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Results of a herpetological survey in the Province of Ağrı (East Anatolia, Turkey)

(Anura; Testudines; Squamata)

Ergebnisse einer herpetologischen Bestandsaufnahme in der Provinz Ağrı (Ostanatolien, Türkei)

(Anura; Testudines; Squamata)

MEHMET ZÜLFÜ YILDIZ & NAŞIT İĞCI & BAHADIR AKMAN & BAYRAM GÖÇMEN

KURZFASSUNG

Literaturrecherchen und Feldstudien in allen Gebieten der türkischen Provinz Ağrı ergaben, daß aus dem Untersuchungsgebiet drei Arten von Froschlurchen, zwei von Schildkröten und 16 Echsen- sowie 14 Schlangenarten bekannt sind. Die nachgewiesenen Arten und ihre in der vorliegenden Feldstudie festgestellten Fundorte sind in einer Karte, einer Tabelle und im Anhang angeführt. Vorkommen von *Mauremys caspica*, *Ablepharus bivittatus*, *Parvilacerta parva*, *Eremias pleskei*, *Xerotyphlops vermicularis*, *Natrix natrix*, *Coronella austriaca*, *Eirenis eiselti*, *Dolichophis jugularis*, *Dolichophis schmidti*, *Platyceps najadum* und *Montivipera wagneri* waren vor dieser Untersuchung aus der Provinz Ağrı nicht bekannt.

ABSTRACT

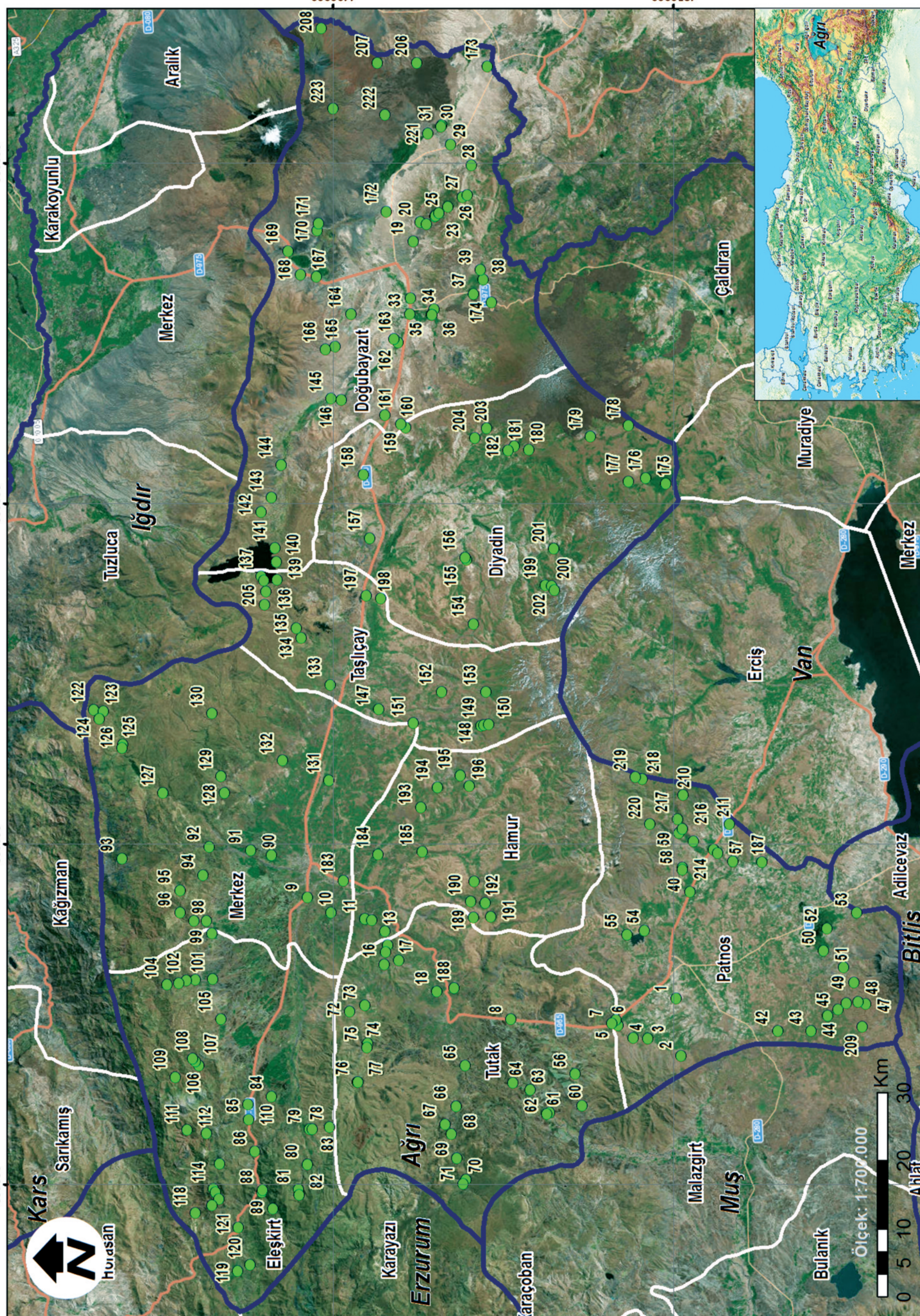
As a result of a literature survey and field studies covering all regions of the Turkish Province of Ağrı, the authors found the area inhabited by three anuran, two chelonian, 16 lizard and 14 snake species. The records and their locations are presented in a map, a table and an Appendix. In the field studies the present paper is based upon *Mauremys caspica*, *Ablepharus bivittatus*, *Parvilacerta parva*, *Eremias pleskei*, *Xerotyphlops vermicularis*, *Natrix natrix*, *Coronella austriaca*, *Eirenis eiselti*, *Dolichophis jugularis*, *Dolichophis schmidti*, *Platyceps najadum* and *Montivipera wagneri* were recorded for the first time in the Province of Ağrı.

KEY WORDS

Amphibia: Anura; Reptilia: Testudines, Squamata; herpetofauna, biodiversity, distribution, chorology, new provincial records, Province of Ağrı, Turkey

INTRODUCTION

Due to particular geographical features, both flora and fauna of Turkey are highly diverse, making this region part of the Mediterranean, Caucasian and Irano-Anatolian biodiversity hot-spots (MARCHESE 2015; AMBARLI et al. 2016). The herpetofauna of Turkey has been surveyed by numerous native and foreign researchers (e.g., BAŞOĞLU & BARAN 1977, 1980; BARAN & ATATÜR 1986; BAŞOĞLU et al. 1994; BARAN et al. 2004; BUDAK & GÖÇMEN 2008). New findings during the last decade show that the herpetofauna of Anatolia is still not fully explored (GÖÇMEN et al. 2007; YILDIZ et al. 2007; HÜR et al. 2008; GÖÇMEN et al. 2009; AFSAR & TOK 2011; AKMAN et al. 2013; GÖÇMEN et al. 2013a, 2013b, 2014; CIHAN & TOK 2014; TOK & ÇIÇEK 2014; İĞCI et al. 2015; AVCI et al. 2015; YILDIZ & IĞCI 2015; YILDIZ et. al. 2015; AKMAN et al. 2016; KUMLUTAŞ et al. 2017). Since published information regarding the herpetofauna of the Province of Ağrı (east Anatolia, Turkey) is very limited, the authors provide an updated herpetofaunal inventory demonstrating the herpetological diversity of this province.


Kars
Horasan
Sarıkamış
Kağızman
Karakoyunlu
Tuzluca
Iğdır
Aralık
Merkez
Doğubayazıt
Taşlıçay
Diyadin
Hamur
Tutak
Ağrı
Eleşkirt
Karayazı
Erzurum
Karaçoban
Patnos
Malazgirt
Muş
Bulanık
Ahlat
Bitlis
Adilcevaz
Erciş
Van
Muradiye
Çaldıran
Ölçek: 1:700.000
0 5 10 20 30 Km
800000
850000
900000
950000
4400000
4350000

MATERIALS AND METHODS

Four herpetological excursions (20 days in total) were conducted in the Province of Ağrı (11,376 km^2) in May, June, August and September 2014 to gather information on the amphibian and reptile species distribution. The area covers 99 grid units, each about 10.8 km x 13.9 km = 150 km^2 in size; at least one site in each unit was investigated. Field studies were conducted in wetlands, forests, steppes, dune and high mountain habitats, settlements and agricultural areas. The sites were selected by evaluation of satellite images or on-site assessment. A total of 223 localities between 1,462 and 2,792 m a.s.l were surveyed during the excursions (Fig. 1). The geographical coordinates of the observed species were identified using the geographical positioning device (GPD) Garmin Montana 650. Coordinates were recorded as latitude and longitude in decimal degrees and referenced to the World Geodetic System established in 1984 (WGS84). These localities are shown on the map in Fig. 1 and their coordinates were deposited in The Noah's Ark Biodiversity Database (< http://www.nuhungemisi.gov.tr/ >, April 20, 2018; The Republic of Turkey, Ministry of Forestry and Water Affairs, General Directorate of Nature Conservation and National Parks).

Reptiles and amphibians were identified during visual encounter surveys supplemented with turning rocks or caught by hand for detailed examination if necessary. Amphibians were additionally identified by calling surveys or caught using a scoop. In addition, opportunistic records were obtained, e.g., on the way while traveling. Photographs of the live animals were taken on site. After the examination and photographing, they were released at the same location where captured. The photographs of the animals and their habitats were taken using digital cameras (Nikon D80, Nikon D300s, Canon 550D) and lenses (S90 mm Macro, 70-300 mm, 18-105 mm and 50-500 mm).

Species were identified utilizing the publications by Başoğlu & Baran (1977, 1980), Leviton et al. (1992) and Baran & Atatür (1998). In the present paper the species are grouped into chorotype categories as proposed by Vigna Taglianti et al. (1999). Species endemic to Anatolia were categorized as Anatolian Endemic, one species was assigned to Armeno-E-Anatolian Endemic and main chorotypes were assigned to non-endemic species. In addition, the amphibian and reptile conservation status is indicated according to the International Union for Conservation of Nature and Natural Resources (IUCN), The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention).

RESULTS

A total number of three species of amphibians and 32 species of reptiles belonging to three orders and 12 families were recorded in the province Ağrı as a result of literature and field surveys. The list of species with the numbers of their localities, conservation status and related references are given in Table 1. *In situ* photographs of selected species are shown in Fig. 2. In summary, the study established the presence of three species of amphibians [Families: Bufonidae (1) and Ranidae (2)], two of chelonians (Families: Testudinidae and Geoemydidae), 16 of lizards [Families:

Fig. 1 (opposite page): Map showing the localities of the authors' field study in the Turkish Province of Ağrı. The numbering corresponds to the locality numbers in Table 1 and the Appendix.

Abb 1 (gegenüberliegende Seite): Karte mit den Fundorten der vorliegenden Felduntersuchung der Autoren in der türkischen Provinz Ağrı. Die Numerierung entspricht den Fundortnummern in Tabelle 1 und im Appendix.

Table 1 (this and opposite page): List of the amphibian and reptile species known to occur in the Turkish Province of Ağrı based on this study and bibliographic data. For each species, record localities of the present survey, status according to Bern Convention Appendix II or III (B), IUCN Red List of threatened species (I) and CITES (C) and selected references reporting the occurrence in Ağrı are given. CR – Critically Endangered, DD – Data Deficient, EN – Endangered, LC – Least Concern, NE – Not Evaluated, NT – Near Threatened, VU – Vulnerable.

Family / Species Familie/ Art	B	I	C	Localities / Fundorte	References / Nachweisquellen
Ranidae					
Pelophylax ridibundus	III	LC	-	1, 5, 8, 9, 10, 11, 12, 17, 18, 30, 31, 33, 35, 36, 38, 40, 52, 54, 57, 61, 65, 68, 69, 70, 71, 73, 75, 77, 78, 79, 83, 84, 91, 92, 94, 97, 98, 100, 101, 102, 103, 104, 113, 118, 119, 126, 127, 129, 130, 131, 132, 135, 137, 138, 139, 141, 143, 144, 145, 147, 148, 149, 150, 151, 156, 162, 163, 167, 175, 178, 183, 184, 185, 186, 187, 188, 190, 192, 197, 204, 211, 212, 213, 215, 216, 217, 221	Başoğlu et al. 1994; Baran & Atatür 1998; Budak & Göçmen 2008
Rana macrocnemis	III	LC	-	9, 11, 23, 24, 25, 27, 52, 61, 81, 117, 118, 130, 131, 136, 141, 147, 148,151, 153, 154, 161, 170, 175, 176, 178, 179, 180, 194, 197, 198, 199, 200, 201, 202, 204, 212	Başoğlu et al. 1994; Mulder 1995; Budak & Göçmen 2008
Bufonidae					
Bufotes variabilis	III	DD	-	2, 3, 5, 20, 27, 39, 40, 57, 58, 128, 130, 131, 137, 138, 140, 148,150, 151, 156, 174, 175, 177, 178, 181, 182, 183, 185, 194, 196, 198, 203, 204, 207, 208, 209, 210, 212, 214, 220, 222, 223	Başoğlu et al. 1994; Mulder 1995; Baran & Atatür 1998; Budak & Göçmen 2008
Testudinidae					
Testudo graeca	II	VU	II	2, 3, 72, 76, 78, 146, 148, 212, 214	Başoğlu & Baran 1977; Mulder 1995; Sindaco et al. 2000
Geoemydidae					
Mauremys caspica	II	NE	-	11, 30, 31, 54, 61, 65, 70, 73, 145, 146, 187, 192, 221	New record
Agamidae					
Paralaudakia caucasia	III	LC	-	2, 3, 19, 20, 21, 26, 34, 35, 36, 37, 39, 58, 59, 156, 168, 171, 172, 174, 208, 210, 214, 215, 217, 222, 223	Başoğlu & Baran 1977; Franzen & Sigg 1989; Mulder 1995; Sindaco et al. 2000
Phrynocephalus horvathi	III	CR	-	171, 172	New print published record. (Previously published in www.turkherptil.org as a photographical record)
Lacertidae					
Darevskia bendimahiensis	III	EN	-	Not observed during this survey	Schmidtler et al. 1994
Darevskia raddei	III	LC	-	96, 111, 113, 121, 183	Schmidtler et al. 1994; Budak & Göçmen 2008
Darevskia sapphirina	III	LC	-	213	Akman et al. 2016
Darevskia unisexualis	III	NT	-	186, 193	Schmidtler et al. 1994; Budak & Göçmen 2008; Arakelyan et al. 2013
Darevskia uzzelli	III	EN	-	Not observed during this survey	Schmidtler et al. 1994
Darevskia valentini	III	LC	-	39, 47, 125, 141, 150, 151, 177, 209	Schmidtler et al. 1994; Mulder 1995; Sindaco et al. 2000
Eremias pleskei	III	CR	-	169	New record
Eremias suphani	III	LC	-	19	Sindaco et al. 2000; Budak & Göçmen 2008; Rastegar-Pouyani et al. 2013

Tab. 1 (diese und gegenüberliegende Seite): Liste der aus der Türkischen Provinz Ağrı bekannten Amphibien- und Reptilienarten auf Grundlage der vorliegenden Untersuchung und von Literaturangaben. Für jede Art sind angegeben: Fundorte als Ergebnis der vorliegenden Arbeit, Status gemäß Berner Konvention Anhang II bzw. III (B), IUCN Rote Liste gefährdeter Arten (I) und CITES (C) sowie ausgewählte Literatur mit Nachweisen für Ağrı. CR – Critically Endangered, DD – Data Deficient, EN – Endangered, LC – Least Concern, NE – Not Evaluated, NT – Near Threatened, VU – Vulnerable.

Family / Species Familie/ Art	B	I	C	Localities / Fundorte	References / Nachweisquellen
Lacertidae					
Eremias strauchi	III	LC	-	29, 171, 172	Başoğlu & Baran 1977; Sindaco et al. 2000; Budak & Göçmen 2008
Lacerta media	III	LC	-	21, 93, 94, 95, 101, 103, 104, 156, 174, 187	Mulder 1995; Sindaco et al. 2000
Ophisops elegans	II	NE	-	2, 29, 42, 54, 72, 77, 78, 79, 84, 98, 99, 100, 160, 165, 166, 168, 173, 189, 206, 207, 208	Başoğlu & Baran 1977; Franzen & Sigg 1989; Budak & Göçmen 2008
Parvilacerta parva	II	LC	-	24, 26, 85, 110, 117, 166	New record
Scincidae					
Ablepharus bivittatus	III	LC	-	26	New record
Heremites auratus	III	LC	-	2	Başoğlu & Baran 1977; Franzen & Sigg 1989; Sindaco et al. 2000; Budak & Göçmen 2008
Boidae					
Eryx jaculus	III	NE	II	Not observed during this survey	Franzen & Sigg 1989
Colubridae					
Coronella austriaca	II	LC	-	118, 121	New record
Dolichophis jugularis	II	LC	-	2, 12, 78, 122	New record
Dolichophis schmidti	III	LC	-	2, 12, 56, 74, 78, 110, 156	New record
Eirenis collaris	III	LC	-	Not observed during this survey	Franzen & Sigg 1989; Teynié 1991
Eirenis eiselti	III	LC	-	2, 3, 14	New record
Eirenis modestus	III	LC	-	Not observed during this survey	Franzen & Sigg 1989
Hemorrhois ravergieri	III	LC		72	Başoğlu & Baran 1980; Teynié 1987, 1991; Mulder 1995; Sindaco et al. 2000; Budak & Göçmen 2008
Platyceps najadum	II	LC	-	213	New record
Typhlopidae					
Xerotyphlops vermicularis	III	LC	-	2, 58	New record
Natricidae					
Natrix tessellata	II	LC	-	10, 11, 35, 36, 38, 77, 119, 123, 124, 125, 127, 128, 129, 130, 131, 132, 143, 144, 145, 146, 148, 153, 156, 163, 170, 171, 176, 178, 183, 185, 186, 187, 188, 192, 197, 211, 216, 220, 221	Clark & Clark 1973; Başoğlu & Baran 1980; Teynié 1987; Franzen & Sigg 1989; Sindaco et al. 2000
Natrix natrix	III	LC	-	22, 137, 138, 139, 140, 141	New record
Viperidae					
Montivipera raddei	III	NT	-	Not observed during this survey	Nilson et al. 2009 (IUCN distribution map)
Montivipera wagneri	II	CR	II	2, 14, 15	New record

Agamidae (2), Scincidae (2), Lacertidae (12)] and 14 species of snakes [Families: Typhlopidae (1), Boidae (1), Natricidae (2), Colubridae (8), Viperidae (2)] for the Province of Ağrı.

Pelophylax ridibundus (Pallas, 1771), was the most common amphibian based on the number of record localities. However, *Rana macrocnemis* Boulenger, 1885, and *Bufotes variabilis* (Pallas, 1769), also occurred in more than 30 localities. *Testudo graeca* Linnaeus, 1758, was found in nine and *Mauremys caspica* (Gmelin, 1774) in 13 localities. Among lizards, *Paralaudakia caucasia* (Eichwald, 1831), *Ophisops elegans* Ménétries, 1832, *Darevskia valentini* (Boettger, 1892), and *Lacerta media* Lantz & Cyrèn, 1920, and from snakes, *Dolichophis schmidti* (Nikolsky, 1909), and *Natrix tessellata* (Laurenti, 1768), were common.

Among 35 herpetological species distributed in the Province of Ağrı, four [*Darevskia bendimahiensis* (Schmidtler, Eiselt & Darevsky, 1994), *D. sapphirina* (Schmidtler, Eiselt & Darevsky, 1994), *D. uzzelli* (Darevsky & Danielyan, 1977), and *Montivipera wagneri* (Nilson & Andrén, 1984)] are endemic to Anatolia.

According to the IUCN Red List criteria (< http://www.iucnredlist.org >, April 14, 2018), three species (*Phrynocephalus horvathi* Méhely, 1894, *Eremias pleskei* Nikolsky, 1905, and *M. wagneri*) are categorized Critically Endangered (CR), two (*D. bendimahiensis* and *D. uzzelli*) Endangered (EN), one [*Montivipera raddei* (Boettger, 1890)] is classified Near Threatened (NT) and another one (*Testudo graeca* Linnaeus, 1758) Vulnerable (VU). IUCN categories of the other species (Least Concern - LC or Not Evaluated - NE) are listed in Table 1.

All of the species are under protection according to the Bern convention appendices II and III (< https://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/104 >, April 14, 2018). However, only the trade of three species [*T. graeca*, *Eryx jaculus* (Linnaeus, 1758), and *M. wagneri*] is regulated according to CITES appendix II (< https:// www.cites.org >, April 14, 2018).

The amphibian and reptile species in the Province of Ağrı can be assigned to 12 chorotype categories (Table 2). The SW-Asiatic chorotype (48.57 %) is the dominant category which is represented by 17 species. The Turano-Mediterranean and Anatolian Endemics categories (11.42 %) are represented by four species each and the Turano-Europeo-Mediterranean chorotype (5.71 %) comprises two species. Other categories are represented by one species each.

Habitat loss is the major factor threatening the amphibian and reptile species in Ağrı province (authors' unpublished observations). Habitat loss/degradation is also considered to be the major factor threatening amphibians and reptiles globally (Cox et al. 2006).

DISCUSSION

Scanning the literature for herpetological species previously recorded in the Province of Ağrı resulted in three amphibian, one chelonian, 13 lizard and six snake species. Selected source references are given in Table 1 for each species. The authors' field studies resulted in twelve new species records for the province and raised the total number of herpetological taxa from 23 to 35. To the best of the authors' knowledge, the present paper summarizes the first published records of *M. caspica*, *E. pleskei*, *Parvilacerta parva* (Boulenger, 1887), *Ablepharus bivitattus* (Ménétries, 1832), *Coronella austriaca* Laurenti, 1768, *Dolichophis jugularis* (Linnaeus, 1758), *D. schmidti*, *Eirenis eiselti* Schmidtler & Schmidtler, 1978, *Platyceps najadum* (Eichwald, 1831), *Xerotyphlops vermicularis* (Merrem, 1820), *Natrix natrix* (Linnaeus, 1758) and *M. wagneri* in the Ağrı Province.

Ablepharus bivittatus, which was previously known from a limited number of localities in the Turkish Province of Van only (Ilgaz et al. 2007), was detected in locality no. 26 (Besler/Doğubayazıt) at 2,206 m elevation. A photograph of this

Table 2: Chorological classification of the amphibian and reptile species found in the Turkish Province of Ağrı according to the chorotype system by VIGNA TAGLIANTI et al. (1999).

Tab. 2: Die Zuordnung der aus der Türkischen Provinz Ağrı bekannten Amphibien- und Reptilienarten zu Chorotypen nach der Einteilung von VIGNA TAGLIANTI et al. (1999).

Chorotype	Amphibia	Reptilia	%	Species
SW-Asiatic	1	16	48.57	*Rana macrocnemis, Phrynocephalus horvathi, Eremias suphani, Eremias strauchi, Eremias pleskei, Lacerta media, Darevskia raddei, Darevskia unisexualis, Darevskia valentini, Ablepharus bivittatus, Heremites auratus, Dolichophis jugularis, Dolichophis schmidti, Eirenis collaris, Eirenis modestus, Eirenis eiselti, Montivipera raddei*
Turano-Mediterranean		4	11.42	*Testudo graeca, Mauremys caspica, Platyceps najadum, Xerotyphlops vermicularis*
Anatolian Endemic		4	11.42	*Darevskia bendimahiensis, Darevskia sapphirina, Darevskia uzzelli, Montivipera wagneri*
Turano-Europeo-Mediterranean	2		5.71	*Pelophylax ridibundus, Bufotes variabilis*
Centralasiatic		1	2.86	*Hemorrhois ravergieri*
Centralasiatic-European		1	2.86	*Natrix tessellata*
Centralasiatic-Europeo-Mediterranean		1	2.86	*Natrix natrix*
Mediterranean		1	2.86	*Eryx jaculus*
E-Mediterranean		1	2.86	*Ophisops elegans*
European		1	2.86	*Coronella austriaca*
Turanian		1	2.86	*Paralaudakia caucasia*
Armeno-E-Anatolian Endemic		1	2.86	*Parvilacerta parva*
Total	3	32	100	

species from the new locality was published by the authors on the Turkherptil website available at < http://www.turkherptil.org/gozlemDetay.asp?UyeId=1380&BilgiId=21125 > (April 20, 2018) soon after its discovery. *Darevskia sapphirina*, an Anatolian endemic lacertid species, was originally described from near the Van-Ağrı border (Erciş); no sites other than the type locality were reported prior to the present study in which new sites in the Van and Ağrı provinces were discovered and published (AKMAN et al. 2016). *Eremias pleskei* is a critically endangered species with a narrow distribution range. Its record from close to Ağrı Mountain (Mount Ararat) and the border to Iğdır province is the first from Ağrı. For *Phrynocephalus horvathi*, the present paper represents the first print published record in the Province of Ağrı. The species has been reported from the Turkish Province of Iğdır (BUDAK & GÖÇMEN 2008; TOSUNOĞLU et al. 2010) and from Ağrı as a photographic record on the Turkherptil web site available at < http://www.turkherptil.org/gozlemDetay.asp?UyeId=376&BilgiId=17465 > (April 20, 2018). *Eirenis eiselti* is distributed in eastern and southeastern Anatolia (GÖÇMEN et al. 2013a). The specimens reported from three sites in Ağrı are the first records for this province. Locality no. 14 between Ceylanlı and Otluca is the northernmost known site for *E. eiselti*. The records of *Coronella austriaca* at localities nos. 118 and 121, respectively, represent the first evidence of this north and northeast Anatolian snake in Ağrı. A prominent finding was the first record of *Montivipera wagneri* in Ağrı. This mountain viper endemic to Anatolia and previously known from a limited number of localities in the Provinces of Kars and Muş only (GÖÇMEN et al. 2014; MEBERT et al. 2015) is critically endangered. The authors observed *M. wagneri* at one site in Patnos (locality no. 2, Koçaklar Village, 1,684 m a.s.l.) close to the previously published record locality in Malazgirt (GÖÇMEN et al. 2014) and two sites in Tutak (localities no. 14 and 15, between Ceylanlı and Otluca, 1,866-1,882 m a.s.l.) extending its known

Fig. 2: Some amphibians and reptiles occurring in Ağrı. / Abb. 2: Einige Amphibien und Reptilien der Provinz Ağrı.
A – *Bufotes variabilis*, B – *Rana macrocnemis*, C – *Phrynocephalus horvathi*, D – *Eremias pleskei*, E – *Darevskia sapphirina*, F – *Ablepharus bivittatus*, G – *Eirenis eiselti*, H – *Montivipera wagneri* (Photos: M. Z. Yıldız & N. İğci).

distribution range 50 km air distance to the northeast of Malazgirt (Muş Province) locality. Photographic records of *P. parva* and *X. vermicularis* from the Ağrı province were posted on the Turkherptil website at < http://www.turkherptil.org/gozlemDetay.asp?UyeId=376&BilgiId=18236 >, < http://www.turkherptil.org/gozlemDetay.asp?UyeId=1380&BilgiId=21122 > (April 20, 2018) soon after their detection.

Based on their known distribution in the adjacent province of Iğdır, some other herpetological species are most likely to occur in the Province of Ağrı. *Pelobates syriacus* Boettger, 1889, widely distributed in Turkey, is known from Aralık (see http://www.turkherptil.org/gozlemDetay.asp?UyeId=376&BilgiId=18149 >, April 20, 2018). *Macrovipera lebetina* (Linnaeus, 1758) and *Malpolon insignitus* (Geoffroy De St-Hilaire, 1827), were recorded from the northwestern slope, and *Lacerta strigata* Eichwald, 1831, from the northern side of Ağrı Mountain by Mulder (1995) as was *Eumeces schneideri* (Daudin, 1802) by Ayaz et al. (2011). Interestingly, neither is the occurrence of members of the families Gekkonidae and Anguidae mentioned in the literature nor were any detected on the field surveys made during day and night, may be due to low population density and limited habitats.

Habitat loss is the major factor threatening the amphibian and reptile species in Ağrı province. Therefore, authorities must ensure that the local people are informed about the conservation of amphibians and reptiles and provide guidance for ecologically sustainable agriculture. The unique semi-desert habitat around Ağrı Mountain, which is a shelter for endangered species (e.g., *Phrynocephalus horvathi*, *Eremias pleskei*), deserves particular attention and should be protected by law.

According to recent studies, 27 amphibian and reptile species are known from the Province of Iğdır (Tosunoğlu et al. 2010) and 37 from the Province of Van (Yildiz et al. 2015), both adjacent of Ağrı. There are no such references on the herpetofaunas of the neighboring Provinces of Kars, Muş and Erzurum. The present study recorded 35 herpetological species thereby revealing the richness of the herpetofauna of Ağrı. The updated herpetofaunal inventory of the province adds 12 species to the known records providing a useful basis for further for conservation and monitoring studies.

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APPENDIX

Information about all the stations where the field studies were carried out. Altitudes in m a.s.l.

1: Yüncüler/Patnos, 1,625 m, 28.05.2014; 2: Koçaklar/Patnos, 1,684 m, 28.05.2014; 3: Çavuşköy/Patnos, 1,716 m, 28.05.2014; 4: Çavuşköy/Patnos, 1,659 m, 28.05.2014; 5: Suluca/Patnos, 1,667 m, 28.05.2014; 6: Between Patnos-Tutak/Patnos, 1,675 m, 28.05.2014; 7: Between Patnos-Tutak/Tutak, 1,676 m, 28.05.2014; 8: Oğlaksuyu/Tutak, 1,677 m, 28.05.2014; 9: Çukurçayır/Center (Merkez), 1,638 m, 29.05.2014;

10: Ağılbaşı/ Center (Merkez), 1,639 m, 29.05.2014; 11: Ceylanlı/Hamur, 1,620 m, 29.05.2014; 12: Ceylanlı/Hamur, 1,644 m, 29.05.2014; 13: Ceylanlı/Hamur, 1,815 m, 29.05.2014; 14: Between Ceylanlı-Otluca/Tutak, 1,882 m, 29.05.2014; 15: Between Ceylanlı-Otluca/Tutak, 1,866 m, 29.05.2014; 16: Between Ceylanlı-Otluca/Tutak, 1,962 m, 29.05.2014; 17: Otluca/Tutak, 1,851 m, 29.05.2014; 18: Yayıklı/Tutak, 1,615 m, 29.05.2014; 19: Doğubayazıt center/Doğubayazıt, 1,687 m, 30.05.2014;

20: Ishak Paşa Palace/Doğubayazıt, 1,943 m, 30.05.2014; 21: Ishak Paşa Palace/Doğubayazıt, 2,013 m, 30.05.2014; 22: Between Doğubayazıt-Yukarıtavla/Doğubayazıt, 2,151 m, 30.05.2014; 23: Between Doğubayazıt-Yukarıtavla/Doğubayazıt, 2,179 m, 30.05.2014; 24: Between Doğubayazıt-Yukarıtavla/Doğubayazıt, 2,249 m, 30.05.2014; 25: Yukarıtavla/Doğubayazıt, 2,306 m, 30.05.2014; 26: Besler/ Doğubayazıt, 2,206 m, 30.05.2014; 27: Besler/Doğubayazıt, 2,009 m, 30.05.2014; 28: Üzengili/ Doğu-bayazıt, 1,980 m, 30.05.2014; 29 Telçeker/ Doğubayazıt, 1,542 m, 30.05.2014;

30: Halaç (Ağrı Mountain)/-Doğubayazıt, 1,464 m, 30.05.2014; 31: Halaç (Ağrı Mountain)/Doğubayazıt, 1,466 m, 30.05.2014; 32: Yılanlı/Doğubayazıt, 1,657 m, 31.05.2014; 33: Yılanlı/Doğubayazıt, 1,675 m, 31.05.2014; 34: Ortadirek/Doğubayazıt, 1,736 m, 31.05.2014; 35: Ortadirek/Doğubayazıt, 1,754 m, 31.05.2014; 36: Ortadirek/Doğubayazıt, 1,734 m, 31.05.2014; 37: Karakent/Doğubayazıt, 1,789 m, 31.05.2014; 38: Çetenli/ Doğubayazıt, 1,829 m, 31.05.2014; 39: Çetenli/ Doğubayazıt, 1,875 m, 31.05.2014;

40: Değirmendüzü/Patnos, 1,746 m, 31.05.2014; 42: Doğansu/Patnos, 1,662 m, 26.06.2014; 43: Özdemir/ Patnos, 1,795 m, 26.06.2014; 44: Çatmaoluk/Patnos, 1,945 m, 26.06.2014; 45: Çatmaoluk/Patnos, 2,084 m, 26.06.2014; 46: Çatmaoluk/Patnos, 2,177 m, 26.06.2014; 47: Onbaşılar/Patnos, 2,357 m, 26.06.2014; 48: Güvercinli/ Patnos, 2,306 m, 26.06.2014; 49: Dizginkale/Patnos, 2,250 m, 26.06.2014;

50: Köseler/ Patnos, 1,789 m, 26.06.2014; 51: Kucak/Patnos, 2,098 m, 26.06.2014; 52: Sarıdibek/Patnos, 1,800 m, 26.06.2014; 53: Dağalan/Patnos, 1,870 m, 26.06.2014; 54: Aşağıgöçmez/Patnos, 1,720 m, 27.06.2014; 55: Yukarıgöçmez/ Patnos, 1,714 m, 27.06.2014; 56: Ocakbaşı/Tutak, 1,644 m, 27.06.2014; 57: Derecik/Patnos, 1,769 m, 27.06.2014; 58: Yeşilhisar/Patnos, 1,841 m, 27.06.2014; 59: Yukarıdamla/Patnos, 1,958 m, 27.06.2014;

60: Hacıyusuf/Tutak, 1,631 m, 27.06.2014; 61: Bozkaş/Tutak, 1,516 m, 27.06.2014; 62: Bozkaş/Tutak, 1,525 m, 27.06.2014; 63: Yukarıkargalık/Tutak, 1,551 m, 27.06.2014; 64: İkigözüm/Tutak, 1,537 m, 27.06.2014; 65: Esmer/Tutak, 1,547 m, 27.06. 2014; 66: Dönertaş/Tutak, 1,674 m, 27.06.2014; 67: Erdal/Tutak, 1,728 m, 27.06.2014; 68: Erdal/Tutak, 1,722 m, 27.06.2014; 69: Karacan/Tutak, 1,825 m, 27.06.2014;

70: Döşkaya/Tutak, 1,693 m, 27.06.2014; 71: Döşkaya/ Tutak, 1,941 m, 28.06.2014; 72: Kılıçgediği/Tutak, 2,027 m, 28.06.2014; 73: Kılıçgediği/Tutak, 1,846 m, 28.06. 2014; 74: Çırpılı/Tutak, 1,754 m, 28.06.2014; 75: Çırpılı/Tutak, 1,743 m, 28.06.2014; 76: Dibelek/Tutak, 1,807 m, 28.06.2014; 77: Dibelek/Tutak, 1,790 m, 28.06.2014; 78: Between Mızrak-Mollahüseyin/Eleşkirt, 1,941 m, 28. 06.2014; 79: Mollahüseyin/Eleşkirt, 1,832 m, 28.06. 2014;

80: Çetinsu/Eleşkirt, 1,954 m, 28.06.2014; 81: Çetinsu/ Eleşkirt, 2,149 m, 28.06.2014; 82: Çetinsu/Eleşkirt, 2,267 m, 28.06.2014; 83: Mollahüseyin/Eleşkirt, 1,830 m, 28.06.2014; 84: Süzgeçli/Eleşkirt, 1,841 m, 28.06.2014;

85: Ağrı-Erzurum road/Eleşkirt, 1,935 m, 28.06.2014; 86: Güneykaya/Eleşkirt, 1,935 m, 28.06.2014; 87: Road to Hayrangöl/Eleşkirt, 1,990 m, 28.06.2014; 88: Road to Hayrangöl/Eleşkirt, 2,217 m, 28.06.2014; 89: Road to Hayrangöl/Eleşkirt, 2,156 m, 28.06.2014;

90: Ozanlar/Center (Merkez), 1,667 m, 29.06.2014; 91: Aşağıyoldüzü/Center (Merkez), 1,674 m, 29.06.2014; 92: Aşağısaklıca/Center (Merkez), 1,720 m, 29.06.2014; 93: Dumanlı/Center (Merkez), 2,096 m, 29.06.2014; 94: Yukarısaklıca/Center (Merkez), 1,823 m, 29.06.2014; 95: Güvenli/Center (Merkez), 2,045 m, 29.06.2014; 96: Dedemaksut/Center (Merkez), 1,961 m, 29.06.2014; 97: Dedemaksut/Center (Merkez), 1,757 m, 29.06.2014; 98: Ahmetbey/Center (Merkez), 1,747 m, 29.06.2014; 99: Haydaroğlu/Eleşkirt, 1,716 m, 29.06.2014;

100: Goncalı/Eleşkirt, 1,785 m, 29.06.2014; 101: Goncalı/Eleşkirt, 1,744 m, 29.06.2014; 102: Between Goncalı-Akyumak/Eleşkirt, 1,803 m, 29.06.2014; 103: Between Goncalı-Akyumak/Eleşkirt, 1,850 m, 29.06.2014; 104: Between Goncalı-Akyumak/Eleşkirt, 1,964 m, 29.06.2014; 105: Toprakkale/Eleşkirt, 1,762 m, 29.06.2014; 106: Aşağıkopuz/Eleşkirt, 1,896 m, 29.06.2014; 107: Between Aşağıkopuz-Hasanpınarı/Eleşkirt, 1,924 m, 29.06.2014; 108: Hasanpınarı/Eleşkirt, 2,014 m, 29.06.2014; 109: Yukarıkopuz/Eleşkirt, 2,024 m, 29.06.2014;

110: Ağrı-Erzurum road/Eleşkirt, 1,858 m, 30.06.2014; 111: Çatkösedağ/Eleşkirt, 2,174 m, 30.06.2014; 112: Çatkösedağ/Eleşkirt, 2,021 m, 30.06.2014; 113: Türkeli/Eleşkirt, 2,225 m, 30.06.2014; 114: Between Türkeli-Tahir/Eleşkirt, 2,459 m, 30.06.2014; 115: Between Türkeli-Tahir/Eleşkirt, 2,449 m, 30.06.2014; 116: Between Türkeli-Tahir/Eleşkirt, 2,482 m, 30.06.2014; 117: Between Türkeli-Tahir/Eleşkirt, 2,325 m, 30.06.2014; 118: Tahir/Eleşkirt, 2,284 m, 30.06.2014; 119: Değirmengeçidi/Eleşkirt, 2,107 m, 30.06.2014;

120: Gökçayır/Eleşkirt, 2,285 m, 30.06.2014; 121: Karabacak/Eleşkirt, 2,060 m, 30.06.2014; 122: Ortakent/Center (Merkez), 2,280 m, 22.08.2014; 123: Ortakent/Center (Merkez), 2,255 m, 22.08.2014; 124: Ortakent/Center (Merkez), 2,273 m, 22.08.2014; 125: Aşağıkent/Center (Merkez), 2,299 m, 22.08.2014; 126: Aşağıkent/Center (Merkez), 2,076 m, 22.08.2014; 127: Ağrı-Kağızman road/Center (Merkez), 1,913 m, 22.08.2014; 128: Başçavuş/Center (Merkez), 1,804 m, 22.08.2014; 129: Başçavuş/Center (Merkez), 1,808 m, 22.08.2014;

130: Kovancık/Center (Merkez), 2,235 m, 22.08.2014; 131: Ballıbostan/Center (Merkez), 1,674 m, 23.08.2014; 132: Sarıdoğan/Center (Merkez), 1,744 m, 23.08.2014; 133: Balçiçek/ Taşlıçay, 1,853 m, 23.08.2014; 134: Yukarıtoklu/Taşlıçay, 2,312 m, 23.08.2014; 135: Yukarıtoklu/Taşlıçay, 2,335 m, 23.08.2014; 136: Tanyolu/Taşlıçay, 2,299 m, 23.08.2014; 137: Fish Lake (Balık Gölü)/Taşlıçay, 2,264 m, 23.08.2014; 138: Fish Lake (Balık Gölü)/Taşlıçay, 2,298 m, 23.08.2014; 139: Fish Lake (Balık Gölü)/Taşlıçay, 2,260 m, 23.08.2014;

140: Fish Lake (Balık Gölü)/Doğubayazıt, 2,262 m, 23.08.2014; 141: Fish Lake (Balık Gölü)/Doğubayazıt, 2,267 m, 23.08.2014; 142: Sarıbıyık/Doğubayazıt, 2,249 m, 23.08.2014; 143: Sarıbıyık/Doğubayazıt, 2,111 m, 23.08.2014; 144: Karaşeyh/Doğubayazıt, 1,867 m, 23.08.2014; 145: Dalbahçe/ Doğubayazıt, 1,741 m, 23.08.2014; 146: Between Dalbahçe-Yağmurdüşen/Doğubayazıt, 1,735 m, 23.08.2014; 147: Çökelge/Taşlıçay, 1,803 m, 24.08.2014; 148: Between Kağnılı-Gündoğdu/Taşlıçay, 2,230 m, 24.08.2014; 149: Between Kağnılı-Gündoğdu/Taşlıçay, 1,766 m, 24.08.2014;

150: Between Kağnılı-Gündoğdu/Taşlıçay, 2,294 m, 24.08.2014; 151: Gözucu/Taşlıçay, 1,892 m, 24.08.2014; 152: Yukarıdüzmeydan/Taşlıçay, 2,318 m, 24.08.2014; 153: Yankaya/Taşlıçay, 2,480 m, 24.08.2014; 154: Şahinşah/Diyadin, 2,366 m, 24.08.2014; 155: Günbuldu/ Diyadin, 2,104 m, 24.08.2014; 156: Günbuldu/Diyadin, 2,085 m, 24.08.2014; 157: Akyolaç/Diyadin, 1,973 m, 25.08.2014; 158: Yeniçadır/Diyadin, 1,924 m, 25. 08.2014; 159: Road to Aşağıtütek/Diyadin, 1,921 m, 25.08.2014;

160: Bulakbaşı/Doğubayazıt, 1,900 m, 25.08.2014; 161: Üçmurat/Doğubayazıt, 1,766 m, 25.08.2014; 162: Tanıktepe/Doğubayazıt, 1,723 m, 25.08.2014; 163: Tanıktepe/Doğubayazıt, 1,713 m, 25.08.2014; 164: Sağlıksuyu/Doğubayazıt, 1,625 m, 25.08.2014; 165: Kutlubulak/Doğubayazıt, 1,748 m, 25.08.2014; 166: Kutlubulak/ Doğubayazıt, 1,861 m, 25.08.2014; 167: Karabulak/Doğubayazıt, 1,542 m, 25.08.2014; 168: Karabulak/Doğubayazıt, 1,576 m, 25.08.2014; 169: Bardaklı (Ağrı Mountain)/Doğubayazıt, 1,536 m, 25.08.2014;

170: Örtülü (Ağrı Mountain)/Doğubayazıt, 1,520 m, 25.08.2014; 171: Örtülü (Ağrı Mountain)/Doğubayazıt, 1,525 m, 25.08.2014; 172: Topçatan (Ağrı Mountain)/Doğubayazıt, 1,527 m, 25.08.2014; 173: Sarıçavuş/Doğubayazıt, 1,462 m, 25.08. 2014; 174: Between Karakent-Aşağızorava/Doğubayazıt, 1,945 m, 26.08.2014; 175: Soğuksu/Diyadin, 2,374 m, 26.08.2014; 176: Dedebulak/Diyadin, 2,422 m, 26.08.2014; 177: Dedebulak/Diyadin, 2,594 m, 26.08.2014; 178: Atadamı/Diyadin, 2,373 m, 26.08.2014; 179: Atadamı/Diyadin, 2,581 m, 26.08.2014;

180: Between Atadamı-Taşkesen/Diyadin, 2,694 m, 26.08.2014; 181: Between Atadamı-Taşkesen/Diyadin, 2,523 m, 26.08.2014; 182: Between Atadamı-Taşkesen/Diyadin, 2,461 m, 26.08.2014; 183: Yolluyazı/Center (Merkez), 1,622 m, 27.08.2014; 184: Aşağıkarabal/Hamur, 1,667 m, 27.08.2014; 185: Civrik/Hamur, 1,812 m, 27.08.2014; 186: Yukarıgözlüce/Hamur, 1,910 m, 27.08.2014; 187: Çukurbağ/Patnos, 1,772 m, 09.09.2014; 188: Aşağıözdek/Tutak, 1,583 m, 09.09.2014; 189: Nallıkonak/Hamur, 1,987 m, 09.09.2014;

190: Nallıkonak/Hamur, 1,838 m, 09.09.2014; 191: Between Baldere-Aşağıderedibi/Hamur, 1,974 m, 09.09.2014; 192: Aşağıderedibi/Hamur, 1,848 m, 09.09.2014; 193: Alakoyun/Hamur, 1,966 m, 09.09.2014; 194: Karlıca/Hamur, 2,161 m, 09.09.2014; 195: Kandildağı/Hamur, 2,388 m, 09.09.2014; 196: Kandildağı/Hamur, 2,334 m, 09.09.2014; 197: Kumlubucak/Taşlıçay, 1,792 m, 10.09. 2014; 198: Kumlubucak/Taşlıçay, 1,874 m, 10.09.2014; 199: Karataş/Diyadin, 2,647 m, 10.09.2014;

200: Karataş/Diyadin, 2,682 m, 10.09.2014; 201: Gedik/Diyadin, 2,132 m, 10.09.2014; 202: Karataş/Diyadin, 2,792 m, 10.09.2014; 203: Yukarıtütek/Diyadin, 2,205 m, 11.09.2014; 204: Rahmankulu/Diyadin, 2,134 m, 11.09.2014; 205: Tanyolu/Taşlıçay, 2,503 m, 11.09.2014; 206: Iran border (restricted military zone)/Doğubayazıt, 1,569 m, 11.09. 2014; 207: Iran border (restricted military zone)/Doğubayazıt, 1,780 m, 11.09.2014; 208: Iran border (restricted military zone)/Doğubayazıt, 1,809 m, 11.09.2014; 209: Çiçek/Patnos, 2,176 m, 12.09. 2014;

210: Gündüz/Patnos, 2,529 m, 12.09.2014; 211: Meydandağı/Patnos, 1,873 m, 12.09.2014; 212: Derecik/Patnos, 1,774 m, 12.09.2014; 213: Derecik/Patnos, 1,796 m, 12.09.2014; 214: Yeşilhisar/Patnos, 1,796 m,

12.09.2014; 215: Ortadamla/Patnos, 1,911 m, 12.09.2014; 216: Yukarıdamla/Patnos, 1,848 m, 12.09.2014; 217: Yukarıdamla/Patnos, 1,917 m, 12.09. 2014; 218: Karabasan/Patnos, 2,539 m, 12.09.2014; 219: Karabasan/ Patnos, 2,555 m, 12.09.2014;

220: Karabasan/ Patnos, 2,249 m, 12.09.2014; 221: Yaygınyurt (Ağrı Mountain)/Doğubayazıt, 1,475 m, 13.09.2014; 222: Between Yaygınyurt-Güngören (Ağrı Mountain)/Doğubayazıt, 1,682 m, 13.09.2014; 223: Güngören (Ağrı Mountain)/Doğubayazıt, 2,648 m, 13.09.2014.

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