to the end of the list as late additions. The locality list below is sorted approximately from west to east, and secondly from a northern to southern direction in larger regional maps:

Türkiye

- 1 **New:** montane summer village Aksu, Beytarla, Kürtün/Gümüşhane at the border to Alucra/Giresun, 40.482745°N, 38.894394°E, at 2,512 m elevation, 26 June 2019. Source: Konrad Mebert, Mert Karis, Mehmet Akif Bozkurt (Fig. 3A of the main article). Remarks: the currently most western record of *V. darevskii* (*V. sakoi* acc. to Tuniyev et al. 2018), coordinates place record into Gümüşhane Province acc. to updated Google Maps/Earth, but Giresun Province is within a few 100s meter of continuous habitat. Field-ID: **Vda94**
- 2 **New:** Burgababa Tepe, Haşhaş Köyü, Çalgan, Alucra/Giresun, 40.343999°N, 39.004550°E, n = 3 within 60 m from coordinates, 2,607–2,613 m elevation, summer 2013 and 01 July 2018 (Fig. 2B of the main article). Source: Nasit Igci, Konrad Mebert (2018, n = 2) and Özgür Aydoğan (pers. data transf., 2013, n = 1). Field-ID: **Vda80–81, Vda103**
- 3 **New:** Yılanlı Yaylası, Gümüstug, Torul/Gümüşhane, with center point at 40.433637°N, 39.081594°E, n = 17 within 600 m from coordinates, between 2,537–2,640 m elevation, (map in Fig. 1B of the main article; and Fig. S1 above). Remarks: *V. sakoi* acc. to Tuniyev et al. (2018), but low genetic divergence suggests *V.*

darevskii (Freitas et al. 2020; Dufresnes et al. 2024). Following sublocalities with coordinates 1 km from each other:

- a. **New:** 40.432244°N, 39.076683°E, n = 11 within 400 m from coordinates, between 2,576–2,640 m elevation, 30 June 2018 and 24 June 2019. Source: Konrad Mebert, Nasit Igci, Mert Karis. Field-ID: **Vda73–79, Vda90–93**
 - b. **New:** 40.427546°N, 39.086817°E, n = 5 within 140 m from coordinates, between 2,535–2,563 m elevation, 19 and 23 June 2018, 22 June 2021. Source: Hamit Şahiner, Adem Adakül, Abdurrahman Sefali, Yasin Turfanda, Emre Hamzaoglu. Field-ID: **Vda68–Vda71, Vda208**
 - c. **New:** 40.436424°N, 39.087106°E, at 2,552 m elevation, July 2024. Source: Yusuf Ardiç Adana, Zafer Yildiz. Field-ID: **Vda235**
- 4 **New:** 1.7 km northeast Mt. Abtal Musa within Artabel Gölleri Tabiat Park, Gümüşhane Dağları, Torul/Gümüşhane, 40.409275°N, 39.072197°E, at 3,110 m elevation, 29 June 2018. Source: Nasit Igci, Konrad Mebert via pers. comm. with police officer Ali Şahiner (Erzincan) who knows this species well and reported us the large population from Yılanlı Yaylası, locality-3, where he owns a summer house. Remarks: currently highest record of *V. d. darevskii* in Türkiye (*V. sakoi* acc. to Tunıyev et al. 2018). Field-ID: **Vda83**
- 5 **New:** Dulaga Yaylası, Cit Creek Valley, Gümüşstug, Torul/Gümüşhane, 40.416800°N, 39.102058°E, n = 2 within 160 m from coordinates, between 2,306–2,354 m elevation, year 2018/July 2024. Source: specimen photographed by Yusuf Ardiç Adana and Zafer Yildiz (Vda234); and one observation next to it by a cattle herder living at the site (Vda82), interviewed by Nasit Igci and Konrad Mebert. Field-ID: **Vda82, Vda234**
- 6 **Corrected:** Esentepe, Gülaçar Plateau (Artabel Valley, Gavur Mts.), Torul/Gümüşhane, 40.380225°N, 39.106778°E, at 2,592 m elevation, 22 September 2003. Source: coordinates based on habitat photo in Fig. 1 of Kutrup et al. (2005). Remarks: originally classified as *Vipera (r.) eriwanensis* by Kutrup et al. (2005) but corrected by us to *V. darevskii sakoi* based on external traits (Figs. 2–4 in Kutrup et al. 2005). Field-ID: **Vda100**
- 7 **New:** About 2 km north-northwest of Cilhoroz, Çayırılı/Erzincan, 39.899789°N, 39.699922°E, at 2,474 m elevation, 15 June 2021. Source: Mert Yılmaz and his related posts on YouTube and Instagram. Remarks: ca. 1.7 km northwest of nearest locality-8; includes a field video of the *V. darevskii sakoi* being consumed and regurgitated by a *Coronella austriaca*. Field-ID: **Vda163**
- 8 **Refined:** Cilhoroz (Otlubekli Dağları Ridge), Çayırılı/Erzincan, 39.889926°N, 39.719152°E, n = 8, all within 500 m from coordinates, between 2,262–2,429 m elevation, on 04/05 June and 05 July 2003, 9/10 July 2012, 02 August 2024, and year 2024 (only year in latter case). Source: Baran et al. (2005) with vouchers ZDEU 57–59/2003, Otto Bylén and Didrik Claesson (pers. data transfer), and S. Yanik and I. Peranic (Instagram). Remarks: Baran et al. (2005) originally classified these vipers as *Vipera (r.) eriwanensis*, but were described as *Pelias (Vipera) sakoi* by Tunıyev et al. (2018), then suggested as pending further research by Freitas et al. (2020), and finally synonymized by us herein due to insufficient genetic and ecological divergence, insufficient morphological separation, and large sampling gaps across extensive suitable habitat between eastern *V. d. darevskii* and the more western *V. d. sakoi* (see main article). Remarks: Cilhoroz is the type locality for *V. d. sakoi* (Tunıyev et al. 2018) and updated Google Maps/Earth from 2025, with more precise provincial borders, show the type location not in Kelkit/Gümüşhane, as indicated originally, but in Çayırılı/Erzincan. The samples above include also the PARATYPES ZDEU 59/2003 from the first sample (Baran et al. 2005; Fig. 5 in Tunıyev et al. 2018) and the Holotype SNP 911 and Paratype SNP 906 (Figs. 4, 6 in Tunıyev et al. 2018a), added by six offspring from the sample in 2012 (Baran et al. 2005, Tunıyev et al. 2018). Elevation of type locality for *V. d. sakoi* was given as 2,000 m with a minimum of 1,850 m. However, such low elevation does not exist near Cilhoroz, hence we adjusted it to 2,319 m elevation according to the type locality shown in Fig. 9 of Tunıyev et al. (2018). The nearest elevation of 1,850 m is > 7 km farther east near Basköy. Field-ID: **Vda84–89, Vda231–233**



SUPPLEMENTAL FIGURE S1. Yılanlı Yaylasi, a prime habitat for Sako's Vipers *V. darevskii sakoi*, discovered a few years ago: A) this site is one of many with a high quality alpine meadow interspersed with rocks in the Gavur Mountains, Gümstüg, Torul/Gümüşhane, Türkiye (locality-3), showing two specimens **Vda76/77** (left/right). B) Sako's Vipers (here **Vda93**) can be observed basking during frequent periods of foggy but warm conditions on Yılanlı Yaylasi, Gümüşhane Province. (All photographed by Konrad Mebert).

- 9 **Corrected:** near the top ridge road between the Great and the Little Palandöken Forts, south of the Palandöken peak and Erzurum city, Palandöken/Erzurum, 39.813299°N, 41.304836°E, at 2,936 m elevation, June 1971 (voucher specimen in Fig. 3B of the main article). Source: Eiselt (1976) voucher ZMH R03297, collected by C. Kosswig, elevation given as 3,000 m. Remarks: specimen assigned to *V. darevskii* by us based on external traits (see main article); we placed coordinates to a suitable habitat ca. 2 km south of the peak of Palandöken Mountain at a similar elevation as indicated in Eiselt (1976), representing the first record for Erzurum Province. It may have originally been found at the Peak of Mt. Palandöken, but unfortunately, no such information was available. This specimen was originally classified as *Vipera ursinii renardi* and subsequently changed to *V. (renardi) eriwanensis* at least as early as Nilson et al. (1988). This record likely is responsible for the frequent account of 3,000 m elevation as the max. elevation for *V. r. eriwanensis* in Türkiye and adjacent regions in many generic publications. To our knowledge, there is no proven occurrence of *V. r. eriwanensis* in Türkiye or nearby cross-border regions at 3,000 m, as elevations > 2,500 m elevation are normally occupied by *V. darevskii*, at least where both species occur in close parapatry (e.g., Mebert et al. 2015). The Mt. Palandöken record is situated in the center, with ca. 140 km straight distance to the nearest, currently known, eastern *V. d. darevskii* site at localities-11 and -12 and the nearest western *V. d. sakoi* site at locality-8. Field-ID: **Vda65**



SUPPLEMENTAL FIGURE S2. A first in situ photograph of *Vipera darevskii* from Mt. Palandöken, Erzurum Province (locality-10; **Vda276**). This is only the second specimen known from that mountain range, with the first having erroneously been labeled as *V. (renardi) eriwanensis* by Eiselt (1976), but was corrected herein, see text and map in Fig. 1B of main article. (Photographed by Ümit İncekara).

- 10 **New:** north slope of Mt. Palandöken, 1.4 km east of the Dedeman Skiresort Hotel/Erzurum, 39.849167°N, 41.301667°E, at 2,699 m elevation, year 2023 (Fig. S2). Source: found and photographed by Ümit İncekara, provided via Bahadır Akman. Field-ID: **Vda276**
- 11 **New:** 4 km northeast Oğuzkent-Karakoçlar, Olur/Erzurum, 40.951672°N, 42.114172°E, at 2,318 m elevation, 24 June 2015. Source: photographic vouchers BGO_5904 and depiction in turkherptil.org by Mert Karis and Bayram Göcmen. Field-ID: **Vda63**
- 12 **New:** Kiliç Dağı, 3 km southwest Zekeriya, Ardanuç/Artvin, next to border with Erzurum Province, 40.959813°N, 42.135560°E, n = 2 within 400 m from coordinates, around 2,619 m elevation, 24 June 2015 and 2 July 2016. Source: photographic voucher BGO_5814 by Bayram Göcmen, Mert Karis, and with the specimen from 2016, also depicted in turkherptil.org. Remarks: mapcarta and peakery.com would place coordinates in Erzurum province; Google Earth/Maps in Artvin Province. Field-ID: **Vda62, Vda125**
- 13 **Refined + confirmed:** ca. 1.5 km west Zekeriya (Yalnızçam Dağları Ridge), Ardanuç/Artvin, 40.980136°N, 42.134191°E, n = 7 within ca. 800 m of coordinates, between 1,970–2,177 m elevation, details below.
- Refined:** 40.980331°N, 42.136449°E, n = 2, around 2,070 m elevation, 01 June 2002. Source: vouchers MNHN2002.410 and ASHNAO.00102, including Figs. 1 and 2 in Geniez and Teynié (2005) and Tuniyev et al. (2018). Remarks: this sublocality was originally indicated as east of Zekeriya (Geniez and Teynié 2005), but was corrected as being west of the village, Philippe Geniez (pers. data transf.), and photos depicted in David and Vogel (2010). Field-ID: **Vda7–8**
 - confirmed:** 40.980833°N, 42.139733°E, at 2,037 m elevation, 23 June 2015. Source: photographic voucher BGO_5526 by Bayram Göcmen, Mert Karis. Field-ID: **Vda60**
 - Refined:** 40.982091°N, 42.133960°E, n = 3 within 100 m from coordinates, around 2,153 m elevation, 31 August 2015 and 2 July 2016. Source: Tok et al. (2018) depicting habitat and two specimens from 2015 in Figures 1–3; one specimen collected in 2016 by Bayram Göcmen, Mert Karis. Field-ID: **Vda122–123, Vda127**
 - confirmed:** 40.977534°N, 42.125385°E, n = 1, around 2,178 m elevation, 2 July 2016. Source: photographic voucher DSC_0231 by Bayram Göcmen, Mert Karis. Field-ID: **Vda126**
- 14 **New:** 1.5 km west Zekeriya (Yalnızçam Dağları Ridge), Ardanuç/Artvin, 40.987518°N, 42.136787°E, n = 2, around 2,440 m elevation, 24 June 2015. Source: Bayram Göcmen, Mert Karis. Remarks: ca. 1 km north and west of localities-13 and -15, respectively; photographic vouchers BGO_5710, BGO_5955. Field-ID: **Vda61, Vda64**
- 15 **Refined:** north of Zekeriya (Yalnızçam Dağları Ridge), Ardanuç/Artvin, 40.988951°N, 42.148549°E, n = 4 within 500 m from coordinates, between ca. 1,993–2,100 m elevation, 11 July 2012. Source: Aziz Avcı (provider), Boris and Sako Tuniyev, Çetin Ilgaz, also material in Tuniyev et al. (2018). Remarks: ca. 1.2 km west from locality-16; specimens include the holotype for *V. darevskii uzumorum* (SNP904, Fig. 11 in Tuniyev et al. 2018) and paratypes (SNP908, SNP909), and three offspring, with specimens depicted in Figs. 12 and 13 in Tuniyev et al. (2018). Field-ID: **Vda104–107**
- 16 **Refined:** 1.5 km east Zekeriya (Yalnızçam Dağları Ridge), Ardanuç/Artvin, 40.993026°N, 42.162774°E, n = 7, between 1,935–1,984 m elevation, 18 September 2000 and 04 July 2011. Source: Philippe Geniez (pers. data transf.), six specimens with vouchers BEV.8369, 8855 from the year 2000 in Geniez and Teynié (2005); seventh specimen from 2011 by Aziz Avcı (provider), also depicted as voucher ZDEU99/2011 in Fig. 13C in Tuniyev et al. (2018) and in Fig. 13 in Tuniyev et al. (2012). Field-ID: **Vda1–6, Vda108**
- 17 **Refined:** Bağdaşan (Yalnızçam Dağları Ridge), Merkez/Ardahan, 41.064881°N, 42.376289°E, at 2,164 m elevation, 12 July 2012. Source: voucher SNP 910, Fig. 16 (Tuniyev et al. 2018), Aziz Avcı (coordinates provider). Remarks: HOLOTYPE for *V. darevskii kumlutasi*, leg. Boris S. Tuniyev, habitat depicted in Fig. 18B of Tuniyev et al. (2018). Field-ID: **Vda10**
- 18 **New:** 1.2 km northeast Highway D010, Çataldere/Ardahan, 41.214421°N, 42.554582°E, n = 3 within 100 m around coordinates, between 2,207–2,297 m elevation, 29 May 2022. Source: Justin L. Lee, Calvin Vick,

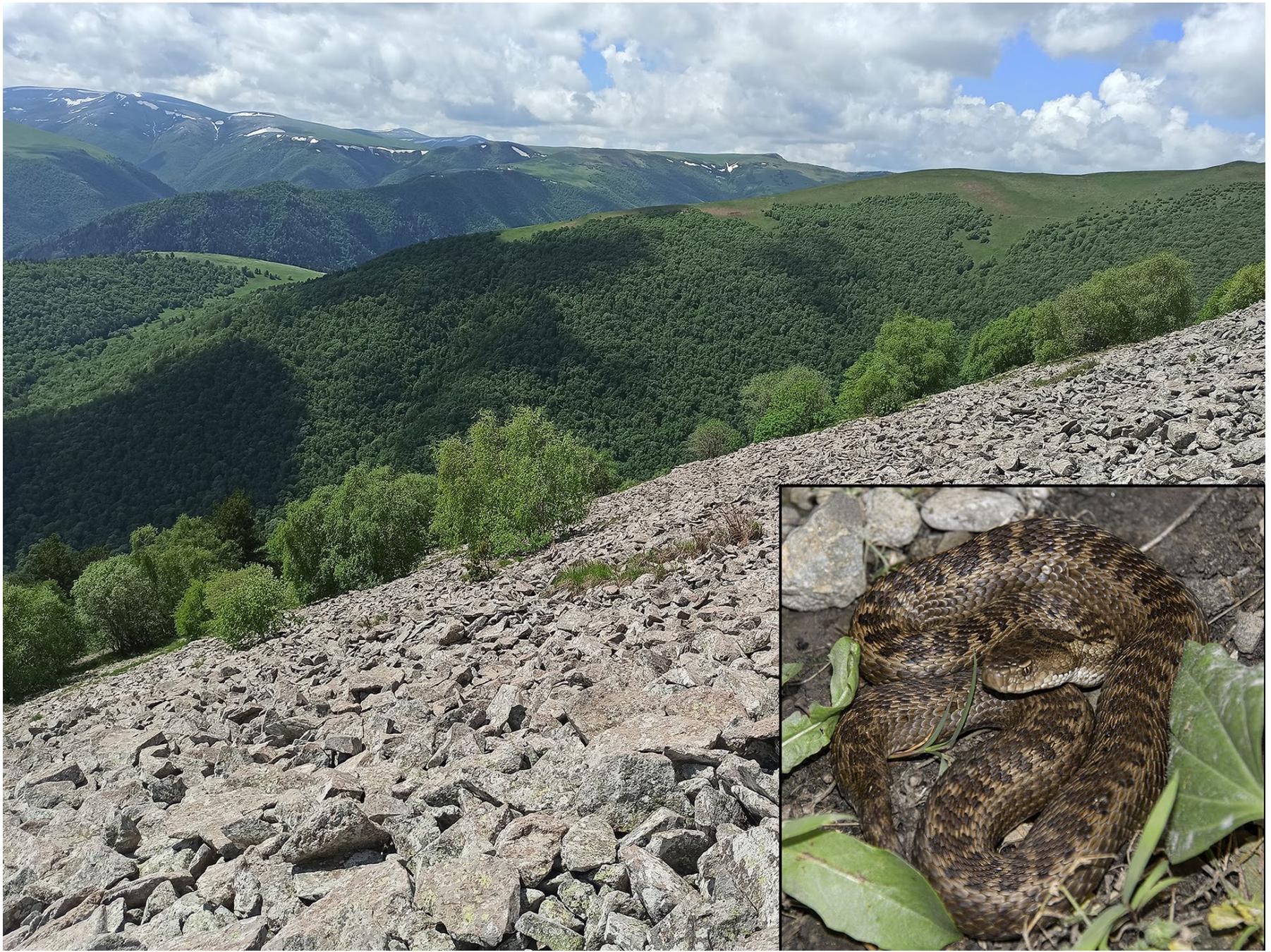
- Benjamin J. Stegenga (pers. data transf.). Remarks: site is at the northeastern exposed slope, at 1 km distance from southern exposed locality-19. Field-ID: **Vda180–182**
- 19 **Refined:** slope above Derin Creek, ca. 3.5 km northwest Çataldere before the Çam Pass (Yalnızçam Dağları Ridge), Merkez/Ardahan, 41.212975°N, 42.567444°E, n = 7 around 2,170 m elevation, 04/05 July 2001. Source: ZDEU 145/2001.1–7 (Baran et al. 2005) and photo vouchers Figs. 17A, B in Tuniyev et al. (2018). Remarks: leg. Kurtulus Olgun, Yusuf Kumlutas, Çetin Ilgaz, Fatma İret, and Aziz Avcı, coordinates point to a suitable habitat (see Fig. 18A in Tuniyev et al. 2018) ca. 20 road-km northwest of Ardahan city near the road to Savsat/Artvin according to information in Baran et al. (2005), who identified them as *V. (r.) eriwanensis*. These specimens were later correctly reassigned to *V. d. darevskii* in Tuniyev et al. (2018), establishing it as a new ssp. *kumlutasi*. Field-ID: **Vda115–121**
- 20 **New:** 1.9 km northeast Kurşunçavuş, Posof/Ardahan, 41.540142°N, 42.637753°E, n = 2 within 400 m from coordinates, around 2,027 m elevation, 08 September/October 2019. Source: shepherd, no name, data provided to Cagatay Altin. Field-ID: **Vda110–111**
- 21 **Refined:** 3.5 km southeast of Saricicek, Türkgözü Plateau, Posof/Ardahan, 41.558187°N, 42.687630°E, n = 2, around 2,050 m elevation, 21 May 2004. Source: Sagdan Baskaya, via Aziz Avcı, including extended photo material provided to us, vouchers ZDEU 270/2005 and Figures 3 and 4 in Avcı et al. (2010). Remarks: habitat is wet alpine meadow, few piles of rocks, east exposed, near a stream across a forested slope. Described as *Pelias (Vipera) olguni* (Tuniyev et al. 2012), relegated as a subspecies of *Pelias (Vipera) darevskii* (Tuniyev et al. 2018), and viewed by us and Freitas et al. (2020) as a regional population of *V. darevskii* due to low genetic divergence and insufficient sample size for morphological separation (see main article). Field-ID: **Vda101–102**
- 22 **New:** north of Ilgar Pass and above the Botas Ilgar Pumping Station complex, 2.3 km east of Aşıküzeyiri, Posof/Ardahan, 41.462830°N, 42.717892°E, at 2,188 m elevation, 15 August 2021. Source: Erdal Taşkıran, via Bahadır Akman and Mehmet Z. Yıldız (TANAP Survey 2021). Field-ID: **Vda154**
- 23 **New:** below and west of Ilgar Pass, above Botas Ilgar Pumping Station complex, 1.4 km east of Aşıküzeyiri, Posof/Ardahan, 41.455122°N, 42.706141°E, at 2,014 m elevation, 10 July 2021. Source: Cagatay Altin. Remarks: 1.3 km southwest of specimen at locality-22. Field-ID: **Vda158**
- 24 **Refined:** Ilgar Valley, 3 km south of Camyazi, Posof/Ardahan, 41.448710°N, 42.751220°E, n = 8 adults within 400 m radius, between 2,020–2,100 m elevation, 21 July 2011, 16 July 2021. Source: Aziz Avcı and vouchers SNP866, 874–880 (7 offspring not counted) and Figures 4–10 in Tuniyev et al. (2012). Remarks: further leg. Boris and Sako Tuniyev; coordinates also complemented by our placement according to habitat Figures 17 and 19 in Tuniyev et al. (2012); specimen from 2021 by Bahadır Akman, Mehmet Z. Yıldız (TANAP Survey 2021). Field-ID: **Vda11–17, Vda153**
- 25 **New:** Mt Ilgar, southeast Çamyazi, Posof/Ardahan, 41.437488°N, 42.763211°E, at 2,720 m elevation, 16 July 2018. Source: Cagatay Altin. Field-ID: **Vda112**
- 26 **New:** upper ridge, Ilgar Valley, Posof/Ardahan, 41.426210°N, 42.749001°E, at 2,765 m elevation, 23 May 2021. Source: Bahadır Akman, Mehmet Z. Yıldız, Cagatay Altin (TANAP Survey 2021). Field-ID: **Vda155**
- 27 **New:** below Ashikzulali summer cottages, 4 km east of Ashikzulali village, Posof/Ardahan, 41.434474°N, 42.710936°E, at 2,149 m elevation, 23 May 2021. Source: Bahadır Akman (TANAP Survey 2021), no voucher, specimen escaped. Field-ID: **Vda143**
- 28 **New:** 2.8 km southeast of Derindere, Posof/Ardahan, 41.428675°N, 42.966473°E, at 2,642 m elevation, 23 June 2021. Source: Cagatay Altin. Field-ID: **Vda160**
- 29 **New:** Tuşda Yaylalar, Damal/Ardahan, 41.375730°N, 42.967721°E, at 2,817 m elevation, 21 June 2021. Source Cagatay Altin. Field-ID: **Vda159**
- 30 **Refined:** western slopes of Kel Mountain Range, 2.2 km northeast Sulakçayır, Hanak/Ardahan, 41.324108°N, 42.918069°E, at 2,250 m elevation, 15 May 2013. Source: Göcmen et al. (2014). Field-ID: **Vda51**

- 31 **Refined + confirmed:** southern and western slopes of Kel Mountain Range, 2.7 km northeast Yamçılı, Hanak/Ardahan, 41.323919°N, 42.955235°E, n = 5 within 700 m from coordinates, 2,279–2,524 m elevation. Sources:
- confirmed:** n = 3 on 15 May 2013 in Göcmen et al. (2014). Field-ID: **Vda52–54**
 - New:** n = 1 on 30 August 2012 by Cagatay Altin. Field-ID: **Vda109**
 - New:** n = 1 on 21 June 2018 by Adem Adakul, Abdurrahman Sefali, Yasin Turfanda. Field-ID: **Vda72**
- 32 **New:** 6 km east Yamçılı, Hanak/Ardahan, 41.334201°N, 43.004732°E, at 2,809 m elevation, 02 August 2012. Source: Cagatay Altin (pers. data transf.), also depicted in turkherptil.org. Field-ID: **Vda9**
- 33 **New:** eastern slopes of Kel Mountain Range, 4.4 km west of Baltali, Cildir/Ardahan, 41.336976°N, 43.063220°E, at 2,458 m elevation, 16 August 2020. Source: shepherd Akin Hamit from Sabaholdu (pers. data transf. with photo/video vouchers via Burak Akdag). Field-ID: **Vda142**
- 34 **New:** Baltali, Cildir/Ardahan, 41.323633°N, 43.084220°E, at 2,312 m elevation, 30 July 2020, Burak Akdag, Ferhat Kurtulus, Mert Gürboğa. Field-ID: **Vda141**
- 35 **Refined + confirmed:** southwestern slopes of Kel Mountain Range, Ortakent Oguzyolu, Hanak/Ardahan, 41.269451°N, 42.976181°E, n = 3 within 320 m of coordinates, between 2,305–2,443 m elevation, 08 June 2014 (Mebert team) and 02 July 2020 (Akdag et al.). Source: Mebert et al. (2015) and Burak Akdag et al. (unpubl.). Field-ID: **Vda55–56, Vda133**
- 36 **Refined + confirmed:** Ortakent Oguzyolu, Hanak/Ardahan, 41.255404°N, 42.977711°E, n = 10 within 770 m from coordinates, between 2,167–2,303 m elevation, 08 June 2014 (Mebert et al.), 01/02 July 2020 (Akdag et al.), and 27 May 2024 (Claesson). Source: Mebert et al. (2015), Burak Akdag et al. (unpubl.), and Otto Bylén and Didrik Claesson (pers. data transf.). Remarks: 1.5 km southwest of locality-35. Field-ID: **Vda57–58, Vda128-134, Vda218**
- 37 **Refined:** southern slopes of Kel Mountain Range, Ortakent Oguzyolu, Hanak/Ardahan, 41.251635°N, 42.995594°E, n = 3 between 2,416–2,213 m elevation, 05/18 May 2015 and 30 May 2024. Source: Karim Amri (pers. data transf.), Mebert et al. (2016), and Otto Bylén and Didrik Claesson (pers. data transf.). Remarks: 1.3 km southeast of locality-36. Field-ID: **Vda59, Vda167, Vda219**

See a recently added locality from Türkiye at “Late Additions” below

Georgia

- 38 **New:** south below Mt. Shuakarav, west of Uraveli, Akhalsikhe/Samtskhe-Javakheti 41.524131°N, 42.966069°E, at 2,274 m elevation, 10 June 2022 (Fig. S3). Source: Konrad Mebert, Giorgi Iankoshvili, Mert Karis, Alisa Sanakoeva. Field-ID: **Vda175**
- 39 **Refined:** Mt. Airilanbashi, 10 km south of Tskaltbila/Samtskhe-Javakheti, 41.483539°N, 42.905724°E, at 2,383 m elevation, July 2014. Source: one killed specimen in Tuniyev et al. (2014), confirmed by Guram Iremashvili. Field-ID: **Vda44**
- 40 **Refined + Corrected:** lower Mt. Gumbati slopes (Erusheti Plateau)/Samtskhe-Javakheti, near Turkish border, centered at 41.355437°N, 43.125376°E, n = 5 within 780 m around coordinates, between 2,015–2,204 m elevation, July 2014. Source: Tuniyev et al. (2014), confirmed by Guram Iremashvili. **Corrected:** Iankoshvili and Tarkhnishvili (2021) placed a presence-square south of Khaveti. However, that record relates to Mt. Gumbati as stated in Tuniyev et al. (2014), see localities-40–42. Field-ID: **Vda34–38**
- 41 **Refined:** middle Mt. Gumbati slopes (Erusheti Plateau)/Samtskhe-Javakheti, near Turkish border centered at 41.364829°N, 43.104228°E, n = 5 within 470 m around coordinates, between 2,304–2,437 m elevation, July 2014. Source: Tuniyev et al. (2014) confirmed by Guram Iremashvili. Field-ID: **Vda39–42**
- 42 **Refined:** higher Mt. Gumbati (Erusheti Plateau)/Samtskhe-Javakheti, 41.370686°N, 43.091231°E, at 2,568 m elevation, July 2014. Source: Tuniyev et al. (2014) confirmed by Guram Iremashvili. Field-ID: **Vda43**

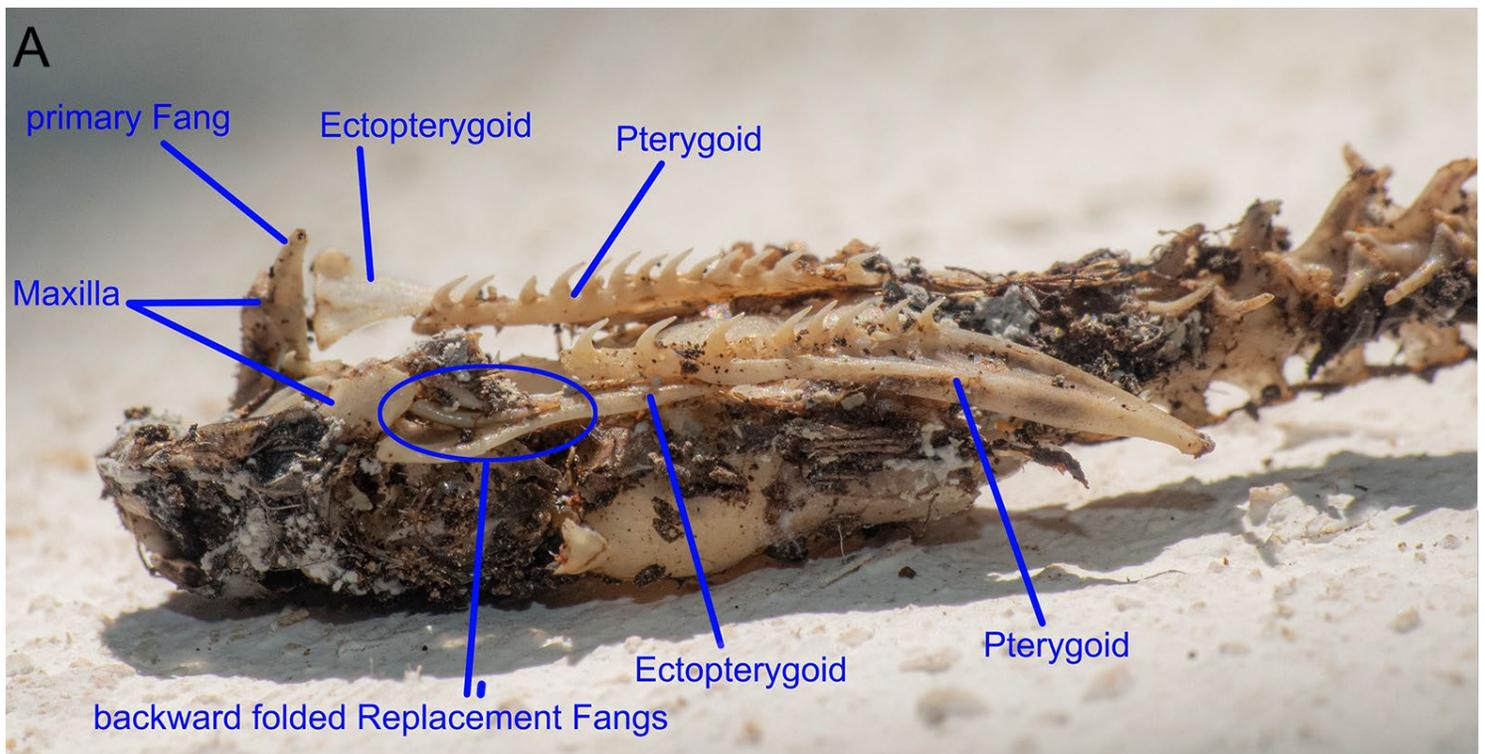


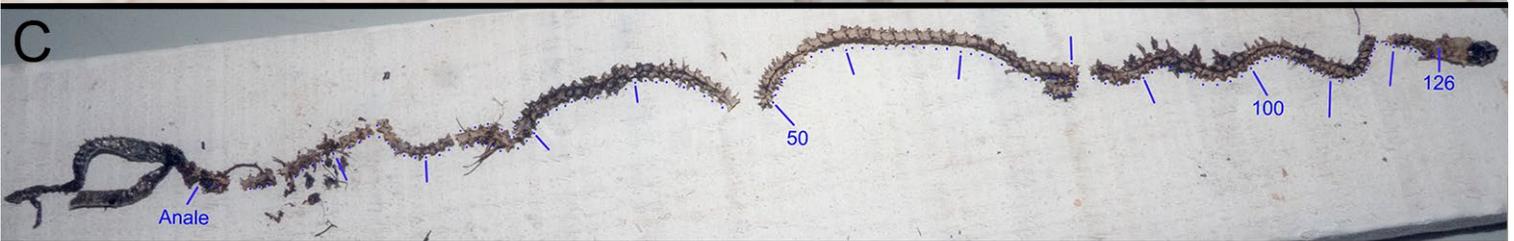
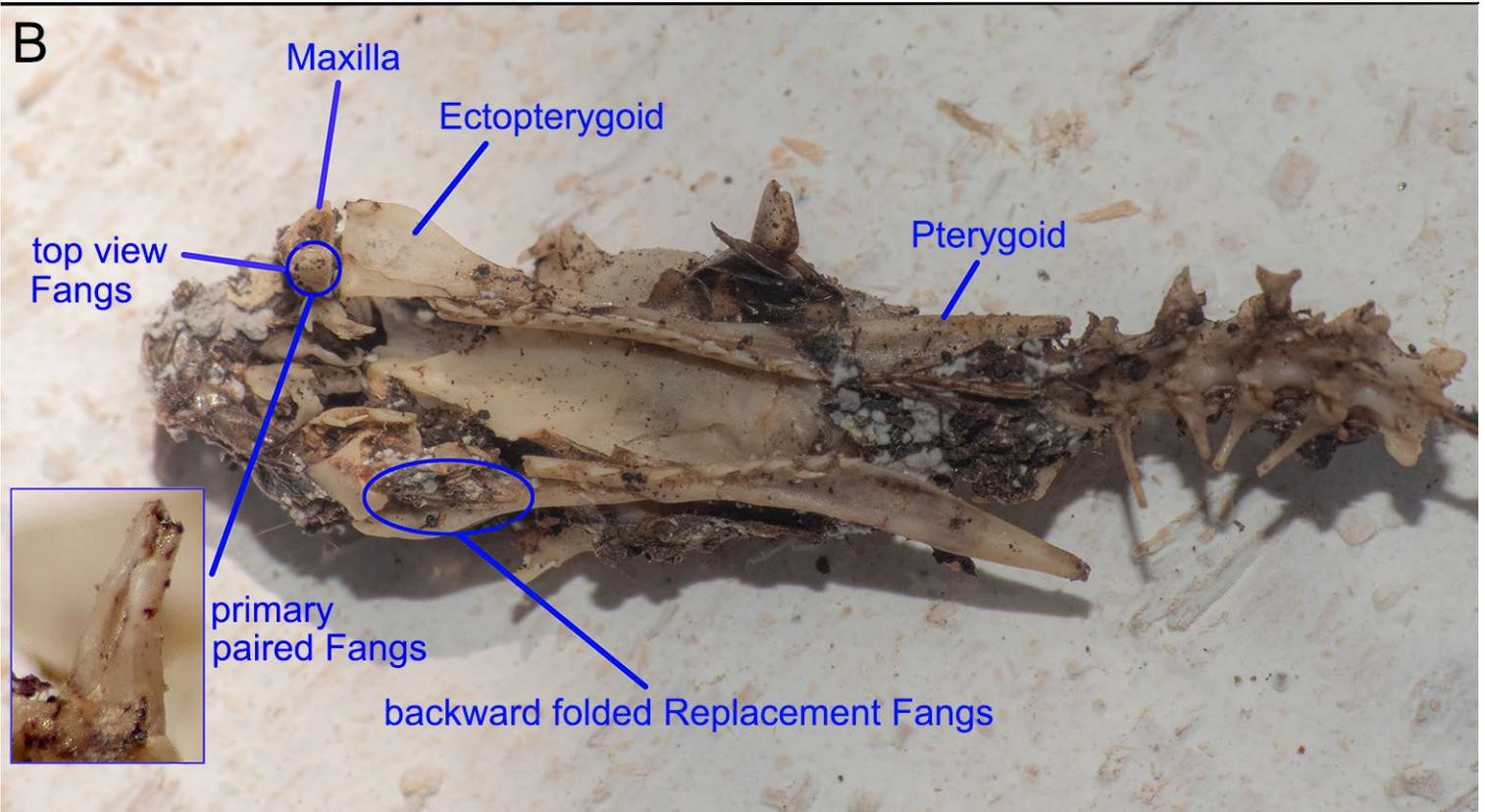
SUPPLEMENTAL FIGURE S3. Large rock slides within the forest belt of Mt. Shuakarav, a new habitat for Darevsky's Viper *V. d. darevskii*, Erusheti Mountains, west of Uraveli, Georgia. Inset shows the specimen **Vda175** found at this locality-38. (Photographed by Konrad Mebert).



SUPPLEMENTAL FIGURE S4. Rock pile within a montane grassland > 2,000 m elevation, a grassland mixed of wet meadows and *Stipa* steppe grass, a new habitat for Darevsky's Viper *V. d. darevskii*, Erusheti Mountains/Plateau, west of Toloshi, Georgia, where we expected *V. r. eriwanensis* instead. Inset shows the specimens **Vda215** and **Vda216** found at this locality-43. (Photographed by Konrad Mebert).

- 43 **New:** easternmost locality within the Erusheti Plateau, between Vani and Erkota, ca. 5 km sw of Atskvita/Samtskhe-Javakheti, 41.481974°N, 43.186851°E, n = 2 within 20 m from coordinates around 2,065 m elevation, 13 August 2023 and 29 June 2024 (Fig. S4). Source: leg. Konrad Mebert, Balkan Mega, Giorgi Elbakidze. Remarks: in shed, basking at 8:20 h in the August sun; thought to be an area for *V. r. eriwanensis* based on abundance of steppe vegetation (*Stipa* grass) and suitable elevation, but that area potentially represents a syntopic transition zone for both grassland viper species, yet, it requires confirmation. Records of *V. r. eriwanensis* are at a distance of around 6 km north above Dzveli and 12 km south above Zeda Tmogvi with massive steppe habitats connecting all three sites (Mebert et al. 2025a). Field-ID: **Vda215–216**
- 44 **New:** southern slope of Sanislo peak, Shavi Klde Mts. (western Trialeti Mts.), 7 km northeast of Ota Fortress, Aspindza/Samtskhe-Javakheti, 41.654895°N, 43.401142°E, at 2,327 m elevation, 13 August 2022 (Fig. 5B of the main article). Source: Shota Zankudeli, Konrad Mebert, Guram Iremashvili, Andro Solomanashvili. Remarks: first record from the Trialeti Mountain Range. Identification is based on a skeleton including skull and some keeled scales, but missing the mandibles (lower jaw). There are only three species of snakes (*Coronella austriaca*, *Natrix natrix*, *Vipera d. darevskii*) known to regularly occur in humid alpine grassland just above the treeline in the northern section of the Lesser Caucasus at elevation of > 2,200 m. Keeled scale excludes *Coronella*, whereas the lack of a maxillary teeth row and low count of 37 caudal vertebrae, respectively subcaudal counts (without the tail tip, Fig. S5D), excludes *Natrix* and any other colubrid snake. Indeed, a closer look reveals fangs (Fig. S5A, B). Hence, these bony remains, fangs, and the spotted ventral pattern (Fig. S5E) clearly relate to a viperid. In this alpine habitat, *Vipera darevskii* would be the common species, whereas *V. meridionalis transcaucasiana* might reach such habitat and elevation, albeit rarely, and *V. r. eriwanensis*, a viper of open, resp. treeless, comparatively drier steppes, is reaching elevations up to 2,200 m elevation in Georgia and Türkiye, but not above (Mebert et al. 2025a). Furthermore, based on summary data from Geniez (2018) and Freitas et al. (2020), there is no clear difference between the regional viper candidates in subcaudal counts (range in *V. darevskii* sensu lato 24–41, *V. m. transcaucasiana* 32–39, *V. r. eriwanensis* 23–39), whereas the ventral counts of 126 (Fig. S5C; increasing a range to 125–130 to account for a small error) clearly assigns the remains of our viper to *V. d. darevskii* or *V. r. eriwanensis*, and excludes *V. ammodytes* with its much higher ventral count (range in *V. darevskii* sensu lato 125–144, *V. m. transcaucasiana* 144–162, *V. r. eriwanensis* 129–143). Elevation and habitat difference exclude *V. r. eriwanensis*, leaving *V. d. darevskii* the sole possibility for these body remains. Field-ID: **Vda207**





SUPPLEMENTAL FIGURE S5A, B, C (above), D, E, F (below). Skeleton of a Darevsky's Viper *V. d. darevskii* discovered under a rock at > 2,300 m elevation in the western Trialeti Mountains (locality-44; **Vda207**; see habitat in Fig. 5 of the main article). Primary and replacement fangs are visible in the skull images (A lateral and B ventral view). The indicated low number of trunk and tail vertebrae (C and D), reflecting linked ventral and subcaudal scales respectively, are present only in two regional grassland vipers, *V. d. darevskii* and *V. r. eriwanensis*, whereby the high elevation and wet montane meadow excludes the latter one, but is typical for the Darevsky's Viper. The black and white spotting pattern of the ventral scales (subfigure E), also shows the typical ventral pattern of regional vipers. (E) Typical spotted ventral pattern of regional *Vipera* species. (Photographed by Konrad Mebert).

-63 **New:** western Mt. Oshora, Aspindza northwest, Trialeti Range, 41.678031°N, 43.230029°E, at 2,360 m elevation, 01 September 2024 (Fig. S6). Source: Vakhtang Kapanadze via Giorgi Gigauri. Remarks: locality-63 interrupts the sequential listing, because it was added post-formatting and thus prevents us from having to change all subsequent locality numbers in all files (texts, tables, KMZ, photos, etc.). This specimen confirms the skeleton voucher of nearby locality-44. Field-ID: **Vda221**



SUPPLEMENTAL INFORMATION FIGURE S6. First life voucher of *V. darevskii* (**Vda221**) from the western Trialeti Mountains at locality-63, ca. 14.4 km straight distance northwest from the skeleton voucher above (**Vda207**). (Photographed by Vakhtang Kapanadze).

-45 **New:** Patara Samsari/Samtskhe-Javakheti, 41.561339°N, 43.637025°E, at 2,269 m elevation, 11 August 20221 (Fig. S7). Source: Barnabás Bancsik (leg.), Konrad Mebert, and more. Remarks: currently most northern record along the Abul-Samsari Range. Due to continuing equivalent habitat, we expect *Vipera d. darevskii* to inhabit rocky grassland all along this mountain range of 40 km length on both sides, western and eastern versants. Field-ID: **Vda206**



SUPPLEMENTAL INFORMATION FIGURE S7. Habitat of *Vipera d. darevskii* along western slope of central Abul-Samsari Range northeast of Patara-Samsari, locality-45. Inset shows the female Darevsky's Viper **Vda206** found by Barnabás Bancsik during our group search. (Photographed by Konrad Mebert).

- 46 **New:** above Olaverdi (western slopes Abul-Samsari Range)/Samtkhe-Javakheti, 41.445186°N, 43.614008°E, at 2,500 m elevation, 09 August 2022 (Fig. S8). Source: Shota Zankudeli (leg.), Konrad Mebert, Guram Iremashvili, Merk Karis. Field-ID: **Vda205**
- 47 **New:** Mt. Abuli, east of Abuli village/Samtskhe-Javakheti, 41.421387°N, 43.654439°E, n = 13 within 430 m from coordinates, around 2,461–2,622 m elevation, years 2018–2021. Source: Lado Ashotia and Nutsa Upastan Tskimanauri for 2018, Lennart Schmid, Yannick Francioli, Guram Iremashvili for 2019, Giorgi Iankoshvili for 2020, Yannick Francioli, Robin Gloor for 2021. **Corrected:** Iankoshvili and Tarkhnishvili (2021) placed two occurrence-squares for *V. darevskii* just south of Mt. Abuli taken from social media information. These records represent observations by our co-authors (Guram Iremashvili and Lennart Schmid), and were slightly adjusted herein, so they correctly occupy jointly the uppermost square on the *V. darevskii* map in Iankoshvili and Tarkhnishvili (2021). Field-ID: **Vda113–114, Vda145–152; Vda164–166**



SUPPLEMENTAL FIGURE S8. Rock slides on the western slopes of Mt. Abuli above Olaverdi, part of continuous habitat for Darevsky's Viper *V. d. darevskii* all along the Abul-Samsari Mountain Range. Inset shows one *V. d. darevskii* **Vda205** from the locality-46. (Photographed by Konrad Mebert).

- 48 **New:** Vladimirovka Slope, 4.3 km west of that village center (Abul-Samsari Range)/Samtskhe-Javakheti, 41.418456°N, 43.715136°E, n = 35 within 440 m from coordinates, between 2,287–2,391 m elevation, 11 June 2019, 09 July/16 August 2021, 07/08 August 2022, 01 June 2023 (Fig. S9). Source: Konrad Mebert, Andro Solomanoshvili, and Beka Chitadze (July 2021), Ondra Trávníček Team (August 2021), Mebert and Mizsei teams (August 2022), Greg Meier et al. (June 2023). Field-ID: **Vda18–25, Vda156–157, Vda161–162, Vda183–186, Vda190–204, Vda211–214**
- 49 **New:** a small marsh 3.3 km west of Vladimirovka (Abul-Samsari Range)/Samtskhe-Javakheti, 41.420772°N, 43.726758°E, n = 3 within 50 m from coordinates, between 2,278–2,283 m elevation, 07 August 2022 (Fig. S9). Source: Konrad Mebert, Guram Iremashvili. Field-ID: **Vda187–189**
- 50 **New:** Gandziskhevi Valley, 9 km east Gamdzani (Javakheti Range)/Samtskhe-Javakheti, 41.337034°N, 43.865545°E, at 2,445 m elevation, 27 May 2021 (Fig. 5A in the main article). Source: Mert Karis, Konrad Mebert, Mehmet Z. Yildiz, Lennart Schmid, Judith Grünewald. Remarks: Most eastern record in Georgia. Field-ID: **Vda144**



SUPPLEMENTAL FIGURE S9. Massive rock slides and alpine meadow provide large habitat for Darevsky's Viper *V. d. darevskii* between Vladimirovka (Paravani Lake) and Mt. Abuli (localities-48 and -49). Inset shows one *V. d. darevskii* **Vda156** from that area, locality-48. (Photographed by Konrad Mebert).

-51 **Refined + confirmed:** Mt. Madatapa (Javakheti Range), 4–5 km northeast of Epremovka, Ninotsminda/Samtskhe-Javakheti, 41.212716°N, 43.802846°E, $n > 20$ within 900 m from coordinates, around 2,200–2,700 m elevation. Source: first collected on 03 July 1975 by V.I. Vedmederja, voucher MNKhNU 29044 (our individual ID **Vda174**), and mentioned as Paravani Valley in Bakradze (1975). We placed the coordinates, 41.210059°N, 43.793290°E, to a rocky site at the southwestern foot of Mt. Madatapa. Further collections/observations from Mt. Madatapa that followed: $n = 7$ in Tuniyev et al. (2014), $n = 2$ on 21 May 2015 by Johan Nylander (pers. data transf.), $n = 5$ on 02 August 2019 by Bobby Bok, Gert van Gerspui and colleagues (pers. data transf.), $n = 2$ by Tim Warfel on 10 June 2018 (pers. data transf.), $n = 4$ by Jeroen Speybroek on 14 August 2021, one shed by David Broek on 27 April 2022, and variable ones by Guram Iremashvili. Remarks: the first *V. d. darevskii* from that site (**Vda174**) was initially identified as *Vipera ursinii darevskii* (Vedmederja, Orlov and Tunijev, 1986; Vedmederja et al., 2007), but later switched to *V. eriwanensis* by Kukushkin et al. (2012). Indeed, the reduced contrast between dorsal band and ground body color is more common in *eriwanensis*, the parietal angles and the shape of lateral blotches appear intermediate between the two grassland viper taxa (Fig. S10 below on next page). In contrast, the anterior end of the dorsal band and its width of 7 scales, as well as the stoutness of the snout are more similar to *darevskii*. It may represent a hybrid due to its proximity to nearby potential *eriwanensis* habitat. **Corrected:** Iankoshvili and Tarkhnishvili (2021) placed an occurrence-square for *V. darevskii* south of Ninotsminda. However, this record relates to Madatapa in Tuniyev et al. (2014) and corresponds to this locality-51. Field-ID: **Vda27–33, Vda66–67, Vda95–99, Vda124, Vda168–172, Vda174**



SUPPLEMENTAL FIGURE S10. First *Vipera d. darevskii* from Mt. Madatapa, Javakheti Range, 4–5 km northeast of Epremovka, MNKhNU 29044 (locality-51; our individual ID **Vda174**). (Photographed by Oleksander Zinenko).

-52 **New:** Zagraniechnoe Ushelie Valley, Karaultepe Mountains, ca. 6 km southeast Khanchali/Samtskhe-Javakheti, 41.203059°N, 43.472647°E, n = 4 within 120 m from coordinates, between 2,491–2,524 m elevation, 15 June 2022 (Fig. S11). Source: Konrad Mebert, Guram Iremashvili, Mert Karis. Remarks: this location lies in a valley with suitable habitat between 2,300 to 2,800 m elevation and is < 5 km distant from similar habitats across the borders into Türkiye (east of Cildir Lake) and Armenia (west of Lake Arpi). This strongly suggests that further populations of this Darevsky’s Viper will be detected in this tri-national mountain range with Mt. Yerakatar its highest peak (3,008 m elev.), as already suggested by Tuniyev et al. (2014). Field-ID: **Vda176–179**

See recently added localities from Georgia at “Late Additions” below



SUPPLEMENTAL FIGURE S11. Rock slides and grazing sheep on an alpine meadow, typical habitat for the Eastern Darevsky's Viper *V. d. darevskii* in the Karaultepe Mountains, southeast Khanchali Lake (Ninotsminda), southwestern Georgia. Inset shows one *V. d. darevskii* **Vda179** from that locality-52, a few km from the border with Armenia and Türkiye. (Photographed by Konrad Mebert).

Armenia

- 53 **Refined + confirmed:** Mt. Kechut (Mt. Leghli), Saragyugh/Shirak, 41.165879°N, 43.905877°E, n = 4 within 600 m southwest and northeast from coordinates, between 2,410–2,627 m elevation, years 1987 (B. Tuniyev), 2006–2009 (Aghasyan et al. 2009), Tigran Tadevosyan (2003–2004, unpubl.). Source: Site 7 in Aghasyan et al. (2009), some listed in Tuniyev et al. (2012), and a distribution point in Tuniyev et al. (2014). Field-ID: **Vda50, Vda137–139**
- 54 **Refined + confirmed:** Mt. Achkasar (Mt. Akchala), Saragyugh/Shirak, 41.154693°N, 43.918278°E, multiple specimens within 370 m from coordinates, between 2,463–2,715 m elevation (remeasured), years 1987 (B. Tuniyev), 2006–2009 (L. Aghasyan), 2003–2004 (T. Tadevosyan, unpubl.). Source: Site 6 in Aghasyan et al. (2009), some listed also in Tuniyev et al. (2012), and a distribution point in Tuniyev (2014). Field-ID: **Vda49, Vda140**
- 55 **Refined:** Mt. Achkasar (Mt. Legli), Saragyugh/Shirak, 41.143535°N, 43.935177°E, n > 7 within 500 m from coordinates, between 2,500–2,800 m elevation, < 2006 and 14 July 2007. Source: one specimen by G. Iremashvili (2007, unpubl.), multiple specimens on map by Aghasyan (2006). Remarks: this site is in close proximity (1–2 km) from locality-54, likely reflecting a continuous distribution. Field-ID: **Vda173**

- 56 **Refined**: west of Mt. Andranik, Sizavet/Shirak, 41.126579°N, 43.906834°E, multiple specimens from 2,389–2,620 m elevation, years 2006–2009. Source: Site 5 in Aghasyan et al. (2009), some listed in Tuniyev et al. (2012). Field-ID: **Vda48**
- 57 **Refined**: southwest of Mt. Andranik, Sizavet/Shirak, 41.116979°N, 43.928510°E, multiple specimens from within 500 m of coordinates, around 2,580 m elevation, < 2006. Source: distribution points in Aghasyan (2006). Field-ID: **Vda236**
- 58 **Refined**: north Mt. Sevsar, Ghazanchi/Shirak, 41.095669°N, 43.916521°E, multiple specimens between 2,481–2,545 m elevation, years 2006–2009. Source: Site 4 in Aghasyan et al. (2009), also listed in Tuniyev et al. (2012). Field-ID: **Vda47**
- 59 **Refined**: upper Mt. Sevsar, Ghazanchi/Shirak, 41.092448°N, 43.932248°E, at 2,684 m elevation, 16 July 2003. Source: Tigran Tadevosyan. Remarks: ca. 1.4 km east of locality-58. Field-ID: **Vda135**
- 60 **Refined**: lower slope of Mt. Sevsar, Ghazanchi/Shirak, 41.089210°N, 43.899785°E, at 2,436 m elevation, 12 October 2006. Source: Tigran Tadevosyan. Remarks: ca. 1.6 km southwest of locality-58. Field-ID: **Vda136**
- 61 **Refined**: south of Mt. Sevsar, east of Mets Sepasar and Ashotsk (Ghukasian)/Shirak, 41.073189°N, 43.911465°E, multiple specimens within 700 m from coordinates, between 2,302–2,500 m elevation, years 1954–1980 (type series), 1992 (G. Nilson) and 2006–2009 (Aghasyan 2009). Source: Sites 1–3 in Aghasyan et al. (2009), listed in Tuniyev et al. (2012). Site 1 also represents the type locality, originally given as Mt. Legli (or Mt. Kechut, sometimes wrongly named as Mt. Achkasar) in earlier references (Darevsky 1956; Vedmederja et al., 1986; Orlov and Tuniyev 1990, incl. Figures 10, 11), but was subsequently corrected to Mt. Sevsar by Tuniyev et al. (2014). Type series collected by I.S. Darevsky: Holotype ZIN (now ZISP) 19934 (June 1980; its Fig. 10), and paratypes: ZISP 16546 a and b (28 May 1954), ZISP 17545 (6 August 1955), ZISP 19935 (June 1980), and additional vouchers NHM (Gothenburg) 6668, 5086, 6860, 7129, 7050, 7230, 7231 by G. Nilson (12/17/28 June 1992). Field-ID: **Vda45–46** (G. Nilson; Aghasyan et al. 2009), **Vda26a, b, c** (type series)
- 62 **New**: northwest Arpi Lake/Shirak (Fig. S12). A 10x10 km grid cell replaces coordinates due to conservation related request by the National Academy of Sciences of the Republic of Armenia Scientific Center of Zoology and Hydroecology, n = 2 within 12 m from each other, between 2,100–2,104 m elevation, 5/6 June 2023. Source: Wilson et al. (2023). Field-ID: **Vda209–210**

Late Additions

- 63 **New**: western Mt. Oshora, Aspindza northwest Trialeti Range is inserted into the list above, between locality-44 and locality-45 to preserve the format of regional presentation of records.
- 64 **New**: Amaratdere rockslide, Mt. Megruki, Borjomi-Khargauli NP/Samtskhe-Javakheti, Georgia, 41.831315°N, 43.114061°E, n = 2 within 15 m around 2,170 m elevation, 18 June 2025. Source: Alisa Sanakoeva, Konrad Mebert, Mert Karis. Remarks: these finds represent the first records for the principal ridge of the Meskheti Range, and the most northern ones for the Darevsky's Viper, as after a few km north, the plateau ends, the northern mountain slopes decrease in elevations towards the adjacent lowland of western Georgia without suitable habitat for *V. d. darevskii*. Field-ID: **Vda223–224**
- 65 **New**: southern slope of Phersati Plateau (Meskheti Range), Gomaro, Adigeni/Samtskhe-Javakheti, Georgia, 41.717504°N, 42.734041°E, n = 5 within 620 m from coordinates, between 1,840–2,127 m elevation, 16/22 May 2021 and 23 October 2023. Source: Konrad Mebert, Giorgi Iankoshvili, Alisa Sanakoeva, Mert Karis, Mehmet Zülfü Yildiz, Lennart Schmid, Judith Grünwald, Giorgi Elbakidze, Guram Iremashvili. Remarks: Darevsky's Viper occur in syntopy (same microhabitat) with high-elevation Eastern Nose-horned Vipers *Vipera ammodytes* (or *meridionalis*) *transcaucasiana*. Field-ID: **Vda225–228, Vda230**
- 66 **New**: eastern slope of Phersati Plateau (Meskheti Range) between Mlashe and Namniauri, Adigeni/Samtskhe-Javakheti, Georgia, 41.752797°N, 42.667706°E, at 2,164 m elevation, 25 May 2023. Source: Mehmet Zülfü Yildiz (leg.), Konrad Mebert, Giorgi Iankoshvili, Alisa Sanakoeva, Mert Karis. Field-ID: **Vda223–229**

- 67 **New:** Güzyurdu, Kelkit/Gümüşhane, Türkiye, 39.883250°N, 39.561767°E, at 2,473 m elevation, 12 June 2016 Fig. S11C. Source: Kurtulus Özgişi (pers. data transfer) via Mehmet Zülfü Yıldız. Field-ID: **Vda222**
- 68 **Refined:** southeast of Mt. Sevsar, east of Mets Sepasar and Ashotsk (Ghukasian)/Shirak, 41.072810°N, 43.938930°E, at 2,772 m elevation, July 2024. Source: Leonid A. Neymark on iNaturalist and pers. data transfer. Remarks: it represents the currently most southeastern record in Armenia, but close (1.6 km) to individual **Ver45** at locality-61. Field-ID: **Vda237**



SUPPLEMENTAL FIGURE S12. A+B) Two *Vipera d. darevskii* from northwest of Arpi Lake, Shirak Province, at around 2,100 m elevation (locality-62; **Vda209** and **-210**). First Darevsky's Vipers from Armenia outside of the Javakheti Range (Wilson et al. 2023; Elden et al. 2025). C) *Vipera d. sakoi* **Vda222** Güzyurdu, Gümüşhane, Türkiye. (A and B photographed by Justin M. Elden; C by Kurtulus Özgişi).

More photo vouchers of steppe vipers for most localities are placed in folders accessible upon request to the senior author. For credible localities without a voucher (museum specimen, photograph, or tissue sample) satellite screenshot taken from GoogleEarth was used to reflect the suitability of a habitat.

While the coordinates herein are open and free to be used, we, or at least the lead author, would certainly appreciate to be contacted for using coordinates in modelling and related studies with a biogeographic content. It is an issue of respect, as the effort to obtain the massive data set and evaluation of each one has taken years of strenuous and disciplined work.

SUPPLEMENTAL LITERATURE CITED

Additional references are cited only in the main article.

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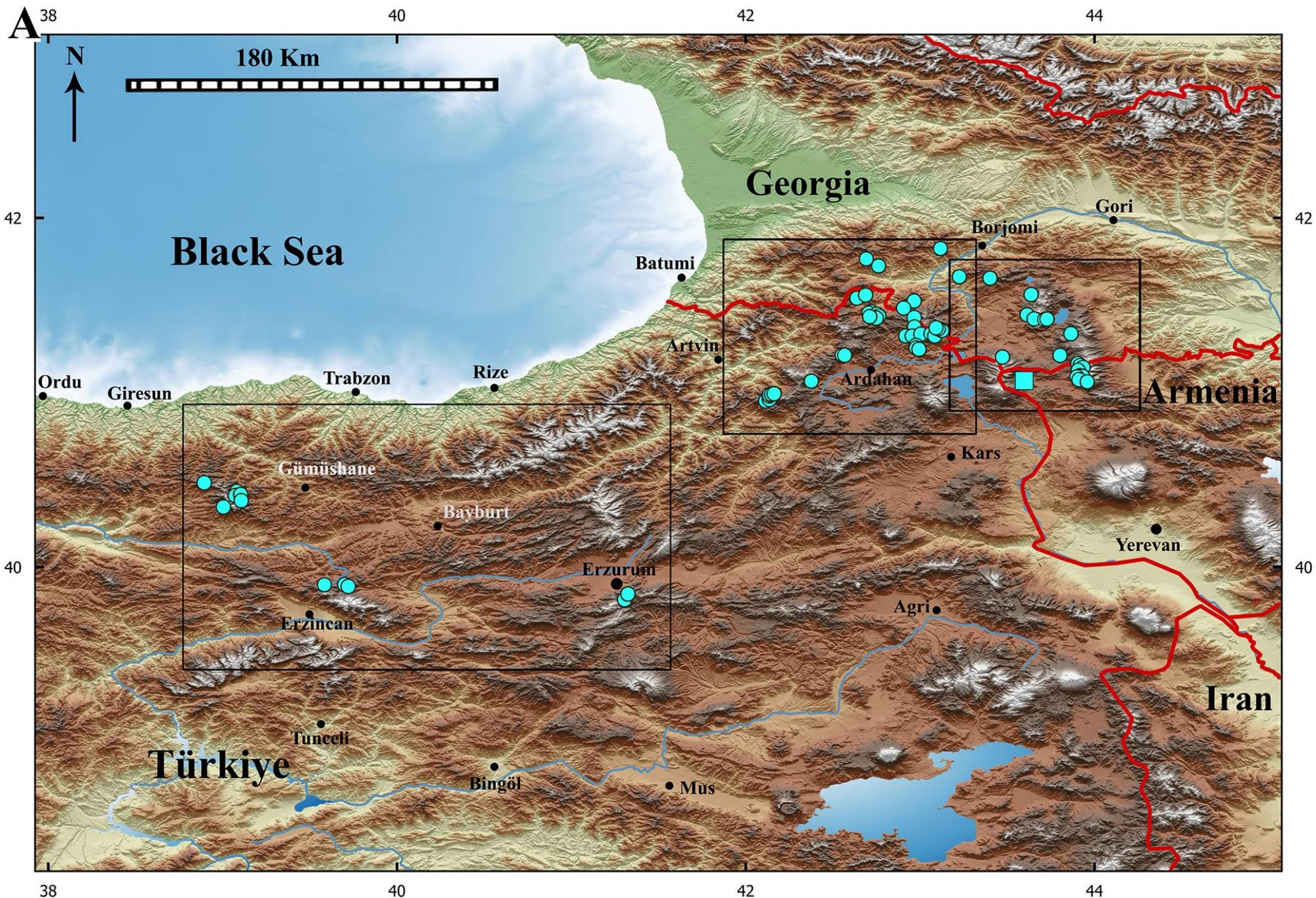


FIGURE 1A-inserted from main article. Currently known distribution of Darevsky's Viper including western populations (*V. d. sakoi*) and eastern populations (*V. d. darevskii*). Black rectangles related to more zoomed-in maps: left rectangle in Fig. 2, middle in Fig. 8, and right in Fig. 9.

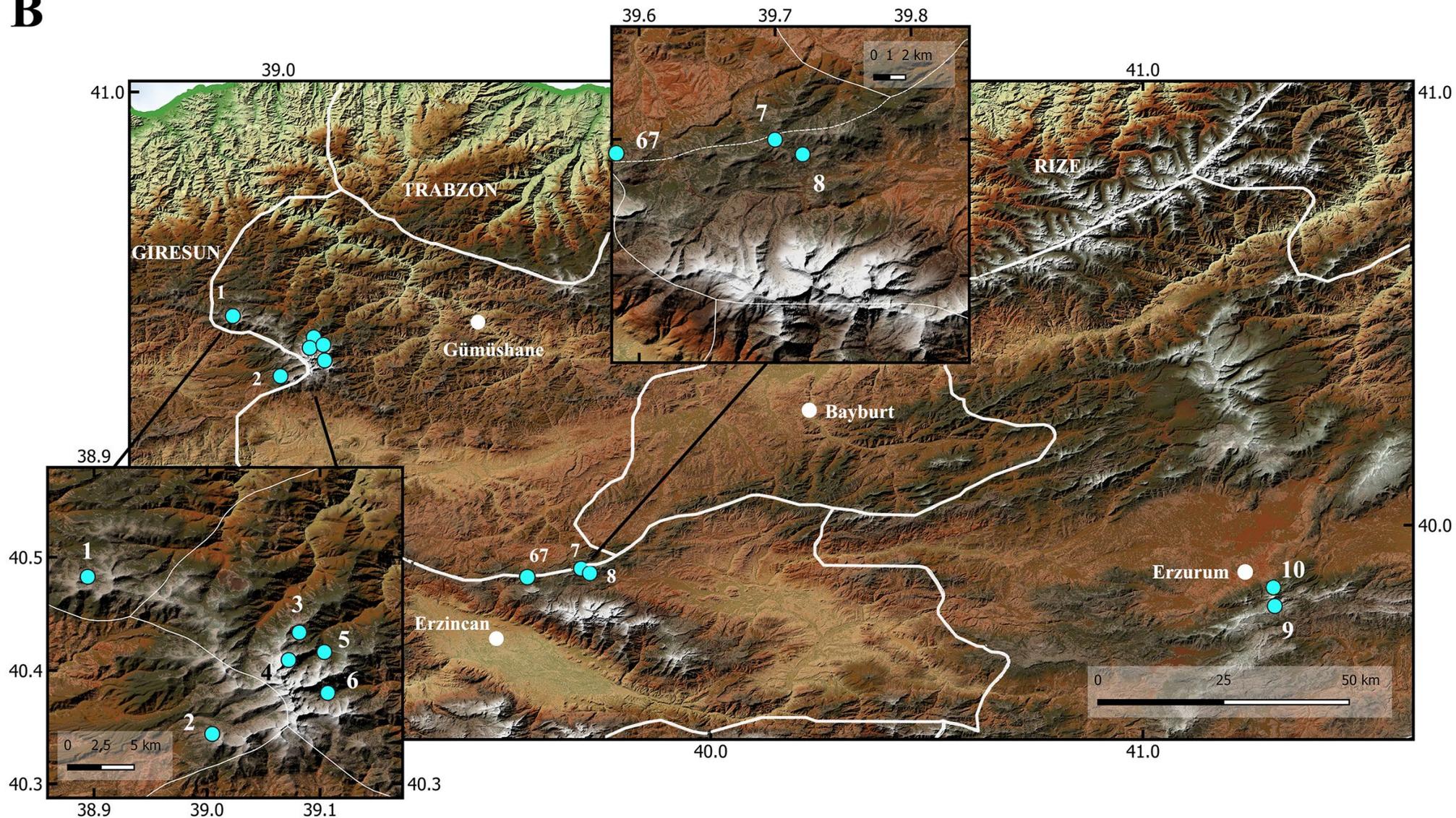
B

FIGURE 1B-inserted from main article. Distribution of Sako's Viper *Vipera darevskii sakoi* in the Gavur Mountains, including the currently westernmost record from Aksu Summer Village, Gümüşhane Province (locality-1) and Burgababa Tepe (locality-2) first record of Giresun Provinces, with a zoomed-in view in the lower inset. Upper inset shows a closer view of the type locality for *V. d. sakoi* at Çilhoroz, Erzurum Province. The far eastern locations refer to two Palandöken specimen in Erzurum Provinc (localities-9, -10). White dots indicate provincial capitals with same-named provinces, whereas additional provinces are labelled in capital letters.



FIGURE 2A-inserted from main article. Sako's Viper, *V. darevskii sakoi*; in **red** and **bold** individual IDs: (Above) type locality of *V. d. sakoi* (Tuniyev et al. 2018), Çilhoroz, Erzincan Province, Türkiye (localities-7 and -8). Due to the low number of rocks the vipers probably use the *Astragalus* spp. (left inset) subterranean root hole system and rodent tunnels in the ground as their principal retreat space. The very pointed spines of the *Astragalus* bushes likely serve the snakes as a well-protected basking/thermoregulation place against livestock grazing, exemplified by the still image of a Smooth Snake *Coronella austriaca* devouring a *V. d. sakoi* (**Vda163**) on top of an *Astragalus* with grazing sheep visible nearby. The clip was recorded 2 km north of the center of the background photo (right inset). (Landscape and *Astragalus* inset photographed by Konrad Mebert 2017, still image by Mert Yilmaz).

FIGURE 2B. (Below) two *Vipera d. sakoi* from the northern slope of Burgababa Tepe, Haşhaş Village, the first records from Giresun Province, Türkiye (locality-2; **Vda80** and **-81**). (Photographed by Konrad Mebert).



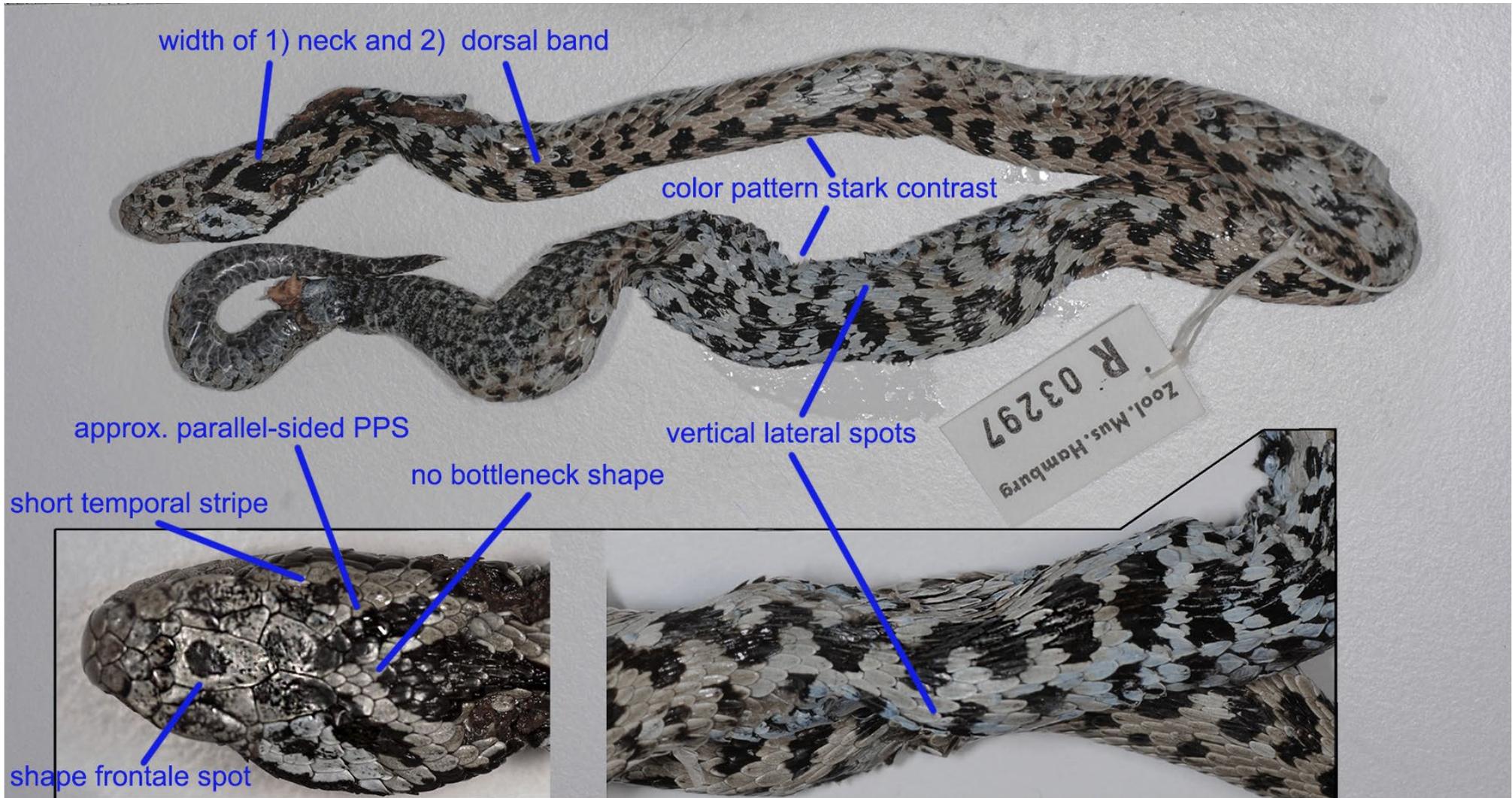
FIGURE 2B-inserted from main article. Legend see previous page.



FIGURE 3A-inserted from main article. Legend see next page.

FIGURE 3-inserted from main article. (Above) Mert Karış holding a young Sako's Viper (*Vipera d. sakoi*), same as in the left inset, from south of the summer village Aksu, Beytarla, near the Gümüşhane-Giresun Province border at the foot of the cliff in the background; in **red** and **bold** individual IDs: It represents the currently westernmost locality for *Vipera darevskii* (*sensu lato*; locality-1; **Vda94**). (Photographed by Konrad Mebert)

FIGURE 3B. (Below) *Vipera darevskii* collected on Palandöken Mt., Erzurum Province (locality-9; **Vda65**), originally described as *V. renardi eriwanensis* by Eiselt (1976). All evaluated external traits except for the shape of the frontal spot exhibit an expression typical for *V. darevskii*, and not *V. r. eriwanensis* (e.g., PPS = Post-Parietal-Stripes). (Photographed by Jakob Hallermann).



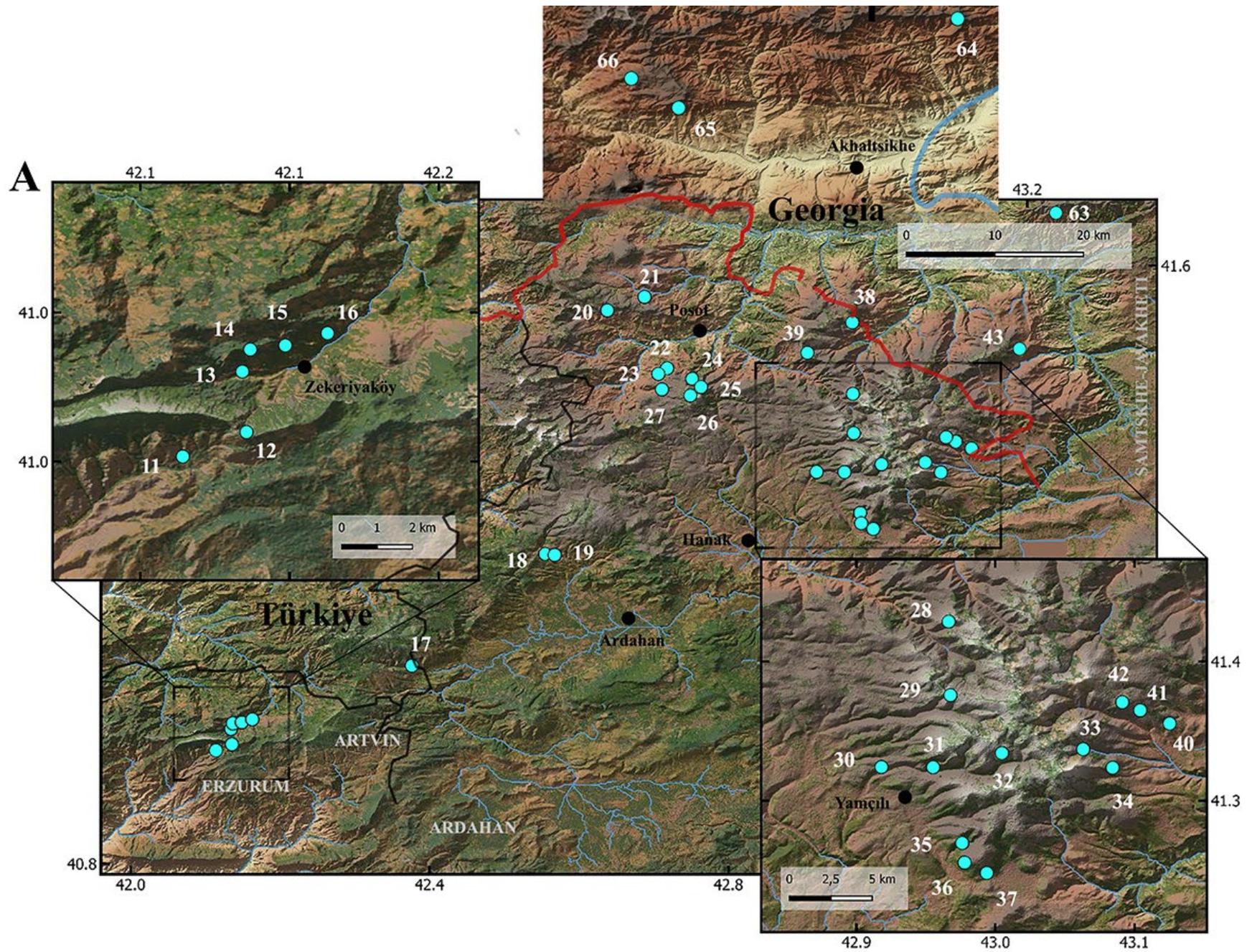


FIGURE 4A-inserted from main article. Distribution of Darevsky's Viper *Vipera d. darevskii* in northeastern Türkiye and a few near-border localities in Georgia. Insets show enlarged areas for the Zekeriya köy region, Artvin and Erzurum Provinces (left inset), Posof-Ilgar region (middle inset) and Kel Mountain (right inset), both in Ardahan Province. Red lines shows the country border, and black dots indicate cities or villages, with provinces labelled in grey capital letters.

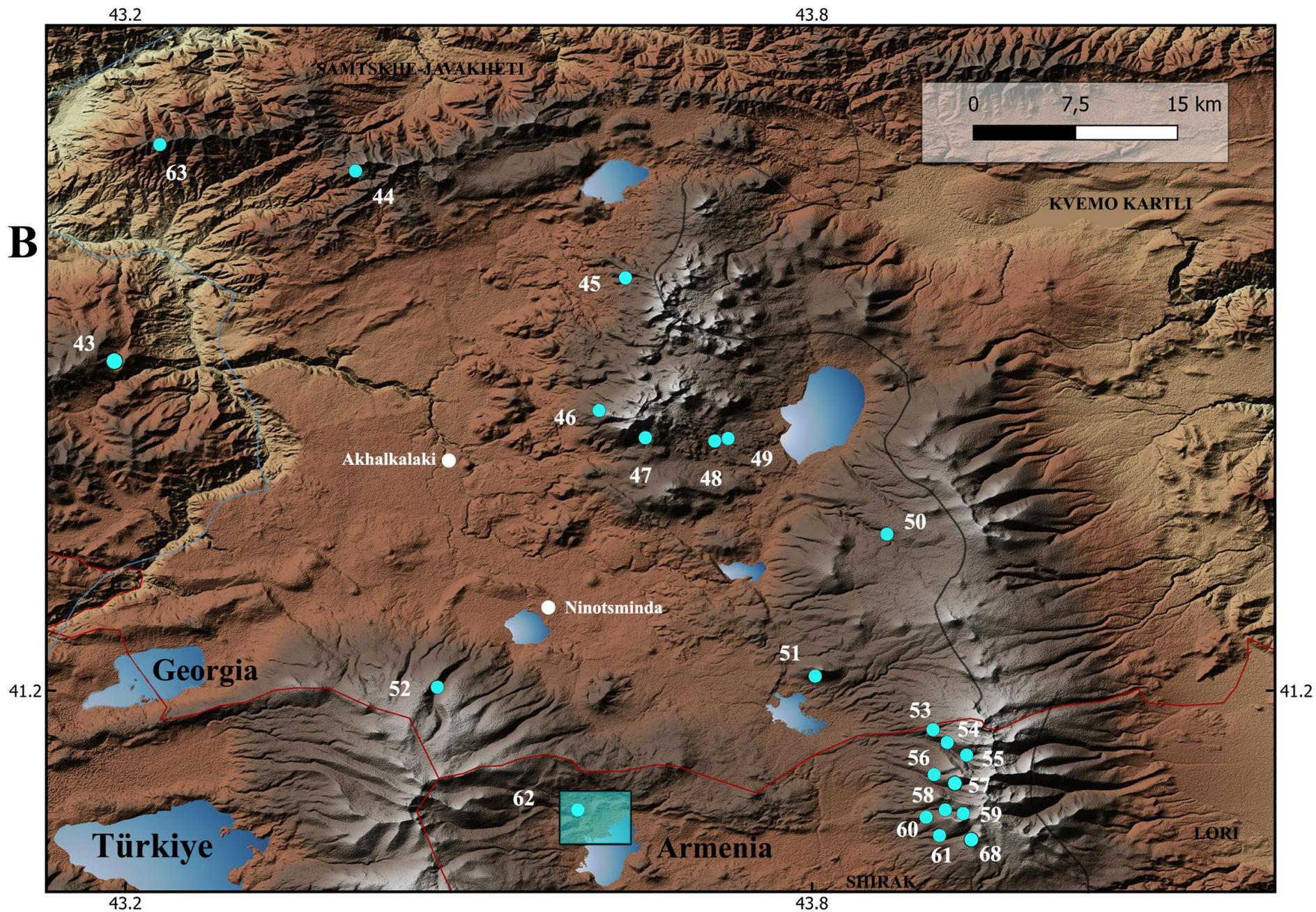


FIGURE 4B-inserted from main article. Distribution of Darevsky's Viper *V. d. darevskii* in the South Caucasus of southern Georgia and northwestern Armenia with the black broken lines showing the country borders. White dots indicate cities or villages and blue patches lakes. For locality-62 a light– blue 10x10 km grid cell replaces coordinates due to conservation related obscuring request by the National Academy of Sciences of the Republic of Armenia Scientific Center of Zoology and Hydroecology.



FIGURE 5A-inserted from main article. Wet alpine meadows with rock slides/accumulations represent the most typical habitat of Darevsky's Viper (*V. d. darevskii*; in **red** and **bold** individual IDs: (Above) Gandziskhevi River > 2,300 m elevation is the currently easternmost habitat for *V. d. darevskii* in Georgia, the most northern record in the Javakheti Mountain Range of Georgia and Armenia (locality-50; **Vda144**). (Photographed by Konrad Mebert).

FIGURE 5B-inserted from main article. (Below) south-facing slopes with alpine meadow and rock slides > 2,300 m elevation in the western part of the Trialeti Mountains, east of Aspindza, located between Kodiani and Shavi Klde mountains (locality-44; **Vda207**). Inset shows the skull (remainder of skeleton not visible) of *V. d. darevskii* discovered under a rock by Shota Zandukeli during our group search. Detailed information see for localities-44 and -63 in the list above. (Photographed by Konrad Mebert).

